

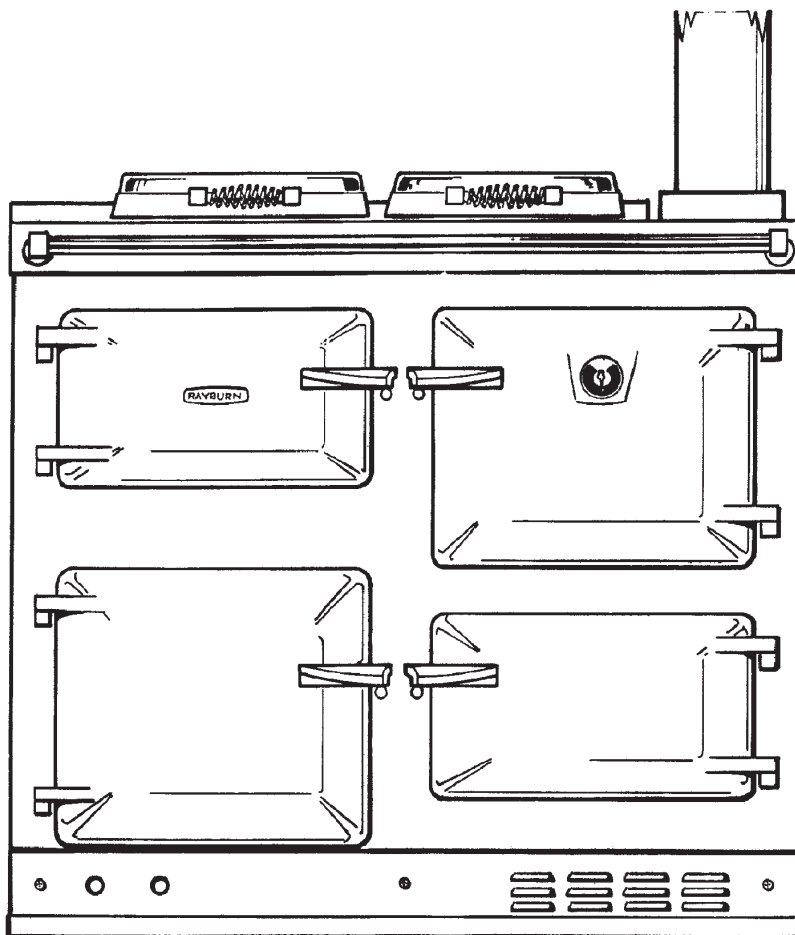


# Installation Instructions

from **AGA**

## Heatranger 440/460/480/499K

For use in GB and IE



DESN 512012 A

REMEMBER, when replacing a part on this appliance, use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by AGA.

**PLEASE READ THESE INSTRUCTIONS BEFORE INSTALLING THIS APPLIANCE**

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## Consumer Protection

As responsible manufacturers we take care to make sure that our products are designed and constructed to meet the required safety standards when properly installed and used.

### **IMPORTANT NOTICE: PLEASE READ THE ACCOMPANYING WARRANTY**

Any alteration that is not approved by AGA could invalidate the approval of the appliance, operation of the warranty and could affect your statutory rights.

### **Health & Safety**

This appliance may contain some of the materials that are indicated. 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**

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.

### **Kerosene and Gas Oil (mineral oils)**

1. The effect of mineral oils on the skin vary according to the duration of exposure.
2. The lighter fractions also remove the protective grease normally present on the surface of the skin. This renders the skin dry, liable to crack and more prone to damage caused by cuts and abrasions.
3. 'Oil acne' is recognised by the presence of skin rashes. The arms are most often affected but may occur where there is contact with oil or oily clothing.
  - Seek medical attention for any rash.
  - Avoid skin contact with mineral oil or clothing contaminated with mineral oil.
4. Inhalation of mineral oil vapours must be avoided. Never fire the burner in the open as unburnt oil vapours are likely to occur.
5. Use a suitable barrier cream which will give protection against mineral oil, lanolin based hand creams are usually very effective.
6. Never syphon mineral oils by use of the mouth. If accidentally swallowed, call a doctor, do not induce vomiting.

### **NOTE: SMOKE/SMELL EMITTED DURING INITIAL USAGE**

Some parts of the cooker have been coated with a light covering of protective oil. During initial operation of the cooker, this may cause smoke/smell to be emitted and is normal and not a fault with the appliance, it is therefore advisable to open doors and or windows to allow for ventilation. Lift the lids to prevent staining the linings.

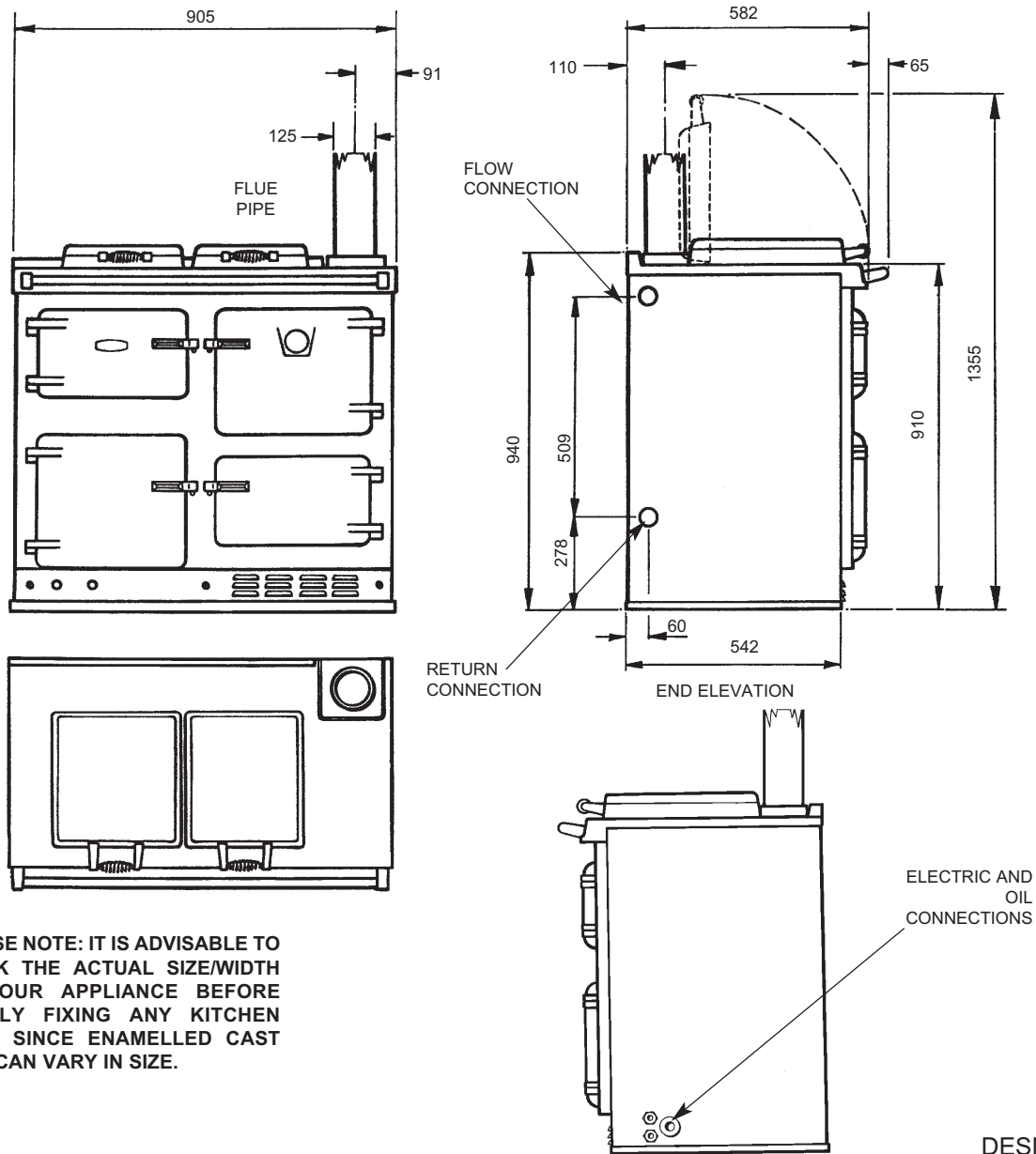


Fig. 2

DESN 512013

## GENERAL SPECIFICATIONS

### Boiler Water Connections

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

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

**Oil Inlet** 10mm copper  
To connect to the R.H. side panel.

**Electrical Supply** 230V ~ 50Hz 220/270 W  
3 Amp Fused

**Flue Outlet** 125mm

**CO<sub>2</sub>%** - BOILER 11.0-11.5  
- COOKER 11.0-11.5

**Max. Water Temp.** 82°C

**Water Capacity of Boiler** 11.5 litres

**Weight of Appliance** 395kg

**Max. Operating Pressure of Boiler** 2 bar (20m)

**Fuel -** Kerosene C2

## Technical Data

<b>440K</b>	BOILER BURNER	COOKER BURNER
BURNER NOZZLE (US g/h)	0.35 @ 60° H	0.35 @ 80° S
OIL PRESSURE Bar (psi)	8.5 (120)	8.5 (120)
OIL BURNING RATE cc/m	23.0	23.0
HEAT INPUT kW	14.2	14.2
BOILER OUTPUT kW	12.3	
TOTAL OUTPUT kW	12.5	3.1

<b>460K</b>	BOILER BURNER	COOKER BURNER
BURNER NOZZLE (US g/h)	0.55 @ 80° EH	0.40 @ 80° EH
OIL PRESSURE Bar (psi)	10 (145)	10 (145)
OIL BURNING RATE cc/m	38	28.5
HEAT INPUT kW	21.7	17.6
BOILER OUTPUT kW	17.5	
TOTAL OUTPUT kW	18.2	3.1

<b>480K</b>	BOILER BURNER	COOKER BURNER
BURNER NOZZLE (US g/h)	0.65 @ 80° EH	0.40 @ 80° EH
OIL PRESSURE Bar (psi)	10 (145)	10 (145)
OIL BURNING RATE cc/m	47.5	28.5
HEAT INPUT kW	29.3	17.6
BOILER OUTPUT kW	23.5	
TOTAL OUTPUT kW	24.7	3.1

<b>499K</b>	BOILER BURNER	COOKER BURNER
BURNER NOZZLE (US g/h)	0.85 @ 80° EH	0.40 @ 80° EH
OIL PRESSURE Bar (psi)	10 (145)	10 (145)
OIL BURNING RATE cc/m	58	28.5
HEAT INPUT kW	35.2	17.6
BOILER OUTPUT kW	29.3	
TOTAL OUTPUT kW	29.5	3.1

### INTRODUCTION

The Rayburn is a floor standing combined cooker and central heating boiler. It gives independent operation of space heating, domestic hot water and cooking.

The appliance is fired by two independent pressure jet oil burners. Either burner can be independently operated under the 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 limited to 2 bar.

#### IMPORTANT

- **This appliance must only be used with Kerosene C2 to BS 2869.**
- **An Indirect Cylinder to BS 1566: 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 BYPASS LOOP should be fitted. (See Fig. 18)**
- **An OFTEC approved Fire Valve MUST be fitted in the oil supply line.**
- **The supplied in line filter MUST be fitted.**
- **Permanent Ventilation must be provided.**

### REGULATIONS

**THIS APPLIANCE IS A CONTROLLED SERVICE BY DEFINITION AND REQUIRES EITHER FITMENT UNDER THE REMIT OF BUILDING CONTROL OR INSTALLATION BY AN OFTEC REGISTERED 105 TECHNICIAN (CLASSED AS A COMPETENT PERSON) WHO CAN SELF CERTIFY HIS OWN WORKS.**

The appliance must be commissioned by a competent or OFTEC approved engineer.

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

**BS5410** Installation of oil fired appliances for space heating and hot water supply purposes. Part 1 Boiler of rated output not exceeding 45kW.

**BS5449** 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** - Technical Booklet to Part L. Heat producing appliances.

**The Control of Pollution (Oil) Regulations.**

# Site requirements

## LOCATION

**Appliance Hearth:** The surface temperature of the floor below the appliance does not exceed 100°C. The constructional hearth described in Section J does not apply. However, this appliance must be installed on a solid floor 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".

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

Between wall or unit and LH side of appliance - 10mm top plate

Between wall or unit and RH side of appliance - 10mm top plate

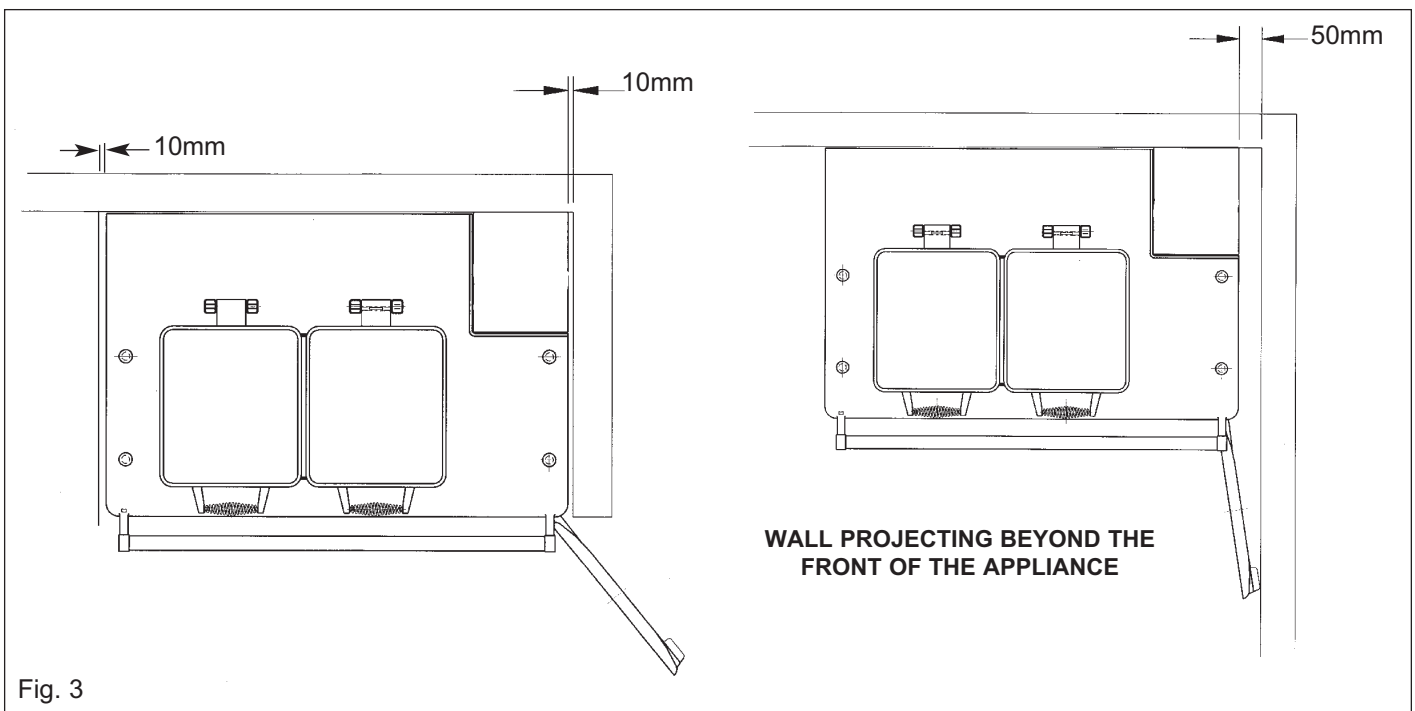
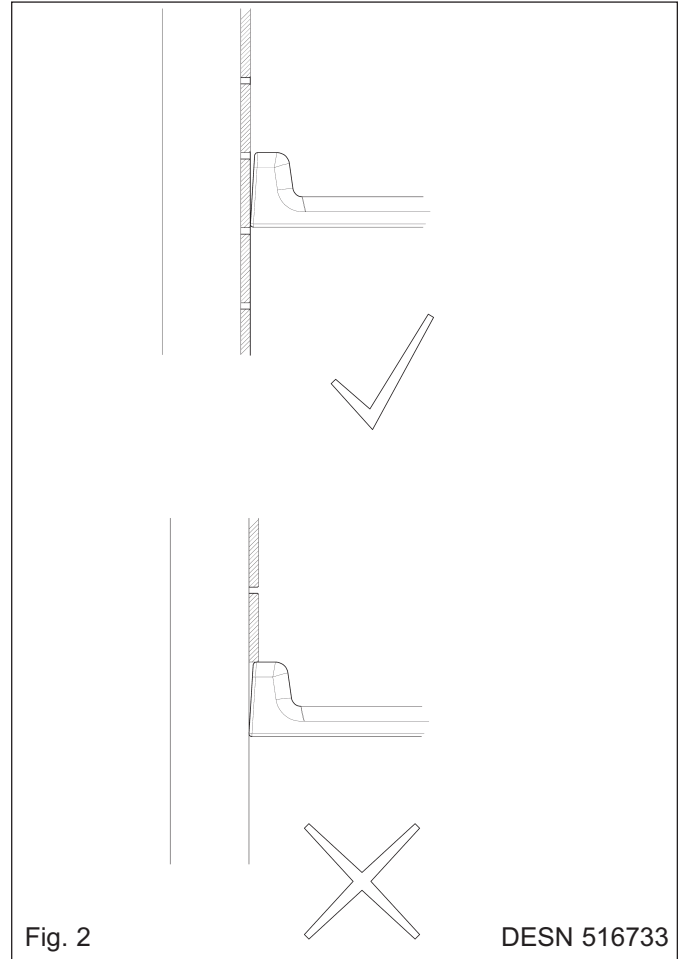
**SHOULD THE WALL PROJECT BEYOND THE FRONT OF THE APPLIANCE, IT MUST BE INCREASED TO 50mm (SEE FIG. 1). To allow door to open enough to change oven and shelf position.**

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. Flue pipes and fittings must not be closer than 25mm to combustible materials and where passing through a combustible partition such as ceiling or roof, must be enclosed in a non-combustible sleeve providing an air space of at least 25mm.

Space around the flue pipes passing through walls or floors should be sealed against the passage of smoke and flame. a fire stop must be provided where the flue passes through a ceiling.

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 COOKER TOP PLATE,** (See Fig. 2).



## OIL PIPE LINE

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

All pipework and fittings must be completely air tight. Only oil resistant compounds and PFTE 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 OFTEC approved fire valve operating at 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 sensing bulb of the fire valve MUST be fitted to the clips located on the L.H. side of the appliance. See Fig. 5.**

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

A flexible pipe connection, approximately 1000mm long, is supplied to fit between the oil supply pipe and the oil pump for ease of burner removal. This must be contained within the appliance.

Where the oil pipe connection is taken out at 90° from the cooker a special elbow fitting is supplied loose with the cooker.

## OIL STORAGE

The minimum recommended oil tank size is 1400 litres and the code of practice governing its installation are covered by BS 5420: Part 1. Mild Steel tanks should be to BS 799: Part 5 and plastic tanks to OFTEC Standard OFS T100.

### TWO PIPE SYSTEM KIT

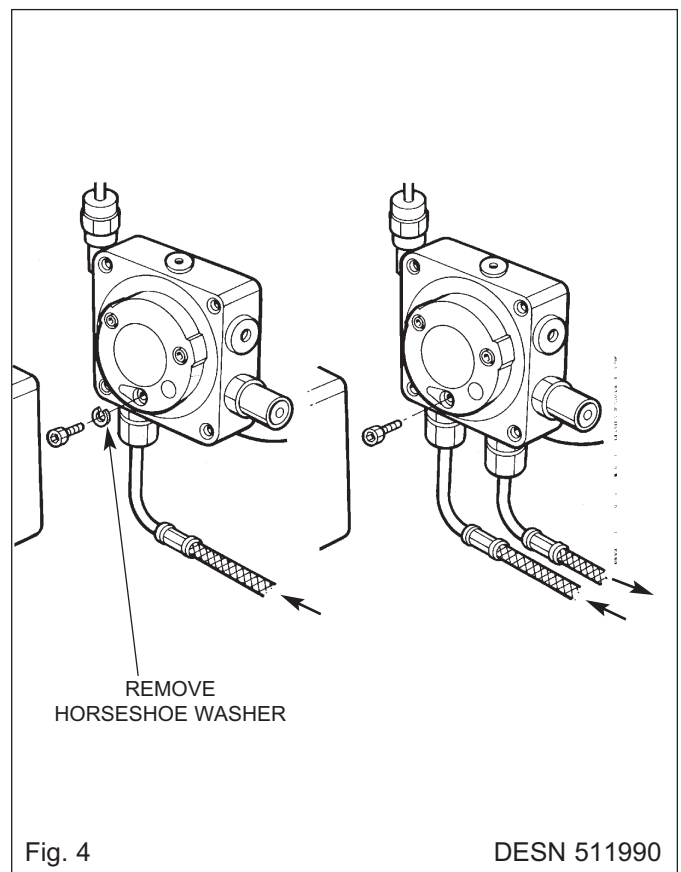
A kit is available for a two pipe system (optional extra).

Part No: RO9M 998550

CAT No: R4613

The kit is made up of the following parts:

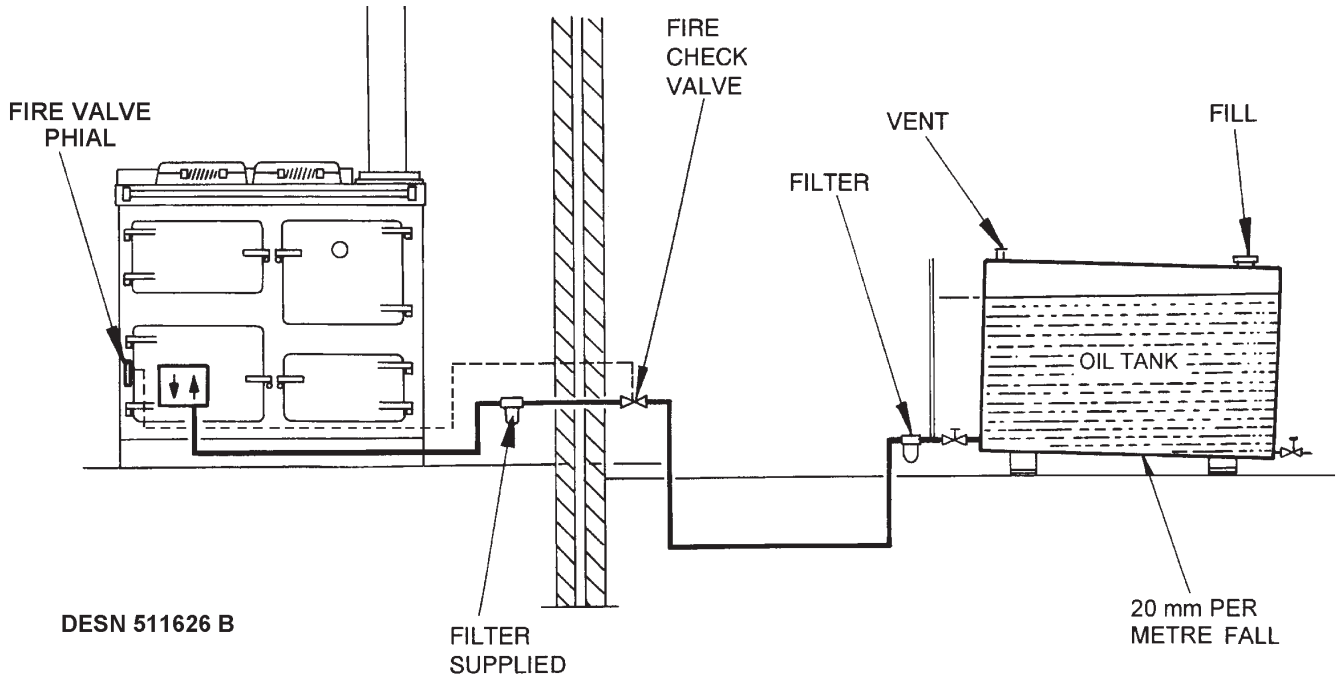
- Bulkhead Fitting
- Flexi Hose
- Return Oil Nipple
- Two Pipe System Fitting Instruction -





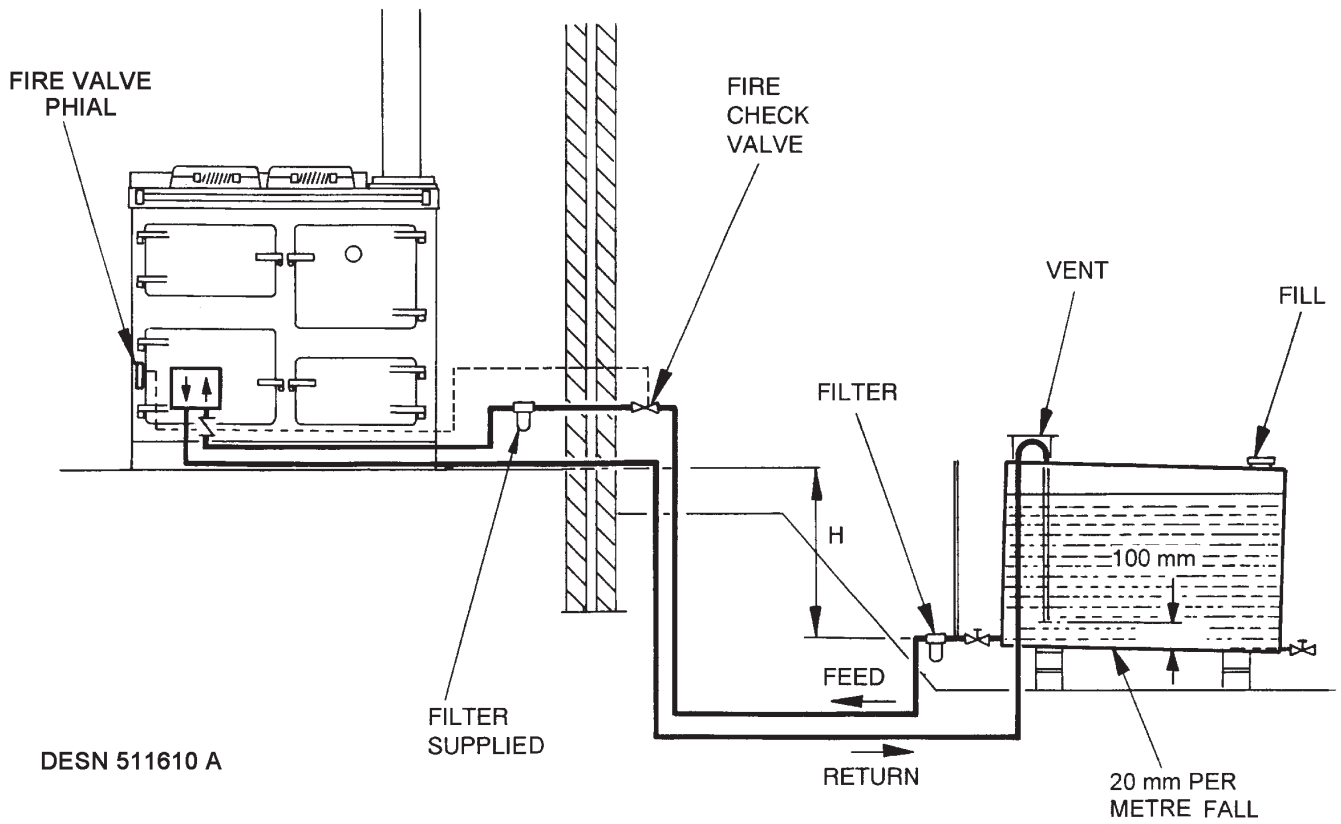
# Site requirements

## GRAVITY SINGLE FEED PIPE SYSTEM



DESN 511626 B

## SUCTION LIFT TWO-PIPE SYSTEM



DESN 511610 A

REFER TO INSTRUCTION SHEET FOR DETAILS ON FITTING TWO-PIPE SYSTEM

	H METRES	0	0.5	1.0	1.5	2.0	2.5	3.0
MAXIMUM LENGTH (METRES)	10mm OD	35	30	25	20	15	8	6
	12mm OD	100	100	100	90	70	30	20

Fig. 5

## FLUE SYSTEM

The flue system must be installed in accordance with the regulations in force.

### Information

Maximum flue gas temperature 260°C

(Both burners on)

Minimum flue gas temperature 125°C

(Boiler burner on only)

The appliance requires a minimum chimney draught of 1.0mm (0.04 WG) with both burners on.

Maximum chimney draught 6.0mm (0.23" WG) draughts in excess of this figure will require a draught stabiliser, fitted either in the chimney or flue pipe and in the same compartment.

Flue gas mass flow (Both burners on) - 440K

460K - 111.5 kgh<sup>-1</sup>

480K - 95.5 kgh<sup>-1</sup>

499K - 185 kgh<sup>-1</sup>

Detailed recommendations for flueing in England and 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.

Due to the range in flue gas temperatures a brick chimney should be fitted with a suitable stainless steel flexible liner. Where it is necessary to avoid condensation, such as an exposed end gable, the lining may be wrapped with a proprietary insulating blanket.

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

### 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 heating season.

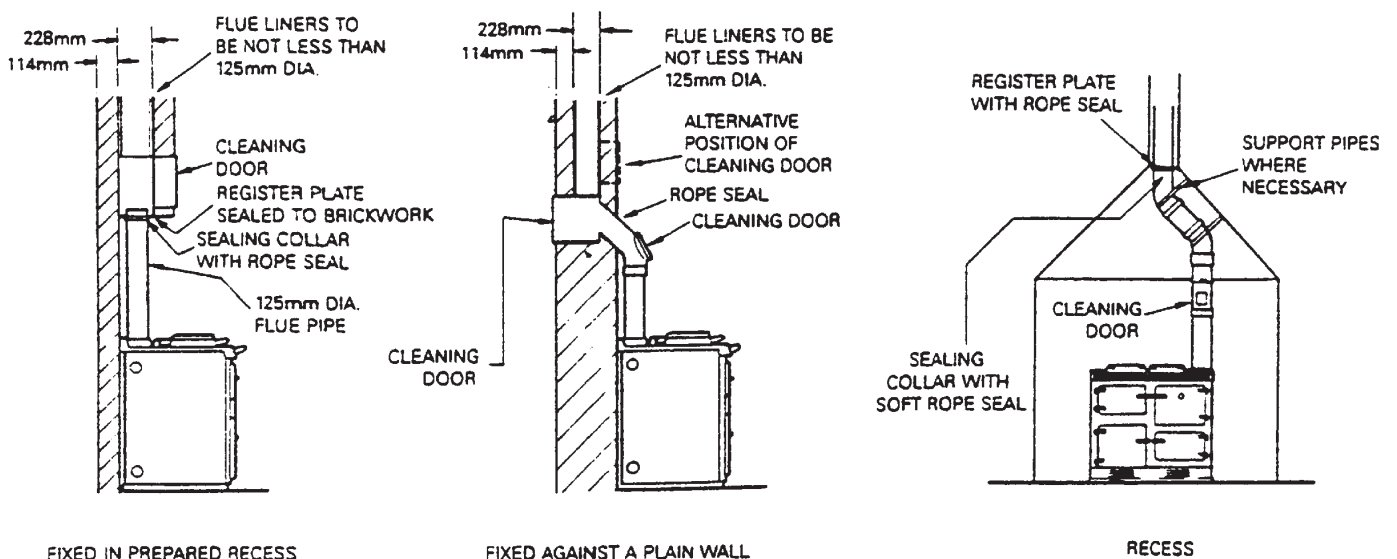


Fig. 6

DESN 510521'A'

## Site requirements

### AIR SUPPLY

The appliance can only be installed in a room which meets the ventilation regulations in force. But, in any event the room must have a permanent vent of minimum free air area, see below.

MODEL	MIN. AIR REQUIREMENT
440K	127 cm <sup>2</sup>
460K	147 cm <sup>2</sup>
480K	180 cm <sup>2</sup>
499K	211 cm <sup>2</sup>

**IMPORTANT: THE LOUVERED AIR INTAKE AT THE BOTTOM FRONT OF THIS APPLIANCE MUST BE KEPT CLEAR OF ANY OBSTRUCTIONS.**

### 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 appliance has to comply with the Building Regulations and with BS 5410: Part 1. The air supply requirement for oil fired appliance is 550mm<sup>2</sup> per kW of maximum rated output above 5 kW. 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 the resistance to air flow.

4. The ventilation requirement for kitchens in Part F of the Building Regulations (England & Wales) 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. The amount can be reduced if the 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 extract rate of one air change per hour or by having ventilation openings of not less than 4000mm<sup>2</sup>.

5. Extract fan 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 the combustion air from a garage.

### WATER CIRCULATION SYSTEM

Flow and return pipework between cooker diverter valves must be 28mm diameter minimum.

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 should not be situated in areas which may be exposed by 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 1/2in 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 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 sized to suit the boiler pressure loss and therefore adequate to give the required temperature differential between the flow and return.

The pump should be able to meet the requirements of the system design and fitted in a readily accessible position.

#### **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 of pump without draining the system.

#### **Inhibitor**

A corrosion inhibitor **MUST** be added to the heating system to protect the heat exchanger and pipework. Inhibitor must also be replaced if the system is drained after installation. As a precaution the heating system **MUST** also be flushed out prior to the addition of the inhibitor to ensure any flux, debris is removed.

## Site requirements

### HEATING CONTROLS

Internal temperature and time controls are supplied. These provide control of cooking and hot water temperatures. The cooker is supplied with 2-channel programmer.

Channel 1 - 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 (if external controls are fitted).

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.

Consideration should be given to fitting a frost thermostat switch should be set to operate at a temperature of approximately 4°C.

Consideration must be given when selecting 3 port mid-position or 2 port zone valves.

It is essential that the capacity of the individual valves is considered to enable the correct size to be chosen.

For this range of appliance, where Honeywell valves are selected, a guide to selection is as follows:-

Model:-

440K, 22mm (3/4")	2 or 3 port
460K, 22mm (3/4")	2 or 3 port
480K, 28mm (1")	2 or 3 port
499K, 28mm (1")	2 port only

3 Port Mid Position valves are inappropriate for selection with the 499K model.

### TIMING CONTROLS

The latest publication of Part L of the Building Regulations states that "separate timing controls should be provided for space heating and water heating".

The 400 Series cookers/boilers are fitted with a 2 channel programmer.

Channel 1 controls the cooking facility.  
Channel 2 controls the boiler facility which is space heating and water heating combined.

To meet the new Building Regulations, the space heating and water heating functions must have individual timing controls, therefore we recommend the fitting of an auxiliary programmable room thermostat to control space heating timings and use channel 2 on the appliance programmer to control the hot water.

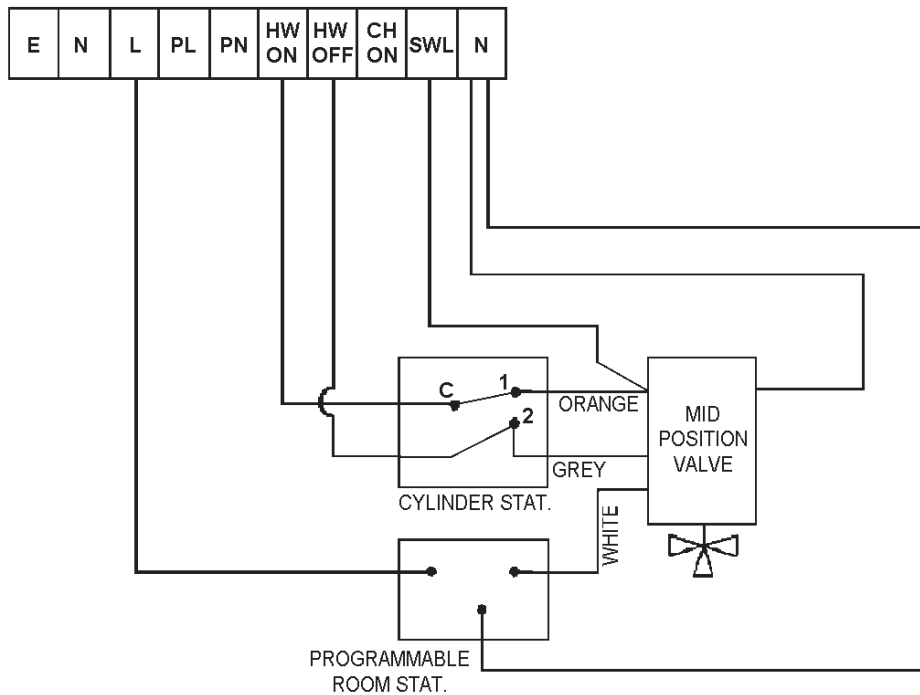
**WARNING: POWER TO THE APPLIANCE AND AUXILIARY CONTROLS i.e. PROGRAMMABLE ROOM STAT MUST BE VIA THE SAME ISOLATION SWITCH.**



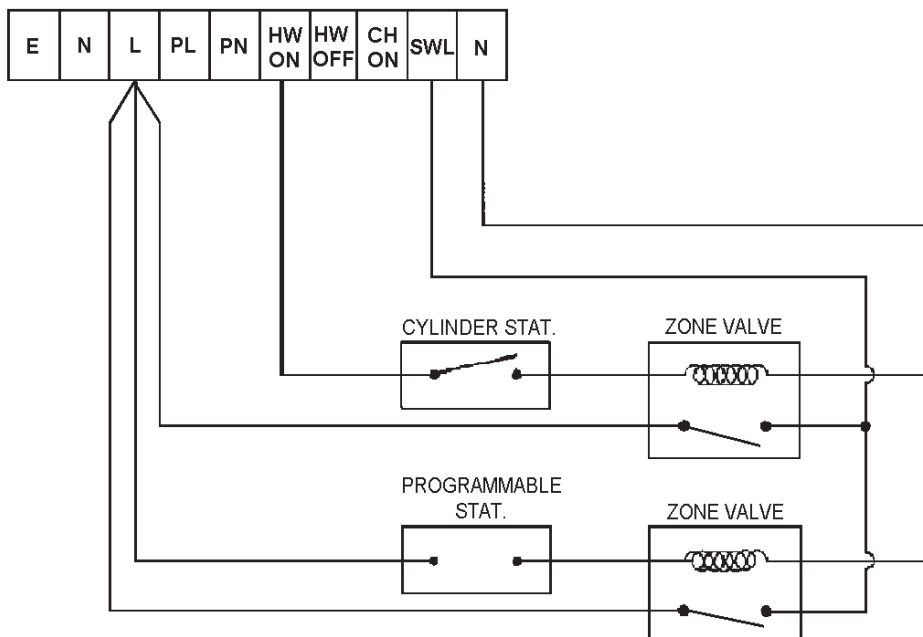
**440/460/480/499K - EXTERNAL CONTROLS**

**WIRING USING HONEYWELL 3 PORT MID-POSITION VALVE  
FOR USE WITH 440, 460 & 480 MODELS**

IF THIS OPTION IS TAKEN, PLEASE ENSURE THAT THE OWNERS IS  
MADE AWARE OF THE REVISED METHOD OF CONTROL AND THE  
NEED TO DISREGARD THE INTERNAL HTG/DHW PRIORITY SWITCH



**WIRING USING HONEYWELL N.C. MOTORISED 2 PORT ZONE VALVES  
FOR USE WITH 440, 460, 480 & 499 MODELS**



## Site requirements

### ELECTRICAL SUPPLY

Wiring external to the appliance must be installed in accordance with current National Wiring Regulations and any local regulations which apply. The appliance is supplied for 230 Volt ~ 50 Hz 220/270W a fuse rating of 3 amps. The method of connection to the mains supply should facilitate complete 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 0.75mm<sup>2</sup> (24 x 0.2mm) to the relevant standard.

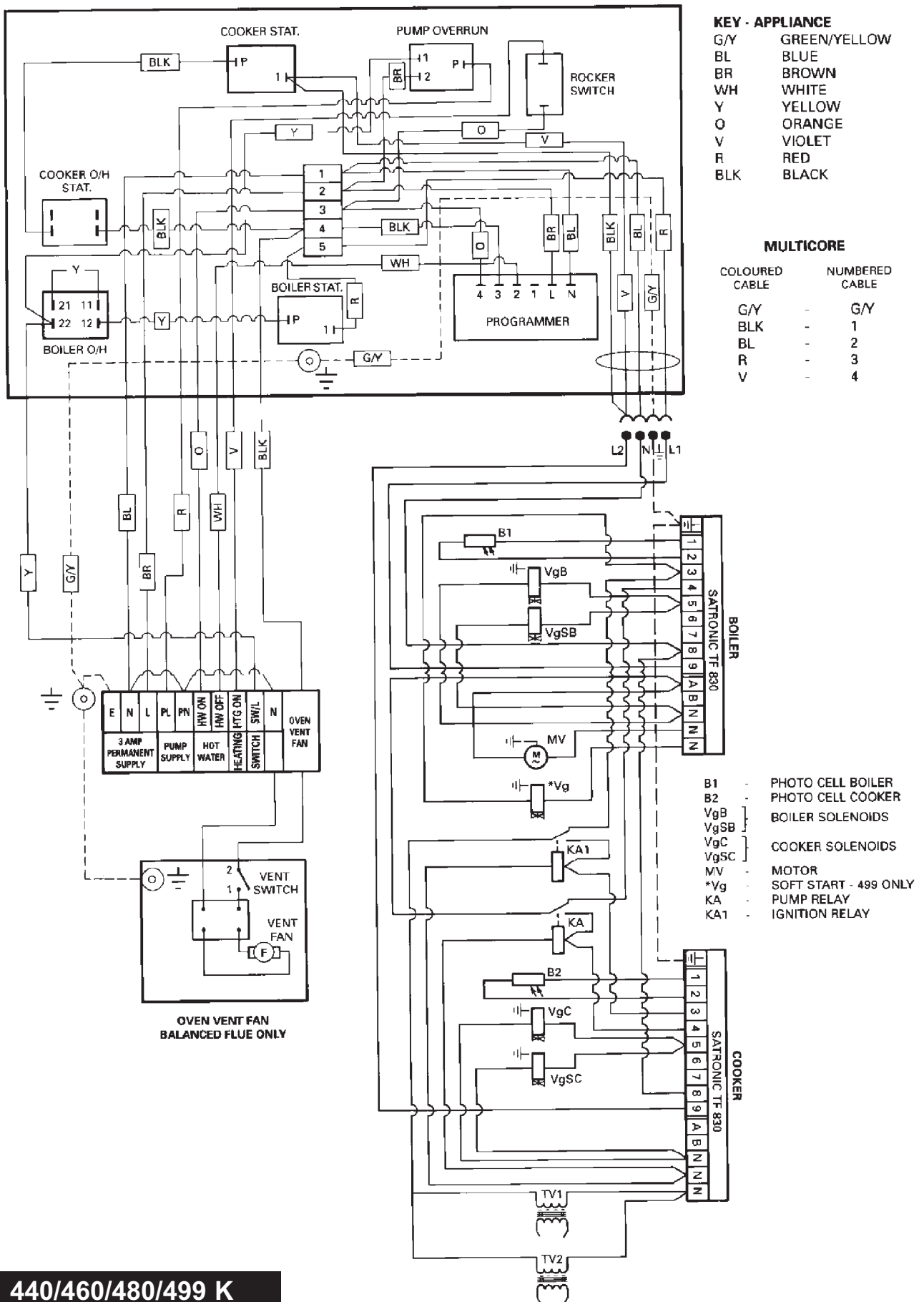
#### **WARNING: THIS APPLIANCE MUST BE EARTHED**

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

For wiring instructions, see wiring diagrams.

The circulating pump must be connected to PL and PN on the terminal block (see Fig. 8) and the cables clamped and passed through the grommet in the right hand side panel.

NOTE: The 3 amp fuse rating takes into account any auxiliary components used. In most central heating systems i.e. circulation pump, zone valves, Aga recommend that only CE marked equipment is used in conjunction with this appliance.



**440/460/480/499 K**

Fig. 8



## Installation requirements

### CLEARANCES

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

Between wall or unit and LH side of appliance - 10mm  
top plate

Between wall or unit and RH side of appliance - 10mm  
top plate

**SHOULD THE WALL PROJECT BEYOND THE FRONT OF THE APPLIANCE, IT MUST BE INCREASED TO 50mm (See Fig. 3). To allow door to open enough to change oven and shelf position.**

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.

The inlet elbow.

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. 9. 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 with fitted endcaps into the brackets, positioning them correctly, and tighten the locating bolts. (Fig. 10).

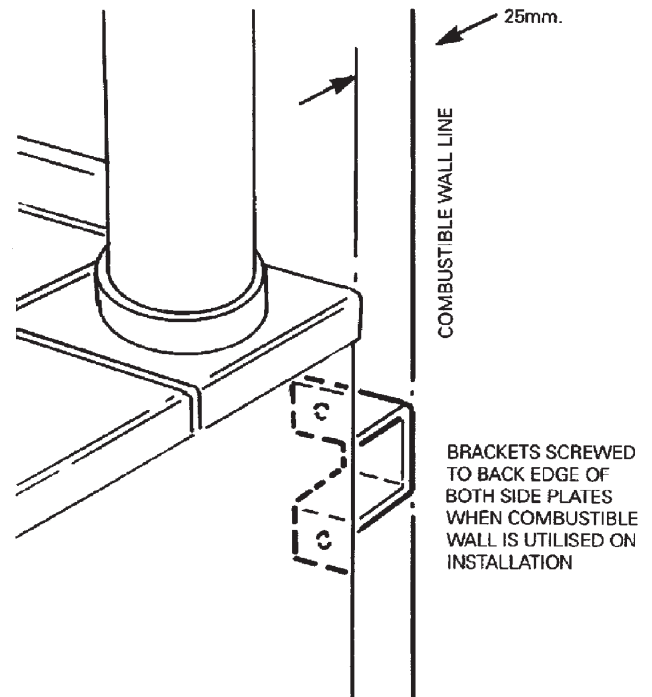


Fig. 9

DESN 510226

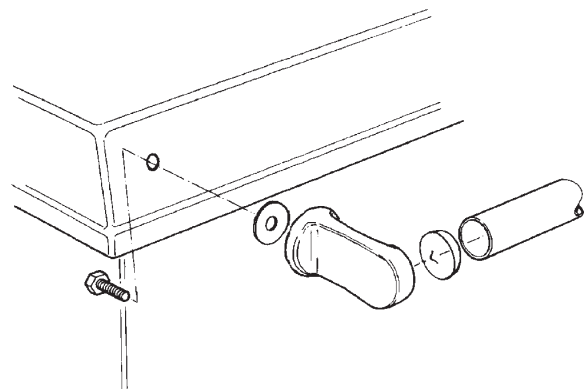


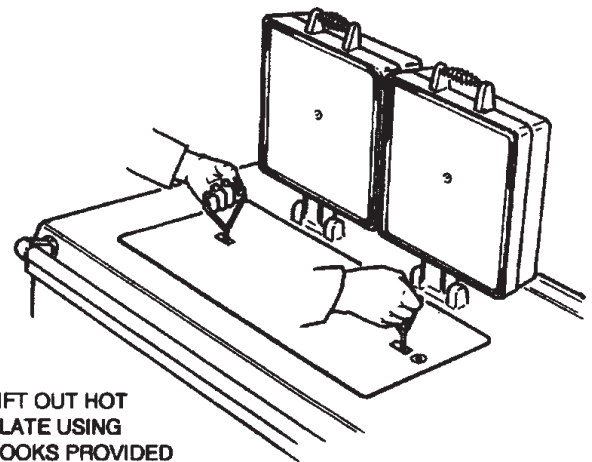
Fig. 10

DESN 510454 A

## SITE LOCATION

SEE FIG. 11 & 12

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 the regulations in force.
4. Lift up the insulating covers and remove the hotplate using lifting hooks provided (See Fig. 11).



LIFT OUT HOT  
PLATE USING  
HOOKS PROVIDED

Fig. 11

DESN 510523

5. Remove the 4 flue cleaning access door securing bolts and remove door.
6. Check the position of the boiler flueway baffles.
7. Replace door and refit bolts.

### NOTE:

The baffles are assembled in alternate directions, to allow gases to flow front to back through the assembly.

Each heat exchanger has two rows of baffles (See Fig. 12A).

Ensure that the baffles are having the top and bottom plates of the same width and marked **TOP** are fitted last. One at top of each flueway.

Total number of baffles fitted:-

440 = 6	(2 x 3)
460 = 6	(2 x 3)
480 = 8	(2 x 4)
499 = 10	(2 x 5)

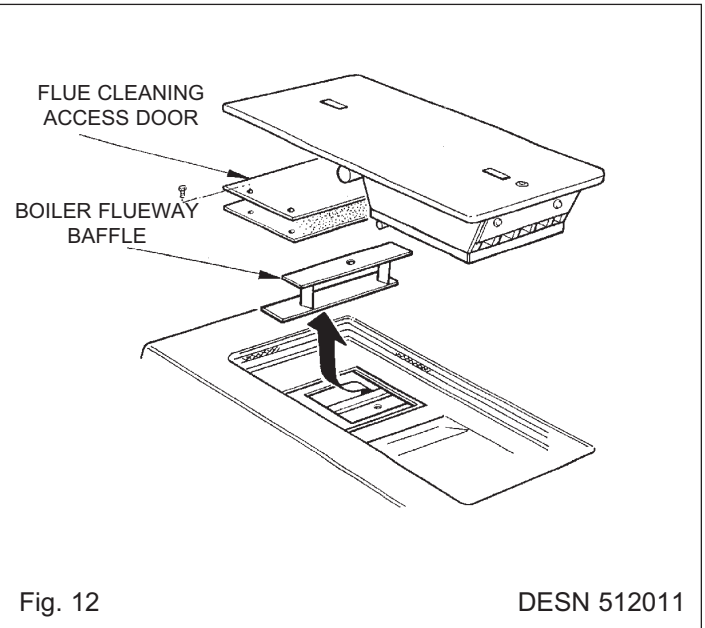
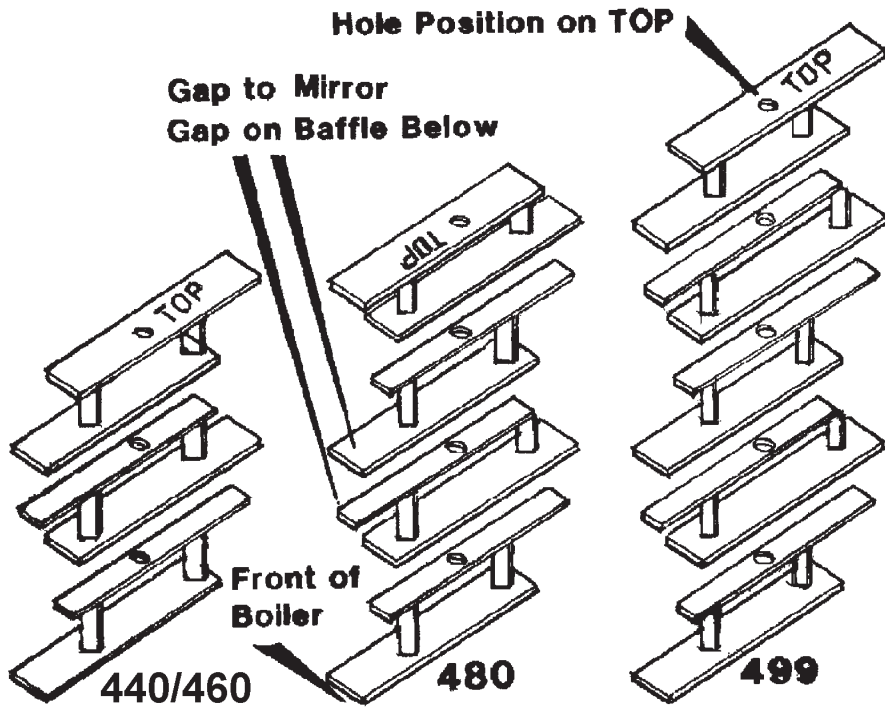


Fig. 12

DESN 512011

# Installation requirements



**ALL BAFFLES MUST BE STACKED AS DIAGRAMS BELOW**

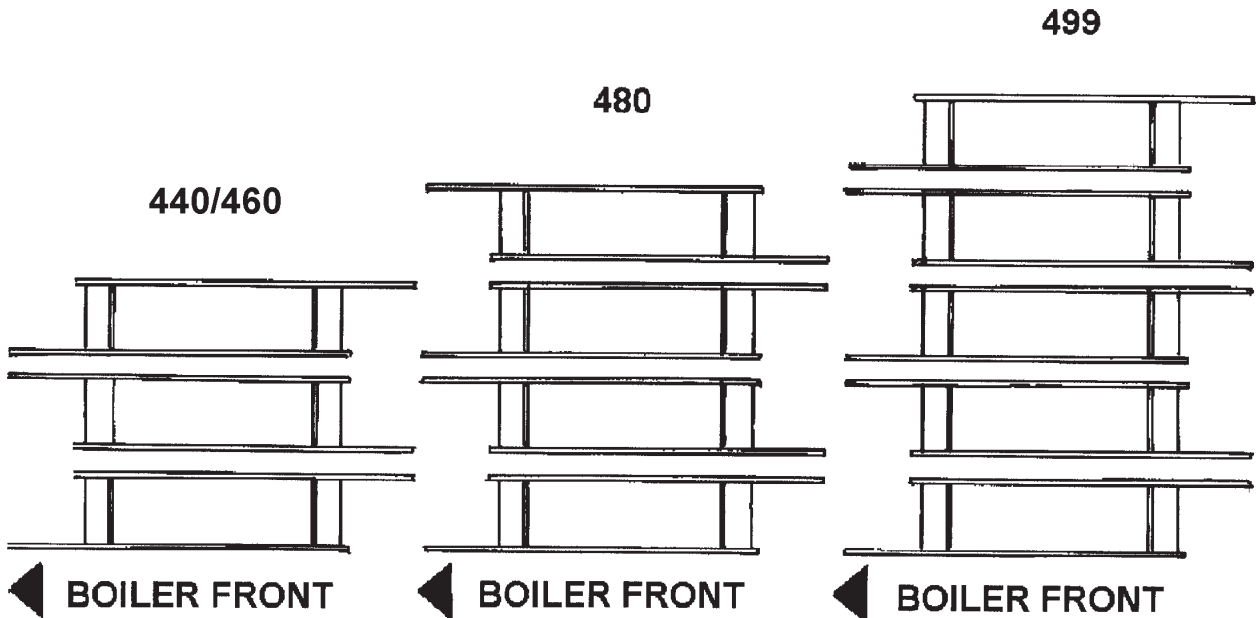


Fig. 12A

## BURNER ACCESS

SEE FIG. 13

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.

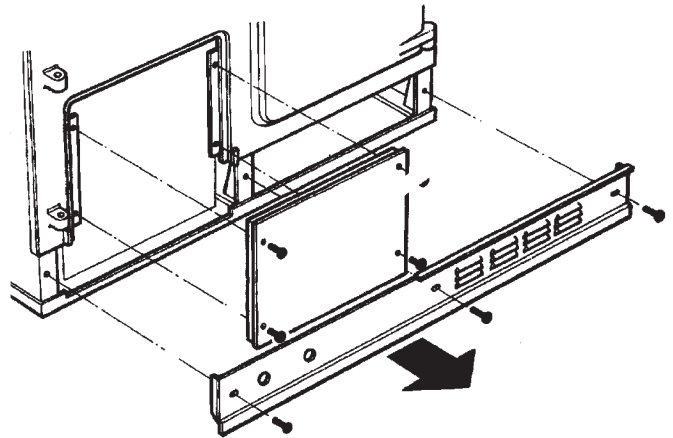


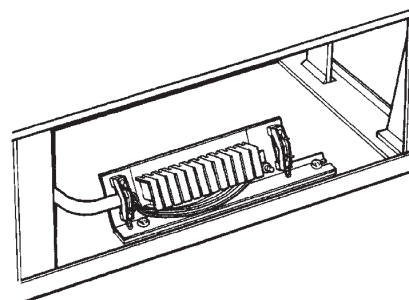
Fig. 13

DESN 511998

## ELECTRICAL CONNECTION

SEE FIG. 14

1. Make electrical connections to terminal strip as wiring diagram (See Fig. 16).



TERMINAL STRIP

Fig. 14

DESN 511577

## OIL PUMP

SEE FIG. 15

1. Bring the sensing phial of the fire valve through the grommet in the right hand side panel and locate in the clips provided.
2. 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 and clean supply to the pump. Make the connection onto the oil pump tight and leave valve open.
3. Ensure that the fire valve is routed to allow free removal of the twin burner assembly.

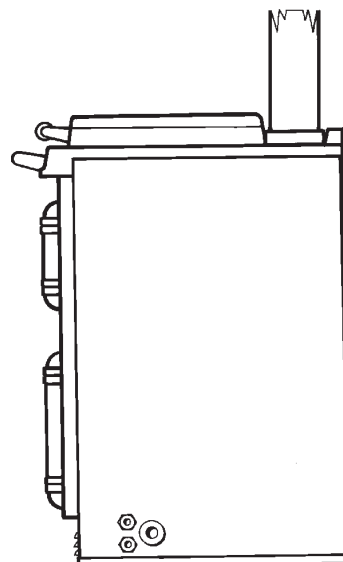
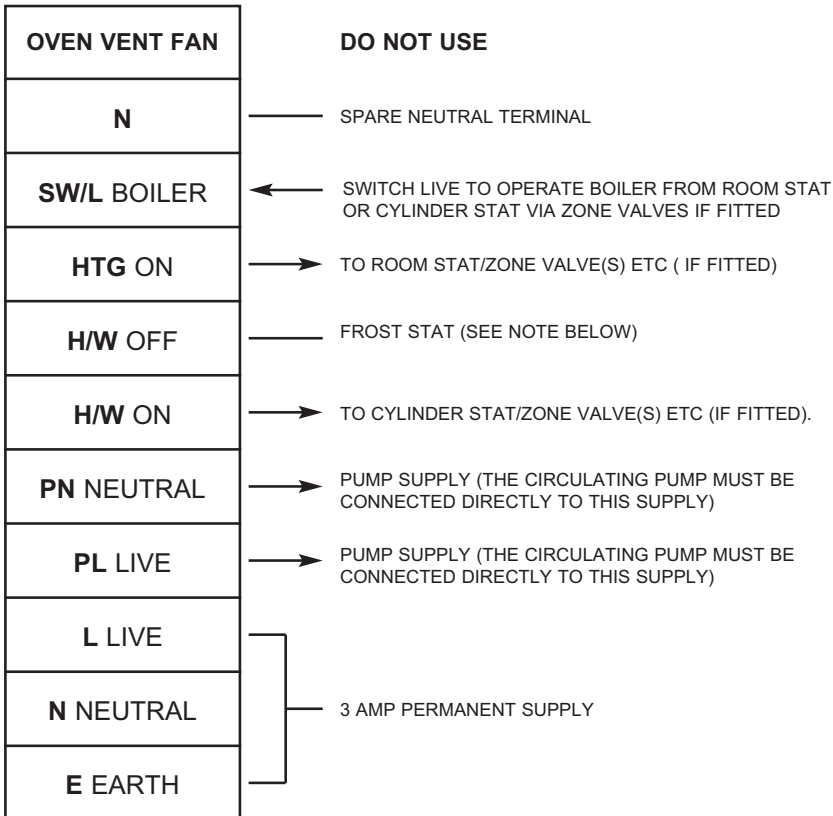


Fig. 15

DESN 512000

# Commissioning Instructions

## TERMINAL STRIP CONNECTIONS



### NOTE:

If no Hot Water System Controls are used a link **MUST** be fitted between **H/W ON** and **SW/L BOILER**.

If no Central Heating System Controls are used a link **MUST** be fitted between **HTG ON** and **SW/L BOILER**.

If a Frost Thermostat is fitted it **MUST** be connected to **SW/L BOILER** and **H/W OFF**

# Commissioning Instructions

## ELECTRICAL CHECK

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

## FIT PRESSURE GAUGE

SEE FIG. 17

Remove the bleed screw from the manifold and fit an oil pressure gauge with R 1/8 connection to check the pump output pressure.

### 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 - 15 seconds with the ignition spark energised. The 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. 17). In this event, **wait at least one minute**, then press the re-set button to restart.

## VENT OIL PUMP

SEE FIG. 17

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. 16

Whilst the burner is running check the oil pressure on the pressure gauge.

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 10 bar (145 lb/in<sup>2</sup>).

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

### NOTE: 440K ONLY

Increase/decrease the pressure until the pressure gauge reads 8 bar (120psi).

### NOTE: 499K ONLY

During initial start up, the pressure will indicate approximately 100 psi for 30 seconds then up to 10 bar (145lb/in). Any adjustments must be made after this sequence has been completed.

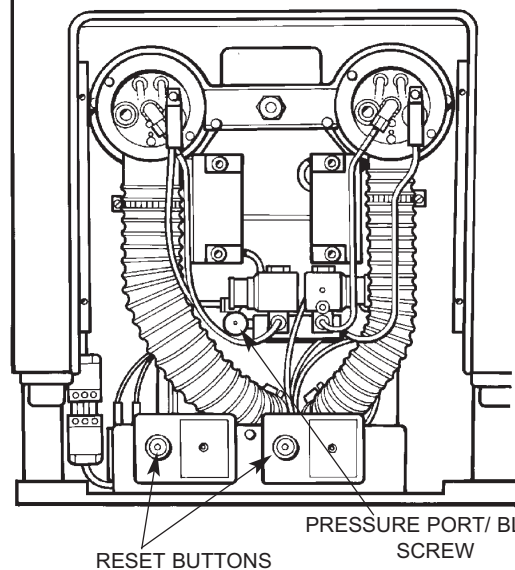


Fig. 17

DESN 511999

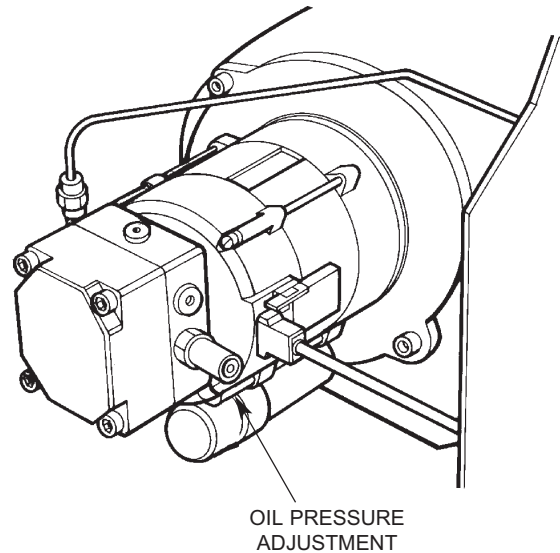


Fig. 18

DESN 511997

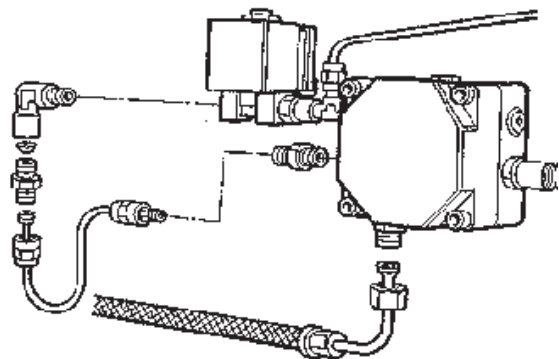


Fig. 18A

DESN 512046

# Commissioning Instructions

## SET COMBUSTION AIR

SEE FIG 19 & 20

The air controls of the burners are factory pre-set, however small adjustments may be necessary to suit the site conditions (See Fig. 19).

**IMPORTANT: Ensure that the bottom louvered plinth is in place during combustion setting procedure.**

Turn boiler burner on.

After 15 minutes remove the enamelled top cover panel (behind the LH insulating cover) and remove the insulation pad. Remove the plugging screw and insert the sensing end of a portable indicator to check the CO<sub>2</sub> (Carbon Dioxide) level. Adjust the boiler burner air intake until a reading of 11.0-11.5% CO<sub>2</sub> is recorded on the indicator.

### Check Smoke

Remove the CO<sub>2</sub> sampling tube 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. After 15 minutes running sample the flue gases from the cooker burner. Lift up the RH insulating cover and remove the countersunk headed screw in the hotplate. The cooker burner should be set to 11.0-11.5% CO<sub>2</sub> with a maximum smoke No. 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.

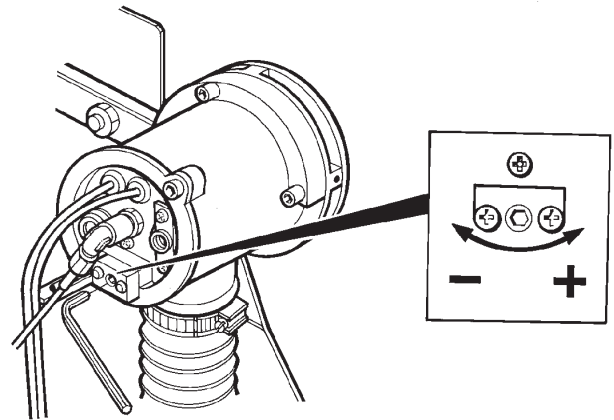


Fig. 19

DESN 512001

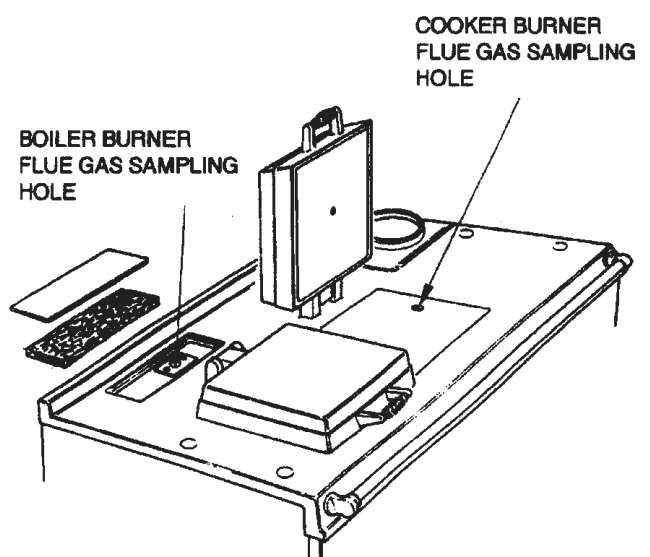


Fig. 20

DESN 511588

### ANCILLARY CONTROLS CHECK

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

The boiler and pump should run until the system is hot and an inspection is made for water leaks.

The system should then be turned off and rapidly drained whilst still hot, with all manual and automatic valves in the open position. The system should then again be filled and cleared of all air locks. Whilst refilling the system it is essential that a corrosion inhibitor is added to the feed water.

When all air locks have been removed and the system is hot the by-pass should be adjusted to ensure a quiet operation and the radiators balanced.

4. Allow the pump adjuster to maintain a "flow and return" temperature of 10°C - 14°C.

Checks must be made by the installer to see that the 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 satisfactory water temperature at each emitter.

5. When the water system reaches working temperature check that the boiler thermostat operates satisfactorily.

### 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 system being inoperative during frost conditions.

2. Advise the User that, for continual 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

## SEALED SYSTEM REQUIREMENTS

See Fig. 21

**a.** The installation must comply with the requirements of BS 6798 and BS 5449. Maximum water 82°C temperature.

**b.** A safety valve set to operate at 2 bar (30lbf/in<sup>2</sup>) shall be fitted in the flow pipe close to the boiler. There must not be any valve between the safety valve and the boiler. The valve should be positioned on a discharge pipe fitted to prevent any discharge or 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/in<sup>2</sup>) shall be fitted in the system, in a visible position.

**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 cistern and the system charge must not be less than the static head at the point of connection. Further details can be obtained from the 'British Gas Specification for Domestic Wet Central Heating Systems Part 3 Sealed Systems'.

Safety Valve Setting	2.0 bar	
Vessel charge and initial system pressure	0.5 bar	1.0 bar
Multiplying Factor	0.09	0.16
Expansion Vessel volume (litres) = System volume Vs x factor	L Vs x 0.09	L Vs x 0.16

**Vs = System Volume Litres**

**e.** The hot water cylinder shall be either the indirect coil type or a cylinder fitted with a calorifer which is suitable for the system pressure.

### f. The Make-Up System

Provision shall be made for replacing the lost water from the system by either of the following methods:

**a)** From a make-up vessel or tank, and connected through a non-return valve to the system on the return side of the hot water cylinder or return side of all heat emitters or radiators.

**b)** Where access to a make-up vessel would be difficult, by a remote automatic pressurisation and make-up unit.

### g. Mains Connection

There shall be no connection to mains water supply or to the water storage cistern supplying domestic hot water, even though a non-return valve may be fitted, without the approval of the local water authority.

### h. The Filling Point

The system shall be fitted with a filling point at a low level, and be used in accordance with the local water authority requirement, and shall generally have a stop valve to BS 1010.

### i. Commissioning - General

The system shall be filled by water by a method acceptable to the Local Water Authority.

Check the operation of the safety valve manually.

Test the operation of the high limit cut-out according to the manufacturers instructions.

After flushing and refilling the system either:-

- (a) If a make-up vessel is filled release water from the safety valve until the level in the make-up bottle falls visibly, then top up the make-up bottle.
- (b) If there is no make-up vessel either release or introduce water until the designed cold water pressure level is reached.

## 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 (22lbf/in<sup>2</sup>). Clear any airlocks and check for water soundness.

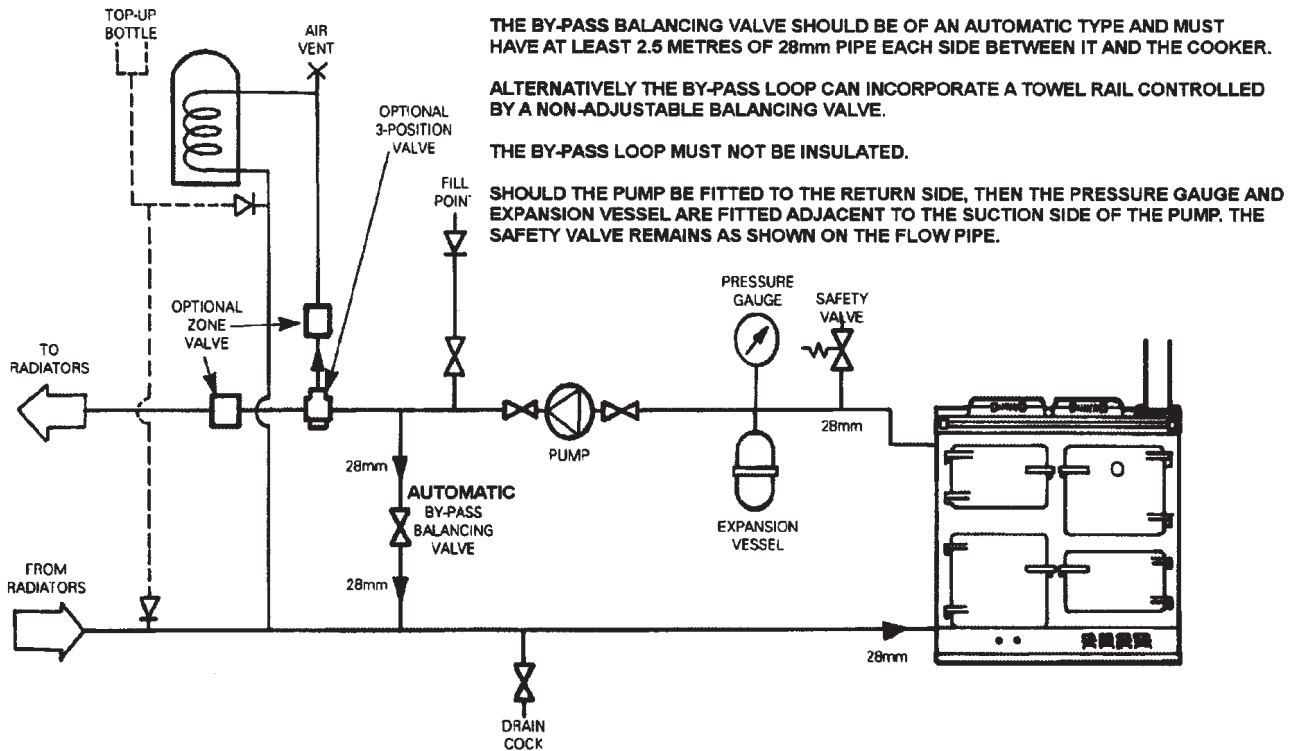
Check the operation of the safety valve, by allowing the water pressure to rise until the valve opens. The valve should open within ±0.3 bar (±4.35 lbf/in<sup>2</sup>) of the pre-set pressure. If this is not possible conduct a manual check and test.

Release cold water for initial filling pressure.

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

# Sealed System

Typical Sealed System



Typical Open Vent System

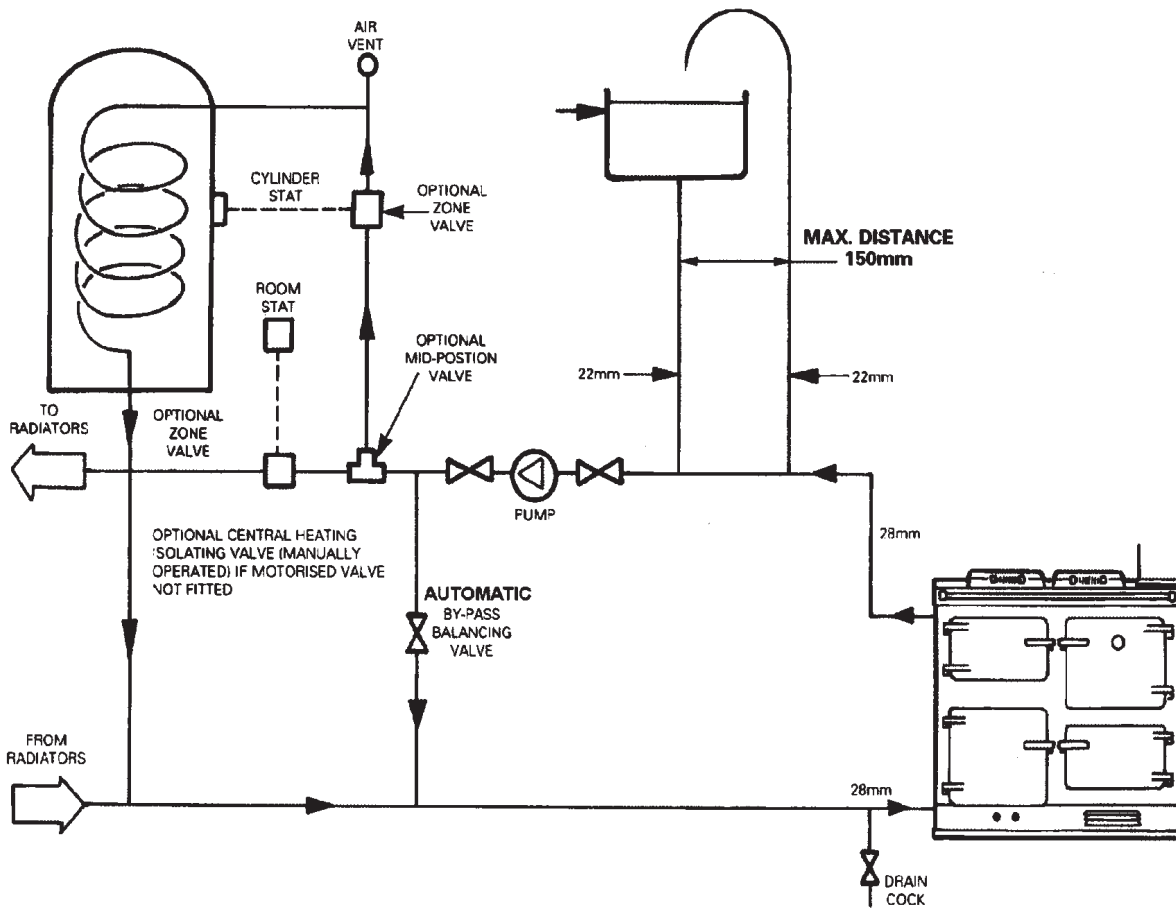


Fig. 21



**For further advice or information contact  
your local distributor/stockist**

With AGA Rangemaster's policy of continuous product improvement, the Company reserves the right to change specifications and make modifications to the appliance described at any time.



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