POTTERTON

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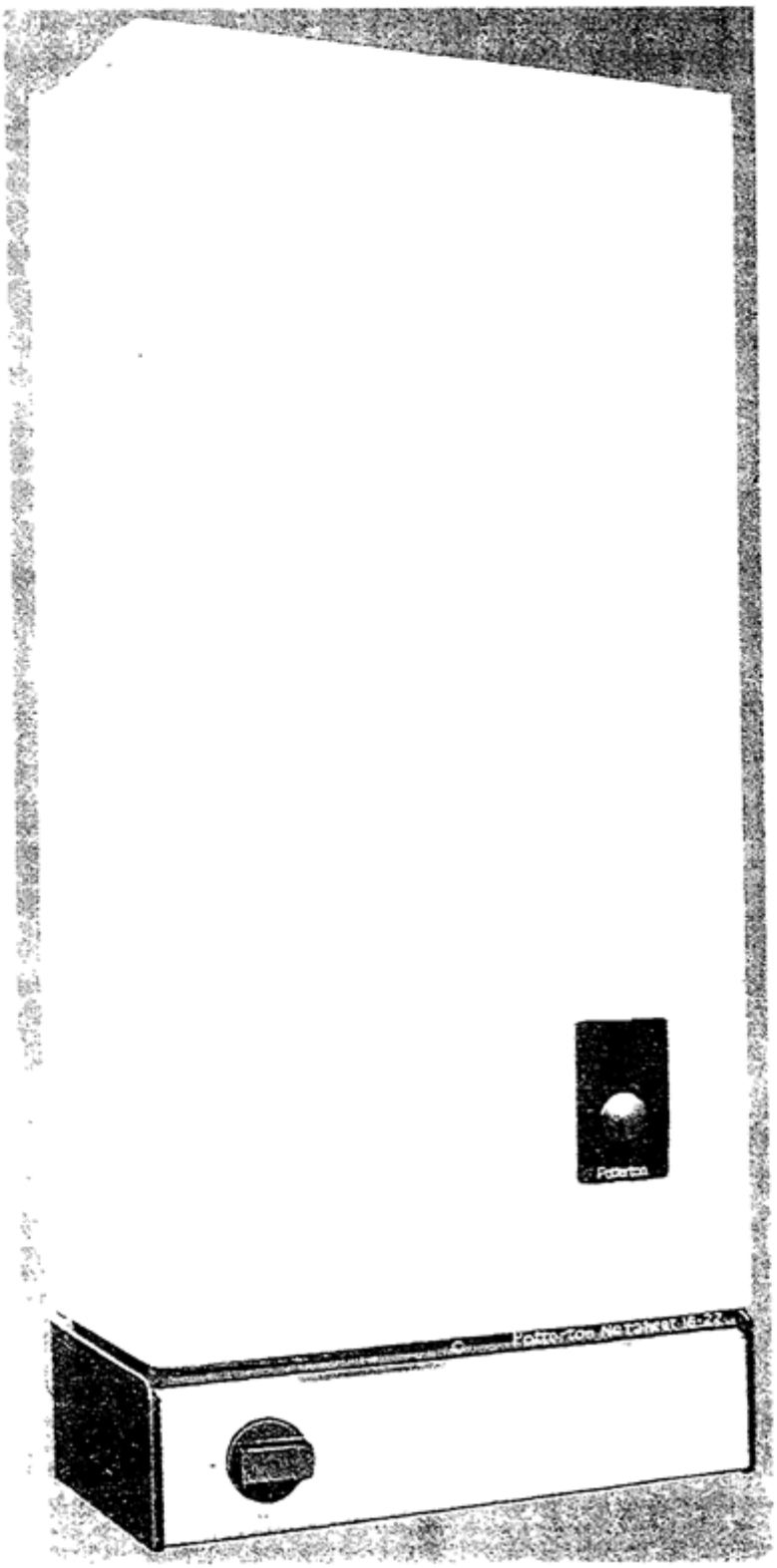
Potterton Netaheat Room Sealed Gas Fired Boilers

Potterton Netaheat 10 - 16	10 to 16 kW (35,000 to 55,000 Btu/h) Output
Potterton Netaheat 16 - 22	16 to 22 kW (55,000 to 75,000 Btu/h) Output



Data & Installation Instructions Potterton Netaheat Room Sealed Gas Fired Boilers

Potterton Netaheat boilers are fully automatically controlled, wall mounted, room sealed appliances, specially designed for combined gravity hot water and pumped central heating or fully pumped systems (small bore or micro-bore). The boilers have the following principal features:–

* Cast iron "Monobloc" heat exchanger having medium capacity water content, so allowing gravity operation on the domestic hot water circuit.
* Pipework can be run behind the boiler within its own width, enabling cupboards to be positioned close to both sides.
* Compact, slim in width and depth; dimensioned to building modular sizes.
* Simple one knob user control.
* Fully automatic in operation; pilot burner only fires during main burner ignition and operation.
* Flue fan enables a miniature flue terminal to be utilised which is unobtrusive and more easily sited on the outside wall of the building.
* Flue discharge can be to the left, right or rear of the boiler.
* Adjustable length flue and fresh air ducts to suit most wall thicknesses.
* Highly efficient and designed solely for natural gas operation.
* A wide range of heat outputs obtained from only two models.

DESCRIPTION — See Fig. 1

The Potterton Netaheat boiler has been designed for ease of installation and servicing. Because of its slim dimensions and wall mounting characteristics, it blends easily with other kitchen furniture and saves valuable floor space. It can be fitted on an outside wall, or on an internal wall as long as it is adjacent to an outside wall. The boiler can also be installed in cupboards or other confined spaces as long as these are suitably ventilated in accordance with British Standard Code of Practice 332. Part 2. All boiler components are secured to the casing back plate. A single piece cover which encloses the fan, heat exchanger and burner, seals the space inside from the room where the boiler is fitted. An easily removable drawer-shaped metal tray houses the boiler controls, but has the shaft for the thermostat knob protruding through it; this knob is the only user control. Side panels, to blank off the space between the wall and the back of the boiler, are available as optional extras.

Heat Exchanger and Burner

The heat exchanger is a single "Monobloc" casting incorporating two finned flueways and three waterways, together with two flow connections, one return connection (for the injector header) and a pocket for the thermostat phial. The capacity of the waterway is 5.7 litres (10 pts) and the resistance through the casting is such that gravity circulation at all ratings is possible on the domestic hot water circuit. The natural gas burner which is fitted immediately below the heat exchanger, has stainless steel blades mounted on a fabricated manifold which is drilled and tapped to take the main burner injectors.

Fan

The fan draws fresh air into the space formed by the boiler back plate and the removable co.er. The air passes down the outside of the heat exchanger, so helping to cool the front cover, then into the combustion chamber. Combustion products pass up through the heat exchanger and into the fluehood where, because the fan has pressurised the inside of the appliance, they are forced out through the flue duct.

Boiler Controls

The operation of the boiler is very simple with the user only having to turn the thermostat knob on or off as required. When the main inlet gas cock is turned on, gas passes up to the solenoid valve. The main electricity supply is then switched on and the thermostat turned on and to the required temperature. This turns on the fan which runs for a 10 to 15 second purge period before the pressure switch, sensing the fan running, closes. Once the pressure switch contacts have closed, the solenoid valve is energised and opens, allowing gas to pass through the governor, up to the mercury vapour flame failure valve and also to the pilot burner. At the same time, the automatic electronic spark generator operates and the pilot is ignited. When the pilot has lit, the spark generator senses a change in resistance due to the presence of the pilot flame, and the spark is cut off, although the system is still energised so that if the flame should go out, the pilot would then automatically relight.

The pilot flame heats up the phial of the flame safety valve and after about 30 seconds, the mercury vapourises, expands and opens the valve allowing gas to the main burner which ignites.

To turn the boiler off, the thermostat knob must be turned to the off position and the boiler will shut down. If there is a gas or electricity power cut at any time while the boiler is operating it will immediately shut down, but as soon as the power supply is restored, it will relight automatically. The controls system is so designed, that any failure in a component is detectable causing the boiler to shut down, before any dangerous condition could arise.

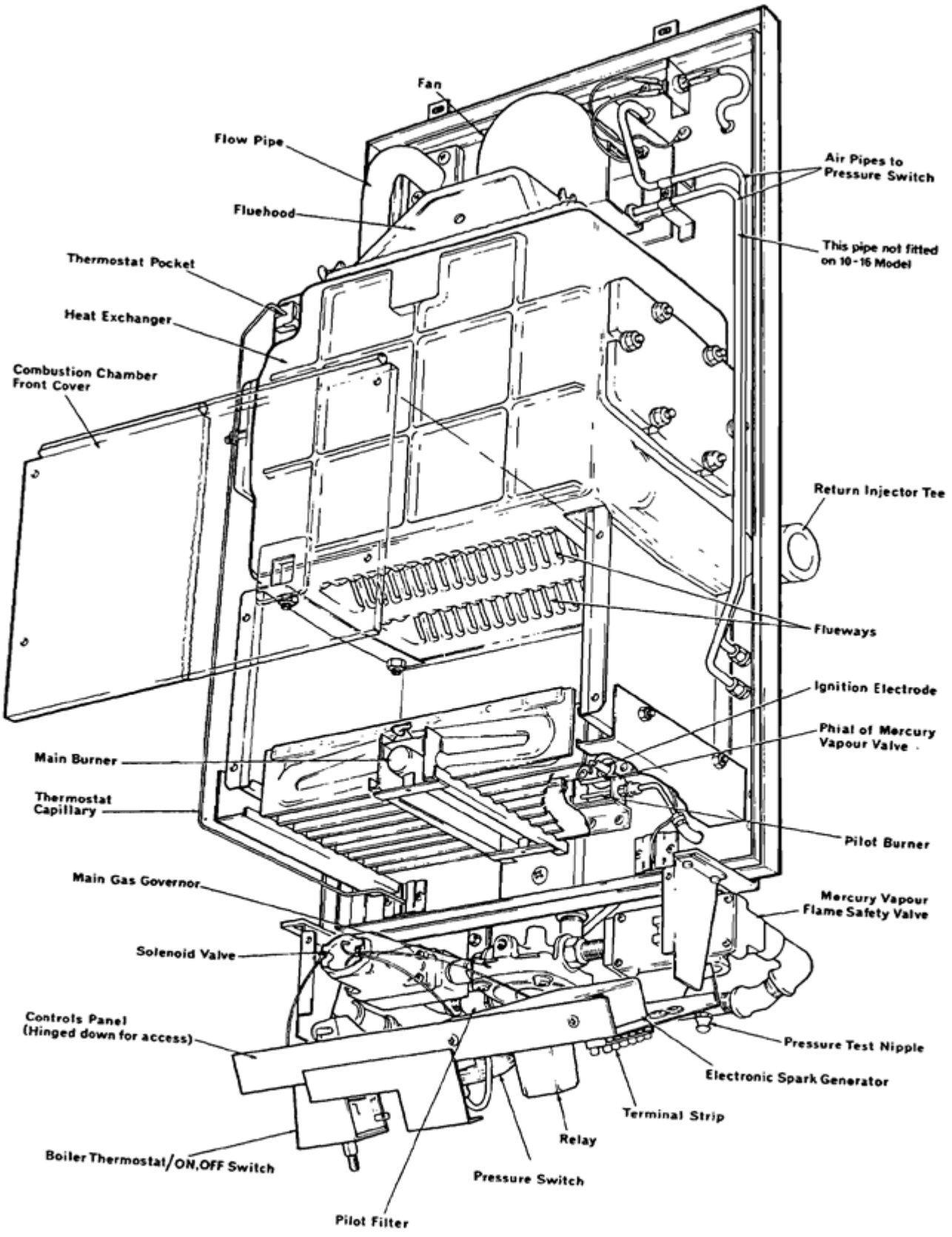


Fig. 1 GENERAL ARRANGEMENT

The thermostat knob can be set to OFF, Min. 1, 2, 3, 4 and Max. The graduations Min. to Max. correspond approximately to a temperature range of 55°–85°C (130°–185°F). A pump over-run thermostat, used only when the boiler is installed in a fully pumped system, is incorporated, and will operate when the water temperature within the boiler is in excess of approximately 70°C (160°F). A drop of approximately 11°C (20°F) will occur before the thermostat will switch the pump off.

A schematic wiring diagram, showing the boiler control system is given in Fig. 11.

Balanced Flue Terminals and Ducting

The fresh air inlet and flue ducts can be run from either the left, right or rear of the boiler to a miniature terminal on the outside wall of the building. The ducts on the 10-16 model are suitable for any wall thicknesses up to 380mm (15 in.) using a side outlet or 510mm (20 in.) with a rear outlet. The ducts of the 16-22 model are suitable for wall thicknesses of up to 406mm (16 in.), but for installations where a rear outlet is to be used, an extension sleeve which can be fitted between the two halves of the telescopic trunking, is available as an optional extra. With the sleeve fitted, wall thicknesses of up to 510mm (20 in.) can be catered for. The siting of the balanced flue terminal on the outside wall of the building is not critical although if it discharges at a low level, a terminal guard, supplied as an optional extra, should be fitted in accordance with Building Regulations. The terminal should be installed in accordance with British Standard Code of Practice CP.337.

THE SYSTEM

Potterton Netaheat boilers have been specially designed for combined systems e.g. small bore or micro-bore central heating with an indirect domestic hot water supply which can either have pumped or gravity circulation; the boiler can also be used for pumped central heating only. The boiler can be installed in most types of system, but the following notes are given as a general guide.

All systems should be designed so that the static head of the boiler is between a minimum of 305mm (1 ft.) and a maximum of 27.5m (90 ft.). To ensure that the minimum 305mm (1 ft.) static head is obtained, the level of the cold water in the expansion tank must not be lower than the top of the boiler casing.

If a minimum 305mm (1 ft.) head is used, extra care should be taken when designing the system, to ensure that pumping over or sucking down at the vent pipe cannot occur.

All gravity domestic systems should have a minimum effective circulating head of 1200mm (4 ft.).

A typical combined gravity system is shown in Fig. 12.

A fully pumped system giving temperature control of the central heating circuit via a room thermostat and one two-way valve is shown in Fig. 15.

Using the boiler as supplied, independent temperature control of the domestic hot water cylinder can only be applied when using fully pumped systems. If temperature control is required on a gravity hot water system, additional relays are required and full details are shown in Fig. 13.

For independent temperature control of both the central heating and domestic hot water circuits, a three-way valve with a central position can be used. This type of valve can give a flow to either circuit separately or to both circuits simultaneously. For the wiring of this type of valve refer to the valve manufacturers literature and the information given in 6. Wiring.

Independent temperature control of both circuits can also be obtained by using room and cylinder thermostats and a two-position diverter valve. This valve provides a flow to one circuit at a time and details are shown in Fig. 14.

The use of two two-way valves and associated electrical relays will also give independent temperature control of both circuits and full wiring details of this type of system are also given in Fig. 15.

A further method of providing independent temperature control in conjunction with room and cylinder thermostats, is by using two pumps. Details are given in Fig. 16. In addition to the system diagrams shown, full wiring details are also illustrated. It is recommended that when installing these systems, an indirect cylinder with a coil type of heat exchanger is used. No system should be designed in which it is possible to completely close both the domestic hot water and central heating circuits, and to obtain this, a by-pass should be fitted between the boiler flow and return pipework, capable of passing at least 1 gall. per min.

As the boilers are wall hung, a drain cock should be included at the lowest point in the central heating system. When selecting a circulating pump for the central heating system, the following data should be borne in mind:

Gravity Primary/Pumped Central Heating Systems

The resistance through the boiler heat exchanger plus the injector tee and nozzle is equal to 68.5 mbar (27½ in. w.g.) at a flow rate of 27.25 litres/min. (6 galls/min.) see Fig. 2.

Pumped Primary Systems

The resistance through the heat exchanger and the injector tee only, is equal to 25 mbar (10 in. w.g.) at a flow rate of 27.25 litres/min. (6 galls/min.), when using the 1 in. flow connection or 43.75 mbar (17.5 in. w.g.) at the same flow rate when using the 3/4 in. flow connection, see Fig. 2. If other controls, such as three-way valves are used in this type of system, the resistance through them, quoted in their manufacturers literature, must be taken into account. The circulating pump may be fitted on either the flow or return side of the boiler. If fitted on the flow, the central heating circuit will be under a positive pressure, so reducing the risk of air being drawn into the system, but if the pump is on the return there will be a negative pressure in the circuit: this applies with systems designed as illustrated in Figs. 12, 13, 14, 15 & 16.

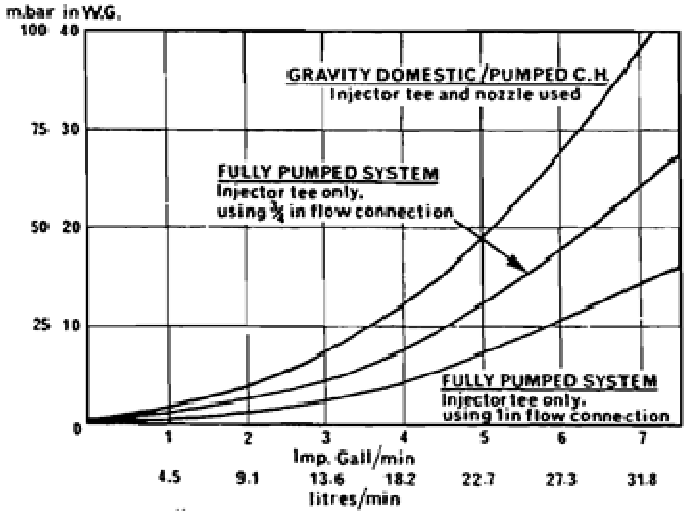


Fig. 2 PRESSURE LOSS ACROSS BOILER

SITE REQUIREMENTS

Ensure that the gas supply pipe and meter are large enough for this appliance and any others that may be run off the same meter: if not, contact the local Gas Regional Office. The boiler can be installed at any height (refer to Clearances Around the Boiler and the static head requirements) on an outside wall or on an internal wall providing that one side of the boiler is next to an outside wall. The recommendations of the relevant British Standards Codes of Practice should be followed.

Boiler Mounting Surface

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

Clearances Around the Boiler – See Fig. 3

Any position selected for the boiler must give the following minimum clearances which are necessary for installation and maintenance.

910mm (3 ft.) at the front of the boiler
100mm (4 in.) at the top
250mm (10 in.) at the bottom

As all pipes can be run behind the boiler within the casing width, no clearance is needed at the sides.

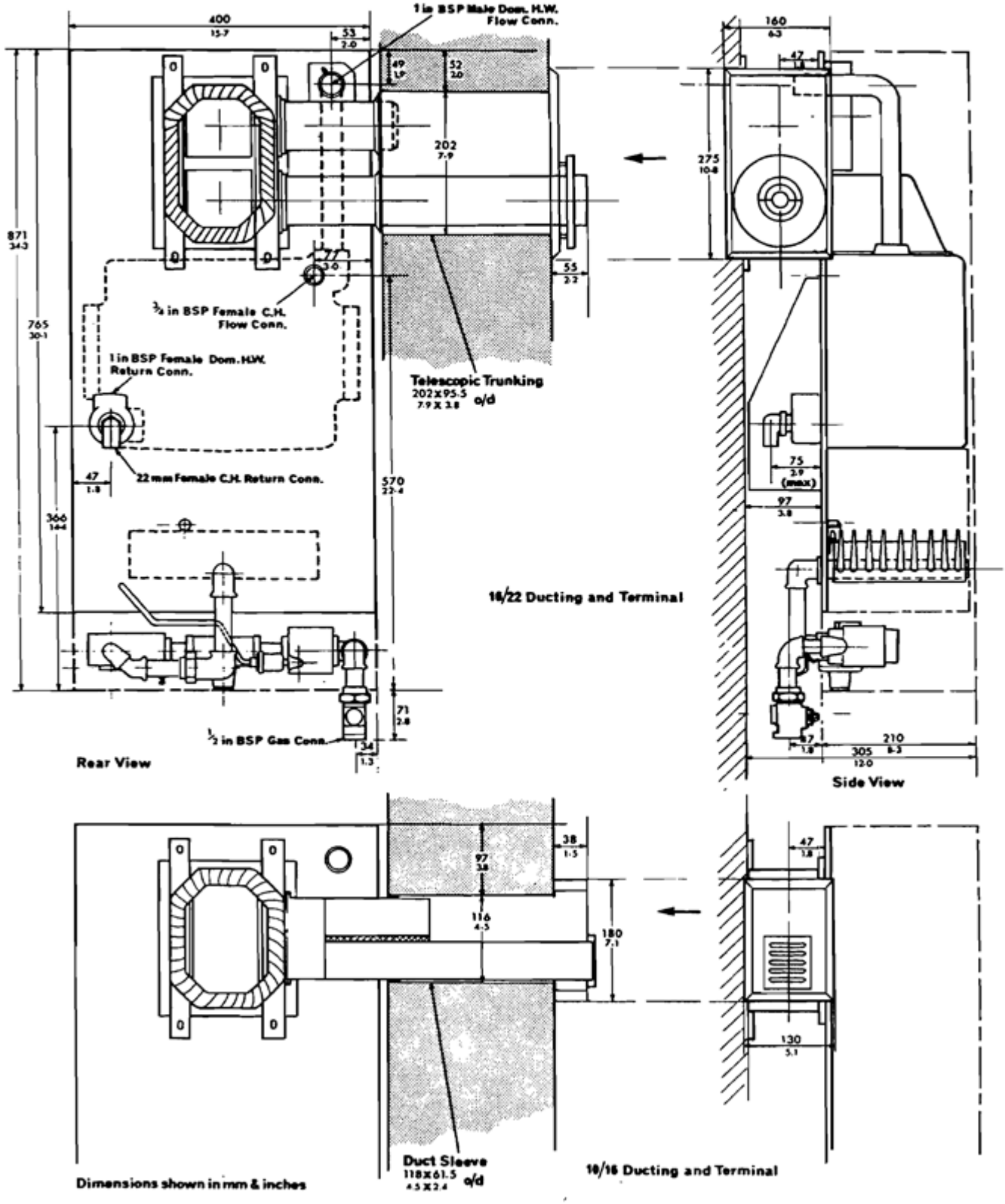


Fig. 3 CONNECTIONS AND DIMENSIONS
(See also Fig. 8)

Ventilation

If the boiler is to be installed in a confined space such as a cupboard, the space will need ventilating. Openings should be provided at the top and bottom of the cupboard each of which should have a free area as follows:—

Potterton Netaheat	Free Area Sq. in.	Sq. cm.
10 - 16	28	181
16 - 22	38	245

If the openings draw air from outside the building, the above free areas may be halved. Refer to British Standard Code of Practice CP.331, Part 1 1968 for further guidance.

Electricity Supply

A 240 volts a.c. 50 Hz. single phase electricity supply fused to 3 amps must be provided in accordance with the latest edition of the Institute of Electrical Engineers Regulations for the Electrical Equipment of Buildings and Local Authorities and British Gas requirements. The current rating of the wiring to the boiler must exceed 3 amps and must include an isolating switch or plug and socket; a double-pole switch is recommended.

MAINTENANCE

The efficient performance of this boiler is dependent upon regular servicing which should be carried out annually. Maintenance is best arranged by a contract placed with the Local Gas Regional Office or a qualified service engineer. In certain areas, a contractual service can be arranged direct with Potterton International and your local Potterton area office should be contacted for advice.

All parts likely to require servicing are easily accessible. By sliding the cover from the boiler controls and removing the front cover from the boiler, most components are exposed. It is then a simple matter to remove the front of the combustion chamber to gain access to the main and pilot burners and the ignition electrode. Removal of the fluehood which is secured by four wingnuts, gives access to the flueways in the heat exchanger.

SETTING UP

Each boiler has to be adjusted once it has been installed and this is a skilled job which should only be carried out by suitably qualified engineers. Potterton International offer this service at a nominal charge.

GENERAL DATA

Potterton Netaheat 10 - 16	- Input: 12.9 to 20.2 kW (44,000 to 69,000 Btu/h) - Output: 10.25 to 16.1 kW (35,000 to 55,000 Btu/h)
Potterton Netaheat 16 - 22	- Input: 21.7 to 28.7 kW (74,000 to 98,000 Btu/h) - Output: 16.1 to 22.0 kW (55,000 to 75,000 Btu/h)
Maximum Working Head:	27.5m (90 ft.)
Weight:	Installed — 72.6 kg. (160 lbs.) Installer lifting weight — 56.7kg. (125 lbs.)
Water Content:	5.7 litres (10 pts)

CONTROLS:

Main Gas Cock:	½ in. BSP union fixed Fan Cock.
Solenoid Valve:	½ in. BSP Essex Controls.
Main Gas Governor:	½ in. BSP Jeavons or ½ in. BSP Evered.
Mercury Vapour Flame Safety Valve:	¼in. BSP Concentric, 10 - 16 only ½in. BSP Concentric, 16 - 22 only
Pressure Switch:	Honeywell, CN150B100.
Thermostat:	Ranco, C77 - P0102.
Relay:	Engle and Gibbs MP2 or Keyswitch KMK 2P.
Fan:	Smiths FFB 0219.
Pilot Burner:	Concentric, MF 246.
Main Burner:	Potterton.
Ignition Electrode:	Kigas, D4748.
Spark Generator:	Plessey, 407/1/72043/001.
Pilot Filter:	Harper Wyman or Concentric.
Circuit Protector:	1 amp fuse. This rating must not be exceeded.

ADDITIONAL CONTROLS

The Potterton Mini-Minder time control, which is a wall-mounted electric programmer giving a choice of programmes for both central heating and domestic hot water systems, is available as an optional extra. The Mini-Minder is fully described in its own Data Sheet which is available on request.

TECHNICAL LITERATURE

The following literature is supplied with each boiler:—
Data and Installation Instructions.
User's Guide.

INSTALLATION INSTRUCTIONS

1. General

The boiler and its associated equipment will arrive on site in two cardboard cartons. The contents of each carton is as follows, see Fig. 4.

CARTON NO. 1:

1. Installation Instructions
2. Template
3. Accessories Card
4. Balanced flue terminal and ducts.
5. Boiler Combustion chamber front cover.
6. The controls cover.
7. Mounting channel with rubber strip, and metal bearing plate and adjusting shims.
8. Telescopic trunking - 16 - 22 only.
9. Duct sleeve - 10 - 16 only.
10. Duct sealing flange and gaskets - 16-22 only.
11. The boiler front cover.
12. Safety strap.

CARTON NO. 2:

The boiler packed on its back. The boiler will be supplied without its combustion chamber front cover fitted so giving a hand hold at the underside of the heat exchanger inside the combustion chamber, when lifting the boiler into position. Two wooden feet will be found attached to the bottom of the boiler and these are to protect the controls during handling and also allow the appliance to be stood vertically prior to lifting it onto the wall.

All items in Carton No. 1 are packed so that they are easily removable in the sequence required.

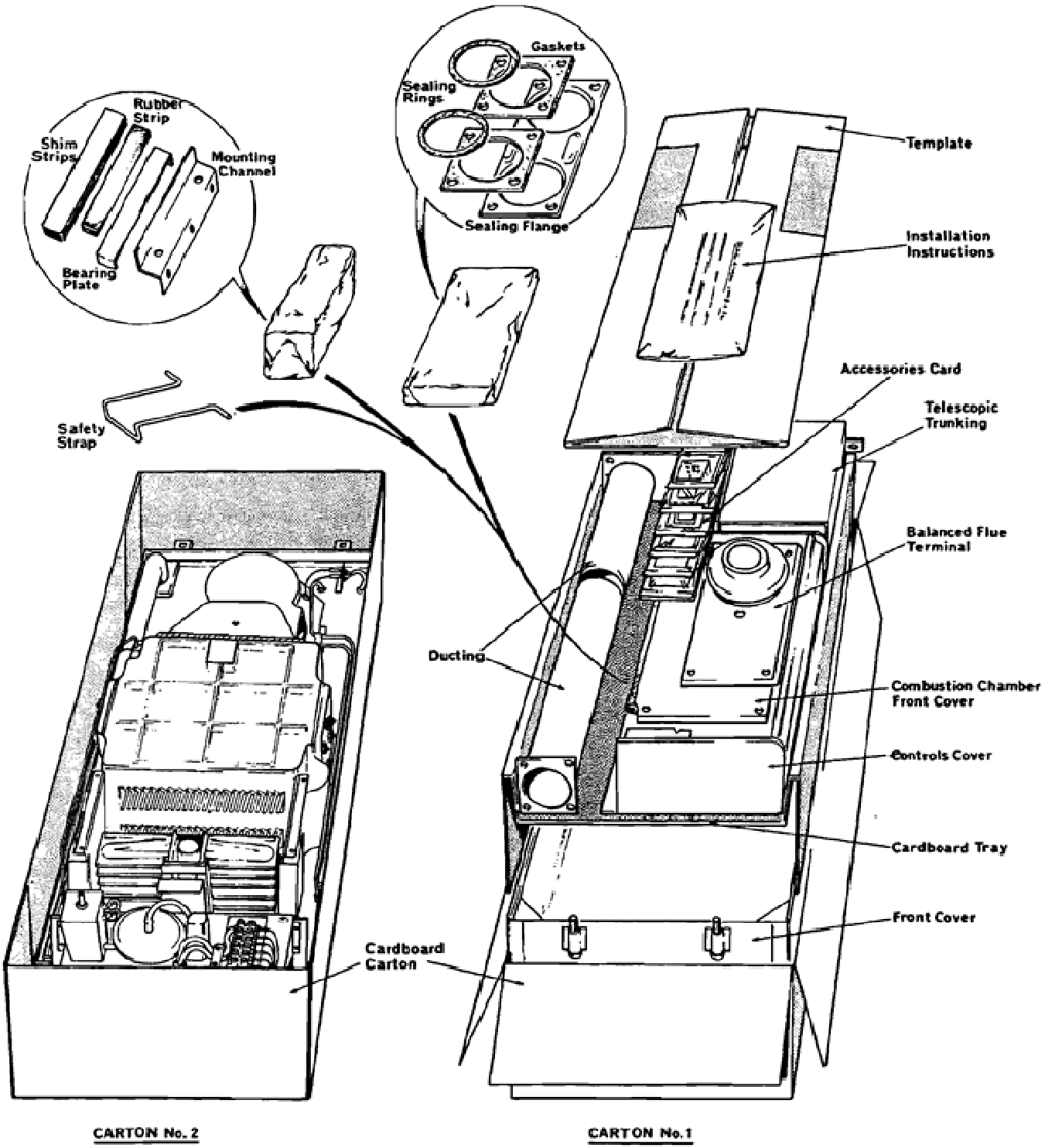


Fig. 4 PACKAGING AND IDENTIFICATION OF COMPONENTS

2. Fitting the Boiler Mounting Channel

Note: The cardboard template has been designed for marking out the wall for boilers with either a rear or side flue outlet. If a side outlet is to be marked, it has been assumed that the boiler will be fitted tightly into the corner. However, allowance should be made if the corners of the wall are not square or vertical, by positioning the template and therefore the boiler, up to a maximum of 1 in. from the outside wall. This can be done by marking the centre of the boiler position on the wall, then using a spirit level or plumb line, dropping a long centre line which can then be lined up with the boiler centre line marked on the template.

A. Using the template, mark out the three screw holes on the wall where the boiler mounting channel is to be positioned, the four screw holes above the mounting channel where the plenum chamber is to be fitted, and the position of the flue and fresh air ducts on the wall.

B. Drill the three holes for the mounting channel securing screws and insert No. 12 Rawlplugs (Accessories Card Item A); fit and secure the channel using the 2 in. No. 12 counter-sunk headed woodscrews cup and flat washers; check that the channel is level. Place three of the six metal adjusting shims in the mounting channel followed by the rubber strip, then the metal bearing plate. Retain the remaining three shims.

Note: The thickness of the wall plaster in some older properties could be excessive and in these instances, it is recommended that 2½ in. long securing screws are used in operation B.

C. Drill the four holes for the plenum chamber securing screws and insert No. 12 Rawlplugs (Accessories Card Item B); do not fit the plenum chamber at this stage.

D. Cut the hole in the wall for the flue and fresh air ducts. Care should be taken when cutting the hole for a rear outlet boiler, that the screw holes for the plenum chamber are not damaged. Make good the inside and outside surface of the wall, if necessary, and also ensure that the face of the wall where the plenum chamber is to be fitted is flat.

E. Open Carton No. 2.

F. Unscrew and remove the wingnuts securing the fluehood, then lift off the fluehood, see Fig. 9. Discard the paper gasket.

G. Disconnect the three electrical leads from the fan, then unscrew and remove the bolts securing the fan. Lift off the fan, see Fig. 9.

H. Unscrew and remove the bolts securing the plenum chamber, see Fig. 9.

J. Remove the boiler from its carton and lay it front face downwards on a protective surface, such as its own carton. Take care not to damage the shaft of the thermostat.

3. Fitting the Ducting, Plenum Chamber and Balanced Flue Terminal

A. Potterton Netaheat 10 - 16 only — See Fig. 5.

(1) Fit and cut the wall liner to size, terminating it flush with the inside and outside wall faces of the building. Ensure the ends are square.

(2) The plenum chamber has two connections for the fresh air and flue ducts, one to one side and the other to the rear. One of these connections is blanked off with a sealing plate and gasket and depending on the direction the ducts are to be connected to the boiler, these should be re-positioned by the installer if necessary. The single side connection can be used either for a left or right hand duct arrangement, simply by rotating the plenum chamber to the required position. With a rear outlet, the smaller opening in the plenum chamber, the air duct,must be positioned uppermost.

(3) Fit the inlet and outlet duct assembly to the plenum chamber using the six screws (Accessories Card Item C) and interposing the gasket. Ensure that the short air inlet duct is fitted uppermost.

(4) Temporarily secure the plenum chamber to the wall using the four 2 in. No. 12 counter-sunk headed screws, cup and flat washers (Accessories Card Item B), positioning the flue and fresh air ducts inside the wall liner.

(5) Mark off the lower flue duct at a point where it protrudes 41mm (1.6 in.) from the outside wall of the building. This dimension is important. Mark off both ducts at a point where they enter the wall liner.

(6) Remove the plenum chamber and liner from the wall, then cut the flue duct to size, removing all burrs.
Note: The upper air duct is already sized to suit wall thicknesses down to 205mm. (8 in.). It will only need shortening if the wall thickness is less than this in which case, cut it so that at least 25mm. (1 in.) protrudes inside the wall.

(7) On boilers using a side outlet only, position the duct assembly inside the liner, aligning the mark on the ducts with the entrance of the liner. Flatten the 13mm asbestos rope supplied, then force it into the gap between the ducts and the liner.
WARNING: IT IS VITAL THAT A GOOD SEAL IS MADE ALL AROUND BOTH DUCTS.

(8) On boilers using a rear outlet only, position the wall liner inside the wall seperately as in this instance, the 13mm asbestos rope is not required. The rope on the rear of the plenum chamber provides the necessary seal.

(9) Position the ducts and liner assembly inside the wall, then secure the plenum chamber to the wall with four 2 in. No. 12 screws, cup and flat washers (Accessories Card Item B). Ensure the chamber is mounted squarely.
Note: The thickness of the wall plaster in some older properties could be excessive and in these instances, it is recommended that 2½ in. long screws are used.

(10) Measure the distance from the bottom of the box section of the plenum chamber to the top of the metal bearing plate in the boiler mounting channel, see Fig. 6. Compare this dimension with the nominal dimension of 338mm. (13.5/16 in.) and by adding additional shims or removing those already in position, adjust the measured distance to equal the nominal measurement, ± 1.5mm (1/16 in.) If a more coarse adjustment is necessary, the plenum chamber and mounting channel can be moved slightly up or down on the wall using the elongated holes in their mounting flanges. It is essential that this dimension is accurately obtained, otherwise once the boiler is lifted onto its mounting channel, the screw holes in the boiler back plate will not align with those in the plenum chamber.

(11) Make good the inside and outside wall surfaces around the liner as necessary.

(12) Fit the balanced flue terminal over the end of the flue duct, ensuring that the duct is located inside the outlet aperture on the terminal. Secure the terminal to the wall with the two size 8, 1 in. long screws supplied (Accessories Card Item E).
Note: When fitting the terminal, observe the "Top" mark on the terminal.

(13) Remove the flue outlet grille from the terminal, then seal the gap between the outlet duct and the terminal with the sealing strip supplied.

(14) Refit the outlet grille to the terminal so that it will direct the flue gasses sideways or downwards away from any obstruction, window, doorway, footpath or plastic pipe.

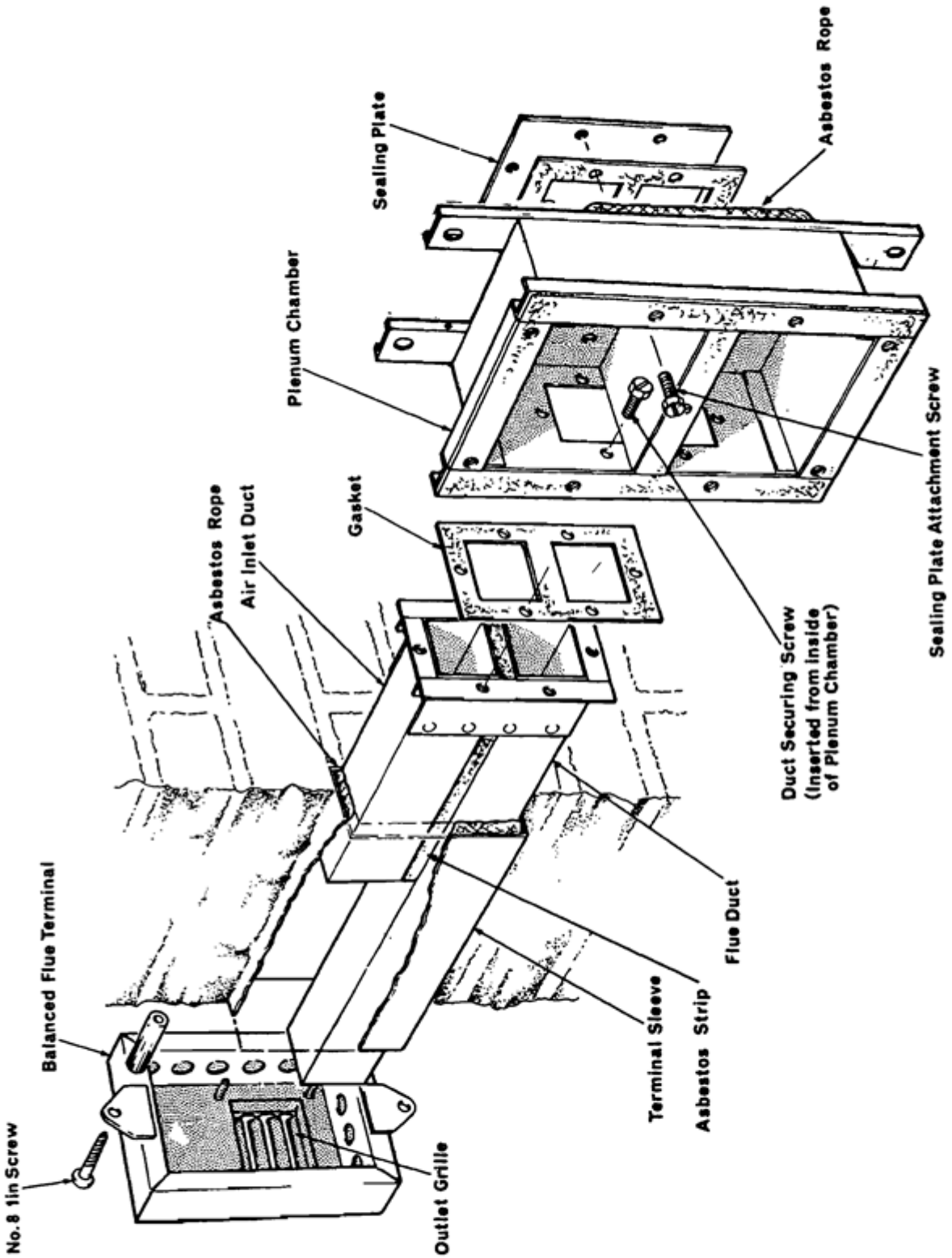


Fig. 5 ARRANGEMENT OF NETAHEAT 10/16 DUCTS

B. Potterton Netaheat 16 - 22 only — See Fig. 7.

(1) The plenum chamber has two connections for the fresh air and flue ducts, one to one side and the other to the rear. One of these connections is blanked off with two sealing plates and gaskets and depending on the direction the ducts are to be connected to the boiler, these should be re-positioned by the installer if necessary. The single side connection can be used either for a left or right-hand duct arrangement, simply by rotating the plenum chamber to the required position. With a rear outlet, the smaller opening in the plenum chamber (air duct) must be positioned uppermost.

(2) Fit the inlet and outlet duct assembly to the plenum chamber using the eight screws (Accessories Card Item C) and interposing the two gaskets. Ensure that the short air duct is positioned uppermost.

(3) Temporarily secure the plenum chamber to the wall using the four 2 in. No. 12 screws, cup and flat washers (Accessories Card Item B), positioning the flue and fresh air ducts through the wall.

(4) Mark off the lower flue duct at a point where it protrudes 32mm (1.3 in.) from the outside wall of the building.

(5) The upper air duct is already sized to suit wall thicknesses between 230mm and 380mm (9 to 15in.) and will only need shortening, if the wall is less than 230mm (9 in.) thick. In this instance, cut off the nozzle end of the upper duct so that not less than 25mm (1 in.) and not more than 50mm (2 in.) protudes inside the wall.

(6) Remove the plenum chamber, then cut the duct(s) to size, removing all burrs.

(7) Fit the telescopic trunking inside the wall and secure it to the inside face of the wall with two 1½ in. No. 10 screws, washers and Rawlplugs (Accessories Card Item D).

Note: If the wall is less than 230mm (9 in.) thick both halves of the telescopic trunking will have to be cut to size at the plain ends where the two halves slide together; e.g. for a 180mm (7 in.) wall, cut 50mm (2 in.) from each half.

(8) On boilers with a side flue outlet, slide the duct sealing flange and sealing rings onto the ducts. On boilers with a rear flue outlet, the flange and sealing rings are not required and should be discarded.

(9) Position the ducts inside the wall, then secure the plenum chamber to the wall with four 2 in. No. 12 screws, cup and flat washers (Accessories Card Item B). Ensure the chamber is mounted squarely.

Note: The thickness of the wall plaster in some older properties could be excessive and in these instances, it is recommended that 2½in. long securing screws are used.

(10) Secure the duct sealing flange and sealing rings, if applicable, to the telescopic trunking using the four screws (Accessories Card Item D).

(11) Measure the distance from the bottom of the box section of the plenum chamber to the top of the metal bearing plate in the boiler mounting channel, see Fig. 6. Compare this dimension with the nominal dimension of 338mm (13.5/16-in.) and by adding additional shims or removing those already in position, adjust the measured distance to equal the nominal measurement, ± 1.5mm (1/16 in.) If a more coarse adjustment is necessary, the plenum chamber and mounting channel can be moved slightly up or down on the wall using the elongated holes in their mounting flanges. It is essential that this dimension is accurately obtained otherwise once the boiler is lifted onto its mounting channel, the screw holes in the boiler backplate will not align with those in the plenum chamber.

(12) Make good the inside and outside surface of the wall around the telescopic trunking. Ensure that the flue outlet duct protrudes from the trunking in the CENTRE of the square aperture. This is essential to enable the next operation to be completed.

(13) Fit the terminal outer wall plate in position, locating the end of the exhaust duct inside the circular connection of the wall plate grille. Loosely attach the plate to the trunking with the single M5 screw (Accessories Card Item E).

(14) Square up the wall plate, then working through the four screw holes in the plate, mark the screw hole positions on the wall behind the plate.

(15) Remove the wall plate, then drill and plug the four holes with No. 8 Rawlplugs (Accessories Card Item E).

(16) Refit the wall plate, then secure it to the trunking with the single screw and to the wall with four No. 8, 1 in. long screws (Accessories Card Item E). It is essential for the correction operation of the unit, that no gap exists between the wall plate and the trunking.

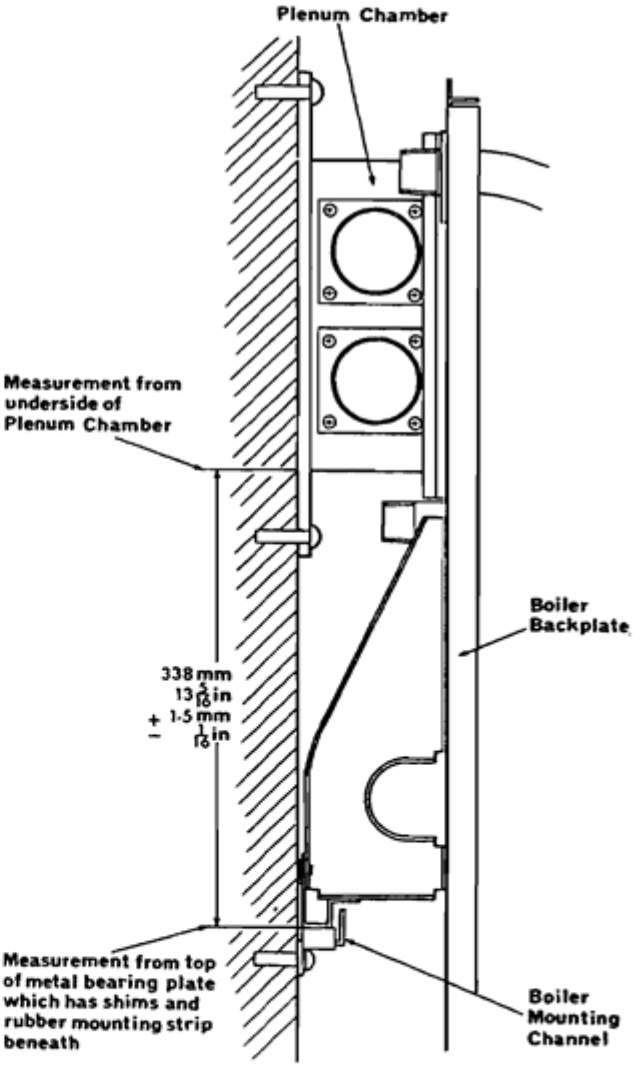


Fig. 6 RELATIVE POSITION OF PLENUM CHAMBER AND MOUNTING CHANNEL

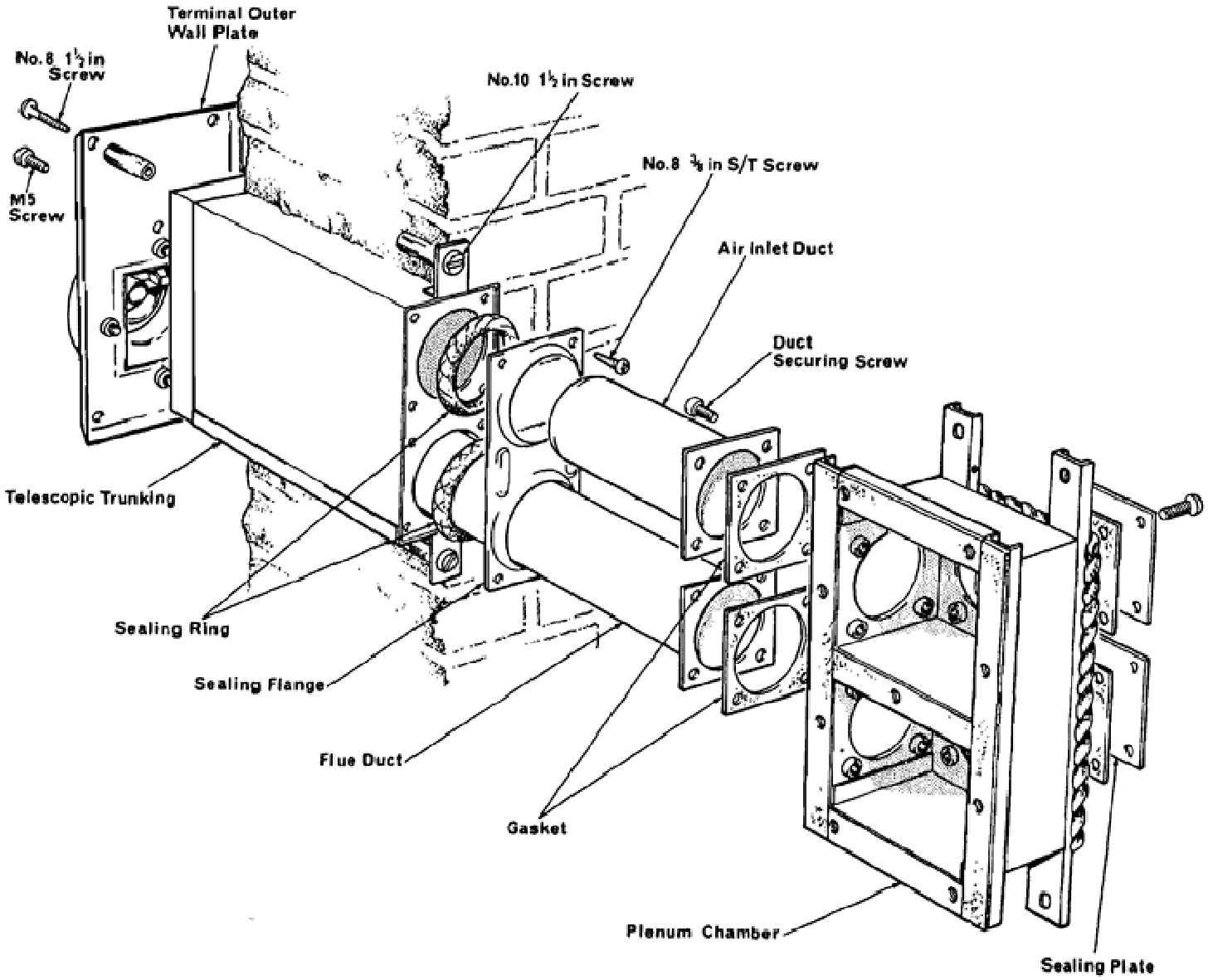


Fig. 7 ARRANGEMENT OF NETAHEAT 16/22 DUCTS

4. Preparing the Boiler

The boiler is designed so that all pipes can be hidden within its own width except where they leave the boiler at top and/or bottom. Because the water connections are behind the boiler backplate, short lengths of pipe will have to be connected to some of the tappings to be used before the boiler is lifted into position, and terminated in a position suitable for connecting to the system pipework; it is recommended that copper capillary connections are used. Although it is possible to install the boiler and its pipework with only access from the front, it is very much easier with access from at least one side. This access is not necessary for maintenance which can be carried out from the front only. The injector tee and special nozzle elbow will first have to be positioned and both joints made sound. Pipe runs must be kept clear of the areas where the plenum chamber is to be fitted and where the air inlet and flue ducts will be located if a side outlet is being used. Connections which can be used and suggested methods of running pipework behind the boiler are shown in Fig. 8. Any pipe tails running downwards from behind the boiler should not protrude below the bottom of the wooden feet. Refer to Figs. 12 to 15 for diagrams of typical systems to which the boiler can be connected.

A. Combined Gravity System

(1) Using Fig. 8 as a guide, decide on the best pipe run at the rear of the boiler to suit the particular system.

(2) Connect a suitable length of 28mm pipe to the domestic hot water flow connection.

(3) Connect a suitable length of 22mm pipe to the heating flow connection. There is space behind the boiler to split the flow if necessary. The central heating circulating pump can be fitted above or below the boiler on either the flow or return as required.

(4) Fit the injector tee and the special nozzle elbow to the boiler combined domestic hot water/central heating return connection. The 1 in. Bsp side outlet in the tee for the gravity domestic return can be located in any convenient position through 360° simply by rotating the tee in its connection; this will enable it to be connected to the domestic return pipework, irrespective of the direction from which the pipework is routed. The same applies to the special nozzle elbow which must be screwed into the back of the tee; the connection in the elbow is 22mm and should be used for the heating return. When the elbow has been screwed into the tee, it should not protrude more than 95mm (3¾ in.) from the boiler backplate or it could foul the wall behind the boiler.

(5) Connect suitable lengths of pipework to the tee and the elbow as necessary. There is space behind the boiler to combine the two heating circuits if required.

B. Fully Pumped System and Central Heating Only

(1) Using Fig. 8 as a guide, decide on the best pipe run at the rear of the boiler to suit the particular system.

(2) When connecting the flow pipework, it is only necessary to use one flow connection, preferably the upper 1 in. BSP with the lower ¾ in. connection being blanked off. However, in certain circumstances where a left-hand flue terminal is being used and only a pipe run to low level is required, the lower ¾ in. BSP connection can be utilised, provided the 1 in. connection is vented. Connect a suitable length of pipe to which ever connection is to be used.

(3) If the cold feed is to be connected into the boiler, it can be made into the 1 in. BSP tapping on the injector tee. The special ¾ in. BSP nozzle elbow can then be used for connecting the return, providing its nozzle in sawn off and any burrs removed. This is necessary to reduce the boiler resistance and to ensure correct water distribution within the heat exchanger.

If the cold feed is to be connected elsewhere in the system, the injector tee can be discarded and the return port in the heat exchanger bushed down to ¾ in. BSP and the return connected directly to the bush. Any method of connecting the return can be used, including the use of the special nozzle elbow as described previously.

Note: On systems requiring a high flow rate, the 22mm (¾ in.) pipework from the flow and return connections should be enlarged as close to the boiler as practicable.

(4) The circulating pump can be fitted on either the return or flow in any position to suit the particular installation.

C. Boiler Main Gas Cock

(1) The main gas cock is supplied loose but tied to the boiler and must be fitted directly to the union nut and liner already fitted to the inlet elbow. The tap must then be located in the most suitable position for operation.

NOTE: In some installations where there is a minimum clearance beneath the boiler, it may be advisable to turn the inlet elbow to the horizontal to enable the connection to be made to the cock.

(2) Connect a suitable length of 15mm pipe to the main gas cock, terminating it above, below or to the side of the boiler in a length which can be easily connected to the main supply, once the boiler is in position on the wall.

5. Fitting the Boiler on the Wall — See Fig. 9

A metal safety strap is provided with this boiler which is used to hold the boiler backplate against the plenum chamber once the boiler has been lifted into position but before any plenum chamber securing bolts have been fitted.

This will enable the installer to leave the boiler unattended once it has been positioned, so enabling him to pick up a screwdriver etc.

The strap must first be positioned by hooking its free ends behind the upper plenum chamber securing bracket, immediately above the two upper securing screws. It can then be hinged upwards against the wall until the boiler has been fitted when it can be hinged downwards, so holding the backplate against the plenum chamber.

A. Stand the boiler on the floor in a vertical position, then using the two wooden feet, the cast iron flow pipe and the underside of the heat exchanger, lift the boiler into position on the wall, locating its mounting bracket on the bearing plate in the mounting channel. Support the boiler in this position using the safety strap if necessary, then secure the boiler backplate to the plenum chamber with seven bolts, see bolts numbered 1 to 7 on Fig. 9. Three bolt holes in the boiler backplate are marked with a ring and these are for use when fitting the fan and must not be used in this operation.

Warning: (1) Take care not to damage the igniter housing on the back of the boiler, adjacent to the boiler main mounting bracket.

(2) When fitting the bolts in A, the weight of the boiler could distort the boiler support bracket so making it difficult to line up the bolt holes in the boiler back plate with those in the plenum chamber. If this should occur, the weight of the boiler should be supported until the bolts are correctly engaged.

B. Fit the fan in position and secure it to the boiler backplate with the three bolts, numbered 8 to 10 on Fig. 9. Connect the two mains electrical leads to their connections on the boiler backplate and the earth lead to the earth screw also on the backplate.

Warning: It is very important that when tightening the bolts in operations A and B that good seals are made. All bolts must be tight.

C. Refit the fluehood to the heat exchanger, ensuring that a good seal is made at the plenum and that all the plenum fixing bolts have been fitted and are tight. Secure the hood in position with the four wingnuts and washers; ensure the wingnuts are tight, and that the hood makes a good seal with the heat exchanger.

D. Fit the combustion chamber front cover, securing it with the four screws (Accessories Card Item F).

E. Unscrew the wingnuts and remove and discard the two wooden feet taking care not to damage the capillary of the mercury vapour flame safety valve.

F. Connect the main gas supply to the length of pipe fitted to the ½ in. BSP gas cock.

G. Connect the short lengths of pipe previously fitted to the boiler, to the system pipework, then fill and vent the water system and test for leaks. Rectify if necessary.

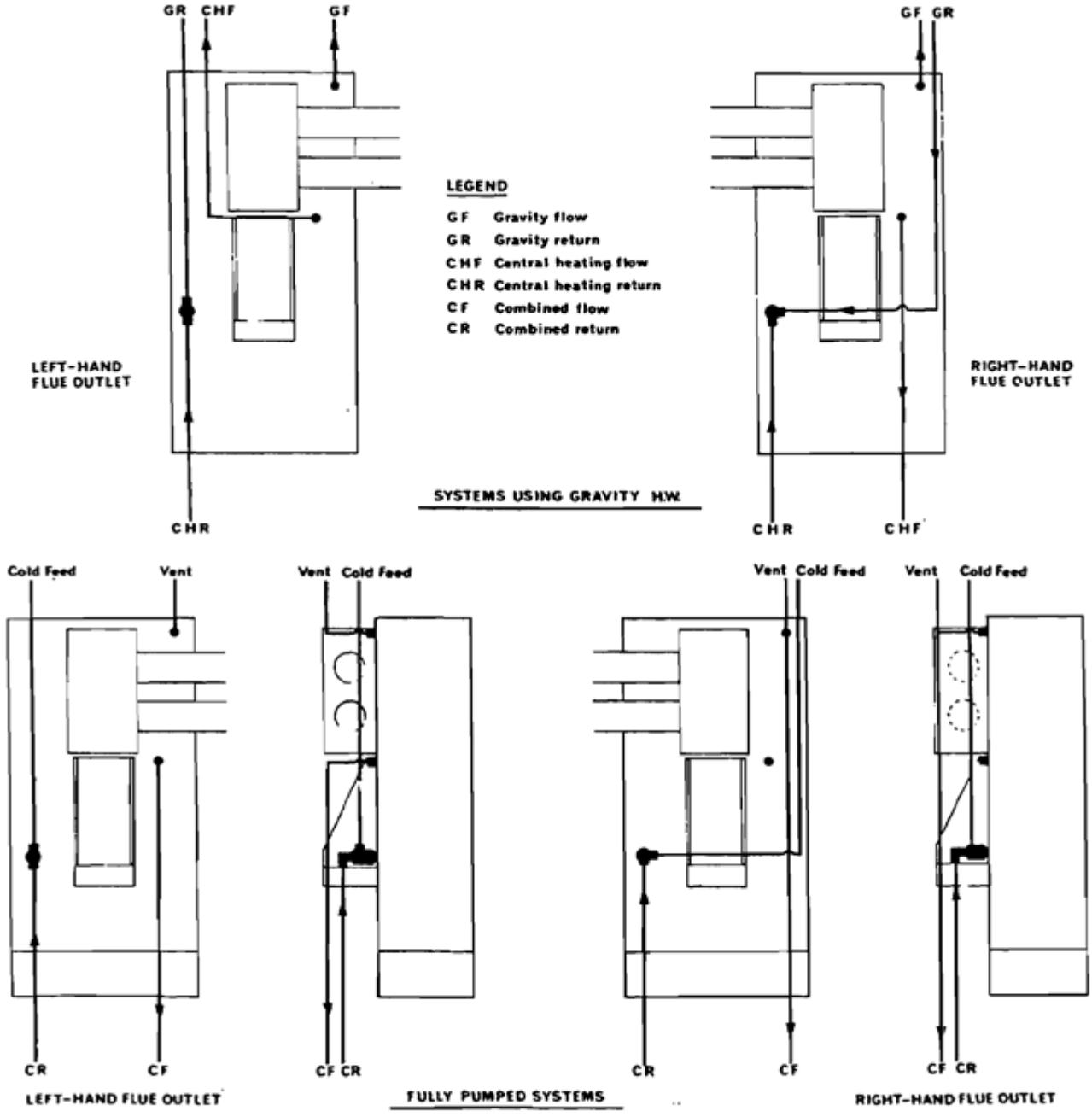


Fig. 8 SUGGESTED PIPEWORK VIEWED FROM BEHIND BOILER

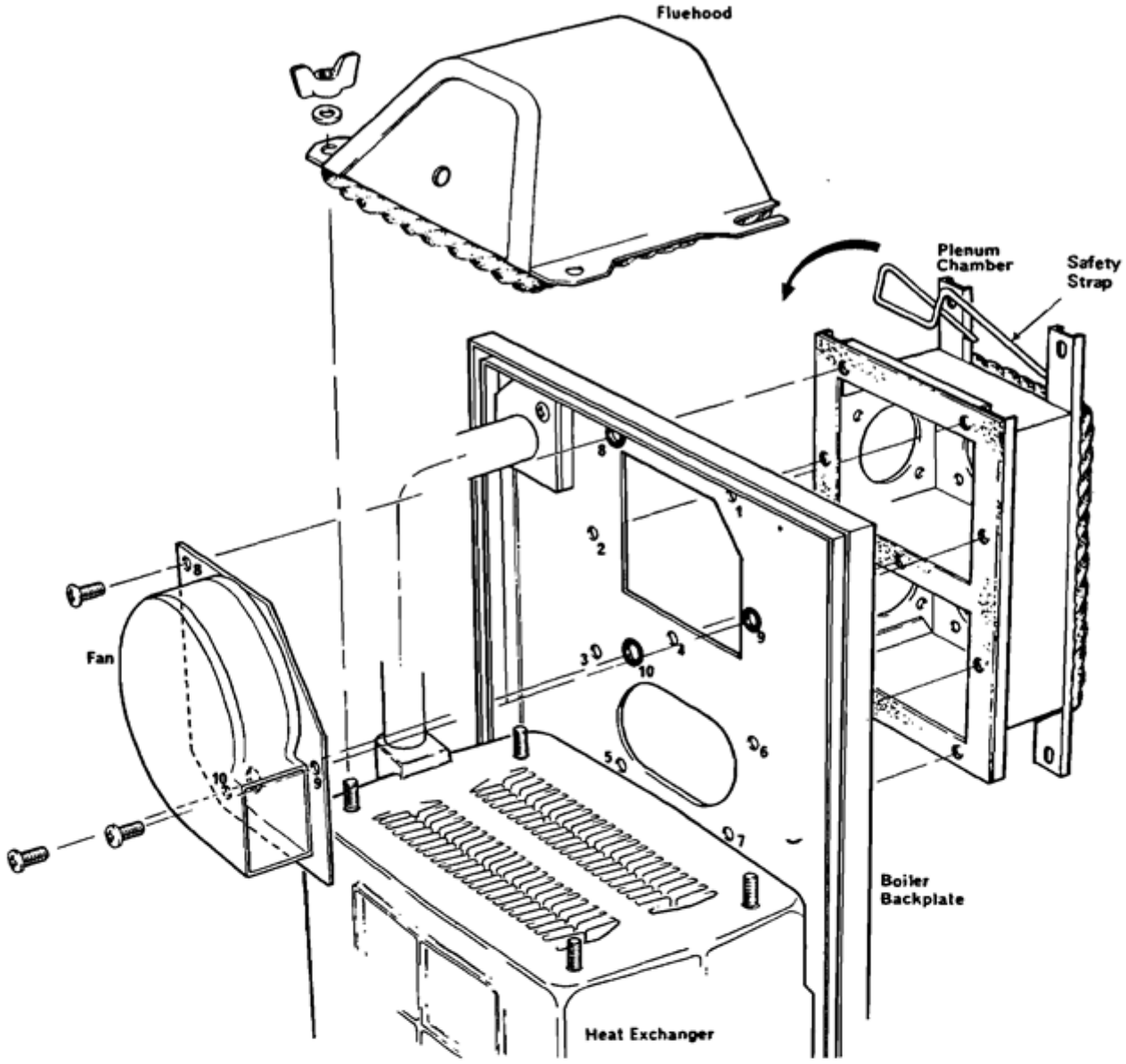


Fig. 9 PLENUM CHAMBER, FLUEHOOD AND FAN ATTACHING PARTS

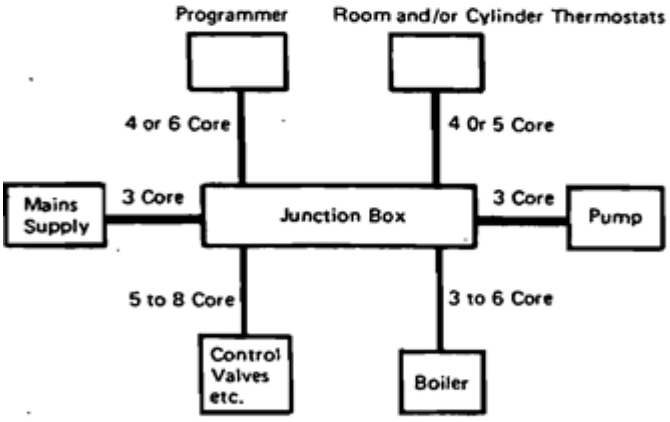


Fig. 10 PRINCIPLE OF WIRING

6. WIRING — See Fig. 11

Care must be taken to ensure that all wiring to the boiler is kept clear of sharp edges and hot surfaces.

The boiler terminal strip is not designed to accept wiring from all the on-site system controls and therefore, the installer will usually need to incorporate a suitable junction box. The principle of wiring up the boiler and its controls is shown in Fig. 10. However, the layout of a particular system will itself govern the most economical location for the junction box and its terminals.

As the boiler thermostat already incorporates a pump over-run facility, the wiring to the pump must always be as illustrated in Fig. 12, 13, 14, 15 and 16.

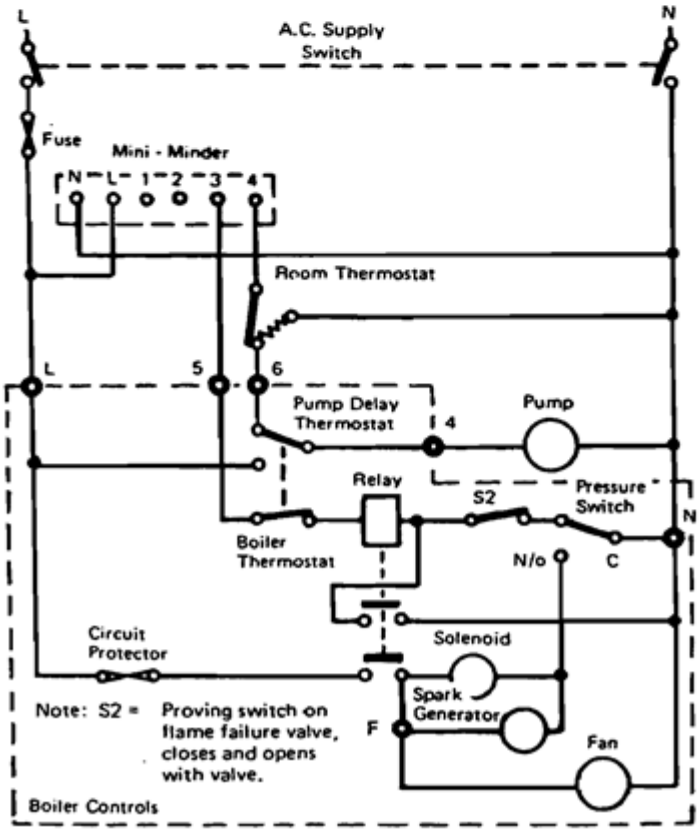


Fig. 11 SCHEMATIC WIRING DIAGRAM

Fig. 15 illustrates a system with a zone valve which requires an electrical supply to motor it both to the open and closed positions. Zone valves which require an electrical supply to open them but not to close them, should be wired in a similar manner but ignoring the closed connection from the room thermostat. For this type of valve, a room thermostat with a single pole contact should only be used. Certain zone valves may require an additional connection to the auxillary switch (shown dotted). This would apply to those valves which internally are not suitable for giving an open signal from the normal opening voltage supply.

Wire up the boiler and system controls as illustrated in Fig. 12, 13, 14, 15 or 16 depending on the type of system installed. The wiring arrangements shown outline only the basic control requirements, and will therefore require on-site interpretation of the various boiler installation arrangements.

If a Potterton Mini-Minder time control is not being fitted, but a three terminal time clock is to be installed to control the systems illustrated in Fig. 12, 13, 14, 15 or 16 the time clock should be wired as follows:–

Live to Time Clock Live.
Neutral to Time Clock Neutral.
Earth to Time Clock Earth.
Wires normally connected to Mini-Minder Terminals 3 & 4 to Time Clock Switch.

A low limit thermostat can be installed to override the "OFF" setting of the time control if the temperature where the thermostat is situated, falls below the thermostat setting. Where a Mini-Minder or Programmer is installed, a double pole or double outlet thermostat may be necessary; for the electrical connections and type required, see the relevant system wiring diagram. Where only a time clock is fitted, the thermostat need only be a single pole type with its contact wired in parallel with the clock switch.

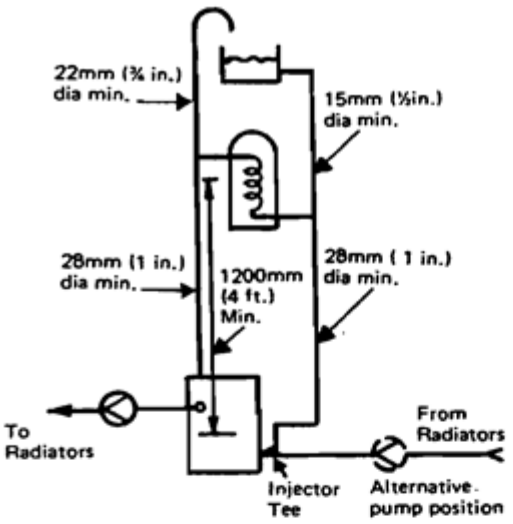
If a three way (proportioning diverter) valve with a mid-position is being fitted in the system, the following instructions must be adhered to in addition to the valve manufacturers wiring information:

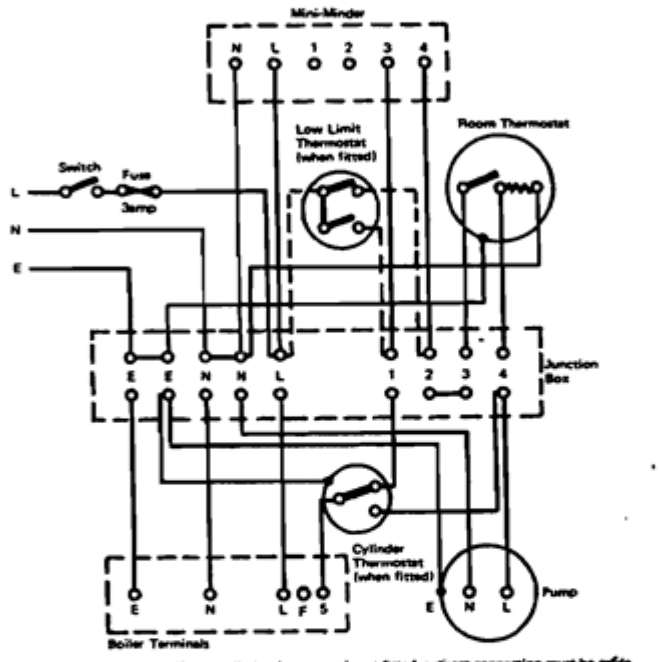
1. Live, neutral and earth connections must be made to boiler terminals L, N and E.
2. The switched supply from the system control circuit (e.g. from the relay), must be connected to boiler terminal 5.
3. Loop boiler terminals 5 and 6 together.
4. The live supply to the pump must be taken from boiler terminal 4.

When all wiring is complete, hinge down the controls panel to gain access to the boiler front cover lower securing points, then fit the front cover to the boiler, securing it with the four captive bolts.

Ensure that an air tight seal is obtained around the perimeter of the casing. Hinge up and secure the controls panel then slide the controls cover onto the boiler and secure it with the captive screw. Fit the thermostat knob (Accessories Card Item G).

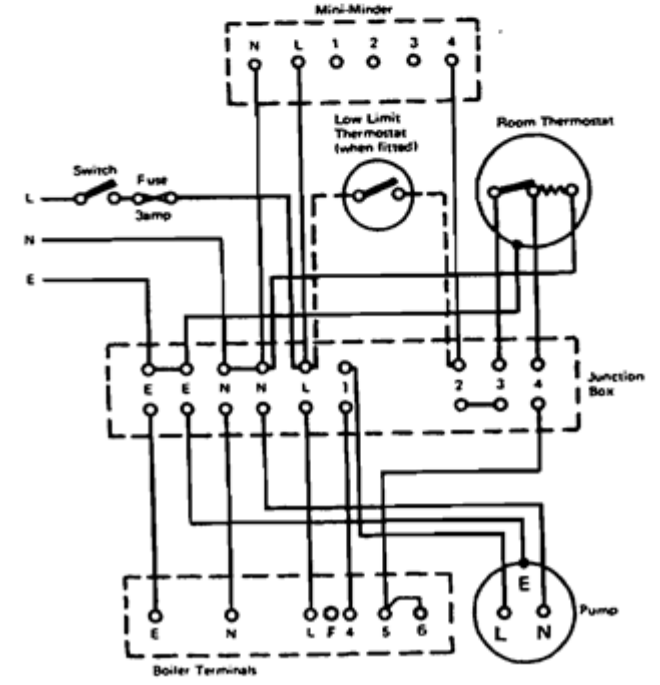
Fig. 12 GRAVITY HOT WATER WITH PUMPED CENTRAL HEATING





Note 1: When a cylinder thermostat is not fitted, a direct connection must be made between junction box terminal 1 and boiler terminal 5.

GRAVITY HOT WATER WITH PUMPED CENTRAL HEATING



PUMPED CENTRAL HEATING ONLY

Fig. 13 GRAVITY HOT WATER WITH TEMPERATURE CONTROL AND PUMPED CENTRAL HEATING

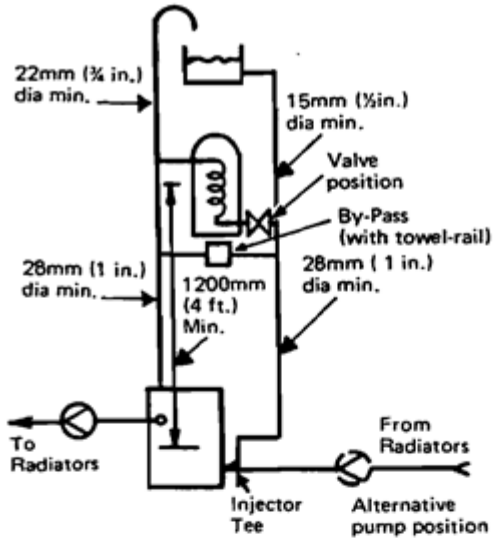
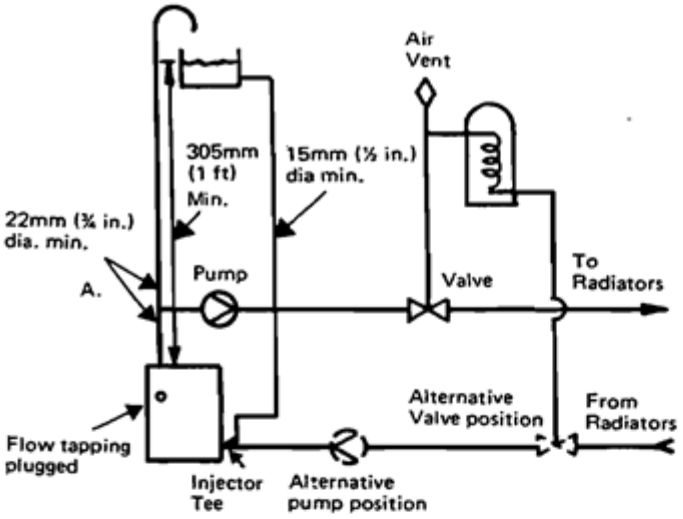
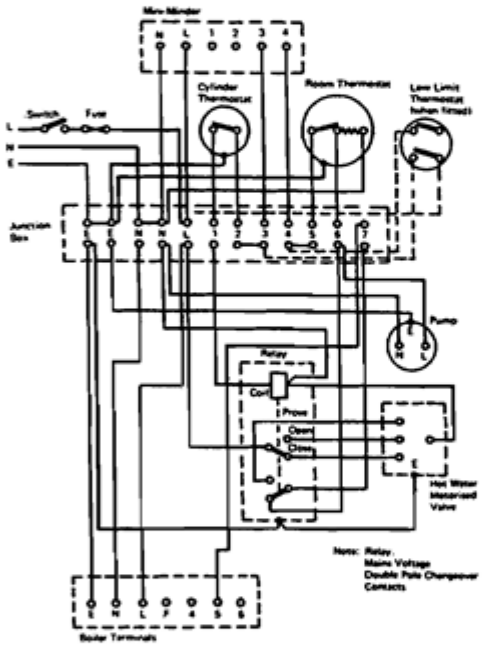
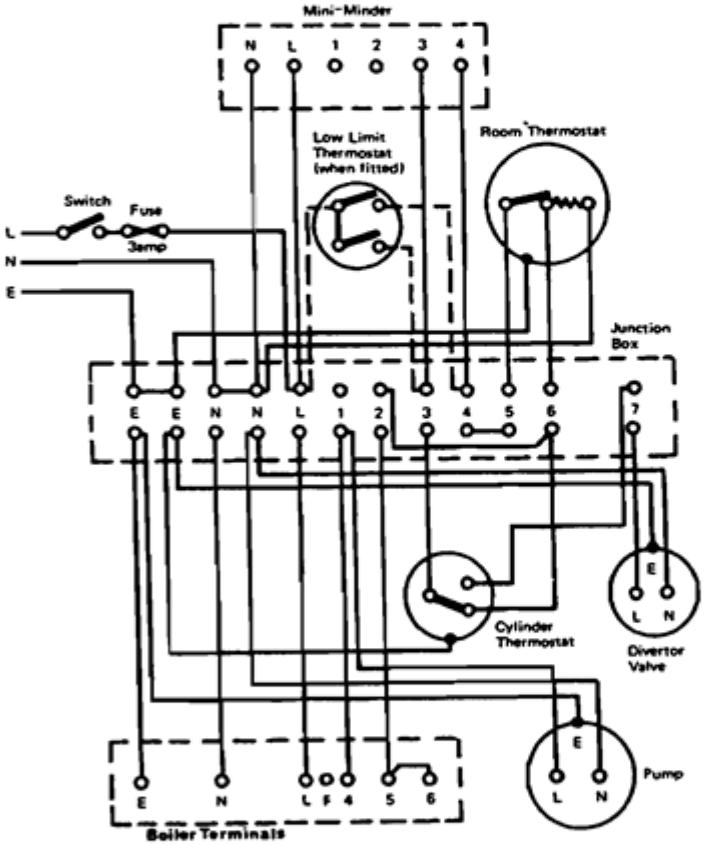


Fig. 14 FULLY PUMPED WITH TWO POSITION DIVERTER VALVE



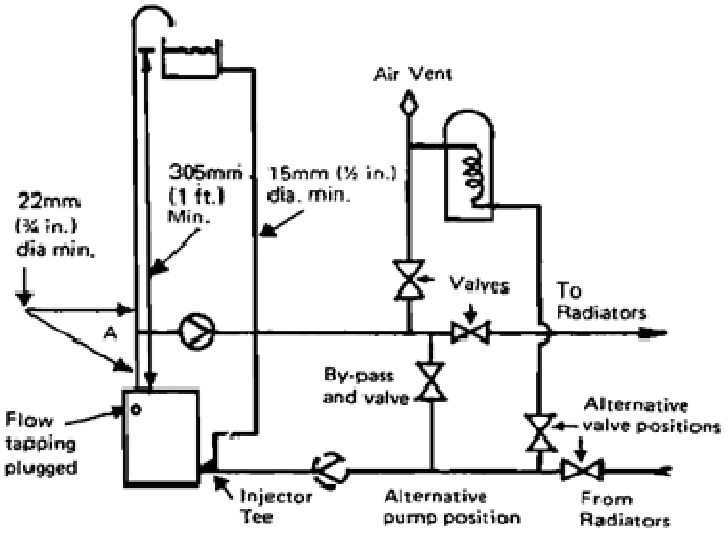
A. Junction between vent and pumped circuit to be on close to boiler as possible — Max. distance 910mm (3 ft.)





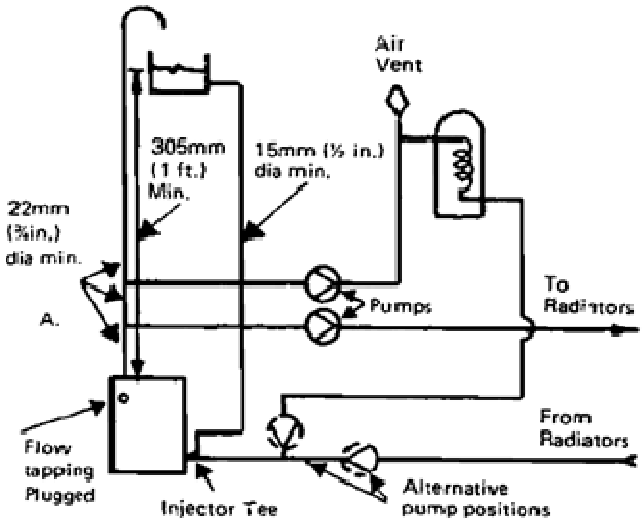
HOT WATER PRIORITY

Fig. 15 FULLY PUMPED WITH ONE OR TWO TWO-WAY VALVES



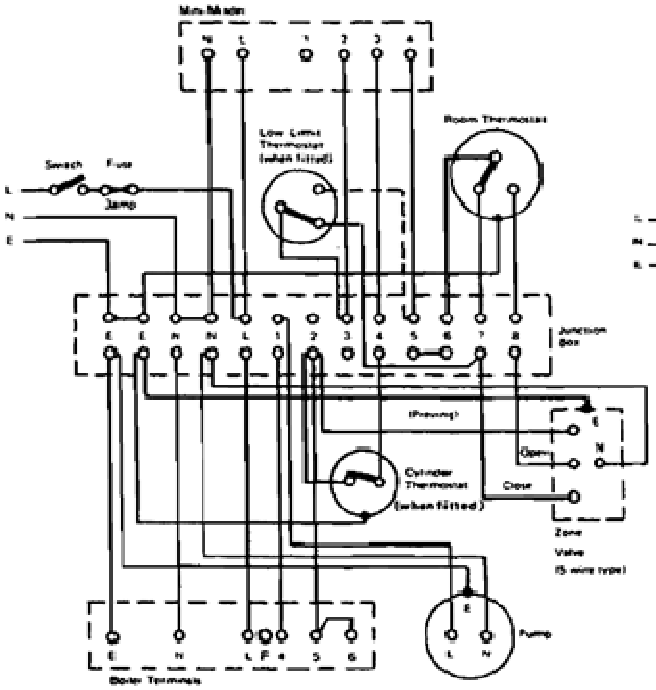
A. Junction between vent and pumped circuit to be as close to boiler as possible – Max. distance 910mm (3ft.)

Fig. 16 FULLY PUMPED USING TWO PUMPS



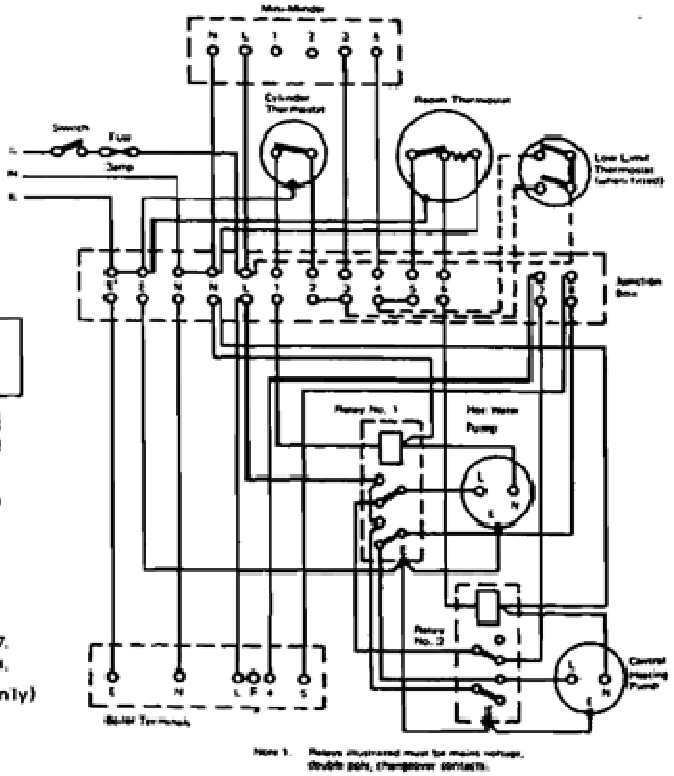
A. Junction between vent and pumped circuit to be as close to boiler as possible – Max. distance 910mm (3 ft.)

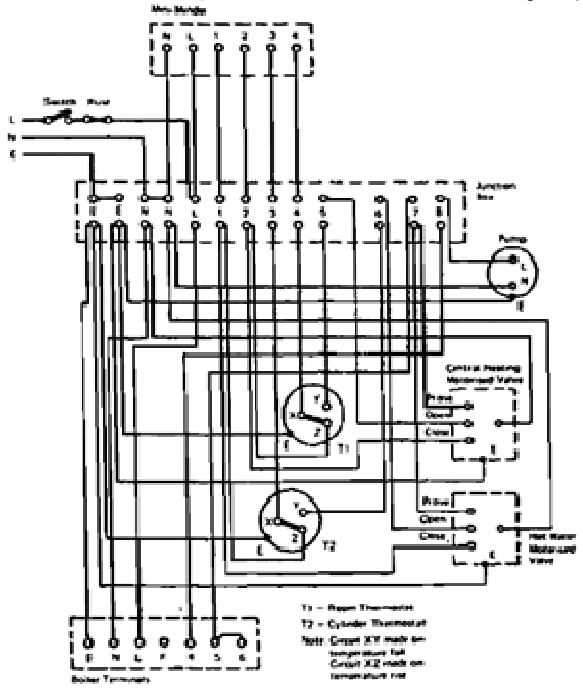
B. To stop intercirculation, a non-return valve should be fitted in each circuit.



NOTE 1. When a low limit Thermostat is not fitted, loop Junction Box Terminals 3 & 7.
2. When a Cylinder Thermostat is not fitted, loop Junction Box Terminals 2 & 4.

WITH ONE VALVE (Temperature control of Central Heating only)





WITH TWO VALVES (Independent temperature control of both circuits)

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Fax: 01926 410006

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