

INSTALLATION  
INSTRUCTIONS

# Potterton

## Diplomat Gas-Fired Boilers Category II (Multigas) 35/40, 41/48, 55/68, 70/80 & 82/92 Standard & Small Bore Units

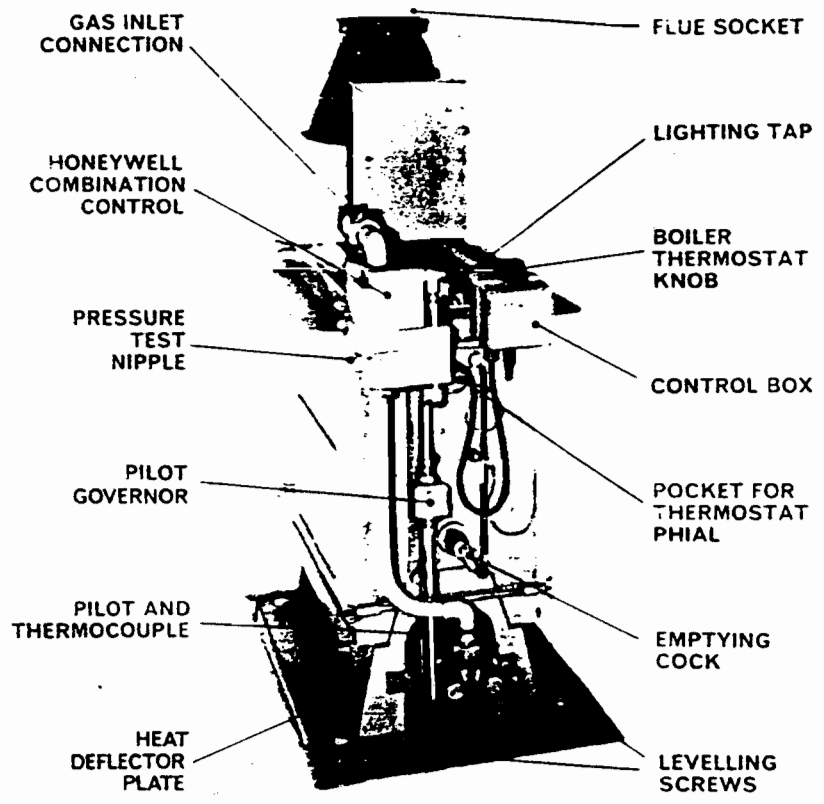


Fig. 1

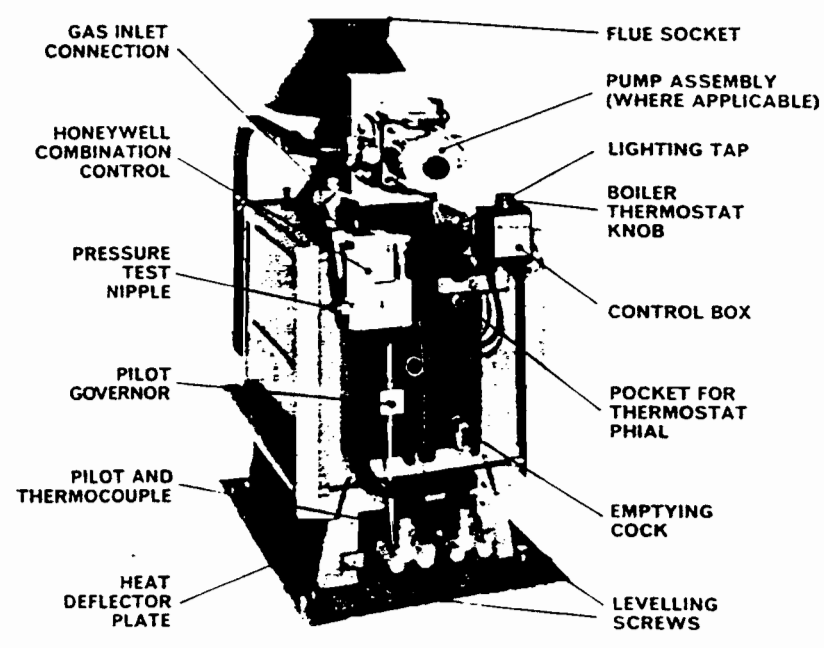


Fig. 2

The Potterton Diplomat Standard Units (Fig. 1) and the Diplomat Small Bore Units (Fig. 2) are delivered with waterway, burner and controls fully assembled and tested. In addition, Diplomat Small Bore Units are fitted with a pump and supplied with a Potterton Time Control, Programmer or Perfect, according to choice. The casing and Potterton time control ('Perfect' or 'Programmer') if ordered, are in separate cartons.

**SITE PREPARATION (Fig.3)**

**Base**  
A level insulated floor, which conforms with the requirements of the local authorities and the building regulations, must be provided. The following minimum clearances, outside the boiler casing, must be allowed for installation and maintenance:-

- (a) Front - 18 in. (460 mm)
- (b) Each side - 2 in. (50 mm)
- (c) Rear - 4 in. (100 mm)

**Fresh Air For Combustion**  
Adequate fresh air is essential for efficient combustion. An air inlet must be provided at a low level, preferably about 12 in. (300 mm) from the ground where it cannot become accidentally blocked or obstructed and it should be as close to the boiler as possible to minimise draughts. Whenever possible the inlet should open to outside the house and for both the Standard and Small Bore Units it must have a free area of:-

- Diplomat 35/40 - 20 sq. in. (130 sq. cm)
- Diplomat 41/48 - 24 sq. in. (160 sq. cm)
- Diplomat 55/68 - 34 sq. in. (220 sq. cm)
- Diplomat 70/80 - 40 sq. in. (260 sq. cm)
- Diplomat 82/92 - 46 sq. in. (300 sq. cm)

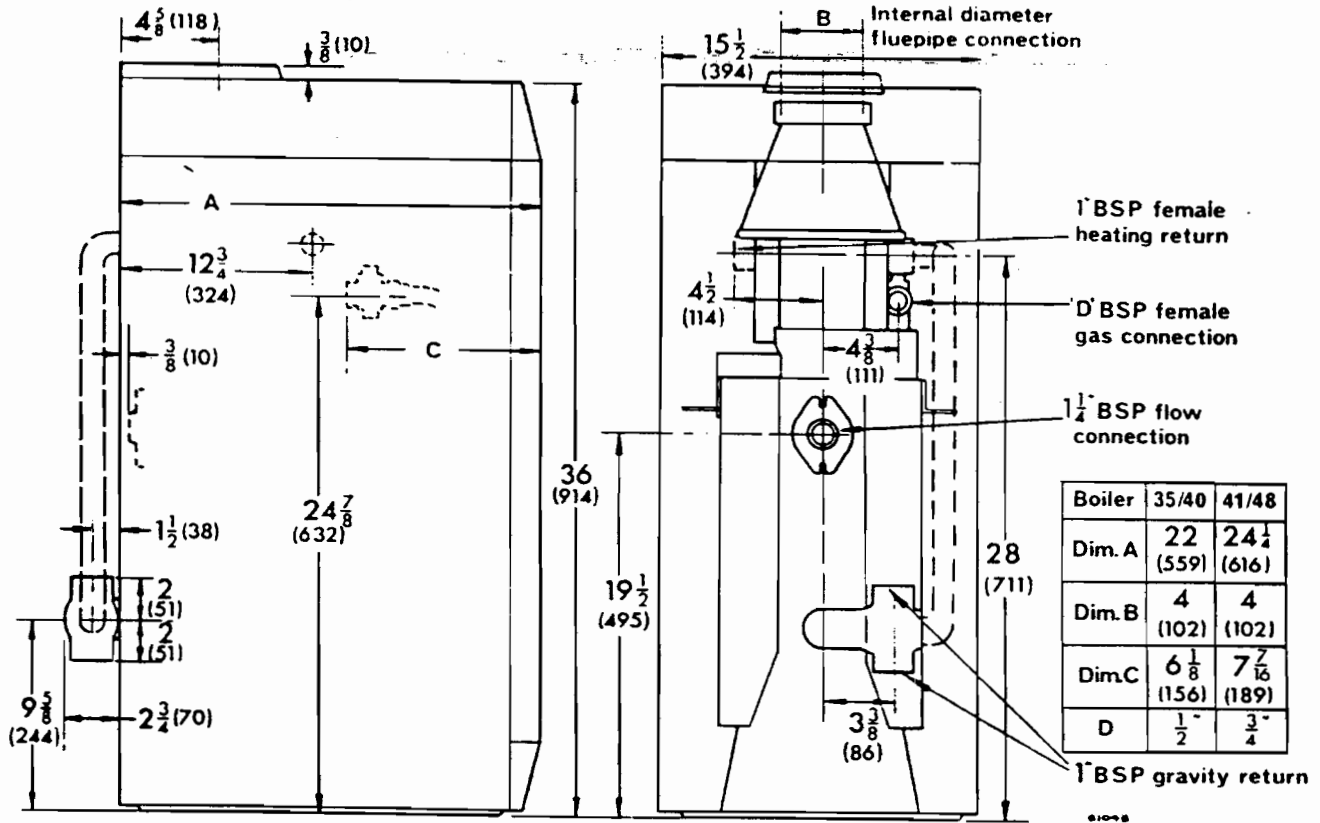
If the inlet opens to a ventilated space within the house these areas should be doubled. Refer to British Standard Code of Practice CP.332. Part 2, 1968 for further guidance.

**Ventilation**  
A high level ventilation grille, with a free area equal to at least half that of the fresh air inlet, should be provided.

**Flue**  
An efficient flue system must be provided to evacuate the products of combustion from the boiler. Reference should be made to British Standard Code of Practice CP. 337.1963 from which the following notes have been compiled for guidance:-

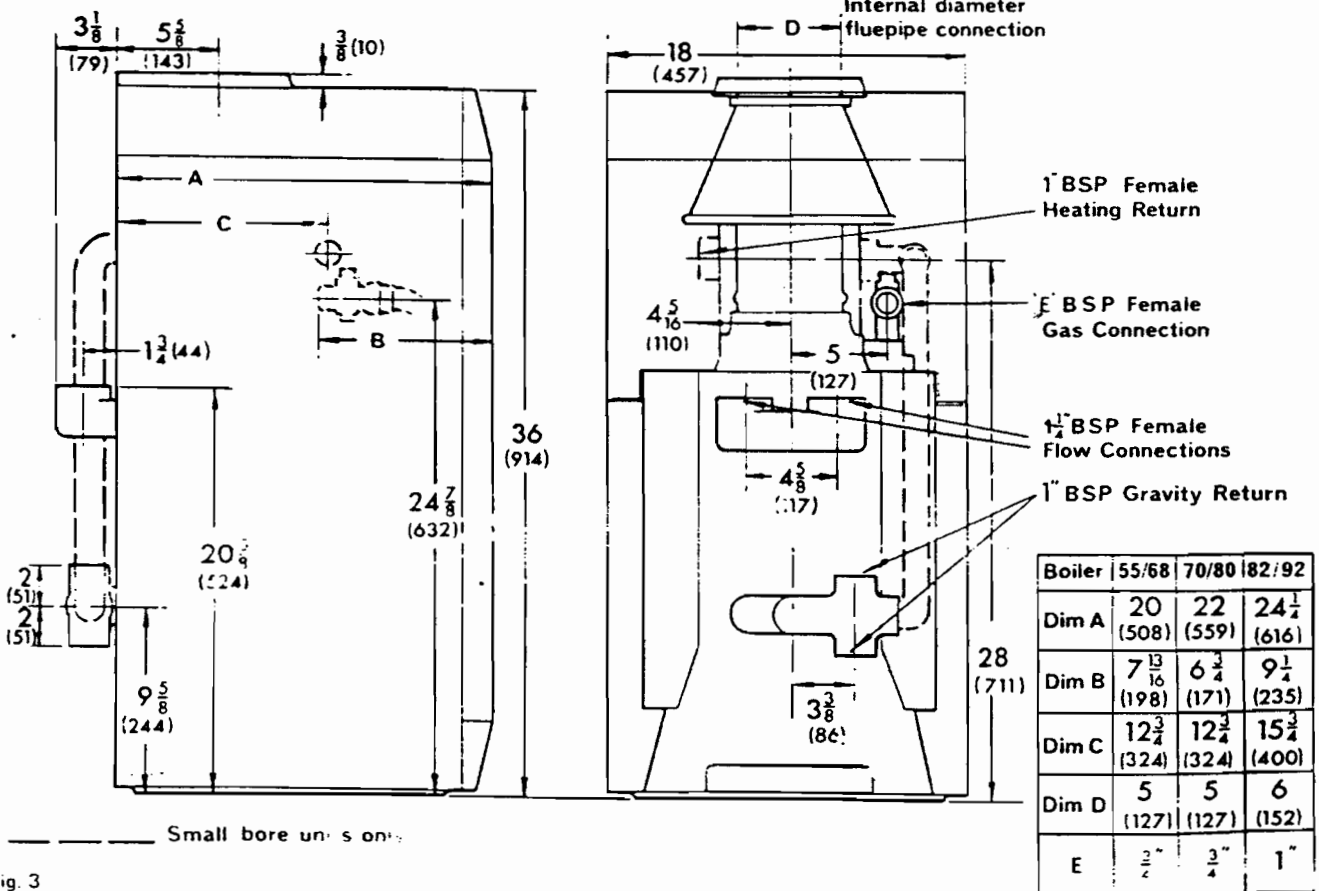
- (a) Ideally a flue should rise vertically to a termination point which is unaffected by downdraught or wind eddies and is not in a pressure zone. Therefore, for practical purposes, the flue should have the shortest possible run to external atmosphere, with as near vertical rise as possible; 90° bends should be avoided.
- (b) Wherever possible there should be at least 3 ft. (920 mm) of vertical flue from the boiler flue socket.

Dimensions in inches (mm)



Small bore units only

Dimensions in inches (m.m.)



Small bore units only

Fig. 3

TABLE 1

BOILER	DIPLOMAT 35/40					DIPLOMAT 41/48				
Input Btu/h (J/s)	48,500 (14,300) to 52,500 (15,480)					57,500 (16,800) to 63,000 (18,550)				
Output-Heat into water Btu/h (J/s)	35,000 (10,400) to 38,000 (11,200)					41,000 (18,100) to 45,000 (13,250)				
Output-Heat into Air Btu/h (J/s)	2,000 (585)					3,000 (875)				
MAIN BURNER Bray 1528	One pair 14.9/16 in. (37 cm) long					One pair 17.1/2 in. (44.5 cm) long				
Gas Rate cu.ft./h (m <sup>3</sup> /h)	97-106 (2.76-2.96)					115-126 (3.25-3.56)				
GAS TYPE	TOWN GAS Wobbe Group				NAT GAS Wobbe No. 1335	TOWN GAS Wobbe Group				NAT GAS Wobbe 1335
		3	4	5			3	4	5	
INJECTOR-Bray Cat. No.11 Size.		1,700	2,000	2,400	520		2,100	2,500	3,000	65
	Output into water Btu/h (J/s)	BURNER PRESSURE IN. W.G. (MM.W.G.)				Output into water Btu/h (J/s)	BURNER PRESSURE IN. W.G. (MM.W.G.)			
		35,000 (10,400)	2.0 (50.8)	1.8 (45.6)	1.5 (38.0)		6.0 (153)	41,000 (12,100)	1.8 (45.6)	1.5 (38.0)
	36,000 (10,600)	2.1 (53.3)	1.9 (48.2)	1.6 (40.5)	6.3 (161)	43,000 (12,650)	1.9 (48.2)	1.7 (43.1)	1.4 (35.5)	6.4 (163)
	37,000 (10,900)	2.3 (58.3)	2.0 (50.8)	1.6 (40.5)	6.7 (171)	45,000 (13,250)	2.2 (55.8)	1.9 (48.2)	1.5 (38.0)	7.0 (177)
	38,000 (11,200)	2.4 (60.8)	2.1 (53.3)	1.7 (43.1)	7.0 (178)					

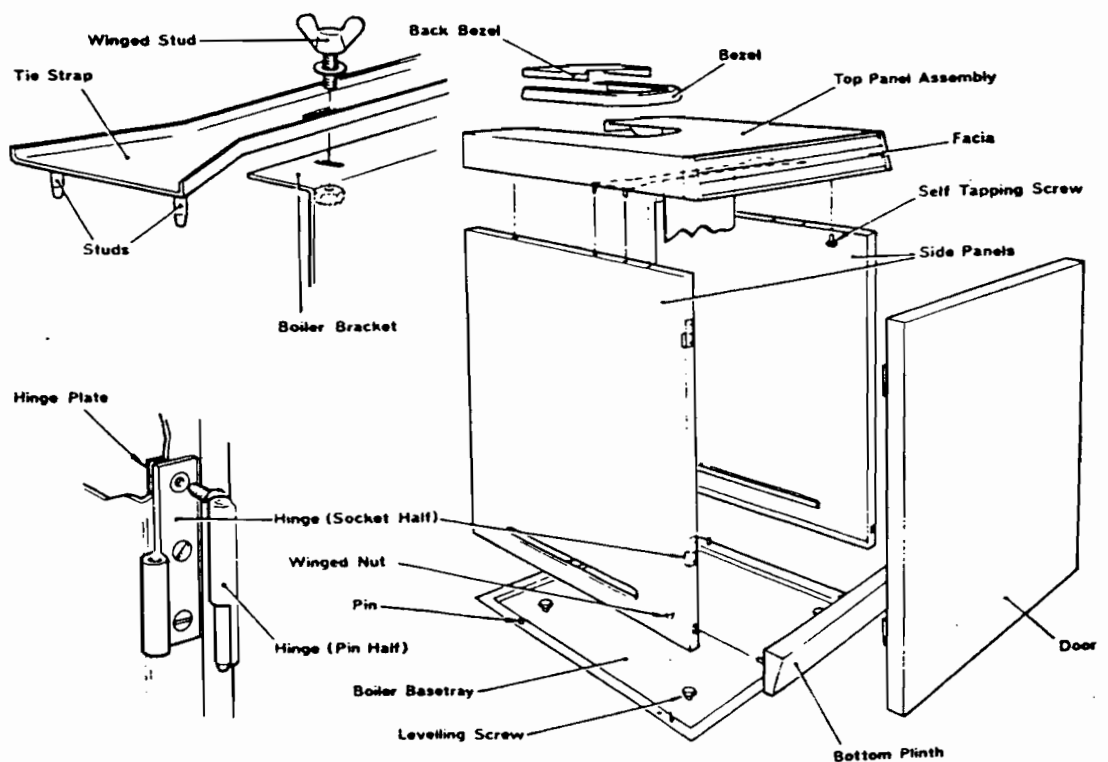


Fig. 6

Note: Some Gas Boards insist on a split socket in this length.

- (c) Horizontal runs should be avoided. If a near-horizontal flue run is unavoidable it must be followed by at least twice its length of vertical flue.
- (d) Wherever possible internal stacks, lined if necessary, should be used.
- (e) Brick stacks on external walls must be lined.
- (f) External asbestos flues must be insulated.
- (g) Where condensation is likely, a means of draining must be provided

### Electricity Supply

A 220-240 volt, 50 cycles, a.c. single phase, three wire electricity supply, fused at 2 amp, and including a suitable isolating switch or plug and socket must be run to the site.

### Gas Supply

The gas meter and supply pipe must be checked to ensure that they are adequate for the installation, taking into account any other appliances already being fitted. The local Gas Board can assist in this matter.

### INSTALLATION

1. Remove the coach bolts securing the wooden packing frame to the base of the boiler.
2. Screw the 3/8 in. Bsw x 3/4 in. long hexagon headed screws (supplied in a linen bag attached to the boiler) into the hank bushes at each front corner of the base tray; level the base tray as necessary
3. Stand the boiler in position (on its base tray) allowing the clearances shown in "SITE PREPARATION".

### Water Connections

Make the flow and return connections in accordance with normal practice, taking the following notes into account, where applicable.

1. Combined system-pumped central heating, gravity domestic hot water.
  - (a) A 'Tee' piece, not supplied, should be fitted as close to the flow tapping as possible on the 35/40 and 41/48 units. The 55/68, 70/80 and 82/92 units have separate connections for independent flows to be fitted from the header. It is important with this type of system that an indirect hot water cylinder be used, this will minimise corrosion in the system and prevent discoloured water being drawn from the hot water taps. If a self priming cylinder is being used, its manufacturers recommendations must be followed otherwise the interchange of water may occur.
  - (b) The primary return from the indirect cylinder should be made into one of the 1 in. Bsp vertical tappings on the injector tee. The pump, when running, will then assist water circulation through the primary hot water circuit.
  - (c) On a Standard Unit the pumped heating return should be made into the horizontal tapping on the injector tee. On a Small Bore Unit it should be made into the pump inlet cock.
  - (d) A vertical check valve should be fitted in a vertical section of the heating flow pipe to prevent gravity circulation in the heating circuit when the pump is not working. This valve should be fitted with the arrow on

it pointing vertically upwards and in the direction of the flow.

- (e) When a Potterton 'Perfect' is being installed, the motorized valve supplied with it must be fitted in the primary return from the indirect cylinder in a position where it will not obstruct the feed or vent pipes between the boiler and expansion tank, or interrupt circulation through a towel rail.
- (f) Where a pump is fitted, disconnect it from the pipework by unscrewing the bolts securing the pump inlet and outlet flanges. Flush the pump and system pipework thoroughly to remove any foreign matter. Reconnect the pump and fully tighten the bolts securing the pump flanges, ensuring that the rubber gasket at each end connection is correctly fitted.

**WARNING:** Great care must be taken to ensure that no foreign matter is left in the system as this could damage the pump. Damage of this nature is NOT covered by the pump guarantee.

**NOTE:** The black knob, usually to be found fitted on the pump clutch shaft at the front of the pump, is a three-purpose knob. It can be used to rotate the pump to assist start up, it is used to operate the pump inlet and outlet valves and it is also used to adjust the variable head of the pump.

### 2. Single Purpose-Standard Unit Only 35/40 & 41/48

(Hot water supply or gravity central heating only) A special return flange with two 1 1/2 in. Bsp vertical tappings should be used. This flange is available on request in exchange for the return header fitted. On glass-lined boilers (for hot water supply in soft water areas) this special flange is fitted as standard.

### 55/68, 70/80 & 82/92

An alternative return header, identical to the existing flow header, is available on request.

### 3. Thermometer

Where a thermometer is being fitted, it should be in the flowpipe as close to the boiler as possible.

### 4. Safety Valve

If local or building regulations require a safety valve to be fitted, it must be fitted by the Installer in the pipework as near as possible to the boiler.

5. Open the pump inlet and outlet valves, then fill and vent the system and check for leaks.

### Flue

Fit the draught diverter to the boiler flue socket and seal it with a suitable compound. Make the flue connection to the draught diverter. (Refer to "SITE PREPARATION".

### Gas Supply

Connect the gas supply. No isolating cock need be fitted unless required by the local Gas Board, as the isolating cock (loose key type) fitted to the boiler serves this purpose. The loose key is not supplied with the boiler.

### Wiring

Connect the electricity supply in accord-

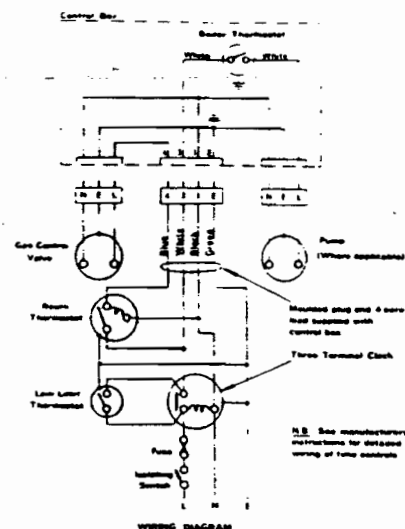


Fig. 4

ance with instructions supplied with the Potterton time control i.e. 'Perfect' or 'Programmer'. If a Potterton time control is not being used, connect the electricity supply as shown in the wiring diagram fig. 4, and in accordance with the latest Institution of Electrical Engineers Regulations for Electrical Equipment of Buildings, local Gas Board regulations and council requirements.

Care must be taken when routing the boiler cable to the isolating switch or plug and socket. The cable must be kept clear of sharp edges and all hot surfaces.

### FIRST LIGHTING

Turn on the main gas supply. Release the main cock union and open the isolating cock (no key is supplied for the cock) to purge air from the pipework. Close the isolating cock, tighten the union and check the gas supply line for leaks.

**WARNING: NEVER USE A NAKED FLAME**

Before lighting ensure that:-

1. The isolating cock is ON and the lighting tap on the Honeywell control is at OFF.
2. The electricity supply is switched OFF.
3. Time control, if fitted, is ON and at a working period.
4. Boiler thermostat and room thermostat (if fitted) are at a high temperature setting.

Then proceed as follows:-

1. Turn the lighting tap to 'PILOT'.

**NOTE:** It is necessary to press the lighting tap slightly whenever it is being turned.

2. Using a match in the match holder attached to the boiler, apply a light to the pilot burner. Press the lighting tap FULLY HOME and hold it there for 30 seconds after the pilot burner has lit.

**NOTE:** On first lighting, establishment of the pilot flame may be slightly delayed due to the presence of air in the pipework.

**CAUTION:** If the pilot fails to light, or goes out at any time, immediately turn the lighting tap to 'OFF'. Wait 3 minutes before repeating the lighting procedure. The lighting tap must not be moved during this period.

3. Turn the lighting tap to 'ON'.
4. Switch ON the electricity supply and the main burner will light.

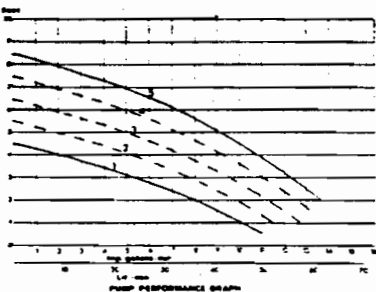
Set the time control, if fitted, and thermostat(s) to the required operating conditions.

Instruct the householder in the lighting procedure.

## BOILER CONTROL SETTING Gas Rate

Connect a pressure gauge to the pressure tapping on the combination control. With the boiler in full operation check that the burner pressure is in accordance with Table 1. If burner pressure adjustment is necessary, remove the screwed cap at the side of the combination control, exposing the adjusting screw. Rotate the governor adjusting screw clockwise to increase or anticlockwise to decrease the burner pressure. Indicate the set pressure by sticking the arrow provided in the correct block on the lighting instruction plate. After the boiler has been running for approximately half an hour, check the gas rate by meter reading. It is advisable to take this reading over a period of at least 5 minutes. With the burner at its designed pressure it should give the gas rate given in Table 1.

The figures are for gas with a calorific value of 500 Btu/cu. ft (3.53 Kcal/m<sup>3</sup>). To calculate gas consumption at any other C.V. multiply this gas rate by 500 and divide by the local declared C.V. If a pressure gauge is not available, setting of the gas rate will have to be done by this method.



## 5 LOT

The pilot governor is pre-set and should not need adjustment. Correctly set, the pilot flame should be sufficient to heat the thermocouple so that the pilot safety valve is 'held in', but should not cause the thermocouple to glow bright red. If the pilot needs adjustment, the pilot governor screw should be screwed in to increase pressure or out to decrease.

**NOTE.** The two nuts on the governor screw should not be loosened, as they are a 'stop' to prevent over-gassing of the pilot.

## BOILER THERMOSTAT

The boiler thermostat has been calibrated by the makers and no attempt should be made to recalibrate it on site. Check that the phial, at the end of the capillary, is in the pocket provided in the waterway and that the securing clip is in position. The thermostat knob is calibrated 120-190°F. (49-88°C) and may be set to give the temperature best suited to the customer's requirements.

## Central Heating & Indirect Hot Water Supply

The setting may be varied up to 190°F. (88°C) in accordance with outside temperatures.

**NOTE:** In all cases a minimum setting of 130°F. (54°C) is recommended. Check the calibration of the thermostat by comparison with the thermometer in the flowpipe. Where a thermometer is not included in the system, a 'clip on' type can be used. Due allowance must be made for some inaccuracy as the thermometer will not be in direct contact with the water.

## Direct Hot Water Supply (Standard Unit Only)

Normally a temperature of 140°F. (60°C) will be found to be adequate. This should not be exceeded in hard water areas unless the water is artificially softened. If the water is artificially softened, or if the boiler is a glass-lined boiler installed in a soft water area, temperatures of up to 190°F. (88°C) may be used.

**WARNING:** THE SCALDING TEMPERATURE OF WATER IS APPROXIMATELY 160°F. (71°C.)

## COMBINATION CONTROL Oil Damped Solenoid Valve

Check the operation of the valve by turning off the electricity supply, either by the isolating switch or by the selector switch on the time control. The main burner should shut down almost immediately.

## Flame Safety Valve

Check the operation of the flame safety device by turning the lighting tap to 'OFF'. A distinct click will be heard within 90 seconds indicating that the valve has closed.

## Pump - Small Bore Unit Only

The output of the pump should be adjusted to give the required temperature differential, usually 20°F (11°C), between the heating flow and return. See Fig. 5. for pump settings.

To adjust the variable head of the pump, fit the pumps black knob to the adjusting shaft at the rear of the pump. The shaft can now be turned and the numbers on the knob aligned with either of the red marks on the pump casing to obtain the required setting. The variable head adjuster is located out of sight at the rear of the pump, so that the householder will not attempt to alter it once it has been set by the installer.

Return the black knob to the clutch shaft at the front of the pump as the householder may have to use it in this position.

## CASING ERECTION (Fig.6)

1. Fit the aluminium bezel (U-section only) to the top panel, with largest projection uppermost.
2. Lay the top panel assembly, suitably protected, upside down on the floor.
3. Fit the side panels to the top panel assembly and secure using two No. 10 self tapping screws each side.
4. Fit the bottom plinth across the front of the side panels and fasten using the two "push in" fasteners.
5. Stand the casing the right way up, in position on the base tray, engaging the pin on each side of the base tray with the rearmost hole in the lower edge of each side panel; the foremost hole in the lower edge of each side panel must be positioned around the stud on each side of the base tray. Screw wingnuts on the studs to secure the side panels.
6. Place the cross brace in position with its two studs each side fitting into holes through the ledge where the top panel assembly joins a side panel. Using two winged studs, washers and nuts, attach the cross brace to the boiler bracket (do not fully tighten these studs yet).
7. Using six sheet metal type screws and spire fasteners (hinge plate), attach the two hinges (socket halves) to the side panel.
8. Position the door assembly on the casing, engaging the longer hinge pin in its socket first.
9. Check that the door closes correctly between the facia panel and the plinth. Adjust if necessary by moving the hinges on the side panel.
10. Hold the casing square and tighten the winged studs securing the cross brace to the boiler bracket.
11. Fit the rear part of the bezel.
12. Affix the "Lighting Instructions" to the inside of the casing door.

## User's Guide

A "User's Guide" is supplied with this boiler, but if possible the householder should have the operation of the boiler and system explained by the Installer.

DIPLOMAT 55/68					DIPLOMAT 70/80					DIPLOMAT 82/92				
76,000 (22,400) to 89,500 (26,400)					98,000 (28,800) to 106,000 (31,000)					115,000 (33,600) to 124,000 (36,300)				
55,000 (16,200) to 65,000 (19,150)					70,000 (20,600) to 76,000 (22,400)					82,000 (24,200) to 88,000 (25,900)				
3,000 (875)					4,000 (1,180)					4,000 (1,180)				
Two pair 12.9/32 in. (32 cm) long.					Two pair 14.9/16 in. (37 cm) long					Two pair 17.1/2 in. (44.5 cm) long				
153-181 (4.30-5.06)					194-211 (5.53-5.98)					230-240 (6.51-6.79)				
TOWN GAS Wobbe Group				NAT GAS Wobbe No. 1335	TOWN GAS Wobbe Group				NAT GAS Wobbe No. 1335	TOWN GAS Wobbe Group				NAT GAS Wobbe No. 1335
	3	4	5			3	4	5			3	4	5	
	1,700	2,100	2,500	505		1,900	2,300	2,700	540		2,200	2,600	3,100	650
Output into water Btu/h (J/s)	BURNER PRESSURE IN. W.G. (MM.W.G.)				Output into water Btu/h (J/s)	BURNER PRESSURE IN. W.G. (MM.W.G.)				Output into water Btu/h (J/s)	BURNER PRESSURE IN. W.G. (MM.W.G.)			
55,000 (16,200)	1.2 (30.4)	0.9 (22.9)	0.8 (20.6)	5.2 (133)	70,000 (20,600)	1.9 (48.2)	1.5 (38.0)	1.3 (33.0)	5.5 (140)	82,000 (24,200)	1.8 (45.6)	1.6 (40.5)	1.3 (33.0)	5.9 (150)
57,000 (16,800)	1.2 (30.4)	1.0 (25.4)	0.8 (20.4)	5.6 (143)	72,000 (21,200)	2.0 (50.8)	1.6 (40.5)	1.4 (35.5)	5.9 (150)	84,000 (24,800)	2.0 (50.8)	1.7 (43.1)	1.4 (35.5)	6.2 (158)
60,000 (17,700)	1.3 (33.0)	1.0 (25.4)	0.9 (22.9)	6.3 (161)	74,000 (21,800)	2.1 (53.5)	1.7 (43.1)	1.5 (38.0)	6.2 (158)	86,000 (25,300)	2.1 (53.5)	1.8 (45.6)	1.5 (38.0)	6.5 (166)
63,000 (18,550)	1.5 (38.0)	1.1 (28.0)	1.0 (25.4)	6.9 (176)	76,000 (22,400)	2.2 (55.8)	1.8 (45.6)	1.6 (40.5)	6.5 (166)	88,000 (25,900)	2.2 (55.8)	1.9 (48.2)	1.6 (40.5)	6.8 (173)
65,000 (19,150)	1.6 (40.5)	1.2 (30.4)	1.0 (25.4)	7.3 (185)										

"All descriptions and illustrations contained in this leaflet have been carefully prepared but we reserve the right to make changes and improvements in our products, which may affect the accuracy of the information contained in it".