

## **Potterton Diplomat**

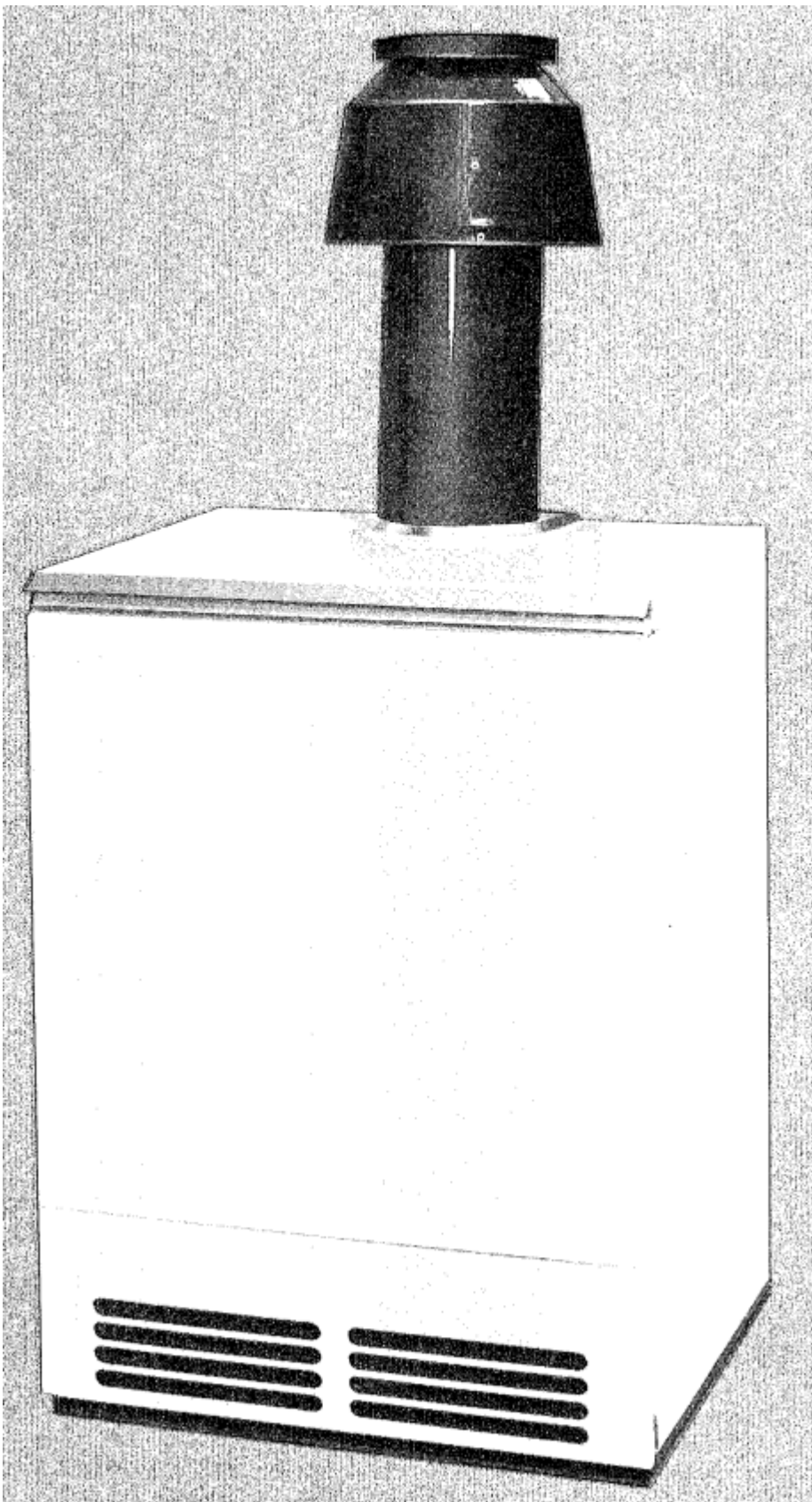
CI/SfB (56.43) Xh September 1972

**C116/34 BE. 34kW (116,000 Btu/h) Output**

**C130/38 BE. 38kW (130,000 Btu/h) Output**

**C165/48 BE. 48kW (165,000 Btu/h) Output**

**C200/58 BE. 58kW (200,000 Btu/h) Output**



**Data & Installation Instructions Basic Electric & Conventionally Flued Gas Fired Boilers**

These are fully automatic boilers designed for use on central heating, indirect hot water or combined systems.

The boilers incorporate the following principal features:

- Cast iron waterways.
- Thermal-electric flame failure device.
- Separate electric boiler control and overheat thermostats housed in one box.
- Two electric gas control valves, individually operated by the boiler and overheat thermostats providing excellent safety precautions.
- Delivered to site fully tested and assembled, except for the casing and draught diverter which are packed separately.
- Compact in size, requiring a minimum of floor space.

## SITE REQUIREMENTS

### Base

A level floor is required which should be insulated in accordance with local authorities and building regulations.

### Fresh Air Requirements

Adequate fresh air is essential for efficient combustion. An air inlet must be provided at a low level preferably about 306 mm (12 in.) 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, but not in a position where direct draughts can enter the combustion chamber. The air should be drawn from outside the building, and the size of the fresh air inlet must be as given in [Table 1](#) . See British Standard Code of Practice CP. 332, Parts 2 & 3.

**Table 1**

<b>Boiler</b>	<b>Fresh air opening</b>
<b>C116/34</b>	187 sq. cm. (29 sq. in.)
<b>C130/38</b>	213 sq. cm. (33 sq. in.)
<b>C165/48</b>	265 sq. cm. (41 sq. in.)
<b>C200/58</b>	323 sq. cm. (50 sq. in.)

### Ventilation

An additional ventilation grille at a high level should be provided. The area of the grille should be at least half that of the low level opening.

### Flue

An efficient flue system must be provided to evacuate the products of combustion. The following notes have been compiled as a guide when installing a system and the flue should comply with as many of these as possible. Notes 1, 2 and 3 do not apply to boilers using induced draught.

**WARNING: THE HEIGHT OF THE DRAUGHT DIVERTER MUST NOT BE REDUCED OR**

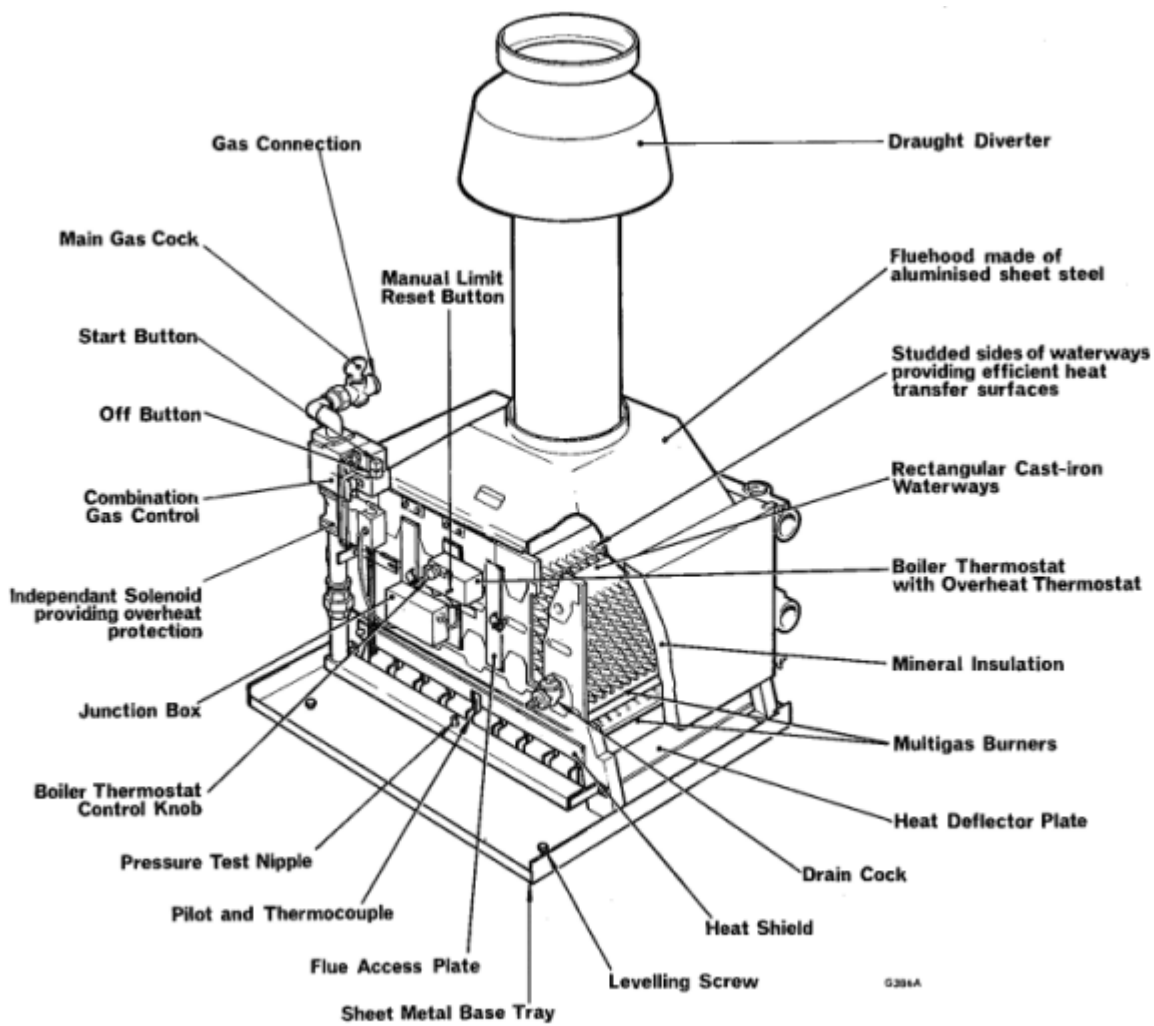
MODIFIED IN ANY WAY. IT MUST BE CONNECTED DIRECTLY AND VERTICALLY ON TO THE FLUE HOOD.

1. 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.
2. Whenever possible, there should be a run of at least 610 mm (2 ft.) effective length of vertical flue from the draught diverter flue socket before any bends.
3. There must be no horizontal runs, but where a near horizontal run is unavoidable, it must be followed by at least twice its length of vertical flue.
4. Use internal flues wherever possible, these may require lining.
5. Brick stacks on external walls must be lined.
6. External asbestos flues must be insulated.
7. Where condensation is likely, a method of draining must be incorporated.

### **Clearances**

The following minimum clearances should be allowed for ease of installation and maintenance.

- (a) 450 mm. (18 in.) at the front of the boiler
- (b) 50 mm. (2 in.) at the rear of the boiler measured from the rear of the headers
- (c) 50 mm. (2 in.) at each side of the boiler.



**NATURAL GAS BOILER**

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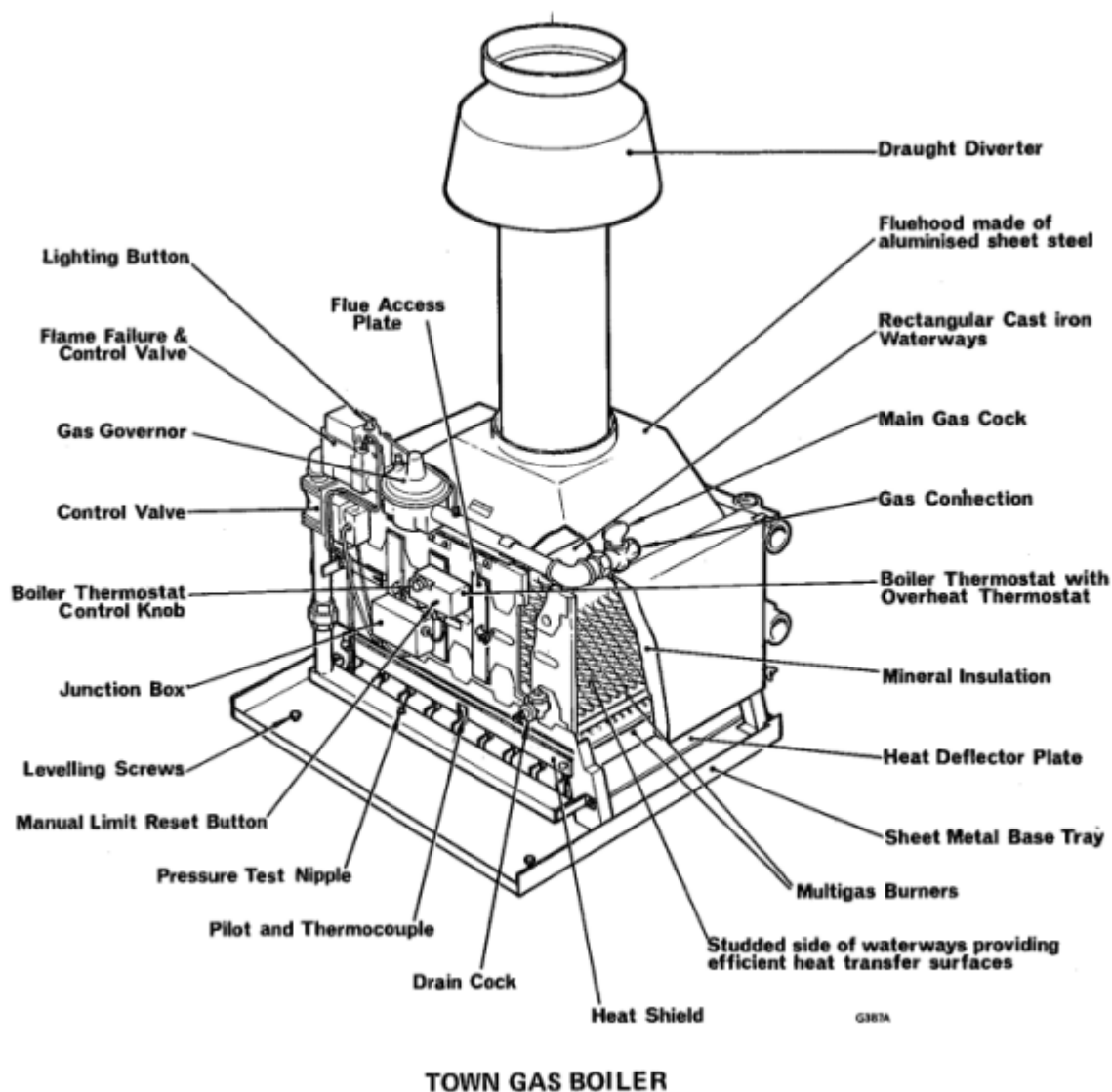


Fig. 1

### Electrical Supply

A 240 volts a.c. 50 Hz, single phase, electricity supply fused to 3 amps should be provided in accordance with the latest edition of the Institute of Electrical Engineers Regulations, local authorities and Gas Boards rulings on electrical equipment of buildings. 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 desirable.

### Gas Supply

Check that the gas meter and service pipe are of an adequate size for the installation, including any other appliance already fitted. The local Gas Board can assist in this matter.

### GENERAL DATA

<b>Boiler</b>	<b>Weight Empty</b>	<b>Water Content</b>
<b>116/34</b>	147.9 kg (326 lb)	17.2 kg (38 lb)
<b>130/38</b>	154.7 kg (341 lb)	22.2 kg (49 lb)
<b>165/48</b>	202.7 kg (447 lb)	26.3 kg (58 lb)
<b>200/58</b>	239.2 kg (527 lb)	31.8 kg (70 lb)

## **CONNECTIONS**

See Dimensions and Connections Diagram. ([Fig. 2](#))

## **CONTROLS**

### **MAIN GAS COCK**

#### **Town Gas Boilers**

116/34 and 130/38 - 1 in. BSP fixed fan union cock.  
 165/48 and 200/58 - 1 1/4 in. BSP fixed fan union cock.

#### **Natural Gas Boilers**

116/34 and 130/38 - 3/4 in. BSP fixed fan union cock.  
 165/48 and 200/58 - 1 in. BSP fixed fan union cock.

#### **Main Governor (Town Gas Boilers Only)**

116/34 and 130/38 - Maxitrol 3/4 in. BSP RV.53M  
 165/38 - Maxitrol 1 in. BSP RV.53M  
 200/58 -Maxitrol 1 in. BSP RV.60M

#### **Combined Flame Failure and Control Valve (Town Gas Boilers Only)**

116/34 and 130/38 - Honeywell 3/4 in. BSP V41D  
 165/48 and 200/58 - Honeywell 1 in. BSP V41D

#### **Combination Gas Control (Natural Gas Boilers Only)**

116/34 and 130/38 - Honeywell 1/2 in. V4400C 1047  
 165/48 and 200/58 - Honeywell 3/4 in. V4400C 1041

#### **Control Valve (Solenoid)**

##### **Town Gas Boilers**

116/34 and 130/38 - Honeywell 3/4 in. V40A  
 165/48 and 200/58 - Honeywell 1 in. V41A

##### **Natural Gas Boilers**

116/34 and 130/48 - Honeywell 1/2 in. V4202A  
 165/48 and 200/58 - Honeywell 3/4 in. V40A

## **Thermostat**

Combined Boiler Control and Overheat  
Thermostats with Manual Limit  
Reset - Honeywell L6091B 1016

## **ADDITIONAL CONTROLS**

The Potterton Mini-Minder which is available as an optional extra, is a wall mounted control incorporating an electric clock. It features a choice of programmes covering both central heating and hot water systems. The Mini-Minder is fully described in a separate Data Sheet available on request.

## **MAINTENANCE**

To ensure continued and efficient operation of the boiler, it is necessary to carry out maintenance and cleaning at least once a year or more frequently if conditions of use make it necessary. The flueways must be cleaned and the controls checked to keep them in good working order.

## **SETTING UP**

Each boiler has to be adjusted after installation by a fully qualified engineer and Thomas Potterton Limited offer this service at a nominal charge.

## **TECHNICAL LITERATURE**

The following technical literature is supplied with each boiler:

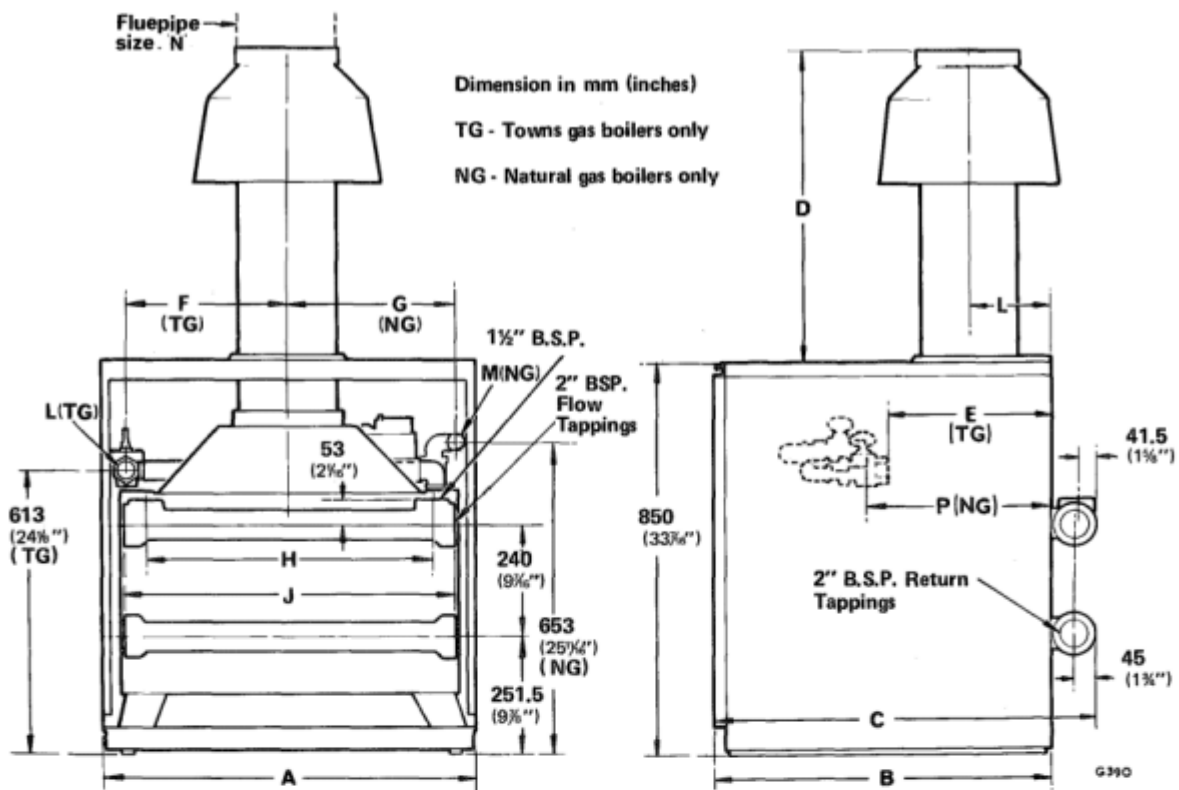
Data and Installation Instructions  
User's Guide  
Lighting Instruction Plate.

## **ORDERING**

When ordering please state:-

- (1) Which size of boiler required.
- (2) For which type of gas required - Town or Natural Gas. If required for Town Gas state Wobbe Group or place of installation.
- (3) Whether Potterton Mini-Minder required.





Boiler	A	B	C	D	E	F(TG)	G(NG)
C116/34BE	610 (24")	575 (22½")	672 (26⅞")	597 (23½")	313 (12¼")	229 (9")	235 (9¼")
C130/38BE	610 (24")	575 (22½")	672 (26⅞")	597 (23½")	377 (14⅞")	229 (9")	235 (9¼")
C165/48BE	800 (31½")	725 (28⅞")	822 (32⅜")	734 (28⅞")	350 (13¾")	290 (11⅞")	310 (12⅜")
C200/58BE	800 (31½")	725 (28⅞")	822 (32⅜")	734 (28⅞")	350 (13¾")	351 (13⅞")	310 (12⅜")

Boiler	H	J	K	L(TG)	M(NG)	N	P(NG)
C116/34BE	361 (14⅜")	469 (18⅞")	133 (5¼")	1" BSP	¾" BSP	152 (6")	375 (14¾")
C130/38BE	361 (14⅜")	469 (18⅞")	133 (5¼")	1" BSP	¾" BSP	152 (6")	438 (17¼")
C165/48BE	478.5 (18⅞")	586.5 (23⅛")	173 (6⅞")	1½" BSP	1" BSP	203 (8")	400 (15¾")
C200/58BE	596 (23⅞")	704 (27¾")	173 (6⅞")	1½" BSP	1" BSP	203 (8")	400 (15¾")

Flue pipe should be to BSS. 835. 1967

Fig. 2 DIMENSION AND CONNECTION DIAGRAM

## INSTALLATION INSTRUCTIONS

Check that the Site Requirements previously detailed have all been met.

### Connections

1. Remove the plastic cover from the boiler and unbolt and remove the wooden skids secured to the base tray.
2. Place the boiler, complete with its integral base tray, in position, allowing the clearances given in "SITE PREPARATION". Level the appliance using the levelling screws in the base tray.
3. Make the flow and return connection. It is recommended that a thermometer is fitted in the flow pipe adjacent to the boiler. To assist water circulation on a combined pumped central heating and gravity primary system, the use of an injector tee is recommended which should be fitted in the circuit between the pump and the return header.
4. Fit the safety valve, if required, to one of the vertical 1 1/2 in. BSP tappings on the flow header. Connect the open vent connection to the second vertical 1 1/2 in. BSP tapping on the header.
5. Connect the gas supply to the boiler. No additional isolating cock need be fitted, unless required by the local Gas Board, as the main gas cock on the boiler serves this purpose.
6. Fit the draught diverter to the boiler flue hood, then seal the gap between the primary flue pipe and the flue hood with asbestos string and boiler cement.
7. Connect the flue to the draught diverter and seal the join as detailed in Operation 6, observing the conditions laid down in "SITE PREPARATION".
8. Fill the boiler and system with water and check for leaks.

### WIRING

#### Mains Supply

Connections to the boiler will be dependent on the type of control being applied to the boiler. Where no other controls are to be installed proceed as follows:

Live to terminal L  
Neutral to terminal N  
Earth to terminal E

The loop between terminals L and SW must not be removed.

The use of flexible or fixed conduit is recommended. Mini-Minder

When a Potterton Mini-Minder time control is being used on a combined system, i.e. gravity hot water and pumped central heating, remove the loop between terminals L and SW and then connect it as shown in [Fig. 3](#) .

#### Time Control

When installing a three terminal time control the loop between terminals L and SW must first be removed and then connect it as shown in [Figs. 4](#) and [5](#).

## **Pump**

No provision is made in the control box for wiring up a pump. If a pump is to be fitted, the wiring connections will depend on the particular system and what other controls have been selected. For combined systems, i.e. gravity domestic hot water and pumped central heating, see [Figs. 3](#) and [4](#). In cases where there is no gravity circulation, i.e. central heating only, it is desirable to keep the pump running for a time after the boiler has been shut down. This is to dissipate any residual heat in the boiler fabric and prevent an excessive local temperature rise with possible lock-out of the limit thermostat. A method of achieving this is shown in [Fig.5](#).

## **Air Temperature**

### **Thermostat**

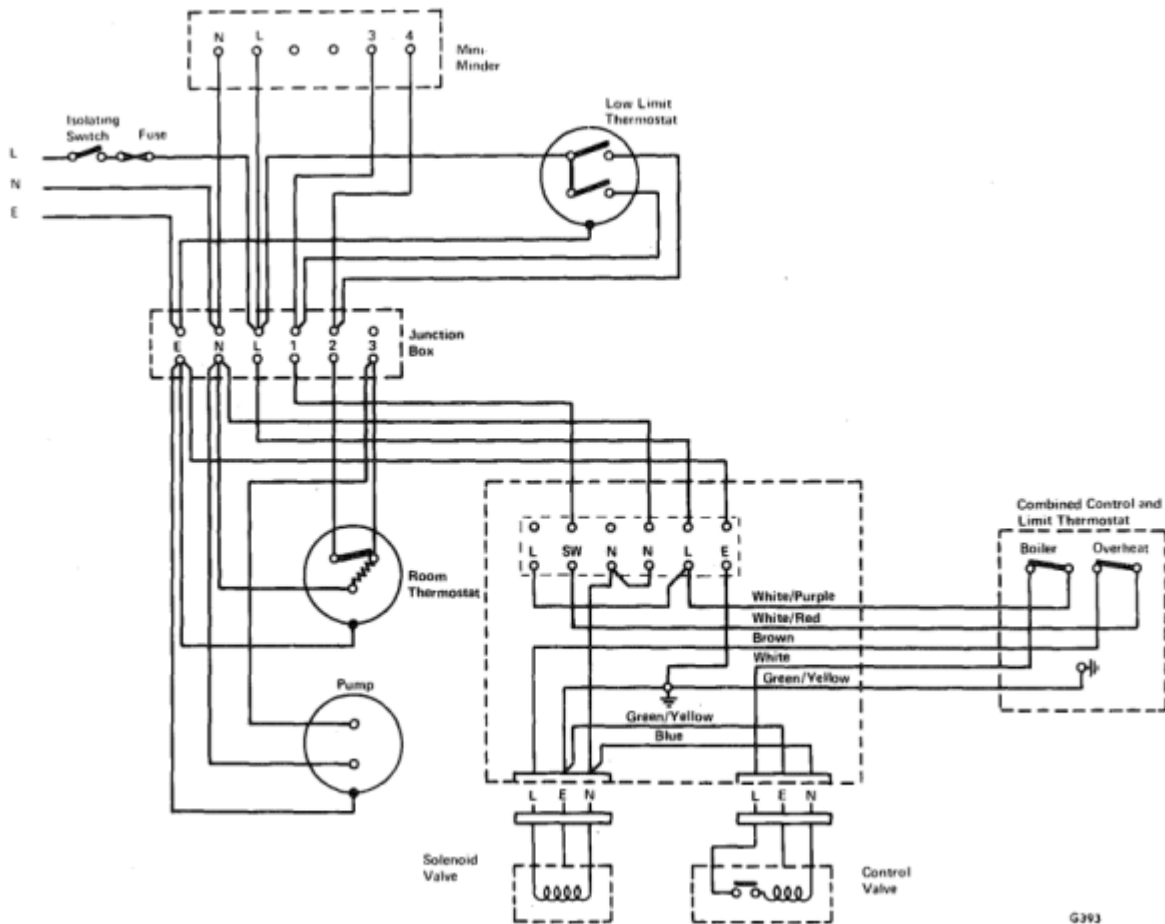
Where an air temperature thermostat is to be fitted, on a combined gravity and small bore heating system, it will normally only control the pump. In a central heating only system, it is recommended that the air thermostat should only control the boiler.

### **FIRST LIGHTING(Town Gas Boiler)**

1. Ensure that the electricity supply is switched off, then turn both the boiler and overheat thermostats to a high temperature.
2. Release the union on the main inlet gas cock, then turn on the gas supply to purge any air from from pipework, then re-tighten the union.
3. Check for leaks using a soap solution. **WARNING: NEVER USE A NAKED FLAME.**
4. Press in the red lighting button then apply a light to the pilot burner; hold the button fully down for at least 30 seconds, after the pilot has lit.
5. When the pilot flame is established, release the red lighting button and the pilot should remain alight.

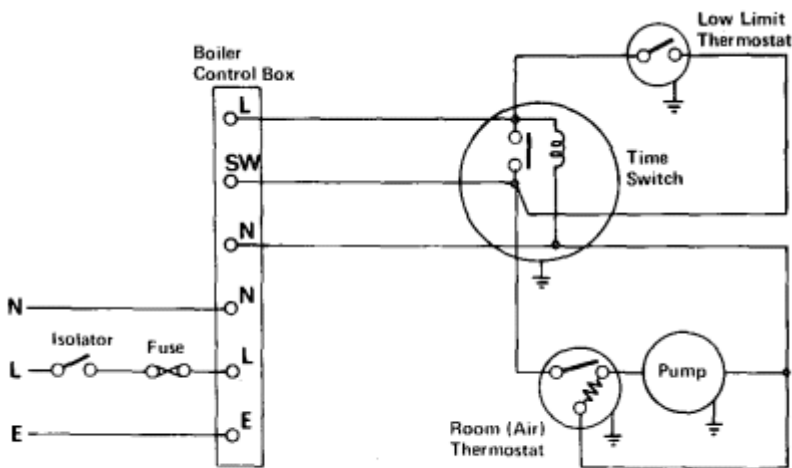
**CAUTION:- IF THE PILOT DOES NOT REMAIN ALIGHT, OR EXTINGUISHES AT ANY TIME, TURN OFF THE MAIN GAS COCK, THEN WAIT FOR AT LEAST 3 MINUTES BEFORE REPEATING THE LIGHTING SEQUENCE.**

6. If a time control is fitted, ensure it is ON at a working period.
7. Turn ON the electricity supply; the main burners will then light.



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Fig. 3 BOILER WIRING USING POTTERTON MINI-MINDER ON COMBINED SYSTEM GRAVITY DOMESTIC HOT WATER, PUMPED CENTRAL HEATING



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Fig. 4

ADDITIONAL ELECTRICAL CONNECTIONS FOR PUMP WIRING COMBINED SYSTEMS-GRAVITY DOMESTIC HOT WATER, PUMPED CENTRAL HEATING

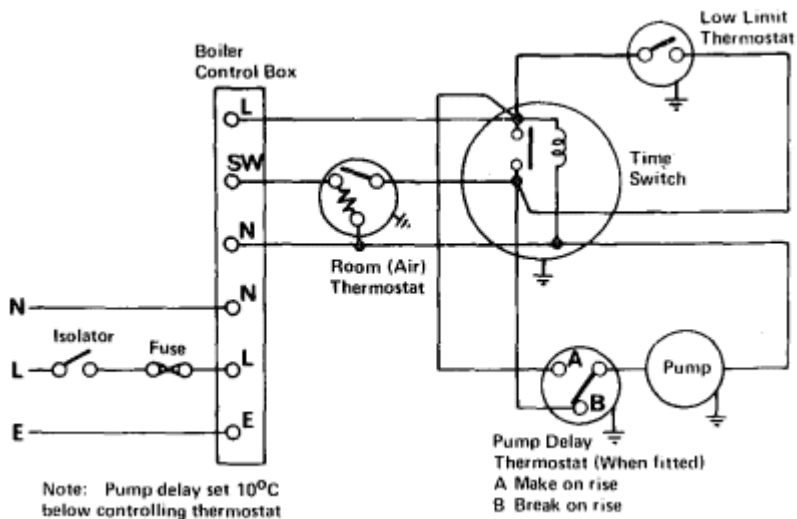


Fig. 5

## ADDITIONAL ELECTRICAL CONNECTIONS FOR PUMP WIRING CENTRAL HEATING ONLY

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8. Shut off the boiler and carry out the operations detailed in "[SETTING OF CONTROLS](#)". Gas Rate.

9. If a time control, or room thermostat is fitted, set them to the required programme.

### FIRST LIGHTING(Natural Gas Boiler)

1. Release the union on the main inlet gas cock, then turn on the gas supply to purge any air from the pipework, then re-tighten the union.

2. Check for leaks using a soap solution. **WARNING: DO NOT USE A NAKED FLAME.**

3. Ensure that the electricity supply is switched off, then turn both the boiler and overheat thermostats to a high temperature.

4. Check that the time control, where installed, is on and at a working period.

5. Press and hold in the 'START' button on the Gas Control Valve.

6. Using a lighted match, apply a light to the pilot burner.

7. After the pilot has been alight for 30 seconds, release the 'START' button.

**CAUTION:- IF THE PILOT DOES NOT REMAIN ALIGHT, OR EXTINGUISHES AT ANY TIME, TURN OFF THE MAIN GAS COCK, THEN WAIT FOR AT LEAST 3 MINUTES BEFORE REPEATING THE LIGHTING SEQUENCE.**

8. Switch on the electricity supply to the unit.

9. Shut off the Boiler and carry out the operations detailed in '[SETTING OF CONTROLS](#)' Gas Rate.

10. Set the room thermostat and time control, where installed, to the required operating conditions.

## SETTING OF CONTROLS

### Gas Rate (Town Gas Boiler)

1. Remove the screw from the top of the pressure test nipple situated on burner manifold and connect a suitable pressure gauge to it.

2. Re-light the boiler and check that the burner pressure is in accordance with that given in [Table 2](#). If the pressure needs adjustment remove the slotted cap from the top of the main gas governor, then rotate the exposed screw clockwise to increase or anti-clockwise to decrease the pressure.

3. After the boiler has been running for approximately 30 minutes, check the gas rate by meter reading, it is advisable to take this reading over a period of at least 5 minutes. With the boiler at its design pressure, the gas rate should be as shown in [Table 2](#).

4. Remove the pressure gauge and reseal the nipple by replacing the screw and replace the slotted cap in the top of the governor.

### Gas Rate (Natural Gas Boiler)

1. Remove the screw from the top of the pressure test nipple situated on burner manifold and connect a suitable pressure gauge to it.

**Table 2**

Boiler		116/34		130/38		165/48		200/5				
Gas Type		Town Gas	Natural Gas	Town Gas	Natural Gas	Town Gas	Natural Gas	Town Gas				
Input	kW	46.0	44.8	51.6	51.3	66.2	64.2	81.4				
	Btu/h	157,000	153,000	177,000	175,000	226,000	219,000	278,000				
Output	kW	34.0		38.0		48.0		58.0				
	Btu/h	116,000		130,000		165,000		200,000				
Gas Rate	cu.m/h	8.9	4.3	10.0	5.09	12.8	6.2	15.75				
	cu.ft/h	314	153	354	175	452	219	556				
Injector Size Bray  Cat. 23	G4	G5		G4	G5		G4	G5				
	3400	3400	850	3600	3600	950	3400	3400	1100	3200	3200	
Burner Pressure	m.bar	3.55	4.23	14.00	4.05	4.82	15.2	3.35	3.93	8.87	3.0	3.7
	in.w.g	1.42	1.69	5.60	1.62	1.93	6.1	1.34	1.57	3.55	1.2	1.5

The Town Gas figures are for gas with a calorific value of 500 Btu/cu.ft (18.96 MJ/m<sup>3</sup>). To

calculate the gas consumption at any other C.V. multiply the new rate by 500 (18.96) and divide by the local C.V. The Natural Gas figures are for gas with a calorific value of 1,000 Btu/cu.ft (37.92 MJ/m<sup>3</sup>). To calculate the gas consumption at any other C.V. multiply the new rate by 1,000 (37.92) and divide by the local C.V.

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2. Re-light the boiler and check that the pressure is in accordance with that given in [Table 2](#) . If burner pressure adjustment is necessary, remove the screw from the top of the regulator on the gas valve, then rotate the small screw located beneath clockwise to increase or anti-clockwise to decrease the pressure.
3. 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 boiler at its designed pressure, the gas rate should be as shown in [Table 2](#) .
4. Disconnect the pressure gauge and reseal the nipple by replacing the screw and replace the small screw in the top of the regulator.

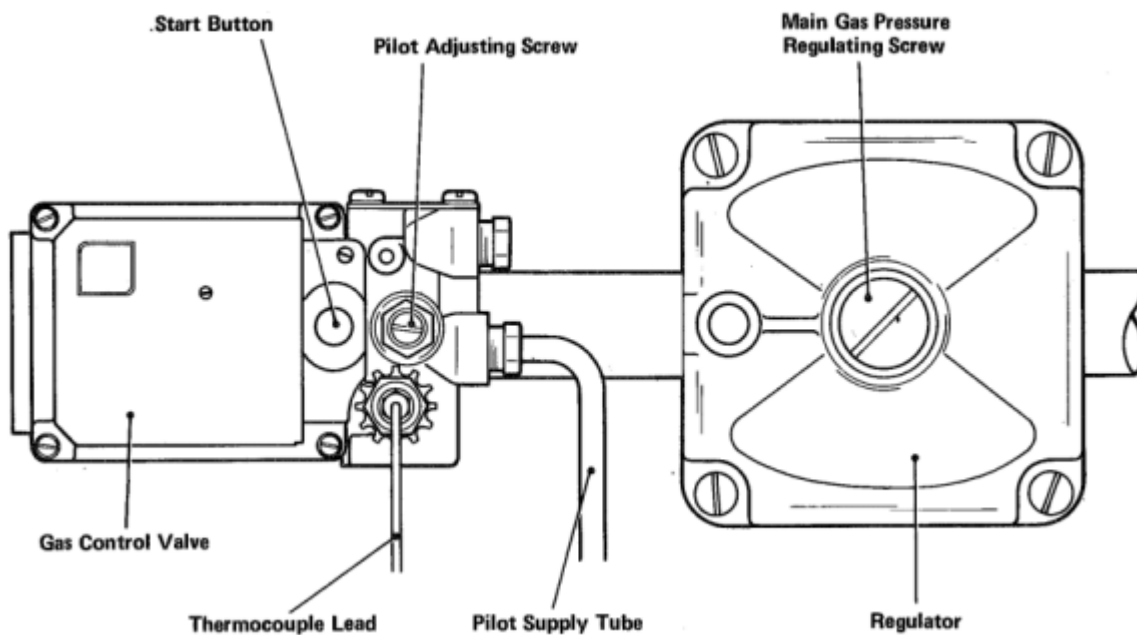


Fig. 6 TOWN GAS CONTROLS

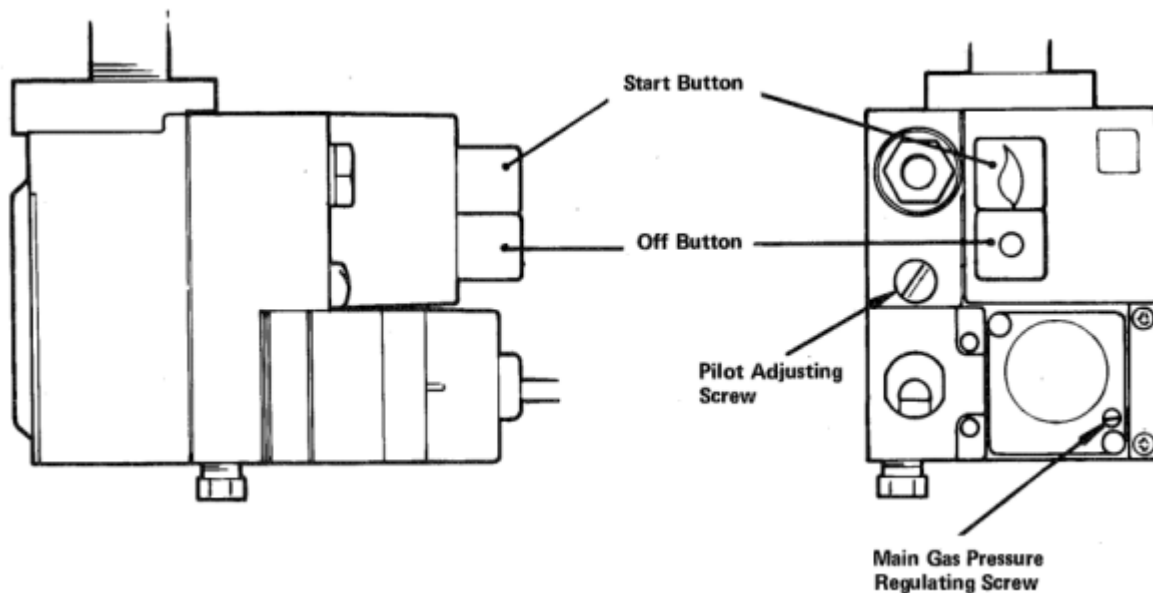


Fig. 7 NATURAL GAS CONTROLS

## Pilot

Correctly set, the pilot flame must be sufficient to heat the thermocouple so that the safety device is "held in" but must not cause the thermocouple to glow bright red. If the pilot needs adjustment, remove the round head screw on the Gas Control Valve from beside the pilot tube connection on a Towns Gas boiler or from beside the thermocouple connection on a Natural Gas boiler, then rotate the exposed pilot restrictor screw clockwise to reduce or anti-clockwise to increase the flame. Replace and tighten the round head screw.

## OVERHEAT THERMOSTAT

To check and set the operation of the overheat thermostat, the following operation should be followed:-

1. With the boiler in full operation, i.e. with the main burners alight, remove the front cover from the thermostat box, then slowly turn down the setting dial of the overheat thermostat until the main burners shut down.
2. Turn the setting dial of the overheat thermostat to a setting of 11° C higher than the highest temperature that the boiler will be operated at. Press the manual reset button, then replace the thermostat box cover.

## BOILER THERMOSTAT

1. To check the calibration of the boiler thermostat, it is necessary to have a thermometer in the flow from the boiler, located as near as possible to the boiler. If a thermometer is not part of the particular installation, a "clip-on" type can be used, but allowance must be made for inaccuracies when using this method.



NOTE:- The boiler thermostat has been calibrated by the makers and no attempt should be made to recalibrate it on site.

2. For central heating and indirect hot water supplies the thermostat may be set at temperatures of up to 95°C (203°F), depending on outside air temperatures.

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

3. Set the boiler thermostat to the required setting.

### **CASING- [Fig. 8](#)**

When all connections and adjustments have been made, the casing must be erected around the boiler.

1. Fit the rear gusset plates, one to each side panel, securing each in position with a screw through the upper hole in the plates.

2. Position the two side panels on the vertical sides of the base tray, ensuring that the folded section on the bottom of each panel is correctly located in the slots in the base tray.

3. Fit the front gusset plate assembly between the two side panels, securing it with two screws, position the earth lead and fit the remaining screws. Do not fully tighten at this stage.

4. Fit the two stays, one to each rear gusset plate, securing each stay with a screw through the lower hole in the plates. Do not fully tighten any screws at this stage. Secure the stays to the boiler using the spare nuts on the boiler flow header retaining studs.

5. Assemble the air intake panel, engaging it in the slots in the front return edges on the side panels.

6. Fit the front flue bezel plate to the top panel.

7. Fit the rear support bar over the gusset plates, then place the top panel in position.

8. Fit the casing door, positioning the bottom lip of the door behind the air intake panel, locating the two pins on the door in the holes in the gusset plates.

9. Square up the casing, remove the door, then finally tighten all screws.

10. Fit the rear flue bezel plate to the top panel, behind the flue.

11. Affix the "Lighting Instructions" to the inside of the casing door.

12. Replace the casing door.

### **USER'S GUIDE**

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

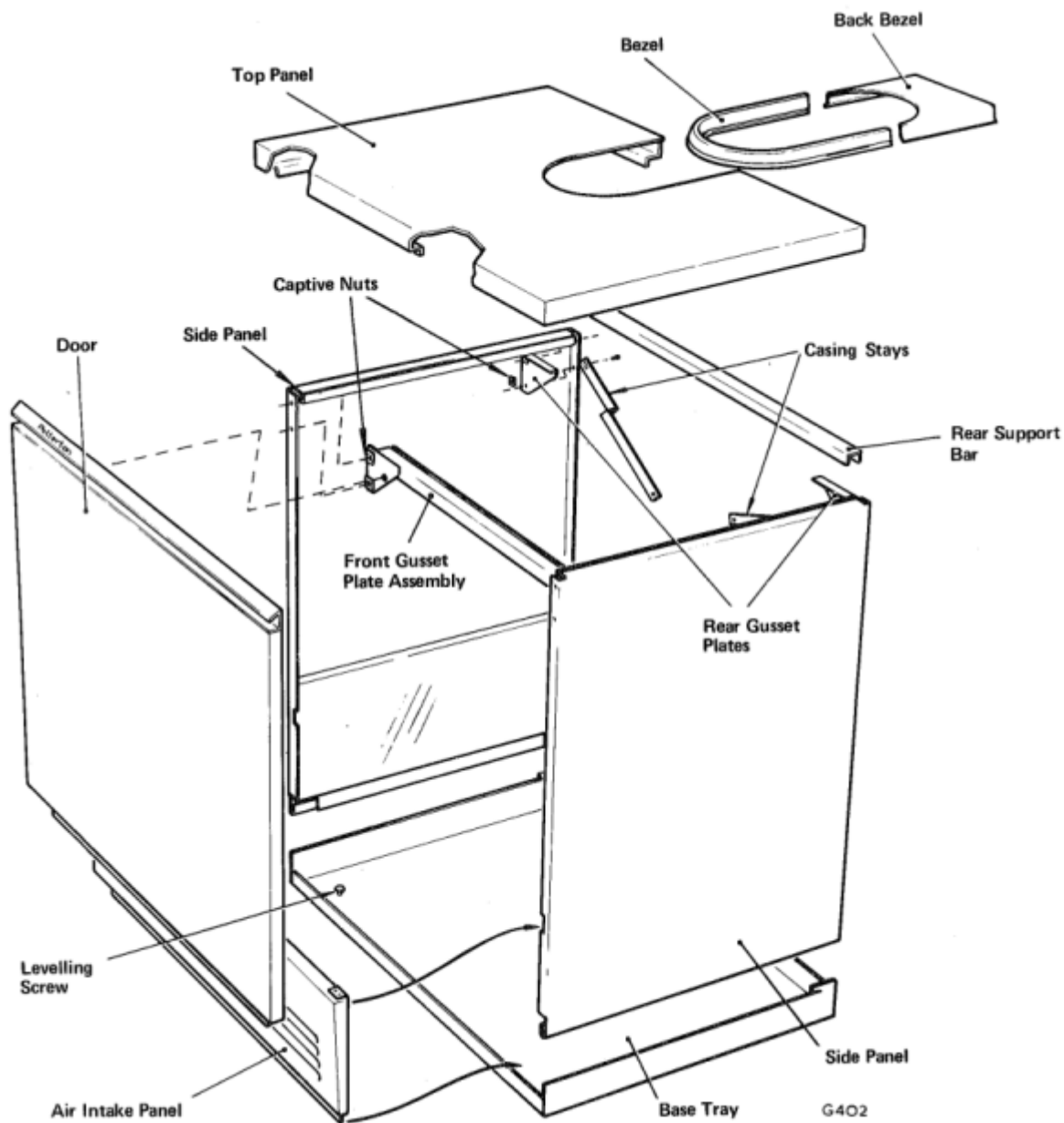


Fig. 8

"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."

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