

# IDEAL

## E Type

### CF. 35N, 50N, 60N & 80N

STELRAD



## Installation and Servicing

April, 1978

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### CAUTION

To avoid the possibility of injury during the installation, servicing, or cleaning of this appliance, care should be taken when handling the edges of sheet steel components.

### B.G.C. Appliance No's

E. Type CF.35N	41. 409. 12
E. Type CF. 50N	41. 409. 13
E. Type CF. 60N	41. 409. 14
E. Type CF. 80N	41. 409. 15

NOTE: The appliances are for use on **NATURAL GAS ONLY** and **CANNOT** be used on any other gas.

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# GENERAL DATA

TABLE 1

Boiler Size	CF 35N	CF 50N	CF60N	CF 80N
Gas Control	← HONEYWELL 'COMPACT' V4600A 1023 (240 Volts) →			
No. of Main Burner Bars (Bray Cat. 3108 AB 14037)	1	2	2	3
Main Burner Injector(s) Natural Gas Bray Cat. 16	1 x size 1200	2 x size 900	2 x size 1000	3 x size 900
Honeywell Pilot Injector Natural Gas	← BCR 18 →			
Flue Outlet size	← 102 mm (4 in.) →		→ 127 mm (5 in.)	
Gas Supply Connection	← Rc½ (½ in. BSP) →		→ Rc¾ (¾ in. BSP)	
Flow Connections	← Rc1 (1 in. BSP) →			
Return Connection (Pump)	← Rc¾ (¾ in. BSP) →			
Return Connection (Gravity)+	← Rc1 (1 in. BSP) →			
Maximum Static Water Head	← 36.6 m (120 ft.) →			
Weight (Standard Model)	95 kg (209 lb)	127 kg (281 lb)	127 kg (281 lb)	161 kg (355 lb)
Weight with SB Kit	105 kg (231 lb)	137 kg (303 lb)	137 kg (303 lb)	171 kg (377 lb)
Electricity Supply	← 240 Volts AC Single Phase 50 Hz →			
External Fuse Rating	← 3 amp →			
Water Content	8.6 litres (1.9 gall)	13.4 litres (3.0 gall)	13.4 litres (3.0 gall)	18.2 litres (4.0 gall)

+ These return tappings are for connection to gravity circuits only:

in no circumstances should they be connected to a pumped circuit.

Two models of the 35, 50, 60 and 80 size boilers, Standard and SB, are available. All boilers are supplied assembled in standard form and are despatched in one large carton containing the assembled boiler and cabinet. When the SB model is ordered an easily fitted SB Conversion Set is shipped with the boiler in an additional package containing pump, isolating valves and associated pipework. Cabinet Design (Figure 1)  
The cabinet design and measurements are the same for all model sizes. Removal of the cabinet front and top panels gives ready access to the gas controls, flue cleanout cover and, in the case of SB models, to the pump and isolating valves.

## LOCATION OF BOILER

The following criteria must be satisfied by the chosen position:-

1. Allow adequate space around the appliance for maintenance (i.e. removal of jacket door and burner assembly and use of a flue brush).
2. The boilers have a water-cooled base and no special insulation of the floor is necessary other than that required by the Local Authority and The Building Regulations. The floor should, of course, be level and of adequate load-bearing capacity.
3. An adequate supply of fresh air for combustion and ventilation must be available ensure safe and efficient

operation of the boiler. Where the appliance is installed in a room, purpose-designed ventilation must be provided in an outside wall of the building. The opening may be either (a) directly into the room containing the appliance or (b) into an adjacent room or space which has an internal purpose-provided opening to the room containing the appliance. The minimum effective areas of all purpose designed ventilation openings must be 4½ cm<sup>2</sup> per kW of appliance INPUT in excess of 7 kW (1 in<sup>2</sup> per 5000 Btu/h INPUT in excess of 25,000 Btu/h) viz:-

CF 35 N	30 cm <sup>2</sup> (4½ in <sup>2</sup> )
50 N	60 cm <sup>2</sup> (9 in <sup>2</sup> )
60 N	75 cm <sup>2</sup> (11 in <sup>2</sup> )
80 N	115 cm <sup>2</sup> (17 in <sup>2</sup> )

Where the appliance is installed in a compartment (e.g. cupboard), whether modified or specially built, the space should meet the following requirements:-

- (a) Have a ½ hour fire resistance from internal fire, and the inside lining or finishing should be non-combustible or a Class 1 finish.
- (b) Be of sufficient size to permit access for inspection and servicing. However, it should not be made larger than necessary, to avoid the use of the compartment as a general storage cupboard. The door must be of sufficient size to permit the removal of the appliance

E Type CF. 35, 50, 60 & 80N

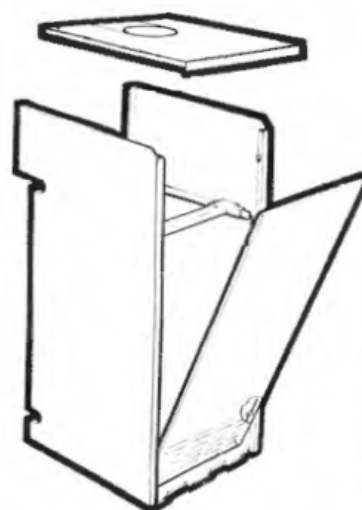


Fig. 1

CABINET

- (c) Be fitted with permanent openings for air for combustion and compartment ventilation at high and low level. When the openings from the compartment communicate directly with the outside of the building, the free areas provided must be at the rate of 4½ cm<sup>2</sup> per kW (1 in<sup>2</sup> per 5000 Btu/h) of the MAXIMUM

appliance INPUT at high level and 9 cm<sup>2</sup> per kW (2 in<sup>2</sup> per 5000 Btu/h) of INPUT at low level, viz:-

At High Level		
CF	35N	65 cm <sup>2</sup> (10 in <sup>2</sup> )
	50N	90 cm <sup>2</sup> (14 in <sup>2</sup> )
	60N	105 cm <sup>2</sup> (16 in <sup>2</sup> )
	80N	150 cm <sup>2</sup> (23 in <sup>2</sup> )
At Low Level		
CF	35N	130 cm <sup>2</sup> (20 in <sup>2</sup> )
	50N	180 cm <sup>2</sup> (28 in <sup>2</sup> )
	60N	210 cm <sup>2</sup> (32 in <sup>2</sup> )
	80N	300 cm <sup>2</sup> (46 in <sup>2</sup> )

When, however, the openings in the compartment communicate with a room, the areas at high and low levels must each be DOUBLED and the room itself must also be provided with purpose designed ventilation to the outside air having a free area of 4½ cm<sup>2</sup> per kW of appliance INPUT in excess of 7 kW (1 in<sup>2</sup> per 5000 Btu/h INPUT in excess of 25000 Btu/h. All ventilation grilles must be so sited that accidental obstruction will not occur.

#### IMPORTANT – EXTRACTOR FANS

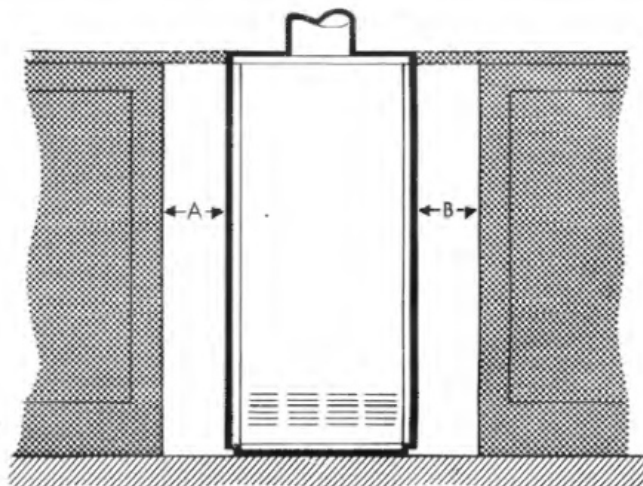
The use of an extractor fan in the same room as this appliance (or in an adjacent room used for through ventilation) can in certain cases adversely affect safe operation. Where a fan is, or is subsequently, installed in such a room the advice of the local Gas Board should be obtained before proceeding.

#### 4. Installation Adjacent to Fixtures (Fig. 2)

- (1) All models may be fitted up to the wall at the rear of the cabinet.
- (2) To ensure correct operation of the diverter, clearances between the cabinet and adjacent fixtures at the sides MUST comply with the requirements shown in Fig. 2. The space between the cabinet sides and fixtures may be bridged if desired AT CABINET TOP LEVEL as shown in Fig. 2.

5. The louvres at the bottom of the front panel of the cabinet must never be obstructed.

6. The chosen location should facilitate flow and return water connections and the flue connection. The flue connection to the appliance outlet must be vertical for at least 610 mm (2 ft.) with an additional 305 mm (1 ft.) of vertical height for every 90° elbow or 152 mm (6 in.) for every 135° bend fitted in the flue. The flue must have a nominal size equal to that of the appliance flue outlet. If a brick flue be used, it must be lined with a suitable corrosion resistant material. As far as is practicable, the flue run should be inside the building. External flues, if unavoidable, must be adequately insulated to guard against condensation. Horizontal flue runs



Boiler Size	CF 35N	CF 50N
Minimum	A + B = 102 mm (4 in.)	A + B = 152 mm (6 in.)
Clearances	A or B may be	A or B not less than
at Sides	zero	51 mm (2 in.)


Boiler Size	CF 60N	CF 80N
Minimum	A + B = 203 mm (8 in.)	A + B = 254 mm (10 in.)
Clearances	A or B not less than	A or B not less than
at Sides	51 mm (2 in.)	51 mm (2 in.)

Fig. 2

CLEARANCES

should be avoided wherever possible and in any case should not exceed 1220 mm (4 feet) in length. The flue should be fitted with a Gas Council approved terminal.

## INSTALLATION

For safety use a competent installer to fit this appliance, e.g. CORGI (the Confederation for the Registration of Gas Installers) requires its registered installers (identified by ) to work to satisfactory standards.

Install in accordance with BS 5376 Pt 2, BS 5440 Pt 2, BS 5449 Pt 1 and CP 331 Pts 2 and 3; the Gas Safety Regulations 1972, the Building Regulations, Local Authority, Gas Council and I. of E.E. requirements. Manufacturer's Notes must not be taken as, in any way, over-riding statutory obligations. Carefully remove the carton and position the boiler at the chosen location.

#### WATER CONNECTIONS (Fig. 3)

It is recommended that union connections be fitted outside the cabinet. Bushing down to a smaller size of pipe on the flow should be done in the vertical. The boilers are suitable for indirect systems only.

Water connections should be made as follows:

The heating return on a pumped system must only be made to the ¾ in. elbow at the rear left-hand side of the boiler. The elbow may be turned through 180° to make a right-hand side connection. A gravity domestic hot water return may be made to either the left or right-hand side 1" tapping near the base of the boiler. Pumped returns must not be connected to these side tapings. The heating and

domestic hot water flow connections should be made one to each of the 1" tapings near the top of the boiler.

NOTE: The boiler is suitable for use with a maximum static head of 36.6m (120 ft.) or 3.6 bar (52 psi) in accordance with BS.779. The SB model is provided with a separate package containing the pump, isolating valves and pipework which should be fitted as shown (Fig. 3). The pump is provided with an output regulator enabling the delivery to be adjusted to match the actual frictional head of the installation. Reference should be made to the graph illustrated herewith (Fig. 4) and the regulator set accordingly. The adjusting dial is located on the right-hand (as installed) side of the pump body. Adjustment is made by turning the dial to the required number; a slot is provided to take a suitable coin or screwdriver. A "click" will be observed as each setting is obtained. Do not attempt to rotate the dial beyond the marked maximum and minimum positions. THE MAINS SUPPLY SHOULD BE SWITCHED OFF WHEN ADJUSTING THE SETTING. If due to initial inertia, the pump does not start when adjusted to a low setting, change the setting to 4 to obtain maximum torque and, after the pump has started, adjust to the required lower setting. The pump is provided with air vents.

#### FITTING SB CONVERSION KIT (Fig. 3).

Warning: The SB conversion kit must be fitted before installing the boiler.

1. Remove the cabinet door.
2. Disconnect union elbow (E) at the bottom centre-tapping of the boiler, and

draw the water pipe assembly forward.

3. Disconnect pipe (D) from the three-way elbow and, having removed the half union elbow, discard pipe (D).

4. Fit the half union elbow (removed from pipe) to the short leg of pipe (B) using suitable jointing compound and remake the union at bottom centre tapping of boiler with pipe (B) positioned as shown.

5. Remove the plug (G) from three-way elbow (F) and using suitable jointing compound fit pipe (A) in position shown. Plug the redundant tapping in the three-way elbow (F) using plug (G).

6. Screw the external threads of the two isolating valves (J & K) into the internal threads of the elbows on pipes (A) and (B). Tighten with the valve spindles facing the front of the cabinet.

7. Place a gasket on the face of each union. Position pump between isolating valves (J) & (K) WITH THE ARROW ON PUMP BODY POINTING TOWARDS VALVE (K) and tighten up the union nuts.

8. Check that the pump does not touch the cabinet door. The pump may be moved back by slightly tightening pipe (A) and inclining pipe (B).

9. Wire the pump lead to the pump (see instructions packed with pump). The free end of the pump lead should now be wired to the control box terminal strip as shown in the wiring diagram for the system being installed. Fasten the pump lead under the cable clip provided on the front return edge of the left-hand cabinet side panel. Keep the lead clear of hot surfaces.

10. Check that the two isolating valves are fully open (turned fully anti-clockwise approximately six complete turns from the fully closed position).

11. Replace front panel. The boiler is now ready for installation.

## ELECTRICAL CONNECTIONS

### IMPORTANT

(Figure 5 shows the internal wiring of the Control Box)

(1) The appliance **MUST BE PROPERLY EARTHED**. The mains earth lead must always be correctly connected to the earth terminal on the control box terminal strip as described in the instructions which follow for wiring up the mains lead. The factory wired earth bond between the earth stud on the front of the control box and the earth stud on the boiler body, if disturbed for any reason during installation, **MUST BE REPLACED** before switching on the electricity supply.

(2) All external controls (e.g. roomstats, clock switches, etc.) used with the boilers, and the associated wiring, must be suitable for the mains voltage.

(3) A 240 Volt 50 Hz single phase supply is required. The maximum fusing value is 3 Amps. The mains connection should be made to a socket outlet situated conveniently near to the boiler with a removable plug. If a switched socket outlet be used, the switch must be of the **DOUBLE-POLE** type but as that type of switched outlet is not generally available, the use of an unswitched

Front view of boiler showing water connections.  
(Position of SB accessory kit, if fitted, shown dotted)

LH 1 in. BSP flow tapping

RH 1 in. BSP flow tapping

$\frac{3}{4}$  in. BSP heating return

(elbow may be turned for RH return).  
The position of this return is unchanged when the SB accessory kit is fitted.

J

H

A

K

B

RH 1 in. BSP domestic hot water gravity return tapping (must not be connected to a pumped circuit).

LH 1 in. BSP domestic hot water gravity return tapping (must not be connected to a pumped circuit).

G

F

D

E

$\frac{3}{4}$  in. BSP heating return (elbow may be turned as shown, dotted, for RH return).  
The position of this return is unchanged when the SB accessory kit is fitted.

C

Plan view of boiler as supplied from factory without SB kit fitted.

Fig. 3

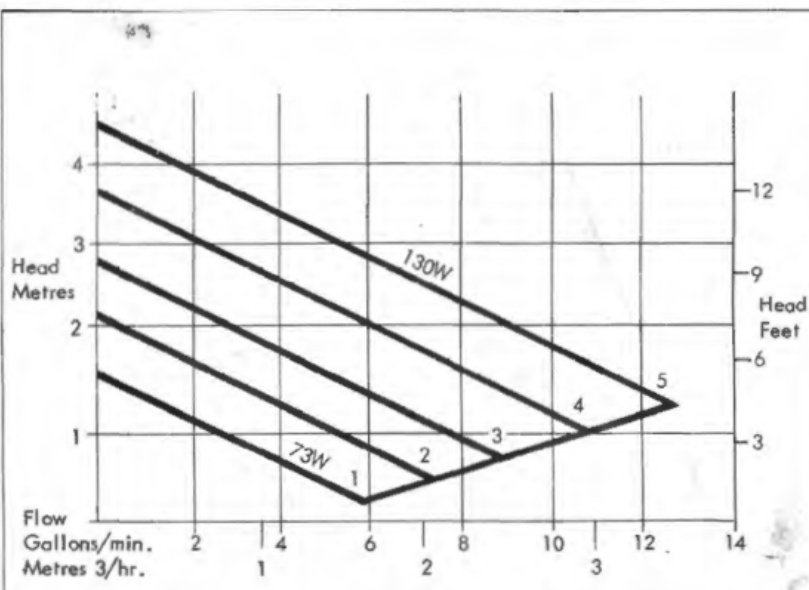


Fig. 4

PUMP PERFORMANCE GRAPH 240v.  
Water Temperature 82°C (180°F)

socket is preferred. Wiring should be in three-core plastic insulated cable of a size not less than 16/0.20 (metric) (14/.0076 Imperial). All wiring must conform with the Rules of the Institution of Electrical Engineers. Wiring within the boiler cabinet should be neatly secured under the cable clips provided. Locate the clips to ensure that wiring cannot contact the burner front plate or the collector hood.

#### WIRING UP

Undo the three screws securing the front of the control box to the housing and separate the front from the housing to gain access to the terminal strip. The internal wiring of the control box is illustrated in Fig. 5 and a wiring diagram is also moulded in the back panel of the housing. Wire the mains lead to the boiler as follows:-

##### Mains Plug

BROWN lead to the live (L) pin.  
BLUE lead to the neutral (N) pin.  
GREEN/YELLOW to the earth (E or  $\frac{1}{\text{ground}}$ ) pin

##### Control Box Terminal Strip

BLUE lead to Terminal 1 (N).  
GREEN/YELLOW lead to Terminal 2 ( $\frac{1}{\text{ground}}$ )  
BROWN lead to Terminal 3 (L).

NOTE: All leads entering the control box must be entered through the labyrinth type cable grip located nearest to the terminals to which they are being connected.

#### EXTERNAL CONTROLS

The wiring diagram which follow illustrate a selection of control systems likely to be connected to the boiler. However, it is impossible to anticipate and illustrate all the many variations and combinations of external controls but a careful study of the control box wiring diagram will enable the electrician to plan the wiring for individual systems to cover any special requirements. It should be clearly understood that controls intended to light and extinguish the boiler burner should be wired in series with the gas valve circuit and controls intended to switch the circulating pump should be wired in series with the pump circuit.

Fig. 6 Gravity domestic water and pumped central heating

##### Notes:-

- 1) If a programmer be used, as shown, it should not be capable of selecting CH without HW. The link between terminals 3 and 4 of the control box terminal strip should be removed without disturbing other wiring.
- 2) If a time clock be used instead of a programmer, leave link 3-4 in place and connect the switched live feed from the time clock to terminal 3.
- 3) If no time control at all be used, connect the mains lead directly to terminals 1, 2, 3 on the terminal strip.
- 4) If a room thermostat be used, remove the link between terminals 5 and 6 of the terminal strip.

Fig. 7 pumped only system two spring return valves

##### Notes:-

- 1) The valves used are of the type which are energised to open and spring-closed when the supply ceases. They should have an auxiliary switch, as shown, to energise the boiler when the valve is open.
- 2) When using a time clock instead of a programmer:-
  - (a) for constant HW, take cylinder stat supply from "permanent live" on time clock.
  - (b) for timed HW, take cylinder stat supply from "switched live" on time clock.

Fig. 8, 9 and 10. Three position pumped only, valve systems

Illustrate the wiring of typical, proprietary, 3 position valve systems. For further information consult the manufacturers literature.

Fig. 11. Frost Thermostat Wiring

##### Notes:-

- 1) When the boiler is to be turned off during frosty weather, this should be done only at the programmer or time clock over-ride control, and all other switches, including the mains supply and the boiler thermostat, must be left in the normal running position.
- 2) The connections should be made as shown without disturbing any other wiring to the time control.



b - blue  
br - brown  
g/y - green/yellow

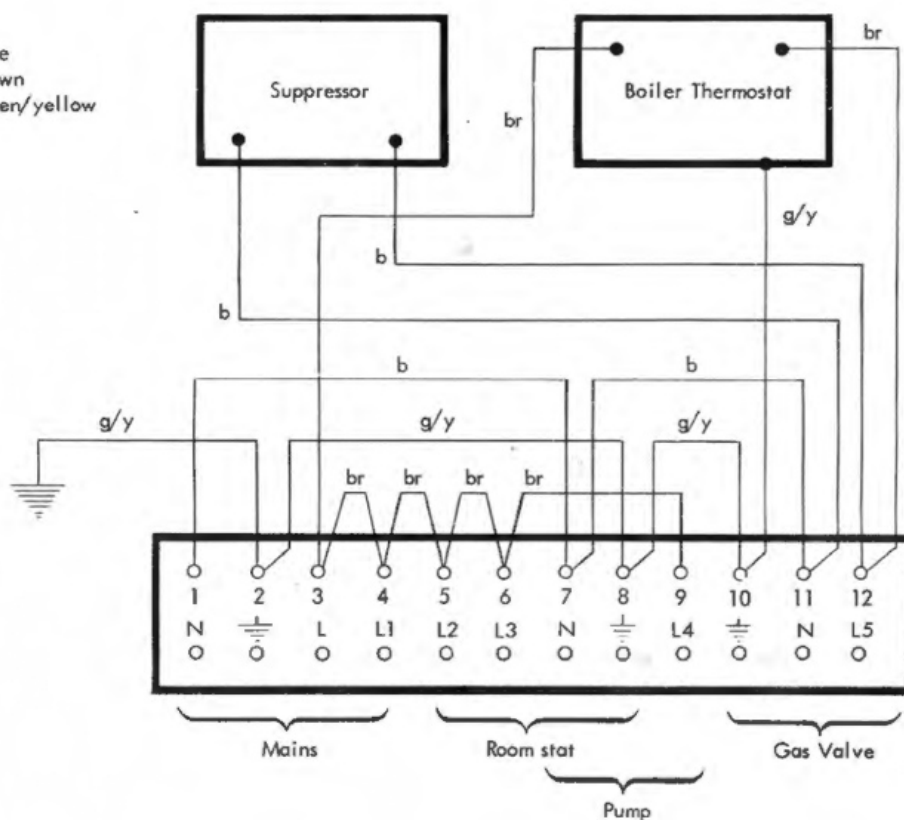


Fig. 5

CONTROL BOX SCHEMATIC WIRING DIAGRAM

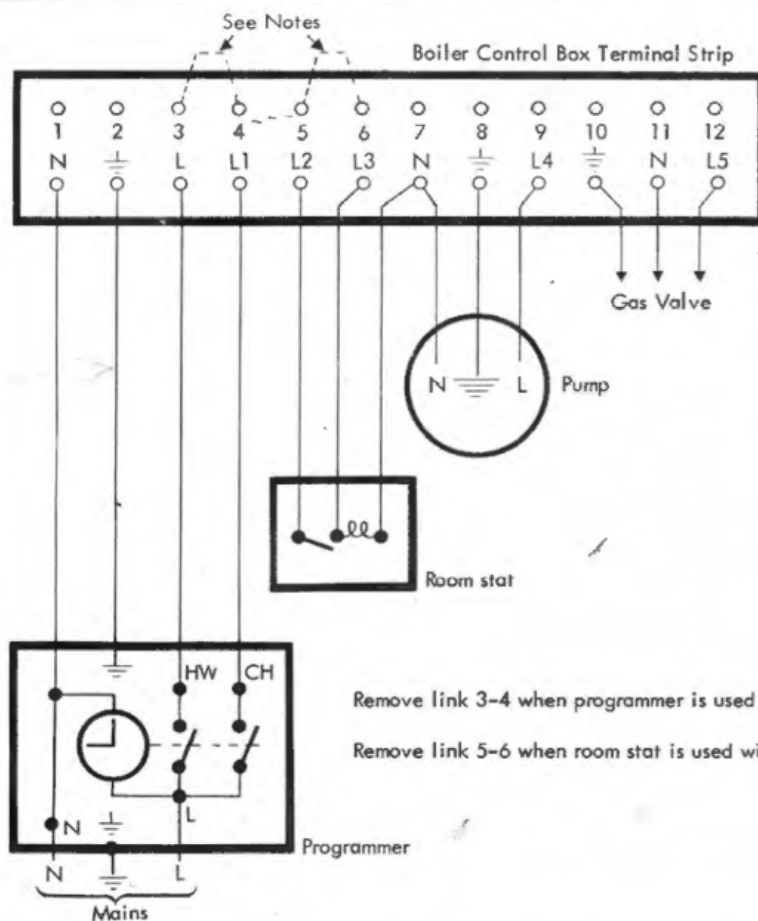
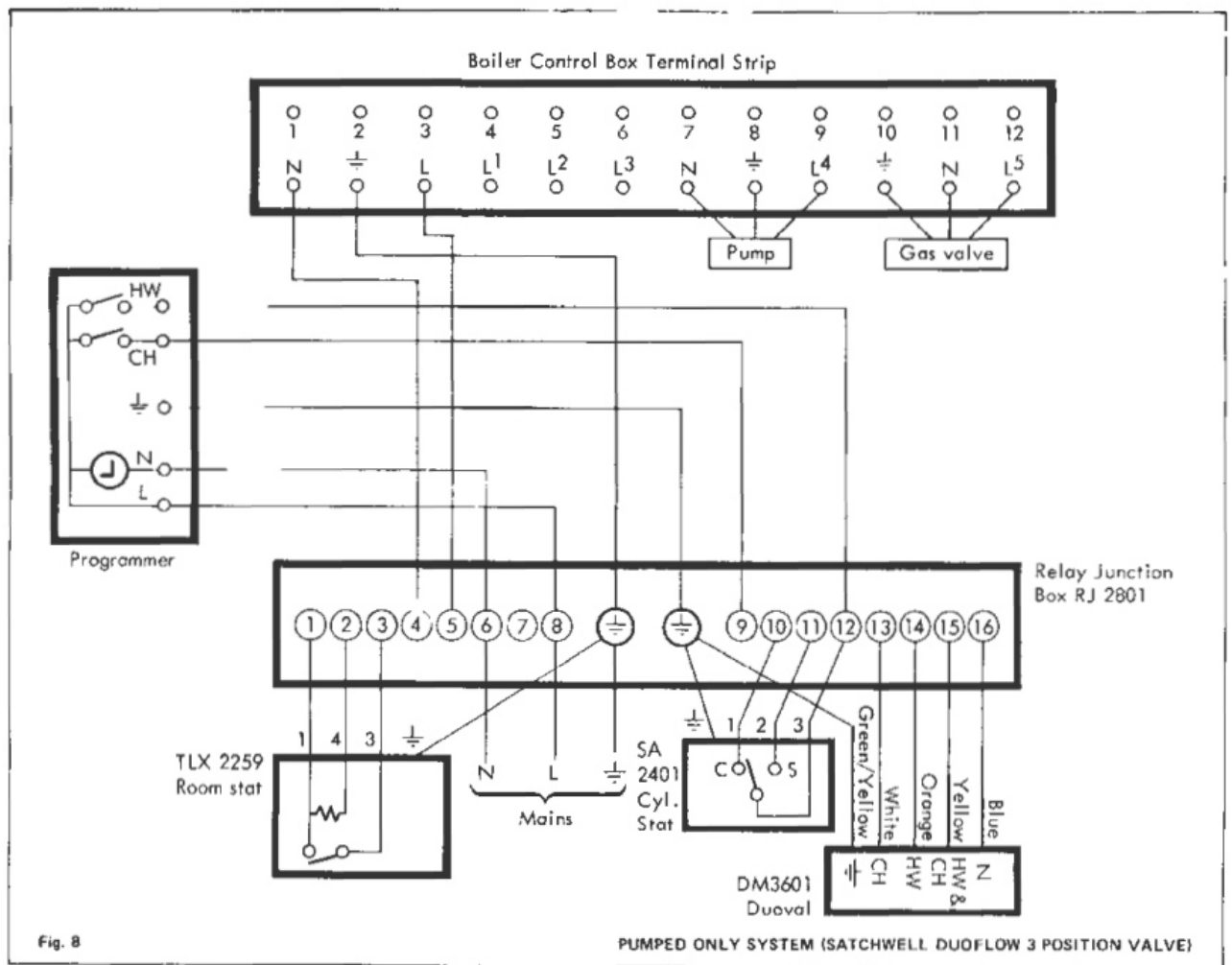
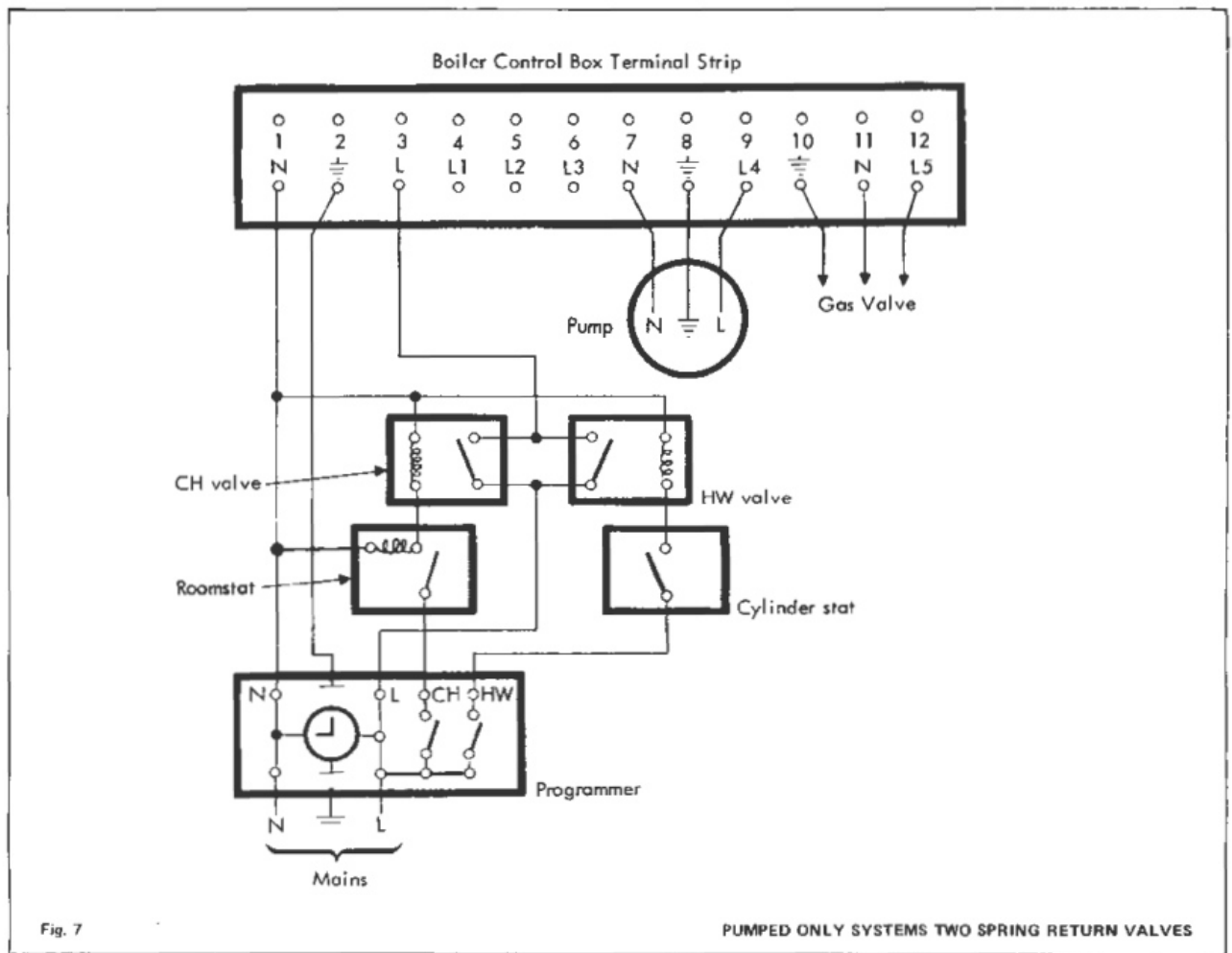


Fig. 6

GRAVITY DOMESTIC HOT WATER AND PUMPED CENTRAL HEATING



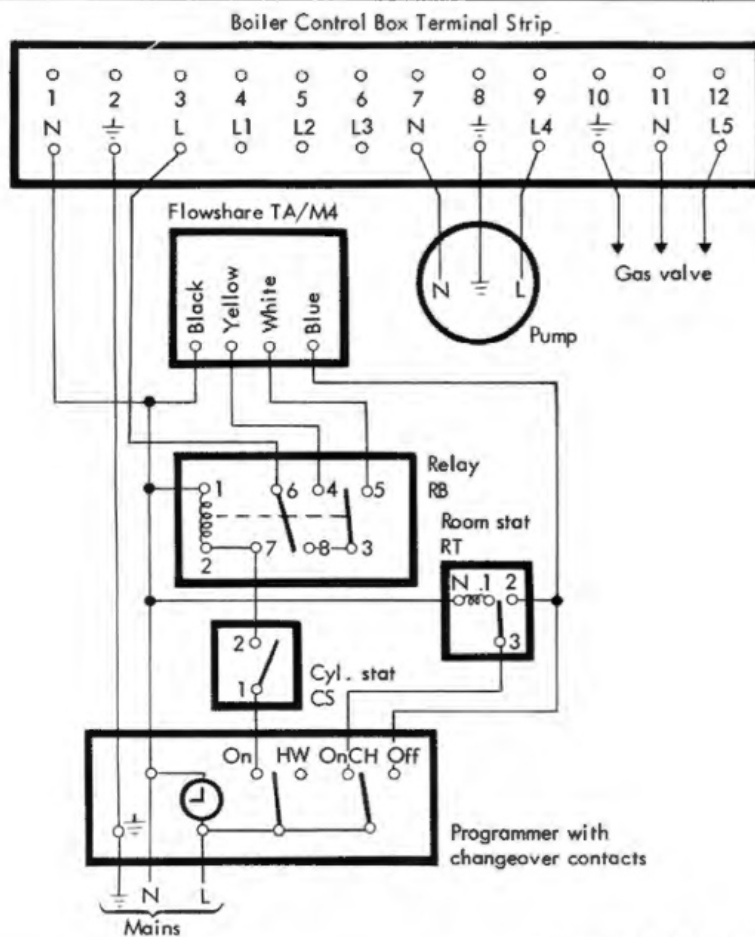


Fig. 9

PUMPED ONLY SYSTEM (DRAYTON FLOWSHARE)

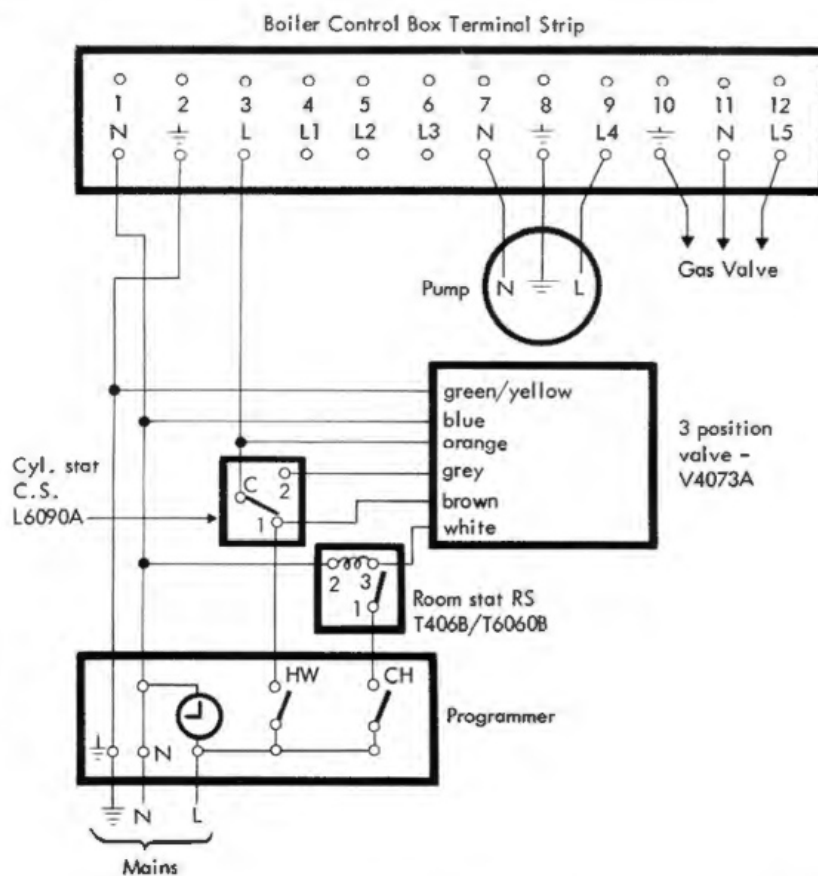
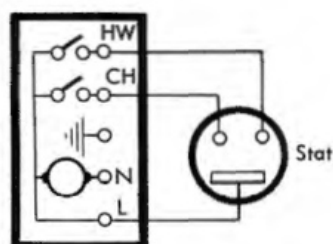


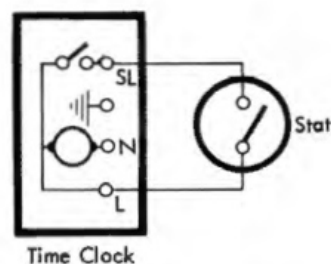
Fig. 10

PUMPED ONLY SYSTEM (HONEYWELL Y PLAN - 3 POSITION VALVE)

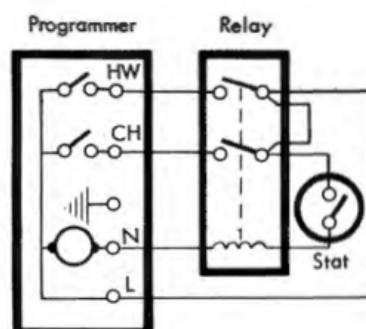




(a) Double Pole frost stat, wired to Programmer



(b) Single Pole frost stat, wired to Time Clock



(c) Single Pole frost stat and relay, wired to Programmer

Fig. 11

FROST THERMOSTAT WIRING

TABLE 2

Boiler	CF 35N				CF 50N				CF 60N			
	kW	1000 Btu/h	kW	1000 Btu/h	kW	1000 Btu/h	kW	1000 Btu/h	kW	1000 Btu/h	kW	1000 Btu/h
Boiler Input*	12.0	41.0	14.0	48.0	15.8	54.0	20.5	70.0	19.9	68.0	23.4	80.0
Boiler Output To Water	8.8	30	10.3	35	11.7	40.0	15.2	52.0	14.7	50.0	17.3	59.0
Manifold Pressure	mbar (gauge)	in.w.g.	mbar (gauge)	in.w.g.	mbar (gauge)	in.w.g.	mbar (gauge)	in.w.g.	mbar (gauge)	in.w.g.	mbar (gauge)	in.w.g.
Natural Gas	9.0	3.6	11.5	4.6	6.7	2.7	10.0	4.0	8.7	3.5	11.8	4.7

Boiler CF 80N				
	kW	1000 Btu/h	kW	1000 Btu/h
Boiler Input*	24.3	83.0	32.6	111
Boiler Output To Water	17.6	60	23.4	80
Manifold Pressure	mbar (gauge)	in.w.g.	mbar (gauge)	in.w.g.
Natural Gas	7.0	2.8	12.1	4.8

\* To obtain gas consumption:-

(a) In cu. ft/h - Divide heat input (Btu/h) by C.V. of gas (Btu/cu.ft).

(b) In litres/second - Divide heat input (kW) by C.V. of gas (MJ/m<sup>3</sup>).

## GAS CONNECTION

A minimum dynamic gas pressure of 20 mbar (8 in. w.g.) must be available at the boiler inlet. The gas supply pipe within the boiler cabinet is provided with an elbow fitting towards the rear and at the lower right-hand side of the boiler. This may be reversed for L.H. connection.

## FLUE CONNECTION

The joint between the boiler socket outlet and the flue pipe must be sealed with suitable compound.

## GAS CONSUMPTION

The gas consumption should be checked on first commissioning the boiler. Table 2 indicates the appropriate manifold pressures and the method of calculating the required consumption. If an adjustment is necessary, first remove the protective screw cap (Fig. 12) on the gas control valve and then adjust the screw in or out to increase or decrease the consumption respectively. Allow the burner to warm up thoroughly before making the adjustment.

## INITIAL LIGHTING INSTRUCTIONS

(see Fig. 13)

### PURGING

When initially lighting a newly installed boiler the gas supply pipe must be purged of air. Check that the electricity supply is switched off. **OPEN ALL WINDOWS AND EXTINGUISH ANY NAKED LIGHTS IN THE ROOM. PUT OUT PIPES AND CIGARETTES.** Remove the cabinet front panel, loosen the union on the main gas cock F and purge until gas is smelled. Retighten the union and check all joints up to cock F with soap solution for leakage.

### LIGHTING (See Fig. 13)

Check the system to ensure that drain cocks are closed and that any stop valves in the flow and return pipes are open. If not already done, fill the system, venting as necessary.

1. Remove the screw from the gas control outlet pressure test nipple (see Fig. 12) and securely connect a suitable gas pressure gauge with flexible tubing. Check that the main gas cock (F) is open. Ensure that the boiler thermostat knob (A) is at "off". Turn the gas control knob (C) clockwise until resistance is felt and then release it. Wait for three minutes. Check that the gas and electricity supplies to the appliance are turned on and that all external controls fitted to the system are "on". Loosen the wing nuts (E) and slide up the sight-glass (D). Insert a lighted spill through the sight-glass opening and position the flame near the pilot burner. Push in the gas control knob (C) and hold it depressed. Keep the lighted spill in position until the pilot burner lights. When the pilot burner has lit, continue to hold down the gas control knob for a further 20 seconds. Should the pilot burner go out at this or any other stage, turn the gas control knob (C) clockwise and release it;

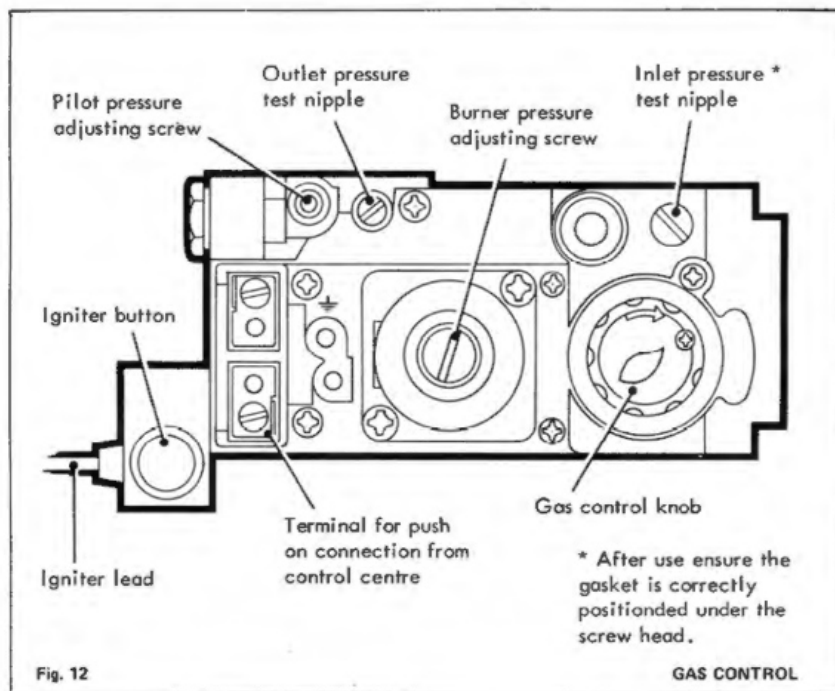


Fig. 12

GAS CONTROL

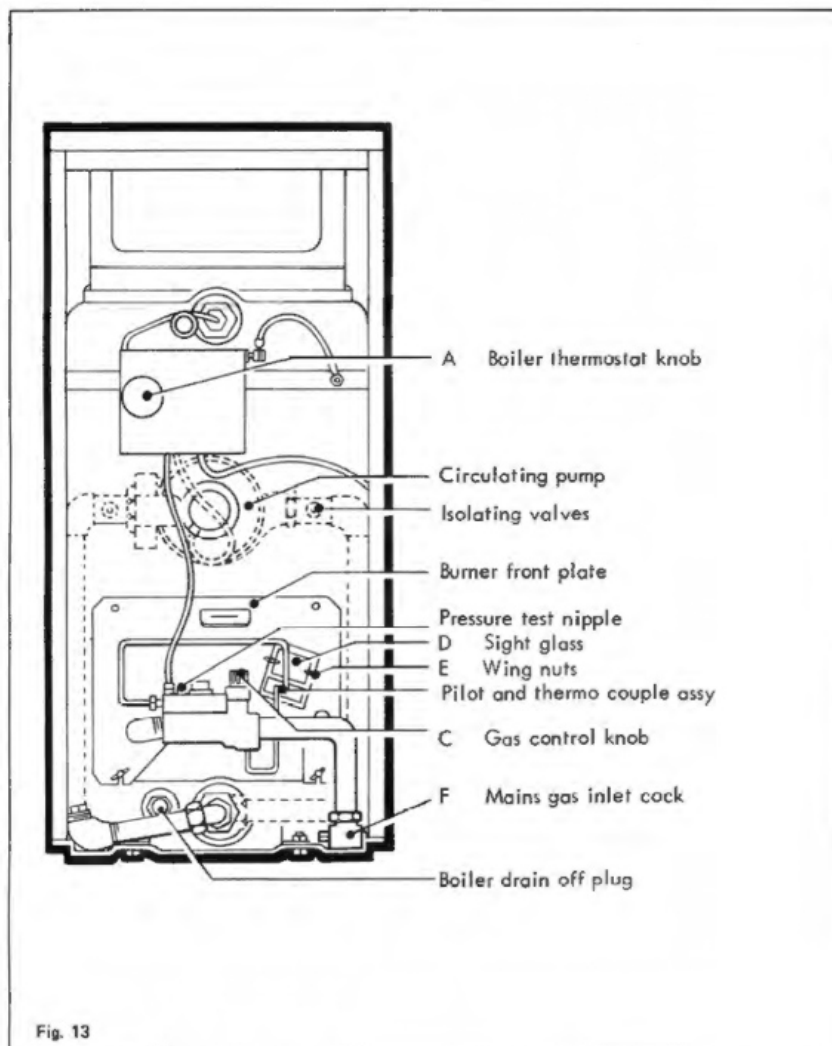


Fig. 13

wait for three minutes and then repeat the instructions in the two preceding paragraphs but wait for longer than 20 seconds before releasing the gas control knob (C).

Close the sight-glass (D) and tighten the wing nuts (E). Do not over-tighten. When the pilot is burning properly, check the size of the pilot burner flame.

Approximately 13mm ( $\frac{1}{2}$  in.) of the thermocouple tip must be immersed in the pilot flame.

Adjust if necessary. The adjuster is on the gas control (Fig. 12).

Turn the adjuster screw anti-clockwise to increase or clockwise to decrease the flame length. Too small a flame will cause unreliable operation, too large

a flame will result in accelerated deterioration of the thermocouple. Turn the boiler thermostat knob (A) to position 6; this action will light the boiler.

After the boiler has lit, allow it to operate for ten minutes to stabilise the burner temperature. Then adjust the burner pressure if necessary to the value given in Table 2 for the boiler output required. The burner pressure adjusting screw is located on the gas control (see Fig. 12) and is turned clockwise to increase and anti-clockwise to decrease the gas pressure. When disconnecting the gas pressure gauge be sure to replace the sealing screw in the pressure test nipple on the gas control.

## TESTING

Make the following tests for correct operation:-

1. Turn the boiler thermostat off and on and observe that the boiler burner goes out and re-lights in response.
2. Check the operation of the flame failure device in the gas control. To do so, turn the gas control knob clockwise until resistance is met and then

release it. This action should immediately extinguish the boiler burner and pilot flames.

**NOTE:-** A safety latch in the gas control provides a delay period before the boiler can be re-lighted.

3. Correct operation of the external controls fitted to the system should be proved. Operate each control separately and check that the boiler burner and pump respond correctly. Finally, set all controls to meet the user's requirements. The table beneath gives a guide to the flow temperatures corresponding to the numbers on the thermostat knob. The temperatures quoted are approximate and may vary with individual installations.

Knob Setting	Flow Temperature °C	°F
1	54	130
2	60	140
3	66	150
4	71	160
5	77	170
6	82	180

## HANDING OVER

Give the "User's Instructions" booklet to the householder and draw attention to the Lighting Instruction Plate on the inside of the cabinet front panel. Demonstrate and explain the lighting and shutting-off procedures. Explain the use of the boiler thermostat and the external controls fitted to the system. Explain the scope for economy given by careful use and adjustment of time and temperature controls, radiator valves, etc. Finally, point out that to ensure efficient reliable operation and a long working life, the appliance and system should be serviced regularly and that this is best arranged for by making a servicing contract with the local Gas Region or a qualified Heating Engineer.

## MAINTENANCE

### WARNING

1. Always switch off and disconnect the electricity supply and close the main gas cock before carrying out maintenance work on the boiler.
2. The earth band between the earth stud on the front of the control box and the earth stud on the boiler body, if disturbed for any reason, **MUST BE REPLACED** before switching on the electricity supply.
3. Never attempt to light the boiler unless the main gas cock has been turned off for at least three minutes and always then follow the "Initial Lighting" procedure.

### GENERAL

Full maintenance on the boiler should be undertaken not less than once per year. The user is recommended to take out a contract with the local Gas Board or a Heating Engineer for this work to be done.

### BURNER ASSEMBLY

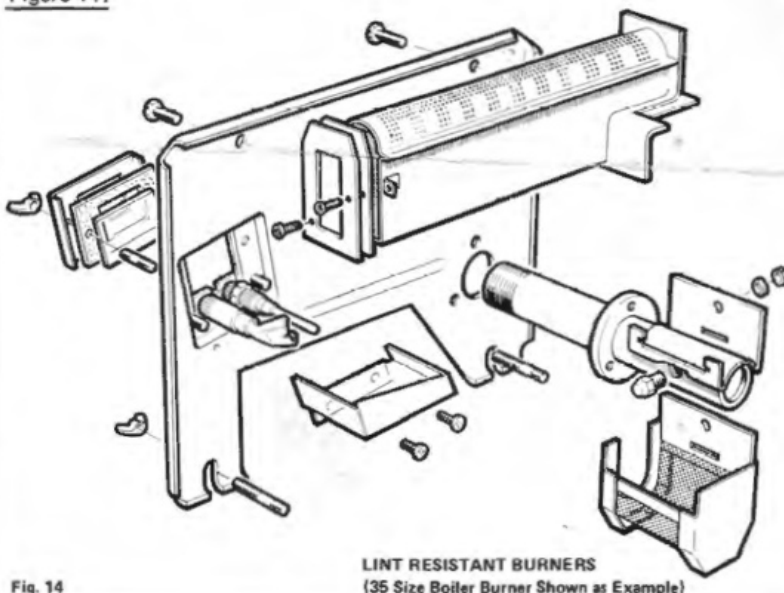
Remove the front panel of the cabinet. Unscrew the union nut at the main gas cock and remove the two screws and two wing-nuts securing the front burner plate. Disconnect the gas control leads from the gas control. Remove the complete burner bar assembly from the boiler.

#### 2. Main Burners and Pilot Burner (Fig. 14)

##### 1. To Dismantle

- (a) Loosen and remove the nuts and

Figure 14.



washers securing the air filter box and burners to the manifold.

- (b) Remove the air filter box by releasing the rear fixing plate from burner locating tags and fixing studs and lifting away from the burner assembly.

- (c) Take off the burner end caps by removing the two retaining screws. A Pozidrive No. 2 screwdriver is suitable for this operation.

#### 2. To Clean

- (a) Remove all traces of lint from inside the burner, particularly that adhering to the underside of the flamestrip.
- (b) Thoroughly clean the gauze of the air filter box by brushing. **DO NOT**

**WASH.** The gauze may be removed from the box by carefully "spreading" the frame and releasing the gauze from the clips.

- (c) Clean any lint from the injectors ensuring that all traces have been removed from the orifices.
- (d) Remove all traces of lint from inside the casing both front and rear.
- (e) Examine the exterior of the burners and brush off any deposits that may have fallen on them; ensure that all flame ports are unobstructed.

#### 3. To Re-assemble

Re-assemble in the reverse order; use a new end cap gasket if necessary. Ensure that the threads on the fixing screws are not crossed or damaged and that a gas-tight seal is made. Ensure that the air filter box is properly

sealed to the burner manifold checking that:-

(a) The reinforcing strip along the front of the gauze forms a seal with the face of the plate in which the burner mixing tube is situated.

(b) The end plates of the box are correctly located with the fixing tabs flush with the burner end plates i.e. the section of the box without a return should be inside the edge of the burner end plate.

(c) Ensure that the gauze is not crushed or distorted.

Inspect the pilot burner and thermocouple; make sure that they are clean and in good condition. In particular check that:-

1. The pilot burner is firmly secured to the front plate.
2. The pilot shield is clean and unobstructed.
3. The thermocouple terminal nut at the gas control is secure but not over-tightened. The terminal must be clean to ensure a good electrical connection.
4. The pilot observation window is clean and undamaged.

#### FLUEWAYS

Having removed the burner assembly, remove the flue clean-out cover plate on top of the boiler body and clean the heat exchanger flueways with a flexible brush. Check that the heat exchanger flueways are quite clean and that all loose deposits are brushed away. After doing so, remove all loose debris from the floor of the heat exchanger.

Refit the flue cleanout cover to the boiler after checking that the seal is in good condition.

Refit the burner assembly to the boiler. Complete the gas and electric connections.

**NOTE:-** The flue cleanout cover seal must be replaced if found to be damaged or deteriorated.

#### PILOT BURNER

Light the boiler and check that:-

1. The pilot flame impinges on the thermocouple head and that the position of the thermocouple relative to the pilot burner and the main burner is as shown (see Fig. 15)
2. The pilot flame is about 25 mm (1") long (to adjust, turn the adjuster screw clockwise to decrease or anticlockwise to increase the pilot flame length). The position of the adjuster screw is shown in figure 12.

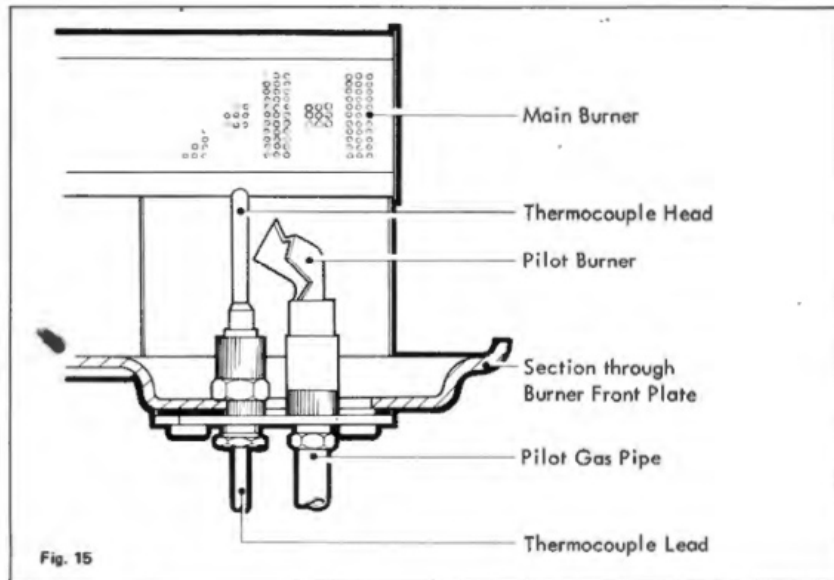
#### SETTING AND ADJUSTMENT OF GAS PRESSURE

Table 2 gives details of rated boiler output with related manifold gas pressure and heat inputs. The location of the manifold pressure adjustment screw on the gas control is shown in Figure 12.

A pressure test nipple for checking the burner manifold gas pressure is provided on the gas control.

#### REPLACEMENT OF FAULTY COMBINATION GAS CONTROL

Remove the burner assembly from the



boiler as described above. Disconnect the thermocouple and the pilot gas pipe at both ends, and remove. Disconnect the gas inlet and outlet pipes from the gas control. Fit the replacement control using an appropriate jointing compound. (An arrow on the valve indicates the direction of gas flow).

Reconnect the pilot pipe and thermocouple. Refit the burner to the boiler and reconnect the gas union, and the electrical leads to the gas control (Fig. 12)

Turn on the main gas cock and check for leaks up to the gas control. Reconnect the electricity and light the boiler, following the procedure on the lighting plate on the inside of the jacket door. After lighting the main burner, check for leaks at all joints.

#### REPLACEMENT OF FAULTY BURNER BARS

(NOTE:- Air baffles are not fitted to 35 and 80 size boilers).

Straighten the tab(s) locating the air baffle(s) and remove the baffle(s) by lifting upward. Remove the nut and washer securing the burner and slide the burner off horizontally. Fit the new burner in the same position and secure with nut and washer. Do not overtighten the nut. Replace the air baffle(s) in position and secure by bending over the tab(s).

#### CONTROL BOX

Fig. 5 shows the control centre circuit. Check that all external wiring and electrical connections are in good condition and correctly made. If a fault develops in the control centre and it cannot readily be detected, the complete unit should be replaced as follows:-

1. Switch off the electricity supply and disconnect all leads to the control centre.
2. Remove the thermostat phial from its pocket.
3. Unfasten the three screws securing the control centre front cover and remove it from the housing.
4. Fit new control centre and reconnect all electrical leads. The earth bond to the earth stud on the boiler body must be re-fitted.
5. Replace thermostat phial in its pocket.

A faulty thermostat may be replaced on site as follows:-

1. Switch off the electricity supply.
2. Remove thermostat phial from its pocket in boiler.
3. Remove the three screws securing the control centre front cover and remove it from the base.
4. Pull off the thermostat knob. Remove the two screws securing the thermostat body.
5. Disconnect electrical leads to thermostat and remove instrument from control centre.
6. Fit replacement thermostat to control centre with the two screws. Reconnect electrical leads.
7. Replace front panel assembly in control centre and fasten securing screws.
8. Replace thermostat phial in boiler pocket.

#### CHECKING OPERATION OF CONTROLS

The initial lighting procedure is in itself a test of the gas controls and ancillary equipment.

#### PUMP AND ROOM THERMOSTAT (SB MODELS ONLY)

The operation of the pump and room thermostat may be checked by turning the room thermostat ON and OFF and, by placing a hand on the pump, feeling the slight vibration when the pump is operating. Unions and isolating valves facilitate the replacement of a faulty pump.

#### SPARE PARTS

An illustrated list of spare parts follows. When ordering, please quote the description and the maker's part number.

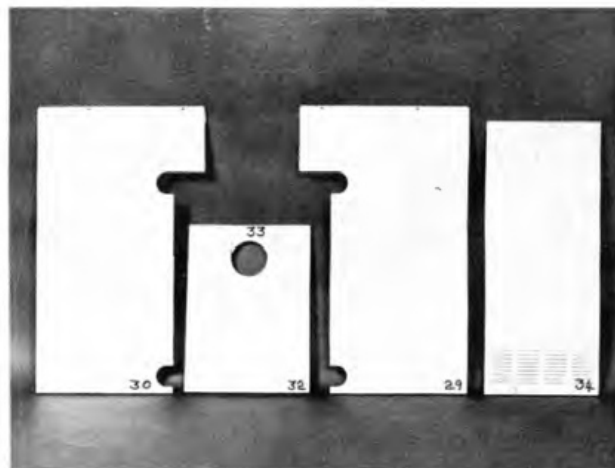
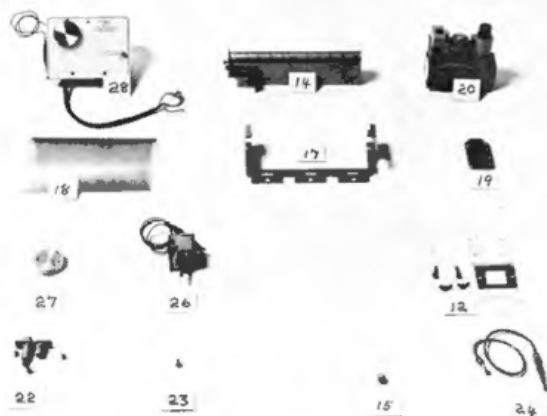


# SHORT PARTS LISTS

The short Parts List which follow are extracted from the complete British Gas Corporation Parts Lists which include all available spare parts. These short Parts Lists contain the times normally required

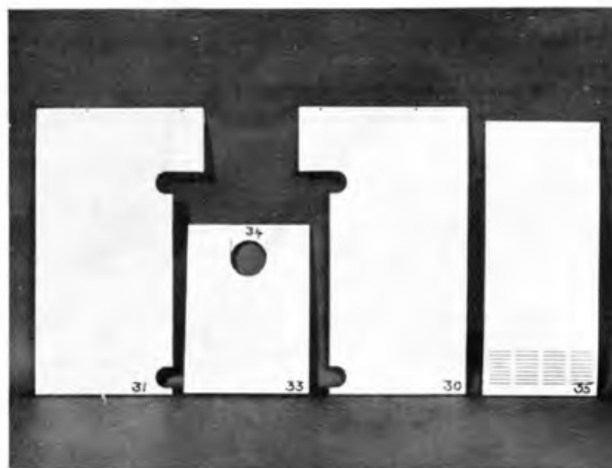
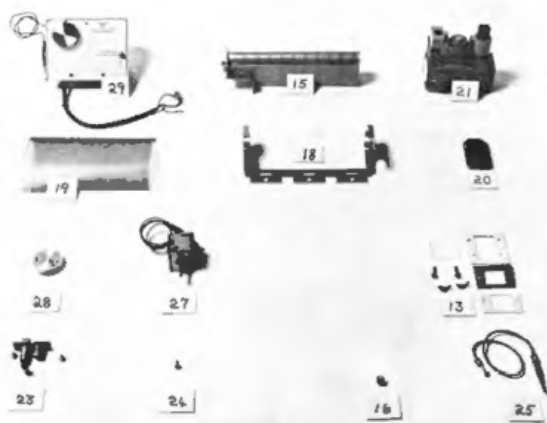
as replacement spares. Copies of the complete Parts Lists are held by Gas Regions and STELRAD GROUP Distributors and Merchants. When ordering spares, please always

quote the Boiler Model and British Gas Appliance Number in addition to the full description and the Maker's Part Number of the item required.



E Type CF 35N Conventional Flue Gas Boiler  
Gas Council Appliance No. 41 - 409 - 12

Key No	British Gas Part Number	Description	No Off	Maker's Part Number
12	354 567	Sightglass frame with sightglass, gasket, pilot thermocouple gasket and including:- 2 - M5 x 20 lg Studs 2 - M5 wing nuts	1	129818035
14	399 928	Multi-gas Burner Bar - Bray Cat. 3108 AB 14037 - LR with anti-flash shield and 1 - M5 washer (Form C) 4 - M5 Hex nut	1	129818040
15	398 323	Burner Injector - Bray multi-hole Cat. 16 size 1200	1	169120450
17	354 868	Lint Box Assy. (not incl. gauze)	1	129528092
18	354 841	Lint gauze assembly only	1	129528043
19	354 840	Burner End Plate and gasket with 2 M5 x 15 posi pan screws	1	129528093
20	393 659	½ in. BSP Compact valve - Honeywell V4600A-1023	1	586121900
22	390 427	Pilot Burner Shell 0314A5039 with BCR 18 Pilot injector & 2 - M5 x 6 lg pozi pan screws	1	586861609
23	319 890	Pilot burner injector - BCR 18	1	169120177
24	390 131	Thermocouple Q309A2721 - 18 in. long	1	586811720
26	382 337	Thermostat C26 - P.0616	1	586121511
27	354 379	Thermostat knob & clip	1	586811517
28	354 872	Control box - plastic with key No's. 26 & 27	1	586121250
29	354 693	LH Side Jacket Panel assy. - White stove enamel	1	129968112
30	354 694	RH Side Jacket Panel assy. - White stove enamel	1	129968114
31	354 575	Jacket Side Panel fixing pack	1	129528119
32	354 576	Jacket Top Panel	1	129528116
33	354 577	Jacket Top Panel Infill piece	1	129528122
34	354 870	Jacket front panel sub-assy. - White stove enamel with instruction plate & nameplate	1	129128118
35	354 871	Jacket complete - White stove enamel	1	129128110



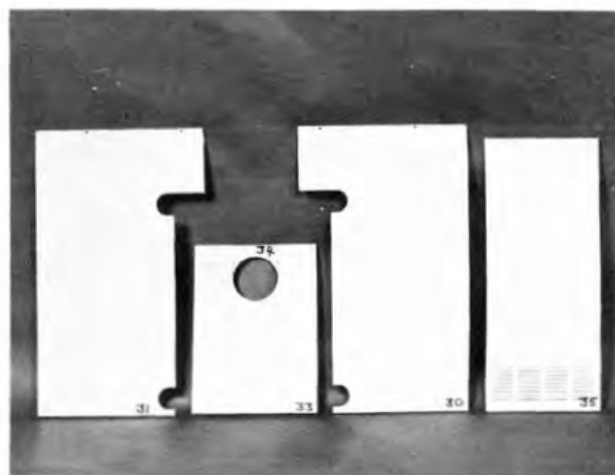
# E Type CF 50N

Conventional Flue Gas Boiler

Gas Council Appliance No. 41 - 409 - 13

Key No.	British Gas Part Number	Description	No. Off	Maker's Part Number
13	354 567	Sightglass frame with sightglass, gasket, pilot thermocouple gasket & including 2 - M5 x 20 lg studs 2 - M5 wing nuts	1	129818035
15	399 928	Multigas burner bar - Bray Cat. 3108 AB 14037 - LR with anti-flash shields & 1 - M5 washer (Form c) 1 - M5 Hex Nut	2	129818040
16	398 344	Burner Injector - Bray Multi-hole - Cat. 16 size 900	2	169120452
18	354 838	Lint Box Assy. (not including Gauze)	1	129658092
19	354 842	Lint Gauze Assy. only	1	129658043
20	354 840	Burner End Plate and gasket with 2 - M5 x 15 posi pan screws	2	129528093
21	393 659	½ in BSP Compact valve - Honeywell V4600A-1023	1	586121900
23	390 427	Pilot burner shell Q314A5039 with BCR 18 pilot injector & 2 - M5 x 6 lg pozipan screws	1	586861609
24	319 890	Pilot burner injector - BCR 18	1	169120177
25	390 131	Thermocouple Q309A2721 - 18 in. long	1	586811720
27	382 337	Thermostat C26- P.0616	1	586121511
28	354 379	Thermostat knob & clip	1	586811517
29	354 872	Control box - plastic with key No's. 27 & 28	1	586121250
30	354 693	LH side Jacket panel assy - white stove enamel	1	129968112
31	354 694	RH side Jacket panel assy. - white stove enamel	1	129968114
32	354 575	Jacket side panel fixing pack	1	129528119
33	354 576	Jacket top panel - white stove enamel	1	129528116
34	354 577	Jacket top panel infill piece	1	129528122
35	354 870	Jacket front panel sub-assy. - white stove enamel with instruction plate & nameplate	1	129128118
36	354 871	Jacket complete - white stove enamel	1	129128110



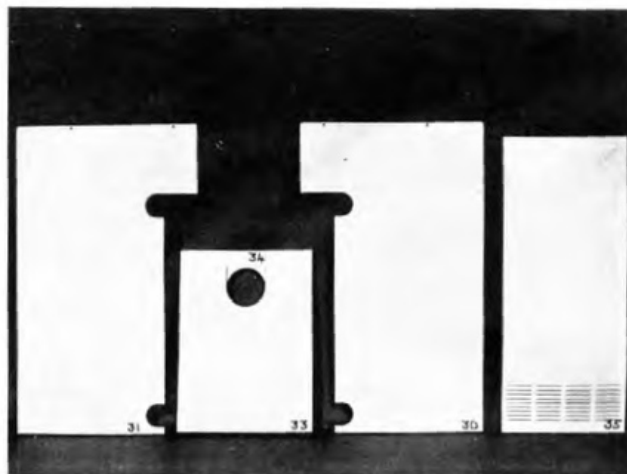
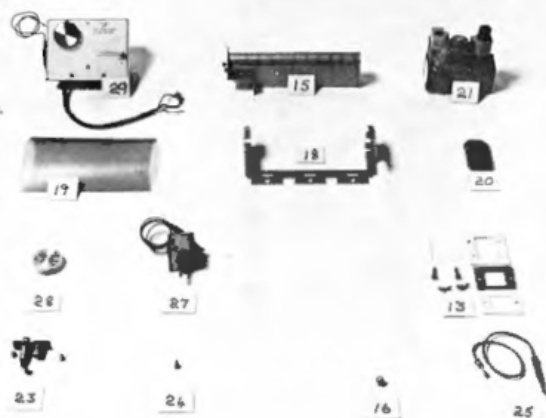


# E Type 60N

## Conventional Flue Gas Boiler

Gas Council Appliance No. 41 - 409 -14

Key No.	British Gas Part Number	Description	No. Off	Maker's Part Number
13	354 567	Sightglass frame with sightglass, gasket pilot thermocouple gasket and including:- 2 - M5 x 20 lg studs 2 - M5 wing nuts	1	129818035
15	399 928	Multi gas Burner Bar - Bray Cat. 3108 AB 14037 - LR with anti-flash over shields and 1-M5 washers (Form C) 1-M5 hex nut	2	129818040
16	398 322	Burner injector - Bray Multihole Cat. 16 size 1000	2	169120451
18	354 838	Lint Box Assembly (not including gauze)	1	129658092
19	354 842	Lint gauze assembly only	1	129658043
20	354 840	Burner end plate and gasket with 2 - M5 x 15 pozi pan screws	2	129528093
21	393 659	½ in. BSP Compact valve - Honeywell V4600A-1023;	1	586121900
23	390 427	Pilot burner shell Q314A5039 with BCR 18 pilot injector and 2 - M5 x 6 lg pozipan screws	1	586861609
24	319 890	Pilot burner injector - BCR 18	1	169120177
25	390 131	Thermocouple Q309A2721 - 18 in. long	1	586811720
27	382 337	Thermostat C26- P.0616	1	586121511
28	354 379	Thermostat knob & clip	1	586811517
29	354 872	Control box - plastic with key No's. 27 & 28	1	586121250
30	354 693	LH side Jacket Panel Assy. - white stove enamel	1	129968112
31	354 694	RH side Jacket Panel Assy. - white stove enamel	1	129968114
32	354 575	Jacket side panel fixing pack	1	129528119
33	354 576	Jacket top panel	1	129528116
34	354 577	Jacket top panel infill piece	1	129528122
35	354 870	Jacket front panel sub Assy. - white stove enamel with instruction plate and name plate	1	129128118
36	354 871	Jacket complete - white stove enamel	1	129128110



E Type CF 80N Conventional Flue Gas Boiler  
Gas Council Appliance No. 41-409-15

Key No.	British Gas Part Number	Description	No. Off	Maker's Part Number
13	354 567	Sightglass frame with sightglass, gasket, pilot thermocouple gasket and including:- 2 - M5 x 20 lg studs 2 - M5 wing nuts	1	129818035
15	399 928	Multigas burner bar - Bray Cat.3108 AB 14037LR with anti-flash shield and 1 - M5 washer (Form C) 1 - M5 Hex nut	3	129818040
16	398 344	Burner injector - Bray multihole Cat. 16 size 900	3	169120452
18	354 839	Lint box assy. (not including gauze)	1	129928092
19	354 884	Lint gauze assembly only	1	129928043
20	354 840	Burner end plate and gasket with 2 - M5 x 15 pozi pan screws	3	129528093
21	393 659	½ in. BSP Compact valve - Honeywell V4600A-1023	1	586121900
23	390 427	Pilot burner shell Q314A5039 with BCR 18 pilot injector and 2 - M5 x 6 lg pozi pan screws	1	586861609
24	319 890	Pilot burner injector - BCR 18	1	169120177
25	390 181	Thermocouple Q309A2721 - 18 in. long	1	586811720
27	382 337	Thermostat C26-P.0616	1	586121511
28	354 379	Thermostat knob and clip	1	586811517
29	354 872	Control box - plastic with key No's. 27 & 28	1	586121250
30	354 693	LH side Jacket panel assy. - white stove enamel	1	129968112
31	354 694	RH side Jacket panel assy. - white stove enamel	1	129968114
32	354 575	Jacket side panel fixing pack	1	129528119
33	354 605	Jacket top panel	1	129928116
34	354 606	Jacket top panel infill piece	1	129928122
35	354 870	Jacket front panel sub assy. - white stove enamel with instruction plate and nameplate	1	129128118
36	354 885	Jacket complete - white stove enamel	1	129158110



THIS SYMBOL IS  
YOUR SAFEGUARD

BS 5258

Products bearing this BSI Safety Mark are made to a safety standard under a stringent scheme of supervision and control monitored by the Quality Assurance Department of the British Standards Institution.

**STELRAD GROUP** pursues a policy of continuing improvement in design and performance of its products. The right is therefore, reserved to vary specification without notice.

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