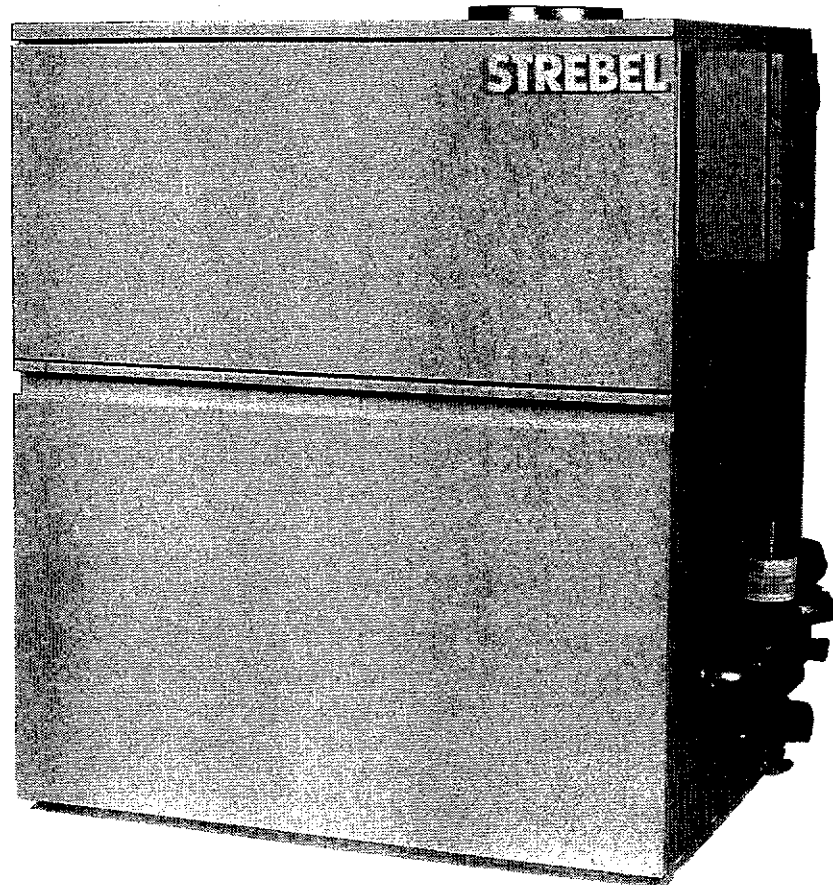


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**STREBEL**

# LUCERNE



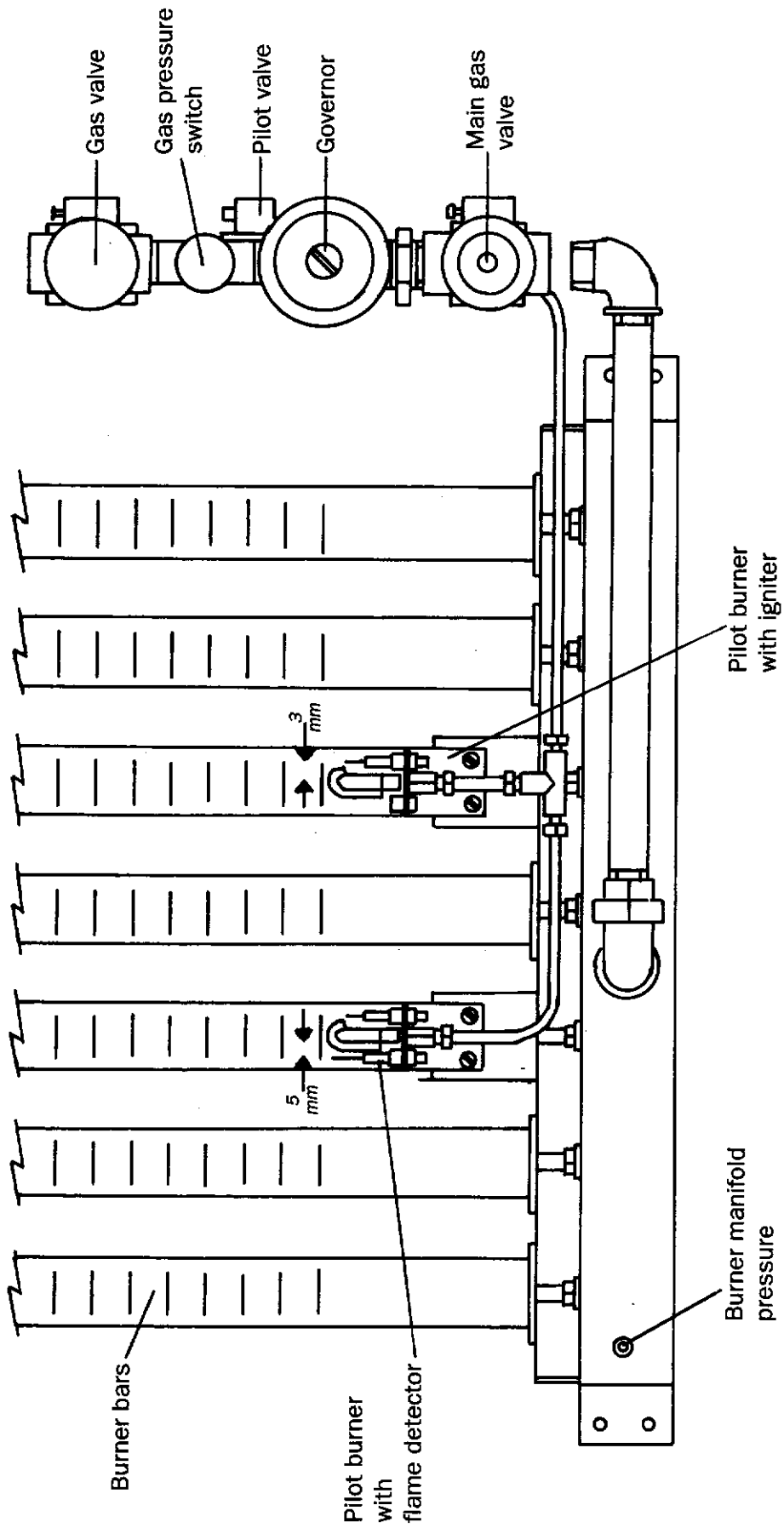
## **ATMOSPHERIC GAS BOILER INSTALLATION, OPERATION AND MAINTENANCE MANUAL**

### **WARNING**

The boiler block is composed of single sections temporarily and solely assembled by means of the four tie bars for transit.

At time of installation remove the burner then the boiler block must be dismantled section by section after removing the four tie bars. Ensuring that the sections are supported so that they do not fall over.

The sections must be assembled in the same order for the holes of the pilot assemblies to be in the correct position (see Fig 2).



# This Boiler is for use on Natural Gas

(Can be used on L.P.G. to special order)

## Installation and Servicing Instructions

### INDEX

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# Section 1 Introduction

The boiler is a cast iron sectional boiler with atmospheric burners and conventional flue. The down draught diverter is integral with the flue hood, and situated at the rear of the boiler.

The boiler sections are insulated with aluminium faced mineral wool blankets, and the whole encased in an enamelled steel jacket. The controls are located within the instrument panel.

6 to 15 section boilers are fitted with fully automatic controls, flame rectification flame failure device and electric ignition.

On these boilers the pilot burners have a separate gas supply and fitted with ignition and flame sensing electrodes.

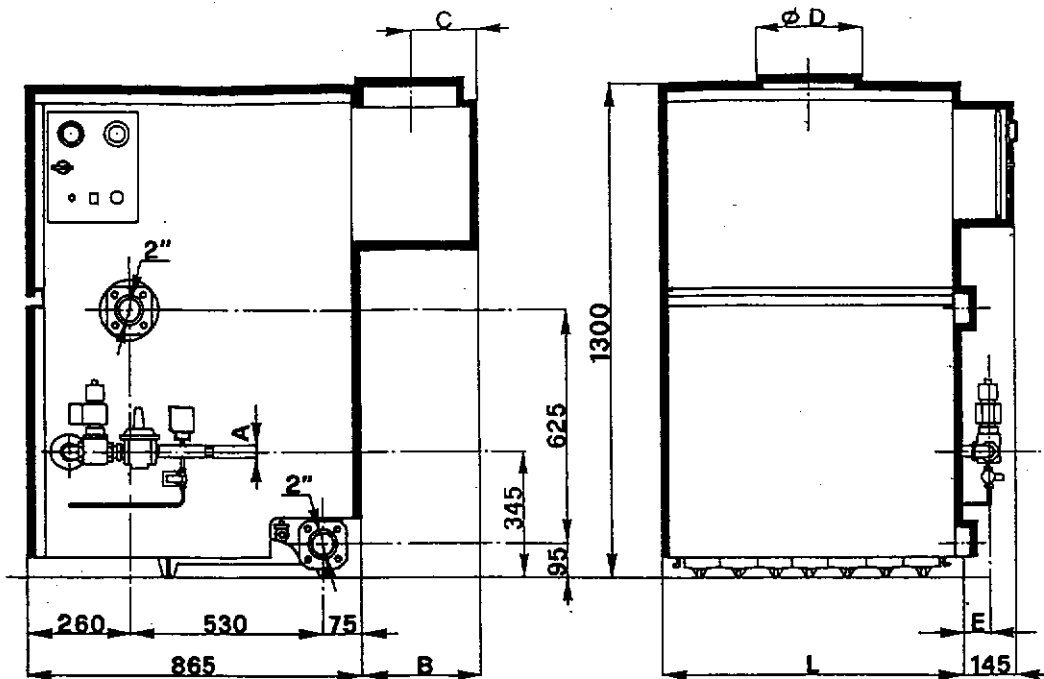
# Section 2 Technical Data

Table 1

Model	No. Sections	Heat Input		Heat Output		Connection Size		Weight		Max. Boiler Temp. °C	Max. Working Pressure bar
		kW	Btu/h	kW	Btu/h	Gas BSP	Flue	kg	lbs		
82	6	118	403,000	96	327,000	1"	250	453	999	95	4
99	7	142	485,000	115	393,000	1"	250	509	1122	95	4
115	8	166	566,000	134	458,000	1"	300	564	1243	95	4
132	9	190	647,000	153	524,000	1½"	300	622	1371	95	4
148	10	210	717,000	173	589,000	1½"	300	678	1495	95	4
165	11	237	808,000	192	654,000	1½"	350	733	1616	95	4
181	12	262	895,000	211	720,000	1½"	350	789	1739	95	4
198	13	284	971,000	230	786,000	1½"	350	844	1861	95	4
214	14	308	1,051,000	249	851,000	1½"	350	900	1984	95	4
231	15	332	1,132,000	268	916,000	1½"	350	955	2105	95	4

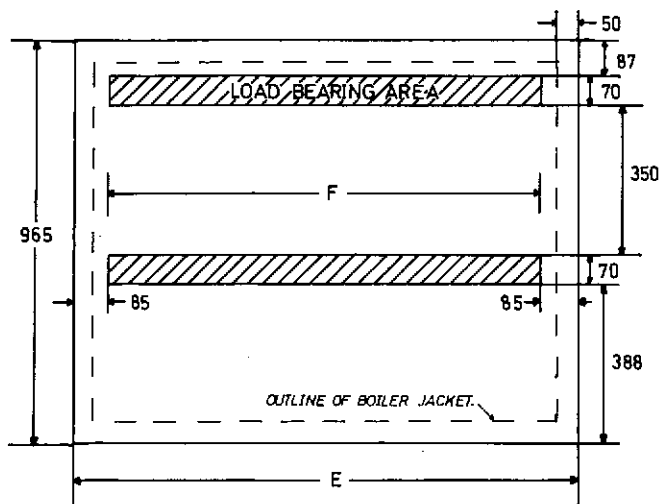
Table 2

Model	No. Sections	Gas Consumption in m³/h		Pressure on Burner mbar		Main Injectors		Pilot Injectors		Water Resistance at 10°C Diff. mbar	Flow Rates at 10°C Diff. L/s
		Natural	LPG	Natural	LPG	Natural	LPG	Natural	LPG		
82	6	11.28	4.32	9.5	30	3.9	2.4	0.29	0.24	4.5	2.28
99	7	13.54	5.18	9.5	30	3.9	2.4	0.29	0.24	6.8	2.73
115	8	15.79	6.04	9.5	30	3.9	2.4	0.29	0.24	9.0	3.19
132	9	18.05	6.91	9.5	30	3.9	2.4	0.29	0.24	11.8	3.64
148	10	20.31	7.77	9.5	30	3.9	2.4	0.29	0.24	14.8	4.11
165	11	22.56	8.64	9.5	30	3.9	2.4	0.29	0.24	18.2	4.57
181	12	24.82	9.50	9.5	30	3.9	2.4	0.29	0.24	22.0	5.02
198	13	27.08	10.37	9.5	30	3.9	2.4	0.29	0.24	26.4	5.47
214	14	29.33	11.23	9.5	30	3.9	2.4	0.29	0.24	31.6	5.92
231	15	31.59	12.09	9.5	30	3.9	2.4	0.29	0.24	37.8	6.38



**Boiler Dimensions**

Model	No. Sections	A	B	C	D	E	L
82	6	1"	313	165	250	60	670
99	7	1"	313	165	250	60	770
115	8	1"	363	190	300	60	870
132	9	1½"	363	190	300	100	970
148	10	1½"	363	190	300	100	1070
165	11	1½"	413	215	350	100	1170
181	12	1½"	413	215	350	100	1270
198	13	1½"	413	215	350	100	1370
214	14	1½"	413	215	350	100	1470
231	15	1½"	413	215	350	100	1570



**Boiler Base Details**

Model	No. Sections	E	F
82	6	770	600
99	7	870	700
115	8	970	800
132	9	1070	900
148	10	1170	1000
165	11	1270	1100
181	12	1370	1200
198	13	1470	1300
214	14	1570	1400
231	15	1670	1500

## Section 3

# Installation Requirements

### 3.1 General

The installation of the boiler must be in accordance with the Gas Safety Regulations, Building Regulations, I.E.E. Regulations and the Bye-Laws of the Local Water Undertaking.

The installation should also be in accordance with any relevant requirements of the Local Gas Region and Local Authority, and the following documents:

C.P.331:3 Low Pressure Installation – Pipes.

C.P.332:3 Boilers of more than 150,000 Btu/h (44 kW)  
and up to 2,000,000 Btu/h (586 kW).

C.P.342 Centralised Hot Water Supply.

B.S.5440 Pt. 1 and 2.

British Gas Publications.

“Technical Notes on the Design of Flues for non-domestic Boilers”.

“Guidance Notes for Boiler Installations in excess of 2,000,000 Btu/h (586 kW)”.

### 3.2 Location

The boiler should be positioned to allow a minimum of 350 mm (14 in) at the left hand side, 450 mm (18 in) at the right hand side of the jacket, and 450 mm (18 in) in front for assembly and maintenance. The draught diverter should be at least 100 mm from the wall behind the boiler to provide access for assembly.

### 3.3 Gas Supply

The Local Gas Region should be consulted at the installation planning stage to establish that an adequate supply is available.

An existing service pipe must not be used without prior consultation with the Local Gas Region.

A meter of suitable capacity must be connected. Installation of pipes should be in accordance with C.P.331:3. The complete installation must be tested for soundness as described in the above Code.

### 3.4 Flue System

The flue system should be in accordance with C.P.332:3 and British Gas “Technical Notes on the Design of Flues”. The nominal flue size should not be less than that of the boiler flue connection (see Section 2 Technical Data), and must be at least equivalent to a vertical height above the boiler outlet of 1 m (3 ft 3 in), due allowance being made for any horizontal or inclined length, and consideration being given to the position of the outlet.

The boiler flue hood is not load bearing and the flue must be supported independently. The flue should be easily disconnected for servicing.

### 3.5 Air Supply (see Fig. 6)

It is important that there are sufficient areas of air inlet and ventilation provided to the boiler room, at least in accordance with C.P.332:3 for installations up to 730 kW (2,500,000 Btu/h), and the British Gas Publication “Guidance Notes for Boiler Installations in excess of 2,000,000 Btu/h (586 kW) output” for larger installations.

Detailed recommendations for air supply are given in C.P.332: Part 2. The following notes are intended to give general guidance.

#### **Room or Internal Space Air Supply**

Where the boiler is to be installed in a room or internal space, the boiler requires the room or internal space containing it to have permanent air vents. The vents may be

either direct to outside air or to an adjacent room or internal space which must itself have a permanent air vent of at least the same size direct to outside air.

The minimum effective area of the permanent air vents is specified below and is related to the maximum rated heat input of the boiler.

Position of Air Vents	AIR VENT AREAS	
	Air from room or internal space	Air direct from outside
High Level	9 cm <sup>2</sup> per kW (2 in <sup>2</sup> per 5,000 Btu/h)	4.5 cm <sup>2</sup> per kW (1 in <sup>2</sup> per 5,000 Btu/h)
Low Level	18 cm <sup>2</sup> per kW (4 in <sup>2</sup> per 5,000 Btu/h)	9 cm <sup>2</sup> per kW (2 in <sup>2</sup> per 5,000 Btu/h)

Note: Both air vents must communicate with the same room or internal space or must both be on the same wall to outside air.

The use of mechanical ventilation for combustion and ventilation air must conform to C.P.332: Part 3.

Ventilation and combustion air flows must be proved before the boiler is allowed to operate.

### 3.6 Electrical Supply

The electrical supply should be 220/250V, 50 Hz, and fused at 10 amps. A suitable independent switch fuse should be installed for each boiler, adjacent to the boiler.

### 3.7 Water Circulation System

The water circulation system should be installed in accordance with the relevant Codes of Practice C.P.332:3 and C.P.342. The flow and return connections to the boiler must be made at the right end of the boiler to ensure the correct water flow through the boiler.

If three-way mixing or diverting valves are installed in the system they should not be of such a type that the flow through the boiler is totally closed. If such valves are used, a by-pass should be fitted. It is generally recommended that the minimum flow through the boiler is at least 10% of the flow at boiler rating with a 11°C (20°F) temperature difference (Max temperature difference is 20°C).

3.8 Minimum head required is approximately 3 ft (1 m) above the top of the boiler.

3.9 The maximum working pressure is 4 bar. Maximum working temperature is 95°C.

### NOTE

**It is essential that all nipples should be checked carefully for damage before assembly. No responsibility can be accepted for leaks attributable to damaged nipples.**

### WARNING

**The boiler block is composed of single sections temporarily and solely assembled by means of the four tie bars for transit.**

**At time of installation remove the burner then the boiler block must be dismantled section by section after removing the four tie bars. Ensuring that the sections are supported so that they do not fall over.**

**If the boiler is installed at the top of the system or the head is low, we recommend that a low pressure switch is fitted and interlocked with the burner controls.**

## Section 4

# Installation of Boiler

### 4.1 General

Boilers are despatched in separate sections for erection on site. Accompanying the sections are the flue hood, and packages containing the following:

Jacket and Insulation.

Instrument Control Panel.

Burner Assembly, Control Line Assembly, Nipples, Flue Baffles and all Parts for erection of boiler body.

The boiler comprises two end sections and the requisite number of middle sections. The sections are machined for the push nipples.

### 4.2 Foundation

The boiler should be erected on a level foundation of brick or concrete, capable of supporting the weight of the boiler, filled, (see Data Table, Section 2). On an existing foundation it may be necessary to provide shims to obtain a level footing.

### 4.3 Water Connections

Flow and return connections are screwed 2 in B.S.P. The flow connection should be made to the right hand side top tapping, of the R.H. end section.

The return connection should be made into the bottom tapping of the R.H. end section.

It is important that the correct tappings are used for the flow and return, and that only one flow and one return connection is made.

### 4.4 Tools and Equipment

Standard heating engineers' tools, metric spanners, wire brush, steel wool, emery cloth, boiled linseed oil, pipe jointing (i.e. Boss White or equivalent), cleaning rags, putty knife, bolster, lever bar, small paint brush, 2 x 30 mm AF ring spanners, lubricating oil for threads and nuts.

#### **Section Assembly (see Fig. 2)**

For boilers despatched in separate sections.

*Note:* The sections must be pulled together using the tool provided, inserted through the nipple holes.

On no account should an attempt be made to assemble the sections using only the section bolts.

- 4.4.1 The boiler is erected using push nipples. Nipple holes and nipples should be wiped clean and coated with Nipple Jointing oil before inserting nipples. (Boiled linseed oil) or thinned pipe jointing.
- 4.4.2 Stand the right hand end section. Clean nipple holes and two nipples, coat with oil and insert nipples. Ensure that nipples are inserted squarely. Tap in lightly with a flat piece of wood and a mallet.
- 4.4.3 Clean nipple holes of a middle section, lay\* sealing mastic in the groove on the L.H. face of the end section, around the top and bottom bosses and along the front and back beading. (\*If the mastic has hardened it will soften if worked in the hands.)
- 4.4.4 Locate the middle section on the nipples in the end section, taking care that the nipples remain correctly positioned.
- 4.4.5 Insert a pulling up rod through each nipple hole. Fit a steel flange on each rod, each side of the sections. One flange is slotted for easy removal. Lock the threaded flange with an M20 nut. Oil the threads and nuts to ensure that they run easily. Locate the pulling up flanges centrally into the nipple ports run the other washer and M20 nut up the rod taking up the slack.

- 4.4.6 Tighten the nut on each rod evenly until the sections are pulled together as close as possible. The sealing exuding from the joint will indicate if the sections are pulled up evenly. When correctly assembled only a thin line of sealant should remain visible in the joint.
- 4.4.7 After assembling the first middle section to the end section. Clean and oil the nipple holes, insert two nipples into the assembled middle section, place sealing mastic in position, and locate the next middle section on the nipples. Hold the section in position and insert the pulling up rods. Run the free nuts and washers back reposition the slotted flange. Run the nuts up taking up the slack. Repeat as 4.4.6.
- 4.4.8 Repeat the operation until all sections are assembled.
- 4.4.9 All screwed connections should be made using a suitable jointing compound.

**4.5 Boiler Connections and Mountings**

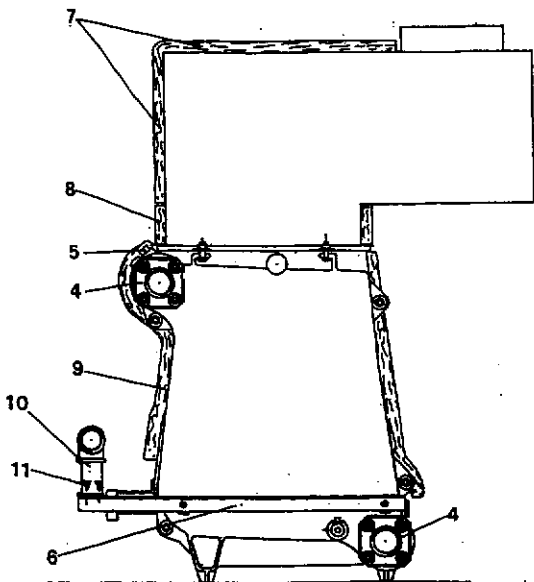
- 4.5.1 Make the thermometer pocket into the 1/2 in B.S.P. tapping in the front of the R.H. end section.  
The drain cock is a 1/2 in hose union in the R.H. end section.
- 4.5.2 Temporarily plug the 2 in flow and return tappings. Fill the boiler and test.  
Site test pressure should be 1 1/2 times working pressure. NOT TO EXCEED 75 PSI (5.2 BAR). After testing, drain boiler and remove plugs from flow and return.

**4.6 Burner Assembly (see Fig. 3)**

Check that the pilot burner or the ignition and probe electrodes are undamaged and correctly set. Slide the burner assembly under the boiler.

**4.7 Fitting of Flue Hood and Insulation**

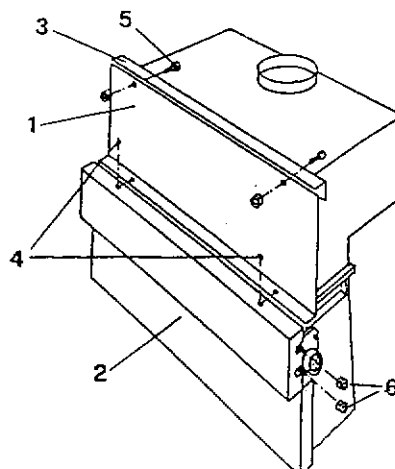
Place the flue hood in position on top of the boiler, locating it over the M8 screws using the foam sealing strip to seal between the flue hood and the boiler. Position the flue hood symmetrically on the studs. Fit washers and nuts and pull down tight. Fit insulation wrap as illustration items 7, 8 and 9.



- 4. 2 in flanges R.H. section (2 blank L.H. section).
- 5. Sensor Pocket
- 6. Burner and Jacket Supports.
- 7.8.9. Insulation Wrap Fix with Adhesive Tape.
- 10. Burner and Gas Train.
- 11. Burner Securing Screws.

**4.8 Front Inner Jackets**

Join the two Inner Panels 1 and 2 with self tapping screws. Fix to the boiler and secure with flange nuts (6). Fix the angle at top with screws and nuts.





#### 4.9 **Fitting Jackets**

Fix the right panel (7) and the left panel (8) to the supports (9) and (10) using the screws, nuts and washers.

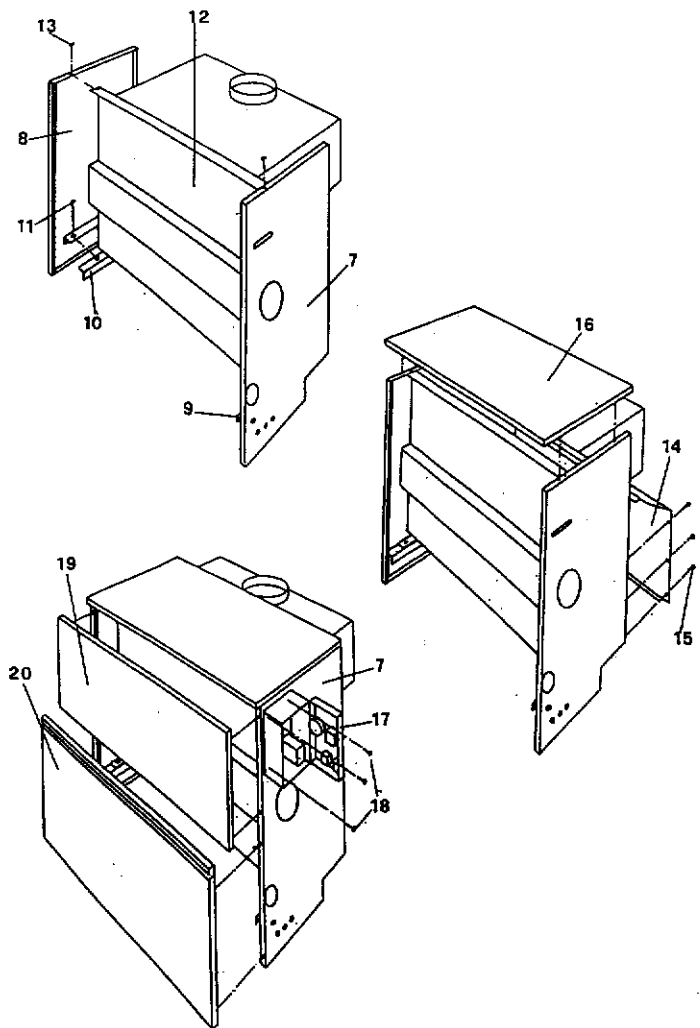
Fix the rear panel (14) to the side panels with 6 x self tapping screws (15). Position the top panel (16).

Fitting the instrument panel, carefully uncoil the capillaries and pass them through the hole in the side jacket. Fix the instrument panel with self tapping screws (18).

Fit the sensor bulbs into the sensor pocket and secure. Pass the electrical cables through the hole in the side jacket and couple with the relevant matching connectors. Pass the mains cable through the side jacket using rubber grommet provided.

Carry out the electrical connections as 4.11.

Hook the front upper panel (19) and the door (20) onto the side panels.



#### 4.10 **Flue Connection**

The boiler flue outlet is sized to accept heavy gauge flue pipe.

The height of this flue must be equivalent to a vertical height of at least 1 m (3 ft 3 in) above the boiler outlet, due allowance being made for any horizontal or inclined length, and consideration given to the termination.

The flue pipe should be sealed to the boiler outlet with a suitable caulking compound.

The boiler flue outlet is not load bearing and the flue pipe should be supported independently. The flue should be easily disconnected for servicing.

#### 4.11 **Electrical Connections (see Fig. 5)**

The mains electrical supply should be taken from a switch fuse (fused at 10 amps) and connected to the terminals (L.N. and earth) in the junction box in the instrument panel.

The junction box must be effectively earthed. All wiring must be installed in accordance with I.E.E. Regulations.

Incoming cables should be suitable for a service temperature of 70°C and 10 amp load, and not less than 0.75 mm cross sectional area.

#### 4.12 **Gas Connection**

The size of the gas supply must be at least equal to the connection size of the gas control line on the boiler, and due consideration should be made to the length of pipe run from the meter and the gas consumption of the boiler in determining the size. To facilitate removal and replacement of the burner assembly, the final connection between the boiler inlet connection and the supply should be made after the burner assembly and gas control line are correctly positioned.

All dirt, swarf, etc., should be removed from the gas supply lines before the final connection is made. The gas line should be purged of air, and tested for soundness as described in C.P.331:3.

## Section 5

# Commissioning and Testing

Before commencing to commission the boiler, check the following:

### 5.1 Electrical

Electrical supply is switched off.  
All electrical connections are sound and correctly made.  
Electrical system is correctly earthed.

### 5.2 Gas Supply

Gas supply is purged of air, and tested for soundness as described in C.P.331:3.  
All appliance gas cocks are turned off.  
Gas supply is turned on at meter.

### 5.3 Water

Boiler and system have been flushed through and are filled, and circulating pumps operational.  
Flow and return valves are open.

### 5.4 To Test Soundness of Safety Shut-Off Valve

1. Ensure that main gas cock and electricity supply are turned OFF.
2. Remove plug from pressure test point on inlet side of the safety shut-off valve and connect pressure gauge.
3. Turn ON main gas cock to pressurise the system up to the seat of the safety shut-off valve.
4. Turn OFF main gas cock, leave for two minutes checking for any drop in pressure on the gauge. If any pressure loss is observed, re-pressurise by opening and then closing the main gas cock, and test the assembly for leaks using a leak detector solution.
5. If no external leaks are detected and loss of pressure occurs, this is the result of let-by at the safety shut-off valve.

### 5.5 To Light Boiler

#### 5.5.1 Fully Automatic Models. (6-15 Section Boilers)

1. Ascertain that electrical supply, main and pilot gas cocks are turned OFF.
2. Set thermostat to required temperature, and press reset button on thermostat on facia to ensure that limit stat is "made".
3. Turn ON pilot gas cock.
4. Switch ON electricity supply (ensure time switch, if fitted, is in ON position).
5. About 15 seconds after switching on, ignition spark should appear, followed by ignition of the main burner. If flame is not established control box will lock out in approximately 5 seconds. This may occur in initial start due to air in the gas line. The control may be reset after a delay of approximately one minute by pressing the red button on the control panel, when the red light will go out.
6. When flame is established on the main burner, turn OFF pilot gas cock and check that burner shuts down. Ignition spark should reappear, followed after 5 seconds by lock out.
7. Connect pressure gauge to pilot test point. Turn ON main and pilot gas cocks.
8. Reset control box. The main burner will light automatically, and when established the main gas valve will open and remaining burners will light, approximately 10-15 seconds after the main burner is established.
- \* 9. Check pressure at pilot test point, 9.5 mbar (3.8 in wg).

10. Switch OFF electrical supply and check that all burners are extinguished. Remove pressure gauge from pilot test point and replace sealing screw.
- \* 11. Fit pressure gauge to manifold test point. Switch ON electrical supply. When all burners are operating check manifold pressure, 9.5 mbar (3.8 in wg). Burner pressures should be re-checked after approximately 30 minutes operation, and adjusted to 9.5 mbar if necessary.
12. Switch OFF electrical supply. Remove pressure gauge and replace sealing screw.

#### 5.6 All Models

After lighting the boiler as described above, the operation of the thermostat should be checked. All gas lines should be re-checked for soundness, using a leak detector solution.

The gas rate should be checked at the meter, but unless this differs significantly from the rated heat input quoted under Section 2 – Technical Data, the setting pressure given above should be maintained.

\* If gas conversion is required refer to Fig. 3.

## Section 6

# Servicing

Before servicing the boiler, switch off electricity supply and then turn off main and pilot gas cocks.

#### 6.1 To Clean Boiler (see Fig. 1, page 12)

1. Remove jacket front panel.
2. Disconnect burner manifold from control line at union.
3. Disconnect pilot line.  
Fully Automatic Models: At outlet of pilot solenoid valve. Disconnect pilot burner leads at connections.
4. Remove M6 screws retaining burner assembly.
5. Withdraw burner assembly from boiler.
6. Remove jacket top panel and top insulation panels. Remove leftside panel.
7. Remove flue hood.
8. Clean burner (see 6.2)
9. Clean boiler flueways from top with flue brush. After cleaning, sweep all debris from under boiler.
10. Check ignition and probe electrodes (fully automatic models) for correct alignment.
11. Re-assembly is a reversal of the above procedure.

#### 6.2 To Clean Burners

1. Remove burner assembly from boiler as described in 6.1.
2. Release screws holding burners.
3. Lift burners at rear and withdraw off injectors.
4. Brush out inside of burners and clean off outside surfaces.
5. Inspect injectors and sealing washers on air boxes. Replace if necessary.
6. Re-assembly is reversal of the above procedure.
7. Check electrical connections to electrodes, and electrodes for correct alignment.

#### 6.3 Test Soundness of Safety Shut-Off Valve

Proceed as detailed in 5.4.

#### 6.4 Recommission boiler as described in Section 5.

## Section 7

# Component Replacement

### 7.1 To Remove Main Gas Control Line

1. Remove jacket front panel.
2. Turn off main gas cock.
3. Unplug flying leads.
4. Disconnect union at manifold pipe, and union between main gas cock and governor.
5. Main gas controls may now be removed and valve or governor replaced as necessary.
6. Re-assemble in reverse order and test for soundness.
7. Recommission boiler as described in Section 5.

### 7.2 To Remove Pilot Gas Control Line (Fully Automatic Models)

1. Remove jacket front panel.
2. Close isolating cock.
3. Unplug pilot solenoid leads from junction box.
4. Disconnect pilot line from outlet of pilot solenoid valve.
5. Disconnect union of union gas cock.
6. Pilot gas controls may now be removed and valve or governor replaced as necessary.
7. Re-assemble in reverse order and test for soundness.
8. Recommission boiler as described in Section 5.

### 7.3 To Replace Thermostats and Thermometer

1. Isolate from main electrical supply.
2. Remove jacket front panel.
3. Open instrument panel. If necessary remove bottom access cover.
4. For thermostat replacement remove thermostat control knob, and disconnect cables from instrument concerned.
5. Release instrument from panel as follows:
  - (a) Control Thermostat: Release two M3 screws in face of panel.
  - (b) Limit Thermostat: Release the retaining nut to face of panel.
  - (c) Thermometer: Release clamp behind panel by undoing two finger nuts.
6. Remove capillary clip from thermostat pocket and withdraw the appropriate phial from pocket.
7. Fit replacement by reversing the above procedure. Care must be taken to reconnect cables as before.

### 7.4 To Replace Control Box (Fully Automatic Models)

1. Isolate from main electricity supply.
2. Open the boiler instrument panel.
3. Release centre screw of control and withdraw control box.
4. Fit replacement in reverse order.

### 7.5 To Replace Electrodes (Fully Automatic Models)

1. Isolate from main electricity supply.
2. Release screws holding pilot burner and withdraw pilot burner.
3. Disconnect lead from electrode assembly to be replaced and release screw to remove assembly.
4. Fit replacement by reversing the above procedure.
5. Check electrodes for correct alignment before fitting burner assembly under boiler. (See illustration inside front cover.)

# Section 8

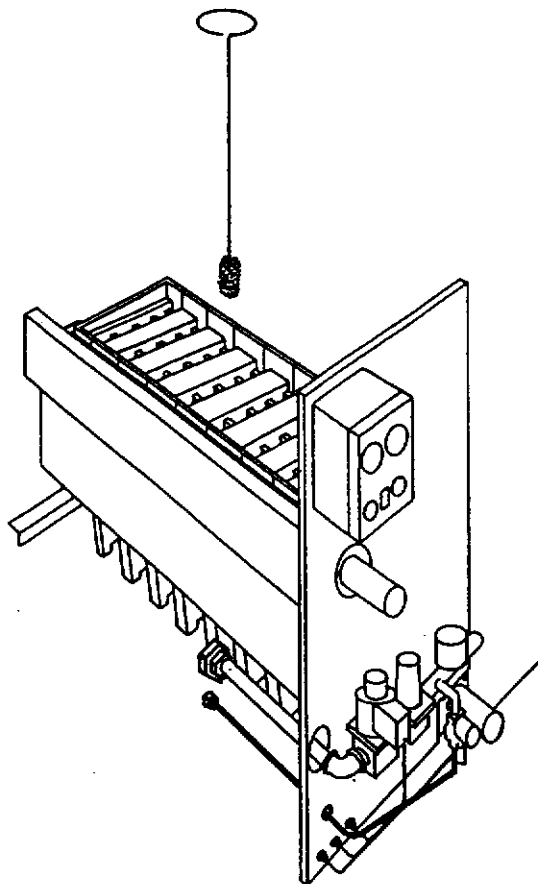
## Fault Finding

### 8.1 Fully Automatic Models

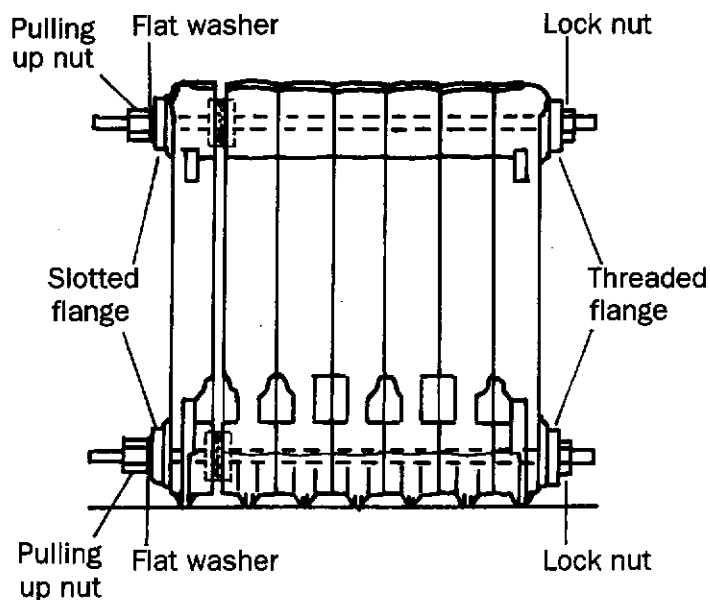
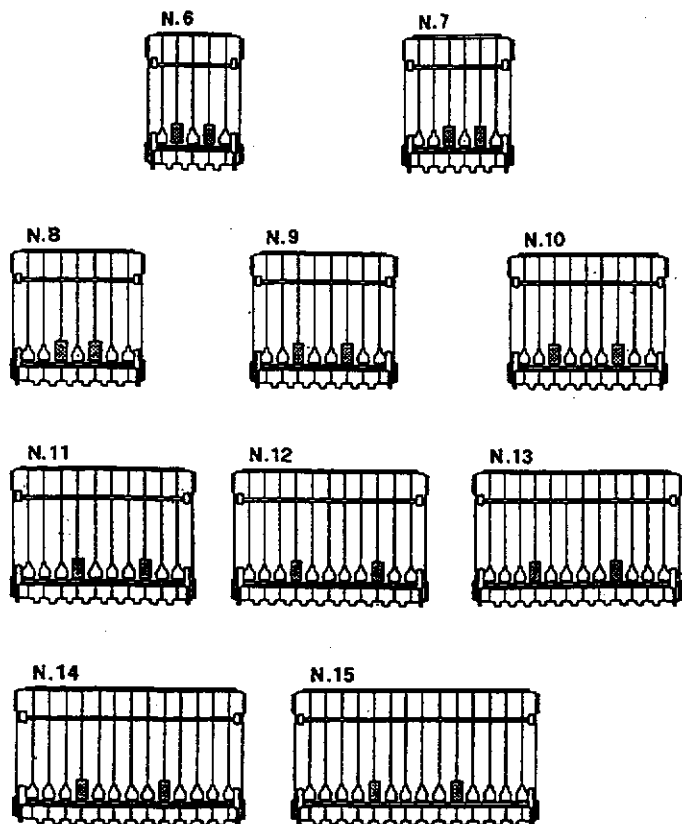
1. Boiler does not attempt to light. Control does not lock out:
  - (a) No electrical supply to boiler, time switch and other external controls.
  - (b) Limit thermostat tripped.
  - (c) Control thermostat set too low.
  - (d) Control fuse blown.
  - (e) Faulty thermostat or connections.
  - (f) Faulty control box.
2. Ignition sparks. First burner does not light and control locks out:
  - (a) Gas supply turned off at meter.
  - (b) Pilot gas cock turned off.
  - (c) Air in gas supply line.
  - (d) Faulty pilot solenoid valve or connections.
  - (e) Lead not plugged into junction box.
3. No ignition spark. Control locks out:
  - (a) H.T. leads disconnected or faulty.
  - (b) Ignition electrode incorrectly set.
  - (c) Faulty electrode.
  - (d) Faulty igniter or connections.
  - (e) Faulty control box.
4. First burner lights. Control locks out:
  - (a) Probe lead not connected to electrode.
  - (b) Earth lead to burner not connected.
  - (c) Loose connections on probe lead or earth lead in junction box, control panel or plugs and sockets.
  - (d) Faulty control box.
  - (e) No earth connection on incoming supply.

*Note:* The probe circuit may be tested with a micro ammeter connected in the probe lead. A reading of at least 10 micro-amps should be recorded when the burner is alight.
5. First burner lights. Main burners do not light. Control does not lock out:
  - (a) Main burner cock turned off.
  - (b) Faulty connections to main valve.
  - (c) Faulty main gas valve.
  - (d) Faulty control box.

**Fig. 1**  
**Servicing the**  
**boiler**



**Position of the Sections for Pilot Assembly Positions**



**Fig. 2**  
**Section Assembly**

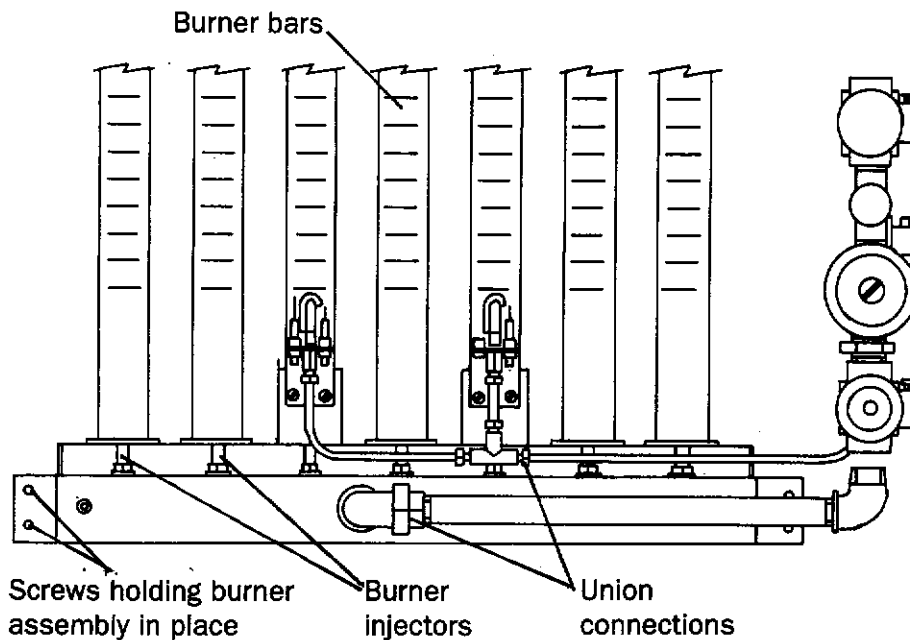
**Attention:** – Pay particular attention to the assembling order of the sections in order for the holes of the pilot flame electrodes to be in their correct position (see layout).

**Fig. 3**

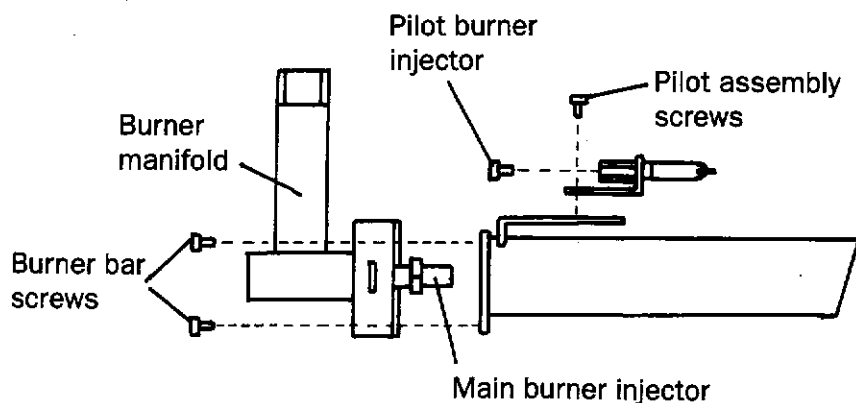
**Gas Conversion**

The boilers can be supplied to be run on either natural or L.P.G. gas. Should it be necessary to convert the boiler from one gas to another, the following operations must be carried out:

1. Remove jacket front panel.
2. Turn off main gas cock.
3. Unplug flying leads.
4. Disconnect union at manifold pipe, and pilot supply pipe.
5. Withdraw burner assembly from boiler.



6. Substitute the injectors on main burner and on pilot burner.  
When using L.P.G. with a VM-L valve, replace the governor spring.

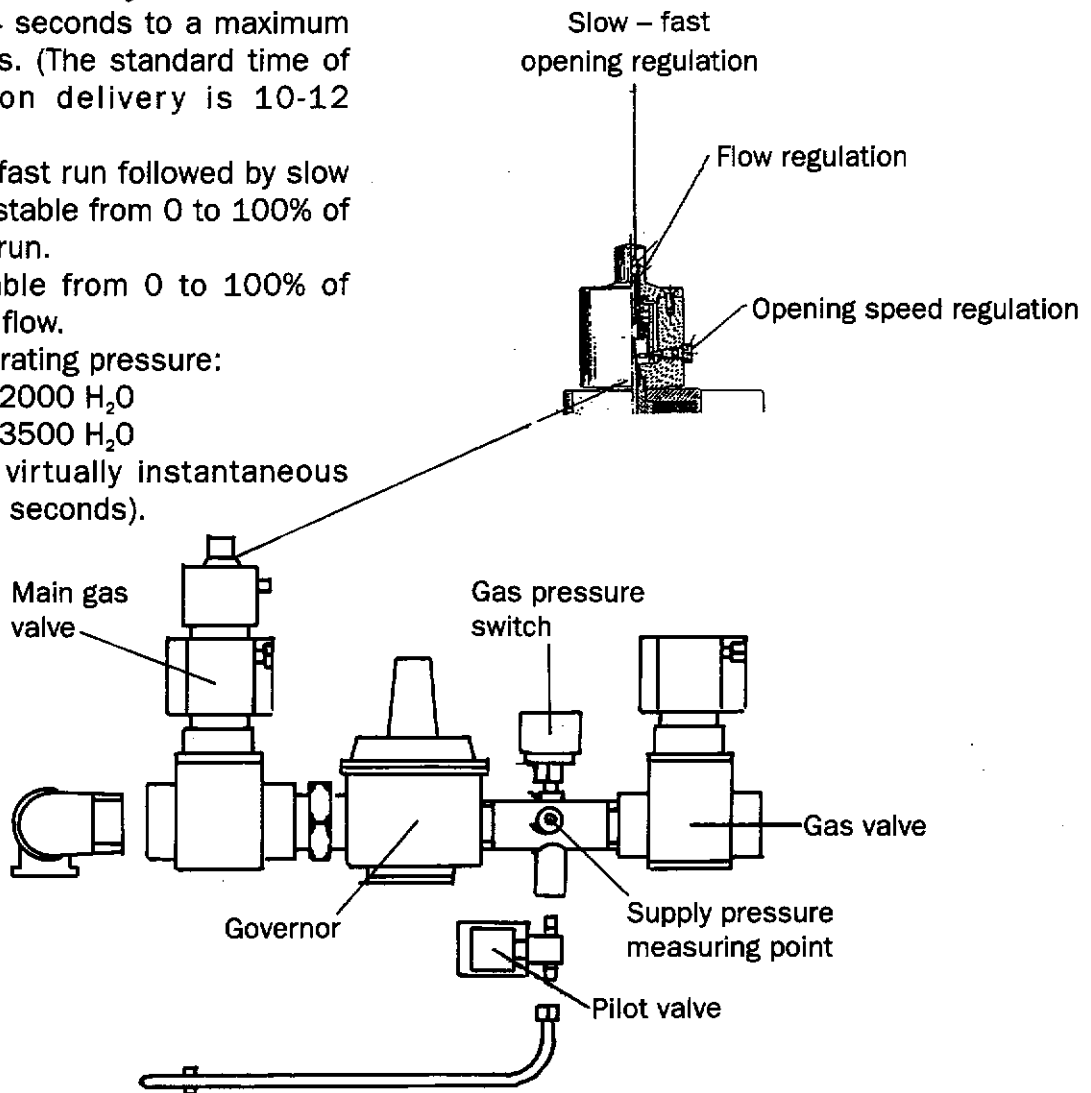


7. Re-assemble in reverse order and test for soundness.
8. Recommission boiler as described in Section 5. Using LPG burner pressure as stated in Section 2.

**Fig. 4**

**Slow Opening and Fast Closing Valve with Hydraulic Damper and Flow Regulator Adjustment Instruction**

- Slow opening time: adjustable from a minimum of 4 seconds to a maximum of 25 seconds. (The standard time of calibration on delivery is 10-12 seconds.)
- Initial part of fast run followed by slow opening: adjustable from 0 to 100% of the complete run.
- Flow: adjustable from 0 to 100% of the maximum flow.
- Maximum operating pressure:  
Series 200 = 2000 H<sub>2</sub>O  
Series 300 = 3500 H<sub>2</sub>O
- Closing time virtually instantaneous (less than 0.5 seconds).



**Flow Regulation**

The flow regulation screw stops the shutter, which can be stopped at any point of the run.

When the regulation screw is in the closed position (shutter stopped against the valve housing with zero flow) and is gradually opened anti-clockwise, the shutter can be raised 0.8 mm at each complete turn.

**Opening Time Regulation**

The slow opening valves are supplied with an opening time of 10-12 seconds.

When the speed regulation screw is completely opened (anti-clockwise) the opening time falls about 4 seconds.

When the screw is gradually closed (clockwise), the opening time can be adjusted up to about 25-30 seconds.

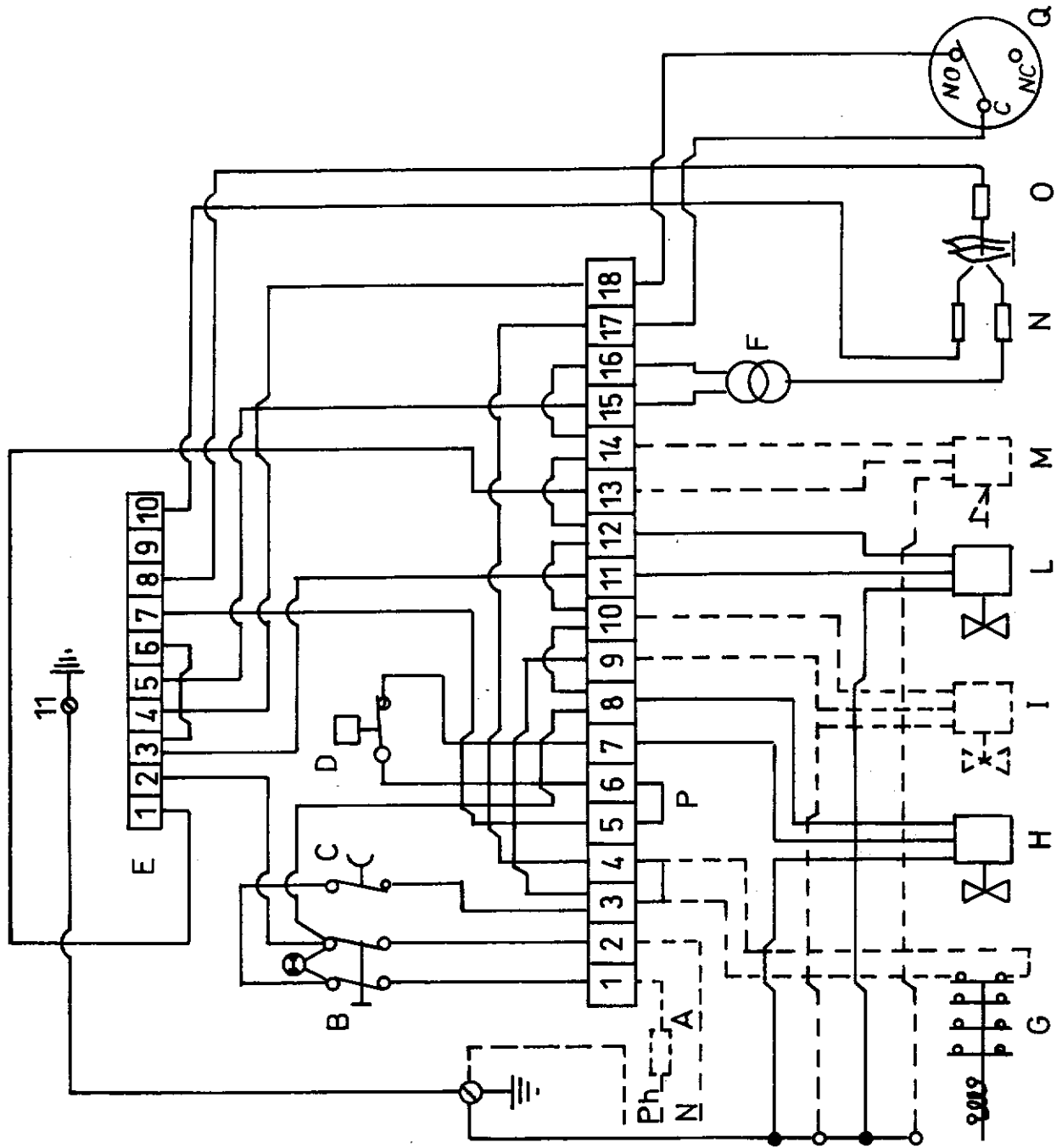
**Regulation of all Initial Part of the Fast Run Followed by the Slow Run**

The initial part of the fast run can be adjusted from 0 to 100% of the complete run by means of the slow opening regulation screws.

The valves are supplied with the screws completely closed and therefore with a slow shutter run.

When the screw is in a closed position and is then gradually opened (anti-clockwise), each complete turn is equal to an initial part of the fast run of 1 mm.





**Fig. 5**  
**Wiring Diagram. 6-15 Section**

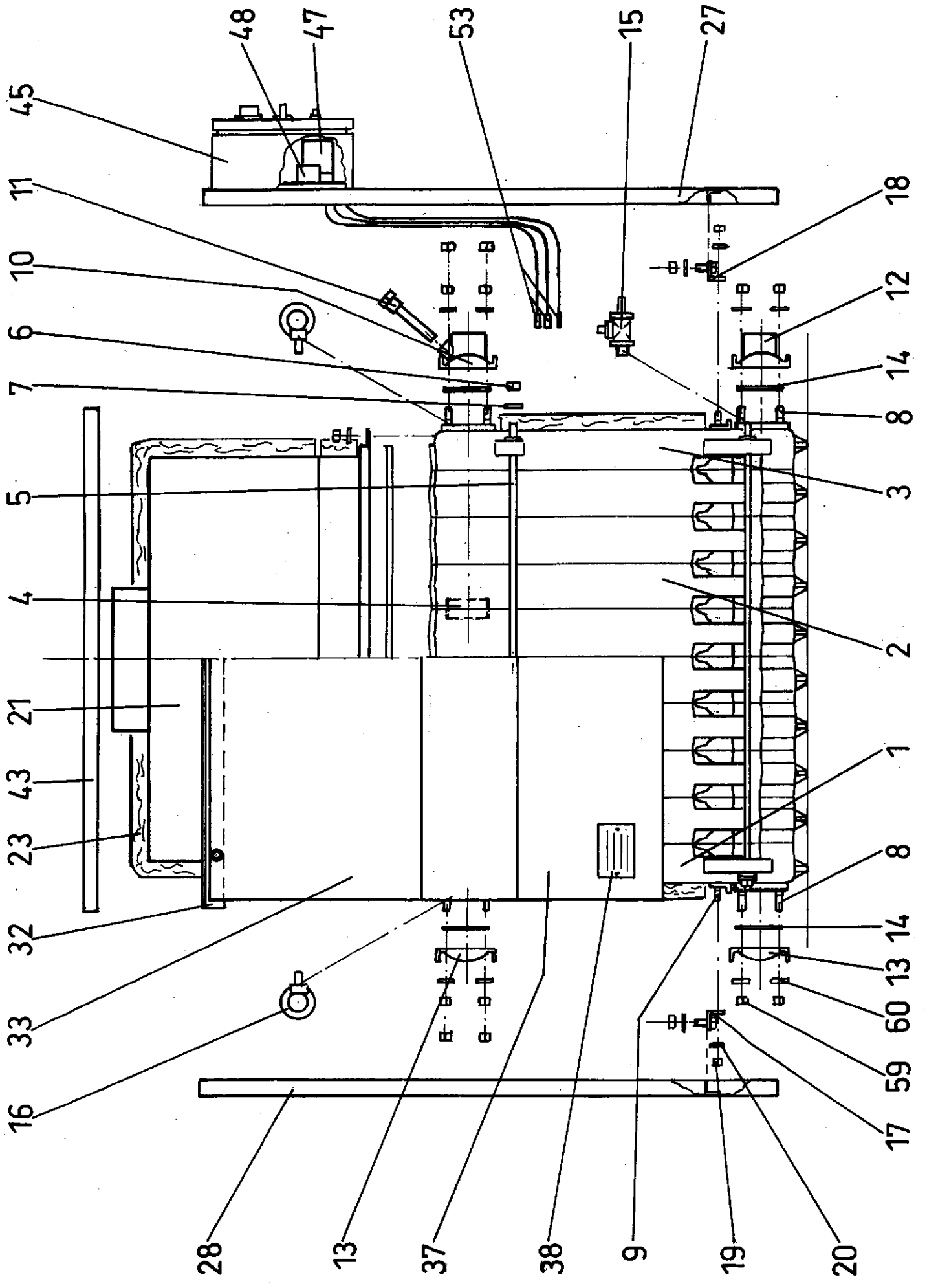
**Electrical Wiring Diagram**

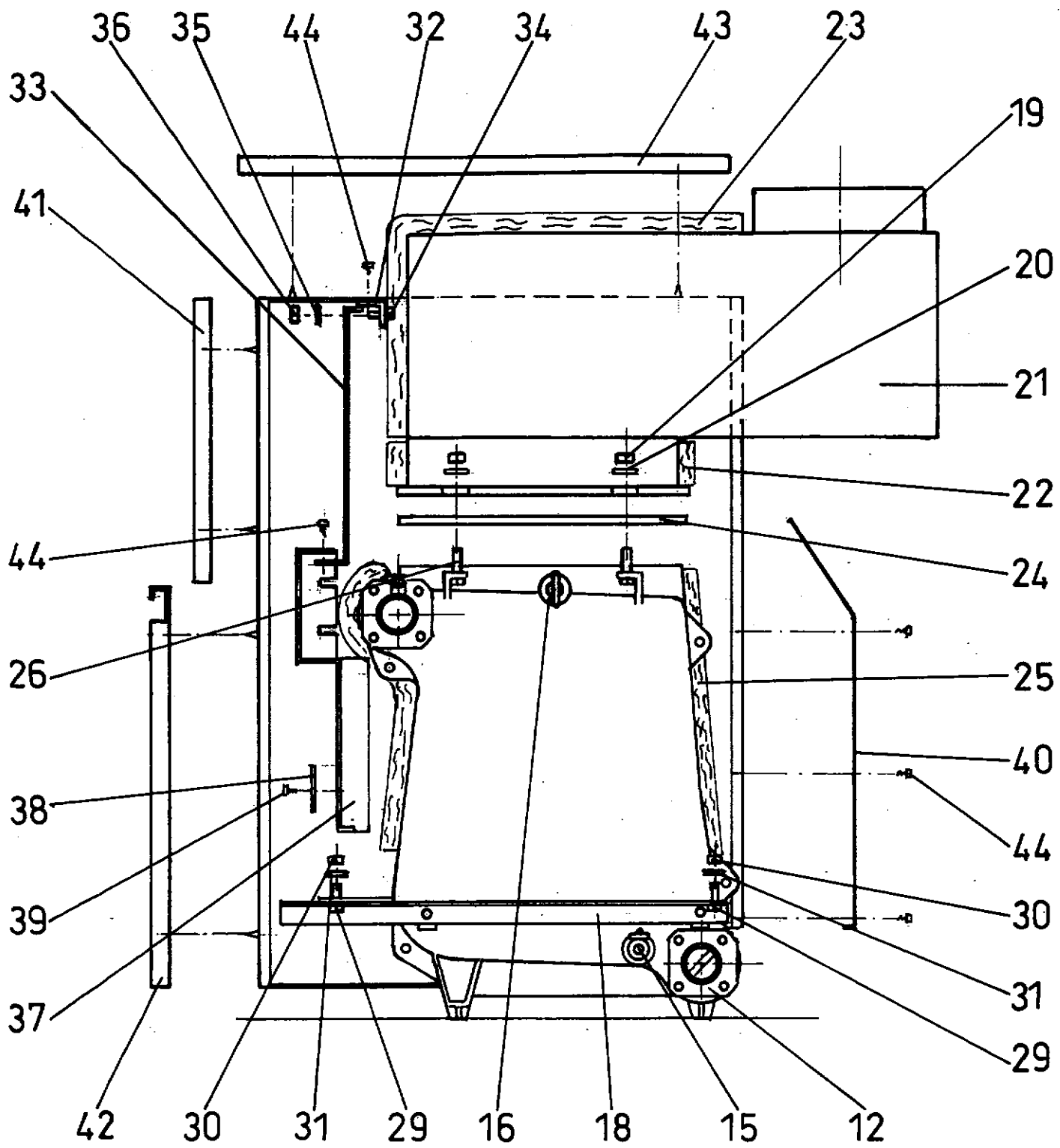
- A - Slow-blow 10A fuse
- B - On/off switch
- C - Limit thermostat
- D - Control thermostat
- E - Burner control box
- F - Ignition transformers
- G - Circulation pump interlock
- H - Gas valve
- I - Safety gas valve (on request)
- L - Pilot valve
- M - Water flow switch (if fitted)
- N - Ignition electrodes
- O - Sensor probe
- P - Link or room thermostat
- Q - Gas pressure switch

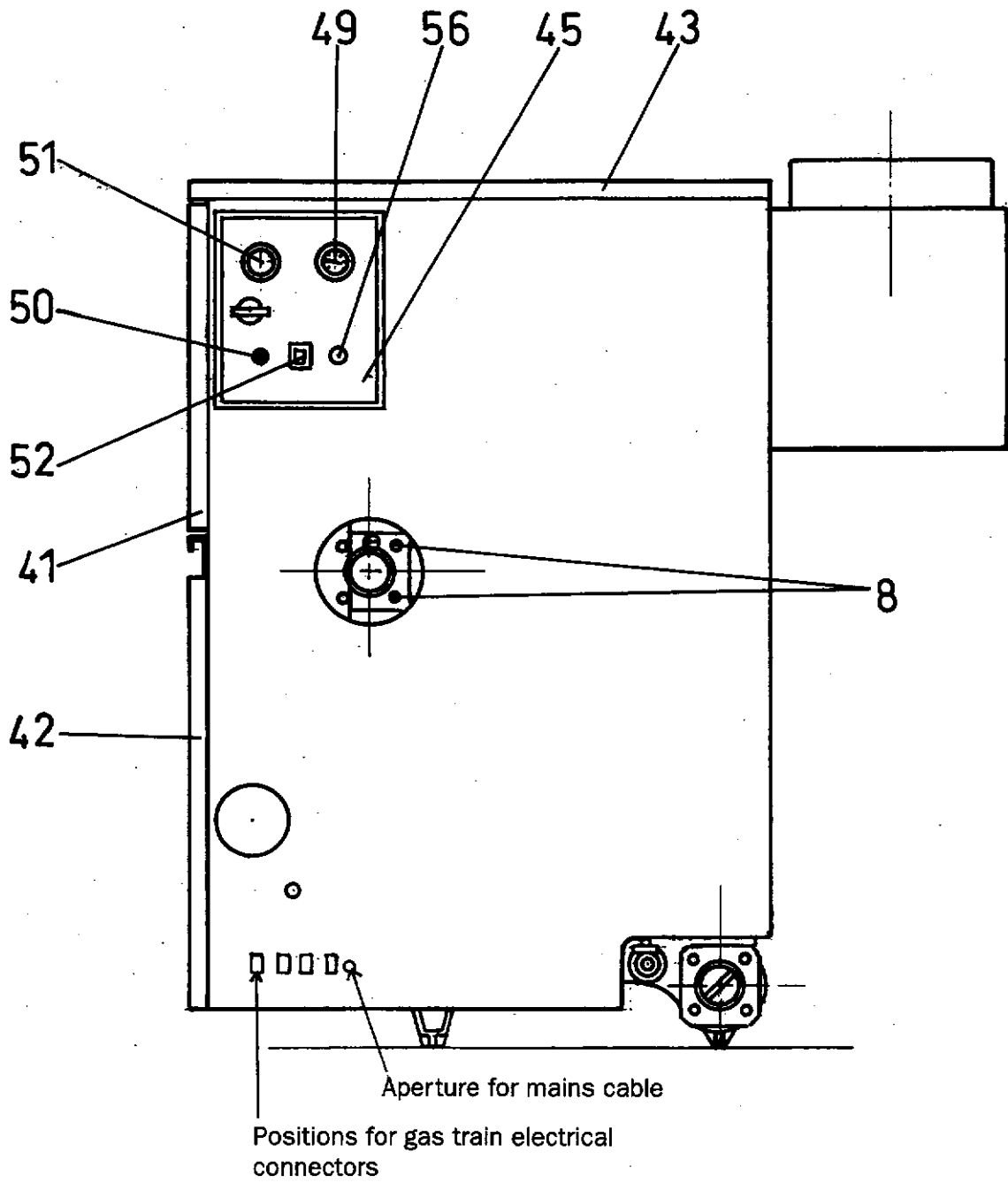
# Lucerne Boiler Components

## Key

No.	Description
1	Left End Section.
2	Intermediate Sections.
3	Right End Section.
4	Jointing Nipples.
5	Tie Bars M12.
6	Nuts M12.
7	Washers M12.
8	Studs M12 x 30.
9	Studs M8 x 25.
10	Screwed Flange 2 in With Sensor Pocket.
11	Sensor Pocket.
12	Screwed Flange 2 in.
13	Blanking Flanges.
14	Gasket O 95 x 75 x 3.
15	Drain Cock ½ in.
16	Lifting Hooks.
17	Burner and Jacket Support (Left).
18	Burner and Jacket Support (Right).
19	Nuts M8.
20	Washers M8.
21	Flue Hood.
22	Insulation.
23	Insulation.
24	Flue Hood Seal.
25	Insulation.
26	Bolts M8 x 30.
27	Side Jacket (Right).
28	Side Jacket (Left).
29	Bolts M6 x 15.
30	Nuts M6.
31	Washers M6.
32	Jacket Support.
33	Top Internal Jacket.
34	Bolts M5 x 12.
35	Washers M5.
36	Nuts M5.
37	Bottom Internal Jacket.
38	Ident Label.
39	Rivets.
40	Rear Jacket.
41	Front Top Jacket.
42	Front Bottom Jacket.
43	Top Jacket.
44	Self Tapping Screws.
45	Instrument Control Panel.
47	Burner Control Box.
48	Ignition Transformer.
49	Thermometer.
50	Limit Thermostat.
51	Control Thermostat.
52	On/Off Switch.
53	Sensor Bulbs.
59	Nuts M12.
60	Washers M12.







# User's Instructions

## 6-15 Section Boilers (Fully Automatic)

### To Light Boiler

1. Ascertain that main and pilot taps are turned ON and that gas supply is ON at meter.
2. Set thermostat to required temperature.
3. Switch ON electricity supply.
4. Pilot burner will light followed by main burners.
5. If red lock-out light shows on control panel, reset by pressing red light after approximately one minute, when red light will go out and boiler will re-start.

### To Shut Down Boiler

1. Switch OFF electricity supply.
2. If shutting down for an extended period, also turn OFF main and pilot taps.

If the boiler will not operate after carrying out the above procedures, contact the Installing or Servicing Engineer.

## WARNINGS

- All the operations described above must be carried out by specialised personnel, authorised in accordance with the regulations.
- **WARRANTY – NORMAL STREBEL WARRANTY APPLIES**  
The Warranty is valid provided that the Installation Standards and everything contained in the present Manual are complied with.
- Keep this booklet carefully for further consultation.
- The book shall be kept in the vicinity of the appliance.

The company reserves the right to change the specification and dimensions without prior notice.

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