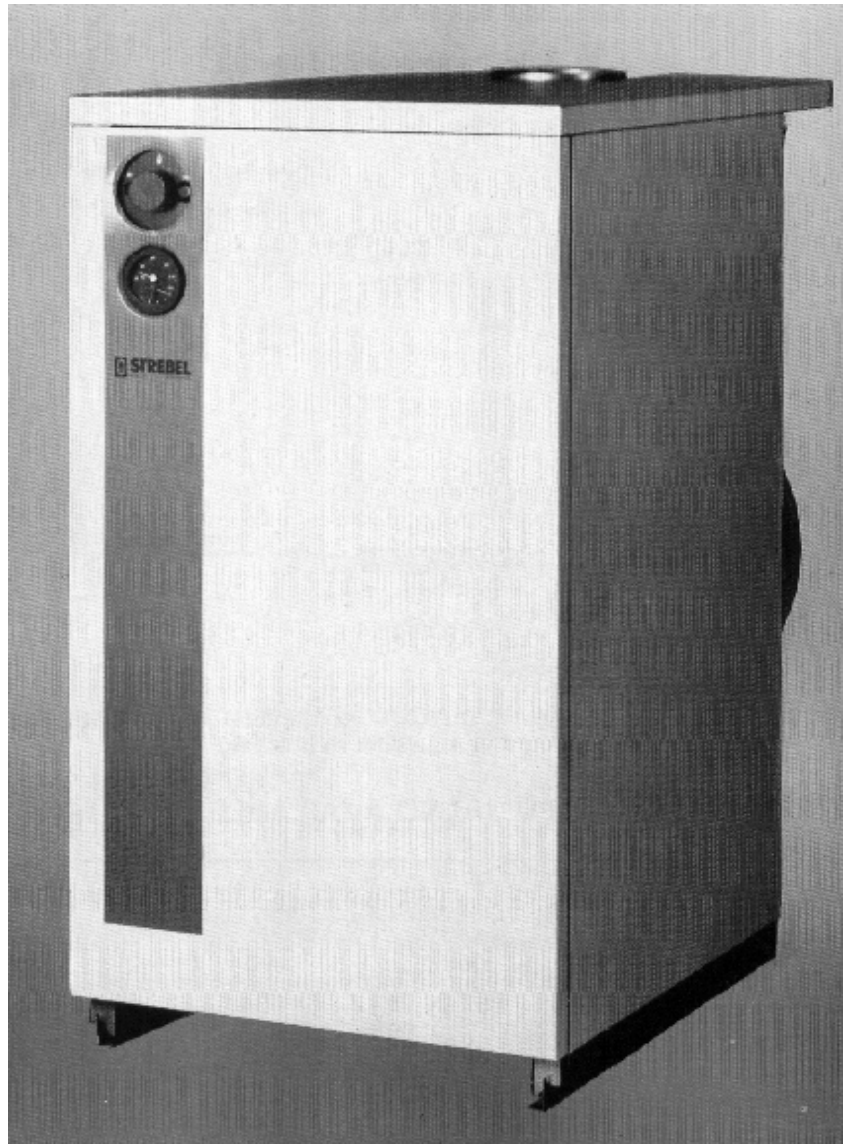


**STREBEL**

**GENEVA**

**CE**



**ATMOSPHERIC GAS BOILER  
INSTALLATION, OPERATING AND  
MAINTENANCE MANUAL**

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# TECHNICAL DATA

BOILER MODEL		C3	C4	C5	C6	C7	C8	C9
Number Of Sections		3	4	5	6	7	8	9
Input	kW	21.4	31.7	42	52.3	62.7	73.7	83.8
	Btu/hr	73,017	108,160	143,304	178,448	213,932	251,464	285,926
Output	kW	19.3	28.6	37.7	47.1	56.5	66.4	75.6
	Btu/hr	65,852	97,583	128,632	160,705	192,778	226,557	257,947
Water Content	Lits	10	12.5	15	17.5	20	22.5	25
Maximum Working Pressure	Bar	4	4	4	4	4	4	4
	Psi	58	58	58	58	58	58	58
Maximum Working Temperature	°C	90	90	90	90	90	90	90
Flow Rate 10°C Differential	Lt/sec	0.47	0.71	0.95	1.10	1.40	1.60	1.90
	M³/h	1.70	2.55	3.42	3.96	5.04	5.76	6.84
Water Resistance 10°C Differential	mbar	9.5	20	36.5	23	34	46	57
	in Wg	3.7	7.8	14.4	9.1	13.4	18.1	22.6
Gas Consumption Natural	M³/h	2.0	2.9	3.9	4.9	5.8	6.8	7.8
	Ft³/h	70.21	104.00	137.79	171.58	205.70	241.79	274.93
Gas Consumption LPG	Kg/h	1.54	2.29	3.03	3.77	4.52	5.31	6.04
	Lbs/h	3.40	5.04	6.68	8.31	9.97	11.71	13.32
Burner Pressure Natural	mbar	14.8	14.5	13.2	14.5	14.5	14.5	14.5
	in Wg	5.8	5.7	5.2	5.7	5.7	5.7	5.7
Supply Pressure Natural	mbar	18	18	18	18	18	18	18
	in Wg	7	7	7	7	7	7	7
Burner Pressure LPG	mbar	31.8	30.8	30.3	29.7	29.4	29.1	31
	in Wg	12.5	12.1	11.9	11.8	11.6	11.4	12.2
Supply Pressure LPG	mbar	37	37	37	37	37	37	37
	in Wg	14.5	14.5	14.5	14.5	14.5	14.5	14.5
Main Injectors Natural	mm	2.6	2.6	2.7	2.6	2.6	2.6	2.6
	LPG	mm	1.75	1.75	1.75	1.75	1.75	1.75
Shipping Weight	Kg	87	110	136	164	186	213	234
	Lbs	192	243	300	362	410	470	516

Geneva 'PV' as above with these changes.

BOILER MODEL 'PV'		PV 3	PV 4
Maximum Working Pressure	Bar	3	3
	Psi	44	44
Expansion Vessel Capacity	Lits	8	10
	Gal	1.76	2.20
Shipping Weight	Kg	94	118
	Lbs	207	260

TABLE. 1

# INSTALLATION INSTRUCTIONS

## 1.0 GENERAL

- 1.1 The STREBEL GENEVA 'PV' & 'C' range of Gas Fired Boilers are floor mounted open flued units for connection to indirect heating and hot water systems.

The Geneva heat exchanger body is constructed of cast iron sections with a stainless steel atmospheric gas burner suitable for Natural Gas and LPG (site conversion) the boilers as standard are fitted with electronic ignition. The boilers are fitted with full safety devices including "Spillage Control System" (SCS) which shuts down the boiler if Spillage is occurring and so prevents any escape of flue gases out the flue diverter, also on the C60 & C68 models there is a Gas pressure switch for low gas inlet pressure.

The boilers are delivered completely assembled jackets fitted and fully insulated.

The Geneva 'PV' range is also fitted with three speed circulating pump, expansion vessel for use with a sealed systems, 3 Bar safety valve, pressure gauge and water fill point (manual).

- 1.2 The installation of this boiler must be carried out in accordance with the relevant requirements of the gas safety (installation and use) Regulations 1984, the I.E.E. Wiring Regulations and the Bylaws of the Local Water Undertaking, and the Building Regulations 1985.

Detailed recommendations are contained in the following:

British Standard Code of Practice CP. 341 : 300-307 ; CP 342 : Parts I and 2 : BS. 5440 parts 1 & 2 : BS.5854 : BS. 6644 :BS. 6798 : BS. 6891 and British Gas Publications :- IM/11 Flues for Commercial and Industrial Gas Fired Boilers an Air Heaters

"The Gas Safety (Installation and Use) Regulations 1984:

It is the law that all gas appliances are installed by CORGI registered contractors in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure that the law is complied with".

## 2.0 LOCATION

- 2.1 The boiler must stand on a level non combustible base, which is capable of adequately supporting the weight of the boiler, water content an any ancillary equipment.

The location chosen for the boiler must permit the provision of a satisfactory flue and termination.

The location must also permit an adequate space for combustion and ventilation purposes (see Section 3 on Ventilation) and adequate space for servicing and air circulation around the boiler.

## 3.0 VENTILATION

- 3.1 It is important that there are sufficient areas of air inlet and ventilation provided to the boiler room detail recommendations for air supply are given in BS. 5440 part 2 & BS. 6644. The following notes are intended to give general guidance.

### 3.2 **Natural Ventilation.**

Where both low- and high-level openings are used, the grilles shall have a total minimum free area as follows:

Low level (inlet): 540 cm<sup>2</sup> plus 4.5 cm<sup>2</sup> per Kilowatt in excess of 60 kW total rated input;

High level (inlet): 270 cm<sup>2</sup> plus 2.25 cm<sup>2</sup> per Kilowatt in excess of 60 kW total rated input.

### 3.3 **Mechanical Ventilation.**

The minimum quantity of air required for combustion and boiler house ventilation shall be supplied at a minimum flow rate in accordance with BS. 6644.

All air inlet and extract fans shall be fitted with automatic controls causing safety shut-down or lockout of the boiler(s) in the event of the inlet or extract air flow failing.

### 4.0 GAS SUPPLY

4.1 An existing meter should be checked preferably by the Gas Supplier, to ensure the meter is adequate to deal with the rate of gas required.

4.2 Pipework from the meter to the boiler must be of adequate size. Pipes of smaller size than the boiler inlet gas connection should not be used. All gas pipework should be fitted and on completion of installation tested, in accordance with BS. 6891 : IGE/UP/2 Gas Installation Pipework, Boosters and Compressors on Industrial and Commercial Premises.

4.3 Gas supply connections is as follows:  
Geneva PV 3 & PV 4 = 1/2" BSP  
Geneva C 3, C 4, C 5, C 6 & C 7 = 1/2" BSP  
Geneva C 8 & C 9 = 1" BSP.

4.4 A gas service cock must be fitted immediately adjacent to the boiler.

### 5.0 FLUE SYSTEM

5.1 Detail recommendations for flueing are given in B.G.C. Publications:- "Flues for commercial and Industrial Gas Fired Boilers and Air Heaters" 1M/11.

Reference should also be made to BS. 5440 Part 1 : BS. 6644 where applicable.

The following notes are intended to give general guidance.

5.2 The nominal flue size should not be less than that of the boiler flue connection, 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.

### 6.5 WATER CIRCULATION SYSTEM

6.1 Flow and return connections are from the back of the boiler with BSP connections.

6.2 In combined heating and hot water systems the hot water storage vessel must be of the indirect cylinder or calorifier type.

6.3 The boiler maximum working pressure is 3 Bar (43.5 Psi) for 'PV' models and 4 Bar (58 Psi) for 'C' models which includes pump circulation head. The minimum head being 1 meter above the top of the boiler.

### 6.5 **Hydraulic Resistance and Flow Rates**

The differential temperatures across the flow and return water connections to the boiler is recommend as 10°C temperature difference (Max. temperature difference 20°C).

Water flow rates and water pressure drops across the boilers are detailed on Table 1.

6.6 If three-way mixing or diverting vales are installed in the systems 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.

7.0 ELECTRICAL SUPPLY

The electrical supply should be 220/250V, 50Hz, and fused at 3 amps. A suitable independent switch fuse should be installed for each boiler, adjacent to the boiler.

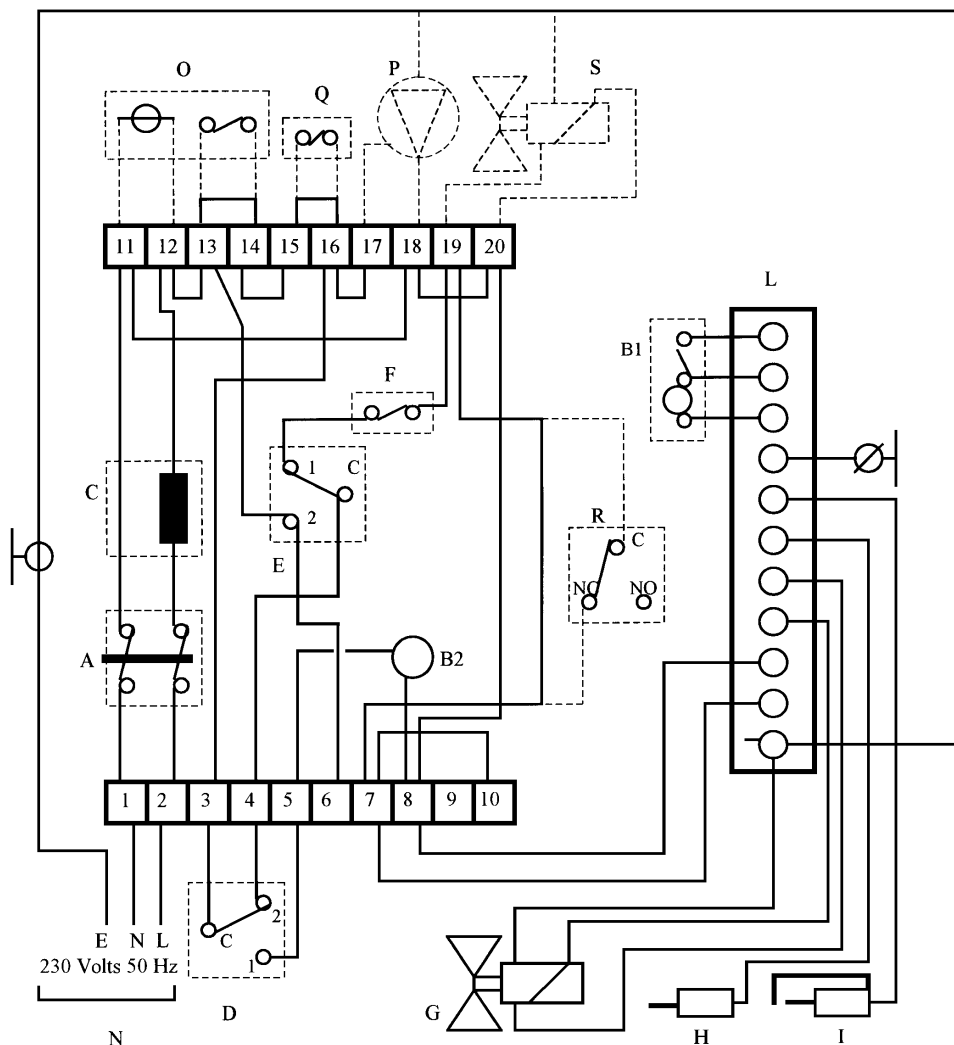
WARNING : This appliance must be earthed.

7.1 GENEVA 'C' & 'PV' SCHEMATIC WIRING DIAGRAM

With Electronic Ignition.

Legend.

- |                                      |   |
|--------------------------------------|---|
| A. ON/OFF SWITCH                     | I. IGNITION ELECTRODE                           |
| B1. LOCK-OUT LAMP                    | L. CONTROL BOX                                  |
| B2. FLUE GAS SPILLAGE DETECTOR LIGHT | N. MAINS IN (230 VOLTS)                         |
| C. FUSE 6.3 Amp                      | O. TIME SWITCH CONNECTIONS                      |
| D. FLUE SPILLAGE DETECTOR            | P. PUMP INTERLOCKS (PV MODELS)                  |
| E. BOILER CONTROL THERMOSTAT         | Q. ROOM THERMOSTAT (WHERE FITTED)               |
| F. BOILER LIMIT THERMOSTAT           | R. GAS DIFFERENTIAL PRESSURE SWITCH (C 8 & C 9) |
| G. GAS VALVE                         | S. GAS SAFETY VALVE (C 8 & C 9)                 |
| H. FLAME DETECTION PROBE             |   |



8.0 INSTALLATION

8.1 The boiler is delivered assembled, on a wooden crate with protection for transportation and site positioning.

Do not remove protection before final positioning.

8.2 The boiler jackets and control panel are fitted.

8.3 The following minimum clearances around the boiler, for installation and servicing purposes, are recommend:

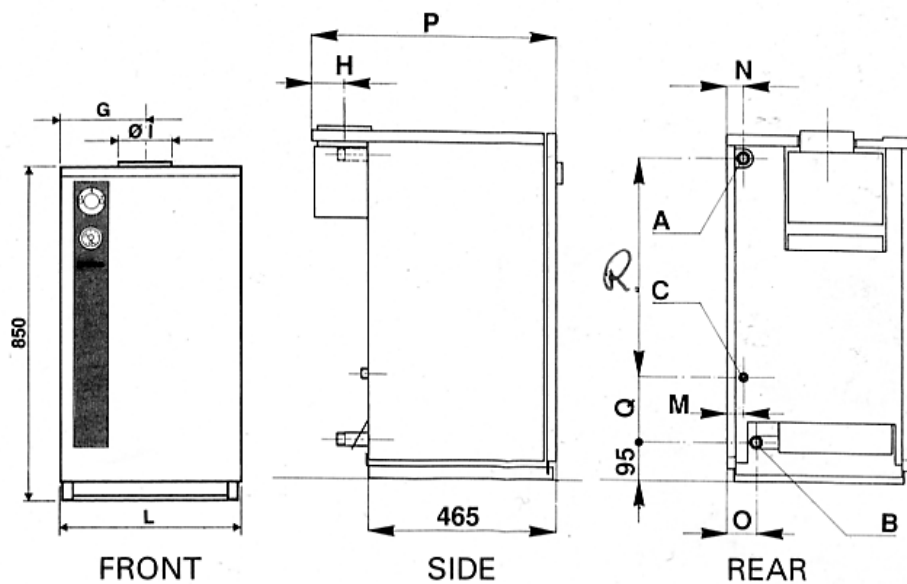
Above the top of the boiler (space for cleaning the flueways) 600mm, one side of the boiler should allow access of 500mm.

In addition a minimum clearance of 350mm should be available at the front of the boiler to enable servicing to be carried out.

8.4 BOILER DIMENSIONS

GENEVA 'C'

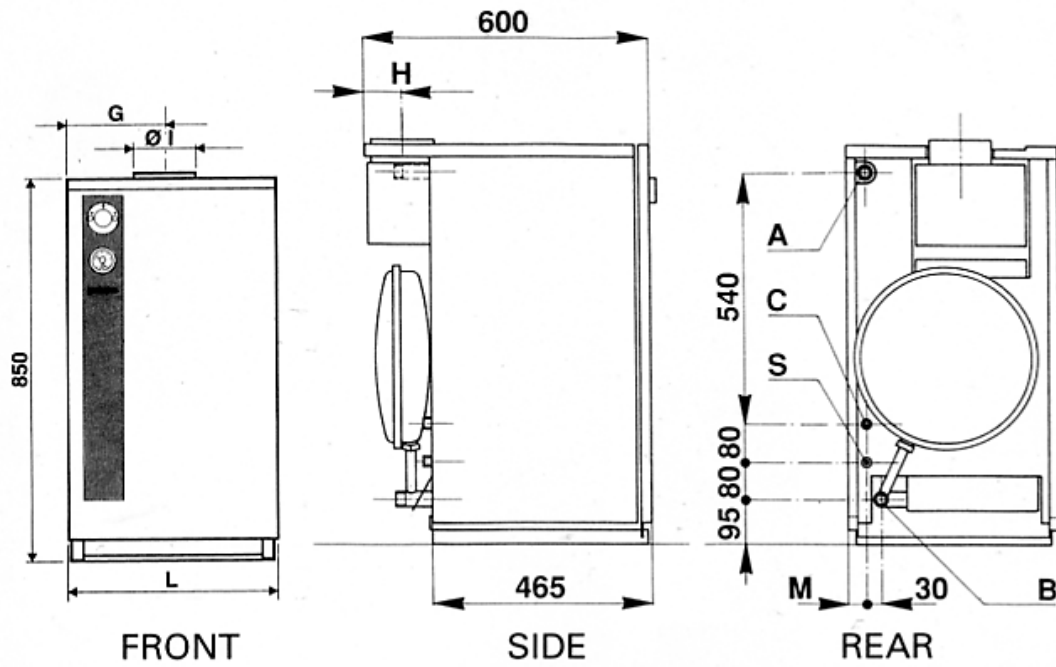
- A FLOW CONNECTION
- B RETURN CONNECTION
- C GAS CONNECTION



MODEL 'C'	3	4	5	6	7	8	9
DIMENSIONS MM							
L	365	450	600	750	750	900	900
P	600	600	600	650	650	705	705
Ø A	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
Ø B	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
Ø C	1/2"	1/2"	1/2"	1/2"	1/2"	1"	1"
G	135	205	205	335	335	405	405
H	80	80	90	105	105	125	125
Ø I	130	130	150	180	180	220	220
M	40	40	115	80	80	80	80
N	40	40	115	55	55	55	55
O	70	70	150	55	55	55	55
Q	160	160	160	150	150	150	150
R	540	540	540	550	550	550	550

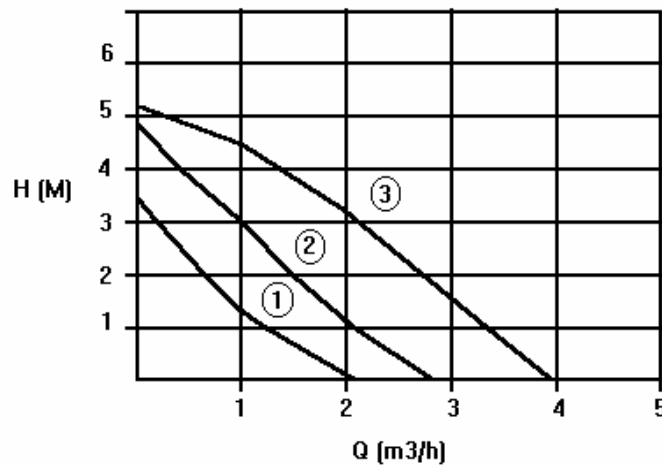
GENEVA 'PV'

- A FLOW CONNECTION 1"
- B RETURN CONNECTION 1"
- C GAS CONNECTION 1/2"
- S COLD FEED 1/2"



MODEL 'PV'	3	4
DIMENSIONS MM		
L	365	450
G	135	205
H	80	80
$\varnothing I$	130	130
M	40	40

CIRCULATING PUMP CHARACTERISTIC





## 9.0 COMMISSIONING AND TESTING

Before commencing to commissioning the boiler, check the following:-

### 9.1 **Electrical**

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

### 9.2 **Gas Supply**

Gas supply is purged of air, and tested for soundness as described in BS. 6891 : IGE/UP/2 Gas Installation Pipework, Boosters and Compressors on Industrial and Commercial Premises.  
All appliance gas cocks are turned off.  
Gas supply is on at meter.

### 9.3 **Water**

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

### 9.4 **To Test Soundness of Safety Shut-Off Valve**

1. Ensure that the 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 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 a let-by at the safety shut-off valve.

### 9.5 **To Light The Boiler**

#### 9.5.1 **Fully Automatic Models** (see Fig. 2 & 3)

1. Connect pressure gauge to burner pressure test point.
2. Switch on mains electrical supply.
3. Turn ON main gas cock.
4. Depress reset button on limit thermostat to ensure stat is "made".
5. Set control thermostat to required temperature and push button "I" (on control panel) to the ON position.
6. After switching on, ignition spark should appear, followed by ignition of the main burner at pilot setting . 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 box may be reset after a delay of approximately 15 seconds by pressing the red button (B1) on the control panel, the red light should go out.
7. When pilot flame is satisfactory the gas valve will open to main flame.
8. Check main burner pressure (as per TABLE 1).  
Adjust burner pressure on gas control if necessary.  
Burner pressure should be rechecked after about 30 minutes of operation and adjusted if necessary.
9. Switch Off electrical supply with button "I" (on control panel). Check that main burners are extinguished.  
Remove pressure gauge and replace plug in test point.

### 9.6 **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 in TABLE 1, the setting pressure given should be maintained.

### 9.7 **LPG**

If gas conversion is required refer to Fig. 4.

## 10.0 SERVICING

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

### 10.1 **To Clean Boiler**

1. Remove jacket front panel.
2. Disconnect pilot line.  
Fully Automatic Models: Disconnect leads for ignition and probe electrodes
3. Remove nuts retaining burner door and assembly.
4. Withdraw burner assembly from boiler.
5. Remove jacket top panel and insulation.
6. Remove the access plate from the top of flue hood.
7. Clean burner (see 12.2).
8. Clean boiler flueways from the top with flue brush. After cleaning, sweep all debris from under the boiler.
9. Check ignition and probe electrodes (fully automatic models) for correct alignment.
10. Re-assembly is a reversal of the above procedure.

### 10.2 **To Clean Burners**

1. Remove burner assembly from boiler as described in 12.1
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 manifold. Replace if necessary.
6. Re-assembly is reversal of the above procedure.
7. Check electrical connections to electrodes, and electrodes for correct alignment.

### 10.3 **Test Soundness of Safety Shut-Off Valve**

Proceed as detailed in 11.4

### 10.4 Re-commission boiler as described in Section 10

## 11.0 FAULT FINDING

### 11.1 **Fully Automatic Models**

1. Boilers does not attempt to light. Control box does not lock out
  - (a) No electrical supply to boiler, time switch and other external controls.
  - (b) Limit thermostat tripped.
  - (c) Control thermostat set to low.
  - (d) Control fuse blown.
  - (e) Faulty thermostat connections.
  - (f) Faulty control box.
2. Ignition sparks. Pilot stage does not light and control box locks out.
  - (a) Gas supply turned off at meter.
  - (b) Air in gas supply line.
  - (c) Solenoid valve or connections.
  - (d) Lead not plugged into junction box.
3. No ignition spark. Control box lock out.
  - (a) H.T. lead disconnected or faulty.
  - (b) Ignition electrode incorrectly set. Distance between ignition and ground electrode should be about 3 mm.
  - (c) Faulty electrode.
  - (d) Faulty igniter or connections.
  - (e) Faulty control box.
4. Pilot stage lights, Control box 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. Pilot stage lights. Main burners do not light. Control box does not lock out.

- (a) Faulty connections to main valve.
- (b) Faulty main gas valve.
- (c) Faulty control box.

6. Noisy burner ignition

- (a) Improper distance between electrode and burner.
- (b) Faulty electrical connection of the electrode.
- (c) Low gas pressure at the burner.

## 11.2 All Models

1. Presence of flue gases in the room.

- (a) Flue size inadequate.
- (b) Restriction in the flue.

2. Presence of unburnt fuel in the room.

- (a) Boiler needs cleaning.
- (b) Insufficient room ventilation.

3. Early soot formation in the boiler.

- (a) Excessive consumption.
- (b) Insufficient air supply.

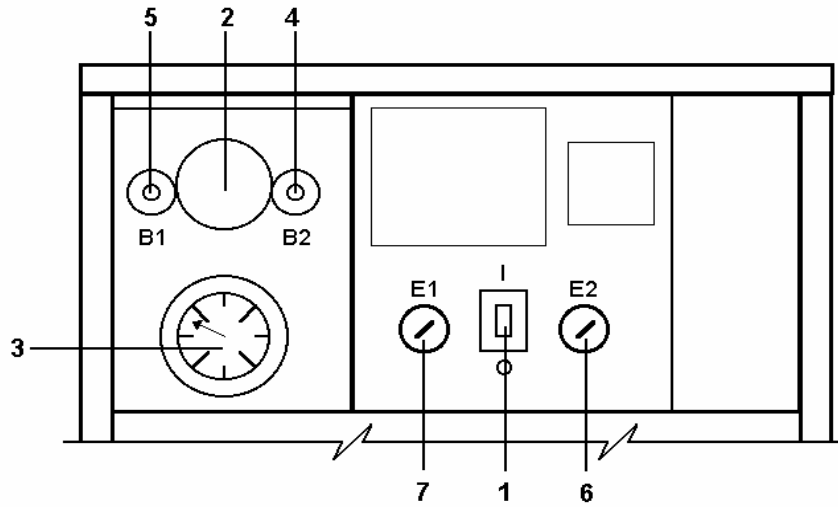
4. Condensation

- (a) Insufficient boiler output
- (b) Boiler control thermostat setting to low.
- (c) Main burner pressure to low.

**Fig. 1**

GENEVA 'C' & 'PV' BOILERS

CONTROL PANEL LAYOUT

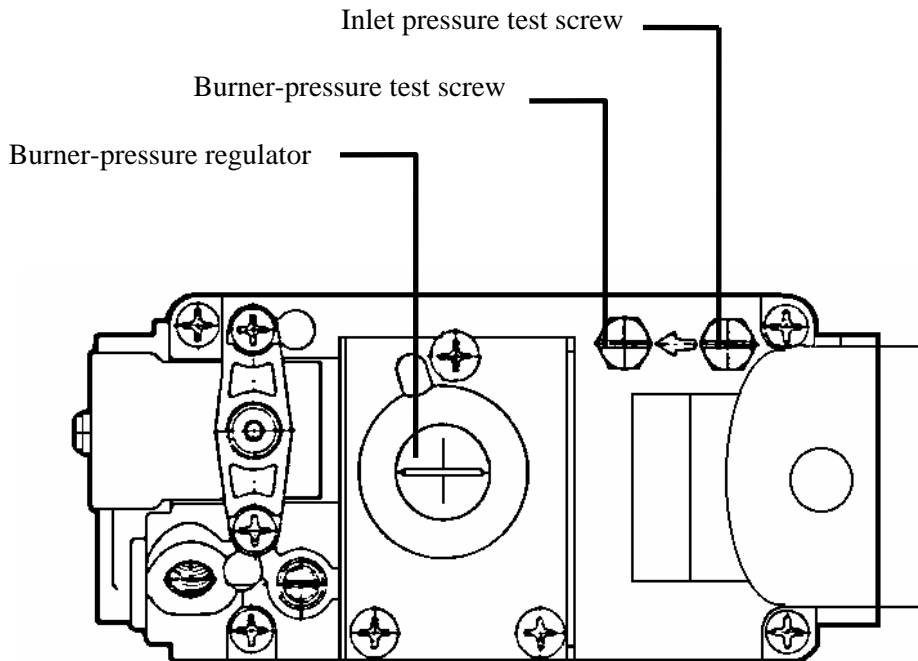


LEGEND

- 1 On / Off Switch
- 2 Boiler Control Thermostat
- 3 Boiler Thermometer (Plus Boiler Pressure Gauge On 'PV' Versions)
- 4 Flue Gas Spillage Detector Light (**B2**)
- 5 Control Box Lock Out Light And Reset Button (**B1**)
- 6 Flue Gas Spillage Detector Reset (**E2**)
- 7 Boiler High Limit Thermostat Reset (**E1**)

**Fig. 2**

NOVA SIT 822 GAS VALVE

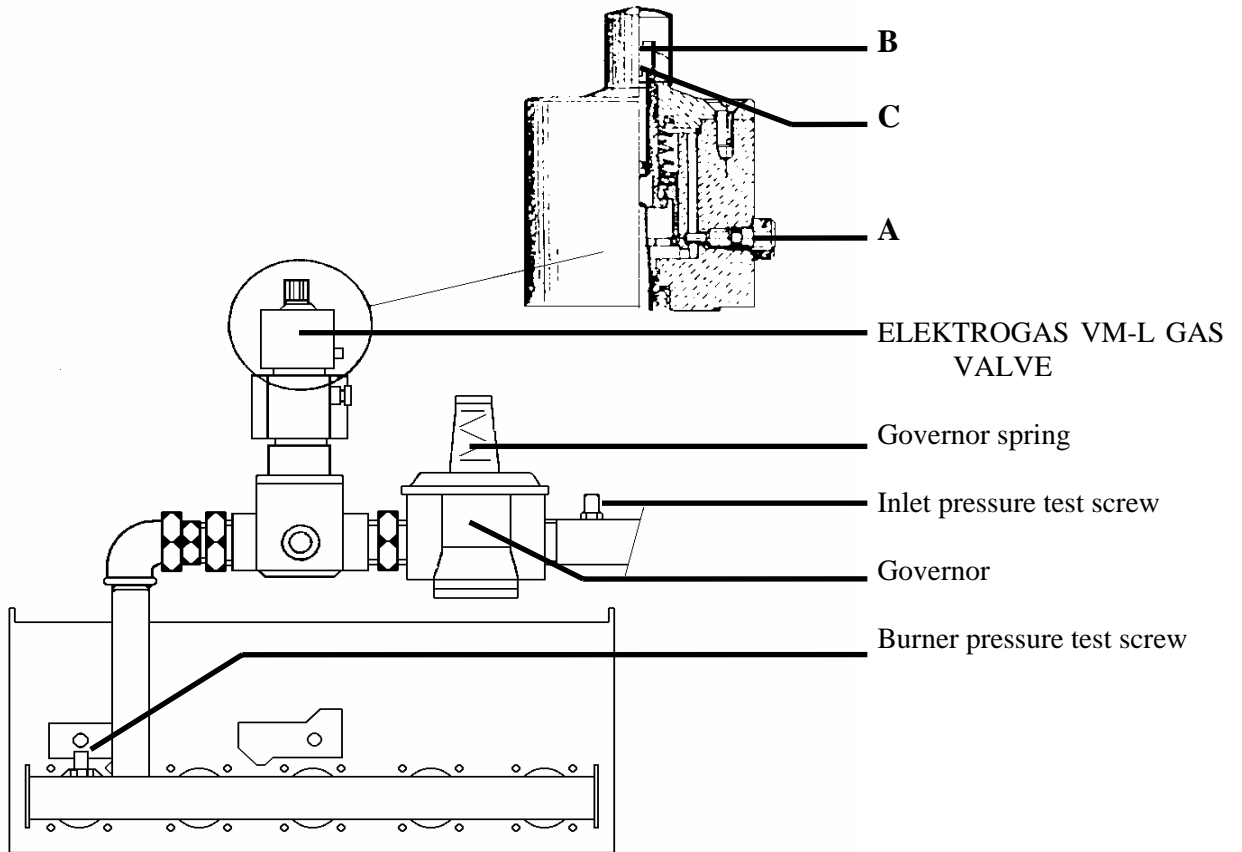


**Fig. 3**

**ELEKTROGAS VM-L GAS VALVE**

**Slow Opening and Fast Closing Valve with Hydraulic Damper and Flow - Rate Control**

- Slow opening time : It can be regulated from a fast speed of 4 sec, to a slow speed of 25 sec. (Valves are delivered with a standard opening time of 10 - 12 seconds).
- Initial fast opening, followed by a slow opening : it can be regulated from 0 to 100 % of the whole lift.



**A    Opening    Time**

**Regulation**

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

By fully unscrewing the speed adjustment screw (anti-clockwise) the valve will open quickly in about 4 seconds.

By gradually turning the speed adjusting screw (clockwise) the opening time can be slowed up to about 25 - 30 seconds.

**NOTE** : Remove the red plastic cap to carry out following settings.

**B Regulation of an Initial Quick - Opening Interval Followed by a Slow - Opening Interval**

The initial quick interval can be regulated from 0 to 100 % of the whole valve movement, by acting on the slow opening adjustment screw.

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

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

**C Flow Regulation**

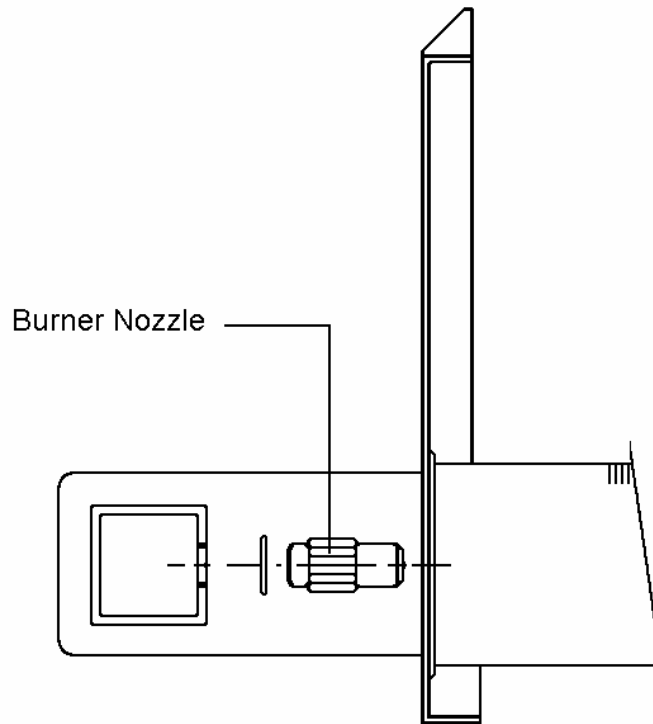
The flow regulation screw (located inside screw **B**) stops the shutter, which can be stopped at any point of the run. When the regulation screw is in the closed position (shutter stopped against the valve seat with zero flow) and is gradually opened (anti-clockwise) the shutter can be raised 0.8 mm at each complete turn.

**Fig. 4**

## LPG CONVERSION

The boilers are supplied as standard to be run on natural gas. Should it be necessary to convert the boiler to LPG the following operations must be carried out :

1. Remove jacket front panel.
2. Switch off electrical supply.
3. Turn off main gas cock.



4. Substitute the injectors on the main burner.
5. Nova Sit 822 gas valve : Remove the burner-pressure regulator cover and screw the governor spring fully in, replace the cover with blank supplied.  
Elektrogas VM-1 gas valve : Replace the governor spring with the one supplied.
6. Test for soundness.
7. Re-commission boiler as described in section 11. Using LPG burner pressure as stated in Table 1.

**NOTE :** The gas supply pressure to the boiler should not exceed the pressure as stated in Table 1.



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

6/96

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**STREBEL Ltd.**

1F, Albany Park Industrial Estate  
Frimley Road, Camberley  
Surrey GU15 2PL  
Telephone : (01276) 685422  
Fax: : (01276) 685405

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