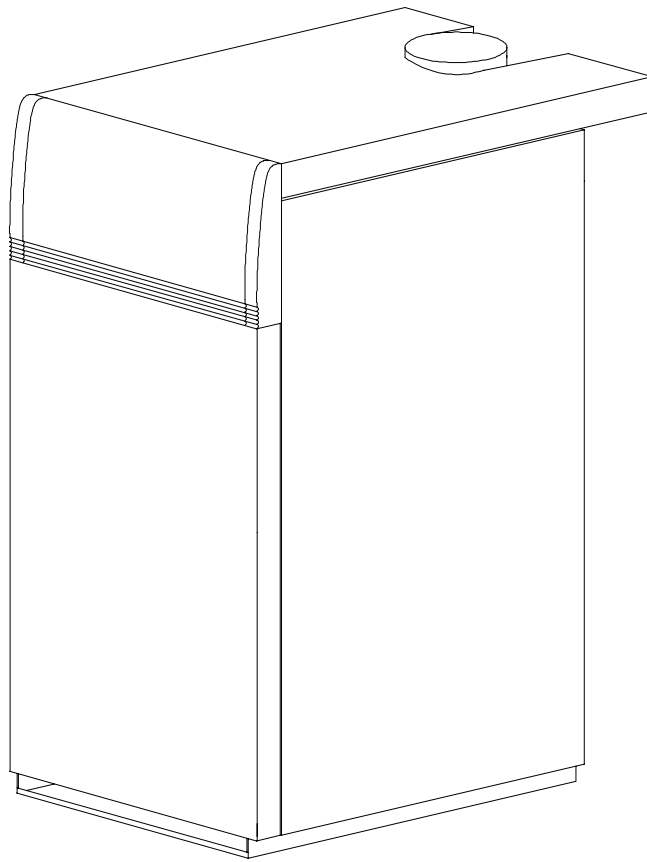


STREBEL

ASCONA 'A' & 'APV'



ATMOSPHERIC GAS BOILER INSTALLATION, OPERATING AND MAINTENANCE MANUAL

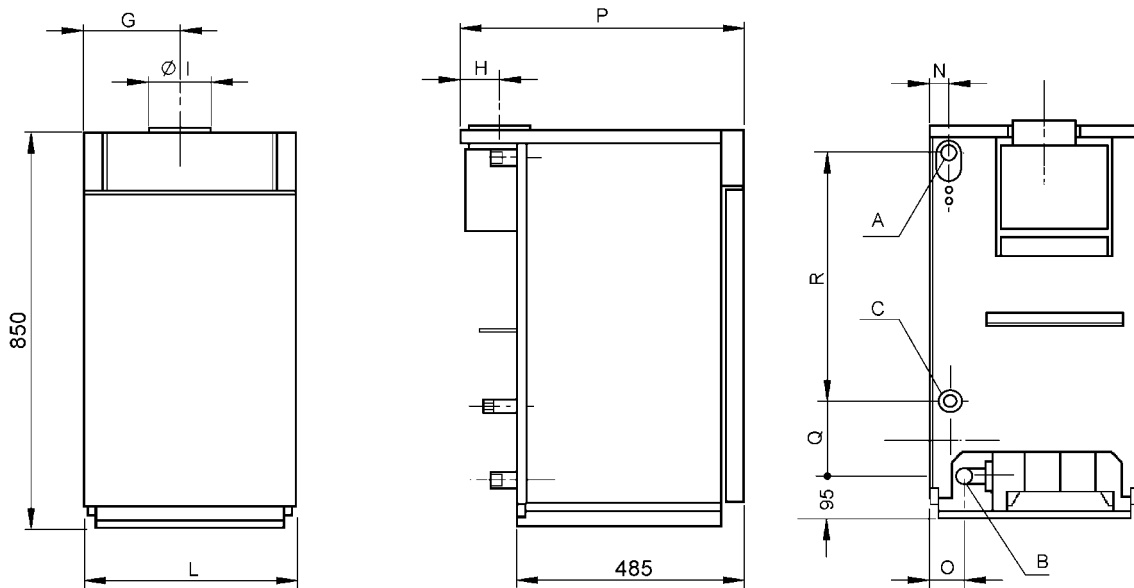
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ASCONA 'A' TECHNICAL DATA – TABLE 1

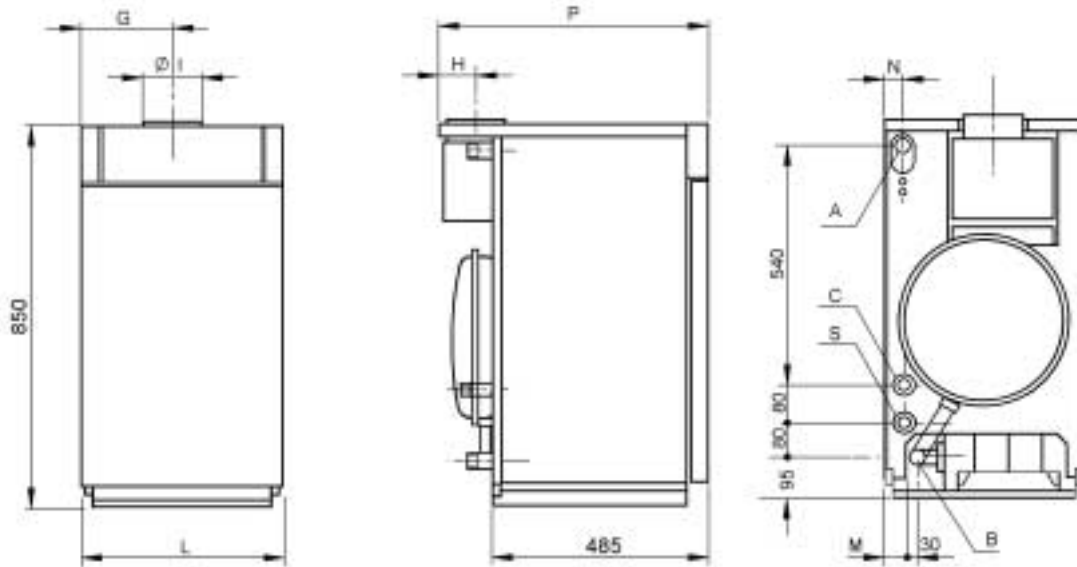
Type and No of Sections		A-3	A-4	A-5	A-6	A-7	A-8	A-9
Nominal output	kW	18.2	27.5	37.7	47.1	56.5	66.4	75.6
Nominal input	kW	20.2	30.5	42.0	52.3	62.7	73.7	83.8
Supply Pressure – Natural gas	mbar	20	20	20	20	20	20	20
Supply Pressure – LPG	mbar	37	37	37	37	37	37	37
Burner Pressure – Natural gas	mbar	14.8	14.5	13.2	14.5	14.5	14.5	14.5
Burner Pressure – LPG	mbar	31.5	30.8	30.3	29.7	29.4	29.1	31
Burner injectors – Natural gas	mm	2.6	2.6	2.7	2.6	2.6	2.6	2.6
Burner injectors – LPG	mm	1.75	1.75	1.75	1.75	1.75	1.75	1.65
Gas consumption – Natural	M ³ /h	2.33	3.44	4.55	5.63	6.72	7.80	8.87
Gas consumption – LPG	Kg/h	1.71	2.52	3.43	4.13	4.93	5.72	6.50
Water Resistance 10°C differential	mbar	9.5	20	36.5	23	34	46	57
Water content	Litres	10	12.5	15	17.5	20	22.5	25
Flue gas volume	G/s	0.017	0.021	0.026	0.037	0.039	0.053	0.053
Flue gas temperature	°C	106	119	134	117	128	112	120
Electrical supply for unit	V/Hz	230/50	230/50	230/50	230/50	230/50	230/50	230/50
Wattage	W	40	40	40	40	40	110	110
Shipping weight	Kg	87	110	136	164	186	213	234



		A-3	A-4	A-5	A-6	A-7	A-8	A-9
L	mm	365	450	600	750	750	900	900
P	mm	600	600	600	650	650	705	705
ØA Flow	inches	1"	1"	1"	1¼"	1¼"	1¼"	1¼"
ØB Return	inches	1"	1"	1"	1¼"	1¼"	1¼"	1¼"
ØC Gas supply	inches	½"	½"	½"	½"	½"	1"	1"
G	mm	135	205	205	335	335	405	405
H	mm	80	80	90	105	105	125	125
ØI Flue size	mm	130	130	150	180	180	220	220
N	mm	40	40	115	55	55	55	55
O	mm	70	70	150	55	55	55	55
Q	mm	160	160	160	160	160	150	150
R	mm	540	540	540	540	540	550	550

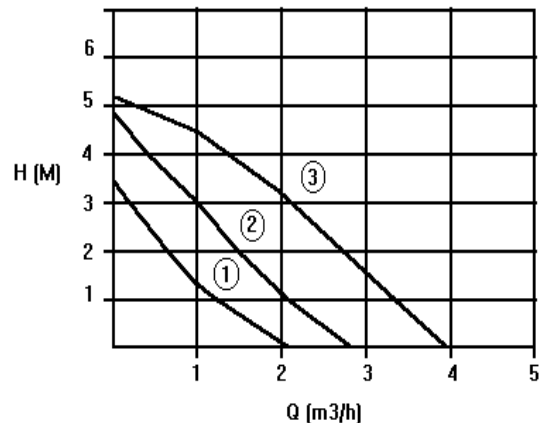
ASCONA 'APV' TECHNICAL DATA – TABLE 2

Type and No of Sections		PVA-3	PVA-4
Nominal output	kW	18.2	27.5
Nominal input	kW	20.2	30.5
Supply Pressure – Natural gas	mbar	20	20
Supply Pressure – LPG	mbar	37	37
Burner Pressure – Natural gas	mbar	14.8	14.5
Burner Pressure – LPG	mbar	31.5	30.8
Burner injectors – Natural gas	mm	2.6	2.6
Burner injectors – LPG	mm	1.75	1.75
Gas consumption – Natural	M ³ /h	2.33	3.44
Gas consumption – LPG	Kg/h	1.71	2.52
Water Resistance 10°C differential	mbar	9.5	20
Water content	Litres	10	12.5
Flue gas volume	G/s	0.017	0.021
Flue gas temperature	°C	106	119
Electrical supply for unit	V/Hz	230/50	230/50
Wattage	W	40	40
Shipping weight	Kg	94	118



		A-3	A-4
L	mm	365	450
P	mm	600	600
ØA Flow	inches	1"	1"
ØB Return	inches	1"	1"
ØC Gas supply	inches	½"	½"
G	mm	135	205
H	mm	80	80
ØI Flue size	mm	130	130
M	mm	40	40
ØS	mm	½"	½"

ASCONA 'APV' Heating pump curve



1.0 **GENERAL**

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

The Ascona 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 A-8 & A-9 models there is a Gas pressure switch for low inlet gas pressure.

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

The ASCONA 'APV' 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 1998, the I.E.E. Wiring Regulations and the Bylaws of the Local Water Undertaking, and current Building Regulations

Detailed recommendations are contained in the following:

British Standard Code of Practice:

BS 6880 parts 1, 2 & 3 1988.

BS 6700 1987; CP. 342 : Part 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 and Air Heaters

"The Gas Safety (Installation and Use) Regulations 1998:

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 and any ancillary equipment.
The location chosen for the boiler must permit the provision of a satisfactory flue and termination. The boiler should be positioned to allow 50 mm between boilers and 500 mm at one end for access to the pipework etc. 600 mm is required above to clean the flue-ways.
There should be 350 mm at the front of the boiler for maintenance and the draught diverter should be at least 50 mm clear of the wall behind the boiler.

The location must also permit an adequate space for combustion and ventilation air 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 detailed recommendations for air supply are given in BS 5440 part 2 & BS 6644.

Table 3 refers to the ventilation requirements (to internal space) for the Ascona A3 – A6. Table 4 refers to ventilation direct to outside for the Ascona A3 – A6.

TABLE 3

VENTILATION INTO A ROOM OR INTERNAL SPACE IN CM ²				
	A3 & APV 3	A4 & APV 4	A5	A6
HIGH LEVEL	182	275	378	471
LOW LEVEL	364	549	756	942

TABLE 4

VENTILATION DIRECT TO OUTSIDE AIR IN CM ²				
	A3 & APV 3	A4 & APV 4	A5	A6
HIGH LEVEL	91	138	189	236
LOW LEVEL	182	275	378	471

Table 5 refers to the ventilation requirements (direct to outside air) for the Ascona A7 – A9 boilers.

TABLE 5

VENTILATION DIRECT TO OUTSIDE AIR IN CM ²			
	A7	A8	A9
HIGH LEVEL	277	301	324
LOW LEVEL	553	602	648

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:
 Ascona APV 3 & PV 4 = 1/2" BSP
 Ascona A 3, A 4, A 5, A 6 & A 7 = 1/2" BSP
 Ascona A 8 & A 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.

6.0 **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 4 Bar (58 Psi) for 'APV' models and 4 Bar (58 Psi) for 'A' 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 recommended 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 valves 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 **INSTALLATION**

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

Do not remove protection before final positioning.

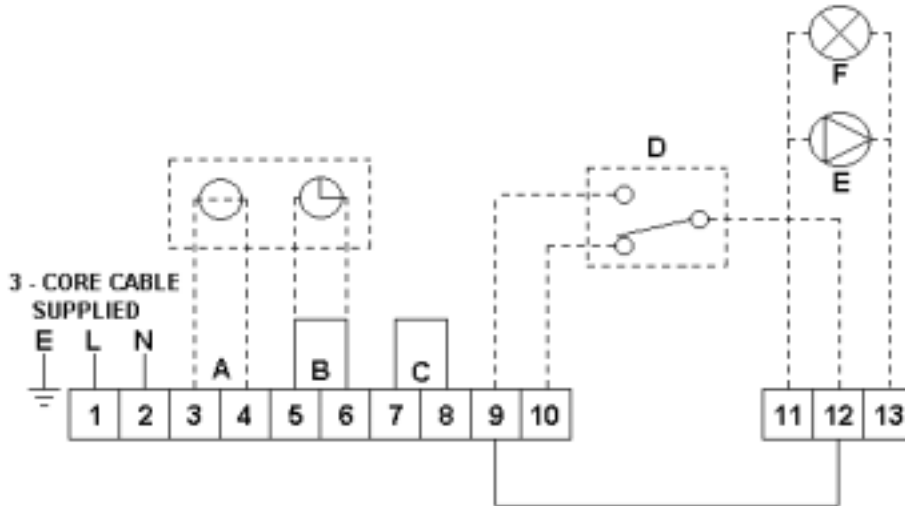
- 7.2 The boiler jackets and control panel are fitted.
- 7.3 The following minimum clearances around the boiler, for installation and servicing purposes, are recommended:
Above the top of the boiler (space for cleaning the flueways) 600mm, one side of the boiler should allow access of 500mm.
- 7.4 In addition a minimum clearance of 350mm should be available at the front of the boiler to enable servicing to be carried out.

8.0 ELECTRICAL SUPPLY

8.1 The electrical supply should be 220V, 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.

8.2 ASCONA 'A' & 'APV' Electrical schematic diagram



LEGEND

A	LIVE CONNECTION TO TIME CLOCK
B	EXTERNAL TIME CLOCK : ON / OFF CONTROL
C	ROOM THERMOSTAT / REMOTE ON / OFF CONNECTIONS
D	THERMAL PUMP OVERRUN – NOT SUPPLIED (LINK BETWEEN TERMINALS 9 & 10 TO BE REMOVED IF DEVICE FITTED)
E	BOILER CIRCULATING PUMP CONNECTIONS (PUMP INCLUDED WITH APV MODELS)
F	BOILER CIRCULATING PUMP RUN LAMP (APV MODELS ONLY)

9.0 COMMISSIONING AND TESTING

Before commencing to commission 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 that it 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 (refer to page 16, No 11) 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 section 13.0

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 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
- 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
- 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 9.4

10.4 Re-commission boiler as described in Section 9.5.1

11.0 FAULT FINDING

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.

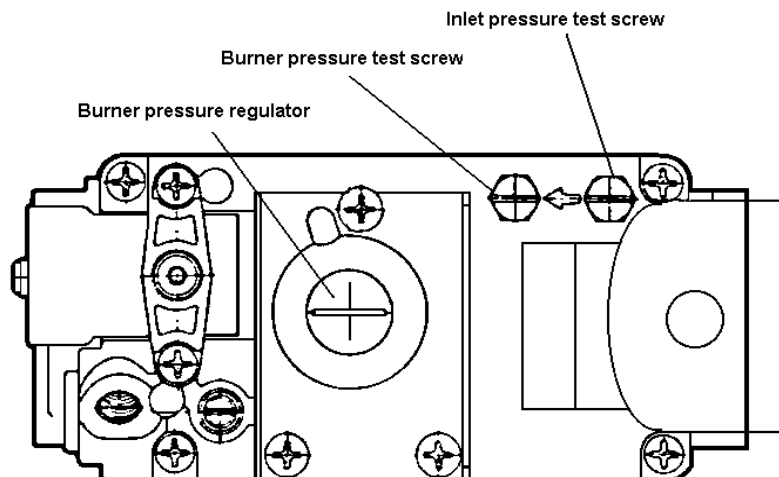
Note: The probe circuit may be tested with a micro ammeter connected in the probe lead. A reading of at least 10 micro-amps should be recorded when the burner is alight.

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.

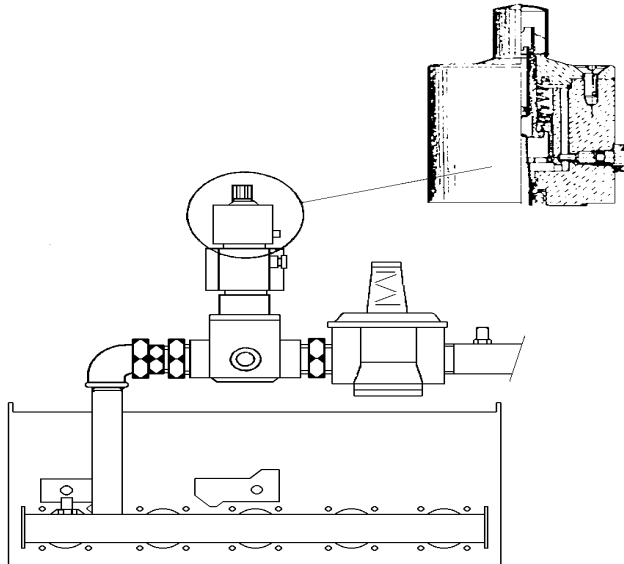
12.0 GAS VALVE ADJUSTMENT



ELEKTROGAS VM-L GAS VALVE

12.1 **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.



12.2

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.

12.3

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.

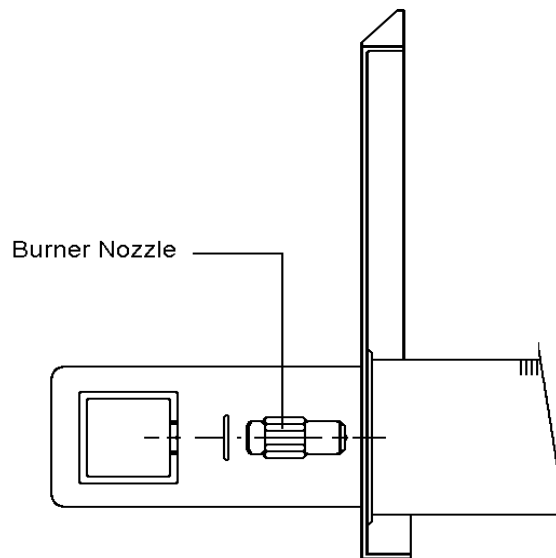
C Flow Regulation

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.

13.0 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 :

BOILER MODEL	PART NUMBER	INJECTORS PER KIT & INJECTOR Ø	INJECTORS PER BOILER	KITS NECESSARY
A – 3	6-P435006	4 / 1.75	2	1
A – 4	6-P435006	4 / 1.75	3	1
A – 5	6-P435006	4 / 1.75	4	1
A – 6	6-P435006	4 / 1.75	5	2
A – 7	6-P435006	4 / 1.75	6	2
A – 8	6-P435006	4 / 1.75	7	2
A – 9	6-P435007	4 / 1.65	8	2

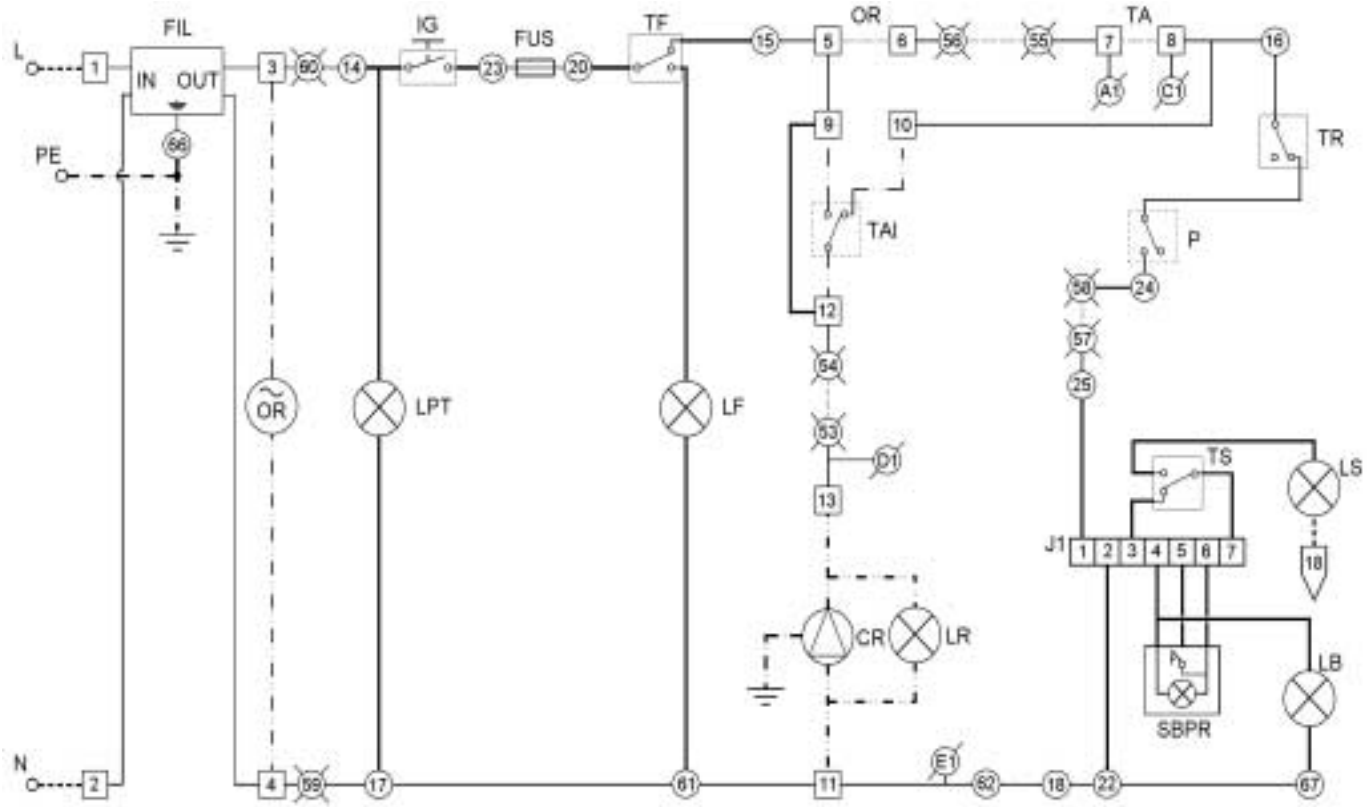


- 1 Remove jacket front panel.
- 2 Switch off electrical supply.
- 3 Turn off main gas cock.
- 4 Substitute the injectors on the main burner.
- 5 Nova Sit 822 gas valve : Remove the burner-pressure regulator cover and screw the governor spring fully in, replace the cover with blank supplied. Elektrogas VM-I 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.

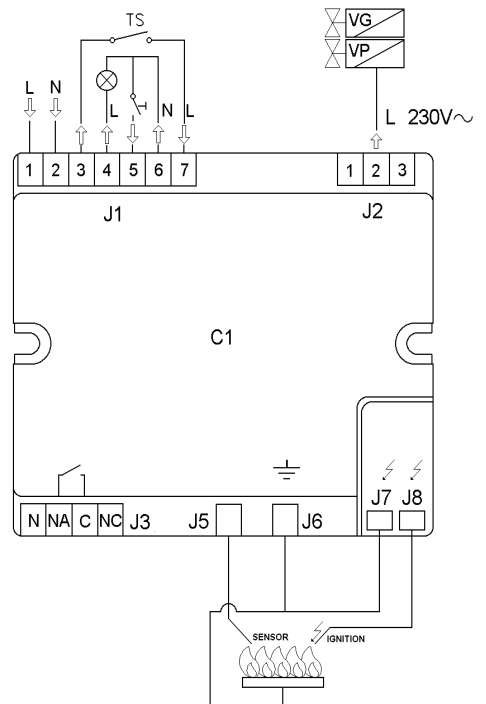
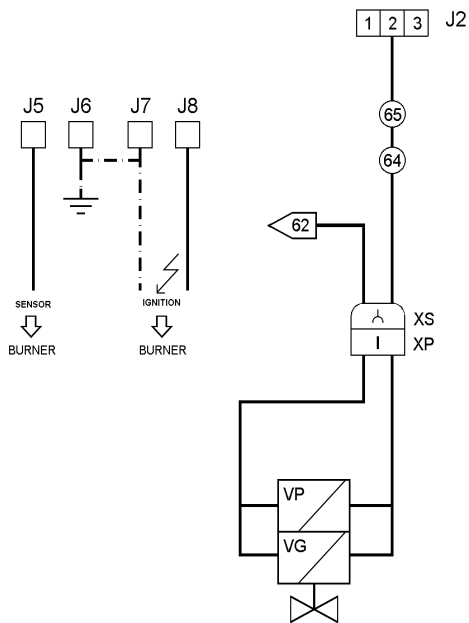
NOTE : The gas supply pressure to the boiler should not exceed the pressure as stated in Table 1.

ASCONA 'A' & 'APV' Wiring Diagram

CIR	Heating Circulation Pump Connections (Supplied with APV models only)
FIL	Noise Suppressor
FUS	Fuse
IG	Boiler On/Off Switch
J1 - J8	Control Box Connections
LB	Burner Lock-out Lamp
LBP	Boiler Lockout Lamp & Reset Button
LC	Heating Circulation Pump 'On' Lamp (Fitted on APV models only)
LF	Flue Spillage Lamp
LPT	Mains Power Indicator Lamp
LS	High Limit Lock Out Lamp
OR	External Time Clock Connections
P	Low Gas Pressure Switch (A8 & A9)
SBPR	Burner Lockout LED & Reset Button
TA	Room Thermostat - On/Off Control Connections
TAI	Thermal Pump Overrun Thermostat (Not supplied)
TF	Flue Spillage Thermostat Reset Button
TR	Boiler Control Thermostat
TS	High Limit Thermostat
VG	Main Gas Valve Solenoid
VP	Safety Gas Valve Solenoid



Terminals 7 and 8 are boiler control circuit



Connector pole for exchange with printed circuit of domestic water



Connector pole of Clima control



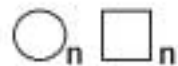
General connector pole



Link for electrical connector referred to pole 'N'
The direction of the arrow indicates the following position (to the right or the previous are (to the left) of the pole



Terminal board pole with screw connection



Number of 'N' links of the pole

Optional connections

Terminal Links

Printed circuit board

Wire connections

15.0 USERS OPERATING AND MAINTENANCE INSTRUCTIONS

To light the Boiler

- 1 Check that the boiler gas supply valves are turned ON and that the gas supply is ON at the meter.
- 2 Set the thermostat to the required temperature.
- 3 Switch on the electricity supply.
- 4 Pilot burner will light followed by main burners.
- 5 If red lock out light shows on control panel (No1), reset by pressing red light (No11) after approximately one minute, then the red light will go out and boiler will restart.

If the boiler malfunctions repeatedly contact a competent boiler servicing engineer

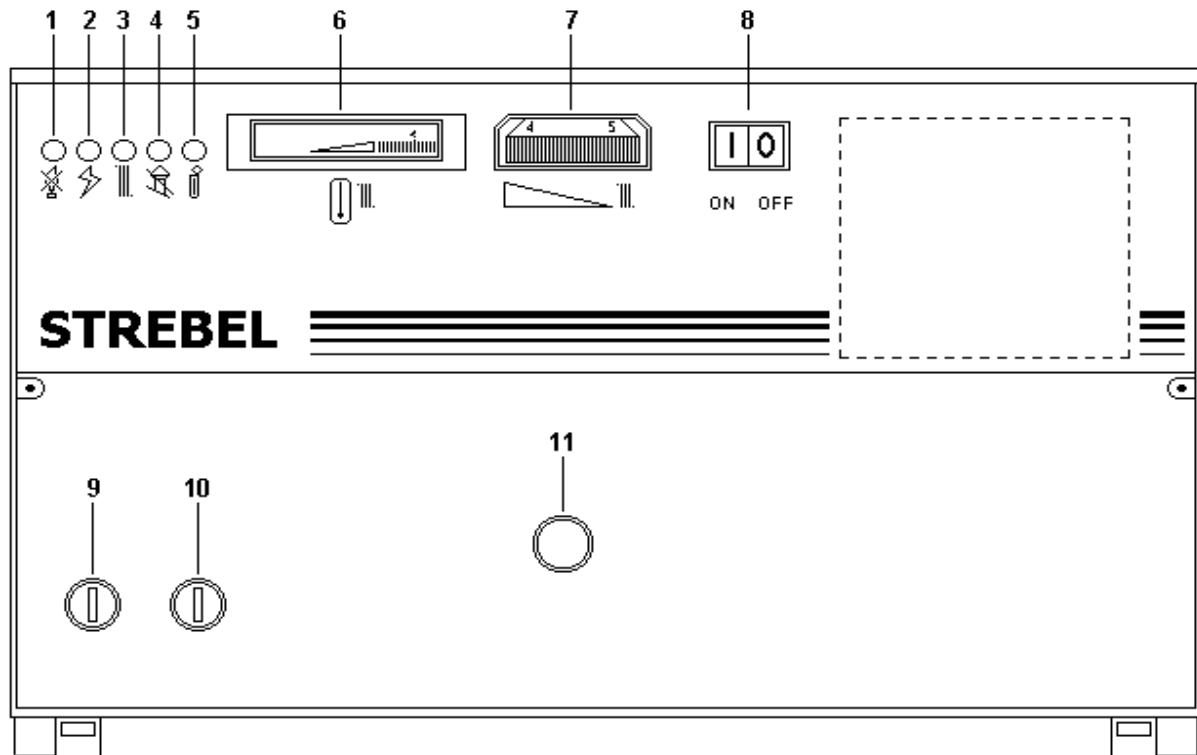
To shut down Boiler.

1. Switch OFF electricity supply
2. If shutting down for an extended period, also turn OFF the gas supply isolating valve.

Maintenance

We recommend that the boiler is serviced at least annually by a competent boiler servicing engineer

Control Panel Layout



1. Burner Lockout Lamp	7. Boiler Control Thermostat
2. Run Lamp	8. On / Off Switch
3. Heating Pump Lamp	*9. High Temperature Limit Thermostat Reset*
4. Flue spillage Lamp	*10. Flue Gas Spillage Thermostat Reset*
5. High Temperature Limit Lamp	11. Burner Lockout LED & Reset Button
6. Boiler Thermometer	* Remove cover and press button

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