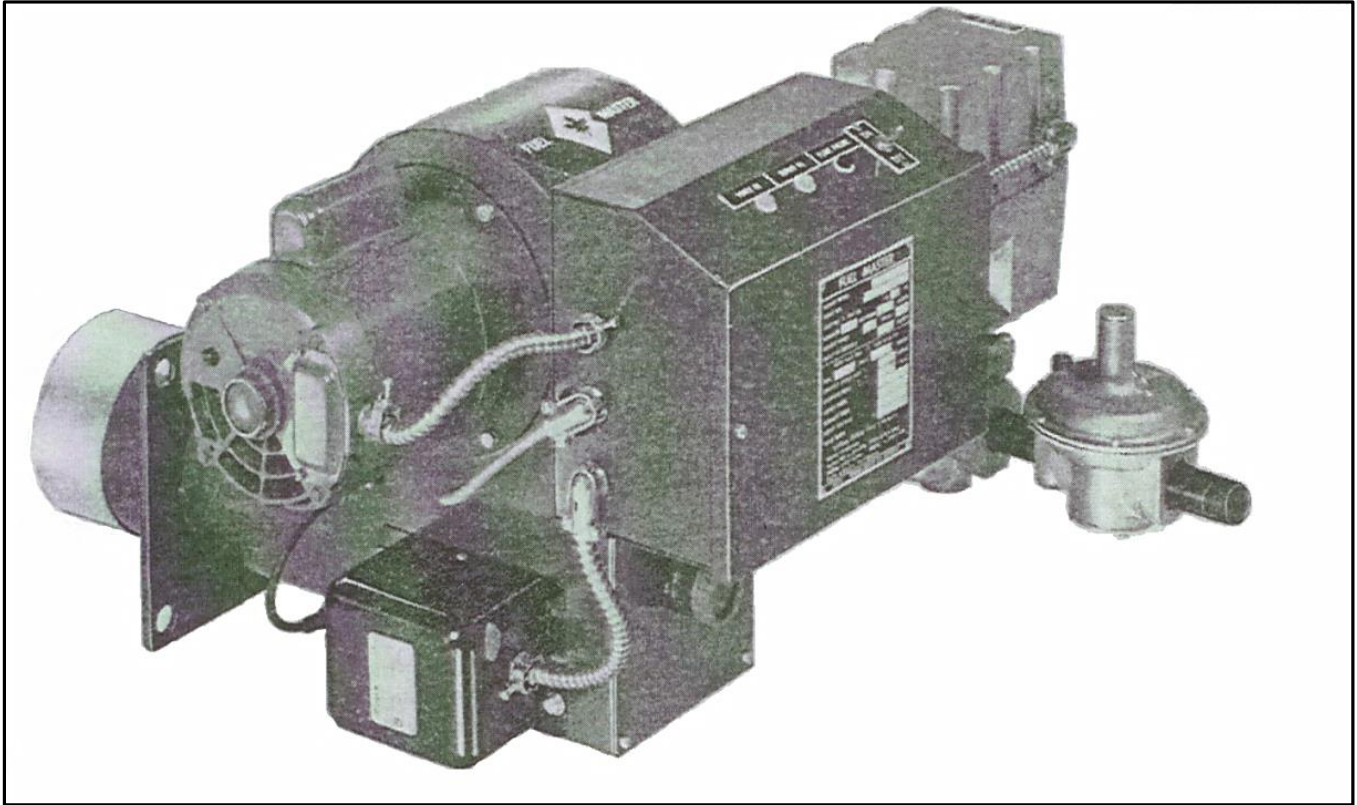


# Fuel Master **SPARK-LIGHT** burner



# INSTALLATION AND SERVICE INSTRUCTIONS



**FUEL MASTER BURNERS**  
*Designed and built by*  
**PENDELL BURNERS**



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## **INSTALLATION AND SERVICE MANUAL**

This FUEL MASTER Model “SL” Gas Burner must be installed by qualified licensed personnel, in accordance with Jurisdictional and Local code requirements, or in their absence, the CSA B-149.1 or B-149.2 gas burner installation codes will prevail. Authorities having jurisdiction shall be consulted before installations are made.

All burners are assembled and test fired at the factory prior to shipping. Any damage to a carton, crate or burner should be reported to the shipper as soon as possible. The carton/crate contains the complete burner and instructions, make sure all cartons/crates are empty before discarding.

Study the manual before assembling or installing the burner. It is important to keep all instructions clean and intact and to deliver them to the owner for future use.

### **BURNER DESCRIPTION**

The FUEL MASTER Model “SL” gas burner has been designed to fire boilers or furnaces incorporating a flame pattern designed to recirculate in front of the burner rather than blast away at the rear of the chamber. This provides a very high radiant heat release for full length of the combustion chamber, giving excellent heat transfer to the primary heat exchange surfaces.

The Model “SL” burner is robustly constructed using an all welded housing and blast tube. The burner end cone is of stainless steel to withstand high temperatures.

The Model “SL” gas burner has been designed for a 5 second duration, 6,000 V., direct spark ignition of the main burner, thus eliminating the pilot burner and pilot gas train. The spark igniter is located in a low pressure zone giving reliable and smooth light-off for the main burner.

### **BOILER OR FURNACE ROOM VENTILATION**

- Make up Air and Ventilation -

To ensure that good clean combustion and a reasonable burner room temperature can be maintained, a source of fresh air is required. The usual practice is to provide a grill or louvre in an outside wall with sufficient area to pass the volume of air required. Two methods are used to calculate the free area of these openings:

For applications such as bake ovens, incinerators or other types of boiler or furnaces, please consult the factory.

## BOILER OR FURNACE ROOM VENTILATION *continued*

Note: A FREE opening is clear and unobstructed, and openings with grills or louvers should be increased in overall size so that the manufacturer’s free rating is adequate.

- (1) On installations where the burner is operating at a negative draft and a barometric draft regulator or draft hood is used, the natural ventilation free area shall provide, not less than 100 square inches for the first 400,000 BTUH plus one square inch for each additional 14,000 BTUH. Refer to Table 1.

**Table #1: With barometric draft regulator**

BTUH input	Combustion air-free area – (in <sup>2</sup> )	BTUH input	Combustion air-free area – (in <sup>2</sup> )
400,000	100	1,000,000	142
500,000	108	1,100,000	150
600,000	114	1,200,000	158
700,000	120	1,300,000	164
800,000	128	1,400,000	171
900,000	135	1,500,000	178
		1,600,000	185

- (2) When the burner is installed in a forced draft unit without a barometric draft regulator or draft hood and unit is sealed, the free area of the opening shall provide at least one square inch for each 30,000 BTUH. Refer to Table 2.

If movable dampers or fans are used to provide make up air, then an electrical interlock is required to prove airflow before the burner can operate.

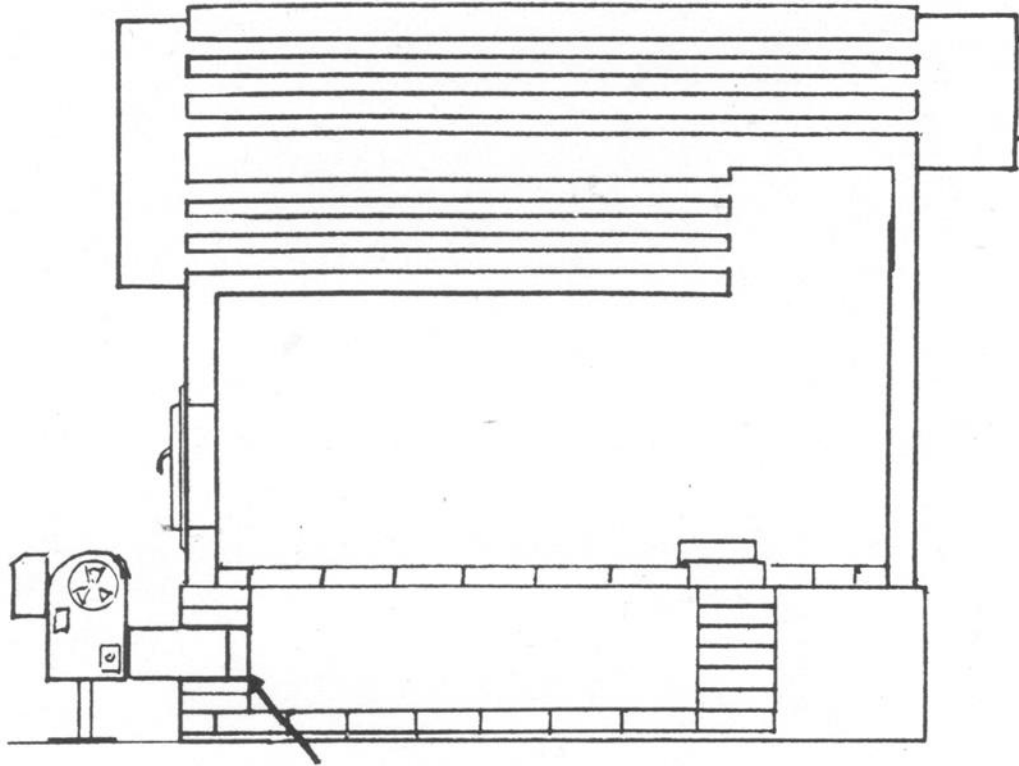
**Table #2: Without barometric draft regulator**

BTUH input	Combustion air-free area – (in <sup>2</sup> )	BTUH input	Combustion air-free area – (in <sup>2</sup> )
400,000	14	1,100,000	37
500,000	17	1,200,000	40
600,000	20	1,300,000	44
700,000	24	1,400,000	47
800,000	27	1,500,000	50
900,000	30	1,600,000	54
1,000,000	34		

Table 2 indicates the area at maximum burner ratings. Building exhaust fans must not affect the fresh air supply to the burner.

DRAWING # 2

Typical Firebox Installation



The blast tube to be installed flush with the face of combustion chamber.

**Table #3: Combustion Chamber Sizing SL Gas Burners**

Input BTUH	Width (in)	Length (in)	Input BTUH	Width (in)	Length (in)
400,000	14"	20"	1,100,000	24"	33"
500,000	14"	26"	1,200,000	24"	36"
600,000	16"	27"	1,300,000	26"	36"
700,000	18"	28"	1,400,000	26"	39"
800,000	18"	32"	1,500,000	28"	39"
900,000	20"	32"	1,600,000	30"	40"
1,000,000	22"	32"			

**Note:** When a narrower width is used, the length should be increased to obtain an equivalent area.

## BOILER OR FURNACE PREPARATION

- A) Clean the boiler or furnace thoroughly and remove all grates and obstructions. Check the entire boiler or furnace assembly, including the flue and breeching, and repair all leaks.
- B) If burner is operating against positive firebox pressure, the entire installation including cleanout doors, flue connection and inspection doors must be air tight. If the firebox pressure is negative, such extreme care can be omitted but the tighter the boiler, the better the combustion efficiency.
- C) Check the size of the flue. Flue dimensions must conform to the boiler or furnace manufacturer's recommendations. The breeching must slope upward toward the flue at a minimum rate of ¼" per linear foot.
- D) The breeching must enter the flue by means of 135° tee or equivalent to avoid pulsation.
- E) Cover the bottom of a firebox boiler or furnace with a sufficient amount of insulation material (refer to drawing #2) – such as rockwool, micro-fill, or equivalent. Lay the combustion chamber floor using insulation fire brick. All brick must be bonded together with a quality grade of refractory cement, such as Sairset, Setcold, Laytite or equivalent.
- F) Refer to Table #3 for recommended firebox combustion chamber dimensions. Erect the side and back walls according to the selected chart dimensions. The walls should be at least 4" higher than the bottom of the water legs of the boiler, or the return inlet of the furnace.

## MOUNTING THE BURNER

The burner must be adequately supported and secured to the appliance. The Blast Tube must be installed with the end cone even with the interior of the combustion chamber. If it is too far forward, the end cone life will be shortened, if too far back the flame recirculation will be affected.

## GAS PIPING

The gas piping must be sized to supply the gas to the burner at the required pressure to operate at rating. Determine the gas volume required in cubic feet per hour, the pressure required at the inlet to the pressure regulator, and from the gas company the available pressure at the meter outlet; calculate the length of piping from the meter to the burner. From this information determine the correct diameter of pipe required using Table #4. For other gas pressures consult your Gas Company or code manual.

## GAS PIPING continued

**Table #4: Maximum Capacity of Pipe in Cubic Feet of Gas per Hour**

(Pressure drop of 0.5 inch water column and 0.6 Specific Gravity Gas)

Pipe Size of Schedule 40 Standard Pipe(feet)	Total Equivalent Length of Pipe (feet)											
	10	20	30	40	50	75	100	125	150	175	200	250
½	120	85	70	60	54	44	38	34	31	29	27	24
¾	272	193	157	136	115	99	82	76	67	65	58	52
1	545	385	315	272	244	198	173	154	141	130	122	109
1 ¼	1201	848	693	600	537	439	380	340	310	287	268	240
1 ½	1862	1316	1074	931	832	680	588	527	480	445	416	372
2	3766	2663	2174	1884	1680	1373	1190	1065	871	900	841	753
2 ½	6165	4358	3559	3082	2752	2254	1950	1743	1593	1473	1379	1233

The gas pipe must not be supported from any other pipe, the pipe supports should be spaced as follows:

Pipe Size	½"	¾ - 1"	1¼ - 2½"	3 - 4"	5 - 8"
Max. Spacing (feet)	6	8	10	15	20

On vertical piping, the supports must be at each floor level. All gas piping must be tested after assembly in accordance with at least one of the following methods. Before connecting the appliances, systems shall be tested to a pressure as shown in Table #5.

**Table #5: Testing Pressure Durations**

Working Pressure P.S.I.G.	Test Pressure P.S.I.G. *	Duration
0 to less than ½	3	10 minutes
½ to less than 5	15	12 hours
5 to less than 33	50	24 hours
33 and over	1 ½ times	24 hours

\*Test are usually performed and recorded by the certified welder or installer.

After appliances have been connected and the gas meter tested, gas piping may be tested by marking the location of the meter test dial. If, after a period of ten minutes, the dial has not moved, the test may be considered satisfactory.

When a meter is not available, a manometer calibrated in increments of 0.1" W.C can be connected to the gas piping and the system pressure indicated. The source of pressure is then turned off and the reading on the manometer must remain the same for at least ten minutes.

## **GAS PIPING continued**

Note: Before turning the gas into the system, make sure that all openings from which gas might leak out are closed.

## **GAS VENTS AND BLEEDS**

Gas vents must be piped to the outside of the building. The pipe size required to vent the valves and regulators on a burner can be determined by adding the area of each of the vent connections and then multiplying by two (2). The following table, Table #6, can be used to calculate the areas:

**Table #6: Area of the Pipes**

Internal Area of Pipes, Sched. 40 Blk. ASA-B-36-10	
1/8 : 0.057 sq. inches	3/4 : 0.533 sq. inches
1/4 : 0.104 sq. inches	1 : 0.864 sq. inches
3/8 : 0.191 sq. inches	1 – 1/4 : 1.496 sq. inches
1/2 : 0.304 sq. inches	1 – 1/2 : 2.036 sq. inches

## **GAS PILOT**

The pilot turndown test can only be used to check the minimum flame signal.

When a pilot is used on the SL burner, a pilot regulator and solenoid gas valves are added to the gas train. The pilot gas is piped into the main gas burner, and expands into the main flame.

## **HIGH LOW FIRE SEQUENCE**

The “SL” burner will operate in a low-high-low off sequence when equipped with a high low actuator on the main gas valve. This actuator has a proof of closure micro switch to indicate the valve is in the closed position. The actuator has three positions; off, low fire, and high fire. While in the low fire position the actuator can be adjusted within the range of 1/3 to 1/2 of its full stroke. (1/2 stroke does not necessarily mean 1/2 flow rate through the valve). This is accomplished by using a special wrench to set the cam located in the lower left side of the actuator when the cover is removed. (See the Valve Manufacturer Bulletin).

Note: When replacing the high-low actuator in the field the low fire adjustment wrench must be removed from inside the cover, and safely taped to the lower right hand floor of the actuator housing.

Air Damper Setting – The fixed damper should be adjusted to provide the correct amount of air for low fire input. When the actuator moves to high fire the damper linkage moves the adjustable damper. The correct setting can be obtained by adjusting the position of the linkage connectors on the damper arm shown (page 9).

## **HIGH LOW FIRE SEQUENCE continued**

Purge Time – This is affected by the low fire damper opening which in turn is dependent on the low fire rate. When the low fire is set at half the total input a 60 second purge time is required, if low fire is less than half then a 90 second purge time is required.

The high/low fire is controlled by an aquastat or pressure control wired to the terminal strip as shown on the wiring diagram.

## **MODULATING SEQUENCE**

The “SL” burner will operate in a low-modulating-off sequence when equipped with a modulating actuator on the main gas valve. This actuator has a proof of closure micro switch to indicate the valve is in the closed position. The valve has three positions; off, low fire and modulating. While in the low fire position the actuator can be adjusted within the range of 5% to 50% of its full stroke. (½ stroke does not necessarily mean ½ flow rate through the valve). This is accomplished by adjusting a “low-fire” screw marked “more-less” in the upper left corner behind the upper actuator cover. (See the Manufacturer Bulletin).

Air Damper Setting – The fixed damper should be adjusted to provide the correct amount of air for low fire input. When the actuator moves to high fire the damper linkage moves the adjustable damper. The correct setting can be obtained by adjusting the position of the linkage connectors on the damper arm as shown (page 9).

Purge Time – This is affected by the low fire damper opening which in turn is dependent on the low fire rate. When the low fire setting is set at half the total input a 60 second purge time is required, if low fire is less than half then a 90 second purge time is required.

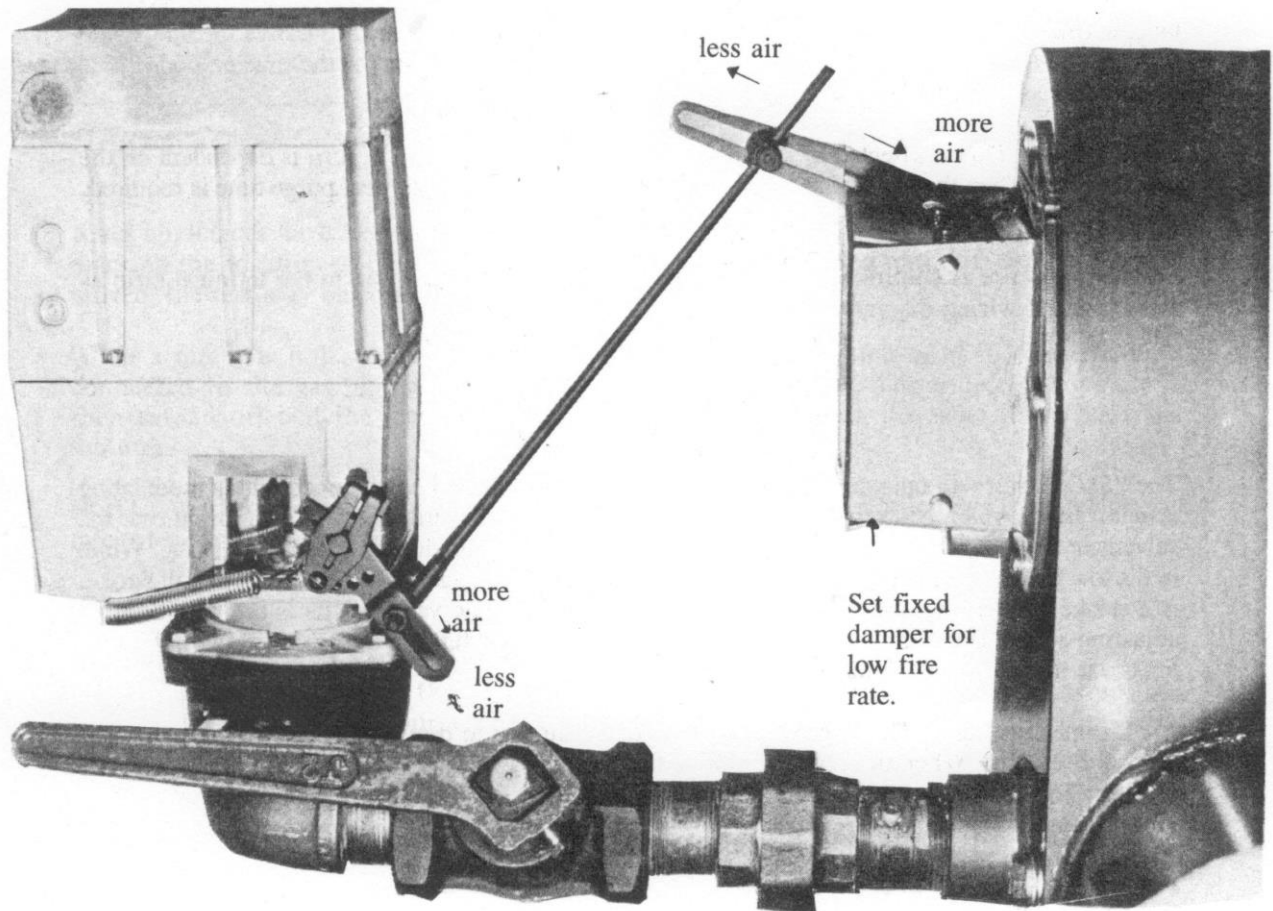
A three wire potentiometer type control is used to control the burner firing rate. The control should be wired to the R W B terminals in the panel box as shown on the wiring diagram. An adapter may be added to the circuit to accommodate a 4 to 20 mA or a 2 to 10 Vdc temperature control.



AIR DAMPER ADJUSTMENTS FOR BURNERS EQUIPPED WITH  
HIGH LOW OR MODULATING VALVES.

(Typical, May vary according to application & adjustment)

Consult valve manufacturers  
bulletin for gas valve  
actuator adjustments.



## WIRING

To protect the motor and electrical equipment and prevent nuisance lock-outs, by the voltage-sensitive flame safeguard system, an adequate, stable, dependable, and properly fused electrical supply must be provided.

A wiring diagram which outlines the power supply and other external connections is furnished with each burner. The installer should familiarize himself with each diagram and follow it logically.

- A) Connect main power supply and safety controls to the panel. All wiring must comply with local electrical codes and regulations.
- B) With the power supply switch in the off position, check all fuses and all terminals for loose wiring connections.
- C) It is good practice to wire the operating controls right back to the burner, in a separate loop from the safety limit controls, to obtain maximum protection from the limit circuit.

## TEST AND START UP PROCEDURE

When the installation has been completed, the gas piping should be purged before attempting to start the burner. This may be done by using an approved purge burner or by connecting a hose to the gas pipe near the burner and expelling the gas outside the building.

- (1) Close both the main gas valve and the firing cock
- (2) Turn on-off switch on the burner to the OFF position

Turn on the main electrical supply, power-on indicator light should glow. Turn burner switch on momentarily to check motor rotation. If necessary, turn off main power supply before changing motor leads (3 Phase).

After re-assembly and with the firing cock closed, check the flame safeguard by attempting to start the burner. With the main gas manual valve still off, turn electrical supply on, turn burner switch on. The program control will start the blower motor; the air flow will close the air switch, and the air switch will start the purge timer. At this point the air switch can be checked by turning its adjusting screw clockwise only enough to stop the motor. Turn off the burner and reset the air switch by turning the adjusting screw counter-clockwise only two full turns. Turning further can nullify the function of the air switch. Again turn on the burner switch, so that the motor is activated to again start the purge timer. In 30 seconds the ignition transformer and the main gas valve will be energized. (60 or 90 seconds on Hi-Lo or Modulating burners). The spark will continue for five(5) seconds, at this point since there will be no ignition detected the gas valve will close, the blower will purge for fifteen to twenty seconds, then the latch-out switch will shut the burner off. The operating, and limit controls should be checked for proper setting and operability.

## **TEST AND START UP PROCEDURE continued**

Check the air switch by turning off the power, disconnecting the motor lead, turning on the power, and attempting to start the burner. The program control will become energized but no further function should occur. If the ignition comes on and the burner attempts to light, the air switch is improperly adjusted or defective requiring replacement.

This dry run must be carried out to prove the flame safeguard system. After allowing the relay time to be reset, push the reset button and the burner should be ready to restart.

### **GAS VALVE TEST**

Turn on the gas supply leaving the firing cock closed, and thoroughly purge any air from the piping system using the test opening at the burner union. Repeat the test procedure as above. This will permit you to check the operation of the main gas valve and also test for leaks. A pressure gauge should be installed downstream of the gas valve and should not indicate pressure until the ignition and main valve are energized. Once again lock out will occur and must be reset. With the power supply off, reconnect the motor.

### **INITIAL FIRING**

The firing cock should be opened and the procedure repeated, the main burner should ignite approximately 2 seconds after the ignition light comes on. (If air is still in the gas pipe more cycles may be required). The burner-on light will indicate the main fuel is on, and the ignition will go off. Once the main flame has been established, the program control will make one attempt at relighting if a loss of flame occurs.

### **ADJUSTMENT**

So that the firing rate may be checked, ensure that all other gas burning equipment supplied by the appropriate meter is turned off. With the burner operating, check the firing rate using the test dial on the gas meter. The input may be increased or decreased by adjusting the gas pressure regulator. Once the correct input is obtained a flue gas analyzer should be used to determine the air fuel ratio, then the air shutter adjusted if necessary to obtain optimum performance:

Low Fire – O<sub>2</sub> 5.0% to 5.5% / CO<sub>2</sub> 8.5%.    High Fire – O<sub>2</sub> 4.0% to 4.5% / CO<sub>2</sub> 9.0% to 9.5%.  
Lock the shutter screw on the rim of the air shutter.

### **BAROMETRIC DAMPER**

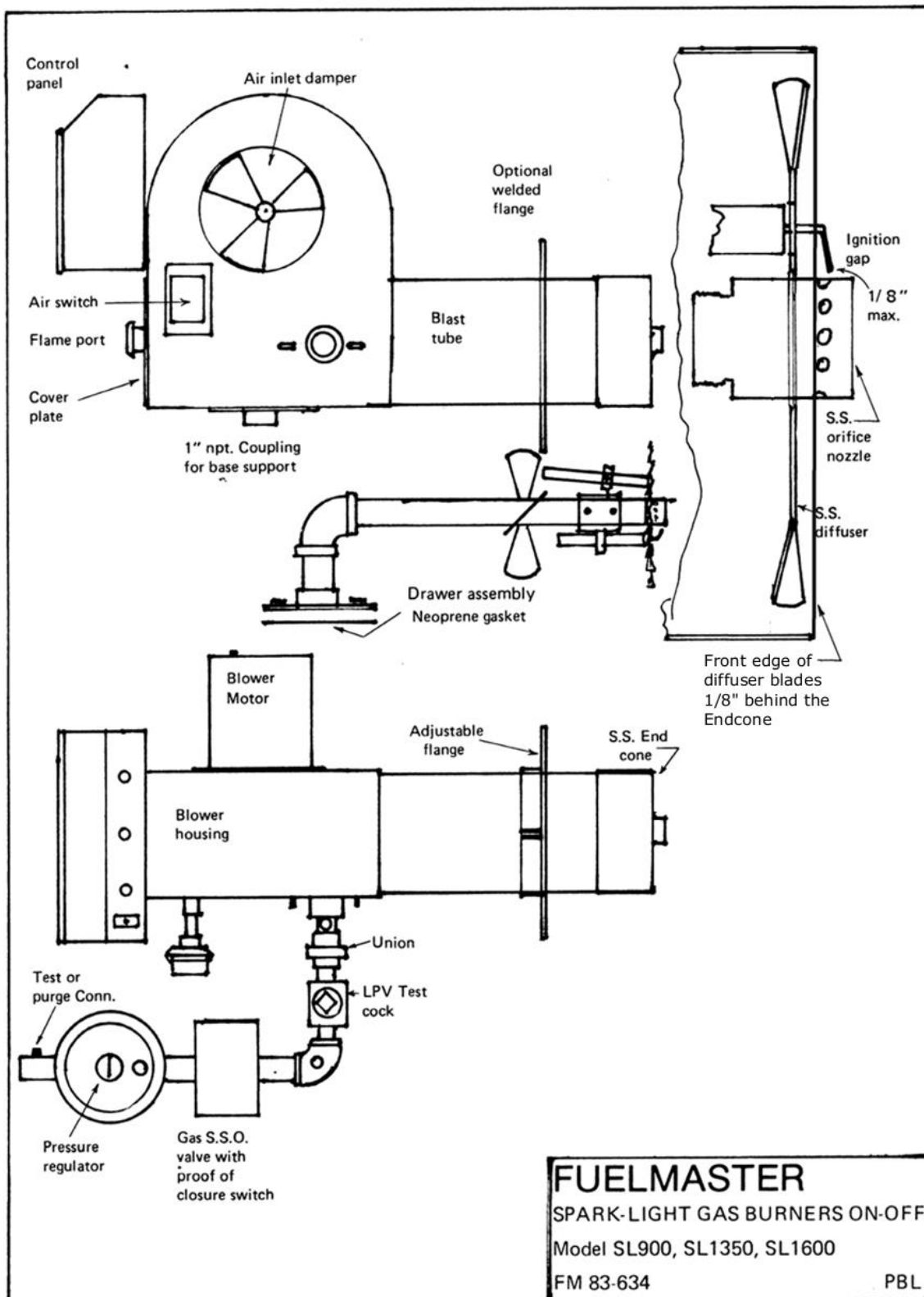
On all installations without a draft hood, operating with a negative over-fire draft, a double acting barometric draft regulator must be used. Follow the sizing, installation and adjustment instructions supplied by the regulator manufacturer.

Do not install a barometric damper on pressurized appliances.

Check the stack temperature and compare your reading to the following chart to determine efficiency.

## LOW VOLTAGE THERMOSTAT OR CONTROLLER:

When the burner is to be controlled by a 24V thermostat, an intermediate relay must be installed.



## EFFICIENCY CHART

**Table #7: Efficiency Chart**

Percent Combustion Efficiency (%). (No Combustibles).															
Natural Gas															
CO <sub>2</sub> %	12.1	11.5	11.0	10.4	9.8	9.2	8.7	8.1	7.5	6.9	6.4	5.8	5.2	4.6	
Excess Air %	0	4.5	9.5	15.1	21.3	28.3	36.2	45.0	55.6	67.8	82.2	99.3	121	147	
Oxygen %	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
°C	°F	% efficiency													
150	300	85.6	85.4	85.2	85.0	84.7	84.5	84.2	83.9	83.5	83.0	82.4	81.7	81.0	81.0
175	350	84.6	84.3	84.1	83.8	83.5	83.2	82.8	83.4	81.9	81.3	80.6	79.8	78.8	77.6
200	400	83.5	83.2	82.9	82.6	82.2	81.8	81.4	80.9	80.3	79.6	78.8	77.8	76.6	75.3
230	450	82.5	82.1	81.8	81.4	81.0	80.5	80.0	79.4	78.7	78.9	77.0	75.9	74.4	72.5
260	500	81.4	81.0	80.6	80.2	79.7	79.1	78.6	77.9	77.1	76.2	75.2	73.9	72.2	70.2
290	550	80.3	79.9	79.4	79.0	78.4	77.8	77.2	76.4	75.5	74.5	73.4	71.9	70.0	67.8

The above chart, Table #7, is based on the gross heating value of the fuel, to obtain the net heating value efficiency as used in Europe and U.K. multiply the result by 1.1, e.g. (84% X 1.1 = 92.4%).

Readings above 500°F are wasteful and readings below 300°F can cause condensation in the chimney.

The operating, limit and low water cut-off etc. controls should all be tested to make sure they are operating properly and at the correct temperature or pressure.

Identify the electrical disconnect and gas shut-off valve. Explain the operating sequence to the customer and show the location of the reset buttons, fuses, electrical disconnect and gas shut-off valve.

Leave the instructions and wiring diagram with the burner for future use in adjusting or servicing the unit.

## SERVICING AND MAINTENANCE

In most applications the burner should be checked at least once a year to ensure that all the settings have been maintained. The gas valve should be tested for tightness by closing the test firing cock and checking the gas pressure at the test point with a manometer. If the pressure rises in a minute or two then the seat is not closing properly. If the gauge does not move after two minutes the valve is closing properly. (A manometer is more accurate at low pressure).

Remove the drawer assembly (all power off and the main gas cock shut) and inspect the firing head. Readjust the igniter if not within setting shown on chart. Check and clean UV scanner. If in a dusty location the blower wheel may require cleaning more often than once yearly. If the blower becomes very dirty the supply of air will be reduced and may cause incomplete combustion, which will soot up the boiler and waste fuel.

If the motor has an oil or grease fitting follow recommended lubrication instructions on the motor specification sheet.

## SERVICE INSTRUCTIONS

### **Burner motor does not start:**

- Check for electrical power to the burner, power on light should glow.
- Turn switch to ON position.
- Press reset on motor or starter/contacter.
- Check the limit circuit for continuity.
- Check proof of closure switch on gas valve.

### **Burner motor starts but flame does not attempt to come on:**

- Check air proving switch circuit
- Open air shutter.
- Install new purge card.

### **Burner purges but does not light:**

- Check ignition transformer circuit.
- Check electrode spark gap setting.
- On initial start, purge gas line to make sure gas is available.
- Check gas valve actuator to make sure it is opening.
- Install new purge card.
- Check vent on regulator.

## SERVICE INSTRUCTIONS continued

### **Burner lights but goes off after a few seconds:**

- Check flame signal. If flame signal is low, check line voltage – if low correct it.
- Check UV scanner. Check combustion control. Check gas supply pressure.
- Check flame pattern, if diffuser not adjusted properly scanner will not see the flame.

### **Burner fires but flame is long and narrow**

- Loosen the two nuts on adjusting plate where gas pipe enters the burner.
- Move the assembly towards the end of the blast tube, until a short bushy flame is produced, and retighten the two nuts.
- The rear edge of the swirl vanes should be in line with the edge of the end cone.

## WARNING

On direct spark ignition burners not equipped with a pilot. The trial for ignition time must not exceed 5 seconds. Do not alternate plug in cards.

**Table #8: SPARK-LIGHT BURNER**

Orifice Chart Sized for 8 Holes					
Burner Model	Input BTU/HR	Natural Gas 7" WC		Propane 11" WC	
		Orifice Size with Manifold Pressure		Orifice Size with Manifold Pressure	
		@ 3.5"	@ 4.0 "	@ 3.5"	@ 4.0"
SL900	500,000	# 20	# 21	# 28	# 31
SL900	600,000	# 15	# 17	# 25	# 29
SL900	700,000	# 8	# 9	#23	# 27
SL900	800,000	# 2	# 3	#19	# 21
SL900	900,000	15/64"	7/32"	# 16	# 18
SL1350	700,000	# 8	# 9	# 23	# 27
SL1350	800,000	# 2	# 3	# 19	# 21
SL1350	900,000	15/64"	7/32"	# 16	# 18
SL1350	1,000,000	¼"	15/64"	# 13	# 16
SL1350	1,100,000	17/64"	1/4"	# 10	# 13
SL1350	1,200,000	9/32"	17/64"	# 6	# 7
SL1350	1,350,000	19/64"	9/32"	# 1	# 2
SL1600	1,200,000	9/32"	17/64"	# 6	# 7
SL1600	1,350,000	19/64"	9/32"	# 1	# 2
SL1600	1,400,000	5/16"	19/64"	15/64"	7/32"
SL1600	1,500,000	21/64"	5/32"	¼"	15/64"
SL1600	1,600,000	11/32"	21/64"	17/64"	¼"

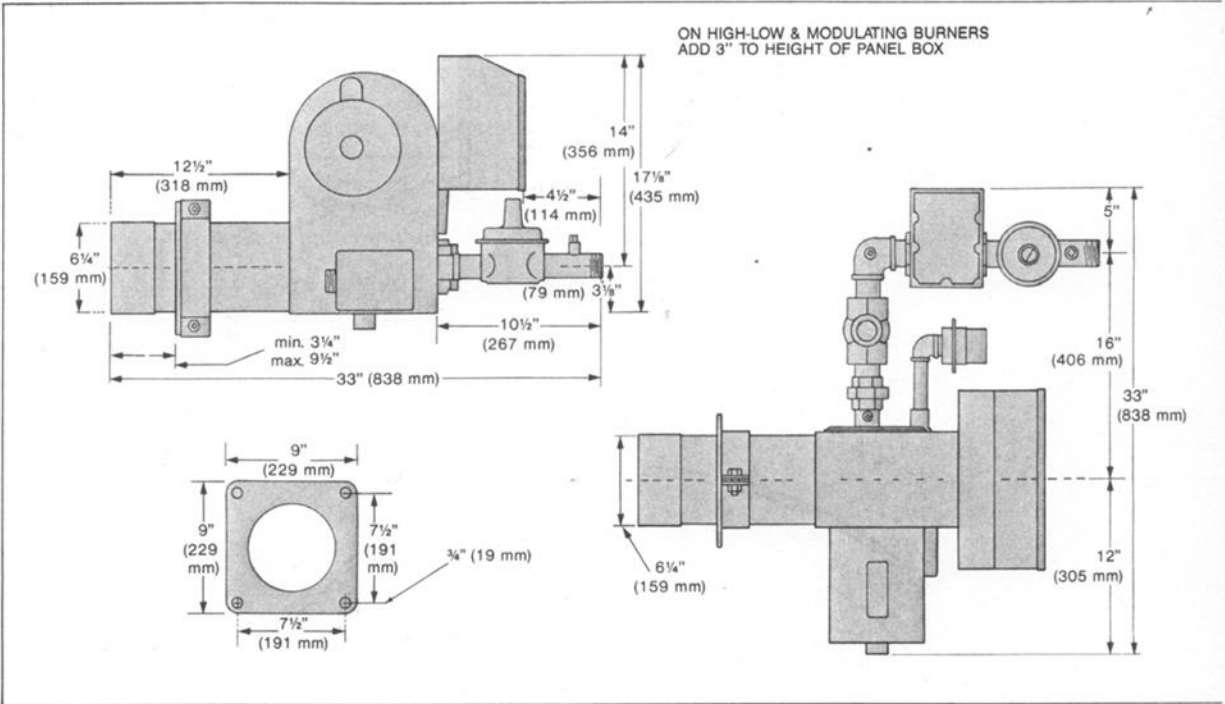


## **BURNER USING PROPANE GAS**

The standard burner has one safety shut-off valve which is suitable for operation on either Natural Gas or Propane up to the maximum permitted inlet pressure of 27 mbar (11" W.C.). Also the control box automatically ensures a 30 to 90 second pre-purge before each ignition.

However it should be remembered that Propane gas is heavier than air, in event of leakage through the valve (due to a fault or accumulation of dirt on the seating for example) the effect may be potentially more hazardous.

Therefore if there are any features of the installation likely to reduce the effectiveness of the pre-purge (e.g. if there is an airtight steel boiler connected to a low level discharge terminal, or the burner fires vertically downwards) or of natural ventilation (e.g. if the boiler is installed in a cellar which is airtight below ground level) then it is considered prudent to have an additional back up solenoid valve in the gas supply at the burner inlet. For this reason Fuel Master "SL" burners are equipped with a second valve, which is double seated with a proof of closure switch. This valve must be an approved type and be connected electrically in parallel with the existing shut off valve.



### Specifications and Capacities

Burner Model Number	*Ratings at 0.02 W.C. Furnace Pressure			Gas Train Size at Regul. Press. Listed Inches (mm)	Listed Gas Press. at Regul. Inches (kPa) (1.74)	Listed Gas Press. Propane Inches (kPa) (2.74)	Blower Motor H.P.	Approx. Crated Weight Lbs. (kg)
	M.B.H. Gas Input		Max. Boiler Output H.P. (kW)					
	Min.	Max.						
SL-900	500 (146.4)	900 (263.6)	21.5 (210)	1" (25.4)	7"(W.C.)	11" (W.C.)	1/2	160 (72.5)
SL-1350	700 (263.6)	1350 (395.4)	32.3 (316)	1 1/4" (31.8)	7"(W.C.)	11" (W.C.)	1/2	165 (74.8)
SL-1600	1200 (395.4)	1600 (468.6)	38.4 (375)	1 1/2" (38.1)	7"(W.C.)	11" (W.C.)	1/2	170 (77.1)

- When Ordering Specify**
- Intended fuel input
  - Gas type and pressure available
  - Flange setting
  - Electrical supply
  - Description of equipment to be fired
  - Firing sequence
  - Special details

Ratings based on 2000 ft. (609.6 m) above sea level.  
 De-rate burner 4% for each additional 1000 ft. (304.8 m) altitude.  
 H.P. Ratings based on 80% combustion efficiency and Maximum burner capacity.  
 Ratings based on Natural Gas @ 1000 BTU (.293 kWh).  
 Ratings based on Propane Gas @ 2500 BTU (.732 kWh).

### Standard Equipment 115 Volt 1 phase 60 cycle.

3450 rpm motor, squirrel cage blower, air switch, interrupted spark ignited system, lubricated firing cock or approved ball valve, main gas control valve, main gas pressure regulator.

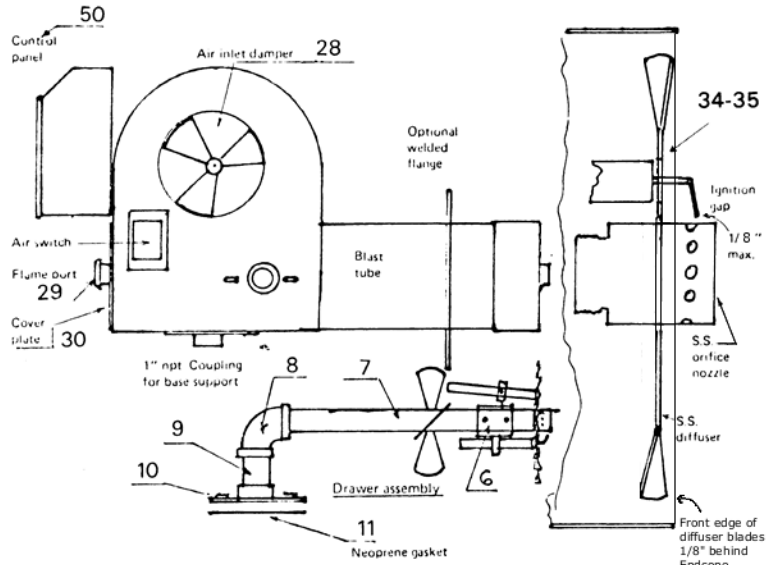
**Available in - On/Off, Hi-Lo, and Modulating Firing Sequences**

**Control System** — pre-purge — UV Scanned Fireye or Honeywell  
 Burner On & Flame Failure lites, On/Off switch, panel box, terminal strip.

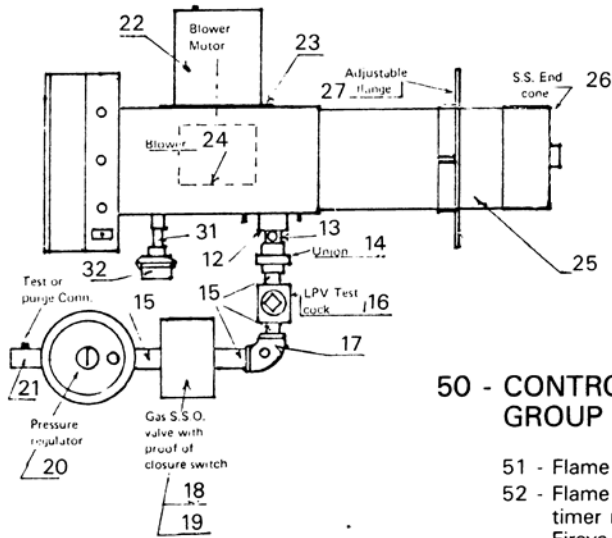
Orifices will be drilled to minimum input when required input is not specified.

## "Fuel-Master / Spark-Light" SL Series Parts Description

When ordering parts, -advise burner  
model and serial numbers



- 6 - Support bracket
- 7 - Drawer Pipe
- 8 - Elbow
- 9 - Nipple
- 10 - Flange
- 11 - Neoprene gasket
- 12 - Bushing
- 13 - Test Nipple
- 14 - Union
- 15 - Short Nipples
- 16 - Test cock
- 17 - Test elbow
- 18 - Gas valve Body
- 19 - Gas Valve Operator  
— Safety Shut-off  
Type with Proof of  
Closure Switch



### 50 - CONTROL PANEL GROUP

- 51 - Flame Safeguard
- 52 - Flame Safeguard timer module Fireye only
- 53 - UV Scanner
- 54 - SPST relay
- 55 - Terminal Strip
- 56 - On/off Switch
- 57 - Pilot Light — Red
- 58 - Pilot Light — White
- 59 - Ignition Lead
- 60 - Ignition Transformer
- 61 - Starter (3 Ph)
- 62 - Overload

- 20 - Gas Pressure Regulator
- 21 - Nipple
- 22 - Blower Motor
- 23 - Motor Mtg. Flange
- 24 - Blower Wheel
- 25 - Blast Tube & Housing
- 26 - End Cone
- 27 - Mounting Flange
- 28 - Air Inlet Damper Set
- 29 - Nut and Window Set
- 30 - Cover Plate
- 31 - Nipple
- 32 - Air Switch
- 33 - Air inlet damper box
- 34 - Air Diffuser (Std)
- 35 - Air Diffuser (Scotch)

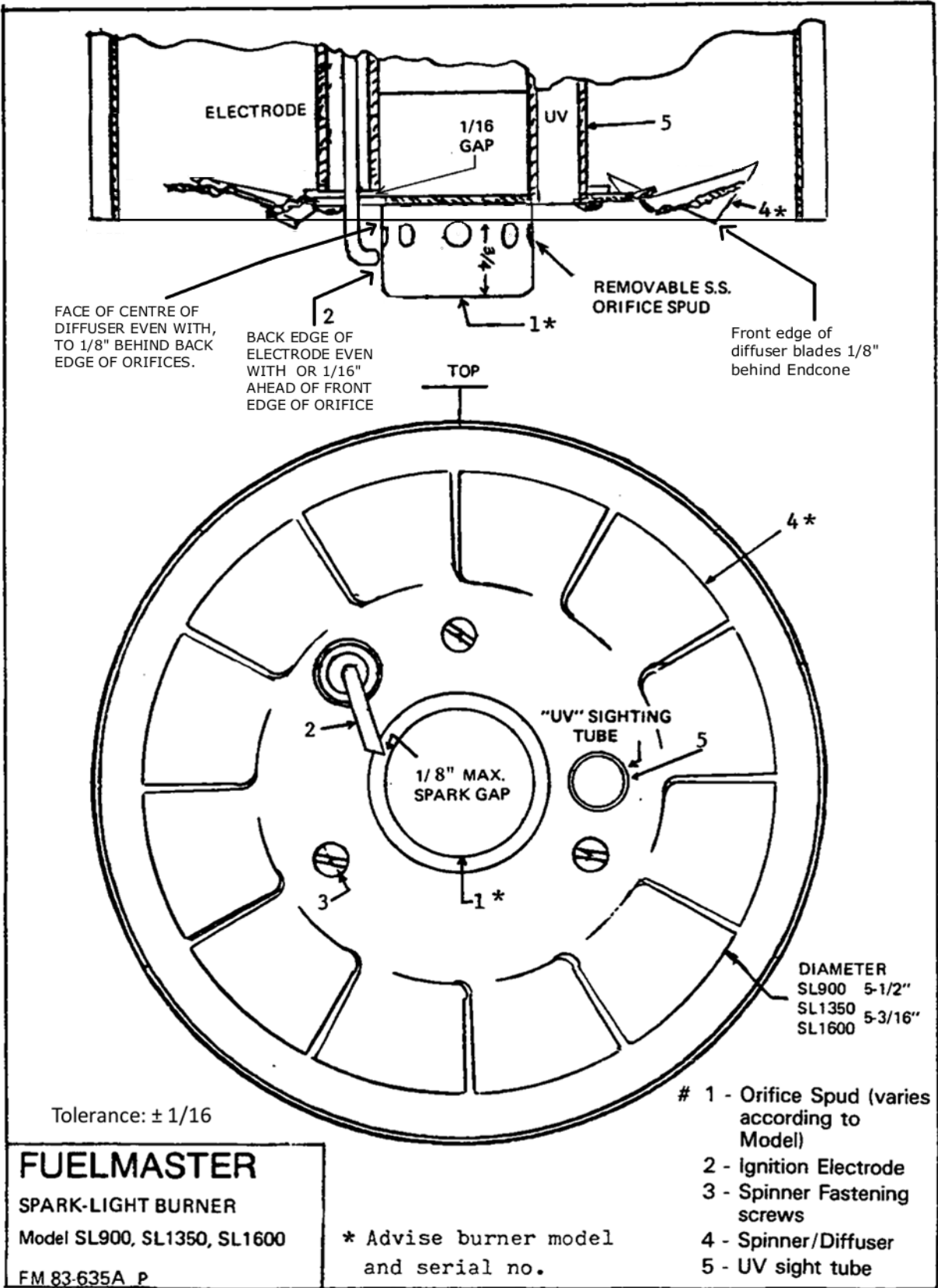
## FUELMASTER

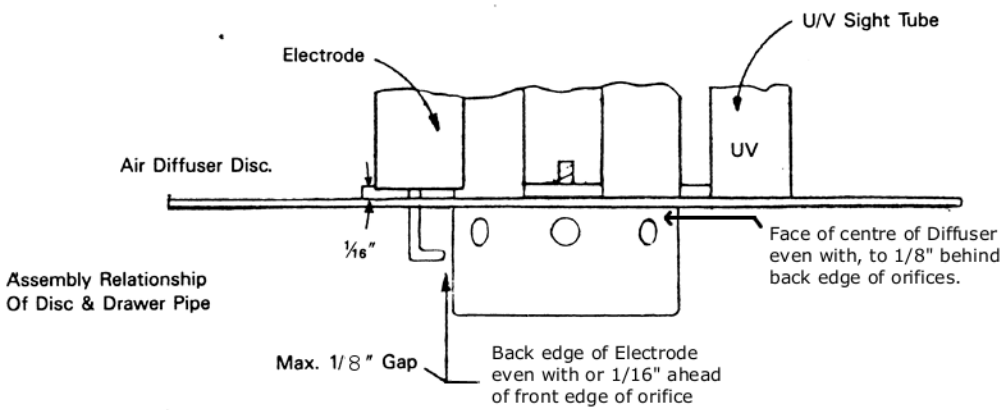
SPARK-LIGHT GAS BURNERS ON-OFF

Model SL900, SL1350, SL1600

FM 83-634 -P

PBL

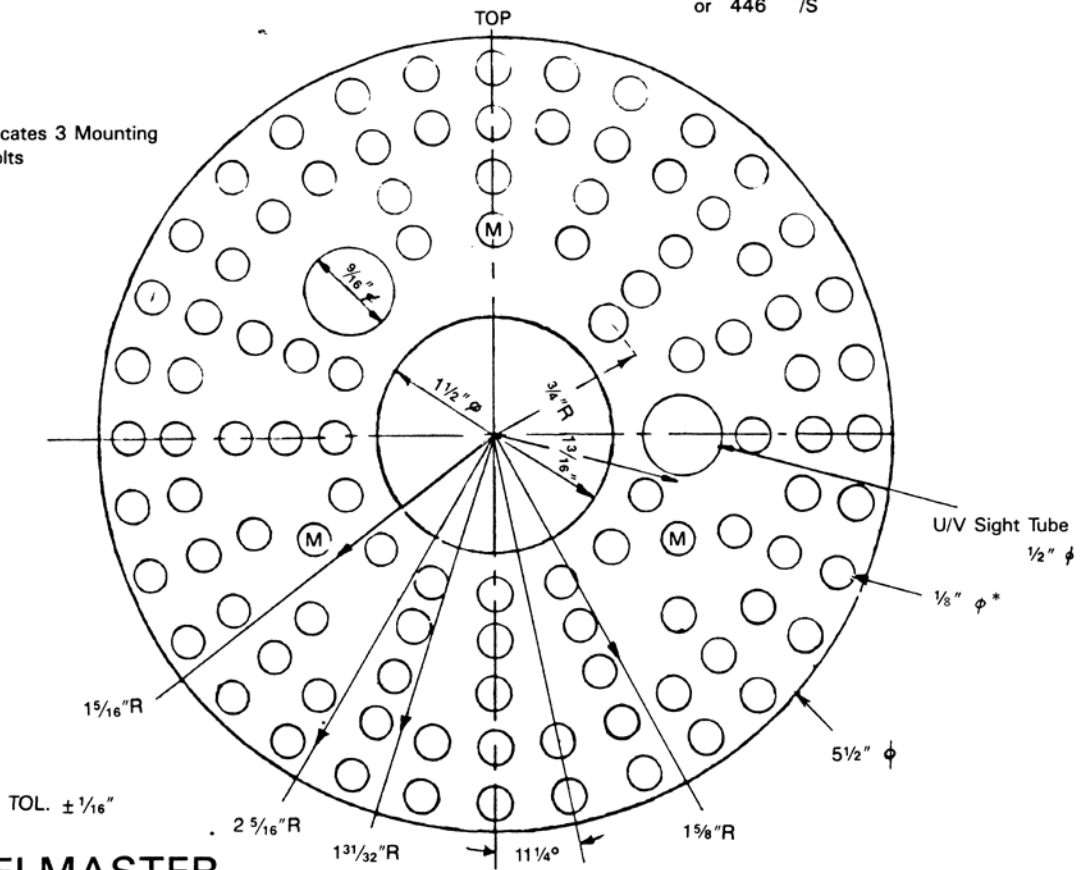




Assembly Relationship  
Of Disc & Drawer Pipe

Discs. Of 16 GA.  
18SR  
or 446 S/S

M - Locates 3 Mounting  
Bolts



# FUELMASTER

SPARK-LIGHT BURNER

Model FS900, FS1350, FS1600

FM 88-887

\* 1/8 initially, number & size can be adjusted to suit firing rate