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# LC2300M

## Gas Burner

Manual 63899-002 | Revision A | Publication Date: 3/20/24



## SPECIFICATIONS

<b>Burner Model:</b>	LC2300M	<b>Mounting Flange:</b>	Fixed Flange
<b>Minimum Input:</b>	60,000 Btu/hr (17.5 kW)	<b>Air Tube Diameter:</b>	6.25 inches (159 mm)
<b>Maximum Input:</b>	2.3 MMBtu/hr (703 kW)	<b>Air Tube Insertions:</b>	8 inches (203 mm) Maximum with 9 inch (229 mm) Air Tube
<b>Standard Voltage:</b>	120 Vac / 60 Hz 1 Phase	<b>Flame Safety:</b>	Single-Rod Ionization UV Scanner - 1000185-SER (Optional)
<b>Supply Line Pressure Required:</b>	(see Table 1&2.)		

**Ignition:** 6,000 Vac Direct Spark Ignition. Standard burners are shipped with the ignition transformer mounted to the burner. If the transformer is to be remotely mounted, the ignition wire must not exceed 36" (914.4mm) per UL795.

De-rate maximum input for altitude over 2000 ft. (610 m) by 4% each 1000 ft. (305 m) above sea level.

### INSTALLATION OF BURNER

INSTALLATION OF THE BURNER MUST BE DONE BY A QUALIFIED INSTALLER IN ACCORDANCE WITH REGULATIONS OF THE NATIONAL FUEL GAS CODE, NFPA 54/ANSI Z223.1, AND IN COMPLETE ACCORDANCE WITH ALL LOCAL CODES AND AUTHORITIES HAVING JURISDICTION.

INCORRECT INSTALLATION, ADJUSTMENT, OR MISUSE OF THIS BURNER COULD RESULT IN DEATH, SEVERE PERSONAL INJURY, OR SUBSTANTIAL PROPERTY DAMAGE AND WILL VOID THE WARRANTY.

A QUALIFIED INSTALLER IS THE PERSON WHO IS RESPONSIBLE FOR THE INSTALLATION AND ADJUSTMENT OF THE EQUIPMENT AND WHO IS LICENSED TO INSTALL GAS-BURNING EQUIPMENT IN ACCORDANCE WITH ALL CODES AND ORDINANCES.

**THESE INSTRUCTIONS SHOULD BE AFFIXED TO THE BURNER  
OR ADJACENT TO THE HEATING APPLIANCE.**



The safety of you and others depends upon you thoroughly reading and understanding this manual. If you have questions or do not understand the information presented in this manual, **please call Wayne Combustion Systems or see [www.waynecombustion.com](http://www.waynecombustion.com)**.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. The meaning of this safety alert symbol is as follows: Attention! Become alert! Your safety may be at risk. The message that appears next to the warning describes the hazard, which can be either written or pictorially presented. NEVER remove or tamper with the warning labels, safety devices or guards fitted on the unit.

Wayne Combustion Systems is NOT responsible for any bodily injury and/or property damage that may result from operation outside of the stated operating conditions for which this unit was intended.

#### HAZARD DEFINITIONS:



Indicates a hazardous situation, which, if not avoided, will result in **death or serious bodily injury**.











Indicates a hazardous situation, which, if not avoided, could result in **death or serious bodily injury**.





Indicates a hazardous situation, which, if not avoided may result in **minor or moderate bodily injury**.



Indicates a situation that may result in equipment-related damage.

HAZARD LEVEL	PICTOGRAM	TYPE	HAZARD EXPLANATION
		Fire or Explosion	<p><b>Failure to follow safety warnings exactly could result in serious injury, death or property damage. Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.</b></p> <p>WHAT TO DO IF YOU SMELL GAS:</p> <ul style="list-style-type: none"> <li>• Open windows.</li> <li>• Do not try to light any appliances.</li> <li>• Do not touch electrical switches; do not use any phone in your building.</li> <li>• Extinguish any open flame.</li> <li>• Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.</li> <li>• If you cannot reach your gas supplier, call the fire department.</li> </ul>
		Electric shock or burn	<p><b>High voltages are present in this equipment. Follow these rules to avoid electric shock:</b></p> <ul style="list-style-type: none"> <li>• Use only a properly grounded circuit. A ground fault interrupter is recommended.</li> <li>• Do not spray water directly on burner.</li> <li>• Turn off power before servicing.</li> <li>• Read the owner's manual before using.</li> </ul>
		Overheating	<p><b>Should overheating occur:</b></p> <ul style="list-style-type: none"> <li>• Shut off the manual gas control to the appliance.</li> <li>• DO NOT shut off power to the equipment, allow blower to continue running.</li> </ul>
		Carbon Monoxide Poisoning	<p><b>Carbon monoxide is a colorless, odorless gas that can kill. Follow these rules to control carbon monoxide:</b></p> <ul style="list-style-type: none"> <li>• Do not use this burner if in an unvented, enclosed area. Carbon monoxide may accumulate.</li> <li>• Do not adjust the pressure regulator. High pressures produce carbon monoxide.</li> </ul>

			<ul style="list-style-type: none"> <li>• Check flue gases for carbon monoxide. This check requires specialized equipment.</li> <li>• Allow only qualified burner service persons to adjust the burner. Special instruments and training are required.</li> <li>• Read the burner manual before using.</li> </ul> <p><b>CARBON MONOXIDE POISONING:</b> Early signs of carbon monoxide poisoning are similar to the flu with headaches, dizziness, weakness, nausea, vomiting, sleepiness, and confusion. If you suspect carbon monoxide poisoning, get outside to fresh air immediately, and then call 911. Some people are more affected by carbon monoxide than others. These include pregnant women, people with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes. Propane/LP gas and natural gas are both odorless. An odor-making agent is added to each of these gases. The odor helps you detect a gas leak. However, the odor added to these gases can fade. Gas may be present even though no odor exists.</p>
 <b>WARNING</b>		Proposition 65 material	This product can expose you to chemicals, including lead, nickel, carbon monoxide and sulfur dioxide, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information, go to <a href="http://www.p65Warnings.ca.gov">www.p65Warnings.ca.gov</a> .
 <b>NOTICE</b>		Special Requirements	When contacting Wayne Combustion Systems for service information, please have the burner specification number and model number when calling or writing.

**IF ANY INSTRUCTIONS IN THE MANUAL ARE NOT CLEAR, CONTACT WAYNE COMBUSTION SYSTEMS AT 1-260-425-9200 FOR ASSISTANCE.**

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## SECTION I

## INSTALLATION

### A. GENERAL

Installation of these power gas burners must conform to local codes, or in their absence, the National Fuel Gas Code, ANSI Z223.1/NFPA 54.

In CANADA, “The equipment shall be installed in accordance with the Provincial Installation Requirements, or in their absence, the CGA B149.1 and B149.2 Installation Codes shall prevail.” Authorities having jurisdiction should be consulted before installations are made.

ANSI or local installation code compliance is the sole responsibility of the qualified installer.

### B. VENTILATION

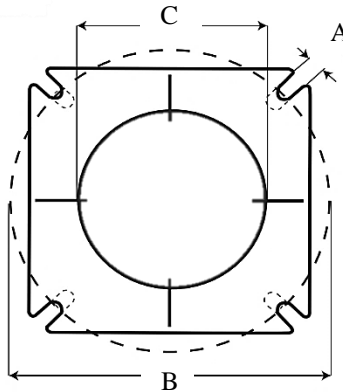
The LC2300M burner models covered by this manual shall not be installed in an appliance located where normal air circulation or infiltration is limited in providing all the air necessary for proper combustion and draft hood dilution air.

When the heating appliance is installed in a tightly closed room without ventilation openings to outdoors, or other rooms, provisions shall be made for supplying air for combustion through special openings, one near the floor line and the other near the ceiling. Each is to be sized based on one square inch (645.2 mm<sup>2</sup>) or more of free area each 1,000 BTU (0.29 kW) input per hour.

### C. MOUNTING TO EQUIPMENT

Mount the burner to the intended application by using 4 bolts within the intended slots. If new mounting holes are needed, use the flange mount (Figure 1 shown below) as a template.

**NOTE: THE BURNER AIR TUBE MUST NOT BE ALLOWED TO EXTEND INTO THE CHAMBER; IT MUST BE SET 1/8 INCH (3.2MM) SHORT OF THE INSIDE SURFACE.**



Mounting Pattern and Locations for LC2300M

**Figure 1**

A	B	C
0.55"	8.26"	6.69"

## D. GAS PIPING

**NOTE: ALL PIPING MUST COMPLY WITH STATE AND/OR LOCAL CODES. THE AVAILABLE GAS SUPPLY PRESSURE SHOULD BE WITHIN THE MINIMUM AND MAXIMUM PRESSURES SHOWN IN THE BURNER SPECIFICATIONS. IF THE GAS SUPPLY PRESSURE EXCEEDS THE 48" W.C. (7 KPA) MAXIMUM, AN INTERMEDIATE MAIN GAS REGULATOR MUST BE INSTALLED AHEAD OF THE MAIN GAS MANUAL SHUTOFF VALVE.**

**NOTE: FAILURE TO INSTALL THE INTERMEDIATE GAS REGULATOR WILL RESULT IN GAS LEAKAGE FROM BURNER GAS VALVE.**

The gas supply piping to the burner should branch off from the main gas supply line as close to the gas meter as possible. Do not connect to the bottom of a horizontal section.

Use new black iron pipe and malleable fittings free from burrs and defects. Use pipe joint compound resistant to LP gases.

A 1/4" NPT pressure port accessible for test gauge connection must be added by the customer for determining gas supply pressure to the burner. Test new supply piping for leaks.

### **NOTICE**

During pressure test for leaks in supply piping, the burner's gas train must be disconnected to prevent exposing the gas train to pressure greater than 1psig (6.9kPaG), possibly damaging the regulator and/or valves and voiding the warranty.

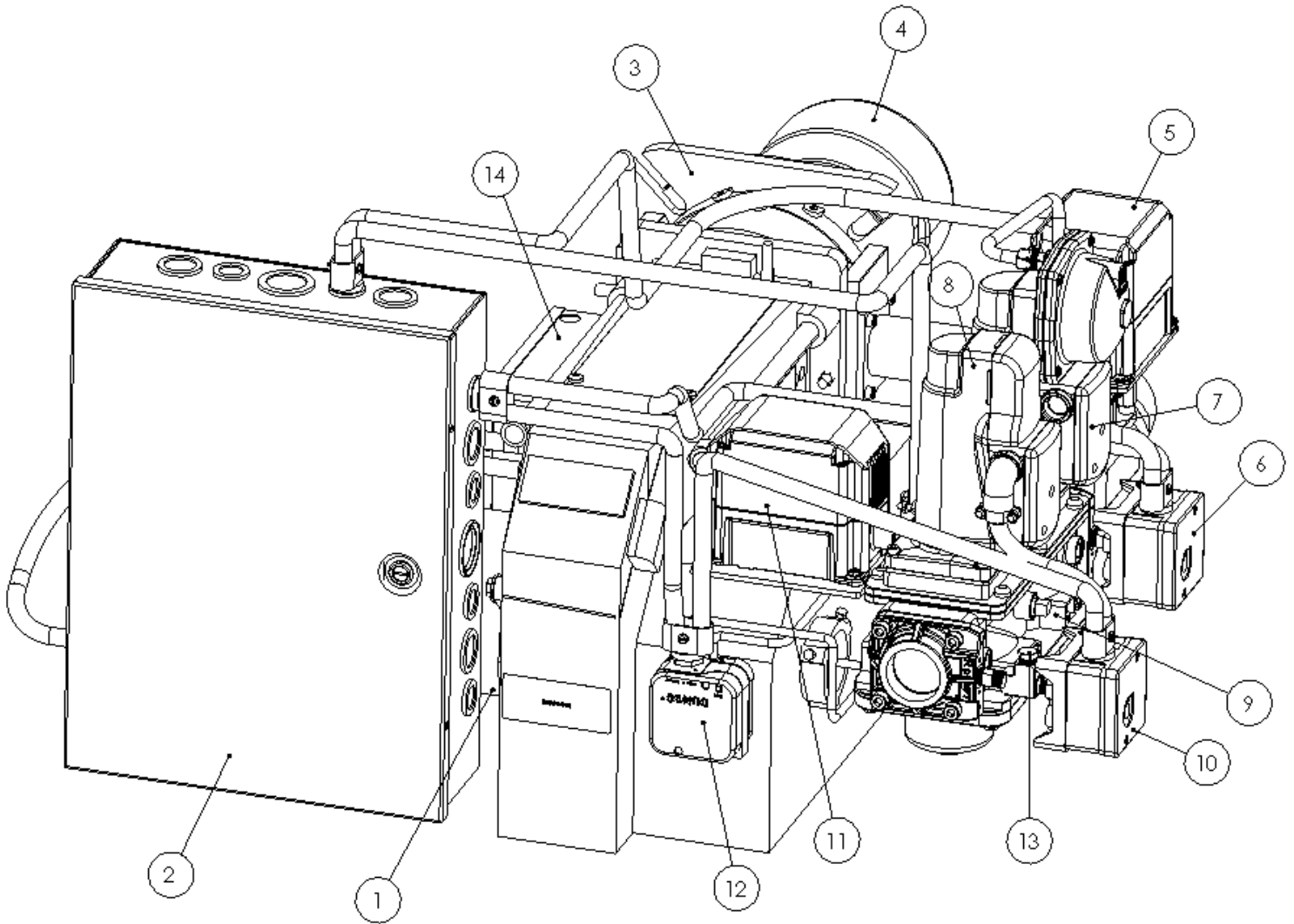
## E. ELECTRICAL SUPPLY

The installation must be wired and grounded in accordance with local codes or in their absence, with the National Electric Code ANSI/NFPA No. 70-2002 or latest edition.

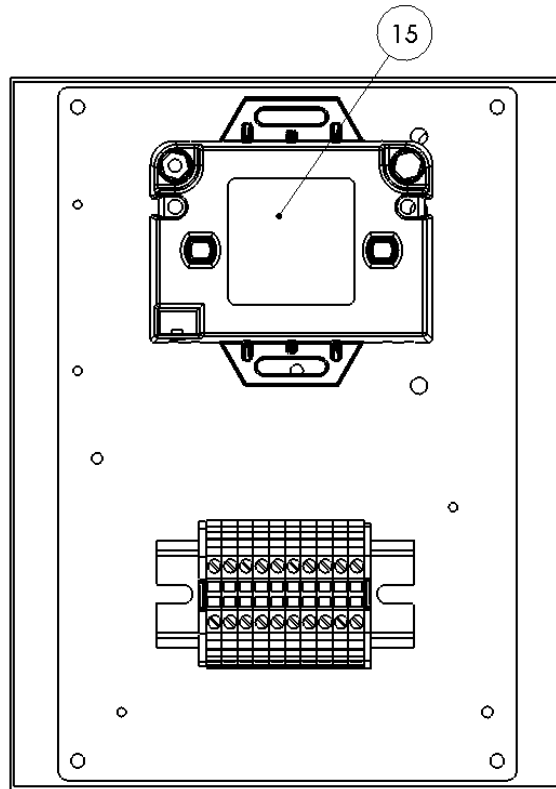
In CANADA, all wiring shall be done in accordance with the Canadian Electrical Code.



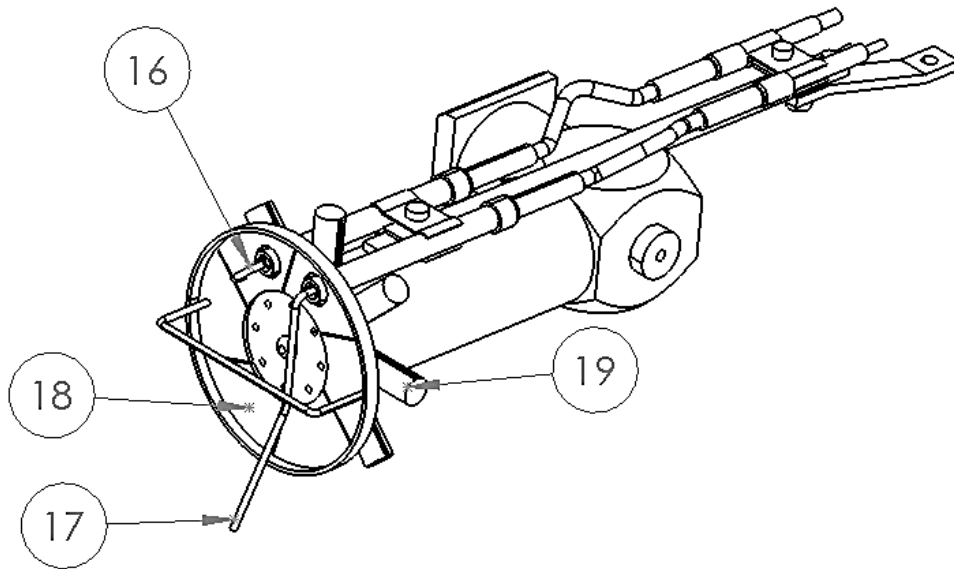
## F. BURNER COMPONENTS



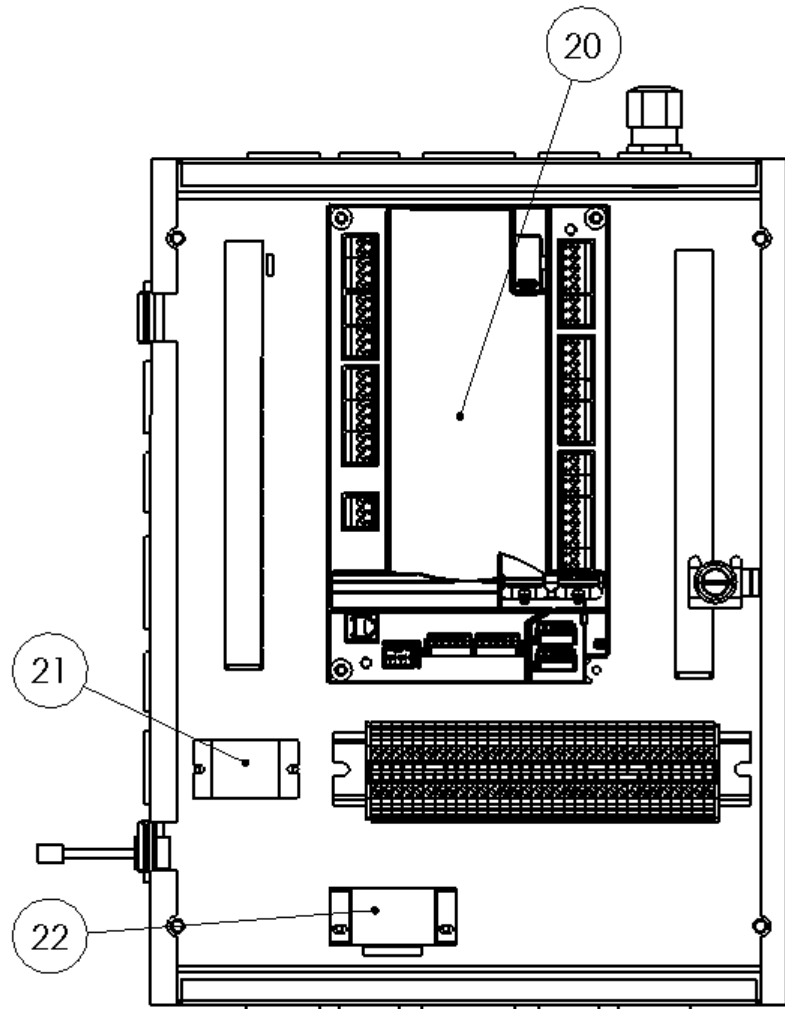
1. Motor
2. Remote Electrical Box
3. Mounting Flange
4. Air Tube
5. Damper Motor - Gas
6. High Pressure Switch – Gas
7. Regulating Gas Valve
8. Safety Gas Valve
9. Double Valve Body
10. Low Pressure Switch – Gas
11. Damper Motor – Air
12. Pressure Switch – Air
13. Line Pressure Port (Customer Added)
14. Fixed Electrical Box



15. Ignition Transformer (Found Within Item #14 – Fixed Control Box)



- 16. Spark Electrode
- 17. Flame Rod
- 18. Air Plate
- 19. Nozzle



- 20. LMV3 Control Unit
- 21. Motor Relay
- 22. Flame Boost Transformer

### F.1 LMV3 CONTROL UNIT

The LMV control system is a control unit that can be used with various burner types. This unit is fully adjustable and is paired with multiple other system components.

The LMV can be used for:

1. Valve proving
2. Electronic air – fuel ratio controls
3. VSD air fans
4. Modbus interface

The burner management system is operated by the AZL display. The AZL contains a display screen and menu driven operations that allow for both straightforward control and diagnostics of the burner system. Passwords are used for various parameter levels to prevent unauthorized access. Within the AZL it is possible to select fuel train types, program times, inputs, and outputs. This fully enables the user to define the optimum choices for their individual application.

## F1-1 PRE-REQUISITES FOR BASIC LMV3 SYSTEMS

Before the burner can be classified as in good working condition, there are various pre-requisites that must be met for the LMV control, burner, and application.

1. Burner must be in good condition, meaning;
  - a. The head must not be melted, cracked, or otherwise damaged.
  - b. If applicable, the UV scanner must be positioned correctly to sight the flame. To limit interference the sight glass must be removed.
2. Actuators must be mounted properly. Specific attention must be given to:
  - a. Actuator shafts must accommodate for angular and parallel shaft misalignment.
  - b. Have little to no backlash.
  - c. Be robust enough to absorb torque applied (27 in/lbs) to the actuator without causing damage.
  - d. The actuator mounting brackets must be rigid enough to prevent amplifying burner vibration.
  - e. The actuator mounting brackets must also not distort under torque applied.
3. All wiring to and from the LMV3 control meets applicable local and national standards.
  - a. The voltage supplied to the LMV3 control must be within 102VAC and 132VAC and between 47-63Hz.
4. Fuel supply must be sufficient to support high fire operation. The gas train must be sized properly.
5. A gas analyzer that has been calibrated must be used for setting proper combustion.
6. A method/calculation for determining firing rate must be known and used. This is used to set the fuel flow for each of the 1-9 setpoints.

## F.2 SQM DAMPER MOTOR

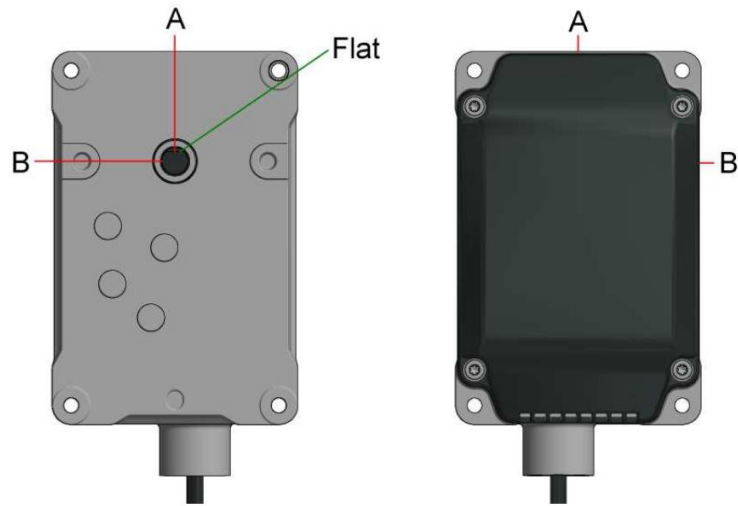
SQM damper motors, with programmable operation direction, are used on the burner to control both gas and air volumes. Within the AZL display, parameters 601 and 602 can be modified to change operational direction and reference direction.

### F.2-1 OPERATIONAL DIRECTIONS

1. Counterclockwise Rotation - When the actuator is at 0°, the flat of the “D” shaft is perpendicular to line **A**. When the position of the actuator reaches 90°, the flat of the “D” shaft will be perpendicular to line **B**.
2. Clockwise Rotation – When the actuator is at 0°, the flat of the “D” shaft is perpendicular to line **B**. When the position of the actuator reaches 90°, the flat of the “D” shaft will be perpendicular to line **A**.

**NOTICE**

**DO NOT ADJUST ANY PARAMETER SETTINGS OF THE AIR SHUTTER ORIENTATION DIRECTION. DOING SO WILL CAUSE DAMAGE TO BOTH THE AIR SHUTTER AND THE ACTUATOR MOTOR.**



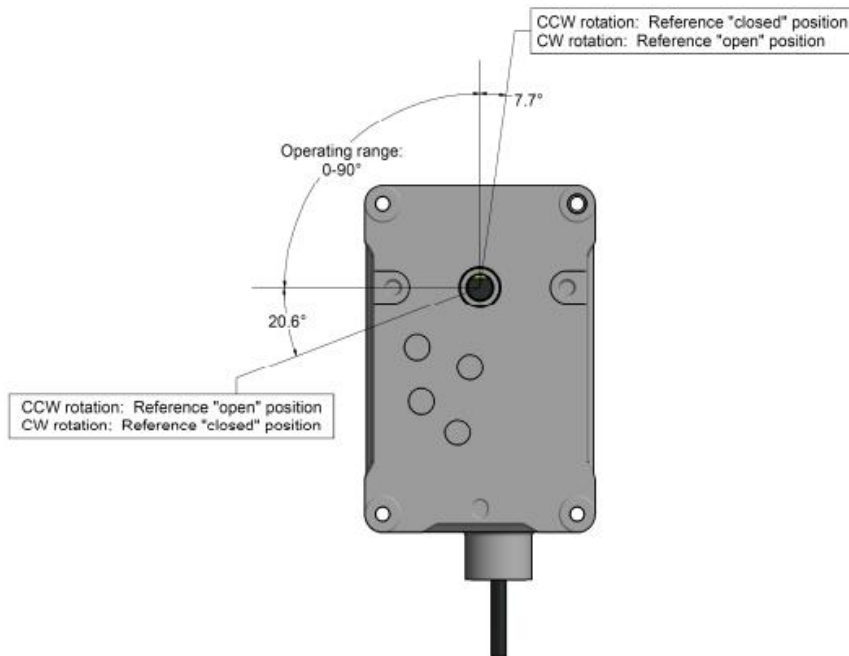
Counterclockwise vs. Clockwise Rotation

**Figure 2**

### F.2-2 REFERENCE DIRECTION

All SQM actuators have a limited range of motion between  $0^\circ$  -  $90^\circ$ . Means of operation mandates the actuator to re-home before each startup. This requires the actuator to rotate the “D” shaft to a different position either less than  $0^\circ$  or greater than  $90^\circ$ . Figure 3 below gives a more detailed view.

1. Reference Open – Based on the direction of operation rotation, rotating to a position greater than  $90^\circ$  is called referencing the “open” side.
2. Reference Closed - Based on the direction of operation rotation, rotating to a position less than  $0^\circ$  is called referencing the “closed” side.



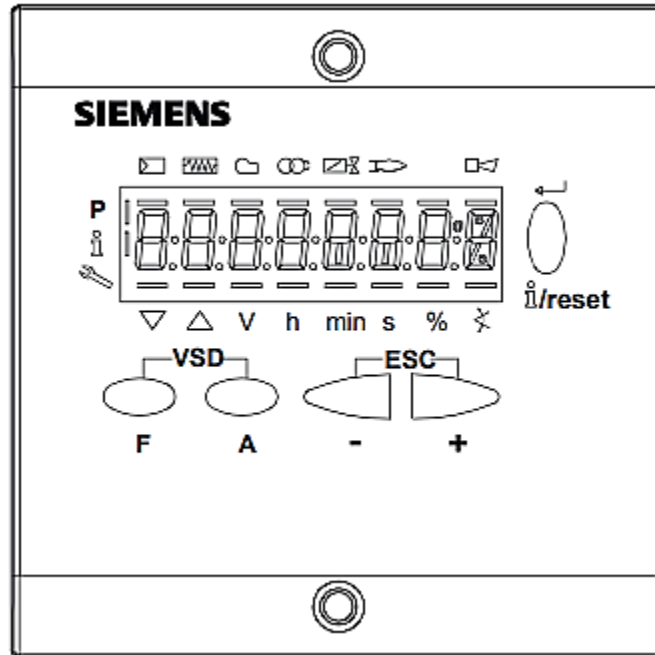
Referencing Open vs. Referencing Closed

**Figure 3**

**NOTE: IN MOST APPLICATIONS, VALVES AND DAMPERS CAN TYPICALLY ROTATE PAST THE OPEN POSITION (90°) WITHOUT INTERFERENCE. THEREFORE, IT IS MOST COMMON TO SET ALL ACTUATOR REFERENCE POSITIONS TO “OPEN”.**

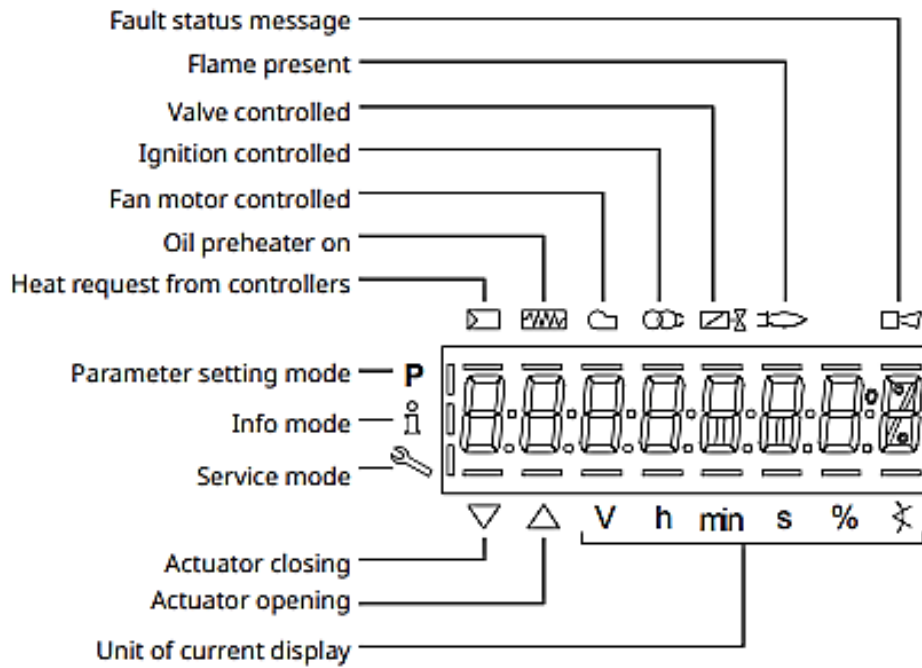
### F.3 AZL DISPLAY

#### F.3-1 EXPLANATION OF DISPLAY AND BUTTONS



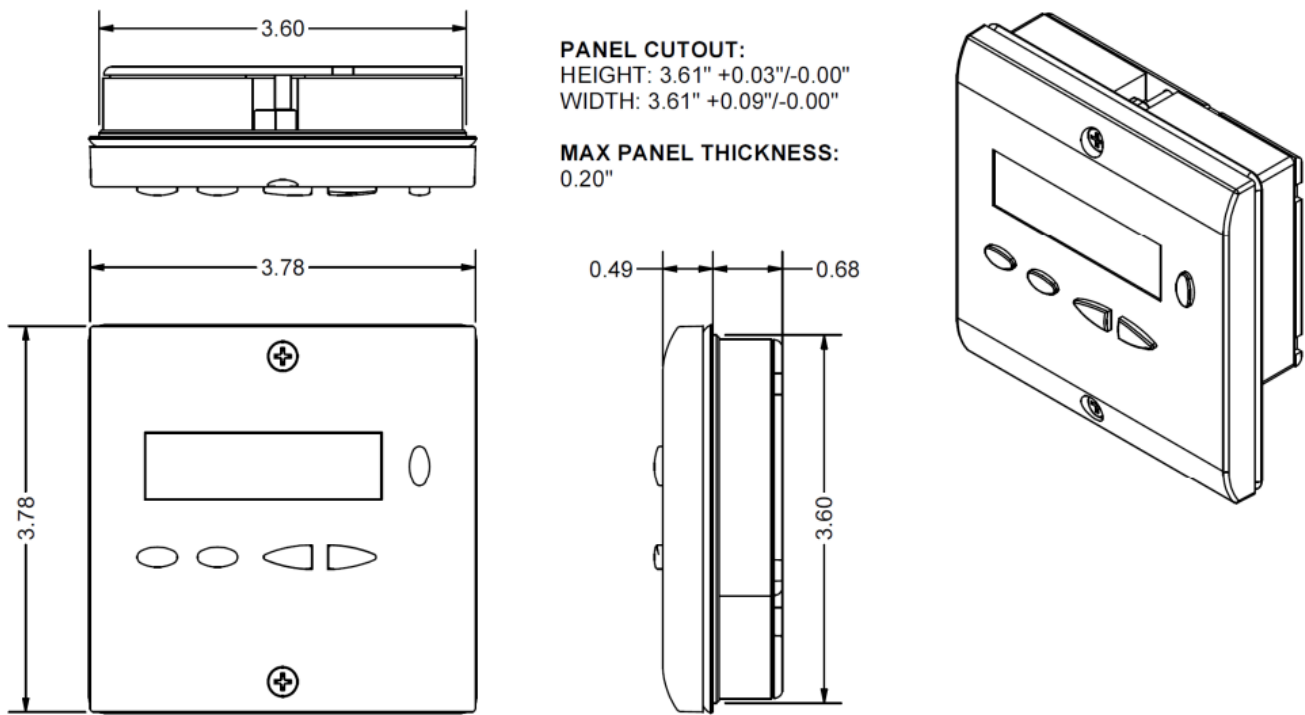
AZL Unit  
Figure 4

Button	Function
F (Fuel)	For adjusting the fuel actuator. (Keep 'F' pressed and adjust the actuator value by holding "+/-").
A (Air)	For adjusting the air actuator. (Keep 'A' pressed and adjust the actuator value by holding "+/-").
A&F: VSD	For changing to parameter setting - mode P. (Press simultaneously "F&A").
Info/Enter/Reset	For navigating through information or service mode; selecting (hold button for <1s), for changing to a lower menu level (hold button for 1...3s), for changing to a higher menu level (hold button for 3...8s), for changing to operating menu (hold button for >8s). This button can be used as an enter key in parameter setting mode and can be used as reset in the event of a fault.
Minus (-)	For decreasing the value. For navigating through curve adjustments during info and service mode.
Plus (+)	For increasing the value. For navigating through curve adjustments during info and service mode.
Plus & Minus: ESC	No selection of value. (Hold "+/-" simultaneously).



Meaning of AZL Icons  
**Figure 5**

To allow for installation flexibility, the AZL display is not pre-mounted on spec number 1000108-600. For panel cutout size, please reference Figure 6 below. Spec 1000108-400 and 1000108-401 contain the AZL display already mounted.



AZL Dimensions

**Figure 6**

## **G. MAIN BURNER INSTALLATION**

The LC2300M power gas burners are approved for use with natural and LP gas only.

### **G.1 GENERAL INSTRUCTION**

Installation must be completed in accordance with current instructions. The installer must be familiar with all regulations, so the installation meets the necessary requirements of the local authorities. Installation, assembly, and set up must be performed to obtain optimal function. Only gas intended for the burner may be used.

### **G.2 INSPECTION AND PREPARATION**

It is the installer's responsibility to instruct the end user about the functions of the burner and the entire system. The system must be maintained following the timeline specified by the service schedule found in SECTION IV - SERVICE. If the burner is in an unclean environment, cleaning and service should be done on a more frequent schedule. Check that the overall burner size and capacity meet that of the intended application.

### **G.3 GAS AND ELECTRIC CONNECTION**

To maintain operational safety, there are a few points that must be considered. The burner and its components must also be approved for the specified gas pressure. All installations for the burner must be carried out in accordance with current standards. All gas lines should be installed so that any routine service and maintenance can be easily performed on both the burner and the intended application. Before installation, all electrical connections must be disconnected. This allows the burner installation to be electronically isolated. Connections must be made according to current regulations. Electrical connections must conform to the wiring diagram provided.

## **H. BURNER SETUP**

**Table 1: LC2300M with 1 ½" Gas Line - Natural Gas**  
(Siemens VGD 1" Double Valve Body with SKP15 and SKP25 Regulators)

Firing Rate (1000's Btu/hr)	Combustion Air Shutter Setting (0-90*)	Butterfly Valve Gas Actuator Setting (0-90*)	Target O <sub>2</sub> (%)	Manifold Pressure Inch of Water	Minimum Inlet Pressure Inch of Water (Burner Running)	Dimension "A" Setting (Figure 6)
57	0	4.5	3-4	9	10	3-3.25"
110	0	10	3-4	9	10	3-3.25"
250	5.0	17	3-4	9	10	3-3.25"
550	26.5	30	3-4	9	10	3-3.25"
1000	42.5	43.5	3-4	9	10	3-3.25"
1400	57	52	3-4	9	10	3-3.25"
1800	68	58.5	3-4	9	10	3-3.25"
2000	82.5	66.5	3-4	9	10	3-3.25"
2300	90	75	3-4	9	10	3-3.25"

\*For all firing rates above, a yellow regulator spring, part #1000176 (provided) is used.



**Table 2: LC2300M with 1 ½' Gas Line - L.P. Gas**  
(Siemens VGD 1" Double Valve Body with SKP15 and SKP25 Regulators)

Firing Rate (1000's Btu/hr)	Combustion Air Shutter Setting (0-90*)	Butterfly Valve Gas Actuator Setting (0-90*)	O <sub>2</sub> (%)	Manifold Pressure Inch of Water	Minimum Inlet Pressure Inch of Water (Burner Running)	Dimension "A" Setting (Figure 6)
57	0	1.8	3-4	9	10	3-3.25"
110	0	4.0	3-4	9	10	3-3.25"
250	5	6.8	3-4	9	10	3-3.25"
550	26.5	12.1	3-4	9	10	3-3.25"
1000	42.5	17.5	3-4	9	10	3-3.25"
1400	57	20.9	3-4	9	10	3-3.25"
1800	68	23.5	3-4	9	10	3-3.25"
2000	82.5	26.8	3-4	9	10	3-3.25"
2300	90	30	3-4	9	10	3-3.25"

\*For all firing rates above, a yellow spring, part # 1000176 (provided) is used.

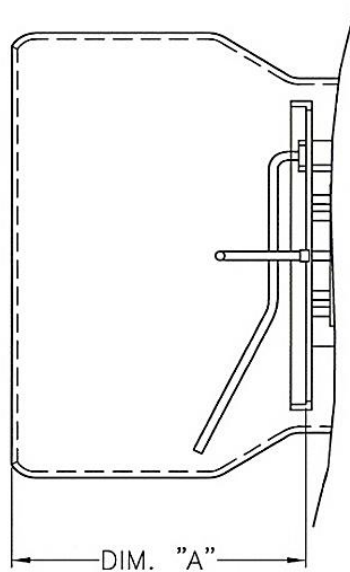
**NOTES ON TABLES:**

- Combustion Air Shutter Setting is the position of the air shutter from 0 to 90 degrees.
- O<sub>2</sub>% is the percentage of oxygen measured in flue products.
- Manifold Pressure is the gas pressure measured from the pressure tap on the back of the SKP25 regulating gas valve. (Figure 8 ahead)
- Minimum Inlet Pressure is the minimum gas supply pressure to the gas train necessary to obtain the desired flow rate. Inlet supply pressures up to 48 in w.c. are permitted.

## H.1 BURNER HEAD ADJUSTMENT:

From Tables 1 and 2, find the Burner Head Setting (Dimension “A”) for the desired flow rate at which the burner will be operating. Referencing Figure 8, adjust the burner head by loosening the both the jam nut that locks the burner head adjusting screw and the black nut along the side of the burner. Without loosening the nut along the side, the adjustment screw mounting bracket is likely to break.

Using a 5mm Allen wrench, adjust the burner head while measuring from the end of the air tube to the front of the burner head, referencing Figure 7. Once Dimension “A” is achieved, re-tighten the jam nut.



Burner Head Setting Dimension “A”

**Figure 7**

**NOTE: BURNER HEAD SETTING WILL FACTORY SET ‘DIM A’ BETWEEN 3” AND 3.25”. BASED ON APPLICATION, FURTHER SCREW ADJUSTMENT MAY BE REQUIRED TO ADJUST FLAME SHAPE (REFERENCE FIGURE 8). THE LARGER THE HEAD SETTING, THE SHORTER AND BUSHIER THE FLAME. THE SMALLER THE SETTING, THE LONGER AND LEANER THE FLAME.**

Burner Head  
Adjustment  
Screw and Nut



Burner Head Adjustment  
**Figure 8**

### **H.2 AIR SHUTTER ADJUSTMENT:**

The air shutter adjustment is programmed electronically in the settings of the AZL Display and may vary by application. Stock air shutter settings according to desired BTU/hr ratings are provided in Tables 1 and 2. Based on each burner application, air shutter settings may change from those pre-set into the AZL.

### **H.3 BURNER MOUNTING:**

Utilizing the integral mounting flange, fasten the burner to the heating appliance as specified by the appliance manufacturer using either the provided gasket or installer supplied appropriate material to ensure gas tight seal. The burner can be mounted horizontally or vertically, but should not be inverted.

### **H.4 GAS TRAIN CONNECTION:**

The VGD Double Valve Body has arrows on the housing. The arrow should be pointing in the intended direction of gas flow. When making connections that utilize NPT threads, use pipe joint compound that is resistant to the effects of LP gases. Using new black iron pipe and malleable fittings, connect the gas supply piping to the inlet of the gas train. Refer to SECTION I-D. GAS PIPING.

#### **NOTICE**

The gas train, and all its safety components, should be leak tested after installation. By installing a 1/4" NPT fitting within the VGD valve body, it is possible to isolate and test the gas valve. The remaining train including all safety components, should be tested for leaks and functionality at regular intervals.

#### **NOTICE**

**GAS TRAINS ARE HEAVY, CAUSING STRESS TO THE GAS CONNECTIONS ON THE BURNER. IT IS SUGGESTED THE GAS TRAIN BE SUPPORTED TO MINIMIZE THE POTENTIAL FOR STRESS ON THE BURNER'S PIPING CONNECTIONS.**

## H.5 ELECTRICAL CONNECTIONS:

The installation must be wired and grounded in accordance with local codes or in their absence, with the National Electric Code ANSI/NFPA No. 70-2002 or latest edition.

In CANADA, all wiring shall be done in accordance with the Canadian Electrical Code.

## H.6 SAFETY SYSTEM

The safety system (Including hatches, doors, water levels, pressure, and temperature systems) must be installed according to current regulations. Power cables for the safety system must be separated so incoming and outgoing signals do not cross within the same cable.



**LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION. VERIFY PROPER OPERATION AFTER SERVICING.**

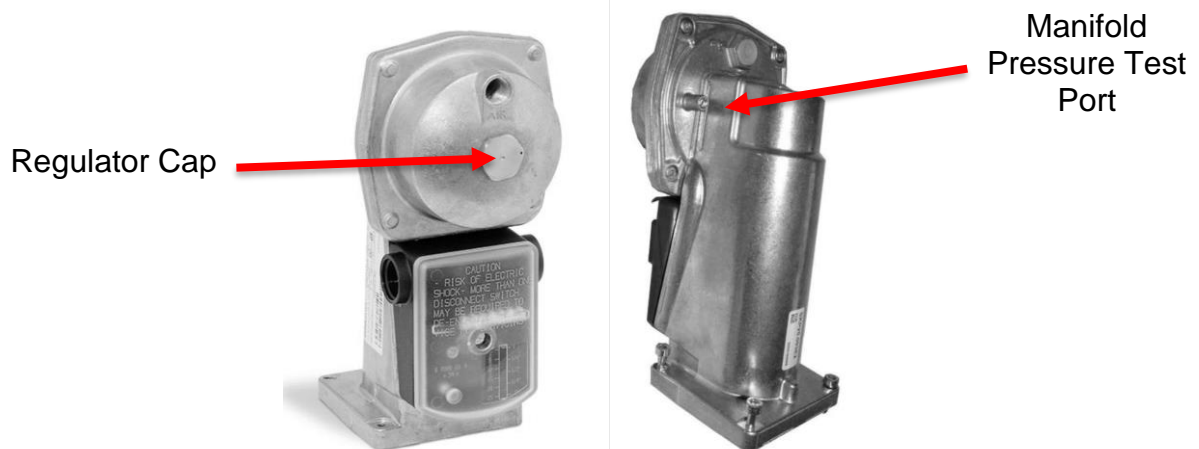
**NOTICE**

**IF ANY OF THE ORIGINAL BURNER WIRING MUST BE REPLACED, IT MUST BE REPLACED WITH #18 AWG 105° C WIRE OR EQUIVALENT.**

## I. PRESSURE REGULATOR ADJUSTMENT

The pressure regulating gas valve (SKP25) is preset to 9 inches water column manifold pressure. This may be field adjusted while the burner is in operation. Refer to Table 1 for pressure requirements.

When adjusting the (SKP25) regulator pressure according to that specified in Table 1, remove the regulator cap for access to the slotted adjustment screw. Turning the screw counterclockwise reduces burner inlet (manifold) pressure, clockwise increases the pressure. Reference Figure 9 for clarification.



SKP25 Regulating Gas Valve  
**Figure 9**

**NOTE: MANIFOLD PRESSURE ADJUSTMENTS CAN ONLY BE MADE WITH THE BURNER FIRING AND THE GAS ON.**

The pressure tap for manifold pressure measurement is located on the back side of the SKP25. Use a “u”-tube manometer or dial type pressure gauge, scaled from 0”w.c. to 15.0” w.c. to read pressure.

**J. GAS PRESSURE SWITCHES**

**J.1 MOUNTING**

All switches can be mounted in either horizontal or vertical position. Switches should be reasonably level but do not require accurate leveling. Switches have been factory calibrated and tested for leaks. However, it is recommended that the switch body, gas pipe inlets and connections be soapy solution tested for leaks after burner installation.

**J.2 OPERATION**

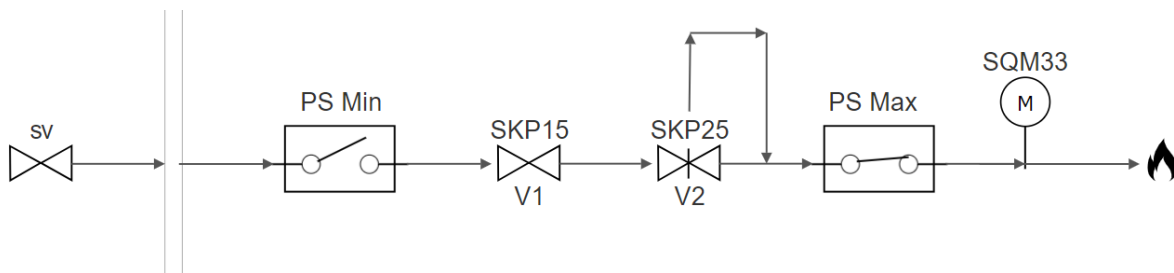
Low Gas Pressure Models: Low gas pressure switches break the electrical circuit upon pressure drop at the point when gas pressure becomes lower than the indicated set pressure. Switch models used are self-resetting and only require that gas pressure returns to the required range prior to resetting any control faults.

High Gas Pressure Models: High gas pressure switches break the electrical circuit when pressure rises above the indicated preset pressure.

Range Adjustment - All Models: To adjust gas pressure cut-off setting, remove the cover. Turn the range scale adjustable knob to increase pressure setting or decrease pressure setting. Install cover and tighten the cover screws to prevent tampering. Proper adjustment of the high and low gas pressure switches is explained in SECTION II – INITIAL START UP.

**J.3 GAS MODULATION – DIRECT SPARK IGNITION**

The LC2300M burner is classified as fuel train option 1. This option is pre-programmed into parameter 201 and allows full gas modulation, direct spark ignition and both air and gas actuators controlled electronically.



Gas Train Skeleton Diagram  
**Figure 10**

SV – Safety Valve (Optional)  
PS Min – Low Pressure Switch (Gas)  
PS Max – High Pressure Switch (Gas)

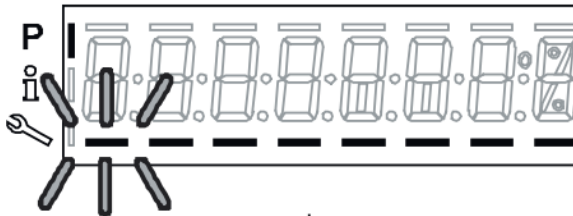
V1 – Upstream Gas Valve  
V2 – Downstream Gas Valve  
M – Gas Actuator

## SECTION II INITIAL START UP

1. Please note the applicable sequence of burner/primary gas control operation, gas pressure switches, etc. in SECTION III - OPERATION AND TROUBLESHOOTING before proceeding.
2. Lay out combustion test equipment, manometers, stopwatch, DC micro-amp meter, and other miscellaneous tools as needed.
3. Temporarily remove the covers from the High and Low Gas Pressure Switches and set the switches using the dials. The High Gas Pressure Switch should be set to the highest inches W.C. setting, as an initial starting point. The Low Gas Pressure Switch should be set to the lowest inches W.C. setting, as a starting point. **NOTE: THESE SETTINGS MUST BE RE-ADJUSTED AFTER THE BURNER IS IGNITED.**
4. Open all necessary valves one at a time, checking any new gas pipe installations for gas leaks with soapy solution or leak detector until you have tested all new pipe leading to the burner. Do not use an open flame to test for gas leaks.
5. Loosen the pressure port screw and attach a manometer to the pressure tap on the back side of the SKP25 Gas Regulator (Figure 8).
6. Apply 120V power to burner, either directly or by way of the appliance control.
7. Note the status on Screen of AZL display and proceed as follows:
  - a. The status should indicate **OFF UPr**. This indicates that the standard firing setpoints are loaded, but the burner programming is not finalized.



8. Press and hold the two “VSD” buttons on the AZL display labeled “F” and “A” until the screen briefly displays “Code” and then displays a series of dashes as shown below.



9. Using the “+” and “-” buttons to cycle through characters and the “Enter” key to select a character, enter the OEM Password provided within the Common Parameters Table on page 27. After the final character of the password is entered, press the “Enter” key one more time to confirm password.

**NOTE: NOT ALL LINES OF THE PASSWORD WILL BE FILLED WITH CHARACTERS.**

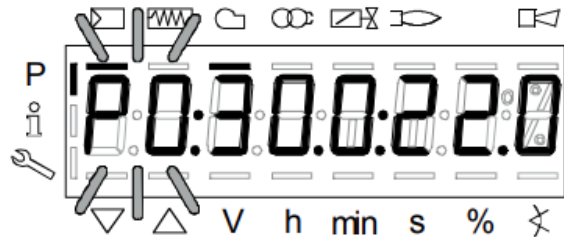
## NOTICE

Before proceeding, **HIGH FIRE AND LOW FIRE RATES HAVE BEEN PRE-SET BY THE MANUFACTURER.** High fire is set for 2.3MMBtu. If the appliance rating is not capable of withstanding the pre-set high fire rate, please continue to step 10 for reprogramming. Otherwise, proceed to step 16.

10. Upon successfully entering the OEM Password the screen will briefly display “PArA” and settle on “400: Set”. Press and hold “Enter” until “P54” briefly shows on the display.



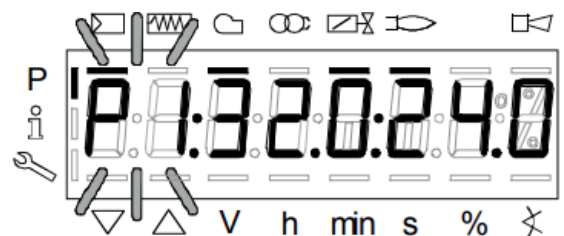
11. Once “P54” has appeared on the screen, “P-: -- --” will then appear. Briefly press “Esc” (“+” and “-” simultaneously).
12. Upon pressing “Esc”, P0 should begin flashing on the screen. P0 is the pre-set ignition point.



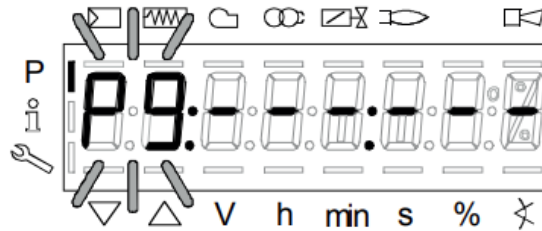
**NOTE: IGNITION POINT (P0) IS NOT LOW FIRE (P1). P0 IS THE SETPOINT THE BURNER USES TO INITIALLY LIGHT. P1 IS OFTEN LOWER THAN P0.**

**NOTE: IF ADJUSTMENTS TO EITHER THE FUEL OR AIR SETTINGS ARE REQUIRED IN THE APPLICATION, THOSE ADJUSTMENTS MAY BE MADE BY HOLDING THE “F” FOR FUEL OR “A” FOR AIR BUTTONS WHILE SIMULTANEOUSLY USING THE “+” AND “-” ARROWS TO ADJUST ACCORDINGLY.**

13. Toggle the “+” key to proceed to P1. P1 is the pre-set low fire point.

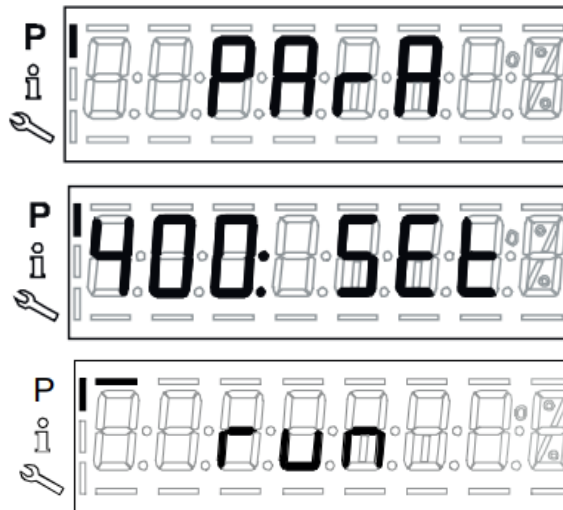


14. Toggle the “+” key to proceed to P9. P9 is the pre-set high fire point.

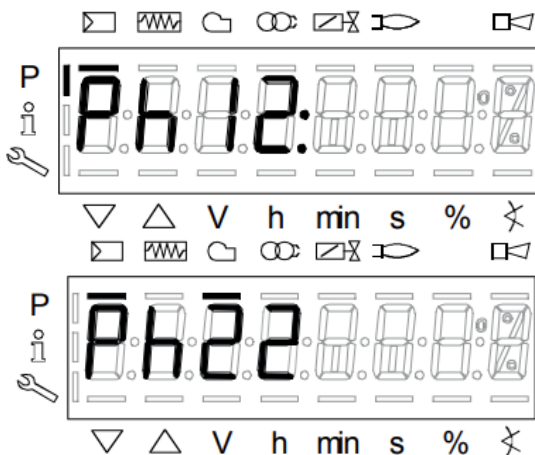


**NOTE: TABLE 1 IN SECTION I – INSTALLATION REFERENCES VARIOUS SETPOINTS PRE-PROGRAMMED INTO THE AZL. FOR REPROGRAMMING P9 TO A LESSER FIRING RATE, USE THE TABLE AS A GUIDE FOR BOTH GAS AND AIR ACTUATOR SETTINGS FOR THE PROVIDED DURING RATES.**

15. Once complete, hit “Esc” (“+” and “-” simultaneously) until “400: Set” reappears. At this point P9 – high fire has been reprogrammed. Startup can be continued as normal. Proceed to Step 16.
16. Upon successfully entering the OEM Password the screen will briefly display “PArA” and settle on “400: Set”. With “400: Set” on the display, press “Enter”. “run” will appear. Press the “Enter” key again to begin setup cycle.



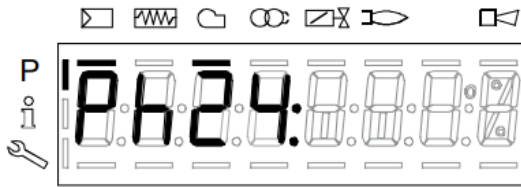
17. Upon pressing “Enter”, the AZL screen will cycle thru the following steps:



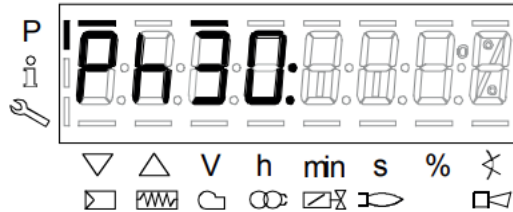
**Ph 12:** Burner standby

**Ph 22:** Burner, Safety Valve, and Fan On





**Ph 24:** Drive to pre-purge position



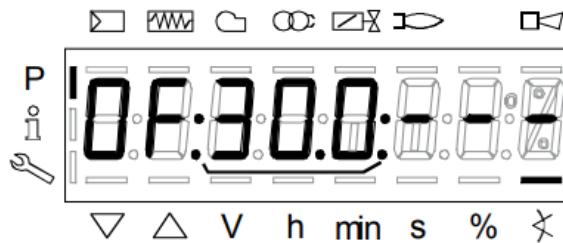
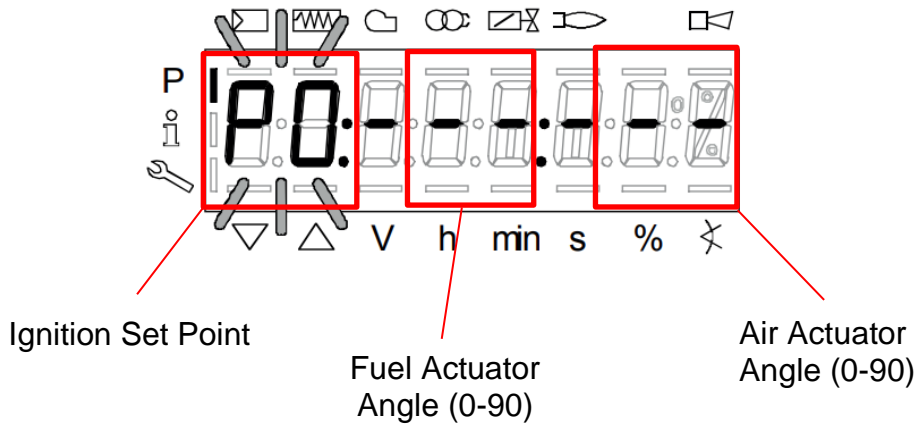
**Ph 30:** Pre-Purge (Number on right of screen counts down from 30 seconds)

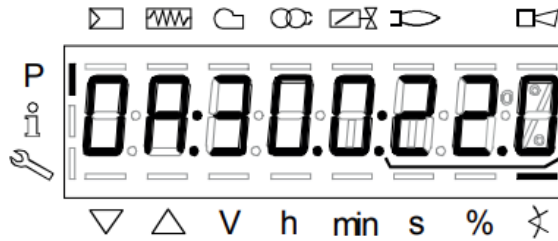


**Ph 36:** Drive to ignition setpoint

18. Upon completion of the startup cycle, the screen will display the factory programmed or user re-programmed ignition set point as shown below. The values within the pictures below are examples.

**NOTE: WHEN THIS SCREEN APPEARS, THE BURNER IS READY TO IGNITE AND WILL DO SO UPON PRESSING THE “+” BUTTON. DO NOT PROCEED UNLESS YOU HAVE CONFIRMED IT IS SAFE TO IGNITE BURNER.**

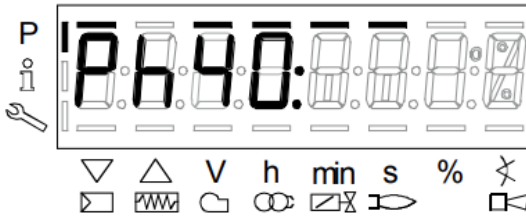




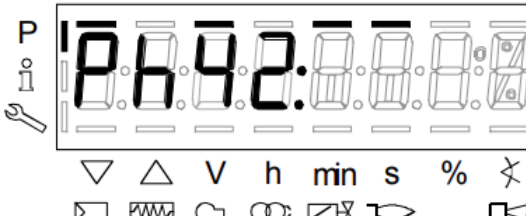
After confirming all safety systems are in place and you are ready to ignite the burner, press the “+” button. The burner will go through the ignition cycle. Here, we will go through Phase 38, 40, 42 and 44.



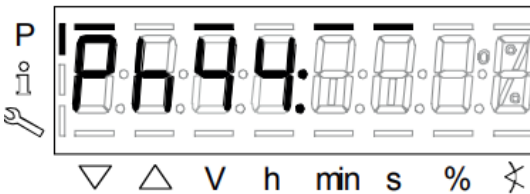
**Ph 38:** Pre-Ignition



**Ph 40:** Initial safety. (Ignition transformer is energized.) At this point the spark electrode continues for 10 seconds. There will be a countdown to the right of the “Ph 40” display.



**Ph 42:** Initial Safety. (Ignition transformer no longer energized)



**Ph 44:** Phase 1

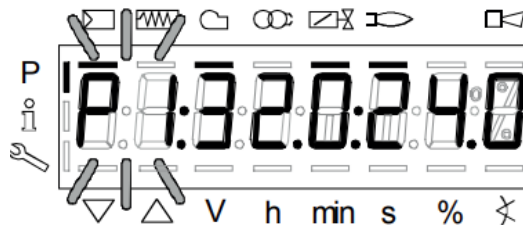
After Phase 44, the burner has ignited, and will remain lit at setpoint P0. Ignition parameters have already been pre-set within the control. If the burner fails to light or to remain lit, note the fault code(s) provided and refer to SECTION III – OPERATION AND TROUBLESHOOTING of this manual for troubleshooting advice. If the fault code cannot be found in the Common Fault Codes Table within SECTION III of this manual, please refer to the LMV3 Technical Instructions. A direct web link and QR code have been attached below on page 39. A comprehensive list of fault codes can be found beginning on the LMV3 Technical Instructions beginning on page 138.

**NOTE: ON NEW GAS LINE INSTALLATIONS, AIR MAY BE TRAPPED IN THE GAS LINE; THE BURNER MAY EXPERIENCE SEVERAL LOCKOUTS UNTIL ALL THE AIR IS PURGED FROM THE LINES.**

**NOTE: IF ADJUSTMENTS TO EITHER THE FUEL OR AIR SETTINGS ARE REQUIRED IN THE APPLICATION, THOSE ADJUSTMENTS MAY BE MADE BY HOLDING THE “F” FOR FUEL OR “A” FOR AIR BUTTONS WHILE SIMULTANEOUSLY USING THE “+” AND “-” ARROWS TO ADJUST ACCORDINGLY.**

**NOTE: TO PREVENT UNINTENDED OPERATION, IT IS IMPORTANT TO ADJUST THE AIR AND FUEL ALTERNATELY IN SMALL INCREMENTS TO AVOID RESONANCE.**

19. When satisfied with the ignition setpoint P0, use the “+” arrow to navigate to P1 (Low Fire) and make any desired adjustments for your application. Keep in mind that P1 will likely be lower than P0. Once the burner has reached P1, the P1 icon will begin blinking. This means the burner is stabilized at P1 set point.



**NOTE: ALL SET POINTS FOR P0-P9 HAVE BEEN PRE-PROGRAMMED TO VALUES SHOWN IN TABLE 1 UNLESS OTHERWISE MODIFIED.**

20. A more accurate Btu/hr (kW) input can be determined by using a gas service meter with the burner operating (all other gas appliances should be off). The hand on the gas meter dial with the lowest cubic feet value (fastest revolving dial), should be clocked (timed) for one complete revolution. Use the following formula:

$$\frac{3600 \times \text{cubic ft. per revolution} \times \text{Btu value/cubic ft}}{\text{Seconds per revolution}} = \text{Btu/hr}$$

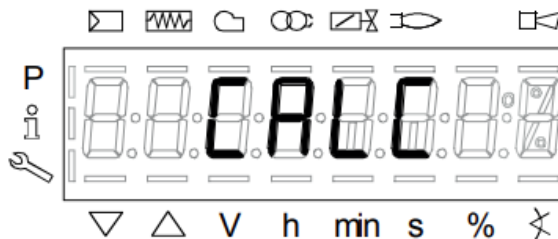
NATURAL GAS EXAMPLE: Timing one revolution of the 1ft<sup>3</sup> dial at 6 seconds on natural gas (roughly 1000 Btu/ft<sup>3</sup> heating value):

$$\frac{3600 \times 1 \times 1000}{6} = 600,000 \text{ Btu/hr}$$

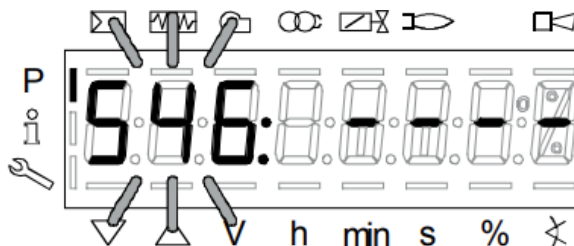
PROPANE GAS EXAMPLE: Timing one revolution of the 1ft<sup>3</sup> dial at 15 seconds on propane gas (roughly 2515 Btu/ft<sup>3</sup> heating value):

$$\frac{3600 \times 1 \times 2515}{15} = 603,600 \text{ Btu/hr}$$

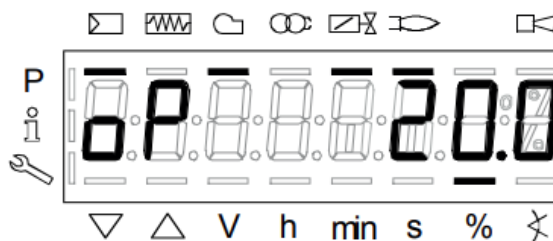
21. Repeat “+” button to progress from through all of the set points (P1-P9).  
 22. When “+” is pressed initially from P1 to P2 for the first time, curve points P2-P8 will be automatically calculated and saved. The automatic calculation creates a linear relationship between the P1 and P9 values given. “Calc” will appear on the screen briefly. Continue to repeat “+” to step through P2-P9. It is essential to allow all set points to blink (stabilize) before progressing.



23. To view the flame sense value at any given set point, press and hold “Enter”. A value will be shown to the right of the screen from 0-100. Burner maintains optimal fire between 40-100% flame sense. Below 40% flame sense the burner may fault. Release the “Enter” key to resume normal screen. This can be done at any time throughout live firing.
24. After confirming each set point and having stabilized on P9, press and release “Esc” (“+” and “-” simultaneously) to finalize the heating curve. The screen will now appear as follows:



25. Parameter 546 represents the High Fire Load Percentage and is typically set at **100**. To do so:
  - a. Press “Enter” and use the up and down arrow keys to set the value.
  - b. Press “Enter” again to save the value.
  - c. Press “Esc” (“+” and “-” simultaneously) to progress to Parameter 545 which is Low Fire Load Percentage.
26. Repeat Step 18 for Parameter 545. **NOTE: THIS VALUE REPRESENTS THE LOWEST FIRING RATE AND TYPICALLY HAS A LOWER LIMIT OF 20.**
27. To finalize programming and enter automatic operating mode, Press “Esc” (“+” and “-” simultaneously) two times. If successful, and a PID input signal is tied into the control, the screen will appear as shown below and begin modulation based on the PID settings.



If no PID input is present within the control, after finalizing the programming, the burner will phase through shutdown operations. These phases can be seen more specifically on page 31 – Figure 11 of this manual.

28. After the burner has been in operation for at least 10 minutes, ensuring combustion chamber and heat exchanger are fully warmed, take combustion analysis flue gas samples just ahead of the draft control in the flue pipe. A combustion gas analyzer must be used to fine-tune the burner. Adjust air and gas set points as needed per application needs.

**NOTE: ALWAYS USE RELIABLE COMBUSTION TEST INSTRUMENTS. BEING PROFICIENT IN THE USE OF THESE INSTRUMENTS AND INTERPRETING THEIR DATA IS NECESSARY FOR SAFE, RELIABLE AND EFFICIENT BURNER OPERATION.**

**29.** Perform the following combustion analysis. All adjustments below must be made with the following instruments: draft gauge, O<sub>2</sub> or CO<sub>2</sub> analyzer and CO tester.

- a.** Adjust the primary air damper to provide about 25% excess combustion air. Confirm this by checking the flue gas for its FREE OXYGEN (O<sub>2</sub>) or CARBON DIOXIDE (CO<sub>2</sub>) PERCENTAGES with a test instrument. Free oxygen should be about 4.5%, or carbon dioxide should be about 9.5% for natural gas, 12.1% for propane gas.
- b.** CARBON MONOXIDE (CO) – Should be checked for its presence in the flue gas. This percentage should not exceed .04% (or 400 PPM air free).
- c.** The flue gas temperature should be between 325°F (163 °C) and 550°F (288 °C) for gas burners. Higher flue gas temperatures indicate over-firing or excessive draft through the appliance. Lower flue gas temperatures may cause excessive condensation and indicate under-firing. Consult your local utility or the appliance manufacturer for acceptable flue gas temperatures.

If an O<sub>2</sub> analyzer is used:

$$CO_{airfree} = \frac{20.9}{(20.9 - \%O_2)} \times CO_{ppm}$$

If a CO<sub>2</sub> analyzer is used:

$$\text{For Natural Gas: } CO_{airfree} = \frac{11.7}{\%CO_2} \times CO_{ppm}$$

$$\text{For Propane Gas: } CO_{airfree} = \frac{13.8}{\%CO_2} \times CO_{ppm}$$

**NOTE: THE LC2300M WAS DESIGNED TO FIRE INTO POSITIVE (UP TO 2.0 INCHES W.C.), NEUTRAL, OR SLIGHTLY NEGATIVE (UP TO -0.2 INCHES W.C.) COMBUSTION CHAMBERS. FOR OPTIMAL PERFORMANCE, CHECK OVERFIRE DRAFT AND ADJUST TO NEGATIVE -.01 (2.491PA) TO -.02 (4.982PA) INCHES W.C. DURING BURNER OPERATION IF POSSIBLE. (2.3MMBTU BASED ON BALANCED CONDITIONS.)**

**30.** Check combustion using flue gas analysis instruments. Set the burner to about 20% excess air and check that good combustion is obtained. Check the actual gas flow on the gas meter to ensure that the correct input power is achieved.

Gas Type	Excess Air Flue Gasses (%O <sub>2</sub> )
Natural Gas	4 ± 1
LP Gas	

31. Adjust the High & Low Gas Pressure Switches according to actual firing conditions. For close burner control, the High Gas Pressure Switch should be set at approximately 1 in. W.C. above the set manifold pressure and the Low Gas Pressure Switch should be set approximately 2 in. W.C. below the manifold pressure. Nuisance lockouts will occur if the switch settings are too close to the manifold setting and if fluctuations in gas pressures occur. Re-attach switch covers.
32. Record the installation data, the combustion readings, etc., and affix to this manual, or the burner and/or appliance. Space has been provided at the beginning of this manual on Page 2 for start-up notes, dealer's name, address, telephone number, as well as the date of installation.

**SUGGESTION: ALL NEW INSTALLATIONS SHOULD BE RE-INSPECTED FOR PROPER COMBUSTION AND BURNER OPERATION AFTER ONE OR TWO WEEKS OF NORMAL OPERATION.**

For subsequent normal starting and shut off procedure, refer to the "Consumer Instructions" in the back of this manual or the instruction plate attached to the burner.

**TO RESTART THE BURNER AFTER A FLAME FAILURE**, Push the reset switch on either the control panel or the handheld AZL display. The burner should relight after power is restored and the unit has a call for heat. If problems persist, refer to SECTION III – OPERATION AND TROUBLESHOOTING.

To stop the burner in the event of an emergency, remove power from the main electrical disconnect, turn "off" any added external "on/off" switch, and close any manual gas ball valve.



## A.1 PARAMETER LIST

A list of the most common parameters used have been noted below, including all necessary login passwords. For a comprehensive list of LMV3 parameters and their functions, please refer to the LMV3 Technical Instructions beginning on page 52. A direct web link and QR code have been attached following on page 39.

**TABLE 3: COMMON PARAMETERS**

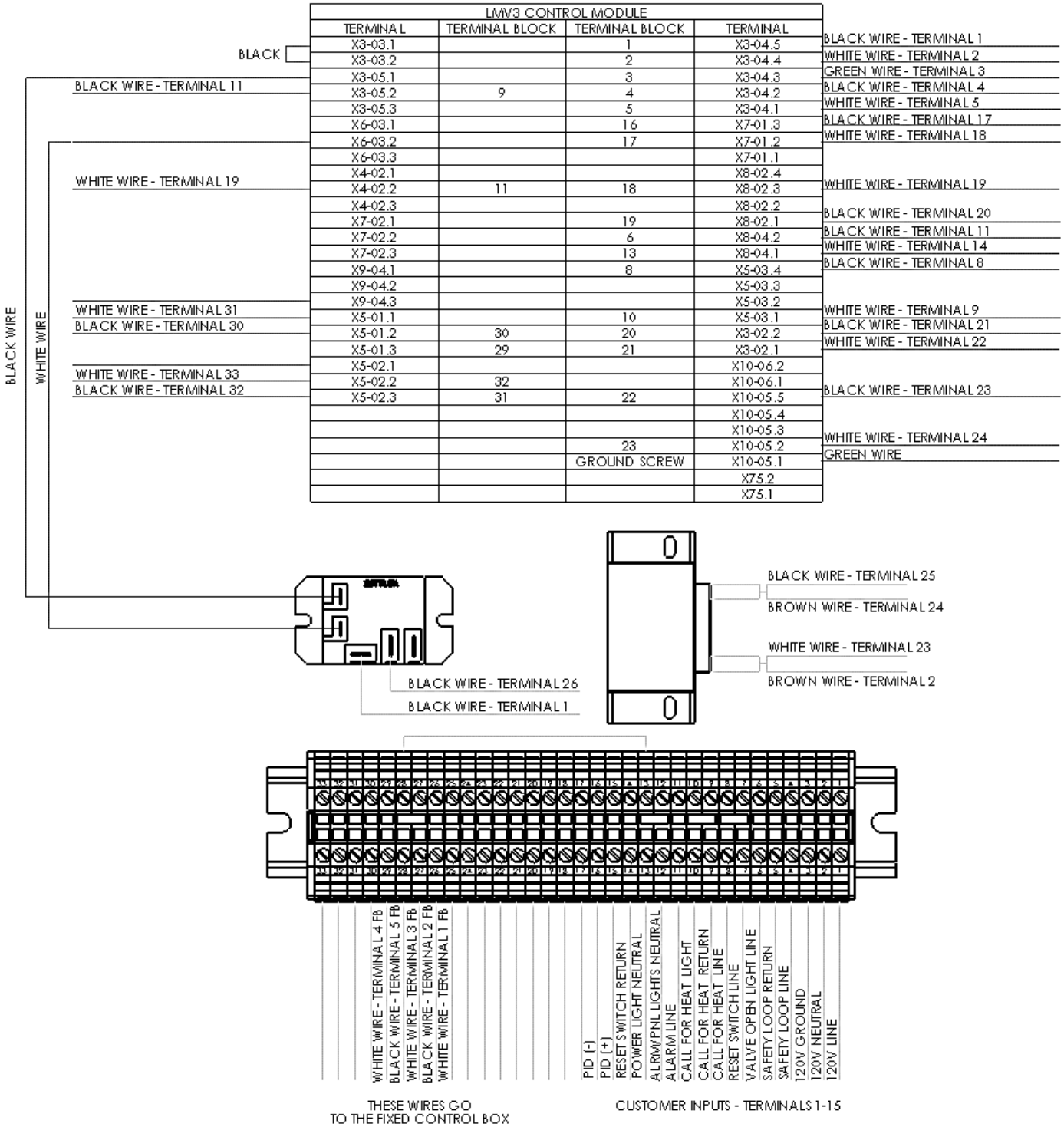
Parameter Number	Parameter Name	User = U Service = S OEM = O	Factory Setting	Range	Description
Fuel 0					
Gas					
041	Service Level Password	O	9876	Any 4 characters	The service level password can be changed here. It must be exactly 4 characters in length. Enter the same password twice to change it (n = new, r = repeat)
042	OEM Level Password	O	EntrY	Any 5 Characters	The OEM level password can be changed here. It must be exactly 5 characters in length. Enter the same password twice to change it (n = new, r = repeat).
50	Backup/Restore	S	Backup-0 Restore -0	-99-50	Used to perform parameter backups and restores. <b>Backup:</b> LMV3 transfer to AZL <b>Restore:</b> AZL transfer to LMV3 Set parameter to 1 and press enter to begin the backup or restore. When the value changes back to 0, the backup or restore was completed successfully. If the value changes to any other number besides 0, see error code 137 for the cause of the failure.
113	Burner ID LMV3	U/S	Not Set	0-99999999	Burner ID is set here. The burner ID must be all digits (no letters), from 1-8 digits in length. Typically, the burner serial number is used. This serves as an identifier for the parameters set. The burner ID must be set to perform any backup or restore.
197	Flame Sensitivity	S/O	1	0-1	Sets the flame signal sensitivity during phases 60-70 for ION (flame rod) and UV flame detectors. 0 = standard sensitivity 1 = high sensitivity
198	Flame Sensitivity Switch Point	S/O	4	2-9	Sets the switching point on the fuel/air ratio curve for high flame sensitivity. 2 = no switching point (always high sensitivity) 3-9 = sets the points (P3-P9) to switch back to standard sensitivity



201	Fuel Train	S	1	1-29	Sets the fuel train. There are 29 possible options available. Setting this parameter to undefined (----) will delete any existing fuel curves.
227	Safety Time 1	O	10 sec	1-10 sec	If directly spark igniting the main fuel, this defines the overlap of the spark and the main fuel valves (outputs X8-02.1 and X7-01.3). This time is also known as TSA1. In summary, sets the duration of phases 40-42.
237	High Gas PS	S	1	1-4	This setting defines the function of input X5-02.2 on gas trains: 1 = high gas pressure switch 2 = POC 3 = valve proving pressure switch 4 = speed dependent air pressure switch
601	Reference Point	S/O	601:00 = 1 601:01 = 1	0-1	Determines the reference point of the SWM 33 actuators. The actuators will reference after a normal shutdown, lockout or loss of power to the LMV3. In order to reference, the actuators must drive outside of their 0-90° operating range. This parameter sets whether the actuators will reference closed (<0°) or open (>90°). <b>Index 00 = fuel actuator. Index 01 = air actuator</b> 0 = closed (<0°) 1 = open (>90°)
602	Rotation Direction	S/O	602:00 = 0 602:01 = 1	0-1	Determines the direction of rotation of the SQM33 actuators. The descriptions of the rotation are valid when the actuator shaft is pointed at your eye. <b>Index 00 = fuel actuator. Index 01 = air actuator</b> 0 = counterclockwise 1 = clockwise
613	Actuator Type	S/O	613:00 = 0 613:01 = 0	0-2	Determines the type of actuator used. <b>Index 00 = fuel actuator. Index 01 = air actuator</b> 0 = SQM33.5... actuators (27 in-lb, 5 sec / 90°) 1 = Not used 2 = SQM33.7... actuators (90 in-lb, 17 sec / 90°)
701-725	Fault History	U	Read Only		Shows the current status (fault) along with the 24 most recent faults. 701 = current status, 702 = most recent fault, 703 = next most recent fault, etc. Each fault has indices that

				<p>provide additional information about the fault:</p> <p>Index 01 = code  Index 02 = diagnostic  Index 03 = class (not used in North America)  Index 04 = phase  Index 05 = start number  Index 06 = load  Index 07 = fuel (LMV36 only)</p>
--	--	--	--	--

# B: WIRING DIAGRAM





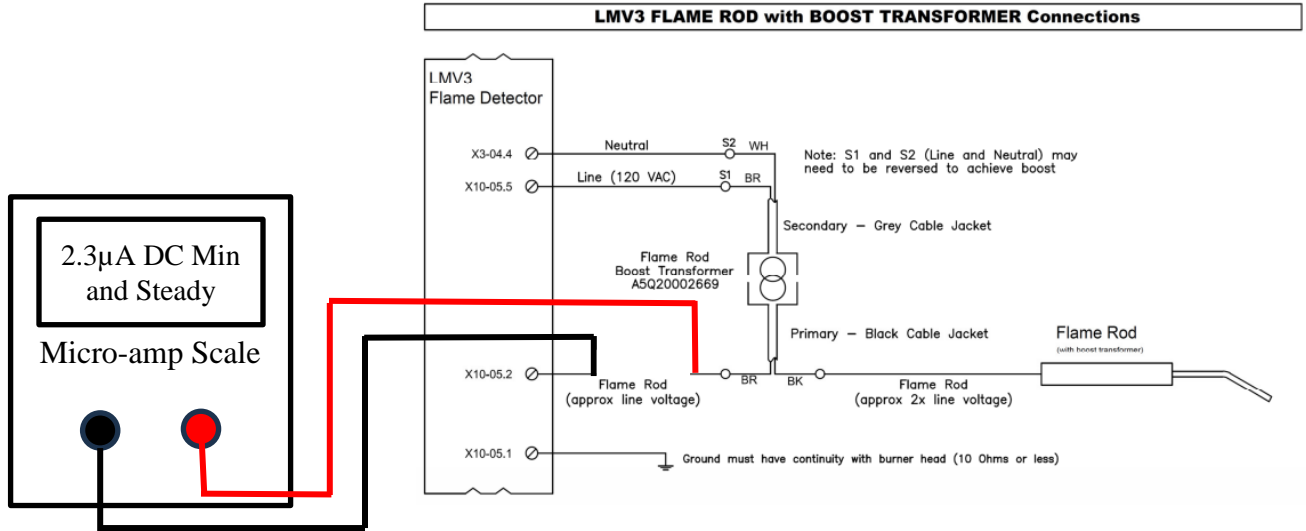
## C: FLAME SENSING WITH EQUIPPED CONTROLS

### UTILIZING FLAME ROD SENSING

The Siemens LMV3 controls equipped with flame rod sensing utilize the flame current rectification principle for main burner flame sensing. The burner is factory programmed to “High Sensitivity” (Parameter 197 = 1 and Parameter 198 = 2) to ensure the best flame sensing performance.

The flame rectification phenomenon occurs as follows: The ignited gas flame causes the immediate atmosphere around the flame to become ionized (gas atoms become electrically charged). The ionization causes the atmosphere around the flame to become electrically conductive. An AC voltage output from the control sensing circuit is routed through the flame sensor probe. When the sensor probe and the burner head are both in contact with a properly adjusted flame, the burner head with its larger surface attracts more free electrons, thus becoming negatively charged. The sensor probe with its small surface area gives up free electrons, thus becoming positively charged. The free electrons from the AC voltage in the sensor probe flow through the ionized gas flame to the grounded burner head. As the AC current passes through the gas flame, it is rectified into a DC current flowing back to the grounded side of the sensing circuit. The flame is a switch. When the flame is present, the switch is closed allowing current to flow through the sensing circuit of the control. When no flame is present, the switch is open with no current flowing through the sensing circuit of the control.

The DC current flow is measured in units called DC microamperes. A steady DC microampere current of 2.3 minimum (and steady) or higher through the sensing circuit of the primary ignition control is sufficient to keep the burner running without a safety lockout. See Figure 21 in SECTION V – TECHNICAL INFORMATION for sensor probe and electrode dimensional settings and Figure 12 for flame current measurement.



Flame Current Measurement

Figure 12

### FLAME SENSING USING A UV SCANNER

An ultra-violet (UV) scanner is sometimes used with a flame safeguard. The UV scanner senses the presence of flame by viewing the ultra-violet light emitted by the flame. A flame safeguard conducts a check of the UV scanner during each ignition sequence. Prior to opening the gas valves, the flame safeguard will verify a “no flame” signal from the scanner. A UV scanner is not provided, but can

easily be added into the system. The LMV3 compatible part number for purchase is **1000185-KIT**. For wiring a UV scanner into the control, please reference the LMV3 Technical Instructions link and QR code found on Page 39. It is important to note that the sight glass must be removed when the UV kit is installed. There will be no flame signal detected if the glass remains in place.

## D: TROUBLESHOOTING

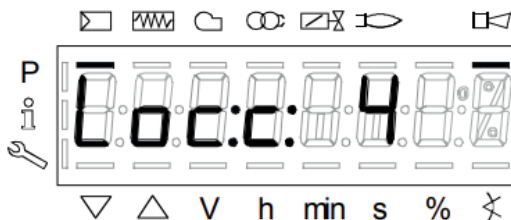
The most common fault codes have been noted below. For all LMV3 fault codes and diagnostic codes please refer to the LMV3 Technical Instructions below on page 39. A QR code and a URL link have been provided for a full electronic copy on Page 39.

**TABLE 4: COMMON FAULT CODES**

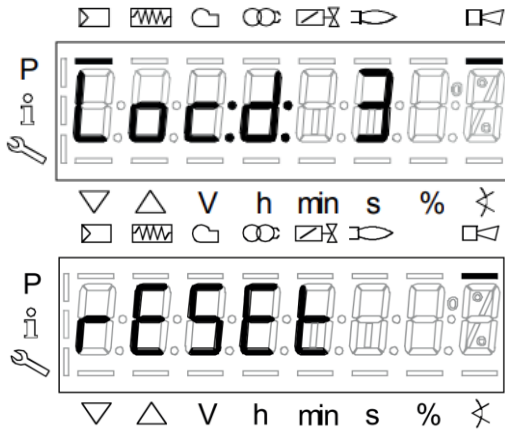
Error Code (Loc:c:)	Diagnostic Code (Loc:d:)	Meaning	Corrective Action
2	Any #	No flame at end of safety time	A flame failure occurred during lighting. 1. Check the wiring of the ignition transformer, pilot valve, and main valve(s). 2. Check manual shutoff valves for supply gas. 3. Check the position of the air damper and close it further if necessary. 4. Check the flame detector signal in the presence of a known flame source. Replace the flame detector if it does not produce the anticipated signal.
3	0	Air Pressure Off	The air pressure switch input was de-energized when it should have been energized. Make sure the blower starts in phase 22 and the switch setpoint is set appropriately.
	1	Air Pressure On	The air pressure switch input was energized when it should have been deenergized. Make sure the blower turns off in phase 78 and the switch setpoint is set appropriately. If necessary, increase the setting of parameter 213.
	4	Air Pressure On Prevention of Startup	The air pressure switch input is energized, preventing the LMV3 from starting up.
7	Any #	Loss of flame	1. Increase the setting of parameter 186:01 (fuel 0) or 187:01 (fuel 1). This increases the FFRT. A maximum setting of 30 equals a 4 second FFRT. 2. Check the flame detector signal in the presence of a known flame source. Replace the flame detector if it does not produce the anticipated signal.
20	Any #	Gas Pressure Switch (Min)	1. A fault occurred related to the low gas pressure switch. See diagnostic codes for more information. 2. The low gas pressure switch (input X5-01.2) opened, causing a fault. Check gas supply and open any manual shutoff valves. Check the setpoint and wiring of the low gas pressure switch. 3. The low gas pressure switch was not made by the end of phase 22, preventing the startup of the LMV3. See diagnostic code 0 for more corrective actions.

### D.1 DISPLAY OF FAULTS

The example shown below displays error code 4, diagnostic 3. Refer to the LMV Manual for a comprehensive list of fault codes.



**Loc:c:** This display shows the current fault status.



**Loc:d:** This display shows the current diagnostic code.

To reset the fault, **press and hold “Enter”** for 1...3s, rESEt will appear on the screen. When the button is released, the control unit is reset.

**NOTE: ABOVE REPRESENTS THE MOST COMMON FAULT CODES A USER MAY EXPERIENCE. FOR A COMPREHENSIVE LIST OF FAULT CODES PLEASE SEE PAGES 138 – 159 OF THE LMV3 MANUAL EITHER BY SCANNING THE QR CODE BELOW OR FOLLOWING THE PROVIDED URL. [HTTPS://SCCCOMBUSTION.COM/WP-CONTENT/UPLOADS/2023/10/LMV3-TECHNICAL-INSTRUCTIONS-LV3-1000-INDEXED.PDF](https://scccombustion.com/wp-content/uploads/2023/10/lmv3-technical-instructions-lv3-1000-indexed.pdf)**



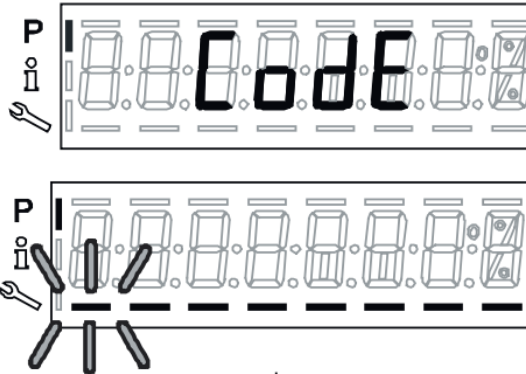
### **E: ADJUSTING SETTINGS OF PREVIOUSLY SET AZL**

If any adjustment is needed for fuel and air values after the control settings have already been finalized, the control will need reprogrammed. By following the steps outlined below, new values can be easily programmed.

1. Apply 120VAC power to burner, either directly or by way of the appliance control.
2. Note the status on the screen of the AZL display and proceed as follows:
  - a. The status should indicate **OFF**. This indicates that the burner has already been fully programmed and has been finalized.



3. Press and hold the two “VSD” buttons on the AZL display labeled “F” and “A” until the screen briefly displays “Code” and then displays a series of dashes as shown below. Following the same steps as done in SECTION II - INITIAL SETUP.



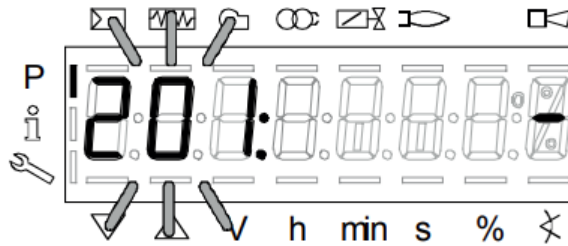
4. Using the “+” and “-” buttons to cycle through characters and the “Enter” key to select a character, enter the Service Level Password provided. After the final character of the password is entered, press the “Enter” key one more time to confirm password.

**NOTE: NOT ALL LINES OF THE PASSWORD MUST BE FILLED WITH CHARACTERS.**

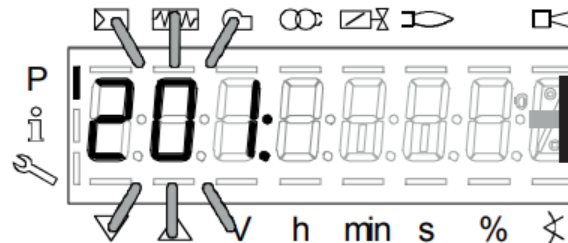
5. Upon successfully entering the Service Level Password the screen will briefly display “PArA” and settle on “400: Set”. Toggle the “-“ button until you reach the “200 Set”. Press “Enter”. The screen will open to parameter 201. To the right of the screen there will be a 1. This is because the gas train type was already pre-programmed. Press “Enter”. Toggle the “-“ button until the 1 becomes a dash (-) as shown. Press “Enter”. At this time, all pre-existing gas train set points have been erased and the control is ready for complete reprogramming.



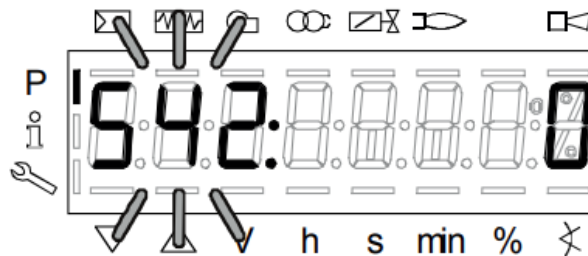




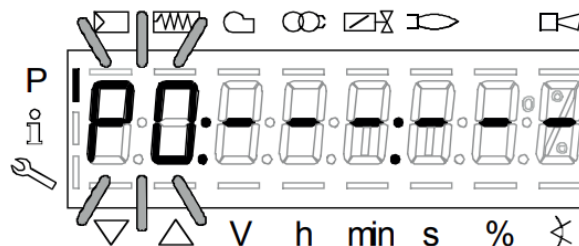
6. Now that parameter 201 has been changed back to dash (-), we are ready to re-assign a gas train type. With parameter 201 still displayed, press “Enter”. Toggle the “+” button to reassign the value to 1. Submit this value to the control by pressing “Enter” again. For direct ignition gas burners, the gas train type is 1.
7. Press “Esc” (“+” and “-” simultaneously) to exit the “200: Set” parameters.
8. Toggle the “+” arrow to settle on “400: Set”. Press “Enter”
9. Here parameter 201 should appear again, with the pre-set value of 1 to the right of the display.



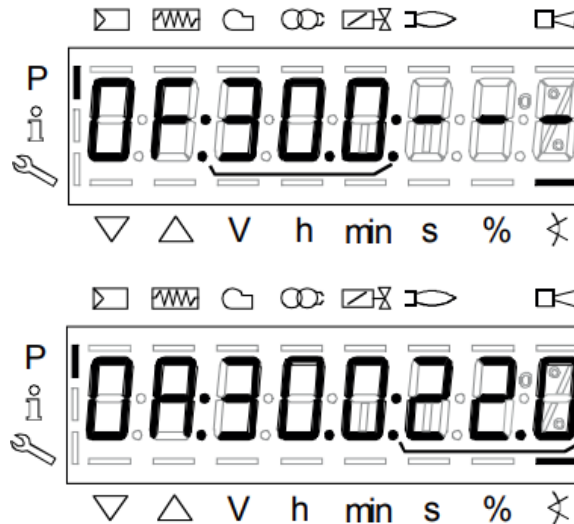
10. Proceed through the setup by clicking “+”.
11. Parameter 542 will appear with a value of 0 displayed on the right. This parameter is to set the VSD fan. If no VSD fan is used, it remains at 0. However, if a VSD fan is used, press “Enter”. Toggle the “+” arrow and change the value to 1. Press “Enter” to submit whichever value desired.



12. To move to the next parameter, click “+”. Parameter 641 will appear. If your value for parameter 542 was 0, 642 will be the same. If parameter 542 was changed to 1, parameter 641 will also change to 1. Parameter 641 controls the speed standardization of the VSD.
13. Click “+” to proceed to the next parameter.
14. On this screen, P0 appears flashing. P0 is your ignition setpoint.

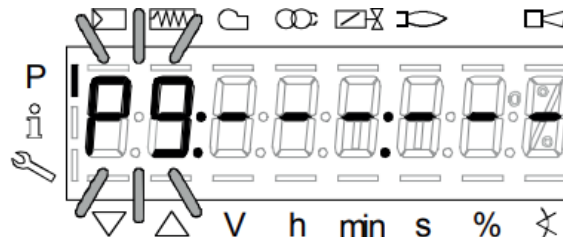


15. Press simultaneously “F” and “+/-“ to set the ignition position of the fuel actuator. Your screen will appear as below. The dashes ( - - - ) to the right of the fuel value indicate that there is no value set for the air actuator. The burner will fault if no value is set, even if the air actuator will remain at 0. To input a position for the air actuator, simultaneously press “A” and “+/-“ to set the ignition point.



16. Press “+” to proceed to the next curve point.  
 17. P9 will appear flashing. This is the setpoint for high fire. Using Table 1 above in SECTION I - INSTALLATION on page 13, generic gas and air actuator settings are shown with their corresponding BTU rate.

**NOTE: THESE ARE NOT EXACT VALUES FOR EVERY APPLICATION. AIR AND GAS SETTINGS MAY NEED MODIFIED AFTER INSTALLATION IN EVERY APPLICATION.**



18. The same procedure as in Step 14 with setting the fuel and air actuator at P0 will be followed.

**NOTE: IT IS IMPORTANT TO SET P0 AND P9 AS ACCURATELY AS POSSIBLE FOR EACH APPLICATION. THESE SETTINGS ARE USED TO CALCULATE THE REMAINING CURVEPOINTS ONCE THE BURNER HAS STARTED.**

19. When P9 values are set, press “+” to start the burner.  
 20. Once P0 and P9 are set and the burner has been initiated, the burner motor will then start, and the burner will cycle through the same set of phases as in SECTION II - INITIAL SET-UP.



**Ph 12:** Burner standby



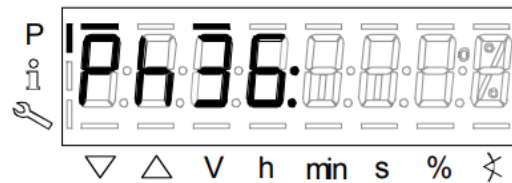
**Ph 22:** Burner, Safety Valve, and Fan On



**Ph 24:** Drive to pre-purge position



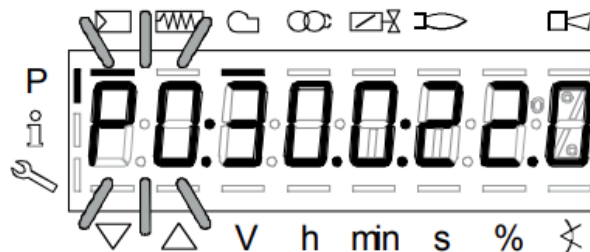
**Ph 30:** Pre-Purge (Number on right of screen counts down from 30 seconds)



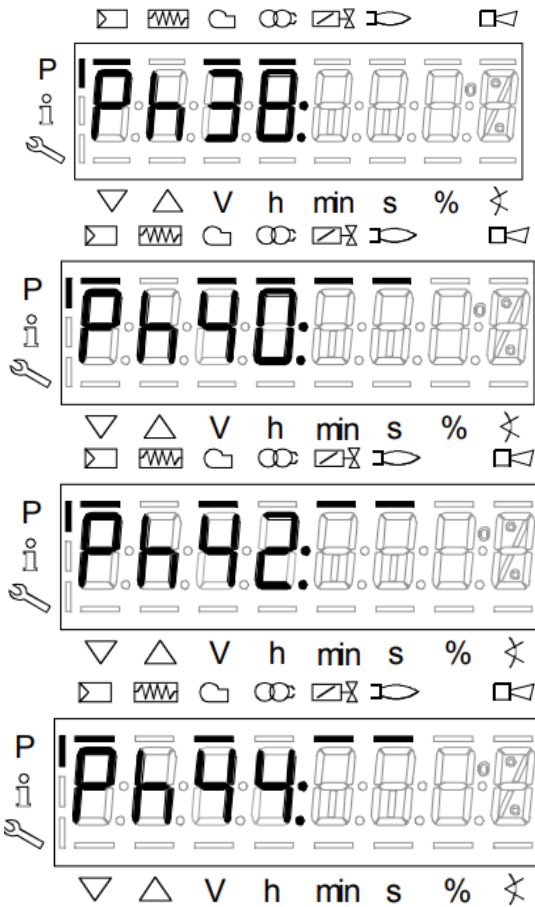
**Ph 36:** Drive to ignition setpoint

21. Upon completion of the startup cycle, the screen will display the factory programmed ignition set point as previously programmed in Step 14.

**NOTE: WHEN THIS SCREEN APPEARS, THE BURNER IS READY TO IGNITE AND WILL DO SO UPON PRESSING THE “+” BUTTON. DO NOT PROCEED UNLESS YOU HAVE CONFIRMED IT IS SAFE TO IGNITE BURNER.**



22. After confirming all safety systems are in place and you are ready to ignite the burner, press the “+” button. The burner will go through the ignition cycle, Phase 38, 40, 42 and 44.



**Ph 38:** Pre-Ignition

**Ph 40:** Initial safety. (Ignition transformer is energized.) At this point the spark electrode continues for 10 seconds. There will be a countdown to the right of the “Ph 40” display.

**Ph 42:** Initial Safety. (Ignition transformer no longer energized)

**Ph 44:** Phase 1

23. Once the burner is lit and remains lit. Follow steps 14-21 from SECTION II - INITIAL SET-UP. This will walk you through finalizing the newly input values, complete the control programming, and allow for full PID controlled modulation.
24. To ensure that all programmed settings and changes are held in the memory of both the AZL and the LMV3 control unit, it is recommended that a backup and restore are done before the burner enters fully automatic operation. This allows for all parameters to be saved in the case of lost information or changes. The instructions for a backup and restore follow.

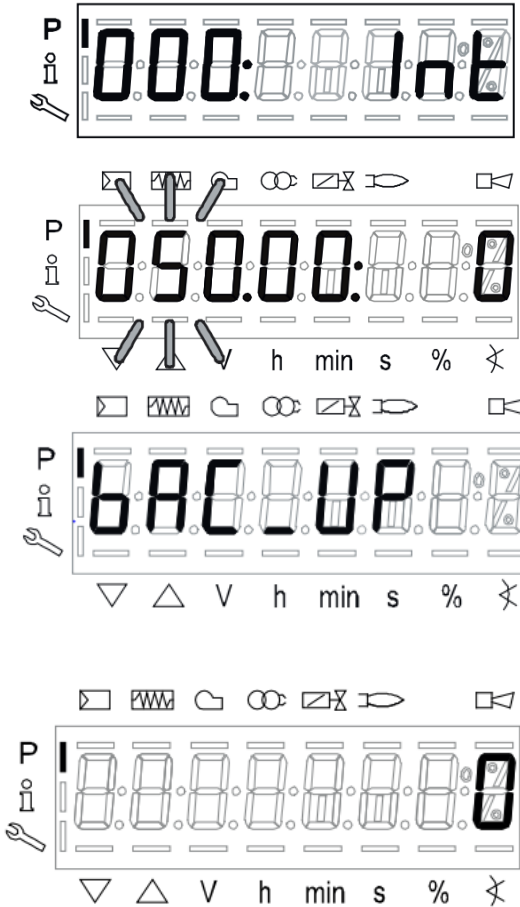
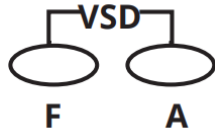
**F: BACKUP AND RESTORE**

When adjustments are made to the burner and the programming is complete, it is suggested that a backup is done. The settings backup also ensures that adjustments are saved into both the AZL and the LMV3. This is useful, especially if there are problems with the LMV3. The troublesome LMV3 can then be replaced and the previous settings for the burner restored from the AZL can be input into the new LMV3.

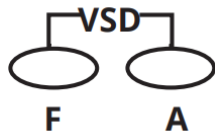
Backup: The parameters set on the LMV3 control are saved into the AZL display.

Restore: The settings saved from the backup into the AZL can be transferred into an LMV3 control unit. This overwrites all existing parameters within the LMV3. The overriding parameters are now the new operating parameters of the burner.

## F.1 BACKUP



## F.2 RESTORE



Press “VSD” > 1 second to access login mode. You will need to log into the service level. See the Common Parameters Table in SECTION III for password.

Toggle “+/-“ to Level 000. Press “Enter”

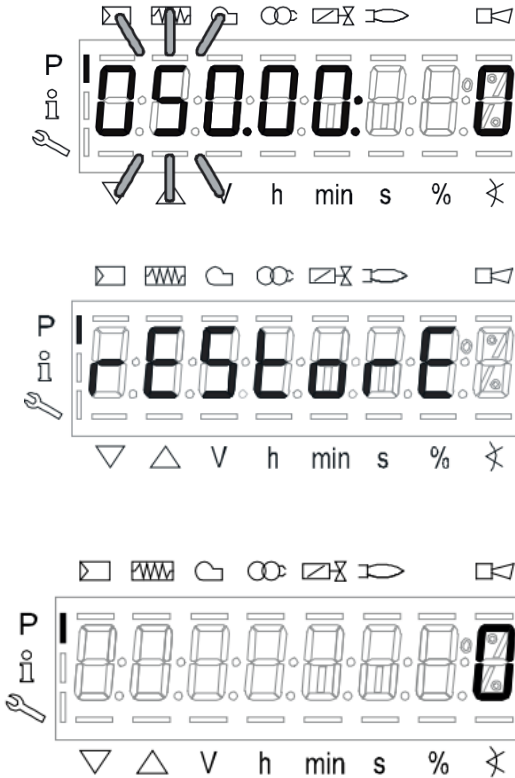
Toggle “+/-“ to Parameter 050. Parameter 050 should begin flashing. Press “Enter”

The screen will then display ”bAC\_UP”. Press “Enter”. The screen will display 0. Press “Enter”. Press “+” to change the 0 to a 1. The value 1 should be flashing. Press “Enter”. The 1 should no longer be flashing. After a few seconds, the 1 will return to a 0.

When the screen displays a 0 again, the backup is complete.

Press “VSD” > 1 second to access login mode. You will need to log into the service level. See the Common Parameters Table in SECTION III for password.

Toggle “+/-“ to Level 000. Press “Enter”



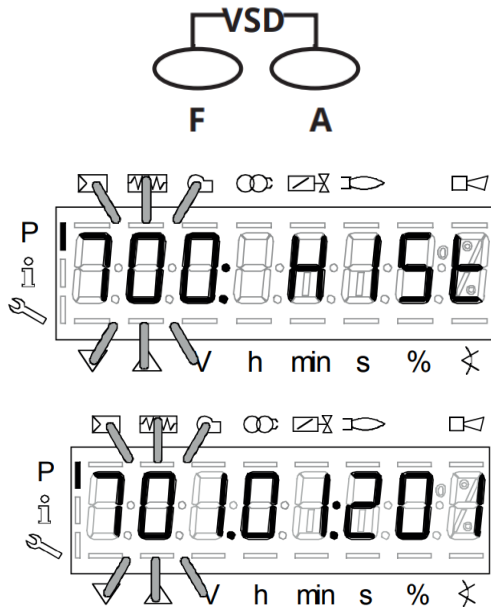
Toggle “+/-“ to **Parameter 050**. Parameter 050 should begin flashing. Press “Enter”

The screen will then display ”bAC\_UP”. Press “+” to “Parameter rEStore”. The screen will display 0. Press “Enter”. Press “+” to change the 0 to a 1. The value 1 should be flashing. Press “Enter”. The 1 should no longer be flashing. After a few seconds, the 1 will return to a 0.

When the screen displays a 0 again, the restore is complete.

### G. ERROR HISTORY

The purpose of the error history is to view all previous faults and diagnostic codes. Depending on the error, there may be secondary causes to a burner fault. Being able to view these in a separate location once the burner is not running will allow for complete diagnostic of the burner fault.

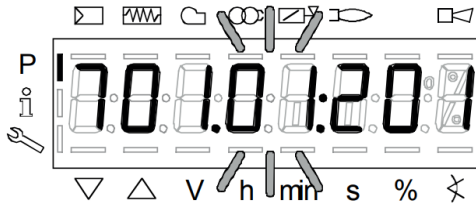


Press “VSD” > 1 second to access login mode. You will need to log into the service level. See the Common Parameters Table in SECTION III for password.

Toggle “+/-“ to **Level 700**. Press “Enter”. Level 700 contains all error history.

Toggle “+/-“ to **Parameter 701**. (Parameter 701 is the initial fault). Parameter 701 should begin flashing. Press “Enter” to enter index 01. (The LMV3 saves the last 25 faults Parameters 701-725).

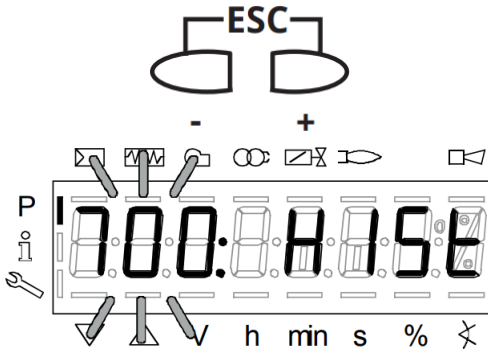
Once within index 01, it will flash. To toggle to the next index, Press “+”, for previous index Press “-“.



- Index .01 = Error Code
- Index .02 = Diagnostic Code
- Index .03 = Error Class
- Index .04 = Error Phase
- Index .05 = Startup Counter
- Index .06 = Output

Each index represents something different and allows for detailed diagnostic of the initial fault.

Press “ESC” to return to the parameter level. Toggle “+/-“ to move through the levels. Viewing the indices for all other parameters is done the same as was done for parameter 701.



Press “+/-“ twice to return back to parameter 700 level.

## SECTION IV SERVICE



Make sure that the main gas valves and electrical power disconnect are turned off before opening the burner or removing any parts for service. All cover plates, enclosures, and guards must always be in place, except during maintenance and servicing.

Qualified personnel may only perform burner service and maintenance. Operational checks of components and in-line safety system at each service is necessary.

### A: SERVICE SCHEDULE

It is recommended that servicing be conducted once a year or after 3,000 hours of operation by qualified personnel. During service, perform operational checks on all safety systems and components.

Burner	1 year
Electrodes	Replacement/cleaning - 1 year
Motor	1 year
Fan Wheel	1 year – Replace if need for cleaning/imbalance
Leak Check	1 year
Inspection of Electrical	1 year

### B: COMPONENT REPLACEMENT SCHEDULE

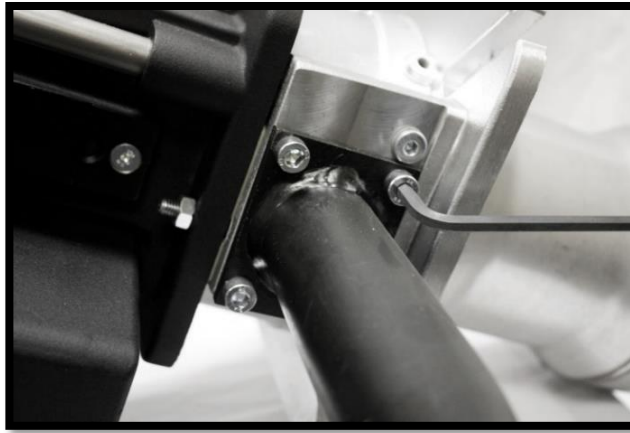
LMV Control Unit	10 years
Valve Control System (Double Valve Body, Regulating, Safety)	10 years
Gas Pressure Switch (High and Low)	10 years
Air Pressure Switch	10 years
Damper Motor (Air and Gas)	N/A

### C. BURNER HEAD AND ELECTRODE/SENSOR ASSEMBLY

The burner head, electrodes, and manifold pipe are part of the burner head assembly. To remove the burner head assembly, follow the procedure outlined below:

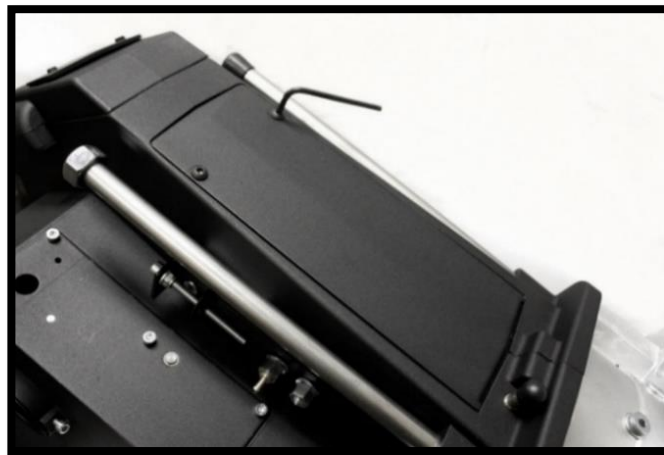
1. Disconnect the union fitting closest to the burner in the gas pipe train.
2. Remove the four Allen head screws that hold the manifold pipe to the burner housing and remove the manifold pipe, see Figure 13.





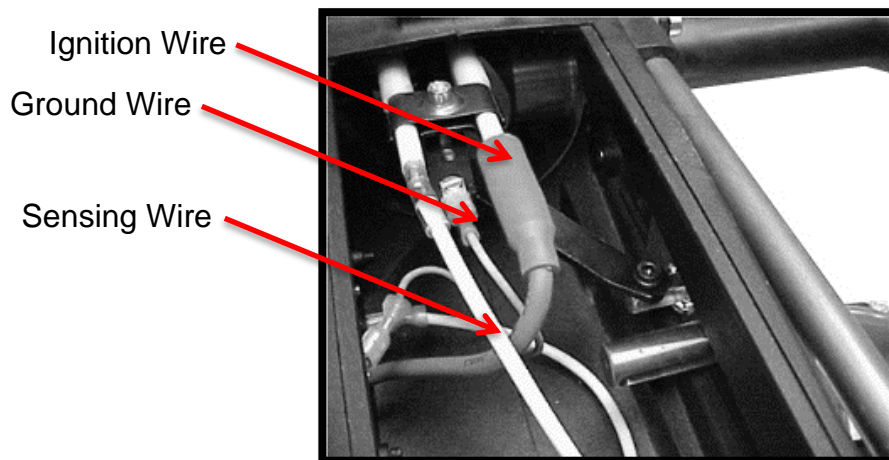
**Figure 13**

3. Remove the cover from the fan housing, see Figure 13.



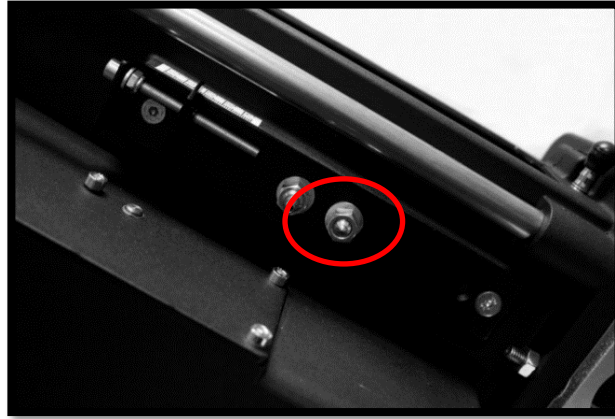
**Figure 14**

4. Disconnect the ignition wire, sensing probe wire, and ground wire of the gun assembly.



**Figure 15**

5. Remove the nut on the right side of the burner housing, see Figure 16.



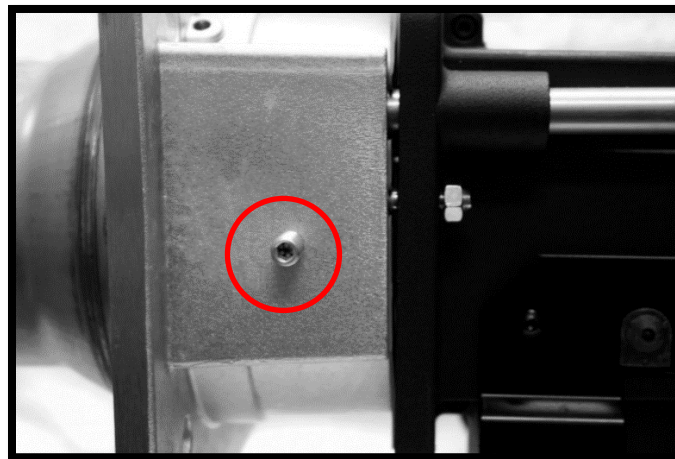
**Figure 16**

6. Remove the two nuts on either side of the burner housing, see Figure 17.



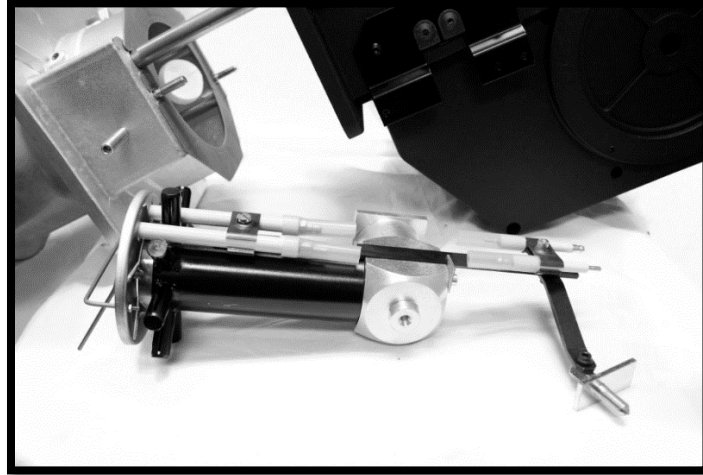
**Figure 17**

7. Loosen screw on the left side of the burner head assembly, see Figure 18.



**Figure 18**

8. Pull the burner body straight back along the slides until you get a gap of approximately 8 inches. The burner head assembly can now be removed, see Figure 19.



**Figure 19**

When servicing, clean burner head ports, electrodes and sensor probe. Inspect the sensor probe and electrode wires and ceramic insulators carefully for hairline cracks, which might provide an electrical leak path that could short out the ignition spark, or flame signal.

Examine the electrode and sensor probe for any serious corrosion or deterioration of metal at the tips. Check for proper dimensional settings of the sensor probe and electrode (SECTION V - Figure 21). Adjust and/or replace these assemblies as necessary. Make sure that the ignition and sensor probe wires go to the correct electrodes and the ignition wire boot is in place over the electrode ceramic.

#### **D. AIR PROVING SWITCH**

The Air Proving Switch is mounted on the right side of the burner housing. Tubes connect the air proving switch to fittings on the side of the blower housing assembly. The tubing allows pressurized air from the blower housing to travel to the air proving switch causing the diaphragm to close a set of micro-switch contacts, thus completing the circuit. The function of the Air Proving Switch is to ensure that the blower motor and blower wheel are developing sufficient combustion air. Should the blower motor fail or the blower wheel malfunction, the voltage to the gas valves is interrupted.

The air proving switch should never require maintenance. However, should nuisance lockouts occur, the switch can be checked. Disconnecting the 24V leads from the air proving switch and “jump” the leads together will bypass the switch’s function. If the burner functions correctly, the switch is malfunctioning and should be replaced.

As mentioned above, the switch should never require maintenance. However, a pinched or blocked tube will shut off the flow of pressurized air to the diaphragm creating a failure like a bad air proving switch. Always check to ensure that the clear tubing is not pinched.

## NOTICE

If a jumper is used to check the switch, the jumper **MUST** be removed, and the Air Proving Switch reconnected or an unsafe condition can occur resulting in **PERSONAL INJURY OR DEATH**

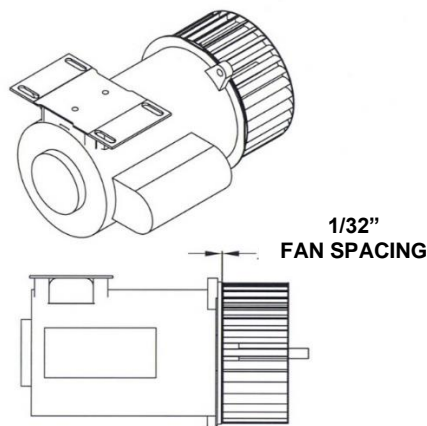
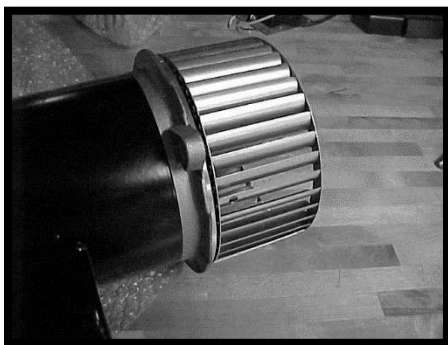
### E: COMBUSTION AIR BLOWER AND MOTOR

Cleaning of the combustion air blower is required if the blades show an accumulation of dust and lint, or if the character of the flame indicates a deficiency of combustion air.

The motor and blower wheel are removed as one assembly. Locate the motor wires in the electrical panel. Note the wire connection points in the terminal block and disconnect the motor wires from the terminal block. Remove the two (2) bolts securing the motor to the burner housing.

Should removal of the blower wheel be necessary for cleaning or replacement of either it or the motor, the blower wheel must be re-positioned correctly on the motor shaft. (Figure 20)

**NOTE: DO NOT REMOVE BLOWER WHEEL FROM MOTOR SHAFT DURING PERIODIC CLEANING.**



Combustion Air Blower  
**Figure 20**

### F. GAS PRESSURE SWITCHES

The gas pressure switches should never require maintenance. If nuisance problems persist, the switches can be temporarily “jumped” out to bypass the switch’s function. If the burner functions correctly, the switch has malfunctioned.

## NOTICE

If a jumper is used to check the switch, the jumper **MUST** be removed, and the Air Proving Switch reconnected, or an unsafe condition can occur resulting in **PERSONAL INJURY OR DEATH.**

## SECTION V TECHNICAL INFORMATION

### A: NUISANCE LOCKOUTS/FLAME SENSING PROBLEMS

Wayne's LC2300M series gas burners utilize a flame rod or prove flame through the process of flame rectification.

One of the most common problems with gas appliances utilizing this type of electronic flame sensing system is the "nuisance lockout". Lockouts are not generally due to the burner failing to ignite, but rather simply the failure of the system to sense the establishment of flame. Should this situation exist for a period longer than the ignition control's preprogrammed lockout timing, the control will shut down or go into permanent lockout. The only way to get the burner to re-cycle is to:

1. Press and hold the "Reset" button on the AZL control or the "Reset" switch on the control box (if equipped) for 3 seconds.

The following situations can lead to flame sensing problems and can be checked without disassembling the main burner:

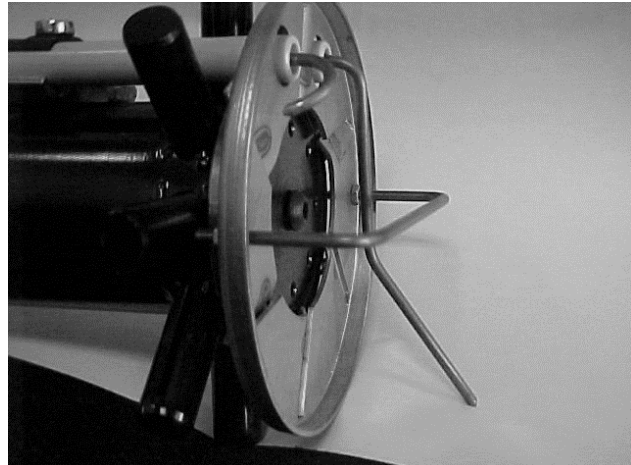
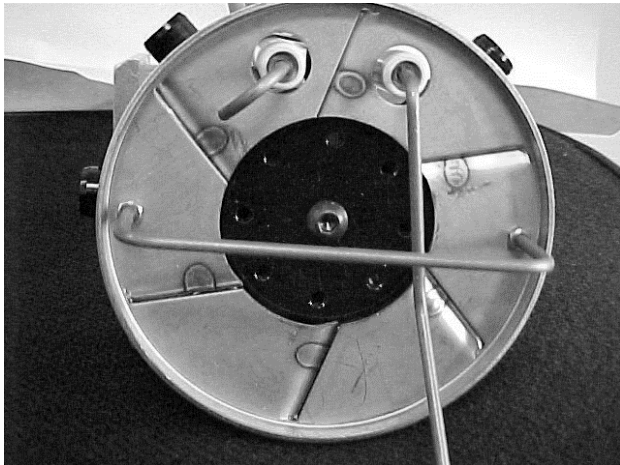
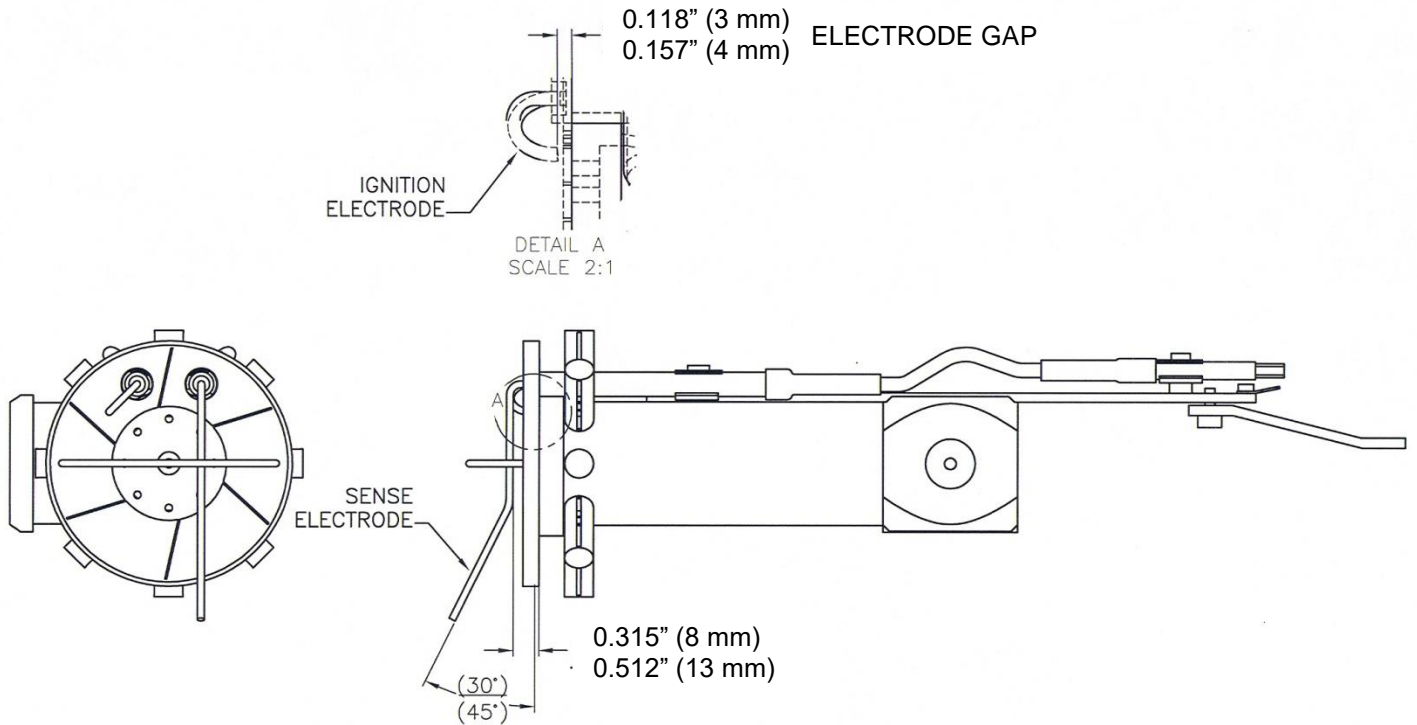
1. The burner is not properly grounded to "earth ground".
2. The ignition control is not properly grounded to the burner itself. Using an ohmmeter, check the wire attached to both parts for good contact and continuity.
3. The burner ignition control is polarity sensitive. The polarity of the incoming line voltage may be reversed. Verify that black and white wires are hot and neutral respectively, and that they are connected to the corresponding black and white wires on the burner.

The remaining checks and/or adjustments require removal of the gas train:

1. Electrical continuity from the "flame sense" terminal of the LMV3 control to the end of the flame rod may be compromised. Check all quick-connect terminations and connections. Check the continuity with an ohmmeter while flexing wires to assure no hidden conductor breakage exists. If replaced, wiring must be of equal or heavier gauge and equal, or better temperature rating.
2. The flame rod probe may be grounded out. Assure that the flame rod probe is not touching the burner head. The probe should be positioned as indicated in Figure 20 below.
3. The flame rod probe should be free of soot and creosote. Deposits may insulate the probe, making it difficult to pass the electrical charge to the flame. The probe can be cleaned with steel wool, emery paper or fine sandpaper. **NOTE: THIS IS THE LEADING CAUSE OF NUISANCE LOCKOUTS IN DUAL-FUEL WOOD/GAS FIRED APPLIANCES.**
4. The flame rod probe may be burned away. Check it against dimensions on the electrode settings drawing. (Figure 21)
5. The dimensional location of the flame rod probe may be incorrect, or the probe may be distorted. Check it against dimensions on the electrode settings drawing and adjust if necessary. (Figure 21)
6. The spark electrode gap may be incorrect, resulting in no spark or an inadequate spark that will not ignite the gas properly. Check the electrode gap against the electrode settings drawing and adjust if required. (Figure 21)



7. The burner body is not properly grounded to the burner head. Check to ensure the ground wire is properly connected to the ground tab on the burner head assembly and the ground tab on the burner body, see Figure 15.
8. The high voltage lead wire from the ignition transformer to the tip of the spark electrode may have broken, preventing the high voltage current from passing to the electrode tip. Check all connections thoroughly and/or check continuity of the lead wire assembly with an ohmmeter.



Electrode and Flame Rod Location Settings  
**Figure 21**

Once all the items listed previously have been checked and corrected as necessary, reinsert the gas train assembly into the burner.

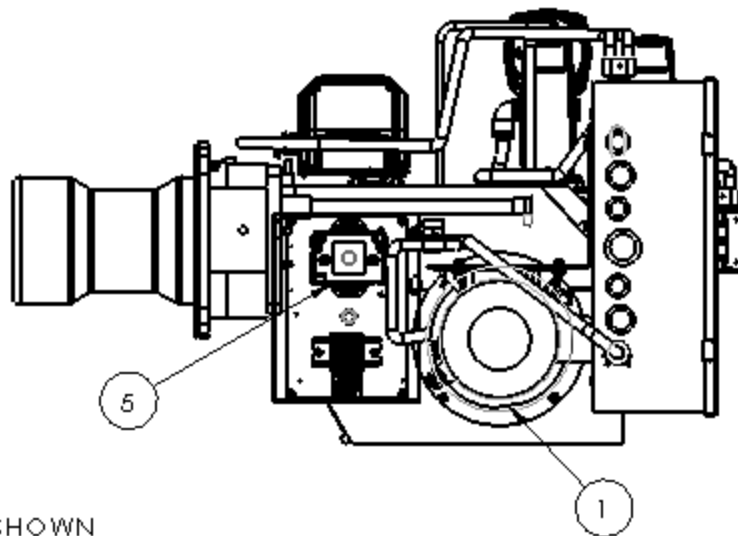
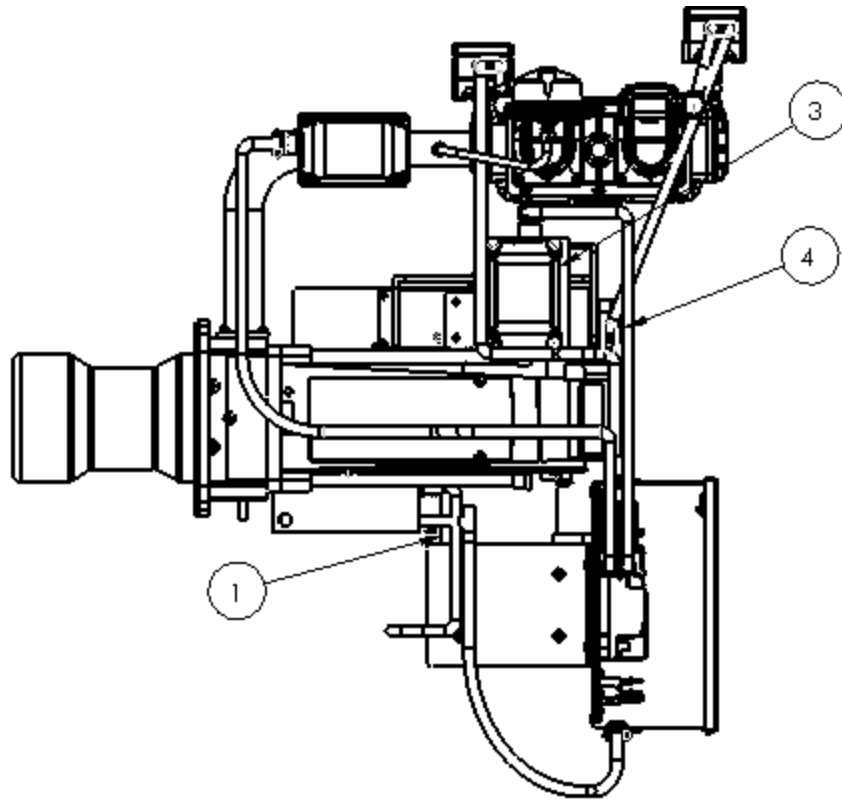
**NOTE: BE CAREFUL NOT TO ACCIDENTALLY REPOSITION EITHER THE FLAME ROD PROBE OR ELECTRODE DURING REINSTALLATION OF THE GAS TRAIN ASSEMBLY.**

If, after all the above listed items have been carefully checked, the burner still fails to work, check that the spark electrode is sparking to the burner head. If the unit does not spark, the ignition transformer is bad and must be replaced.

## SECTION VI DRAWINGS AND PARTS LIST

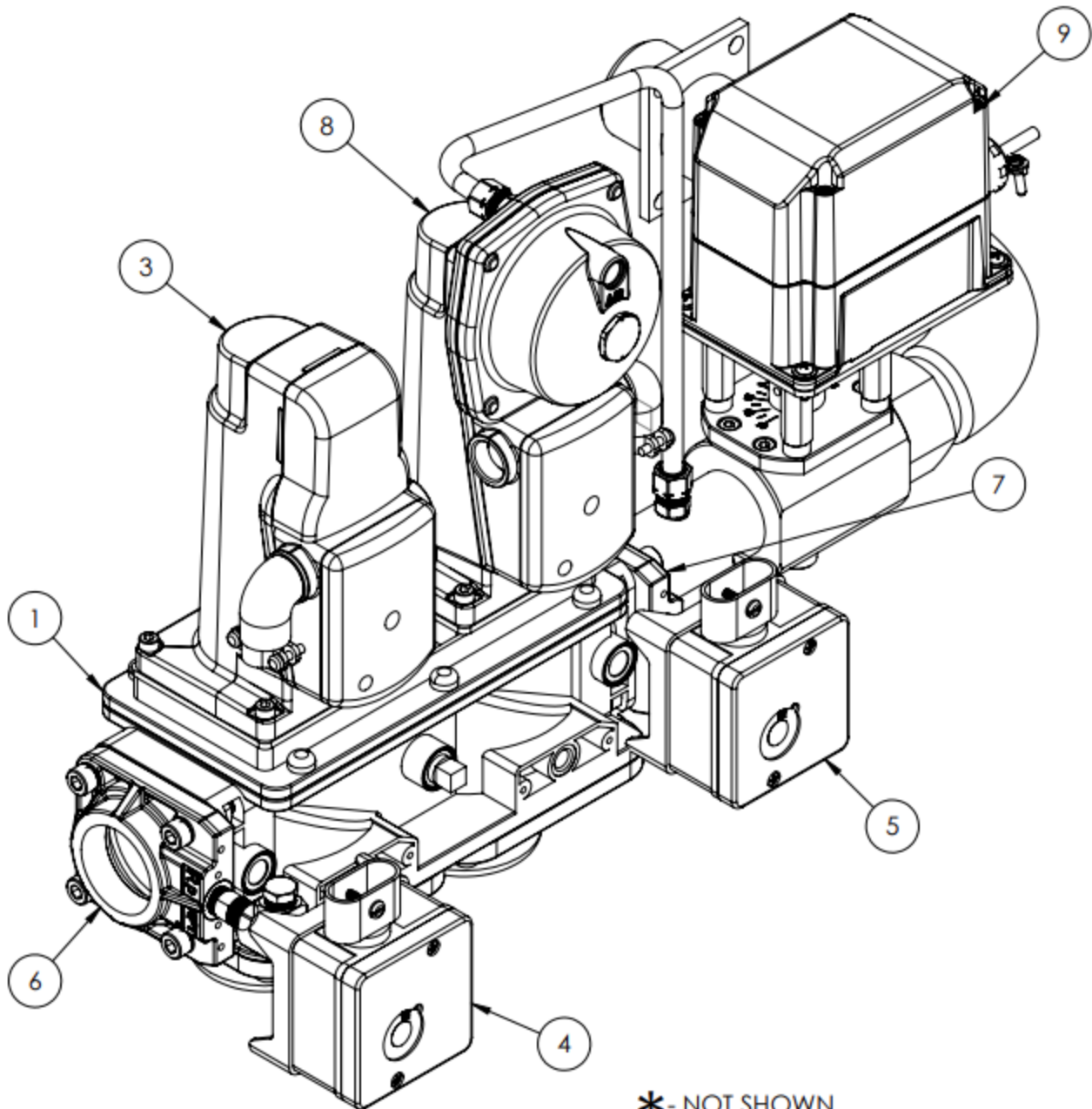
**NOTE:** A parts list for your gas burner can be generated directly from the Wayne Combustion Systems' website. Visit our website at [www.waynecombustion.com](http://www.waynecombustion.com). Enter the "Specification Number" of your gas burner in the "Product Search" box. Click on "Search" and follow the results page to a product parts list. Print the product parts list for your reference by clicking on the "Print This Page" icon located near the top right of the page.





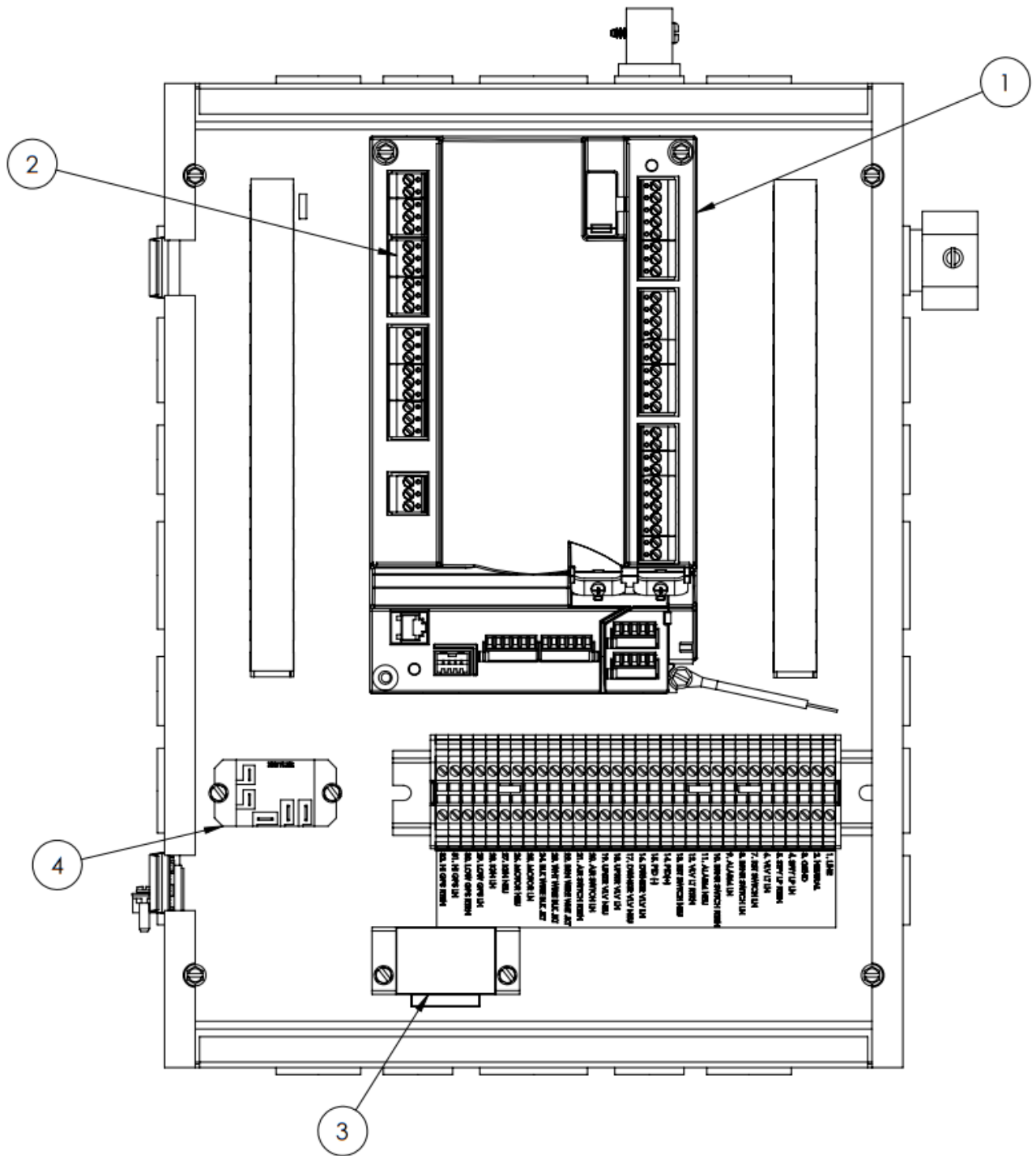
\*- NOTSHOWN

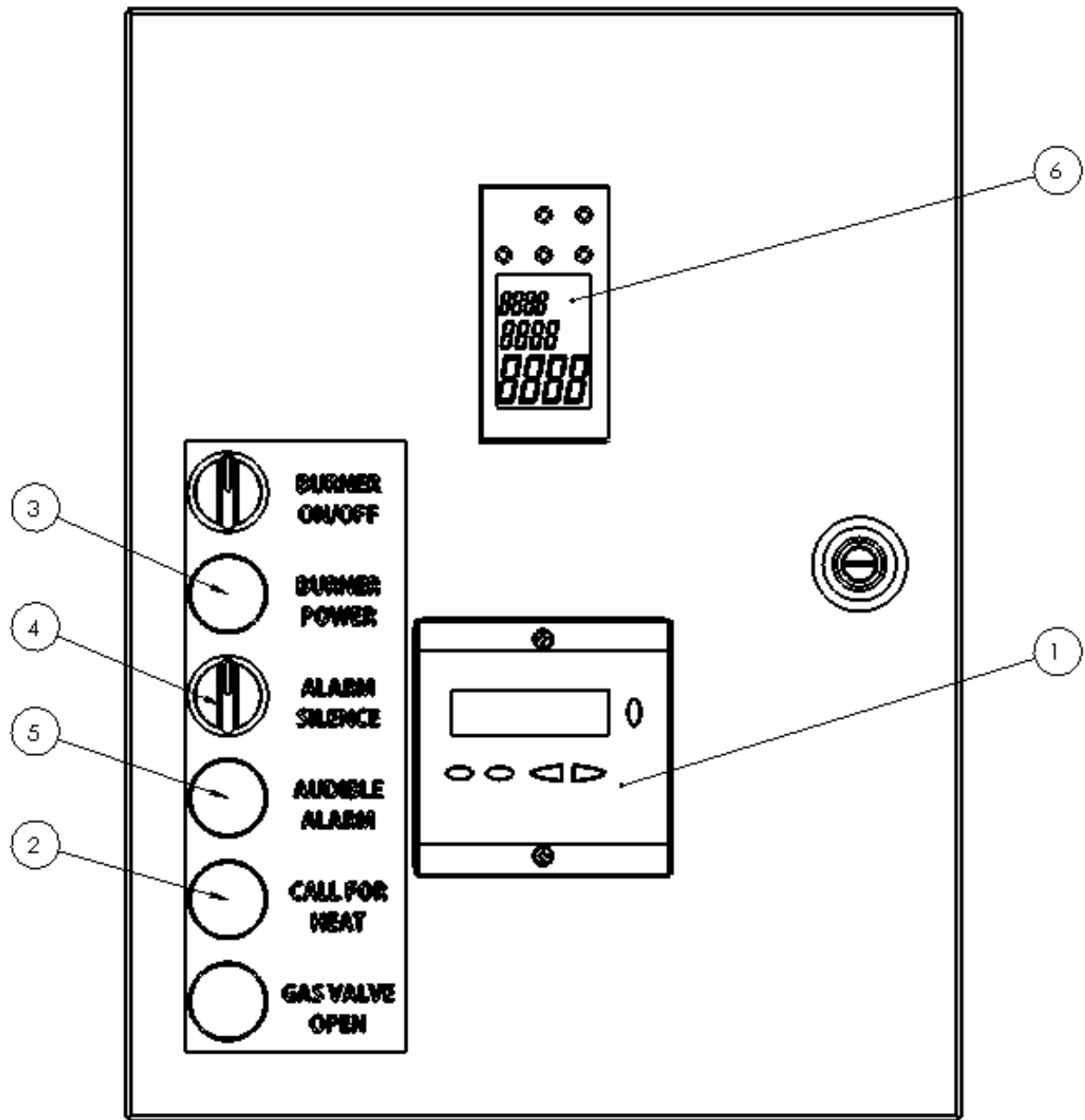
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	63793-001	MOTOR,3/4 120/50-60 LC23 W/B	1
* 2	63800-002	FAN-LC2300	1
3	1000169	Control,Actuator-AIR	1
4	1000197	SWITCH,AIR PRESS DIFF-SP.2 DUNGS	1
5	63873-001	IGNITOR-A 120V/50-60 HZ	1
* 6	1000185-SER	UV SCANNER W/ WIRING CABLE	1



\*- NOT SHOWN

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1000138-SER	DOUBLE GAS VALVE BODY - 1"	1
* 2	1000139-SER	GASKET,NEMA 4 FOR SKPx5 ACTUATOR	2
3	1000140-SER	ACTUATOR,SOV W/POC SWITCH	1
4	1000141-SER	SWITCH,HIGH PRESSURE	1
5	1000142-SER	SWITCH,LOW PRESSURE	1
6	1000144-SER	FLANGE,1-1/2" NPT for VGD20/VKP Valves	1
7	1000145-SER	FLANGE,1-1/4" NPT for VGD20/VKP Valves	1
8	1000149-SER	ACTUATOR,REGULATION W/ POC SWITCH & SPRING	1
9	1000147-SER	CONTROL,ACTUATOR-GAS	1
* 10	1000176-SER	SPRING,ACTUATOR-SKP25" (YELLOW)	1





ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1000168-SER	DISPLAY, LMV3/LME7 w/ CABLE COMBO	1
2	1000223-SER	LIGHT, PANEL MOUNT AMBER	2
3	1000222-SER	LIGHT, PANEL MOUNT GREEN	1
4	1000224-SER	SWITCH H, SELECTOR-2 POSITION w/ CONTACT	2
5	1000226-SER	LIGHT, PANEL MOUNT RED	1
6	64588-001 SER	CONTROLLER, PID	1

## SECTION VII CONSUMER INSTRUCTIONS

Keep the area around the burner clear and free of combustible materials, gasoline or other flammable liquids or vapors. Do not obstruct burner air openings or ventilation grilles for combustion air. If the burner is to be shut down for an extended time, the main manual gas valve should be closed as a precaution.

**NOTE: CHECK THE BURNER FLAME PERIODICALLY. A PROPER NATURAL GAS FLAME WILL APPEAR BLUE AT THE BURNER FACE WITH ORANGE AND YELLOW TIPS. A PROPER PROPANE GAS FLAME WILL APPEAR BLUE AT THE BURNER FACE WITH YELLOW TIPS. IF THE FLAME IS TOO RICH, IT WILL APPEAR BILLOWY AND YELLOW WITH HAZY TIPS, IF TOO LEAN, IT WILL APPEAR SHORT AND ALL BLUE. BURNER CLEANING AND/OR READJUSTMENT IS INDICATED BY FLAMES THAT ARE TOO RICH OR TOO LEAN. A COMBUSTION ANALYZER MUST BE USED TO FINE TUNE THE BURNER.**

**NOTICE**

**IF ANY FLAME IS OBSERVED WHEN THE BURNER IS ON STANDBY, OR IF THE IGNITION SPARK OR VALVE OPERATOR IS HEARD TO COME ON BEFORE THE MOTOR REACHES OPERATING SPEED, IMMEDIATELY TURN OFF THE MANUAL GAS CONTROL AND MAIN POWER. A DANGEROUS CONDITION HAS DEVELOPED AND MUST BE CORRECTED.**

**CONTACT A QUALIFIED SERVICE TECHNICIAN FOR CLEANING, ADJUSTMENT OR REPAIR.**

### **LIGHTING INSTRUCTIONS:**

1. Turn the main electrical disconnect power switch on.
2. Open all manual gas valves.
3. Set thermostat or operating control to call for heat.
4. Turn burner on-off switch to the on position.

Wait 30 Seconds. If the burner has failed to light, or if the burner lights then goes out, note the fault code on the AZL display and refer to SECTION III – OPERATION AND TROUBLESHOOTING. Press and hold the “Reset” button for 3 seconds to clear the fault code and re-attempt ignition.

### **TO SHUT OFF:**

1. Turn the main power switch off or turn the burner switch off.
2. Shut all manual gas valves.

For further questions, please see SECTION II - INITIAL START UP.

### **START-UP & SERVICE NOTES**

Record the installation data, the combustion readings, etc., and affix to this manual, or the burner and/or appliance. Space has been provided for start-up notes, dealer’s name, address, service telephone numbers, emergency telephone numbers, as well as the date of installation.



## LIMITED WARRANTIES FOR OIL AND GAS BURNERS, MADE BY WAYNE AND USED IN RESIDENTIAL INSTALLATIONS

**WAYNE COMBUSTION SYSTEMS (“WAYNE”)** warrants to those who purchase its **Oil Burner Models** for resale or for incorporation into a product of resale, that its burner is free from defects in material and workmanship under normal use and service for thirty-six (36) months from the date of manufacture. **ALL GAS BURNERS** manufactured by “WAYNE” will be similarly warranted for eighteen(18) months from date of manufacture except where original manufacture offers a greater warranty. (Reference #6 below) **THESE LIMITED WARRANTIES DO NOT APPLY UNLESS THE BURNER COVERED BY IT IS PROPERLY INSTALLED BY A QUALIFIED, COMPETENT TECHNICIAN, WHO IS LICENSED WHERE STATE AND/OR LOCAL CODES PREVAIL, AND WHO IS EXPERIENCED IN MAKING SUCH INSTALLATIONS,** in accordance with NFPA #31 of the national fire protection association and in accordance with all local, state and national codes.

Any **IN-WARRANTY** burner component which is defective in material or workmanship will be either repaired or replaced as follows:

1. Fuel pumps, motors, transformers, gas valves, and controls should be returned to an authorized service station or distributor of WAYNE for determination of applicability of this LIMITED WARRANTY as to either repair or replacement, where said service station or distributor is reasonably available in the customer’s locality. The manufacturers of burner components regularly publish and distribute listings showing the locations of their network of service stations. Where such local service is NOT available for the burner components described above or other burner parts are involved, these items should be returned, freight prepaid, to WAYNE Service Department, 801 Glasgow Ave, Fort Wayne, Indiana 46803.
2. Burners and/or component(s) determined to be covered under this LIMITED WARRANTY by WAYNE shall be repaired or replaced at WAYNE’s sole option.
3. WAYNE is not responsible for any labor cost for the removal and replacement of said burner or burner components and equipment associated therewith.

4. A burner so repaired will then carry the LIMITED WARRANTY equal to the unexpired portion of the original burner LIMITED WARRANTY.
5. If inspection by WAYNE does **NOT** disclose any defect covered by this LIMITED WARRANTY, the burner or burner component(s) will be either repaired or replaced at the expense of the customer and WAYNE’S regular charges will apply.
6. If the original manufacturer of a burner component offers a warranty greater than either of our LIMITED WARRANTIES described above, then this portion will be added to our LIMITED WARRANTY.

This LIMITED WARRANTY does **NOT** cover products which have been damaged as the result of accident, abuse, misuse, neglect, improper installations, improper maintenance or failure to operate in accordance with WAYNE’s written instructions.

These LIMITED WARRANTIES do not extend to anyone except the first purchaser at retail and only when the burner is in the original installation site.

**IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED TO THE DURATION OF THE LIMITED EXPRESS WARRANTIES CONTAINED HEREIN. WAYNE EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY NATURE FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY.**

Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you. Also, some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. WAYNE neither assumes or authorizes any person to assume for WAYNE any other liability or obligation in connection with the sale of these products. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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