

ACL

Manufacturing Inc.

ACL 3000 FLARE STACK IGNITION SYSTEM

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WARNING

This manual must be read in its entirety before installation of this system. Installation must be performed by a qualified technician and must adhere to the standards set by the local regulatory authorities.

ACL is not responsible for the misuse or incorrect application of this product.

ACL 3000 FLARE STACK IGNITION SYSTEM



ACL 3000 PROVIDES

- Fully retractable ignition system
- Continuous pilot with electric automatic relight system
- Solar, 12 VDC, 24 VDC or 120/240 VAC
- Unique design provides for a pilot and ignition in a single unit
- Flame sensing and control provided by flame rod technology
- Alarm annunciation and alarm output contacts
- Solid state ignition delivers 30 sparks per second
- Flame rod technology utilized to sense pilot flame, ignition resumes immediately upon loss of pilot flame
- Extremely low fuel consumption
- CSA approved Class 1 Div 2 location
- CSA approved C22.2 No 199-M89. Combustion Safety Controls and solid state ignitors for Gas and Oil burning equipment.
- Pilot ignitor and ignition coil all mounted on retractable trolley system
- Pilot gas is ignited inside pilot nozzle by electrode
- Cable & pilot gas line secured inside 1 5/8" rail system
- 1400 lb winch and 5/32 SST aircraft hoisting cable
- Ignitor constructed of SST for extreme operating conditions

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Theory of Operation

The ACL 3000 utilizes a single ignitor/flame rod to provide both flame acknowledgment and ignition at the pilot tip. When the ACL 3000 starts its ignition sequence, fuel gas must be turned on where it travels to the pilot tip where the ignitor/flame rod is located and sparking. Once the gas is lit, the flame becomes a current path for the ignitor/flame rod for flame acknowledgment and the unit stops sparking. If this flame is ever to blow out, the current path is broken and the ignitor/flame rod starts sparking within 1 second. NOTE: Flame rod technology requires an intense cone shaped flame. (A yellow, lazy flame may not be sufficient). The pilot orifice is factory sized at .025" to achieve maximum flame current. A larger pilot orifice will result in a reduced flame signal and possible flame fail shut down.

Sequence of Operation

	System On Light	Pilot Light	(Optional Solenoid)	Alarm/Light Alarm/Contacts	Ignition	Run Status Contacts
Stop/Reset Pressed	OFF	OFF	OFF	OFF	OFF	OPEN
Push start 5 second trial for ignition	ON	ON	ON	OFF	ON	CLOSED
Pilot flame lit	ON	ON	ON	OFF	OFF	CLOSED
Pilot flame blows out	ON	ON	ON	OFF	ON	CLOSED
Fails to light after 5 seconds	ON	OFF	OFF	ON	Off	OPEN
15 seconds later (T3 adjustable) sequence restarts 5 second trial for ignition (Note 1)	ON	ON	ON	OFF	ON	CLOSED

Note1: Restart cycle is continuous until pilot flame is established and acknowledged.

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Electrical Connection

The electrical drawing provided with each unit mounted in the control box will provide enough information for connection of the unit. The ignitor box mounted on trolley is already connected to the cabtire. The only connections required are the power supply hook-up and the cabtire wire from the ignitor box into the control box.

Piping Connections

The ACL 3000 comes with a regulator, gauge and 1/4" flexible hose. The 1/4" hose is to be directly connected to the output of the regulator. The gauge is also to be mounted on the regulator. A clean, dry fuel gas supply is to be piped to the inlet of the regulator and not to exceed 150 psi. Regulator can be mounted close to the bottom of stack approximately 3 to 4 feet above the ground.

Start Up

After electrical connections and piping connections are completed, ensure supply gas is purged of any solid particles as they may get caught in the pilot orifice. Install trolley into rail system and hoist with hand winch. The pilot line should be fed into the rail portion to protect it from the elements and wind. Once the ignitor and trolley have been hoisted, press the start button and then turn on the fuel gas supply. Set the regulator output between 5 & 10 psig. The unit will then spark and light the pilot. Once flame is established the unit will be in normal operating condition.

Setting Spark gap

Spark gap should be approximately 1/8" from the inside wall of nozzle and is factory preset.

Ignitor Rod Adjustment

There are three ignitor rod adjustments that can be made in order to achieve correct positioning of the pilot tip for reliable light off.

- Ignitor rod can be adjusted up or down on the trolley arm by loosening the 4 bolts, which hold the ignitor rod itself.
- The trolley arm can be adjusted up or down by loosening the (2) bolts on the trolley assembly.
- The angle at which the ignitor rod tips into the shroud can be adjusted by changing the hole patterns on the trolley wheels.

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Alarm Output

Alarm output status provides the user with a normally closed and normally open set of dry contacts. The only time these contacts change state is when the controller has been unsuccessful in lighting the pilot assembly after 1 try.

Run Status

This output provides a run status of the controller. These contacts are a normally open set of dry contacts when the controller is off or in alarm state. When the controller is running normally, these contacts are closed.

Restart Timer

The ACL 3000 comes with a restart timer so that when the controller goes into alarm mode the restart timer (T3) is activated and will clear the alarm and begin start sequence again. The time increments are 15 seconds, 1 minute 15 seconds, 2 minutes 15 seconds, and so on.

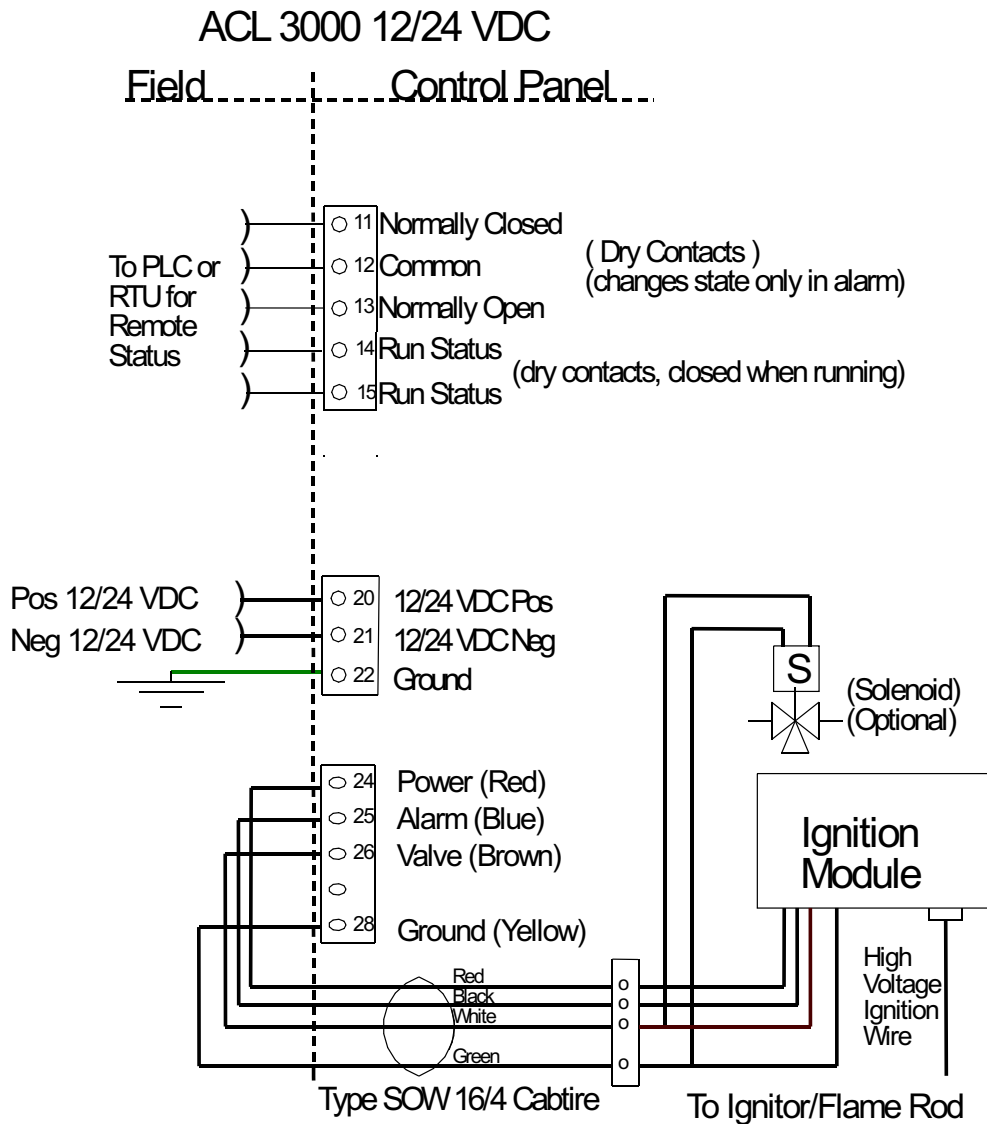
Re-setting The controller

Re-setting of the controller is required when:

- Power outage occurs
- Stop button is pushed inadvertently
- Pilot gas is lit from a source other than the ignition module

To reset, the operator must turn off the fuel gas and press the stop button of the controller. Wait 1 minute, then press the start button, then turn on fuel gas while in ignition mode.

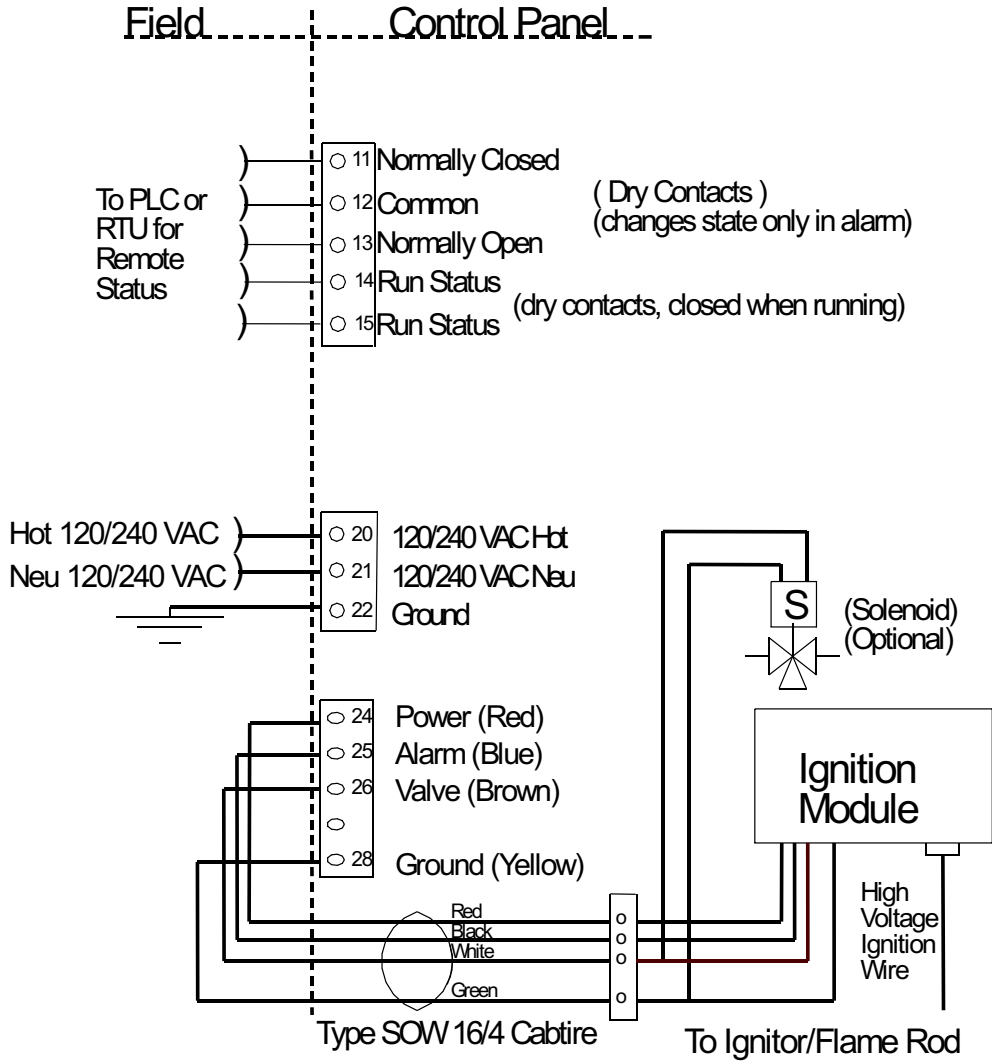
ACL 3000 FLARE STACK IGNITION SYSTEM



SPECIFICATIONS DC		
VOLTAGE	12 VDC	24VDC
CURRENT	0.204A	0.102A
POWER	2.45W	
OPERATING TEMPERATURE	-40 C to 60 C	
FLAME SENSITIVITY	1 micro amp minimum	
FLAME FAILURE RESPONSE TIME	0.8 seconds maximum	
SPARK RATE	25 sparks per second	

ACL 3000 FLARE STACK IGNITION SYSTEM

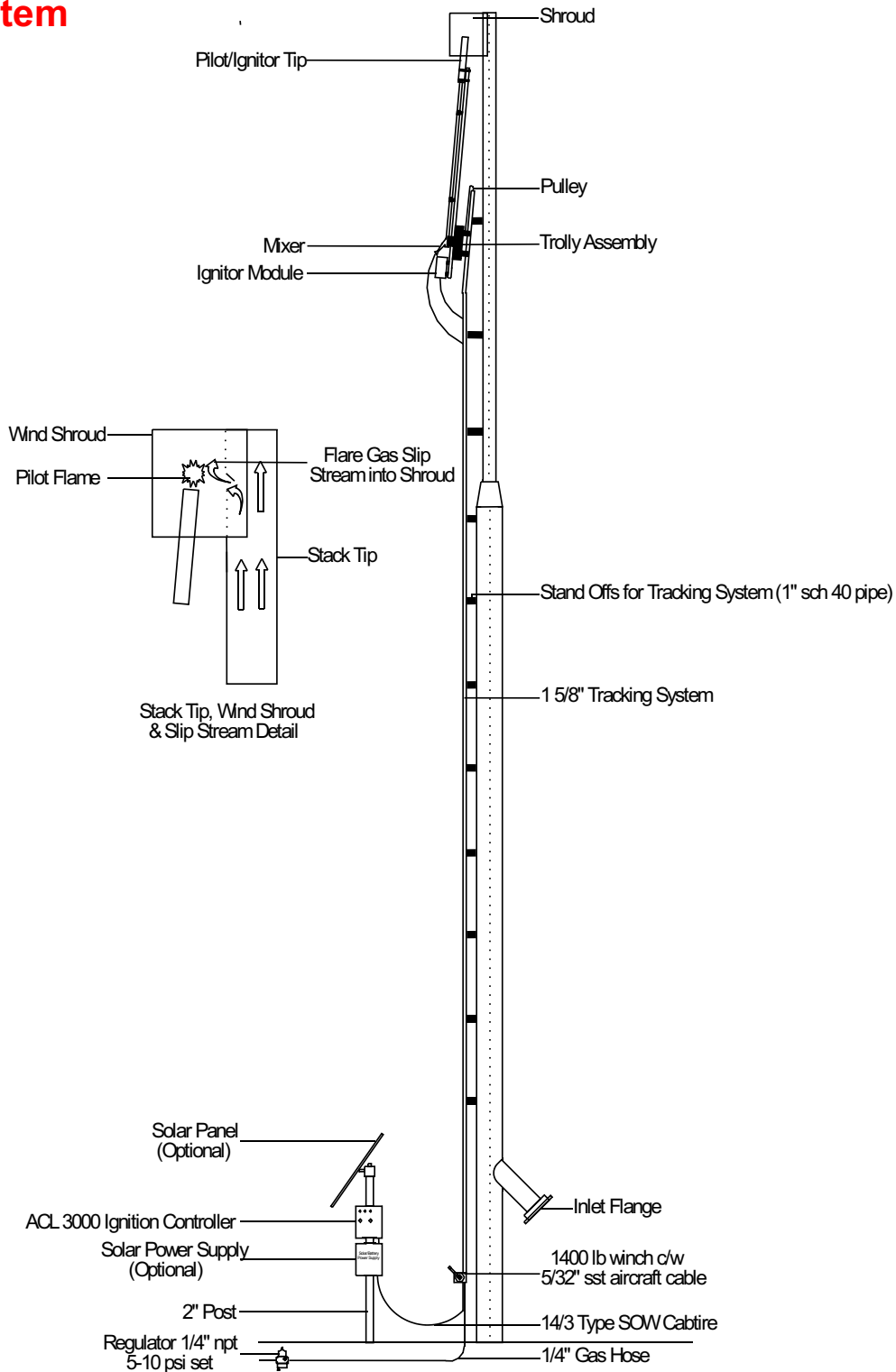
ACL 3000 120/240 VAC 50/60 Hz



SPECIFICATIONS AC		
VOLTAGE	120 VAC	240 VAC
CURRENT	0.058A	
POWER	2.75W	
OPERATING TEMPERATURE	-40 C to 60 C	
FLAME SENSITIVITY	1 micro amp minimum	
FLAME FAILURE RESPONSE TIME	0.8 seconds maximum	
SPARK RATE	25 sparks per second	

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ACL 3000 Flare Stack Ignition System



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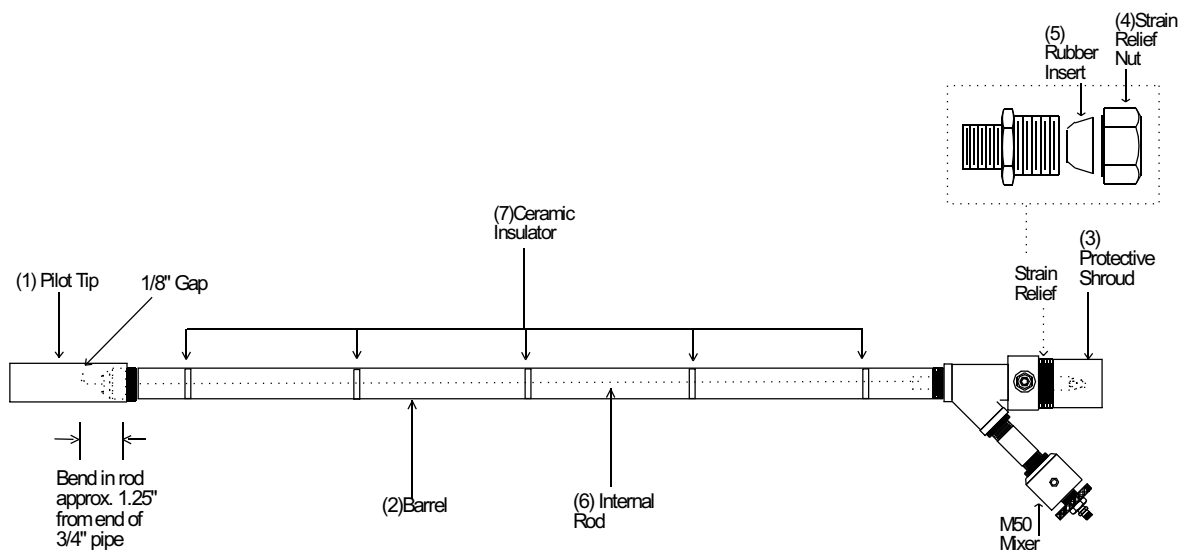
ACL 3000 Internal Rod Replacement

(Removal)

1. Unscrew pilot tip (1) from end of ignitor barrel (2)
2. Unscrew protective shroud (3) from Y fitting
3. Unscrew strain relief nut (4) and rubber insert (5) and remove
4. Remove internal rod (6) from barrel through tip end

(Installation)

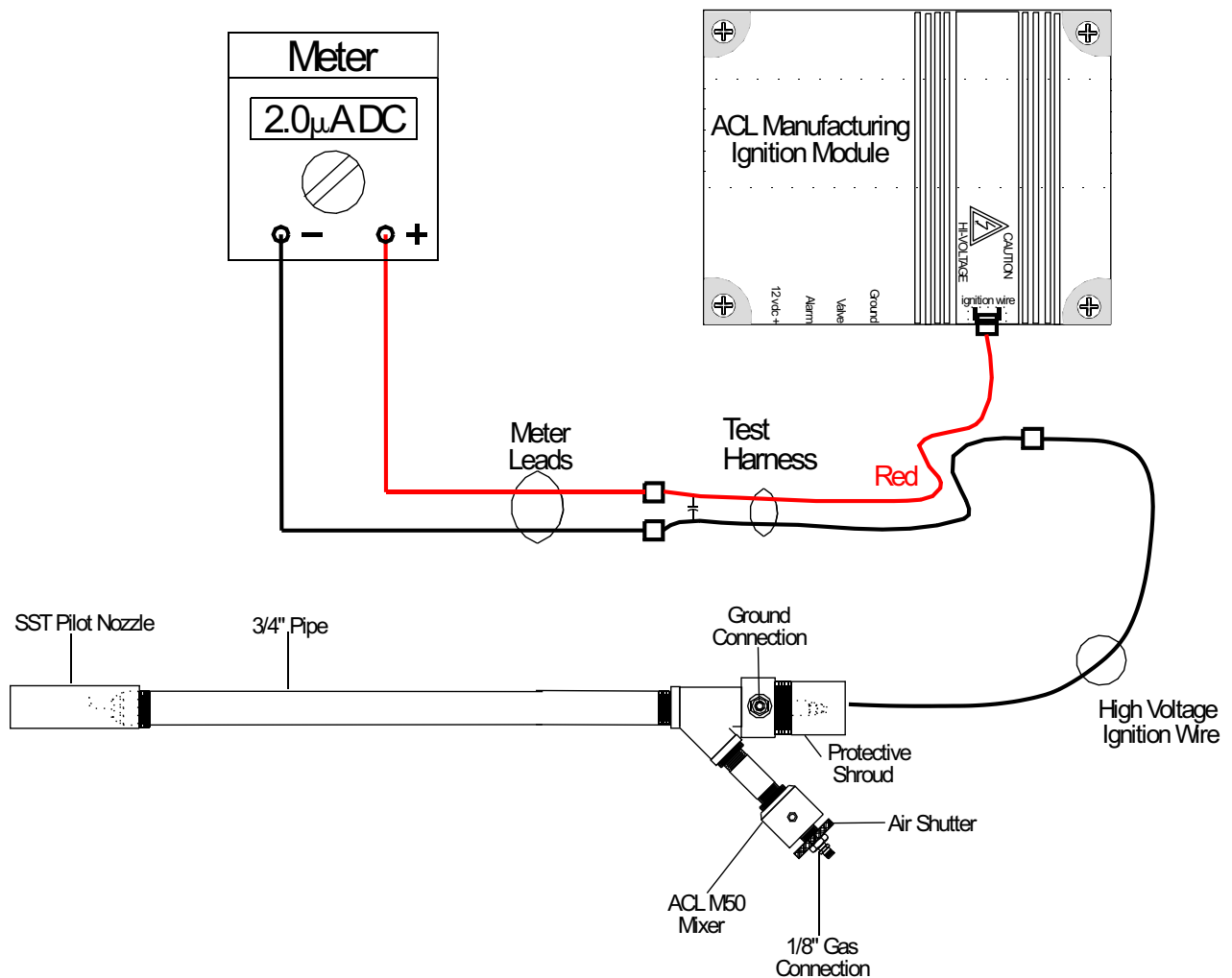
1. **Clean out inside of barrel** to ensure there are no contaminants such as oil or condensate residue on the walls of the pipe
2. Install new internal rod from pilot tip end. Make sure not to force rod as it may damage ceramic insulators (7)
3. Internal rod tip must be positioned 1.25" from threaded end of barrel
4. Once positioned correctly, replace strain relief nut and rubber inserts. Do not over tighten strain Relief as this may damage the ceramic
5. Re-install pilot tip and ensure gap is approximately 1/8"
6. Re-install protective shroud to Y fitting



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Flame Signal Test Procedure

1. Turn power off to ACL controller
2. Remove High-Voltage Ignition wire from Ignition Module and insert meter leads with test harness as shown
3. Turn on power and initiate start sequence
4. Meter will give erratic readings during ignition period but should settle down between 1-2 μ A reading on meter
5. Adjust air shutter on pilot mixer and adjust pressure on regulator to achieve a flame signal close to 2 μ A which is optimum



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Troubleshooting Guide

<u>Fails to attempt ignition</u>	
Blown fuse	Replace fuse 4 amp max-F1, F2 on circuit board
Battery voltage low (solar pkg only)	Charge battery to minimum of 11.5 volts. Check solar panel connections
Poor power connections	Check connections on terminal strips
Defective ignition module	Remove module and send for repair/replace
Defective control board	Remove control board and send for repair

<u>Attempts ignition but doesn't light</u>	
Fuel gas supply to pilot may be too high or low	Pilot fuel gas supply should be set at 5 pounds, adjust regulator
Gap setting on ignitor/flame rod not correct	Gap should be approximately 1/8"
Poor ground	Ensure ground connections are good in control box and at pilot assembly on trolley
Pilot solenoid failure (if applicable)	Replace solenoid
Plugged orifice on pilot	Clean out pilot orifice (Do not redrill)

<u>Weak or erratic spark</u>	
Gap setting too wide	Shorten gap setting 1/8" to 1/4" max
Ignition cable defective or insulation worn	Replace cable
Poor ground	Check ground at booth ends (control box & ignitor tip)
Contaminated electrode	Remove electrode, clean & swab 3/4" pipe

<u>Alarm rings in but pilot still lit</u>	
Controller microprocessor locked up	Remove power to controller for 10 seconds. Perform restart sequence as in manual
Poor ground	Tighten all ground connections
Flames not ionizing properly	Check orifice, adjust fuel gas pressure
Faulty ignition module	Remove module and send for repair/replace
Defective control board	Remove control board and send for repair
Pilot or orifice improperly sized	See Theory of Operation



Website: www.aclmfg.com

Limited Warranty

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any product which is found to be defective in such workmanship or material will be repaired or replaced by Seller for a period of one year from purchase date. Warranty of such items do not include shipping, installation or set-up.

Liability Statement

ACL Manufacturing Inc. Shall not be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss of expenses of any nature incurred by the buyer or any third party.

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