

ISIMET

LA v2 Utility Controller

HV (120VAC) / LV (24VDC)

Installation Manual



ISIMET LA_{v2}
Installation Manual

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Patent 6,757,589 B1, 6,990,393 B2, 8,543,225, Other Patents Pending

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Important Warnings

Indoor Storage and Installation:

Installers shall be responsible for protecting the control panel, solenoids, and electrical enclosures from rain, liquids, construction and drywall debris and materials, dust, and extreme heat or cold (above 90°F and below 32 F°). Such exposure may result in equipment malfunction/failure.

Preventing Transient Voltage:

Control wiring **MUST** be housed in separate conduit from power wire (120VAC, 24VDC or 12VDC).

Codes and Experience:

Only qualified, licensed plumbers and electricians within the governing jurisdiction should perform this installation and/or service this equipment.

All ADA, local plumbing and national electrical codes must be followed.

Mounting the LA_{v2} Utility Controller

The LA must be mounted in a location that is easily and readily accessible. The installation height of the LA must comply with ADA standards. There are two options for mounting the LA: [Surface Mount \(page 5\)](#) or the recommended [Flush Mount \(page 3\)](#). Skip to the required section for installation instructions.

Flush Mount Installation (Recommended)

1. Place the LA Enclosure Box next to the stud taking into consideration the finished wall thickness. (The front of the LA Enclosure Box should be installed flush with the finished wall).

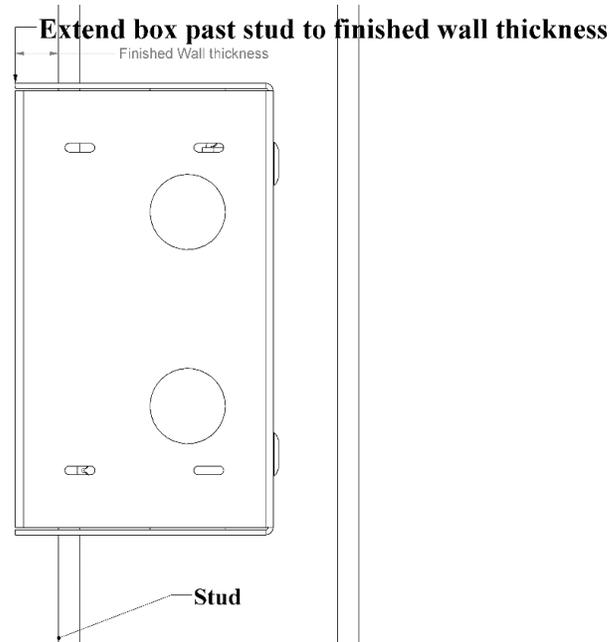


Figure 1: Flush Mount Installation (Protrude to finished wall thickness)

2. Attach the LA Enclosure Box to the stud through the slotted cutouts using appropriate screws.

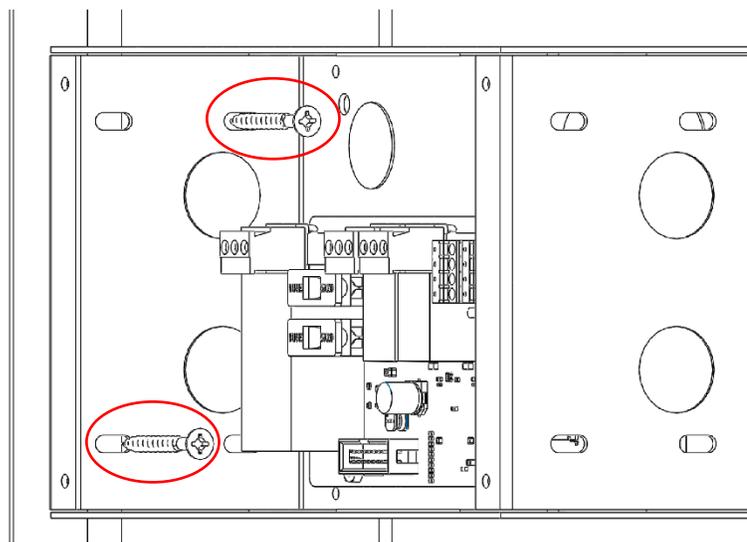


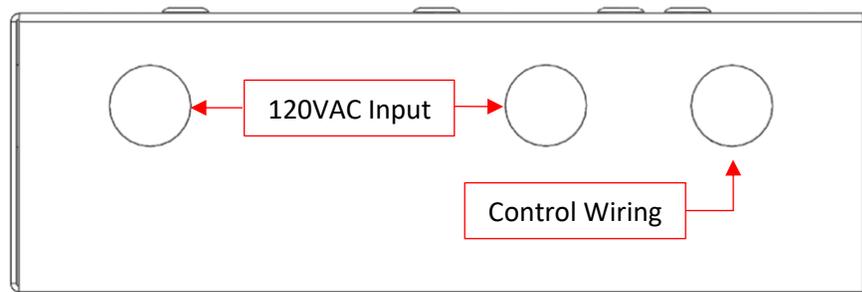
Figure 2: Mount LA to Stud

3. Remove only the necessary knockouts from the LA Enclosure Box for wiring.



Note for Low-Voltage LAV2-LV:

DO NOT install a connector in top left corner as this will interfere with the 24VDC outputs.



Front

Figure 3: Example of typical wiring knockouts for the LA (Top View)

4. Install EMT conduit with connectors to the LAV2 enclosure for the 120V line voltage and control wiring.

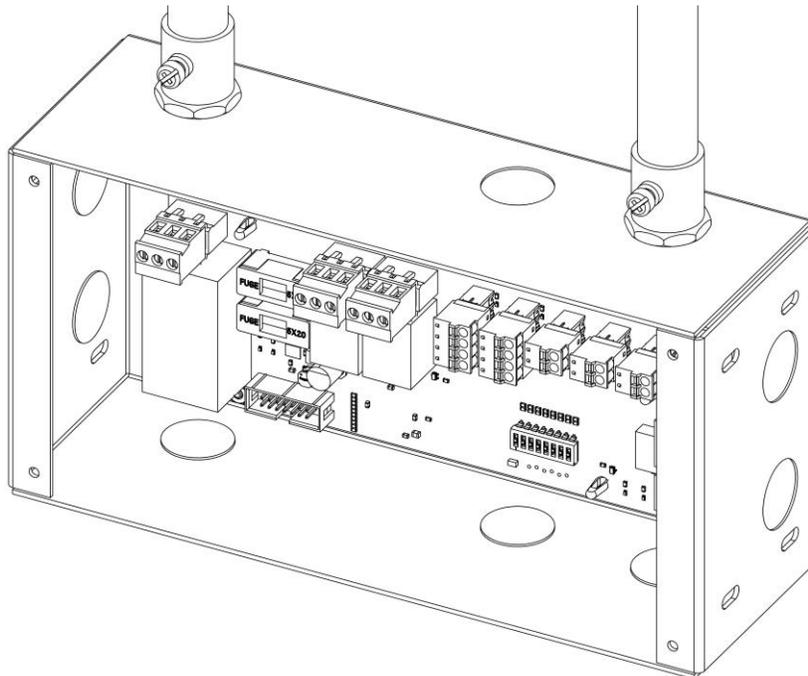


Figure 4: Recommended EMT conduit installation for LAV2-HV

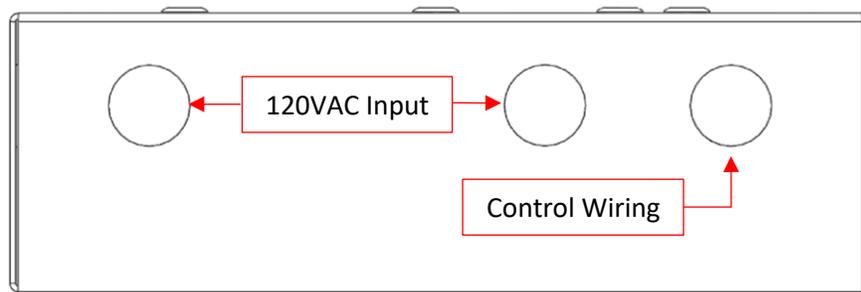
Surface Mount Installation

1. Remove only the necessary knockouts from the LA Enclosure Box for wiring.



Note for Low-Voltage LAV2-LV:

DO NOT install a connector in top left corner as this will interfere with the 24VDC outputs.



Front

Figure 5: Example of typical wiring knockouts for the LA (Top View)

2. Level and plumb the LA Enclosure Box to the wall and secure the enclosure through the predrilled holes (in the four corners) using appropriate mounting screws.

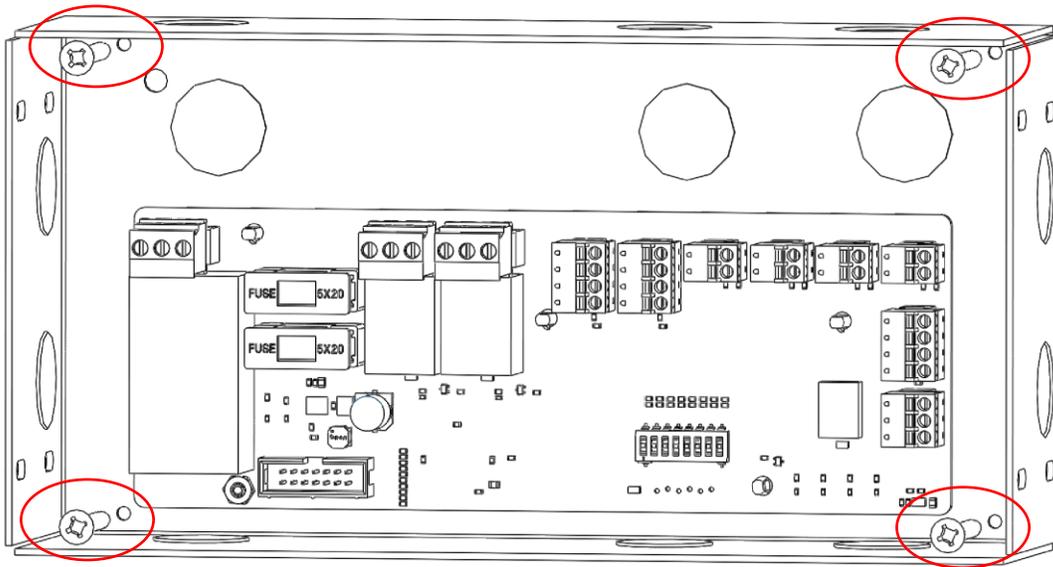


Figure 6: Surface Mount Installation (LA)

Surface Mount Installation (Continued)

3. Drill out the Surface Mount Sleeve to match the knockouts previously removed from the LA Enclosure Box.

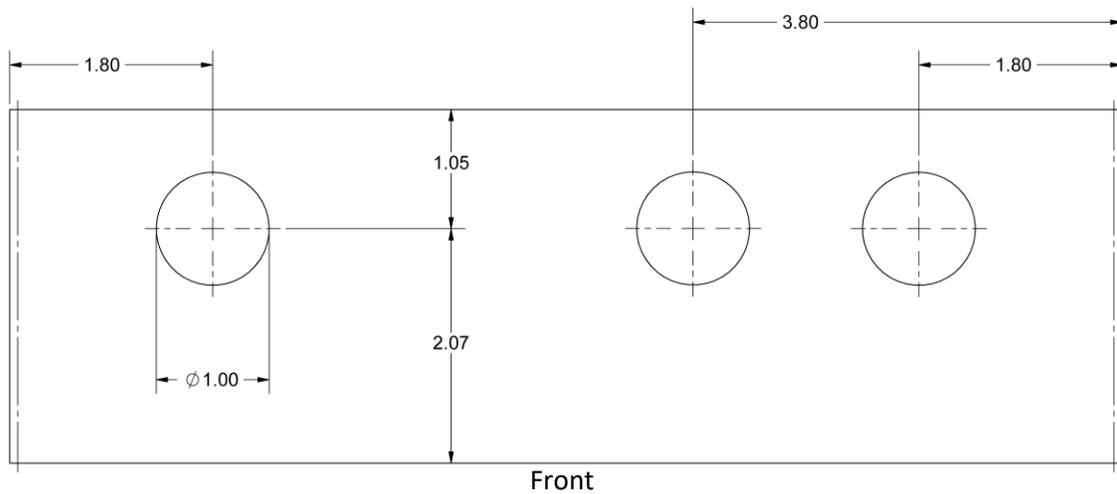


Figure 7: Surface Mount LA Sleeve Drill Points (Top View)

4. Slide the Surface Mount Sleeve over the LA Enclosure Box and install EMT conduit with appropriate connectors for the wiring.

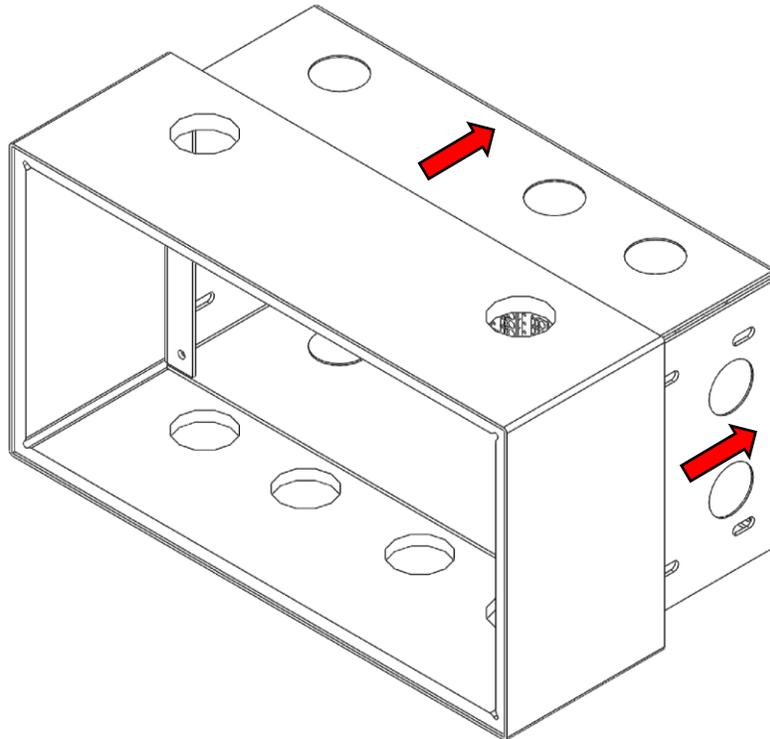


Figure 8: Install Surface Mount Sleeve onto the LA

Mounting the Solenoid(s) (If used)

Solenoid Installation Recommendations:

- A licensed installer should complete this section following all National and Local Codes.
- Ensure that 120VAC solenoids are ONLY used with the LA_v2-HV (High-Voltage), while 24VDC solenoids are used exclusively with the LA_v2-LV (Low-Voltage).
- Install solenoid(s) with ISIMET's S-Series Enclosure, which will typically include a Solenoid Assembly (see below), which includes a Y-Strainer, Ball Valve, and Unions.
- The solenoids should be installed with an access panel for maintenance and/or service.
- Remove the solenoid assemblies and flush the piping systems prior to initial startup.

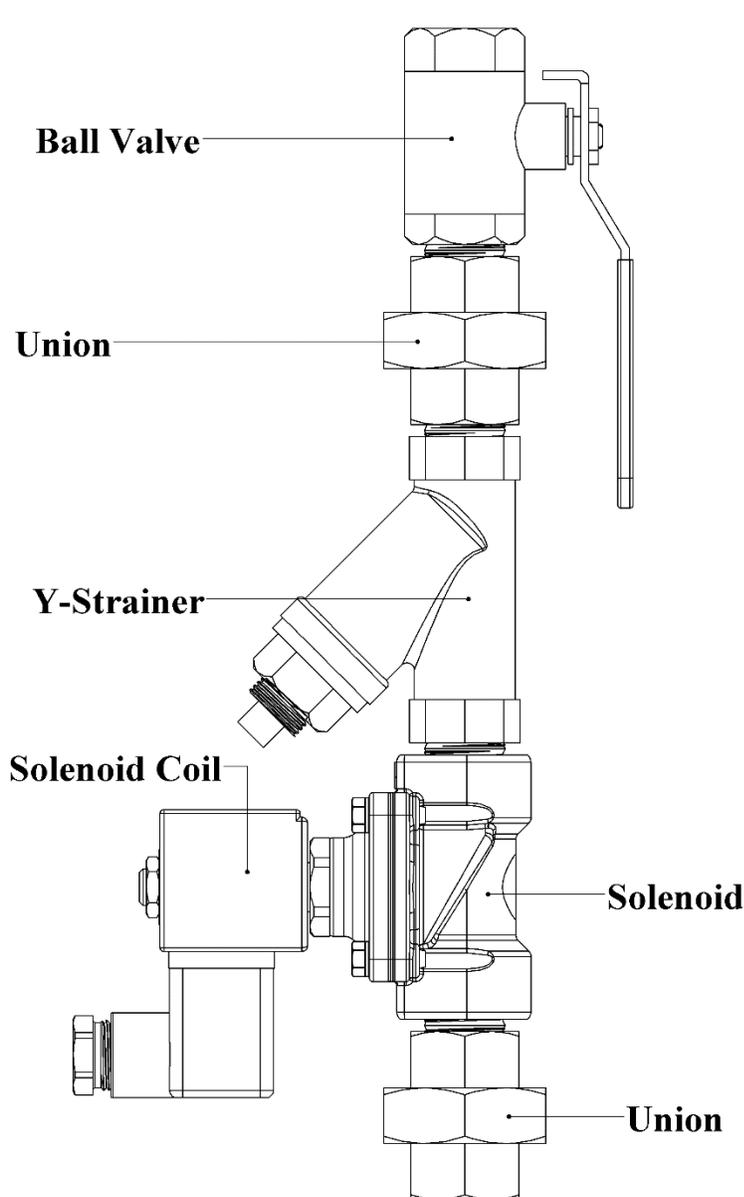


Figure 9: Recommended ISIMET Valve Assembly for Water Control

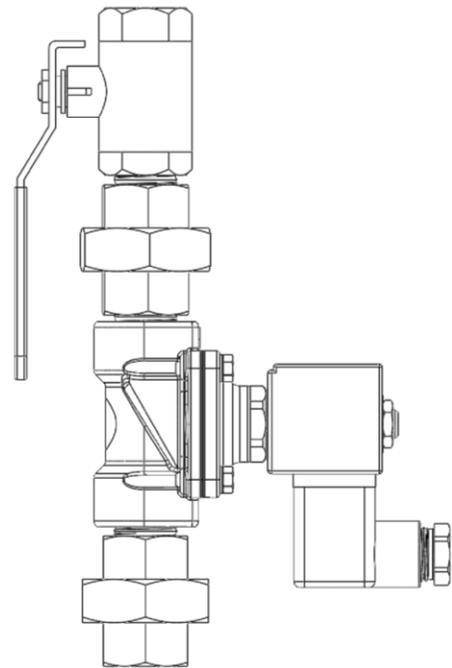


Figure 10: Recommended ISIMET Valve Assembly for Gas Control

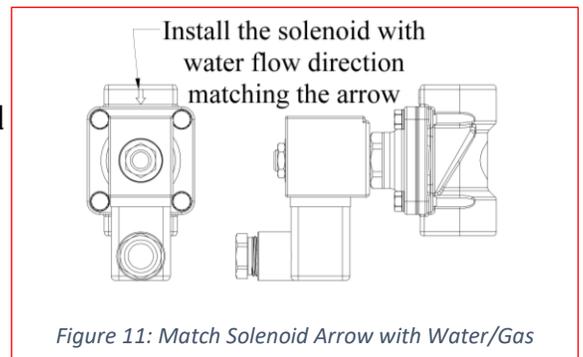
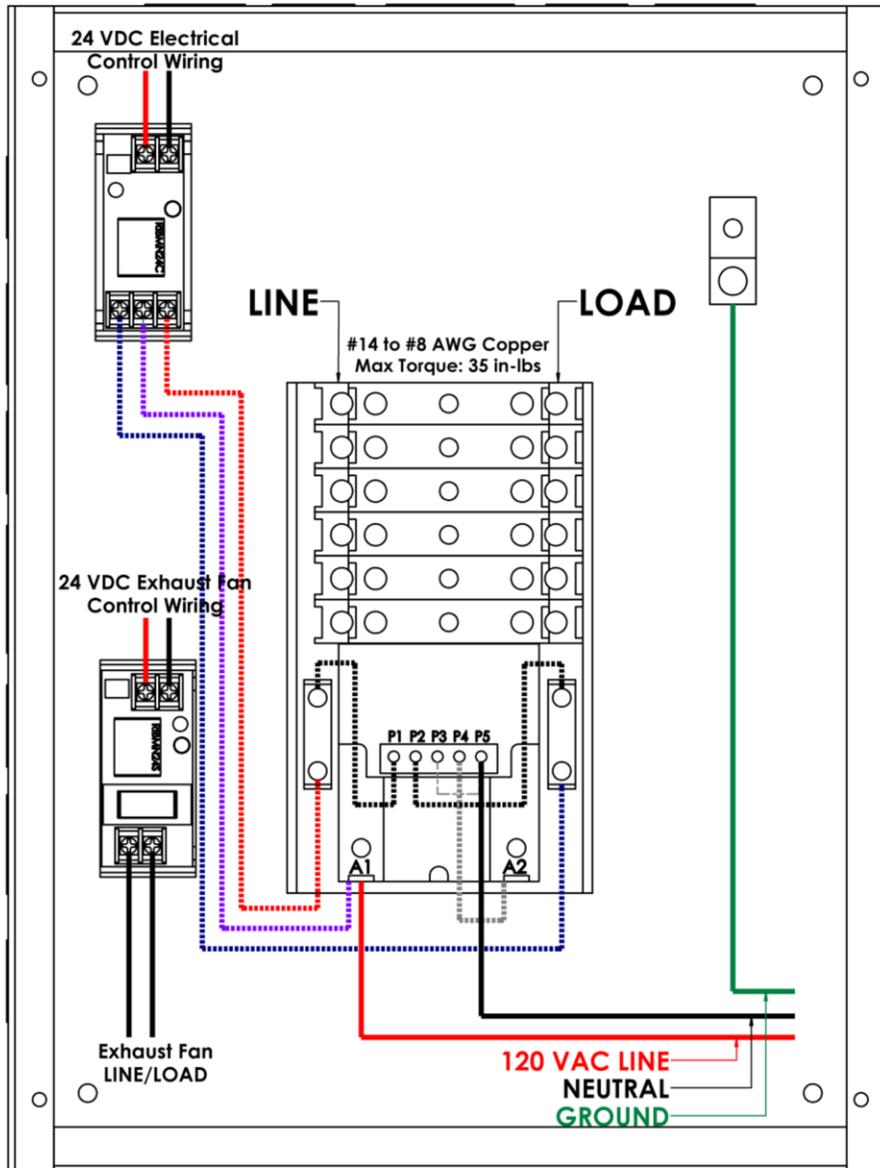


Figure 11: Match Solenoid Arrow with Water/Gas

Mounting the E-Series or an Electrical Contactor (Optional)

Electrical Contactor Installation Recommendations:

- A licensed installer should complete this section following all National and Local Codes.
- Ensure that a 120VAC contactor is used with the LA_v2-HV (High-Voltage), while a 24VDC contactor or relay rated at 24V is used exclusively with the LA_v2-LV (Low-Voltage).
- It is recommended to control electrical devices through ISIMET's E-Series Enclosure, which will typically include either an Eaton or Square-D Electrical Contactor and application specific relays.
- Read and follow all installation instructions of the selected electrical contactor.



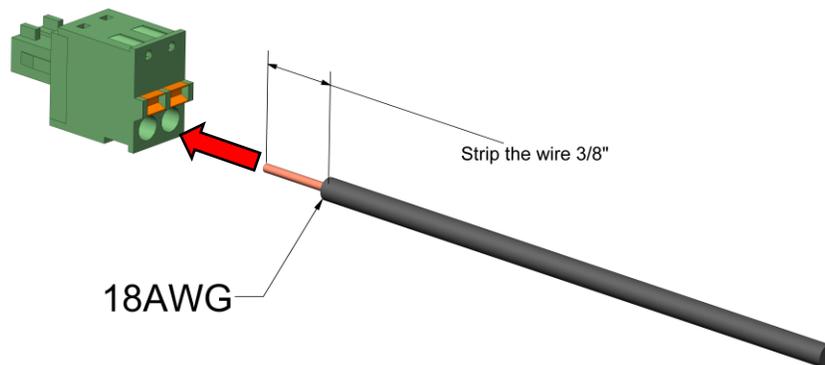
Note: Dashed lines indicate connections are pre-made.

Figure 12: Optional Eaton Contactor in E-Series (for the LA_v2-LV)

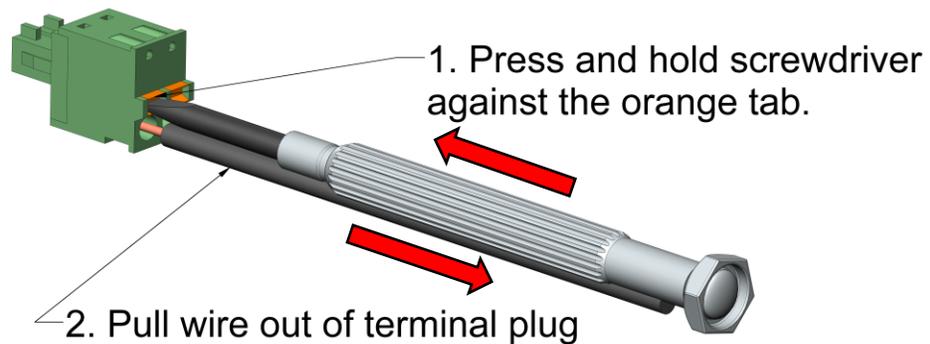
Wiring the LA_{v2}

A licensed electrical contractor should perform all 120VAC wiring following all electrical codes and procedures. Low-Voltage and control wiring should be isolated from any line voltages and use 18 AWG minimum. **Warning: All Inputs MUST be Dry-Contact (Voltage-Free)!**

How to attach wiring to terminal plug



How to remove wiring from terminal plug



LA_v2-HV (120V) Wiring Instructions (Skip ahead for the LV version)

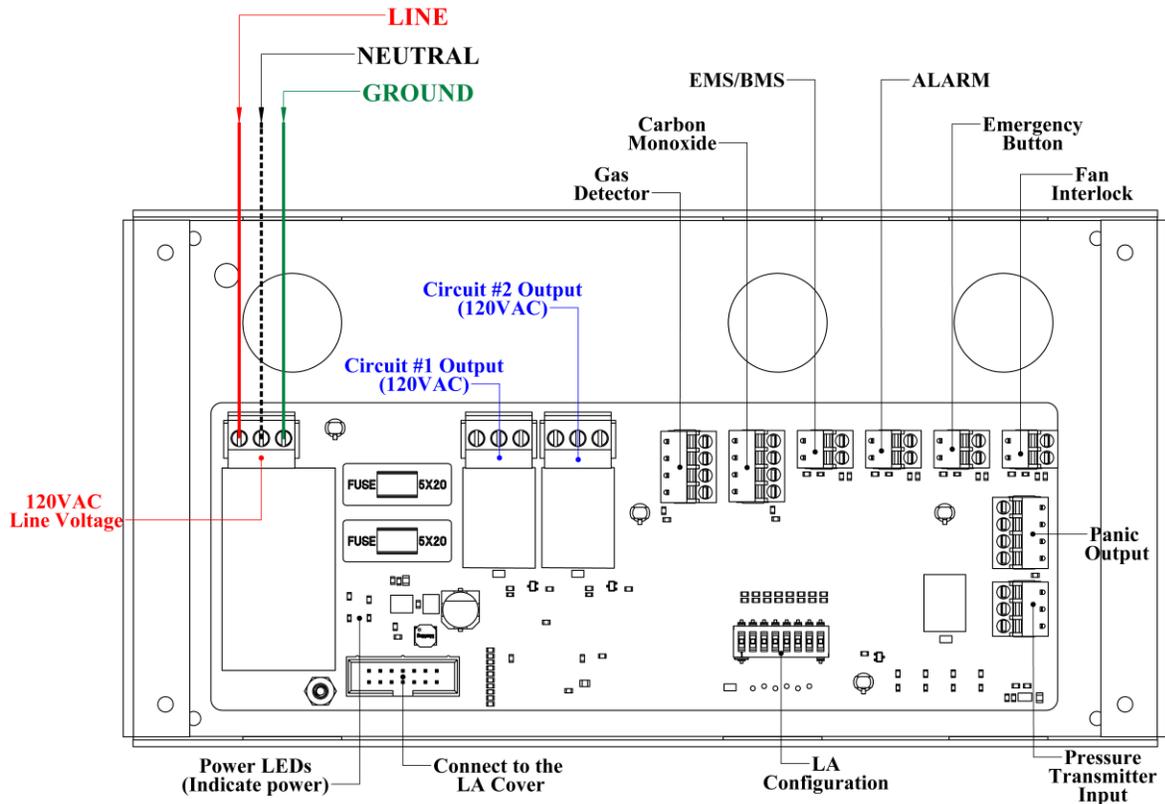


Figure 13: LA_v2-HV (120V) Wiring Diagram

LA_v2-HV Label	Description
<i>120V_Input</i>	<i>120VAC Line Voltage Input</i>
<i>Circuit #1 Output</i>	<i>First 120VAC Circuit Output</i>
<i>Circuit #2 Output</i>	<i>Second 120VAC Circuit Output (Optional)</i>
<i>Gas Detector, Carbon Monoxide</i>	<i>Dry-Contact Input with 24VDC Output</i>
<i>EMS/BMS, ALARM, Emergency Button, Fan Interlock</i>	<i>Dry-Contact (Voltage-Free) Inputs</i>
<i>Panic Output</i>	<i>24VDC and Dry-Contact Configurable Output</i>
<i>Pressure Transmitter Input</i>	<i>ISIMET approved Gas Pressure Transmitter</i>

LA_v2-LV (Low-Voltage) Wiring Instructions

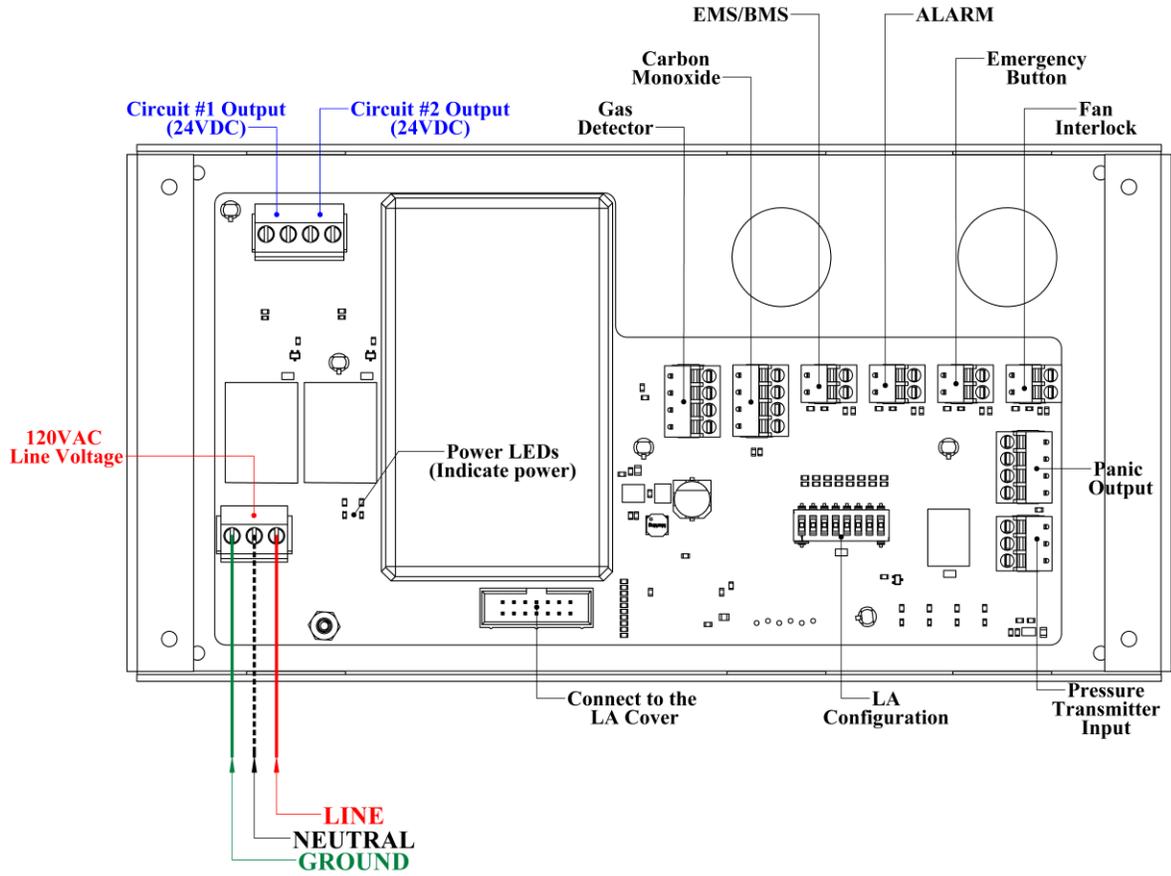


Figure 14: LA_v2-LV (Low-Voltage) Wiring Diagram

LA _v 2-LV Label	Description
<i>120V_Input</i>	<i>120VAC Line Voltage Input</i>
<i>Circuit #1 Output</i>	<i>First 24VDC Circuit Output</i>
<i>Circuit #2 Output</i>	<i>Second 24VDC Circuit Output (Optional)</i>
<i>Gas Detector, Carbon Monoxide</i>	<i>Dry-Contact Input with 24VDC Output</i>
<i>EMS/BMS, ALARM, Emergency Button, Fan Interlock</i>	<i>Dry-Contact (Voltage-Free) Inputs</i>
<i>Panic Output</i>	<i>24VDC and Dry-Contact Configurable Output</i>
<i>Pressure Transmitter Input</i>	<i>ISIMET approved Gas Pressure Transmitter</i>

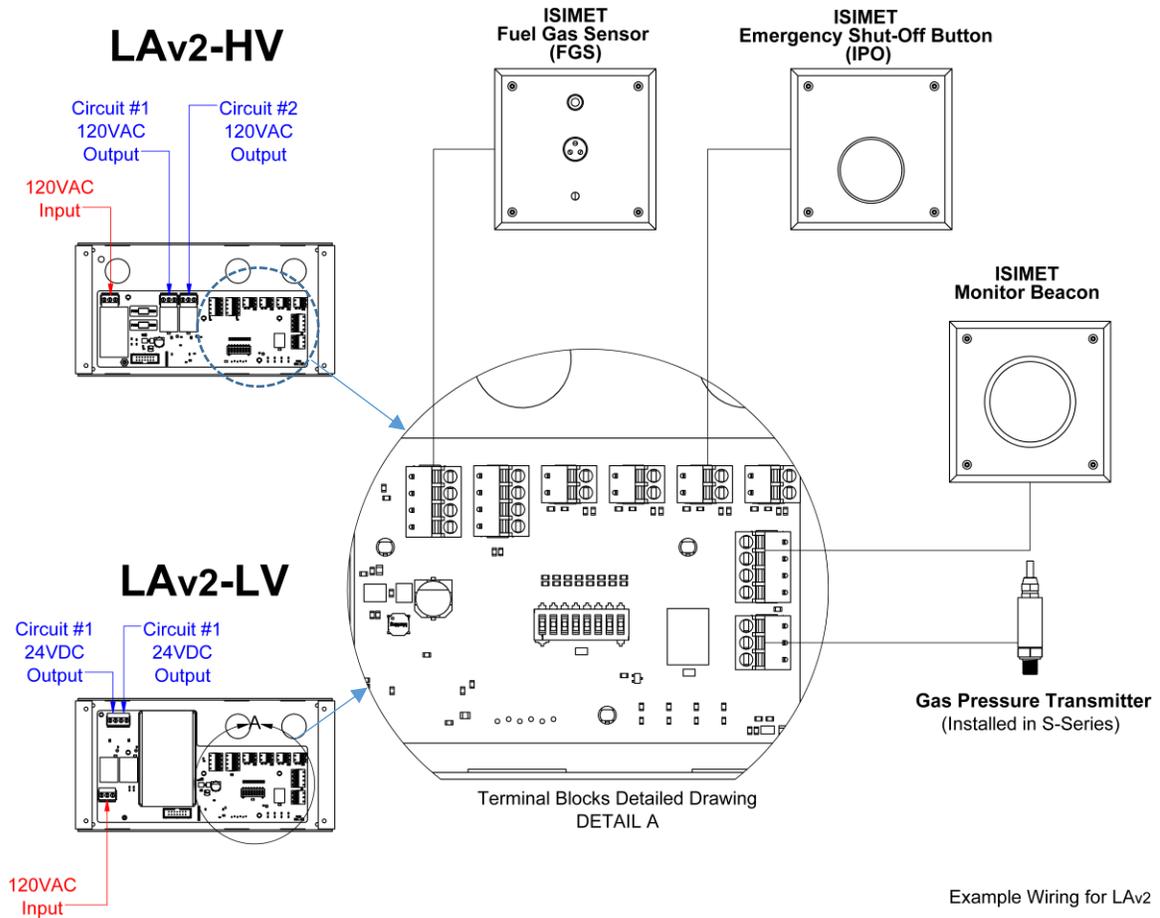


Figure 15: Example Wiring Drawing with ISIMET Optional Components

Example Wiring for LAv2

LAv2 Label	Description
<i>Gas Detector</i>	<i>Dry-Contact Input with 24VDC Output for ISIMET's Fuel Gas Sensor</i>
<i>Carbon Monoxide</i>	<i>Dry-Contact Input with 24VDC Output for a Carbon Monoxide Detector</i>
<i>EMS/BMS</i>	<i>Dry-Contact Input for the Energy/Building Management System to shut down the LA</i>
<i>ALARM</i>	<i>Dry-Contact Input for Building Alarm</i>
<i>Emergency Button</i>	<i>Dry-Contact Input for Emergency Shut-Off</i>
<i>Fan Interlock</i>	<i>Dry-Contact Input to disable the LA</i>
<i>Panic Output</i>	<i>24VDC and Dry-Contact Configurable Output</i>
<i>Pressure Transmitter Input</i>	<i>ISIMET approved Gas Pressure Transmitter</i>

Completing the LA Installation

Flush Mount Completion (Skip ahead for Surface Mount)

1. After the walls are finished, firmly attach the ribbon cable from the LA Enclosure Box to the LA Front Cover plug.

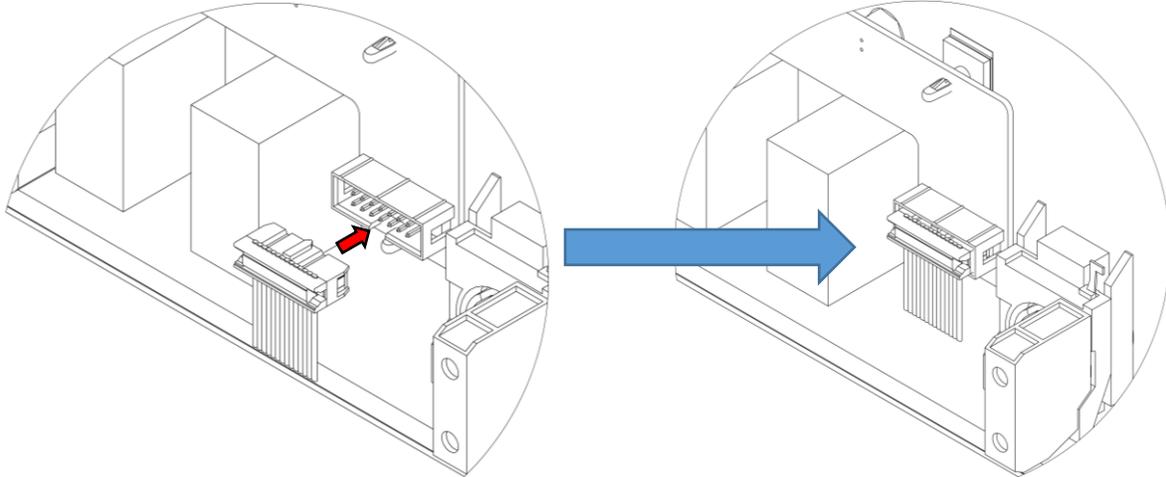


Figure 16: Attaching the Ribbon Cable from the LA Daughterboard to the LA Motherboard

2. Attach the Cover using the included #8-32 Stainless-Steel Screws.

Surface Mount Completion

1. Verify the fitment of the LA Surface Mount Sleeve and attach the ribbon cable from the LA Enclosure Box to the LA Front Cover plug (See Figure Above).
2. Attach the Cover using the included #8-32 Stainless-Steel Screws.

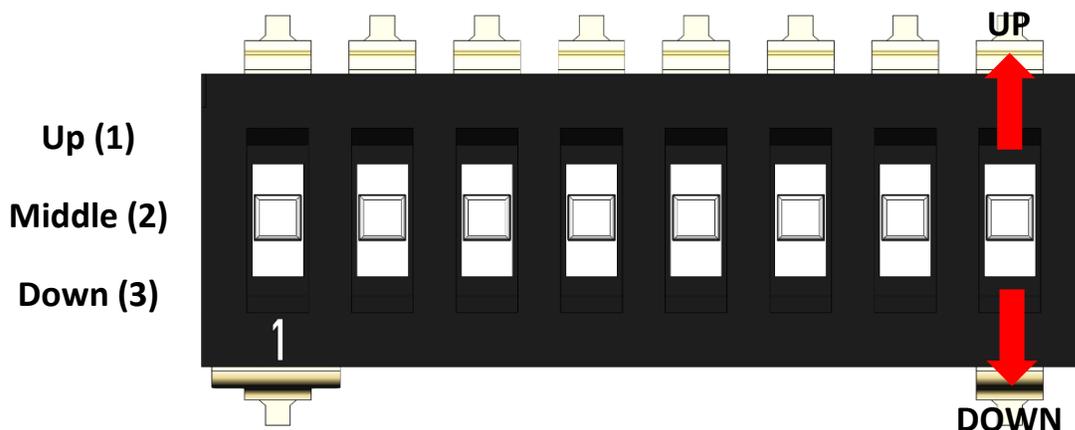
Verify LA Functionality

1. Verify that all inputs are attached to dry-contact sources.
2. Turn on power to the LA and verify that the power LEDs are illuminated.
3. Test the control switches and verify that Circuit #1 and Circuit #2 turn on when activating the key switch.
4. Test the devices that are connected to the LA inputs and verify they are working properly.
5. Press the Emergency Shut-Off Button and confirm that the Circuits turn off.

Configuring the LA_v2

The LA_v2 will come preconfigured from the factory; however, at times it may be necessary to make adjustments to the configuration. (Default Settings are attached to a sticker inside the enclosure)

<i>Basic Configuration</i>			
Setting	Position	Options	Description
Panic Output	1	Middle (2) Up (1) Down (3)	Panic Output Enabled on Emergency Momentary (3s) Panic Output on Emergency Always ON except on Emergency
Circuit Config	2	Middle (2) Up (1) Down (3)	Switches 1 & 2 operate independently Switch 1 is Standard and Switch 2 is a FAN Single Switch Only
Circuit Timing	3	Middle (2) Up (1) Down (3)	No Timing CIR 1 & 2 Timeout Based on Time Period CIR 2 on Timer as FAN
Time period on Circuit Timing	4	Middle (2) Up (1) Down (3)	1 hour (15 minutes if FAN) 2 hours (30 minutes if FAN) 3 hours (1 hour if FAN)
EMS/BMS	5	Middle (2) Up (1) Down (3)	First Key Timing Enabled Active OFF (Input signal will turn OFF Circuits) Active ON (Input signal required to turn ON Circuits)
First Key Timing	6	Middle (2) Up (1) Down (3)	8 hours 10 hours 12 hours
LED Indicators	7	Middle (2) Up (1) Down (3)	3rd=Pressure Test Failed, 4th=Gas Leak Detected 3rd=Gas Leak Detected, 4th=Pressure Test Failed KLA Only
Test	8	Middle (2) Up (1) Down (3)	Normal Operation Test Mode for All Inputs Test Mode for All Outputs



Troubleshooting the LA

LA_v2-HV and -LV Troubleshooting

- It is recommended to remove all input and output terminal plugs and verify the functionality of the LA_v2 prior to performing any other troubleshooting.
 - Test the system by attaching 120VAC to the input.
 - Verify the '3V3 Power' and '24V Power' LEDs illuminate.
 - Turn the switch(es) to the ON position and key the system.
 - Verify the green ON LED(s) illuminate on the front cover.
 - Verify the Circuit(s) LED(s) on the board illuminate.
 - Reconnect the circuit output(s) and re-key the system.
 - Verify that the circuit outputs are working as intended.
 - Press the Emergency Shut-Off Button
 - Verify the red Emergency Indicator LED illuminates and the circuit(s) are disabled.
 - Re-key the system and verify any other inputs function as intended.
- If the Circuit Output LED illuminates, but there is no voltage on the Circuit Output:
 - Remove and check the fuse and replace if blown (HV Only).
- If an input is not working as expected, verify that a dry-contact source was used and that the corresponding LED to the input illuminates. The input can be shorted to test its functionality as needed.
- If the Power LEDs are not illuminated, check for proper connections, 120V input power, and verify there are no electrical shorts.
- If the Panic Output is not functioning as intended, verify the configuration from the previous page.

Note:

The LA_v2 was designed to shut-off all utilities at the end of each day by using First Key Timing. First Key Timing is enabled by default to shut-off the controller after its default 8-hour timing has been reached. The solenoids included are designed to be rested within a 24-hour period as they can reach very high temperatures (140° F). Resting the solenoids prolongs their lifespan and reduces maintenance. ISIMET believes that utilities should default to an OFF-state as this is the safest and most efficient way to prevent accidents and/or vandalism.

Electrical Specifications

The LA Utility Controller system is designed to be used with 120VAC line voltage and 120VAC outputs (HV) or 24VDC outputs (LV).

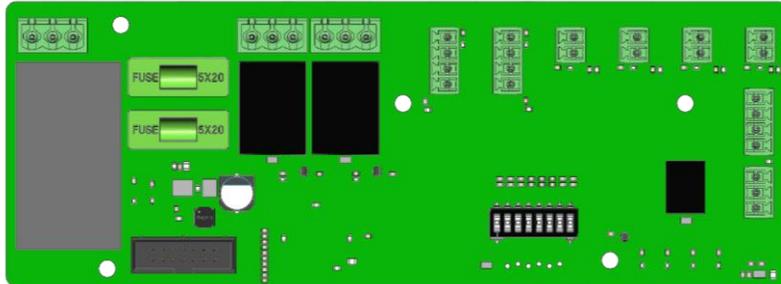


Figure 17: LAv2-HV PCB

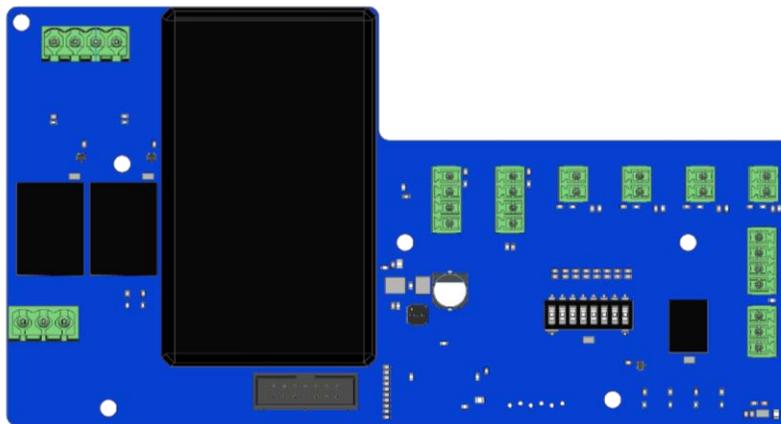


Figure 18: LAv2-LV PCB

LA_{v2}-HV (120VAC Version)

LA_{v2}-LV (24VDC Version)

120VAC (60Hz) Line Voltage Input	100-240VAC (50/60Hz) Line Voltage Input
120VAC Circuit Output (Max 15A)	24VDC Circuit Output (Max 2.5A)
24VDC Output (Max 5W)	24VDC Output (Max 10W)
120V – 2A Fuse (Quantity: 2)	Short-Circuit Protection (No Fuses)

Control Wire Size: 18 AWG Recommended