



ISA 66RLUC

User Manual

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1.0 THEORY OF OPERATION

The ISA 66RLUC is a multiple zone gas monitor with two alarm points per zone. In the presence of a gas an output is produced, enabling the activation of alarms, relays, etc. at specific levels. The ISA 66RLUC may be supplied with RLU MOS sensors, EC-Gold sensors or a 4-20 mA transmitter (1 per zone board). The MOS technology is also referred to as Broad Range sensing because the sensor will respond to a *broad range* of gases. The electrochemical sensors (EC-Gold Series) may be referred to as wetchem or near specific.

The sensor selected for this unit has been determined to be the most suitable for your target gas. The unit and sensor have been calibrated to specific alarm levels using the target gas for this application (i.e. carbon monoxide).

Other toxic or combustible gases may also cause the sensor to respond and alarm the unit. The sensors should be installed in areas where influencing background gases are not constantly present.

Your Arjay / Enmet gas detector is the state of the art in gas detection, but like any other part of your ventilation system, it requires periodic maintenance and calibration.

The MOS sensor and the Carbon Monoxide sensor (EC-Gold Series) used in your new gas detector will have a normal operating life of 3 to 5 years under ambient conditions. Other electrochemicals such as NO₂ will last 1 to 2 years. If you have a 4-20 mA transmitter, please refer to the specific manual attached. You should consider a preventive maintenance schedule whereby you test your system on a periodic basis to ensure its proper calibration and operation.

Most users have their unit tested every three to four months with test gas. This is a simple procedure, which will indicate any problems with your system.

A test and calibration kit may be purchased from Arjay / Enmet for this purpose. Parts are also readily available from our facility.

2.0 UNPACKING

Inspect all parts of the gas detector upon receipt for any damages that may have occurred during shipping and that all parts ordered were received. Contact Arjay Engineering Ltd / Enmet Canada or your local representative if anything is in error or damage is suspected.

3.0 SENSOR LOCATION

Gases of different molecular structures have different densities; some are heavier than air and concentrate at the bottom of a space and some will rise.

The following is a general guide. For assistance in sensor location consult your Arjay / Enmet Representative.

Carbon Monoxide	same as air	place about 4-6' above finished floor *
Methane	lighter than air	place near ceiling
Ammonia	lighter than air	place near ceiling
Propane	heavier than air	place about 2' above finished floor
H ₂ S	heavier than air	place about 2' above finished floor
Freon	heavier than air	place about 2' above finished floor

* Check local building codes. (i.e. Ontario Building code requires mounting 2'11" to 3'11")

NOTE: Place sensors in a location that is easily accessible for calibration and testing. Mount so the sensors are facing downward to avoid dust or debris collection on the sensor.

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4.0 INSTRUMENT OVERVIEW

4.1 FEATURES

- Supports 10 Arjay / Enmet Remote RLU MOS or 20 remote EC-Gold Sensors or 1 4-20 mA transmitter per zone board
- DPDT 250 VAC / 5A relay contacts for High, Low and Sensor Fault alarms
- Adjustable / independent 0-20 minute time delay to on and delay to off for High and Low alarms
- Independent Fail-Safe setting for High and Low alarms
- Board level Audible alarm output with silencer. Remote audible alarm & silencer push-button optional
- Adjustable time delay for Audible Alarm (delay starts after High alarm)
- Board level Push to Test button. Remote Push to Test push-button optional.
- Additional High and Low alarm outputs (+24V out) to Building Automation System (BAS)

4.2 DESCRIPTION

The Arjay / Enmet ISA 66RLUC detection systems offer the ability to monitor for a variety of gases. It offers DPDT contacts for High, Low and Sensor Fault alarms, 1 per zone. In addition, High and Low signals are also available for connection to a Building Management System (BMS). High and Low alarms have independent Delay-ON and Delay-Off time delays adjustable from 0 – 20 minutes (total of 4 delay adjustments).

4.3 SPECIFICATIONS

FUNCTION

Two level alarm system: High and Low Alarms plus Sensor Fault Alarm

SENSOR TYPE

RLU MOS (Metal Oxide Semiconductor) Sensor, EC-Gold Transmitter or 4-20 mA transmitter

GASES

Carbon Monoxide, Propane, Methane, Ammonia, Hydrogen Sulfide, Nitrogen Dioxide, Chlorine (consult factory for others)

ALARM RELAYS

Relays	3 DPDT relays for High, Low and Sensor Fault Alarms
Contacts	250 VAC or 30 VDC @ 5A
Fail-Safe	Fail-Safe / non-fail-safe settings for all 3 relays
Time Delay	0 – 20 minutes. Independent Delay-On and Delay-Off for both High and Low Alarm relays (total 4 delay adjustments)

BAS OUTPUTS

Signal output	High and Low Alarm status outputs. +24V when alarm is active, 0V if not. The status signals reflect the alarm condition AFTER the corresponding alarm delays i.e. the status signal is active while the corresponding alarm light is active.
Drive capability	The status signals are meant to be connected to a BAS / PLC and are not intended to drive any appreciable load. A 330-Ohm resistor protects each output. Thus for a 500 Ohm load, the output voltage is 14.5V, and for a 1000 Ohm load the output voltage is 18.0V.

AUDIBLE ALARM (Optional)

Function	Activated on High Alarm. (After High Alarm Delay)
Drive capability	24V @ 50 mA max. If greater drive is required, use a slave relay.
Silencer	Push-button silencer (auto-reset). Connection for remote silencer push-button (optional)
Time Delay	0 – 20 minutes Delay – On. (In addition to High Alarm Delay-On).

DIAGNOSTICS

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Push to Test push-button. Tests by forcing a Sensor Fault on the internal sensor. Alarm lights, relays, and BAS status signals are tested. Note: the time delay settings are still active during test. Adjust them to 0 minutes prior to test if the time delays are not to be tested.

POWER-115VAC

**If supplied with an Arjay / Enmet Internal power Supply
115 VAC at 100W (220 VAC available)**

POWER-24VDC

Remote Sensor System 24 VDC @ 0.5A + 0.25A per MOS RLU Sensor / 100mA per EC-Gold Sensor / 20mA per 4-20 mA transmitter

MECHANICAL SPECIFICATIONS

Enclosure Nema 12
Dimensions See enclosure drawing

ENVIRONMENTAL SPECIFICATIONS

Operating Temp. -20 to 60 Deg. C
Relative Humidity 90% max. with no condensation.

5.0 INSTALLATION

5.1 MECHANICAL INSTALLATION

See Subplate Layout Drawing

5.2 ELECTRICAL HOOKUP

See PCB Layout Drawing

5.2.1 POWER

The circuitry and sensors operate from a 24 VDC supply. The panel ordered may have included an internal or external 115 VAC to 24 VDC power supply. Determine if a power supply has been included with this system. If the power supply is internal, it will be indicated on the subplate drawing.

5.2.2 REMOTE SENSOR(S)

The RLUC may have up to 10 RLU MOS, or 20 EC-Gold, or one 4-20 mA transmitter per zone (ISA 66RLUC) board. The remote sensors are connected via a 16-18 gauge shielded 4 conductor cable that carries power (2 conductors) and a common remote signal pair for the RLU MOS. The EC-Gold requires a 16-18 gauge shielded 3 conductor cable. A 4-20 mA transmitter requires a 16-18 gauge shielded 2 conductor cable

Locate the Remote Sensor connector on the left edge of each of the ISA 66RLUC boards. The connector may be unplugged for ease of wiring. See drawing 20010201 for more detail.

5.2.3 RELAYS

Three DPDT 250 VAC / 5A contact relays are provided: for High Alarm, Low Alarm, and Sensor Fault. These relays are common to the remote sensors, i.e. one of the remote sensors is in low alarm then the Low Alarm relay and LED are activated.

Sensor Fault: If any RLU MOS sensor is removed from the sensor assembly then the Sensor Fault relay and LED are activated. IF the CO EC-Gold Sensor is removed a fault condition will occur within 18 hours (after the unit does its self-test).

NOTE: Each relay may be set as Fail-Safe (normally energized, and de-energized on alarm condition) or non-fail-safe (normally de-energized, and energized on alarm condition).

The connections are as shown on the PCB Layout drawing.

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5.2.4 BUILDING AUTOMATION SYSTEM (BAS) CONNECTION

Each ISA 66RLUC board provides external High and Low Alarm status signals (+24V when in alarm, 0 V when not) for connection to a Building Automation System (BAS). The signals are non isolated and are referenced to the provided +24V power supply ground.

The connection is located on the right edge of the ISA 66RLUC board as shown on the PCB Layout drawing.

5.2.5 AUDIBLE ALARM (Optional)

The Audible Alarm connector (2 conductor) is located on the right edge of the ISA 66RLUC board. The connection is either to a Horn / Buzzer on the side panel (typical) OR connected to a remote horn / buzzer (both optional). The output is +24V @ 50 mA (maximum current). Some horns / buzzers are polarity sensitive i.e. make sure the + output is connected to the + terminal of the horn.

6.0 CALIBRATION AND SETUP

6.1 CALIBRATION

See the attached sensor manual

6.2 SETTING THE TIME DELAY RELAYS

1. SETTING THE ALARM DELAYS: The High Alarm Delay-On is the leftmost pot. on the top edge of the ISA 66RLUC board, while the Delay-Off is the 2nd from the left. On delay means relay state will change after "X" minutes after concentration level reaches. Off delay means relay state will stay on "X" minutes after concentration levels are back to normal. Locate the Low Alarm delay pots which are on the top edge of the ISA 66RLUC board and are the 3rd and 4th pots from the left edge. See PCB Layout drawing for placement. The Delay-On is the leftmost of the group of 2 (3rd from the left edge). Adjust the pots for the desired time delays. Full scale is about 20 minutes so half way is about 10 minutes. This concludes the Low Alarm setup.
2. TIP: Setting the delay "ON" for a few minutes will allow the unit to ignore spurious alarms caused by sudden clouds of gas momentarily passing over the sensor. Setting the delay "OFF" for a determined time will keep the fans operating after the sensor has cleared to ensure remote areas from the sensor are also clear.
3. SETTING THE HORN DELAY: The audible alarm (optional) is triggered by the High Alarm. The audible alarm delay is therefore in addition to the High Alarm delay. The sequence is as follows: when the gas concentration is higher than the high alarm setpoint for at least the high alarm Delay-On then the high alarm relay and indicator (RED) are activated. At this time the audible alarm is also triggered. After an additional time as set by the horn delay, the audible alarm is turned on and continues until either the High alarm is deactivated or the silencer switch (Board mounted) is pressed. The horn time delay also has a 0-20 minute scale. The horn may thus be turned on a maximum of about 40 minutes after the sensor senses a high alarm (High Alarm Delay-On plus the Horn Delay-On).