



### INSTALLATION, OPERATION & APPLICATION GUIDE

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#### PURPOSE

The ICM-UA2L-24-DUAL is a refrigerant detection system which maintains a safe and controlled environment for compressors utilizing either R-32 or R-454B refrigerant. If a leak is detected, the control will safeguard against the possibility of ignition by forcing a compressor lockout and activating a fan blower to dissipate the refrigerant and prevent it from reaching the Lower Flammability Limit.

#### NORMAL OPERATION

Upon initial power up, a 1-minute initialization period occurs which allows time for the sensor(s) to warm up and communicate valid messages to the control board. Once the control detects valid messages from the required number of sensors, it will disengage the FAN output, engage the ALARM output and engage the CC output. If the control times out while waiting for sensor messages, it will enter a communication fault lockout (2 blinks on the status indicator). The control will recover once the sensor(s) are communicating and the lockout timer expires.

#### LEAK DETECTION

When the detected refrigerant level is above the LFL trip point, the control will enter an LFL lockout. The mitigation control board will turn off the CC output, turn off the ALARM output, and turn on the FAN continuously until all sensors report refrigerant levels are below the LFL recovery point and the lockout time delay expires. Upon recovery, the unit will resume normal operation.

#### FACTORY SETTINGS

- **Fault Recovery:** Auto
- **%LFL (Lower Flammability Limit) Trip Point:** 14.5%
- **%LFL Recovery Point:** 8%
- **Lockout Time (anti-short cycle):** 300s

#### STATUS TABLE

Current State	Outputs	Status Indication	Next state
Sensor Warm-up	CC: Off    Alarm: Off Fan: On	• On	<ul style="list-style-type: none"> <li>• If sensor reports Run mode: Normal Operation</li> <li>• If sensor reports Error mode: Communication Fault</li> </ul>
Normal operation	CC: On    Alarm: On Fan: Off	• Off	<ul style="list-style-type: none"> <li>• If %LFL ≥ Trip point: % LFL Fault</li> <li>• If board loses communication with sensor: Communication Fault</li> </ul>
Communication Fault	CC: Off    Alarm: Off Fan: On	• 2 blinks	• If board receives valid data on required sensor port(s) and lockout timer expires: Normal operation*
%LFL Fault	CC: Off    Alarm: Off Fan: On	• 1 blink	• If %LFL < Recovery point and lockout timer expires: Normal operation*

\*2-second push button press also required when the Reset Mode is set to "Manual".

#### SPECIFICATIONS

- **Input Voltage:** 24 VAC, 50/60 Hz Input (SELV/Class 2)
- **Frequency:** 50/60 Hz
- **Output ICM-UA2L-24C-DUAL:**
  - 80mA @ 5VDC per RS-485 port (maximum)
  - **K1: Dry Contact SPST**  
NO: CC Output; Class 2, 100VA (Nominal 2.5A @ 24V)
  - **K2: Dry Contact SPDT**  
NC: Fan Output; Class 2, 100VA (Nominal 4A @ 24V)  
NO: Alarm Signal; Class 2, 100VA (Nominal 4A @ 24V)
- **Operating Temperature:** -40°C to 70°C
- **Storage Temperature:** -40°C to 85°C (not powered)
- **Relative Humidity:** 0-95% RH
- **Dimensions:** 2.75" x 4"
- **Function Class:** A
- **Certified to:** UL 60335-2-40 Annex LL and UL 60730-1

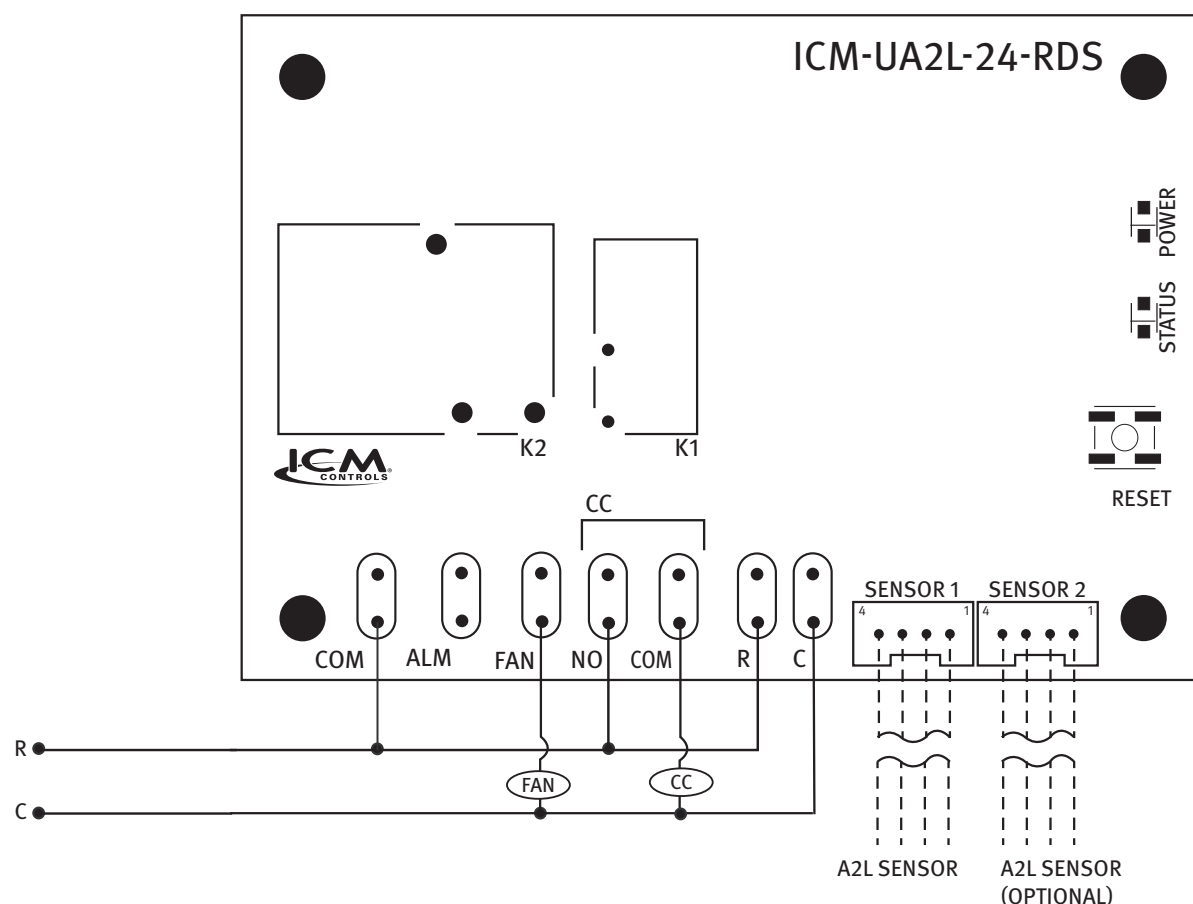
#### FEATURES

- Fault Monitoring
- Status, Power LED Indicators
- Dry Contact Fan Output (N.C.) and Alarm Output (N.O.)
- Dry Contact CC Output
- Detection and mitigation of R454B and R32 A2L Refrigerants
- Common 1/4" Quick Connect Terminations

#### TROUBLESHOOTING NOTES

- If a sensor is disconnected and causes a communication fault, it can be reconnected on either port.
- If two sensors are connected to the control while powered, the control will always require two sensors from that point on (even if power cycled).
- If two connected sensors report different statuses, the control will enforce this priority order: LFL fault -> Communication fault -> Normal Operation.
- Manual Reset mode ONLY allows clearing lockouts by pressing and holding the push-button for 2 seconds AFTER BOTH: the fault condition is rectified AND the lockout timer expires.
- The ALM contact uses inverse logic (energized whenever the FAN is disengaged).

## WIRING DIAGRAMS



### LEGEND

Code	Description
CC	Compressor Contactor
COM	Common (Relay)
ALM	Alarm
R	24 VAC
C	Common

### FAULT CODE

Status LED	Mode
Off	Normal operation
On	Sensor "warm up"
1-blink	LFL Fault
2-blink	Communication Fault

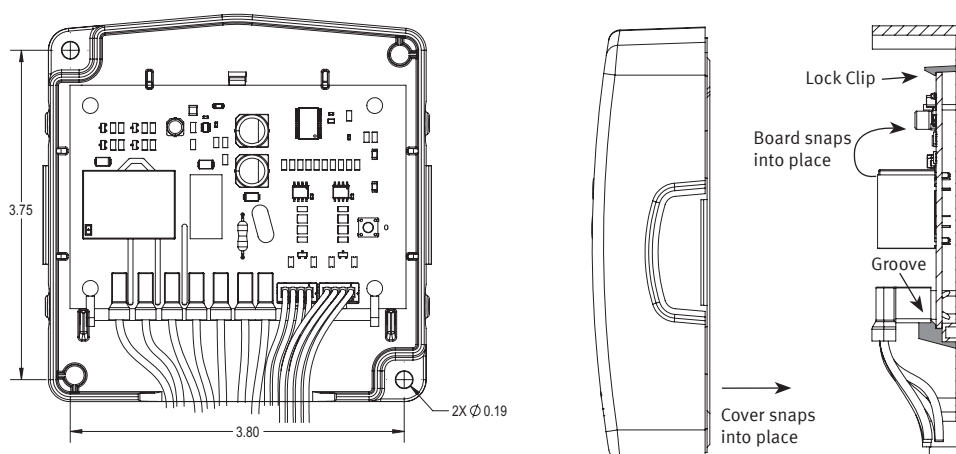
### PIN CONNECTIONS

Pin	Mode	Wire Color
PIN 1	5V	Red
PIN 2	A+	White
PIN 3	B-	Green
PIN 4	GND*	Black

\*Note: GND is non-isolated. Connected to digital ground, "C" termination, which in most systems is also tied to earth ground through the chassis.

- TE Pins Part #2232983-1
- TE Mating Connector Part #1744417-4
- Cable AVL2, Style 2464, 22 awg, 300V, 80C

### PLASTIC ENCLOSURE ASSEMBLY



### Mounting Instructions

- Locate the 2 mounting holes as shown in the dimensional drawings.
- Mark each mounting hole and drill a .15-inch hole for each mounting tab.
- Use #10 sheet metal screws to mount enclosure to sheet metal housing of the AC unit, ensuring no wires are in the way or could be pierced by the screws.

