ICM-UA2L-24C-DUAL

R32 & R454B Universal A2L Refrigerant Detection System

USA INNOVATION

INSTALLATION, OPERATION & APPLICATION GUIDE

For more information on our complete range of American-made products – plus wiring diagrams, troubleshooting tips and more, visit us at **www.icmcontrols.com** Service indicator; read technical manual

SA46365

A2L READY

This device is a UL Recognized Refrigerant Detection System (RDS) component intended for field installation as an auxiliary control. Installation must follow these instructions and all applicable national and local codes. Installation is subject to the requirements of the equipment end-product certification and approval by the Authority Having Jurisdiction (AHJ).

CAUTION: Installation of the ICM-UA2L-24C-DUAL must be done by a certified HVAC technician.

OPERATION

The ICM-UA2L-24C-DUAL is a refrigerant detection system which maintains a safe and controlled environment for compressors utilizing either R-32 or R-454B refrigerant. When the detected refrigerant level is above the trip point, the control will enter a 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 recovery point and the lockout time delay expires. Upon recovery, the unit will resume normal operation.

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

FACTORY SETTINGS

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

SPECIFICATIONS

- Input Voltage: 24V, 50/60 Hz Input (SELV/Class 2)
- Frequency: 50/60 Hz
- Output:
  - 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 Recognized Refrigerant Detection System

SENSOR REPLACEMENT

If an additional sensor or replacement is needed it is recommended to order part number **ICM-A2L-SENSOR**.

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.
- The ALM contact uses inverse logic (energized whenever the FAN is disengaged).

FAULT CODE

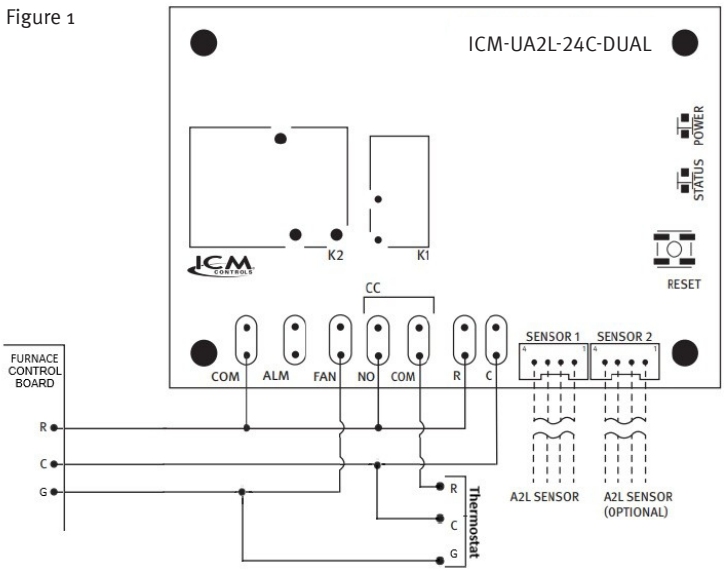
Status LED	Mode
Off	Normal operation
On	Sensor "warm up"
1-blink	LFL Fault
2-blink	Communication Fault

STATUS TABLE

Current State	Outputs	Status Indication	Next state
Sensor Warm-up	**CC:** Off **Alarm:** Off **Fan:** On	• On	• If sensor reports Run mode: Normal Operation • If sensor reports Error mode: Communication Fault
Normal operation	**CC:** On **Alarm:** On **Fan:** Off	• Off	• If %LFL ≥ Trip point: % LFL Fault • If board loses communication with sensor: Communication Fault
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

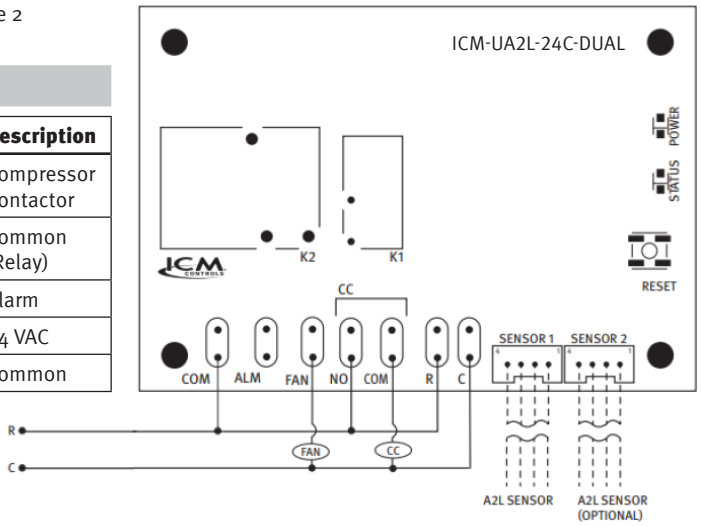
WIRING DIAGRAM - RESIDENTIAL

Figure 1



WIRING DIAGRAM - LIGHT COMMERCIAL

Figure 2



LEGEND

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

TYPICAL RESIDENTIAL/LIGHT COMMERCIAL INST. OPTION 1

Connect wiring according to Figure 1 diagram (**NOTE:** Ensure board is powered off when connecting sensor).

- Disconnect the thermostat R wire from the furnace control board and connect it to the CC (COM) terminal of the ICM-UA2L-24C-DUAL.
- Connect a field installed R wire from the furnace control board to the R, CC (N.O.), and the COM terminal located next to the ALM on the ICM-UA2L-24C-DUAL.
- Connect the C terminal from the furnace board to the C terminal next to Sensor 1 on the ICM-UA2L-24C-DUAL and to the C terminal of the thermostat if used.
- Connect the G terminal of the furnace board to the FAN terminal on the ICM-UA2L-24C-DUAL and to the G terminal on the thermostat.

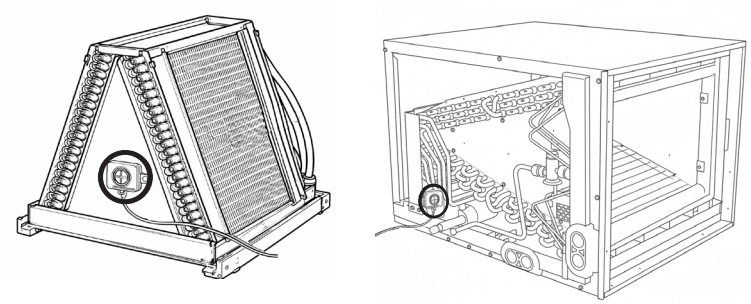
TYPICAL RESIDENTIAL/LIGHT COMMERCIAL INST. OPTION 2

Connect wiring according to Figure 2 diagram (**NOTE:** Ensure board is powered off when connecting sensor).

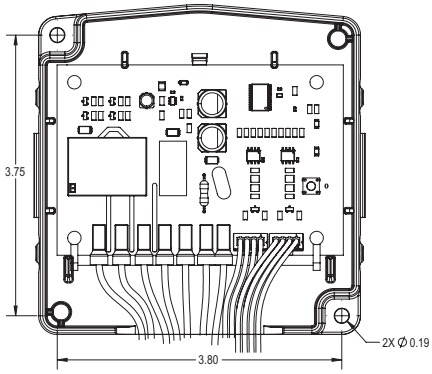
- Connect the R of the 24VAC source to the R, (CC) N.O. terminal, and the COM terminal located next to the ALM terminal on the ICM-UA2L-24C-DUAL.
- Connect the C (common) of the 24VAC source to the C terminal next to Sensor 1 on the ICM-UA2L-24C-DUAL.
- Connect the C (common) of the 24VAC source to the common side of the FAN and common side of the compressor contactor (CC).

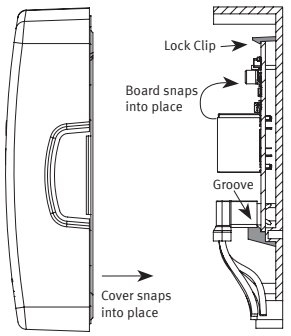
SENSOR INSTALLATION

The sensor should be mounted 6–12 in. above the bottom of the cabinet, at least 2 in. from cabinet walls, away from condensate drain pans or moist areas, while positioned in areas where refrigerant is likely to accumulate. The sensor location should remain unobstructed and accessible to service personnel for inspection and maintenance.



PLASTIC ENCLOSURE ASSEMBLY





Mounting Instructions

- Mount the ICM-UA2L-24C-DUAL in a upright position with wires extending out the bottom of the control.
- Use #10 self drilling 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