



# QIRF

## Infrared Refrigerant Detector



The QIRF Refrigerant Gas Detectors are the second generation of a proprietary designed gas detector that is easily configured to meet the International Mechanical Code, ASHRAE 15 and B52 requirements. These transmitters are engineered to address the deficiencies inherent with solid-state sensors. Infrared technology facilitates specific gas type refrigerant detection without any cross-sensitive interferences. Standard features include a digital display, three user configurable relays, buzzer, horn/strobe output, NEMA 4X enclosure and non-intrusive calibration. Sensor Housings are thermally controlled at elevated temperatures to eliminate errors due to condensation forming and from temperature fluctuations allowing operations at temperatures from -49 to 149°F (-45 to 65°C). Analog outputs of 4-20 mA and or 2-10 VDC are available along with RS-485 Communications that can be used with a Modbus RTU or proprietary OptoMux communication

protocol for use with any of the standalone gas controller such as the Q4C, M-Controller or Q-Controller. A Zero gas of 20.9% Oxygen with the balance Nitrogen should be used to perform a Zero calibration while a known concentration of any span gas can be used to perform yearly bump testing and calibration. Never use 100% Nitrogen gas to perform a Zero calibration on the QIRF transmitters. Calibration gases and a 0.4 to 0.6 liter/minute flow limiting gas regulator are not available through ACI and should be purchased through your local gas supply company or on-line companies such as Portagas® (Praxair®, Inc.) or Mesa Specialty Gases®. ACI also offers a full line of horns and strobes that can be used with the Gas detectors or building management system to alert building occupants of an alarm condition in order to meet the B-52 or other code requirements. Refer to all applicable Federal, State, Provincial and Local Health and Safety laws and regulations before using these products.

**Applications:** Mechanical Equipment Rooms, Propellant Filling Stations, Solvent Cleaning Stations, Cold Storage and Transport Facilities, Meat Packing Plants, Super Markets, Convenience Stores, Refrigerant Storage Locations, Chiller Plants, Manufacturing Plants, Pharmaceutical Labs, Other Specialty Applications using Halocarbons

**The QIRF Refrigerant Detectors are covered by ACI's Two (2) Year Limited Warranty. The warranty can be found in the front of ACI's Sensors & Transmitters catalog, as well as on ACI's web site, [workaci.com](http://workaci.com).**

### PRODUCT SPECIFICATIONS

|   |  |
|---|--|
| <b>Supply Voltage:</b>  | <b>VDC Supply Voltage:</b> 24 VDC nominal (+18 to 30 VDC)<br><b>VAC Supply Voltage:</b> 24 VAC nominal, 50/60 Hz (+15 to 24 VAC, AC Power must not be grounded)  |
| <b>Resettable Fuse Protection (Polyswitch):</b>   | <b>F1 on Display Board:</b> 1.6 A<br><b>F2 on Display Board:</b> 50 mA (Resets once fault is cleared & power is removed)   |
| <b>Supply Current   Power Consumption:</b>  | 1.0 A maximum   27 VA  |
| <b>Analog Output Signals:</b>   | 4-20 mA (4-wires) or 2 to 10 VDC (4-wires)   |
| <b>Output Load Impedance:</b>   | <b>4-20 mA Output:</b> 600 Ohms maximum   <b>2-10 VDC Output:</b> 3000 Ohms minimum  |
| <b>RS-485 Communication Protocols:</b>  | Modbus RTU / OptoMux (Proprietary Gas Controller Protocol for Q4C, M-Con. & Q-Con. only)   |
| <b>RS-485 Communication Baud Rates:</b>   | 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 76800 Bits/Second (Default: 4800 BPS)   |
| <b>Refrigerant Types:</b>   | R11, R12, R23, R32, R114, R116, R123, R134A, R141B, R402A, R404A, R407A, R407B, R407C, R407D, R407E, R407F, R408A, R409A, R410A, R422A, R438A, R448A, R449A, R452A, R507A, R508B, R513A, R514A, R1233ZD, R1234ZE |
| <b>Factory Calibration Range:</b>   | 0 to 1000 ppm for all standard Refrigerants except R123 (0 to 100 ppm); Others available   |
| <b>Accuracy   Repeatability:</b>  | +/-3% of Reading   +/-1% of Full Scale   |
| <b>Sensor Warm Up Time:</b>   | 60 Minutes   |
| <b>Sensor Type:</b>   | Infrared, Temperature Controlled   |
| <b>Response Time (T90):</b>   | <30 seconds for 90% step change  |
| <b>Display:</b>   | 2 x 8 Character Display with backlight   |
| <b>Keypad:</b>  | Four Magnetic Sensors with Magnetic Tool   |
| <b>Relays   Contact Type   Relay Contact Ratings:</b>   | Three   SPDT (Form C) Dry Contacts   1.0 max. @ 30 VDC or 0.3A max. @ 125 VAC (Resistive Loads)  |
| <b>Relay Life Expectancy:</b>   | <b>Mechanical:</b> 50,000,000 operations minimum @ 36,000 operations/hour<br><b>Electrical:</b> 200,000 operations minimum @ rated load  |
| <b>Status LEDs:</b>   | Two Green LED's (Tx/Rx Communication Status); Three Red LED's (Relays 1, 2 & 3)  |
| <b>Buzzer:</b>  | 80 dB at 3.94" (10 cm), 2700 Hz (3 Programmable Tones)   |
| <b>Coverage Area   Mounting Height:</b>   | 7500 ft <sup>2</sup> (696.7 m <sup>2</sup> ) or 49 ft (14.9 m) Radius   6" (15.3 cm) to 18" (45.8 cm) above floor  |
| <b>Sensor Life Expectancy:</b>  | 14 Years, typical  |
| <b>Recommended Maintenance:</b>   | Accuracy & Bump Test once per year or as required by Code  |
| <b>Enclosure Specifications (Material Type, Flammability, NEMA/IP Rating, Cover Torque Rating):</b> | Plastic Enclosure; Polycarbonate/ABS Blend; UL94 5VA; NEMA 4, 4X 12 & 13(IP66); 2.5 lbs.-in (0.2825 Nm)  |
| <b>Enclosure Knockout:</b>  | 7/8" Knockout (accepts 1/2" Conduit Fitting); Quantity: 1  |
| <b>Operating Temperature   Humidity:</b>  | -49 to 149°F (-45 to 65°C)   5 to 95% RH, non-condensing   |



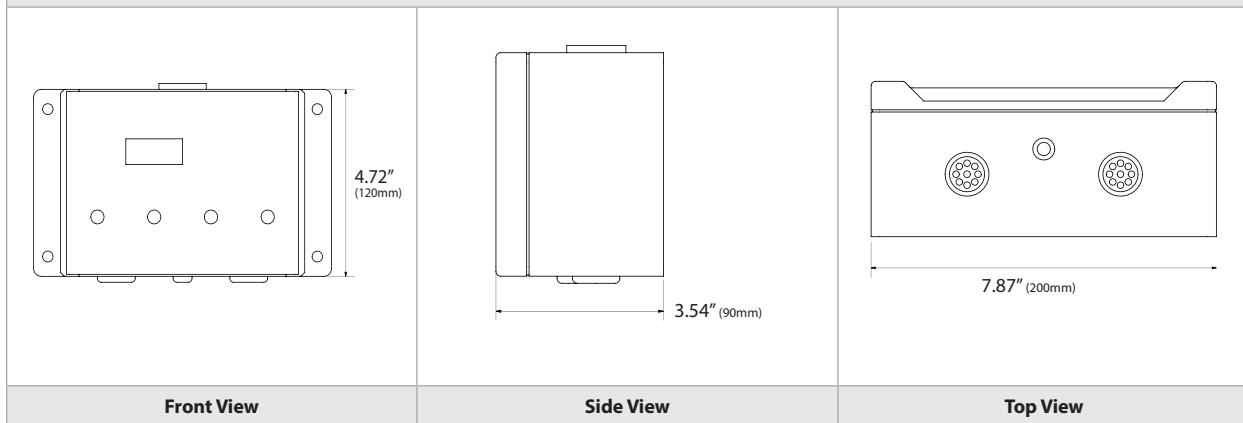


**PRODUCT SPECIFICATIONS**

|   |  |
|---|--|
| <b>Operating Atmospheric Pressure<sup>1</sup>:</b>    | 14.696 psi (1.0132 bar) +/-10%   |
| <b>Recommended Storage Temperature/<br/>Humidity:</b> | -49 to 158°F (-45 to 70°C)   5 to 95% RH, non-condensing                                     |
| <b>Wiring Connections   Wire Size:</b>                | De-pluggable Screw Terminal Blocks   16 to 24 AWG (0.2047 to 1.301 mm) Shielded Twister Pair |
| <b>Communications Cable:</b>                          | Belden 9841 or Equivalent, 120 Ohms Input Impedance  |
| <b>Terminal Block Torque Rating:</b>                  | 0.37 ft-lb (0.502 Nm) Nominal  |
| <b>Approvals:</b>                                     | RoHS   |
| <b>Product Weight:</b>                                | 2.50 lbs (1.134 kg)  |
| <b>Product Dimensions ( L x W x H):</b>               | 7.87" (200 mm) x 4.72" (120 mm) x 3.54" (90 mm)  |

**Note<sup>1</sup>:** When installed @ >3000' above sea level, the refrigerant detectors must be verified for accuracy & re-calibrated as needed after installation

**DIMENSIONAL DRAWING**



| <b>STANDARD ORDERING</b>                                |  | <b>MODEL #</b> |
|---|--|----------------|
| <b>A. Sensor Series</b><br><i>No Selection Required</i> | <b>QIRF</b>  | <b>QIRF</b>    |
| <b>B. Refrigerant Code</b><br><i>Select One (1)</i>     | <b>Enter a "Refrigerant Code"</b> : R11, R12, R23, R32, R114, R116, R123, R134A, R141B, R402A, R404A, R407A, R407B, R407C, R407D, R407E, R407F, R408A, R409A, R410A, R422A, R438A, R448A, R449A, R452A, R507A, R508B, R513A, R514A, R1233ZD, R1234ZE |                |
| <b>C. Revision</b><br><i>No Selection Required</i>      | <b>X</b> = Factory Provided  | <b>X</b>       |
| <b>D. Revision</b><br><i>No Selection Required</i>      | <b>O</b> = Factory Provided  | <b>O</b>       |