



# QIRF-FREON

## IRFD SERIES FREON DIGITAL/ANALOG TRANSMITTER/SENSOR

The QIRF Freon gas detectors are the second generation of QEL proprietary designed transmitter/sensors. They are configured easily to meet the International Mechanical Code, ASHRAE 15, and B52 requirements. These transmitters were engineered to address the deficiencies inherent with solid-state sensors. Infrared technology facilitates specific gas type Freon detection without any cross-sensitive interferences. Its sensing technology is a non-contact, non-depleting form of concentration measurement that has a sensor life of over ten years. Standard equipment includes a digital display, three user configurable relays, buzzer, horn/strobe output and non-intrusive calibration. Sensor housings are thermally controlled at elevated temperatures to eliminate errors due to condensate formation and from temperature fluctuations allowing operation in temperatures from -45°C to +65°C. Each unit can be connected to either the M-Controller or Q4C controller through RS-485 digital communication allowing for cost effective wiring installation. Equally the transmitter is available with 4-20 mA, and Modbus outputs to any Building Automation System(BAS). Controllers can be equipped with internal and external horns and strobes to alert personnel prior to entering the hazardous area. Both the M-Controller and Q4C are available with M-Net and M-Logger which allows remote monitoring, notification, programming and datalogging features. NEMA 4X enclosures are standard. Calibration procedures are straight forward, non-proprietary and can be performed by any competent technician. Consult the factory for specific gases.

### MODEL NUMBER ORDERING CODE

Q I R F - [ ] [ ] [ ] X - [ ] [ ]

**Gas Type**  
(See Gas Selection Table for #)

**Revision**  
(Factory Provided)

**Options**  
(Enter 0 for No Selection)

**Sample Pump** ————— P

### GAS SELECTION TABLE

Gas Type	#	Range
R11	026	0-1000ppm
R22	028	0-1000ppm
R123	029	0-100ppm
R134a	030	0-1000ppm
R114	114	0-1000ppm
R404a	404	0-1000ppm
R407c	407	0-1000ppm
R410a	410	0-1000ppm
R427	427	0-1000ppm
R438a	438	0-1000ppm
R507a	507	0-1000ppm
Others Consult Factory		

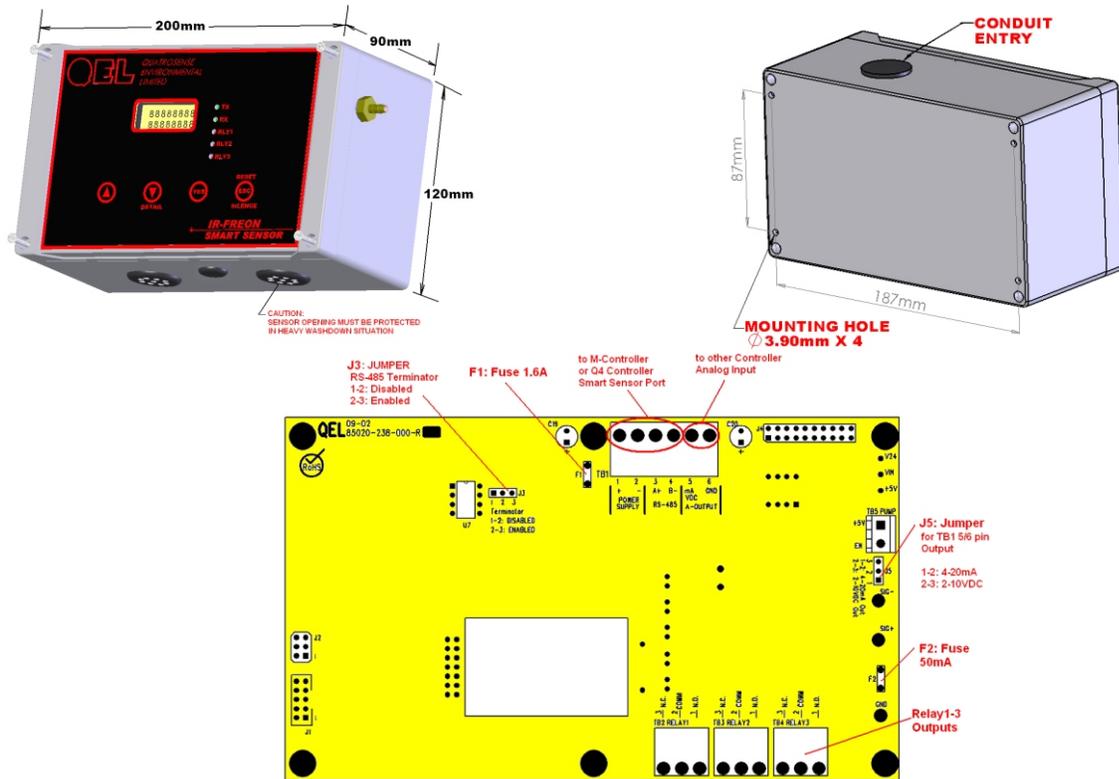


### PRINCIPLE OF OPERATION

The concentration of Freon is measured by determining the amount of absorption of light in a specific frequency band. Most gases have their unique characteristic spectra in the infrared band. Those spectra are derived from the molecule's composition in such a way that no two molecular gases have the same IR spectrum. IR spectra are the fingerprints of gases, and thus allow gases to be uniquely identified. By transmitting a beam of IR radiation through the air, or through any particular gas volume, and recording how much is transmitted at selected spectral lines, one can determine the gas and its concentration. This is a standard and well-proven principle, routinely used in laboratory analysis of chemical species. An IR detector is essentially a temperature sensor and is, therefore, potentially very sensitive to changes in ambient temperature. Our IR-FREON smart sensors are entirely electronic with no moving parts. They are built around our unique QT temperature-controlled Gas Sample Cell with an integrated IR Source and IR Detector. This allows the operating temperature range to span from -45C to +65C eliminating errors due to condensation and ambient temperature fluctuations. Heavier gases tend to pool on the floor so an available sample pump is recommended to sample these heavier gases.

# SPECIFICATIONS

<b>Input Power:</b>	24 VDC nominal, range 18 to 30 VDC 24 VAC nominal, range 15 to 24 VAC	<b>Display:</b>	2 x 8 character display c/w with backlight
<b>Enclosure Materials:</b>	Polycarbonate / ABS blend ip66, NEMA 4X, 12 & 13	<b>Keypad:</b>	4 magnetic sensors with magnet tool
<b>Temperature:</b>	-45° C to 65° C	<b>Panel Indicators:</b>	5 Status LEDs
<b>Humidity:</b>	Continuous 5 to 95% RH, non-condensing Intermittent 0 to 99% RH, non-condensing	<b>Output Signal:</b>	Digital RS-485 to QEL Controllers ModBus 4-20 mA or 2-10 VDC Analog Signal
<b>Sensor Type:</b>	Infra-Red Temperature Controlled	<b>Relays:</b>	Three, Single pole double throw (SPDT), 1.0A max at 30VDC(resistive load) 0.3A max at 125VAC(resistive load)
<b>Sensor Life:</b>	Typical 14 years	<b>Buzzer:</b>	80db at 10cm, 2700 Hz
<b>Pressure:</b>	Atmospheric ±10%	<b>Time Delays:</b>	Actuation - 0 to 60 minutes in 1 minute increments De-Actuation - 0 to 60 minutes in 1 minute increments
<b>Response Time:</b>	Less than 30 seconds for 90% of step change		
<b>Accuracy:</b>	± 3% of reading		
<b>Repeatability:</b>	± 1% of full scale		
<b>Factory Set Range:</b> (Consult factory for non-standard gases)	All Freons 0-1000ppm except R123, 0 -100ppm		



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**Read and understand fully all instructions before using these products**

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