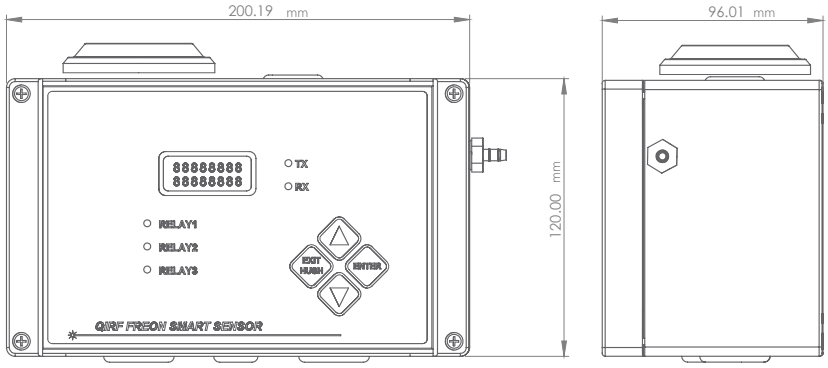
GREYSTONE
ENERGY SYSTEMS INC

GAS REFRIGERANT TRANSMITTER



QIRF2 SERIES

PRODUCT DESCRIPTION

The QIRF2 refrigerant gas detectors are advanced sensors designed to meet international standards like the International Mechanical Code, ASHRAE 15, and B52. They use infrared technology for precise gas detection without cross-sensitivity issues and have a sensor life of over ten years. Key features include a digital display, configurable relays, buzzer, horn/strobe output, and non-intrusive calibration. The sensors operate in temperatures from -45°C to +50°C and can connect to various controllers via RS-485, 4-20mA, Modbus, and BACnet outputs. They come in NEMA 4X enclosures and are easy to calibrate. The detectors can monitor various refrigerants, including R134A, R123, R22, R404A, R407C, R410A, R507C, R513A, R1233ZD, R1234ZE, and R454B.

PRINCIPLE OF OPERATION

The concentration of refrigerant is measured by the amount of light absorption in a specific infrared frequency band, Which is unique to each gas. This method, using IR spectra as gas fingerprints, allows for precise identification and concentration measurement. The QIRF Refrigerant smart sensors use this principle with a temperature-controlled Gas Sample Cell, integrated IR Source, and IR Detector, ensuring accurate readings from -45°C to +50°C by eliminating errors from condensation and temperature changes.

SPECIFICATIONS

VOLTAGE	24 VDC Nominal, range 18-30 VDC, 1.0 A DC Total Max 24 VAC Nominal, range 15-24 VAC, 1.0A AC Total Max
FUSE	F1 on Display Board: 1.6 A F2 on Display Board: 50 mA (Resets once fault is cleared & power is removed)
SUPPLY CURRENT | POWER CONSUMPTION	27 VA
SENSING ELEMENT TECHNOLOGY	INFRARED REFRIGERANT
SENSOR LIFE	14 years typical
ACCURACY	± 3% of reading
REPEATIBILITY	± 1% of reading
RESPONSE TIME	Less than 30 seconds for 90% step change
COVERAGE AREA	7500 ft2 (696.7 m2) or 49 ft (14.9 m) Radius
MOUNTING HEIGHT	6" (15.3 cm) to 18" (45.8 cm) above floor
FACTORY CALIBRATION RANGE	0 to 1000 ppm for all standard Refrigerants except R123 (0 to 100 ppm); Others avaliable
DISPLAY	2 x 8 Character graphic display c/w with backlight

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SPECIFICATIONS

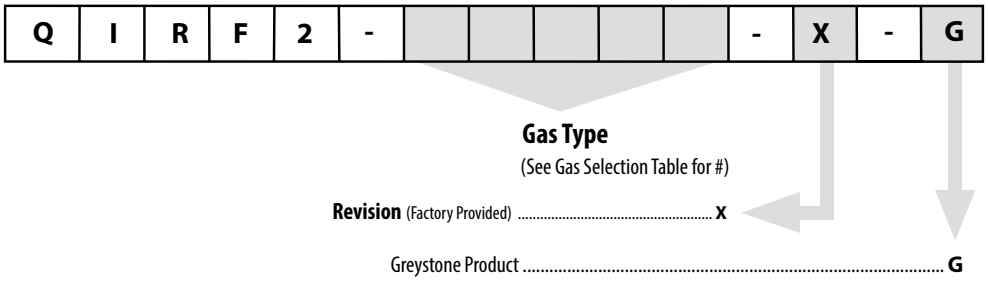
PANEL CONTROL	Keypad: 4 tactile and audible keys
PANEL INDICATOR	5 Status LED's RS-485 TX Status (Green) RS-485 RX Status (Green) Relay 1 Status (Red) Relay 2 Status (Red) Relay 3 Status (Red)
WARM UP TIME	15 minutes @ 25 C using 24VDC power
RELAYS OUTPUTS	3 Relays SPDT (Form C), dry contacts 1.0 A maximum at 30 VDC (resistive load) 0.3 A maximum at 125 VAC (resistive load)
TIME DELAYS	Actuation 0 to 60 min in 5min increments De-actuation 0 to 60 min in 5 min increments
RELAYS LIFE EXPECTANCY	Mechanical : 50,000,000 Operations minimum @36000 operations/hours electrical : 200000 operations minimum @ rated load
ANALOG OUTPUTS	4-20mA (4 wires) , 2-10 VDC 1-5 VDC (4 wires)
DIGITAL OUTPUT	RS-485 Modbus (Proprietary GES Controller Protocol) and BACnet MS/TP connects to Q4C Controller, M-Controller and Q-Controller
BUZZER	80 db at 10 cm, 2700 Hz Buzzer with 3 programmable tones
OPERATING ENVIRONMMENT	Indoor Use only
OPERATING TEMPERATURE	(see table of gas)
STORAGE TEMPERATURE	-49 to 158°F (-45 to 70°C)
OPERATING HUMIDITY	5% to 95% RH non condensing
OPERATING PRESSURE	Atmospheric +/-10%
ENCLOSURE	Plastic Enclosure ,Polycarbonate Lexan, Fire retardant UL94 V-0 IP 66 & NEMA 4, 4X, 12 & 17
WIRING	12 AWG to 24 AWG for Screw Terminals Blocks(De -Pluggable), 16 AWG or 18 AWG wire for Power supply (1km max)
CABLE SPECIFICATION	BELDEN 9841 or equivalent ,120 ohms Input
DIMENSIONS	7.87" x 4.72" x 3.54"(200 mm x 120 mm x 90mm)
WEIGH	2.5lbs (1.134 kg)

Ensure a complete understanding of all applicable Federal, State, Provincial and Local Health and Safety laws and regulations before using these products.

ACCESSORIES

Q-CONTROLLER	Communication central unit, RS-485 port, Modbus protocol, BACnet /IP, 3 Relay , 128 Analog outputs
M-CONTROLLER	Communication central unit, RS-485 port, Modbus protocol, BACnet /IP, 3 Relay , 8 Analog outputs
Q4C- CONTROLLER	Communication central unit, RS-485 port, Modbus protocol, BACnet /IP, 4 Relays

ORDERING CODE



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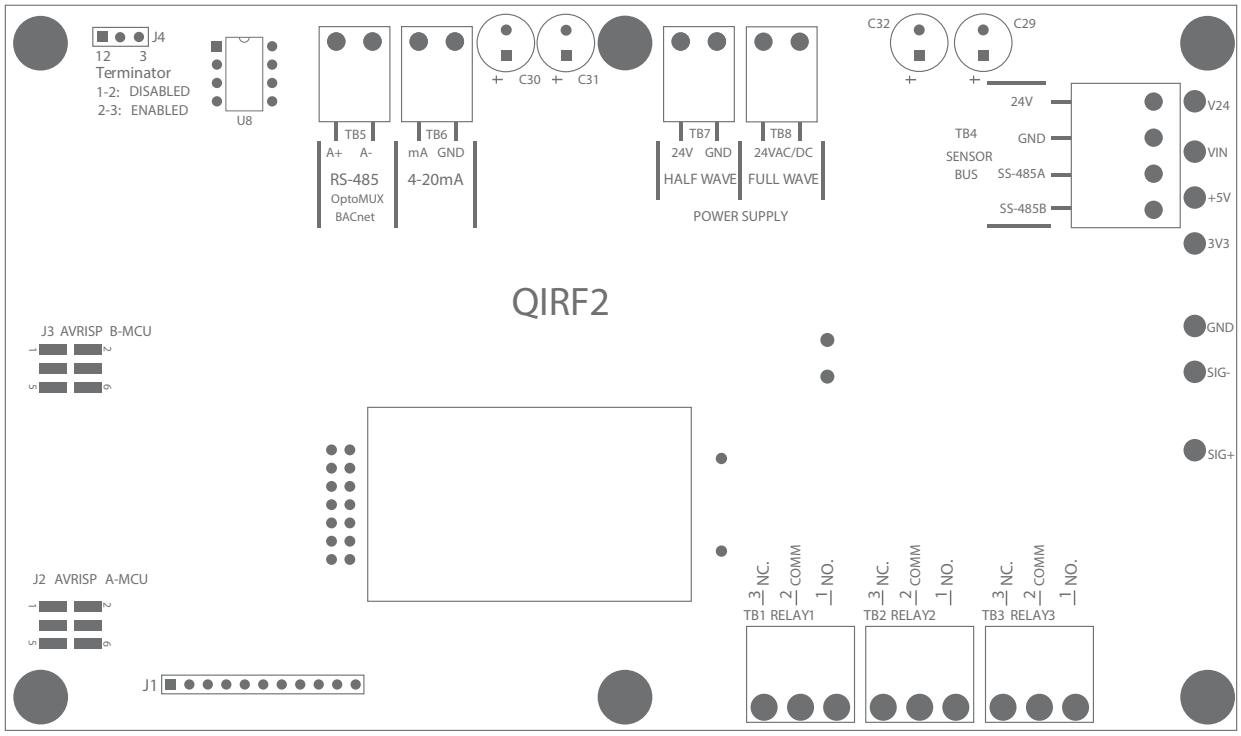
WIRING INFORMATION



QIRF2

TERMINAL		FUNCTION
TB1 TB2 TB3	NC: Normally Close COM: Common NO: Normally Open	3 x Relays Outputs
TB4	24V GND A+ B-	Sensor Local bus Main board
TB5	A+ B-	RS-485 port for OPTOMUX BACnet
TB6	mA GND	Analog Output Output Port to Controller input
TB8	24VAC/VDC	Power IN Full Wave
J4	1-2: Disabled 2-3: Enabled	RS-485 port to Termination resistor
GND		Ground
SIG+		Positive Signal
SIG-		Negative Signal

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GAS TYPE	SPAN RANGE	ORDERING CODE	AREA FT2 (M2)	RADIUS FT (M)	MOUNTING HEIGHT	OPERATING TEMPERATURE F (C)
R11	0-1000ppm	R11	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R12	0-100ppm	R12	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R22	0-1000ppm	R22	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R23	0-1000ppm	R23	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R32	0-1000ppm	R32	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R114	0-1000ppm	R114	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R116	0-1000ppm	R116	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R123	0-100ppm	R123	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R134a	0-1000ppm	R134a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R141B	0-1000ppm	R141B	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R402a	0-1000ppm	R402a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R404a	0-1000ppm	R404a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R407a	0-1000ppm	R407a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R407b	0-1000ppm	R407b	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R407c	0-1000ppm	R407c	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R407d	0-1000ppm	R407d	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R407e	0-1000ppm	R407e	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R407f	0-1000ppm	R407f	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R408a	0-1000ppm	R408a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R409a	0-1000ppm	R409a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R410a	0-1000ppm	R410a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R422a	0-1000ppm	R422a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R422b	0-1000ppm	R422b	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R438a	0-1000ppm	R438s	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R448a	0-1000ppm	R448a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R449a	0-1000ppm	R449a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R452a	0-1000ppm	R452a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R453a	0-1000ppm	R453a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R454b	0-1000ppm	R454b	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R507a	0-1000ppm	R507a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R508b	0-1000ppm	R508b	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R513a	0-1000ppm	R513a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R514a	0-1000ppm	R514a	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R1233zd	0-1000ppm	R1233zd	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R1234Ze	0-1000ppm	R1234Ze	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R515a	0-1000ppm	R1234Ze	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)
R515b	0-1000ppm	R1234Ze	7500 (696.7)	49 (14.9)	6 inch to 18inch (0.16m to 0.46m)	- 50 to 122 (- 45 to 50)

RoHS COMPLIANT

MADE IN CANADA

ISO9001

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