

Duct Relative Humidity/Temperature Sensors



Energy &
Atmosphere



Indoor
Environmental
Quality



QFM Series Duct Relative
Humidity Sensor.



QFM Series Duct Relative Humidity and
Relative Humidity/Temperature Sensor.

Description

The QFM Series Duct Relative Humidity and Relative Humidity/Temperature Sensors monitor and transmit changes in humidity and temperature to the building control systems. Several models are available for humidity only (in 5%, 2% and 2% certified) or for humidity and temperature sensing (also in 5%, 2% and 2% certified versions). The humidity only units are available in either 4 to 20 mA or 0 to 10 Volt signal versions. Combination humidity and temperature units are also available in either dual current or voltage versions, transmitting proportional signals back to the controller. Nickel 1000 Ohm (Siemens type) or Platinum 1000 Ohm RTD (385 ALPHA type) temperature outputs on combination versions are also offered.

Features

- 4 to 20 mA or 0 to 10 Vdc output signals
- High degree of accuracy
- Removable, replaceable sensing tip (2% and 2% certified models)
- Versions with LCD display also available

Applications

The QFM Series Duct Relative Humidity and Relative Humidity/Temperature Sensors are especially suited for applications where precise, stable humidity sensing is required.

E-27

Sensors

QFM Series Specifications

General

Installation..... 18 AWG cable length shared in conduit with other sensor wiring 750 ft. (229 m) max

Connections Screw Terminals

Dimensions
 Probe..... 0.6" O.D. x 7.2"L (15 mm O.D. x 183 mm L)
 Housing ..3.1" L x 2.3" W x 1.5" O.D. (80 mm L x 60 mm W x 40 mm D)

Voltage Requirement..... 13.5 to 35 Vdc and 24 Vac (for sensors with 0-10 Vdc outputs)

Input Impedance (4 to 20 mA versions only) Less than 500 Ohms

Housing Material TypePolycarbonate plastic, UL 94-5VB rated, suitable for plenum installations

Housing Protection Class..... IP 65 (QFM3xxx, QFM4xxx types), IP54 (QFM2xxx types), NEMA 1 (all types)

Filter Material and Specification Teflon, 10 micron filter

Agency Certification..... UL listed to UL 873 for Temperature Indicating and Regulating Equipment

CE Conformance EC Directive on electromagnetic compatibility: 89/336/EEC

Humidity Element

Operating Range..... 0 to 100% RH

Measurement Range 0 to 95% RH

Accuracy at Room Temperature $\approx 73^{\circ}\text{F}$ (20°C):
 All types:..... $\pm 5\%$ RH, 0-95% RH ($\pm 3\%$ RH, 30-70% RH)
 $\pm 2\%$ RH, 0-95% RH

Operating Temperature Jumper Selectable..... 32 to 122°F (0 to 50°C)
 or -31 to 95°F (-35 to 35°C)
 or -31 to 140°F (-35 to 60°C)

Temperature Effect..... Less than 0.1% per degree C

Sensing Element..... Capacitive humidity sensing element

Output Signal
 RH only units 4 to 20 mA and 0 to 10 Vdc, 0-100% Linear, Proportional
 RH/T units 0 to 10 Vdc, 0-100% Linear, Proportional

Polarity Protection..... Yes

Temperature Element Specifications (for Combination RH/T Units Only)

	QFM2110 (Platinum) QFM2120 (Nickel)	QFM2160 QFM2171	QFM31xx QFM41xx
Operating Temperature	-31 to +140°F (-35 to +60°C)	-31 to +122°F (-35 to +50°C)	-31 to +158°F (-35 to +70°C)
Time Constant	Approximately 20 seconds in moving air		
Accuracy			
+/-0.6K	—	—	59 to 95° F (15 to 35°C)
+/0.8K	59 to 95°F (15 to 35°C)	59 to 95°F (15 to 35°C)	31 to 158°F (-35 to +70°C)
+/-1.0K	31 to 140°F (-35 to +60°C)	-31 to +122°F (-35 to +50°C)	—
Output Signal	Platinum 1K Ohm RTD (385) Nickel 1K Ohm RTD (Siemens)	0 to 10 Vdc (QFMx160) 4 to 20 mA (QFMx171)	
Calibration	None		

QFM Series Product Ordering

Application	Description	Part No.
Duct Humidity 5%	0 to 10 Vdc	QFM2100
Duct Humidity 5%	4 to 20 mA	QFM2101
Duct Humidity 5% & Temperature	0 to 10 Vdc / Temp 1K Ohm Platinum RTD (385 alpha)	QFM2110
Duct Humidity 5% & Temperature	0 to 10 Vdc / Temp 1K Ohm Nickel RTD (L&S Type)	QFM2120
Duct Humidity 5% & Temperature	0 to 10 Vdc / Temp 0 to 10 Vdc	QFM2160U
Duct Humidity 5% & Temperature	4 to 20 mA / Temp 4 to 20 mA	QFM2171
Duct Humidity 2%	0 to 10 Vdc	QFM3100
Duct Humidity 2%	4 to 20 mA	QFM3101
Duct Humidity 2% & Temperature	0-10 Vdc / Temp 1K Ohm Platinum RTD (385 alpha)	QFM3110
Duct Humidity 2% & Temperature	0 to 10 Vdc, Temp 0 to 10 Vdc	QFM3160
Duct Humidity 2% & Temperature	0 to 10 Vdc, Temp 0 to 10 Vdc, w/Display	QFM3160D
Duct Humidity 2% & Temperature	4 to 20 mA / Temp 4 to 20 mA	QFM3171
Duct Humidity 2% & Temperature	4 to 20 mA / Temp 4 to 20 mA, w/Display	QFM3171D
Duct Humidity	4 to 20 mA (Certified)	QFM4101
Duct Humidity & Temperature	0 to 10 Vdc, Temp 0 to 10 Vdc (Certified)	QFM4160
Duct Humidity & Temperature	4 to 20 mA / Temp 4 to 20 mA (Certified)	QFM4171