



Texas Electronics, Inc.

The Gold Standard in Weather Instrumentation Since 1957

Relative Humidity

TH-2013-QR Humidity Sensor



Description

The Texas Electronics, Inc. Model TH-2013-QR Relative Humidity Sensor consists of two major components; the sensing element and the radiation shield. The capacitive sensing element and its signal conditioning electronics are housed in an ABS plastic, IP65 probe-like housing. The element is protected from dust, dirt and debris by a filter and a metal shield. This assembly is mounted inside an all-aluminum radiation shield with a white baked-enamel finish. This shield keeps sunlight from directly hitting the element or the probe housing, as well as providing substantial physical protection from rain, hail, small animals, etc.

The capacitive sensing element can be easily replaced in the field with no calibration needed. The elements are interchangeable with no degradation in accuracy. The quick-release mounting bracket allows for ease in maintaining the unit.

Features & Benefits

- Interfaces to virtually all data acquisition systems
- Capacitive sensing element, interchangeable with no loss of accuracy
- Sensing element and signal conditioning encased in ABS probe housing
- Quick-release mounting bracket for easy installation and maintenance
- Over 5 years in production
- Lightweight spun Aluminum Exterior with white baked-enamel finish

Specifications

Range:	0-100% Relative Humidity
Accuracy:	+/- 3% with +/- stability per year over 10% to 90% range
Power Supply:	7 - 28 VDC
Output:	0-1 VDC
Wiring:	Brown - Signal Black - Common Red - Excitation
Environmental Range:	Temperature +14° to +140°F, -32° to +194°C
Physical:	Height: 6.75" (17.1 cm) not including mounting bracket Diameter: 7.25" (18.4 cm) Weight: 3.5 lb. (1.587 kg) Cable: 60 ft. (18.29 meters), 3-conductor Materials: Element - encased in ABS plastic
Warranty:	3 year

Installation & Maintenance

The radiation shield with sensing element can be pole or mast mounted. Whenever possible, sensors should be installed at a height of 4 ft. (1.2 meters) or greater over earth or sod at least 100 ft. (30.48 meters) away from any concrete or other hard-surfaced area and not closer to any other object than four times the height of the object above the instrument shelter or remote sensors. Avoid roof installations if possible. If it is necessary to roof-mount shelters and sensors, they should not be closer than 30 ft. (9.14 meters) to any large, vertical reflecting surface (walls, etc.), exhaust fans, or cooling towers. Electronic remote sensors when roof-mounted should be at least 9 ft. (2.74 meters) or greater above the roof surface. To minimize radiation effects from the roof, they can also be mounted on a horizontal boom so that they will extend from the side of the building roof or tower assembly.

Because of the interchangeability and the ease with which the elements can be replaced, it is recommended that the element be replaced every two to three years to maintain accuracy. No further calibration is required.

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Ordering Information

<u>Model #</u>	<u>Description</u>
TH-2013QR	Relative Humidity Sensor with Quick-Release Mounting Bracket

Optional Parts / Accessories

Humitter 50U	Humidity Sensing Element with probe housing & signal conditioner
H50	Interior Humidity Sensing element only
Cable	Additional Cable



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Ambient Air Temperature

TT-101-QR Temperature Sensor



Description

The Texas Electronics, Inc. TT-101QR Air Temperature Sensor with the proper signal processor provides a DC signal proportional to ambient temperature. A highly sensitive linear thermistor-resistor network is utilized as the sensing element. Sensors feature direct interchangeability with one another without system recalibration. (See "Calibration/Cleaning Frequency" to the right.) Air temperature variations create a resistance bridge imbalance, the subsequent output signal varying linearly with temperature. A naturally aspirated sensor shelter is provided which permits temperature measurement substantially free of solar radiation. Exposed shelter components are constructed of aluminum with a white baked-enamel finish for maximum environmental protection. The signal conditioner output voltage may be interfaced with various types of recorders, indicators, dataloggers, etc. as required by the user.

Two or more sensors may be mounted on a tower to obtain vertical temperature profile studies for the measurement of inversion conditions. This differential air temperature may be displayed or programmed, in the same formats as the single sensor.

The TT-101QR now features a quick-release mounting bracket for easy installation and maintenance.

(Specifications on next page)

Features & Benefits

- Available in four different temperature ranges
- Signal Conditioner output can be interfaced with indicators or dataloggers
- Quick Release Mounting Bracket provides ease in installation and maintenance
- Sensing element utilizes a highly sensitive linear thermistor-resistor network
- Optional Yellow Springs sensing element available
- Over 25 years in production
- Lightweight and rugged white baked-enamel finished aluminum exterior

Installation & Maintenance

The radiation shield with sensing element can be pole or mast mounted. Whenever possible, sensors should be installed at a height of 4 ft. (1.2 meters) or greater over earth or sod at least 100 ft. (30.48 meters) away from any concrete or other hard-surfaced area and not closer to any other object than four times the height of the object above the instrument shelter or remote sensors. Avoid roof installations if possible. If it is necessary to roof-mount shelters and sensors, they should not be closer than 30 ft. (9.14 meters) to any large, vertical reflecting surface (walls, etc.), exhaust fans, or cooling towers. Electronic remote sensors when roof-mounted should be at least 9 ft. (2.74 meters) or greater above the roof surface. To minimize radiation effects from the roof, they can also be mounted on a horizontal boom so that they will extend from the side of the building roof or tower assembly.

Installation:

The system is delivered consisting of two principle parts: (1) the radiation shield containing the sensor with 60 feet (18.28 meters) of cable attached; and (2) an electronics package. The radiation shield may be installed with provided clamps in whatever area that it is desired to sense the temperature. The electronic package may be installed within 60 ft. (18.28 meters) of the sensor. Longer cable is available upon request.

Calibration / Cleaning Frequency:

The temperature system should not require calibration, however, the system may be checked for accuracy each six months, if desired. In the event that it is required, field calibration (zeroing and spanning) can be readily accomplished by substituting fixed standard resistor values for the sensor output.

No cleaning program should be required with normal use.

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Specifications

Ranges Available:	-40° to +120°F -60° to +40°C -40° to +50°C +60° to +220°F
Response (Nominal):	Time to reach 90% of DT 0.8 sec./F
Signal:	Signal output in many forms, depending on signal processor
Accuracy:	+/- 1° within the range of -30° to + 110°F (-34.4° to +43.3°C) +/- 3° from -30° to -40°F (-34.4° to -40°C) and +/- 3° from +110° to + 120°F (+43.3° to +48.8°C)
Environmental Limits:	Temperature: -55° to +180°F (operating range: -40° to +120°F) Humidity: 0-100%
Dimensions:	6.75"H x 7.25"W (17.1cm x 18.4cm)
Cable:	60 ft. (18.28 meters)
Warranty:	3 year

Temperature Sensor Characteristics

Degrees F	Degrees C	Resistance	Degrees F	Degrees C	Resistance
Null	Null	34,274	+40°	+4.44°	5,942
-40°	-40°	33,336	+50°	+10°	5,051
-30°	-34.44°	24,904	+60°	+15.55°	4,282
-20°	-28.88°	18,985	+70°	+21.11°	3,642
-10°	-23.33°	14,824	+80° span	+26.66°	3,087
0° Null	-17.77°	12,002	+90°	+32.22°	2,602
+10°	-12.22°	9,844	+100° span	+37.77°	2,186
+20°	-6.66°	8,252	+110°	+43.33°	1,839
+30°	-1.11°	7,002	+120°	+48.88°	1,543

Ordering Information

<u>Model #</u>	<u>Description</u>
TT-101QR	Temperature Sensor

Optional Parts / Accessories

Cable	Additional Cable available upon request
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Texas Electronics, Inc.

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Ambient Air Temperature & Humidity

TTH-1315 Temperature Humidity Sensor



Description

The Texas Electronics, Inc. Model TTH-1315 Sensor utilized a Rotronics HygroClip S3 Humidity Temperature Probe with interchangeable sensing elements that do not require calibration.

The unit is encased in a corrosive-resistant spun aluminum radiation shield that allows for wind aspiration and protection from the sun's UV rays. The shield is finished in white baked-enamel to provide for virtual cosmetic invisibility while reflecting much of the radiant heat from surrounding objects and the sun.

Overcurrent protection is provided in a NEMA 4X enclosure that is mounted to the angled mounting bracket on the sensor. Transorbs are utilized to protect the sensor and signal conditioning units in an overcurrent situation.

With DC voltage applied to the sensor, the unit will return signal voltages that are linear to the range of the instrument. Signal conditioning is applied to ensure proper voltages are returned and can be amplified or modified to a current output to connect to any analog signal processing unit.

Specifications

Humidity Sensor:	ROTRONIC Hygromerò C94 (capacitive)
Temperature Sensor:	RTD Pt100 Ohm, 1/3 DIN
Sensor Protection:	Wire Mesh filter (standard) / foam filter (optional)
Measuring Range:	0-100 % Relative Humidity -40° to +140°F (-40° to +60°C)
Operating Limits:	Same as measuring range
Accuracy at 73°F / 23°C:	+/- 1.5% RH and +/- 0.5°F / 0.3°C - standard calibration +/- 1.0% RH and +/- 0.4°F / 0.2°C - special calibration (optional)
Repeatability:	Better than 0.5% RH and 0.1°C/ 32.18°F
Analog output signals:	0...100% RH = 0...1V (minimum load >10k ohm) -40...+140°F = 0...1V (-40...+60°C) Analog Signal Resolution 0.02% RH and 0.1°F
Sampling Time:	<0.7 sec
Maximum cable length:	5 m / 15 ft. for direct output Up to 100 m / 325 ft. with signal amplifier
Connection Type:	Bayonet cap on mounting connector
Protection grade:	IP65 (probe to connector)
Supply voltage:	3.5 ... 50VDC
Current consumption:	<4 mA
Minimum excitation time:	<4 sec
EMC compatibility (CE):	EN-50081-2, EN-50082-2
Material:	Polycarbonate, white
Dimensions:	Length: 100 mm (3.94") Diameter: 15 mm (0.59")
Weight:	14 g / 0.5 oz.

Features & Benefits

- Combines Temperature and Humidity onto one sensing unit
- Rotronics HygroClip S3 has interchangeable sensing elements requiring no calibration
- Stacked plate construction of shelter provides natural ventilation
- Quick-Release mounting bracket allows for easy installation and maintenance
- Aluminum radiation shield is lightweight and extremely durable
- White baked-enamel finish reflects most radiant heat from sun and surrounding objects

Ordering Information

<u>Model #</u>	<u>Description</u>
TTH-1315	Temperature & Humidity Sensor
TTH-1315A	Temperature & Humidity Sensor, 4-20 mA

Optional Parts / Accessories

H50	Interior Humidity Sensing element only
Cable	Additional Cable

Installation & Maintenance

The radiation shield with sensing element can be pole or mast mounted. Whenever possible, sensors should be installed at a height of 4 ft. (1.2 meters) or greater over earth or sod at least 100 ft. (30.48 meters) away from any concrete or other hard-surfaced area and not closer to any other object than four times the height of the object above the instrument shelter or remote sensors. Avoid roof installations if possible. If it is necessary to roof-mount shelters and sensors, they should not be closer than 30 ft. (9.14 meters) to any large, vertical reflecting surface (walls, etc.), exhaust fans, or cooling towers. Electronic remote sensors when roof-mounted should be at least 9 ft. (2.74 meters) or greater above the roof surface. To minimize radiation effects from the roof, they can also be mounted on a horizontal boom so that they will extend from the side of the building roof or tower assembly.



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Ambient Indoor Air Temperature

TT-309-I



Description

The Texas Electronics, Inc. TT-309-I Indoor Air Temperature Sensor with the proper signal processor provides a DC signal proportional to ambient temperature. A highly sensitive linear thermistor-resistor network is utilized as the sensing element. Sensors feature direct interchangeability with one another without system recalibration. (See "Calibration/Cleaning Frequency" to the right.) Air temperature variations create a resistance bridge imbalance, the subsequent output signal varying linearly with temperature. The sensor is housed in a small aluminum housing that can be mounted to a flat surface.

The signal conditioner output voltage may be interfaced with various types of recorders, indicators, dataloggers, etc. as required by the user.

(Specifications on next page)

Features & Benefits

- Available in four different temperature ranges
- Signal Conditioner output can be interfaced with indicators or dataloggers
- Small sensor housing can be mounted to any desired flat surface
- Sensing element utilizes a highly sensitive linear thermistor-resistor network
- Optional Yellow Springs sensing element available
- Over 25 years in production
- Lightweight and rugged white baked-enamel finished aluminum exterior

Installation & Maintenance

The radiation shield with sensing element can be mounted to any flat interior surface where temperature is to be monitored.

Installation:

The system is delivered consisting of two principle parts: (1) the indoor housing containing the sensor with 60 feet (18.28 meters) of cable attached; and (2) an electronics package. The indoor housing with sensor may be installed in whatever area that it is desired to sense the temperature. The electronic package may be installed within 60 ft. (18.28 meters) of the sensor. Longer cable is available upon request.

Calibration / Cleaning Frequency:

The temperature system should not require calibration, however, the system may be checked for accuracy each six months, if desired. In the event that it is required, field calibration (zeroing and spanning) can be readily accomplished by substituting fixed standard resistor values for the sensor output.

No cleaning program should be required with normal use.

Specifications

Ranges Available:	-40° to +120°F -60° to +40°C -40° to +50°C +60° to +220°F
Response (Nominal):	Time to reach 90% of DT 0.8 sec./F
Signal:	Signal output in many forms, depending on signal processor
Accuracy:	+/- 1° within the range of -30° to + 110°F (-34.4° to +43.3°C) +/- 3° from -30° to -40°F (-34.4° to -40°C) and +/- 3° from +110° to + 120°F (+43.3° to +48.8°C)
Environmental Limits:	Temperature: -55° to +180°F (operating range: -40° to +120°F) Humidity: 0-100%
Cable:	60 ft. (18.28 meters)
Warranty:	3 year

Temperature Sensor Characteristics

Degrees F	Degrees C	Resistance	Degrees F	Degrees C	Resistance
Null	Null	34,274	+40°	+4.44°	5,942
-40°	-40°	33,336	+50°	+10°	5,051
-30°	-34.44°	24,904	+60°	+15.55°	4,282
-20°	-28.88°	18,985	+70°	+21.11°	3,642
-10°	-23.33°	14,824	+80° span	+26.66°	3,087
0° Null	-17.77°	12,002	+90°	+32.22°	2,602
+10°	-12.22°	9,844	+100° span	+37.77°	2,186
+20°	-6.66°	8,252	+110°	+43.33°	1,839
+30°	-1.11°	7,002	+120°	+48.88°	1,543

Ordering Information

Model # Description

TT-309-I Temperature Sensor

Optional Parts / Accessories

Cable Additional Cable available upon request



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Water / Soil Temperature Sensor Probe

TT-103R-W



Description

The Texas Electronics, Inc. Model TT-103R-W Temperature Sensor utilizes a highly sensitive linear thermistor-resistor network as the sensing element. Sensors feature direct interchangeability with one another without system recalibration. Temperature variations create a resistance bridge imbalance, the subsequent output signal varying linearly with temperature.

The TT-103R-W has the same characteristics as the TT-101QR. The sensor is housed in a brass thermowell with a waterproof connector. The thermowell can be screwed into a 1/4" - 14 NPT pipe thread for monitoring fluids or pipes or can be mounted to a surface by the bracket provided. It can also be directly buried in soil or pavement.

(Specifications on next page)

Features & Benefits

- Available in four different temperature ranges
- Signal Conditioner output can be interfaced with indicators or dataloggers
- Brass thermowell with waterproof connector provides ease in installation and maintenance
- Sensing element utilizes a highly sensitive linear thermistor-resistor network
- Optional Yellow Springs sensing element available
- Over 25 years in production
- Rugged construction allows varied applications in fluid or solid mediums

Installation & Maintenance

Installation:

Brass thermowell housing with waterproof connector can be screwed into a 1/4" NPT pipe thread for monitoring fluid in pipes, or mounted to a surface by provided bracket. It can also be directly buried in soil or pavement. Probe comes with a 6 ft. (1.82 meter) or a 60 ft. (18.28 meter) sensor cable.

Calibration / Cleaning Frequency:

The temperature system should not require calibration, however, the system may be checked for accuracy each six months, if desired. In the event that it is required, field calibration (zeroing and spanning) can be readily accomplished by substituting fixed standard resistor values for the sensor output.

No cleaning program should be required with normal use.

Specifications

Ranges Available:	-40° to +120°F -60° to +40°C -40° to +50°C +60° to +220°F
Response (Nominal):	Time to reach 90% of DT 0.8 sec./F
Signal:	Signal output in many forms, depending on signal processor
Accuracy:	+/- 1° within the range of -30° to + 110°F (-34.4° to +43.3°C) +/- 3° from -30° to -40°F (-34.4° to -40°C) and +/- 3° from +110° to + 120°F (+43.3° to +48.8°C)
Environmental Limits:	Temperature: -55° to +180°F (operating range: -40° to +120°F) Humidity: 0-100%
Cable:	60 ft. (18.28 meters)
Warranty:	3 year

Temperature Sensor Characteristics

Degrees F	Degrees C	Resistance	Degrees F	Degrees C	Resistance
Null	Null	34,274	+40°	+4.44°	5,942
-40°	-40°	33,336	+50°	+10°	5,051
-30°	-34.44°	24,904	+60°	+15.55°	4,282
-20°	-28.88°	18,985	+70°	+21.11°	3,642
-10°	-23.33°	14,824	+80° span	+26.66°	3,087
0° Null	-17.77°	12,002	+190°	+32.22°	2,602
+10°	-12.22°	9,844	+100° span	+37.77°	2,186
+20°	-6.66°	8,252	+110°	+43.33°	1,839
+30°	-1.11°	7,002	+120°	+48.88°	1,543

Ordering Information

<u>Model #</u>	<u>Description</u>
TT-103R-W	Temperature Sensor Probe w/ 6 ft. or 60 ft. cable

Optional Parts / Accessories

Cable	Additional Cable available upon request
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