

Space Humidity and Temperature Sensor

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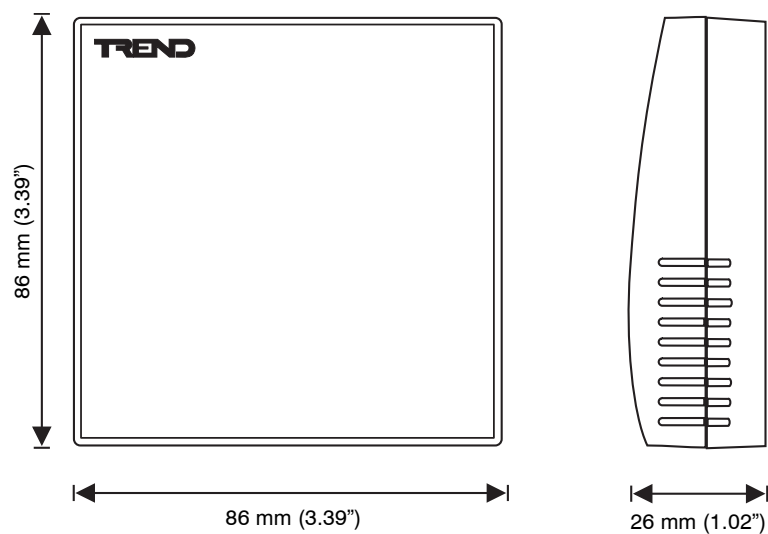
Description

Wall mounted relative humidity measurement combined with temperature measurement. The certified 2% high accuracy ($\pm 2\%$) and standard 3% versions offer excellent linearity and stability over a wide humidity range.

Features

- Precalibrated for ease of commissioning
- Operates over 0 to 100 %RH non-condensing
- $\pm 2\%$, and 3% accuracy versions
- 2 part connectors for ease of installation
- Humidity sensor element protected by replaceable filter
- Capacitive humidity sensing element provides excellent long term stability

Physical



FUNCTIONALITY

The HT/S humidity and temperature sensors can be used for a wide range of HVAC applications, operating over a 0 to 100 %RH (non-condensing) range. They use a capacitive humidity sensing element which exhibits excellent long term stability. The HT/S/2% and HT/S sensors exhibit 2% and 3% humidity measurement accuracy respectively over a defined %RH range (see specification section), with a 4 to 20 mA transmitter output (corresponding to 0 to 100%RH).

The HT/S/2% version incorporates a platinum resistance temperature (PRT) sensor with 4 to 20 mA transmitter output (corresponding to 0 to 40 °C, 32 to 104 °F), whereas the standard HT/S version incorporates a directly connected thermistor temperature sensor.

INSTALLATION

The sensor housing consists of a front panel and a backplate. The backplate is designed to be surface mounted on surface conduit, mini trunking, wall box or end box (BESA), or directly onto a wall or other flat surface.

Note that the sensor should not be mounted on a surface which could be washed or splashed.

Supply Voltage: The minimum supply voltage is 15 V when used with an IQ controller; if used with another device, the minimum voltage should be calculated from the equation:

$$\text{minimum voltage} = 10 + 0.02 \times R_{in} \text{ (where } R_{in} \text{ is input resistance)}$$

e.g. if $R_{in} = 500$ ohms

$$\text{minimum voltage} = 10 + 0.02 \times 500 = 10 + 10 = 20 \text{ V}$$

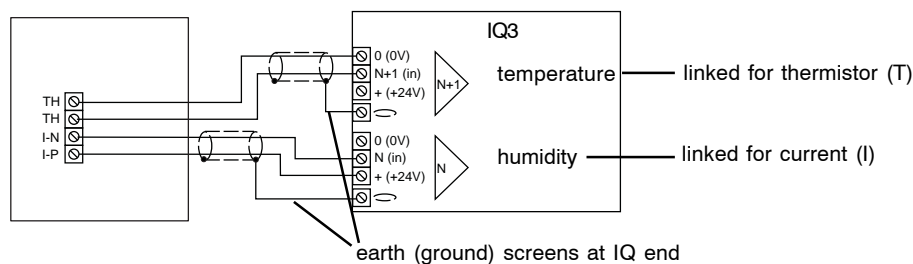
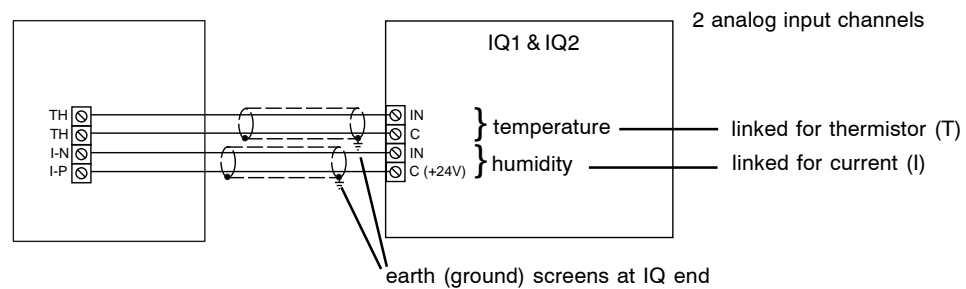
The installation involves:

- choose location
- separate front panel and backplate
- remove cable knockouts (if required)
- mount backplate
- check link position (see 'Connections' section below)
- wire sensor cables
- push front panel onto backplate
- set up IQ channels for current (I) (all humidity channels, and HT/S/2% temperature)
 - or thermistor (T) (HT/S temperature)
- configure IQ sensor modules
- test sensor

Full installation details are given in the HT/S Installation Instructions TG200990.

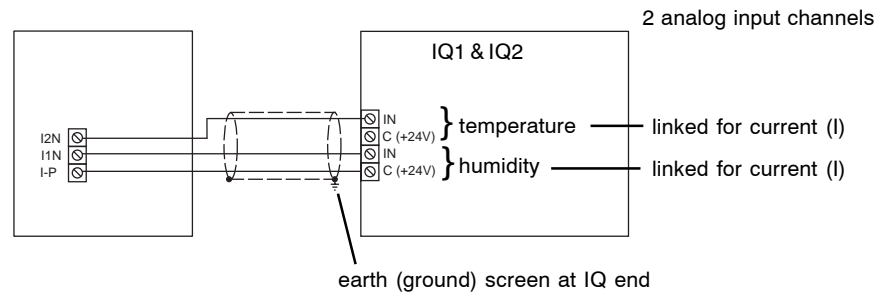
CONNECTIONS

HT/S

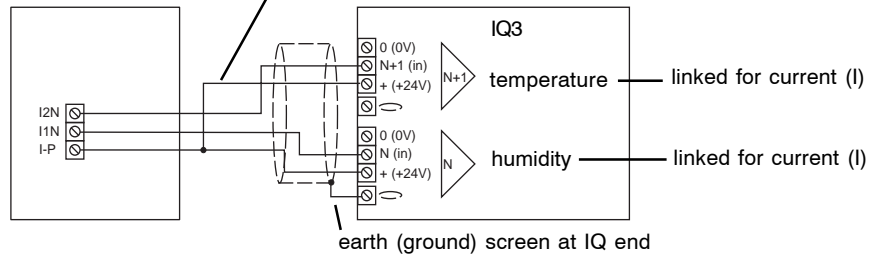


CONNECTIONS (continued)

HT/S/2%



Note that when connecting to IQ3, in order to provide sufficient supply current to the sensor, the sensor I-P terminal must be connected to **both** channels' 24 V terminals.



Note that in order to maintain the HT/S/2% temperature sensor accuracy, the temperature sensor should only be used if the humidity sensor is also used.

FIELD MAINTENANCE

The removal of dust is covered in the HT/S installation instructions.

PRODUCT CODES

The HT/S sensors both have 2 parts (front panel and backplate) for surface mounting on a flat surface or wall box.


HT/S/2%

Space humidity and PRT temperature sensor with $\pm 2\%$ humidity accuracy over 30 to 70 %RH and $\pm 3\%$ over 20 to 90 %RH. Complete with calibration certificate

HT/S

Space humidity and thermistor temperature sensor, $\pm 3\%$ humidity accuracy over 30 to 75 %RH, and $\pm 4.5\%$ over 20 to 95 %RH.

DISPOSAL



WEEE Directive :

At the end of their useful life the packaging and product should be disposed of by a suitable recycling centre.

Do not dispose of with normal household waste.

Do not burn.

SPECIFICATIONS

Electrical

Humidity

Humidity operating range :0 to 100 %RH non-condensing
 Humidity element :Capacitive RH element
 Linearity : (0 to 98 %RH) $\pm 1.5\%RH$
 Stability : (20 to 30 °C, 68 to 86 °F, 20 to 80 %RH)
 HT/S: drift <math>< 1.5\%/year</math>
 HT/S/2%: drift <math>< 1\%/year</math>
 Humidity accuracy :of sensor (at 23 °C, 73.5 °F, and 24 Vdc supply)
 HT/S :$\pm 3\%RH$ (30 to 75 %RH), $\pm 4.5\%RH$ (20 to 95 %RH)
 HT/S/2% :$\pm 2\%RH$ (30 to 70 %RH), $\pm 3\%RH$ (20 to 90 %RH)
 Temperature dependence : (at 60 %RH)
 HT/S :typically $-0.18\%RH/^{\circ}C$ ($-0.1\%RH/^{\circ}F$)
 HT/S/2% :typically $0.06\%RH/^{\circ}C$ ($0.03\%RH/^{\circ}F$)
 Hysteresis :typically 1.7%RH
 Resolution :0.05%RH
 Response time : (at 23 °C, 73.5 °F) $t_{90} \leq 20\text{ s}$
 Humidity output signal :4 to 20 mA for 0 to 100 %RH

Temperature

Temperature measurement range :0 to +40 °C (32 to 104 °F) (recommended)
 Temperature element
 HT/S :Thermistor 10 kΩ at 25 °C (77 °F)
 HT/S/2% :Pt1000 (tolerance class A, DIN EN60751)
 Temperature accuracy:of sensor
 HT/S : (0 to 40 °C, 32 to 104 °F) $\pm 0.5\text{ }^{\circ}C$, $\pm 0.9\text{ }^{\circ}F$
 HT/S/2% : (at 23 °C, 73.5 °F) $\pm 0.4\text{ }^{\circ}C$, $\pm 0.7\text{ }^{\circ}F$
 Temperature output signal
 HT/S :Thermistor 10 kΩ at 25 °C (77 °F)
 HT/S/2% :4 to 20 mA for 0 to 40 °C (32 to 104 °F)
 Supply Voltage :15* to 30 Vdc
 * see calculation on page 2 if connected to a non-IQ device

Input channels and sensor scaling

The IQ controller's input channels must be set up correctly as described below, and the sensor type modules must be set up with the correct scaling. It is recommended to use SET (software tool) for the setting of sensor type modules. For all IQ2 series controllers with firmware of version 2.1 or greater, or IQ3 series controllers, the SET Unique Sensor References should be used.

If not using SET, use the appropriate manual settings and tables described below for all IQ2 series controllers with firmware version 2.1 or greater or IQ3; for all other IQ controllers see the Sensor Scaling Reference Card TB100521A.

Humidity

For both HT/S versions, link input channel for current, I. SET Unique Sensor Reference: **Humidity I**
 Manual setting: Use sensor type *scaling mode 5, characterise, with the input type set to 2 (current, mA) and the table below:

System Accuracy (including controller) :same as humidity accuracy of sensor

| Y | Input type | 2 (current) |
|----|------------|-------------|
| *E | Exponent | 3 |
| U | Upper | 100 |
| L | Lower | 0 |
| P | Points | 2 |
| x | Ix | Ox |
| 1 | 4 | 0 |
| 2 | 20 | 100 |

Temperature

HT/S/2%
 Link input channel for current, I.
 SET Unique Sensor References: **PRTI 0+40 (°C)**
PRTI +32+104 F (°F)
 Manual setting: Use sensor type *scaling mode 5, characterise, with the input type set to 2 (current, mA) and the table below:

System Accuracy (including controller) :same as temperature accuracy of sensor

| Units | °C | °F |
|-------|------------|-------------|
| Y | Input type | 2 (current) |
| *E | Exponent | 3 |
| U | Upper | 40 |
| L | Lower | 0 |
| P | Points | 2 |
| x | Ix | Ox |
| 1 | 4 | 0 |
| 2 | 20 | 40 |

HT/S
 Link input channel for thermistor, T.
 SET Unique Sensor References:

Thermistor HTST DT (°C)
Thermistor HTST DT F (°F)

Manual setting: use sensor type *scaling mode 5, characterise, with the input type set to 1 (thermistor volts, V) as in the table below.

System Accuracy (including controller) :$\pm 0.9\text{ }^{\circ}C$, $\pm 1.62\text{ }^{\circ}F$ (0 to +40 °C, 32 to 104 °F)

| Units | °C | °F | |
|-------|------------|----------------------|---------|
| Y | Input type | 1 (thermistor volts) | |
| *E | Exponent | 3 | |
| U | Upper | 50 | |
| L | Lower | -5 | |
| P | Points | 6 | |
| x | Ix | Ox (°C) | Ox (°F) |
| 1 | 2.641 | 50 | 122 |
| 2 | 3.47 | 40 | 104 |
| 3 | 4.46 | 30 | 86 |
| 4 | 6.663 | 10 | 50 |
| 5 | 7.668 | 0 | 32 |
| 6 | 8.102 | -5 | 23 |

*Note that for IQ3 the scaling mode and exponent do not need to be set up.

Mechanical

Dimensions :86 mm (3.39") x 86 mm (3.39") x 26 mm (1.02")
 Enclosure Material :Flame retardant (V0) ABS
 Connectors :Two part rising cage terminals for 0.2 to 2.5 mm² (16 to 24 AWG) cable
 Weight :86 gm (3.03 oz)

Environmental

CE Compatibility :EN61000-6-1, EN61000-6-3
 Working ambient limits
 temperature :$-5\text{ }^{\circ}C$ (23 °F) to $+55\text{ }^{\circ}C$ (131 °F)
 humidity :0 to 100 %RH non-condensing
 Storage Temperature :$-25\text{ }^{\circ}C$ (-13 °F) to $+60\text{ }^{\circ}C$ (140 °F)
 Protection :IP20 (NEMA1)

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