

Outside Humidity and Temperature Sensors

HT/O



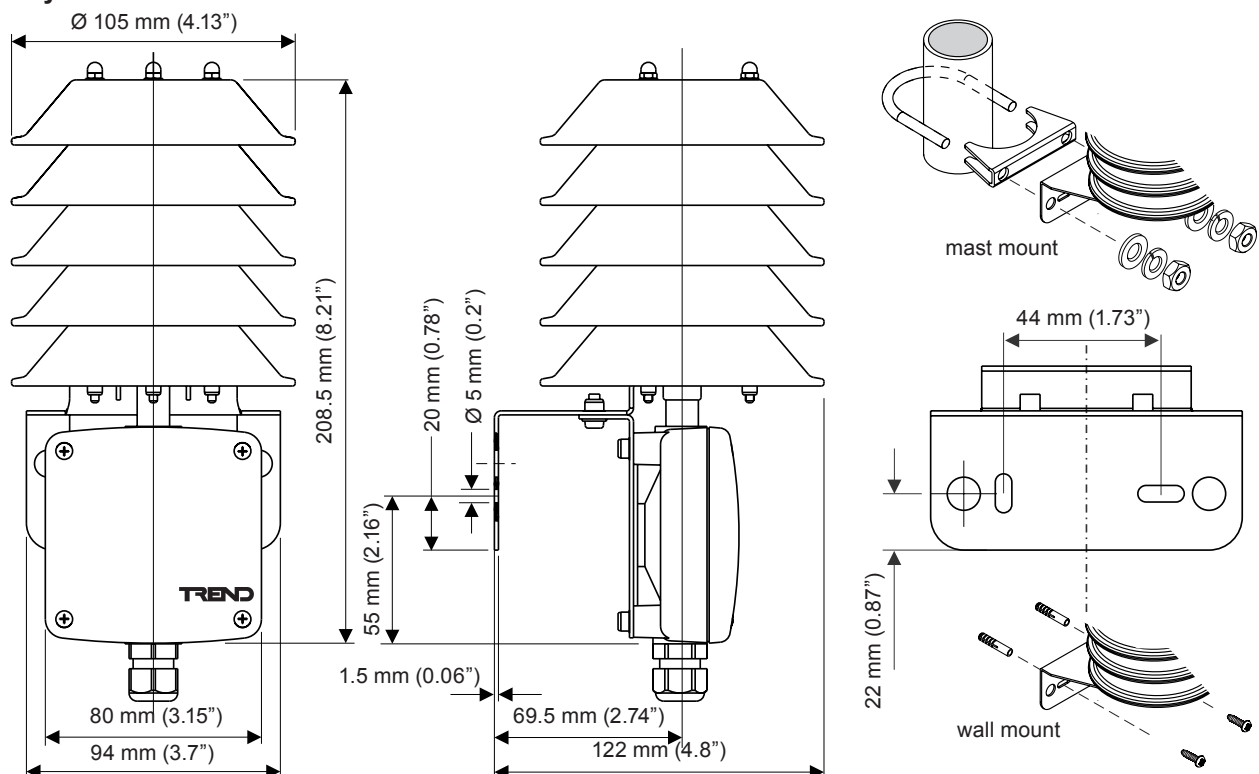
Description

Relative humidity and temperature sensors for outside air measurement applications, providing high quality humidity sensing combined with temperature monitoring. The HT/O offers excellent linearity and stability over a wide humidity range (0 to 100 %RH). This sensor is fitted with a radiation shield to avoid solar, rain and wind effects. Electronics are mounted in an IP65 (NEMA4) housing with M20 conduit entry with M16 cable gland..

Features

- Passive thermistor and active 4 to 20 mA temperature outputs
- 4 to 20 mA humidity output
- IP65 housing
- Operates over 0 to 100 %RH non-condensing
- Humidity element protected by replaceable filter
- Capacitive humidity sensing element provides excellent long term stability
- Radiation shield reduces solar, rain, and wind effects

Physical



FUNCTIONALITY

The sensor contains humidity and temperature sensing elements with 4 to 20 mA outputs, and a thermistor temperature sensing element (10 kohm NTC resistive output).

INSTALLATION

The HT/O sensor can be mounted on a wall using screws and wall plugs supplied, or on a mast (57 to 68 mm, 2.25" to 2.68" diameter) using the 'U' bolt supplied. It should be located in a relatively sheltered environment, out of direct sunlight, preferably by a north or north west facing wall. The HT/O sensor should be mounted so that the radiation shield is vertical.

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

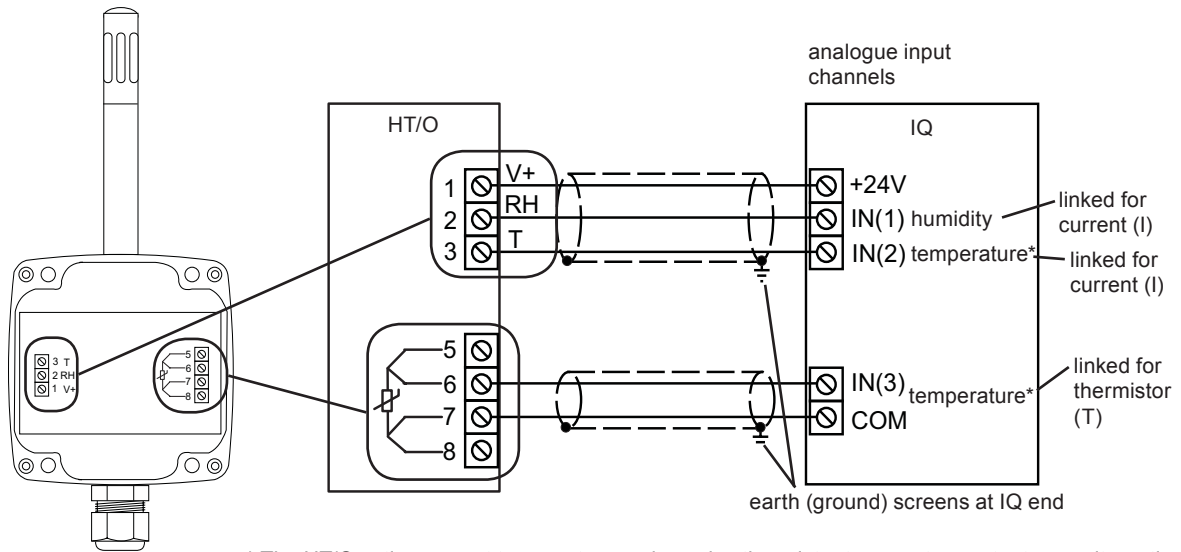
$$\text{minimum voltage} = 10 + 0.02 \times 500 = 10 + 10 = 20 \text{ V}$$

The installation involves:

- choose location
- mount on wall using screws and wall plugs supplied or on a mast using the 'U' bolt supplied
- insert probe in shield gland
- remove sensor lid
- feed IQ cable through gland
- wire cables
- replace lid
- setup IQ channels (current (I) for humidity, and thermistor (T) or current (I) for temperature)
- configure IQ sensor modules
- test sensor

Full installation details are given in the HT/O Installation Instructions, TG200992.

CONNECTIONS



FIELD MAINTENANCE


The sensor filter should be periodically checked for dust contamination and cleaned or replaced as required. The removal of dust and accuracy checking are covered in the HT/O Installation Instructions, TG200992.

The accuracy of the sensor should be checked annually. If the sensor falls outside the quoted accuracy the sensor should be replaced.

PRODUCT CODE

- HT/O** Outside humidity and temperature sensor with radiation shield including mounting bracket, screws, and wall plugs
- ACC/HTO/FILTER** Replacement metal grid filter for HT/O (pack of 5 filters)

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.

SPECIFICATION

Electrical

Humidity

Humidity measuring range	:0 to 100 %RH
Humidity element	:Capacitive RH element
Linearity	:(0 to 98 %RH) less than ± 1.5 %RH
Stability	:(20 to 30 °C, 68 to 86 °F, 20 to 80 %RH) drift <1 %/year
Humidity accuracy	:of sensor (at 23 °C, 73.5 °F, and 24 Vdc supply) ± 2 %RH (0 to 90 %RH), ± 3 %RH (90 to 100 %RH)
Temperature dependence	
probe	:typically 0.03%RH/°C (0.02%RH/°F)
electronics	:typically 0.03%RH/°C (0.02%RH/°F)
Hysteresis	:(10% to 80% to 10%) typically 1.7 %RH
Resolution	:0.1 %RH
Response time	:(at 23 °C, 73.5 °F) t_{90} less than 30 s
Load resistance	:Less than 500 Ω
Humidity output signal	:4 to 20 mA for 0 to 100 %RH

Temperature

Temperature measuring range	:-40 to +50 °C, -40 to + +122 °F
Temperature accuracy	
Thermistor	± 1 °C, ± 1.8 °F
Current	: ± 0.3 °C, ± 0.6 °F
Temperature output signals	
Thermistor	:Thermistor 10 k Ω at 25 °C
Current	:4 to 20 mA
Supply voltage	:15* to 30 Vdc
* see calculation on page 2 if connected to a non-IQ device	

Input channels and sensor scaling

IQ controllers with fixed strategies have the scalings pre-configured. A SET pre-defined strategy (**HT O Outside Air Temperature and Humidity**) can be used which will set up the scalings*.

*The pre-configured strategy does not include scaling for the temperature current output.

For all others the input channel must be set to the appropriate input type (see controller documentation for details) and the sensor type module must be set up with the correct scaling.

For IQ2 v2.1 or greater, IQ3, and IQ4, the recommended method of setting the sensor scaling is to use the 'Unique Sensor Reference' provided in SET, see below for details.

For all other controllers, see Sensor Scaling Reference Card TB100521A, and set up manually in SET.

Humidity: An analog input channel must be set for Current (I) and the sensor scaling set by using the SET Unique Sensor Reference:

Humidity I

Temperature (Thermistor output): An analog input channel must be set for Thermistor (T) and the sensor scaling set by using one of the following SET Unique Sensor References:

Thermistor HTOT (°C)
Thermistor HTOT F (°F)

These standard scalings are for -30 to +50 °C, -22 to + +122 °F

Temperature (Current output): An analog input channel must be set for Current (I) and the sensor scaling set by using one of the following SET Unique Sensor References:

PRT I -40+50 (°C)
PRT I -40+122 F (°F)

These standard scalings are for -40 to +50 °C, -40 to + +122 °F

Mechanical

Dimensions	:irregular (see 'Physical' page 1)
Cable entry	:M16(Pg9)
Material	
Probe	:Polycarbonate (flammability HB)
Housing	:Polycarbonate (flammability HB)
Filter	:Metal grid (stainless steel wire mesh)
Radiation Shield Louvres	:ABS (UV stabilised)
Radiation Shield Brackets	:Stainless steel
Connectors	:1 part screw terminals for 0.2 to 1.5 mm ² (16 to 24 AWG) max. cable.
Weight	:424 gm, 14.9 ozs

Environmental

CE Compatibility	:EN61000-6-2, EN61000-6-3
Working ambient limits	
probe temperature	:-40 °C (-40 °F) to +60 °C (140 °F)
electronics temperature	:-40 °C (-40 °F) to +60 °C (140 °F)
humidity	:0 to 100 %RH non-condensing
Storage temperature	:-25 °C (-13 °F) to +60 °C (140 °F)
Protection (housing)	:IP65

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Trend Control Systems Limited

Albery House, Springfield Road, Horsham, West Sussex, RH12 2PQ, UK. Tel:+44 (0)1403 211888 Fax:+44 (0)1403 241608 www.trendcontrols.com

Trend Control Systems USA

6670 185th Avenue NE, Redmond, Washington 98052, USA. Tel:(425) 897-3900 Fax:(425) 869-8445 www.trend-america.com