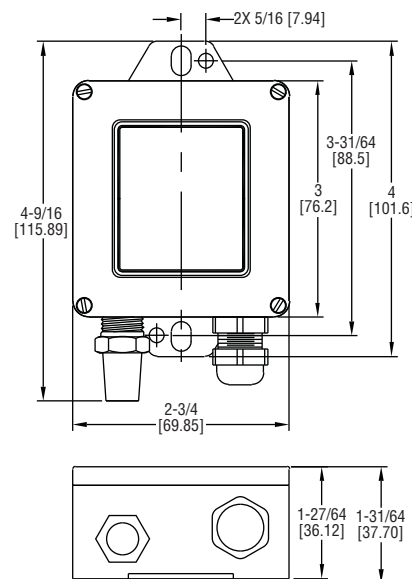




Series WHT Weather-Proof Humidity/Temperature Transmitter

Specifications - Installation and Operating Instructions



The Compact Series WHT Humidity/Temperature Transmitter is designed to withstand the elements. A removable sintered filter protects the polymer capacitance sensor from solid objects that may come in contact with the transmitter. The transmitter is available with 4 to 20 mA, or 0 to 10 VDC or 0-5V output signals for both temperature and humidity or a passive thermistor for temperature. This transmitter is ideal for measuring outside air temperature and humidity levels for air handling economizer applications.

INSTALLATION

Warning: Disconnect power supply before installation to prevent electrical shock and equipment damage.

Make sure all connections are in accordance with the job wiring diagram and in accordance with national and local electrical codes. Use copper conductors only.

Caution: Use electrostatic discharge precautions (e.g., use of wrist straps) during installation and wiring to prevent equipment damage.

Avoid locations where severe shock or vibration, excessive moisture or corrosive fumes are present. NEMA Type 3S (IP54) housings are intended for outdoor use primarily to provide a degree of protection against wind-blown dust, and rain.

Do not exceed ratings of this device, permanent damage not covered by warranty may result. The 4-20 mA models are not designed for AC voltage operation.

SPECIFICATIONS

Relative Humidity Range: 0 to 100% RH.

Temperature Range: -40 to 140°F (-40 to 60°C).

Accuracy, RH: $\pm 3\%$ 20-80% RH, $\pm 4\%$ @ 10-20%, 80-90%.

Accuracy, Temp, Models with 4-20mA Temp. Output:

$\pm 0.9^\circ\text{F}$ @ 72°F ($\pm 0.3^\circ\text{C}$ @ 25°C).

Accuracy, Models with Passive Thermistor Temp Sensor:

$\pm 0.4^\circ\text{F}$ @ 77°F ($\pm 0.22^\circ\text{C}$ @ 25°C).

Hysteresis, RH: $\pm 1\%$.

Repeatability, RH: $\pm 0.1\%$ typical.

Temperature Limits: -40 to 140°F (-40 to 60°C).

Storage Temperature: -40 to 176°F (-40 to 80°C).

Compensated Temperature Range, RH: -4 to 140°F (-20 to 60°C).

4-20 mA Loop Powered Models:

Power Requirements: 10-35 VDC.

Output Signal: 4-20 mA.

0-10V Output Models:

Power requirements: 15-35 VDC or 15 -29 VAC.

Output Signal: 0-10V @ 5 mA max.

0-5V Output Models:

Power requirements: 10-35 VDC or 10-29 VAC.

Output Signal: 0-5V @ 5 mA max.

Response Time: 15 seconds.

Electrical Connections: Removable screw terminal block.

Drift: $< 1\%$ RH/year.

RH Sensor: Capacitance polymer.

Temperature Sensor: 4-20mA Output, Solid State Band Gap.

Passive Output: 10K @ 25°C Thermistor (Dwyer curve A).

Housing Material: ABS.

Enclosure Rating: Designed to meet NEMA 3S (IP54).

Weight: 0.3oz (8.5g).

Agency Approvals: CE.

MOUNTING

The transmitter should be mounted with the sensor pointing downward to prevent water collection in the housing. The integral mounting tab has two sets of mounting holes. The larger holes are for the suspension mounting and the smaller holes are for surface mounting the transmitter to a wall. Please see Figure 1 and 2 for more information on both mounting methods.

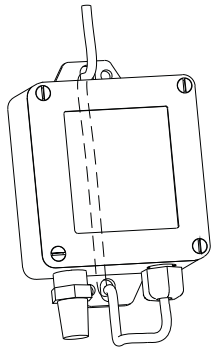


Figure 1 Suspension Mounting

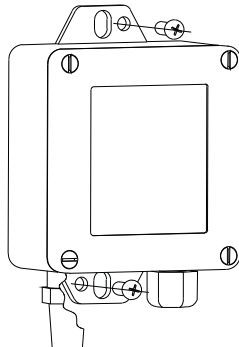


Figure 2 Surface Mounting

WIRING

Use maximum 18 AWG wire for wiring terminal. Refer to Figures 3-6 for wiring information.

Models with 4-20mA RH Output, with or without 4-20mA Temperature Output

4-20 mA output units may be powered with a 10-35 VDC supply. The following describes the proper wiring of these transmitters with mA output.

Models with 4-20mA RH and 4-20mA Temperature outputs are designed as a 4-20mA device with two channels. The channels are common on the positive side of the current loop.

Sensor excitation is derived from the relative humidity channel, so power must always be applied to that channel. If the temperature channel is not equipped or used, it can be left disconnected. Wire as shown in Figure 3.

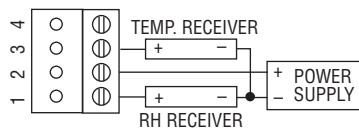


Figure 3

Models with 4-20mA RH Output and a Passive Thermistor Temperature Sensor

The 4-20mA RH output is identical to the above model with a 4-20mA temperature output. The required power supply and wiring of the RH output is the same. The passive thermistor temperature sensor wires to terminals 3 and 4. Wire as shown in Figure 4.

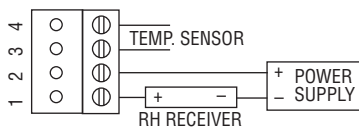


Figure 4

Models with 0-5V or 0-10V RH Output, with or without 0-5V or 0-10V Temperature Output

The 0-10V output models may be powered with 15-35 VDC or 15-29 VAC. The 0-5V models may be powered with 10-35 VDC or 10-29 VAC. Note the polarity when using DC power. The channels are common on the negative side. For RH and Temperature outputs, either or both may be used. The maximum load is 5mA (1K for 0-5V, 2K for 0-10V). Wire as shown in Figure 5.

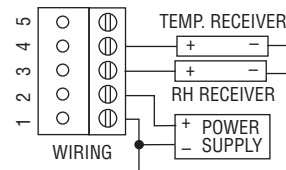


Figure 5

Models with 0-5 or 0-10V RH Output and a Passive Thermistor Temperature Sensor

The 0-5V or 0-10V RH output is identical to the above model with a 0-5V or 0-10V temperature output. The required power supply and wiring of the RH output is the same. The passive thermistor temperature sensor wires to terminals 4 and 5. Wire as shown in Figure 6.

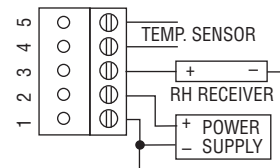


Figure 6

CHECKOUT

4-20 mA Models:

Verify appropriate supply voltage. The transmitter requires a minimum of 10 and a maximum of 35 VDC at its connection for proper operation. Choose a power supply with a voltage and current rating which meets this requirement under all operating conditions. If the power supply is unregulated, make sure voltage remains within these limits under all power line conditions. Ripple on the supply should not exceed 100 mV.

Loop Resistance – The maximum allowable loop resistance depends on the power supply voltage. Maximum loop voltage drop must not reduce the transmitter voltage below the 10 VDC minimum. Maximum loop resistance can be calculated with the following equation. V_{ps} is the power supply voltage.

$$R_{\max} = \frac{V_{ps} - 10.0}{20 \text{ mA}}$$

Some receivers, particularly loop powered indicators, may maintain a fixed loop voltage to power the device. This voltage drop must also be subtracted from the power supply voltage when calculating the voltage margin for the transmitter. The following equation takes this into account. V_{rec} is the receiver fixed voltage.

$$R_{\max} = \frac{V_{ps} - 10.0 - V_{rec}}{20 \text{ mA}}$$

0-5, 0-10 V Output Models:

Verify appropriate supply voltage. The 0-10V output models require a DC supply of 15 to 35 V or an AC supply of 15-29 V for proper operation maximum. The 0-5 V output models require a DC supply of 10-35 V or an AC supply of 10-29 VAC. Both outputs may be loaded simultaneously with 5 mA.

MAINTENANCE

Upon final installation of the Series WHT Temperature/Humidity Transmitter and the companion receiver, no routine maintenance is required. A periodic check of the system calibration is recommended. The Series WHT is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.