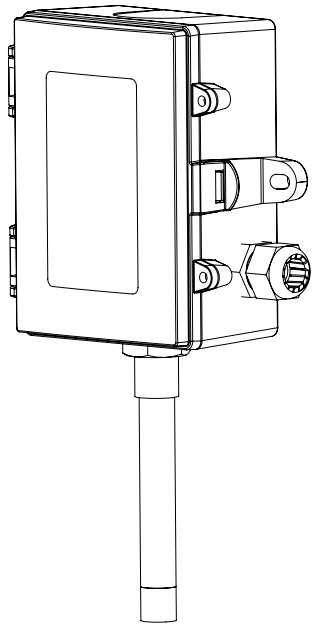
HTX2 Series

HTX2 Series – Analog Installation Instructions



INTRODUCTION

The HTX2 High-Accuracy Humidity and Temperature Transmitter is used in environmental monitoring and control systems that require high accuracy and stability. The state-of-the-art design combines digital linearization and temperature compensation. A highly accurate and Thermoset Polymer-based Sensor Chip humidity sensor and a Bipolar Transistor Sensor Chip temperature sensor provides reliability and accuracy in the most critical applications.

The HTX2 Series Transmitters default measurement variables are relative humidity (RH) and dry-bulb temperature. Additional variables of Dewpoint, Enthalpy and Wet Bulb Temperataure can be field selected. The selected variables are available as analog signals (2X) to provide the most efficient monitoring and control solution. A polycarbonate enclosure protects the electronics. The hinged and gasketed cover provides ease of installation.

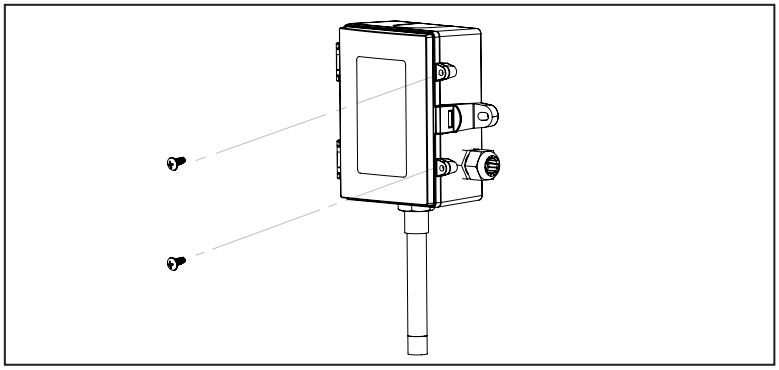
WARNING

Read these installation instructions carefully before commissioning the humidity/temperature transmitter. Failure to follow these instructions may result in product damage. Do not use in an explosive or hazardous environment, with combustible or flammable gases, as safety or emergency stop devices or in any other application where failure of the product could result in personal injury. Use electrostatic discharge precautions during installation and do not exceed the device ratings.

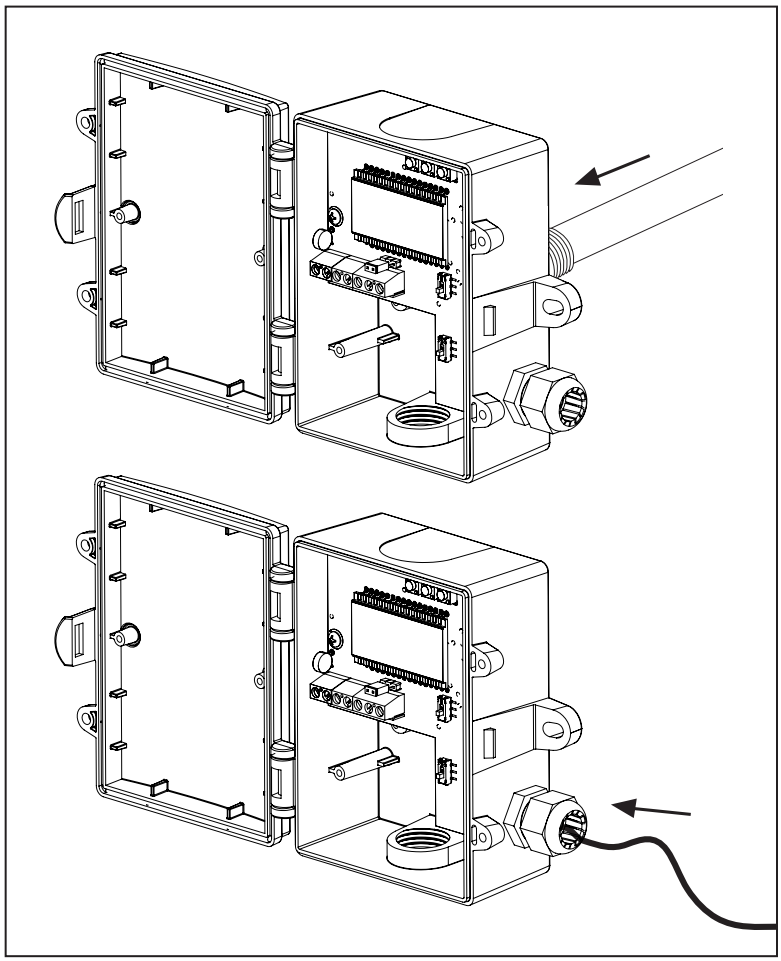
Do not mount the sensor near opening windows, supply exhaust air louvres or other known air disturbances. Avoid areas where the sensor is exposed to vibrations or rapid temperature changes.

MOUNTING

The humidity/temperature transmitter installs directly on a smooth surface using the two integrated mounting holes provided on the enclosure. The two mounting holes will facilitate a #10 size screw (not supplied).



The enclosure has a hinged cover with a latch. Open the cover by pulling slightly on the latch on the right side of the enclosure. At the same time pulling on the cover.

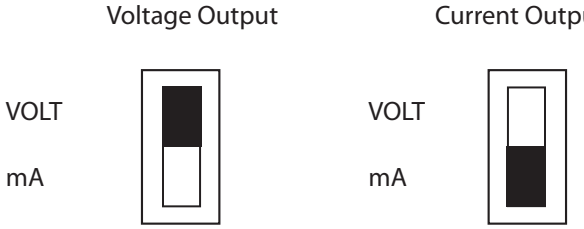


For model using conduit, Feed conduit through the provided hole in the back of enclosure and secure with a lock nut. For model using cable gland, feed control wiring through cable gland and tighten nut.

Phone: +1 506 853 3057 Web: www.greystoneenergy.com

OUTPUT SELECTION

The device has selectable 4-20 mA, 0-5 Vdc or 0-10 Vdc Outputs. To select 4-20 mA, slide both output switches to CUR. To select 0-5 Vdc or 0-10 Vdc Outputs, slide both switches to VOLT. See Figure 5. When VOLT is selected, the default is 0-5 Vdc. It may be changed to 0-10 Vdc during set up.

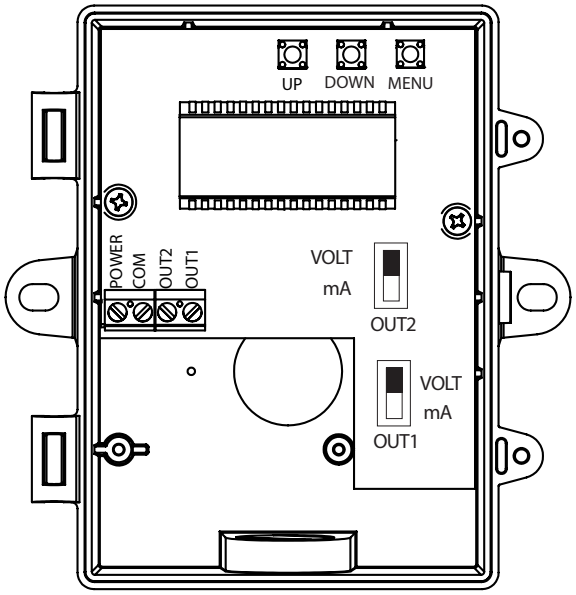


NOTE: Both switches need to be in the same mode

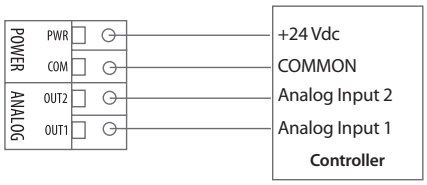
WIRING

- Deactivate the 24 Vac/dc power supply until all connections are made to the device to prevent electrical shock or equipment damage.
- Follow proper electrostatic discharge (ESD) handling procedures when installing the device or equipment damage may occur.
- Use 22 AWG shielded wiring for all connections and do not locate the device wires in the same conduit with wiring used to supply inductive loads such as motors.
- Make all connections in accordance with national and local codes.

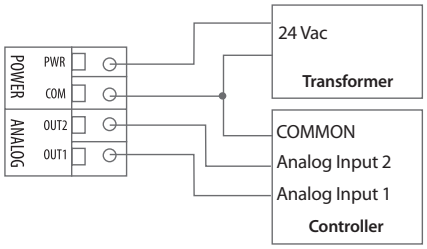
Connect the 24 Vac/dc power supply to the terminals labeled PWR (power) and COM (common) as shown in Figure 6. This device has a half-wave type power supply so use caution when wiring multiple devices so that the circuit ground point is the same on all devices and the controller. The device is reverse voltage protected and will not operate if connected backwards.



Wiring for all output signals with power from controller



Wiring for all output signals with external power supply or transformer



OPERATION

START-UP MODE

When the device is powered on, it will go through a brief start-up mode. The LCD will display a sequence of information depending on the model. At the end of the start-up sequence, normal operation will begin.

STEP 1. LCD TEST

All segments lit for 2 seconds.

STEP 2. SOFTWARE VERSION

Display Software Version for 2 seconds

STEP 3. MODEL

Displays the model type for 2 seconds.
(Volt or current depending on output selected)

STEP 4. DEFAULTS

Displays Readings as per Channel 1 & 2 Defaults (RH & Temp). Alternates 2 Second Intervals

NORMAL MODE

In normal operation the device:

- Reads the temperature and RH sensors
- Calculates values for dewpoint, wet bulb and enthalpy
- Updates the LCD values
- Updates the analog outputs
- Monitors the menu key for activity

If the <MENU> key is pressed, normal operation is suspended while the menu functions are serviced. The program will automatically exit the menu after a period of inactivity.

MENU

The device has several parameters that can be configured locally via the User menu using the keypad and LCD. All parameters default to typical values but the installer may want to change some values. Any changes made are saved in non-volatile memory and are restored in case of a power loss. Only the menu items relevant to the device model will be shown. The menu can be accessed at any time after the start-up mode and if there is 5 minutes of inactivity the menu will close and normal operation will continue.

USER MENU

To enter the menu, press and release the <MENU> key. This will enter the User menu step 1, pressing the <MENU> key a second time advances to step 2. Each press of the <MENU> key saves the current setting and advances the menu item. The <UP> and <DOWN> keys are used to make changes to program variables by scrolling through the available options. When a value is changed, use the <MENU> key to save it to memory and advance to the next menu item.

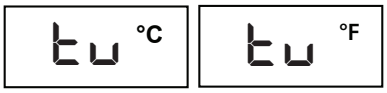
<MENU> Press and release to enter the User menu.

1. VOLTAGE OUTPUT

This setting only shows if the output jumpers were set to VOLT. The default is 0-5 Vdc.
Press <UP> or <DOWN> to toggle the selection.

Press <MENU> to save and advance to next menu item

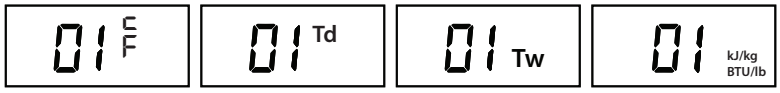
2. TEMPERATURE UNITS



Press <UP> or <DOWN> to toggle the selection.
Press <MENU> to save and advance to next menu item.

3. CHANNEL 1 SETTINGS

Default is Humidity.
Press <MENU> to save and advance directly to STEP 5 - Channel 2 Settings.
Press <UP> or <DOWN> to scroll through additional parameter options.



Temperature | Dewpoint | Wet Bulb | Enthalpy

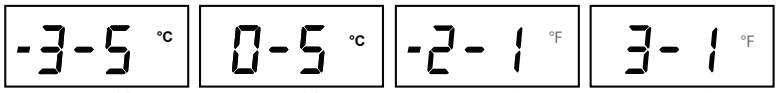
Press <MENU> to select and save parameter and advance to range selection.

4. CHANNEL 1 RANGE SELECTION

Only shows if parameter changed in previous step.
Only ranges for selected parameter will be shown.

4.1 TEMPERATURE RANGE

Default is -30 to 50 °C.
Press <MENU> to save and advance directly to STEP 5 - Channel 2 Settings.
Press <UP> or <DOWN> to scroll range options.

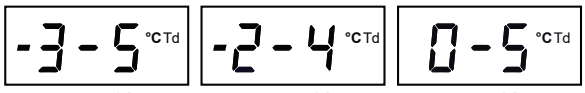


-30-50 °C | *0-50 °C* | *-22-122 °F* | *32-122 °F*

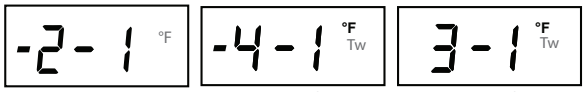
Press <MENU> to select and save range and advance to STEP 5 - Channel 2 Settings

4.2 DEWPOINT RANGES

Default is -30 to 50 °C.
Press <MENU> to save and advance directly to STEP 5 - Channel 2 Settings.
Press <UP> or <DOWN> to scroll range options.



-30-50 °C | *-20-40 °C* | *0-50 °C*



-22-122 °F | *-4-104 °F* | *32-122 °F*

Press <MENU> to select and save range and advance to STEP 5 - Channel 2 Settings.

4.3 WET BULB RANGES

Default is -20 to 50 °C.
Press <MENU> to save and advance directly to STEP 5 - Channel 2 Settings.

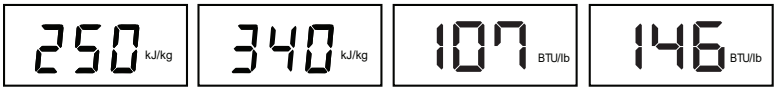
Press <UP> or <DOWN> to scroll range options.

-20-50 °C | *0-50 °C* | *-4-122 °F* | *32-122 °F*

Press <MENU> to select and save range and advance to STEP 4 - Channel 2 Settings.

4.4 ENTHALPY RANGES

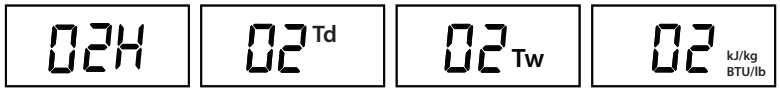
Default is 250 kJ/kg.
Press <MENU> to save and advance directly to STEP 5 - Channel 2 Settings.
Press <UP> or <DOWN> to scroll range options.



Press <MENU> to select and save range and advance to STEP 4 - Channel 2 Settings.

5. CHANNEL 2 SETTINGS

Default is Temperature.
Press <MENU> to save and advance directly to STEP 7 - LCD Display.
Press <UP> or <DOWN> to scroll through additional parameter options.



Humidity Dewpoint Wet Bulb Enthalpy

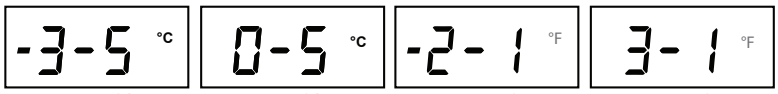
Press <MENU> to select and save parameter and advance to range selection.

6. CHANNEL 2 RANGE SELECTION

Only shows if parameter changed in previous step.
Only ranges for selected parameter will be shown.

6.1 TEMPERATURE

Default is -30 to 50 °C.
Press <MENU> to save and advance directly to STEP 7 - LCD Display.
Press <UP> or <DOWN> to scroll through options.



-30-50 °C *0-50 °C* *-22-122 °F* *32-122 °F*

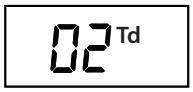
Press <MENU> to select and save parameter and advance to range selection.

6.2 HUMIDITY

Press <MENU> to save and advance directly to STEP 7 - LCD Display.

Press <MENU> to select and save parameter and advance to range selection.

6.3 DEWPOINT



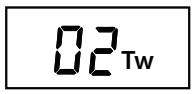
Default is -30 to 50 °C.
Press <MENU> to save and advance directly to STEP 7 - LCD Display.
Press <UP> or <DOWN> to scroll through options.

-30-50 °C *-20-40 °C* *0-50 °C* *-22-122 °F*

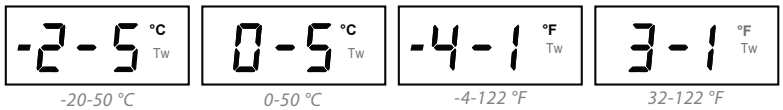
-4-104 °F *32-122 °F*

Press <MENU> to select and save parameter and advance to range selection.

6.4 WET BULB



Default is -20 to 50 °C.
Press <MENU> to save and advance directly to STEP 7 - LCD Display.
Press <UP> or <DOWN> to scroll through options.



-20-50 °C *0-50 °C* *-4-122 °F* *32-122 °F*

Press <MENU> to select and save parameter and advance to range selection.

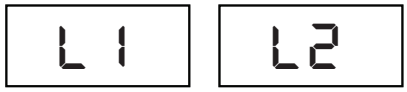
6.5 ENTHALPY

Default is 250 KJ/KG.
Press <MENU> to save and advance directly to STEP 7 - LCD Display.
Press <UP> or <DOWN> to scroll through options.

Press <MENU> to select and save parameter and advance to next menu item.

7. LCD DISPLAY

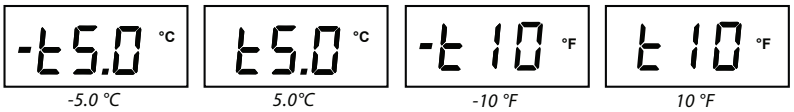
Alternate Channel 1 and Channel 2.
Press <UP> or <DOWN> to scroll through options.



Press <MENU> to save and advance to next menu item.

8. TEMPERATURE OFFSET

Default = 0 °C or 0 °F.
Press <UP> or <DOWN> to scroll through options.



-5.0 °C *5.0°C* *-10 °F* *10 °F*

Press <MENU> to save and advance to next menu item.

9. HUMIDITY OFFSET

Default is 0% RH.
Press <UP> or <DOWN> to set offset.

Press <MENU> to save and advance to next menu item.

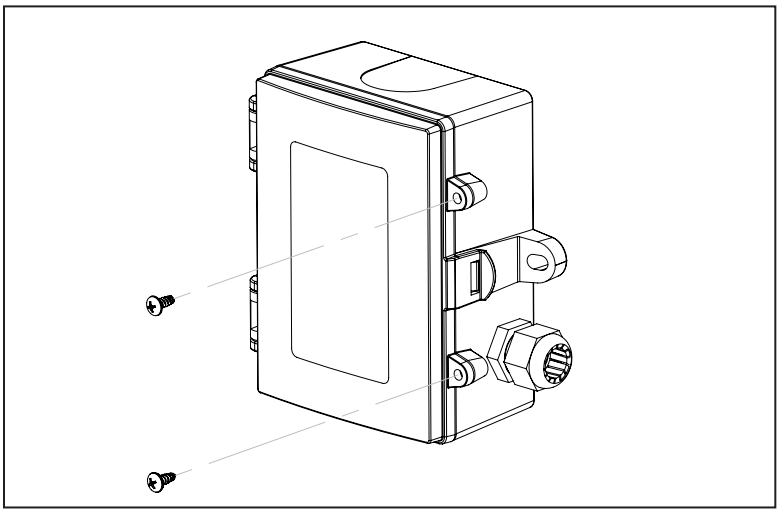
10. ALTITUDE

Default is 0 ft.
This item is to set the local altitude to increase calculation accuracy. Use <UP> or <DOWN> to change from A 0 to A60. Resolution is 100 ft steps.

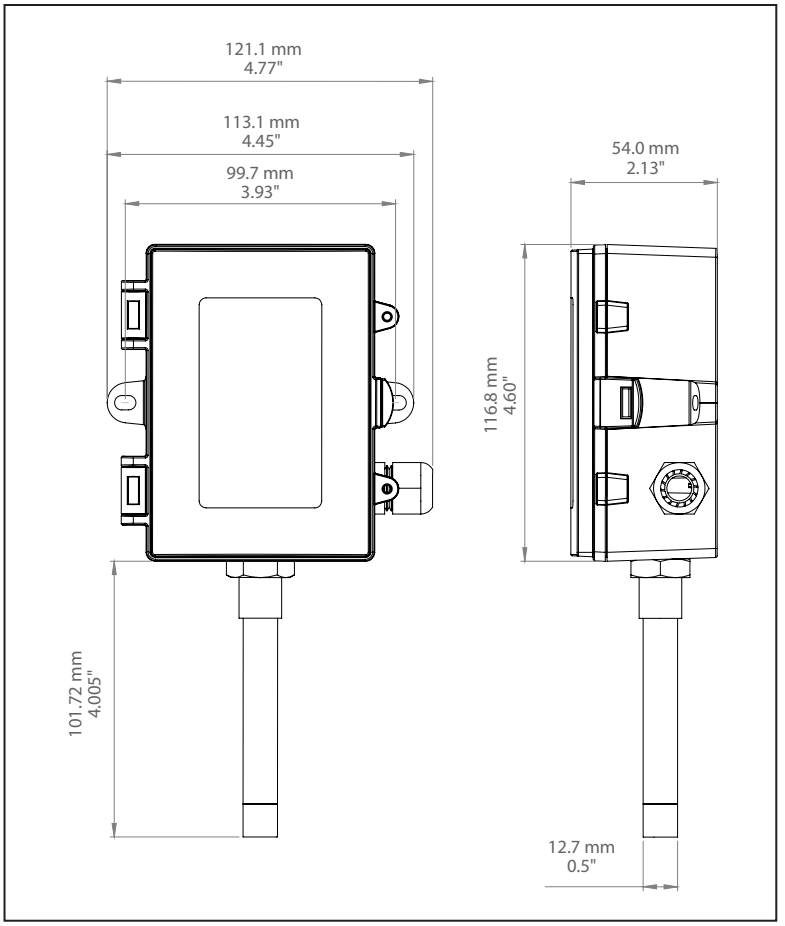
Press <MENU> to save and advance to next menu item

WIRING

Swing door closed until securely latched. For added security, two screws are provided that may be installed in the integrated screw tabs.



DIMENSIONS



SPECIFICATIONS

Humidity Sensor Type: Thermoset polymer-based capacitance sensor chip
Temperature Sensor Type: Bipolar Transistor Sensor Chip
Measurement Range: Relative Humidity:
0-100% RH
Dry Bulb Temperature:
-30°C to 50°C (-40°F to 122°F)
Calculated Values: Dewpoint Temperature: 0-100% RH
Wet Bulb Temperature: -30°C to 50°C (-40°F to 122°F)
Enthalpy: 0 to 340 kJ/kg (0 to 146 BTU/lb)
Accuracy: Relative Humidity:
±1% RH, 20% to 70% RH @ 25°CTypical
±1.5% RH, 0% to 20% RH and 70 % to 90%RH @ 25°C Typical
Dry Bulb Temperature (T):
±0.1°C (±0.2°F) @ –40 to +125°C (-40 to 257°F)
Dewpoint Temperature (Td): ±1.0°C (±1.8°F) @ 40 %RH / 25°C
Wet Bulb Temperature (Tw): ±1.0°C (±1.8°F) @ 50 %RH / 25°C
Enthalpy: ±2 kJ/kg (±1 BTU/lb) @ 50 %RH / 25°C
Response Time: < 8 seconds
Calibration: Humidity: -10 to 10%RH Offset, Resolution = 1% RH
Temperature: -5°C to 5°C (-10°F to 10°F) Offset, Resolution = 0.5°C

OUTPUT

Outputs (2x): 4-20mA, 0-5 Vdc or 0-10 Vdc, Field Selectable
Output drive at 24 VDC: Current: 550 Ω **Max Voltage:** 10,000Ω Min
Outputs: Limited Energy, < 15W

SPECIFICATIONS

Humidity Sensor Type: Thermoset polymer-based capacitance sensor chip
Temperature Sensor Type: Bipolar Transistor Sensor Chip
Measurement Range: Relative Humidity:
0-100% RH
Dry Bulb Temperature:
-30°C to 50°C (-40°F to 122°F)
Calculated Values: Dewpoint Temperature: 0-100% RH
Wet Bulb Temperature: -30°C to 50°C (-40°F to 122°F)
Enthalpy: 0 to 340 kJ/kg (0 to 146 BTU/lb)
Accuracy: Relative Humidity:
±1% RH, 20% to 70% RH @ 25°CTypical
±1.5% RH, 0% to 20% RH and 70 % to 90%RH @ 25°C Typical
Dry Bulb Temperature (T):
±0.1°C (±0.2°F) @ –40 to +125°C (-40 to 257°F)
Dewpoint Temperature (Td): ±1.0°C (±1.8°F) @ 40 %RH / 25°C
Wet Bulb Temperature (Tw): ±1.0°C (±1.8°F) @ 50 %RH / 25°C
Enthalpy: ±2 kJ/kg (±1 BTU/lb) @ 50 %RH / 25°C
Response Time: < 8 seconds
Calibration: Humidity: -10 to 10%RH Offset, Resolution = 1% RH
Temperature: -5°C to 5°C (-10°F to 10°F) Offset, Resolution = 0.1°C/F

OUTPUT

Outputs (2x): 4-20mA, 0-5 Vdc or 0-10 Vdc, Field Selectable
Output drive at 24 VDC: Current: 550 Ω **Max Voltage:** 10,000Ω Min
Outputs: Limited Energy, < 15W
Output Parameters: Relative Humidity: 0-100% RH
Dry Bulb Temperature (T):
Range 1: -30 to 50°C (-22 to 122°F).
Td Range 2: 0 to 50°C (32 to 122°F)
Dewpoint Temperature (Td):
Range 1: -30 to 50°C (-22 to 122°F)
Range 2: -20 to 40°C (-4 to 104°F)
Range 3: 0 to 50°C (32 to 122°F)
Wet Bulb Temperature (Tw):
Range 1: -20 to 50°C (-4 to 122°F)
Td Range 2: 0 to 50°C (32 to 122°F)
Enthalpy: Range1: 0 to 340 kJ/kg (0 to 146 BTU/lb)
Range2: 0 to 250 kJ/kg (0 to 107 BTU/lb)

POWER SUPPLY

Power Source UL: 24Vac/dc ±10% typical, SELV (Class 2) supply, non-isolated, half wave rectified
Consumption: Current: 50 mA max @ 24 Vdc, 1 VA Max. 70 mA @ 24 Vac
Voltage: 30mA @ 24vdc, 1VA @ 24Vac

LCD DISPLAY VALUES

Relative Humidity: 0 to 100% RH (1% Resolution)
Dry Bulb Temperature: -30.0 to 50.0°C (0.1°C resolution) or -22 to 122°F (0.1°F resolution)
Dewpoint Temperature: -30.0 to 50.0°C (0.1°C resolution) or -22 to 122°F Td (0.1°F resolution)
Wet Bulb Temperature: -20 to 50.0°C Tw (0.1°C resolution) or -4 to 122°F Tw (0.1°F resolution)
Enthalpy: 0 to 340 kJ/kg (1 kJ/kg resolution or 0 to 146 BTU/lb (1BTU/lb resolution)

ENCLOSURE

Enclosure Material: Grey Polycarbonate, UL94-V0
Enclosure Rating: IP65 (NEMA 4X)
Wiring Access: Rear: 0.895" hole for EMT connection or
Side: M16 x 1.5 Cable gland
Dimensions: 116.5mm W x 112.5mm H x 54.0mm (4.58" x 4.43" x 2.125")
Probe: 304 S/S, 104.1 mm x 12.7 mm (4.1 in. x 0.5 in.)
Filter: 20 Micron porous PTFE filter

GENERAL

Operating Conditions: -30 to 60°C (-22 to 140°F), 0 to 95%RH non-condensing
Storage Conditions: -40 to 70°C (-40 to 158°F), 0 to 95 %RH non-condensing
Protection Class: III
Purpose of Control: Operating Control
Type of Action: Type 1
Impulse Voltage: 330V
Pollution Degree: 2
Wiring: Screw terminal block (14 to 22 AWG)
Country of Origin: Canada

CONFORMITY / CERTIFICATION

EU Conformity: CE, UKCA
UL Model: MRHLWMCSHT
Certification: UL 60730 & CSA, E60730, (UL E539555 file#)