24-9647-10, Rev. B

Hx-68P3 Series Outside Humidity and Temperature Transmitters

Installation Instructions

HE-68P3-0N000, HT-68P3-0N000

Part No. 24-9647-10, Rev. B
Issued March 2016

Refer to the QuickLIT website for the most up-to-date version of this document.

Application Requirements

The Hx-68P3 Series Outside Humidity and Temperature Transmitter measures and transmits outside relative humidity (RH) from 0 to 100% and temperatures from -40 to 140°F (-40 to 60°C). In addition to RH, the transmitter offers selectable parameters including dew point, wet bulb temperature, and enthalpy.

The integral weather shield provides ventilation, blocks direct and reflected solar radiation, and blocks precipitation without affecting performance. Mount the transmitter outside on a pole or on a side of a building.

IMPORTANT: The Hx-68P3 Series Outside Humidity and Temperature Transmitter is intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the humidity and temperature transmitter could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the humidity and temperature transmitter.

IMPORTANT: Le Hx-68P3 Series Outside Humidity and Temperature Transmitter est destiné à transmettre des données entrantes à un équipement dans des conditions normales de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du humidity and temperature transmitter risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du humidity and temperature transmitter.

North American Emissions Compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case users will be required to correct the interference at their own expense.

Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

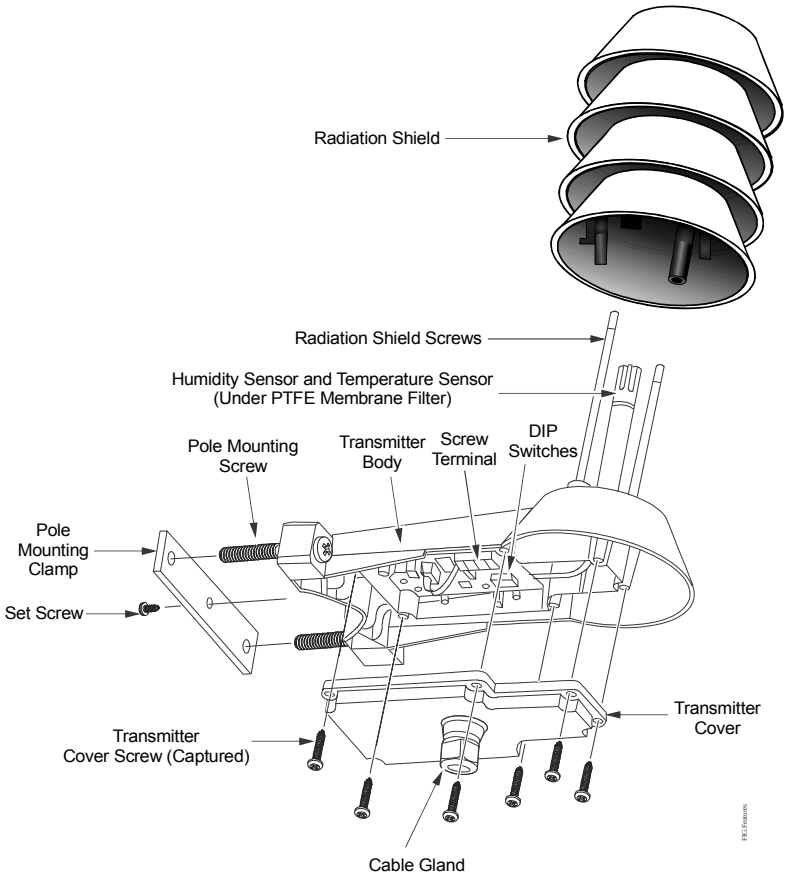


Figure 1: Hx-68P3 Series Outside Humidity and Temperature Transmitter Features

Installation

Parts Included

- relative humidity and temperature transmitter with cable gland
- conduit adaptor
- weather shield
- pole mounting clamp with screws (wall mount screws and anchors not included)
- installation instructions

Tools Needed

- medium Phillips screwdriver
- small slotted screwdriver
- wire cutters
- open-ended wrench
- zip ties
- cable clips

Dimensions

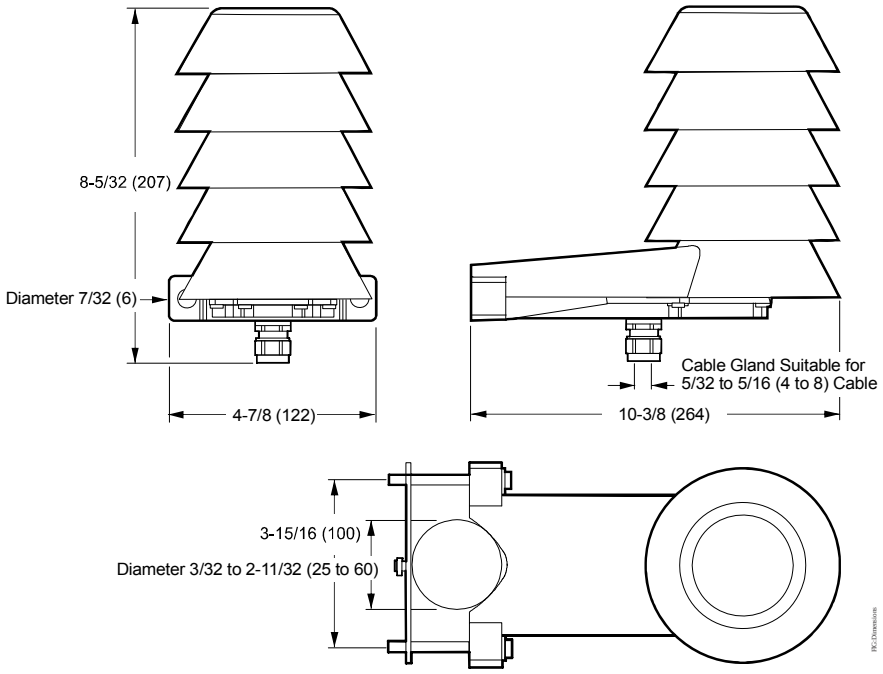


Figure 2: Hx-68P3 Series Outside Humidity and Temperature Transmitter Dimensions, in. (mm)

DIP Switch Settings

The DIP switches on the component board control the humidity output parameter and scaling. Figure 3 shows the default DIP switch settings.

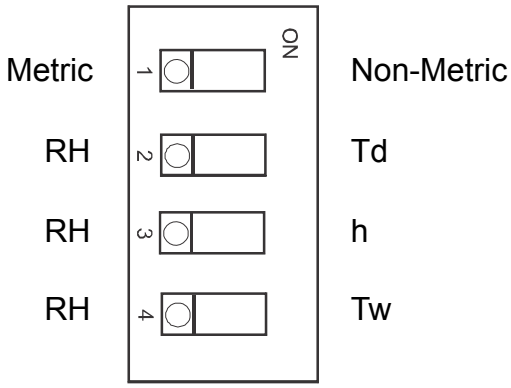


Figure 3: DIP Switch Positions

Change the position of the DIP switches to the desired setting.

Table 1: DIP Switch Positions for Metric Output

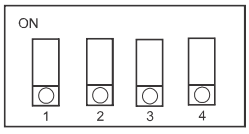
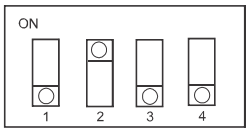
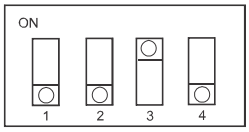
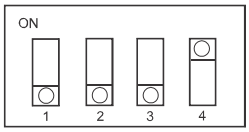
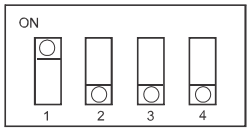
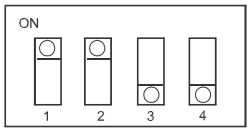
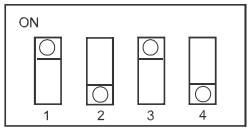
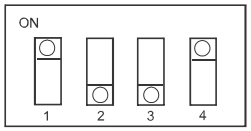
DIP Switch Position	Analog Output Parameter and Scaling
	Relative Humidity (RH) 0 to 100% Temperature (T) -40 to 60°C
	Dewpoint (Td) -40 to 60°C Temperature (T) -40 to 60°C
	Enthalpy (h) -40 to 460 kJ/kg Temperature (T) -40 to 60°C
	Wet Bulb Temperature (Tw) -40 to 60°C Temperature (T) -40 to 60°C

Table 2: DIP Switch Positions for Non-Metric Output

DIP Switch Position	Analog Output Parameter and Scaling
	Relative Humidity (RH) 0 to 100% Temperature (T) -40 to 140°F
	Dewpoint (Td) -40 to 140°F Temperature (T) -40 to 140°F
	Enthalpy (h) -10 to 190 BTU/lb Temperature (T) -40 to 140°F
	Wet Bulb Temperature (Tw) -40 to 140°F Temperature (T) -40 to 140°F

Installing the Conduit Adaptor - Optional

Using the conduit adaptor is optional. If you do not use the conduit adaptor, proceed to *Mounting*.

To install the conduit adaptor, follow these steps.

1. Loosen the six captive screws that hold the transmitter cover in place. See Figure 5.
2. Unscrew the cable gland from the transmitter cover. See Figure 1 for the location of the cable gland.
3. Align the nut with the opening inside the transmitter cover, and insert the adaptor body into the transmitter conduit opening.

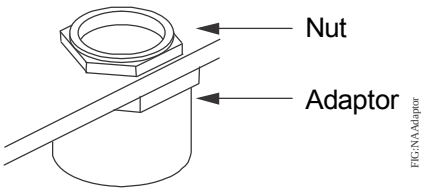


Figure 4: Conduit Adaptor

4. Manually tighten the adaptor into the nut, turning in a clockwise direction.
5. Tighten the adaptor onto the adaptor body, turning in a clockwise direction.

Mounting

CAUTION: Risk of Electric Shock.
Disconnect the power supply before making electrical connections to avoid electric shock.

MISE EN GARDE : Risque de décharge électrique.
Débrancher l'alimentation avant de réaliser tout raccordement électrique afin d'éviter tout risque de décharge électrique.

Location Considerations

- Install the transmitter in a place that receives minimal direct sunlight.
- Avoid placing the transmitter near windows, air conditioning units, or other heat and moisture sources such as cooling towers.
- Install the transmitter at least 8 ft (2.5 m) above the ground.

IMPORTANT: To minimize the time spent working on a ladder, prepare the transmitter configuration and wiring before mounting the transmitter.

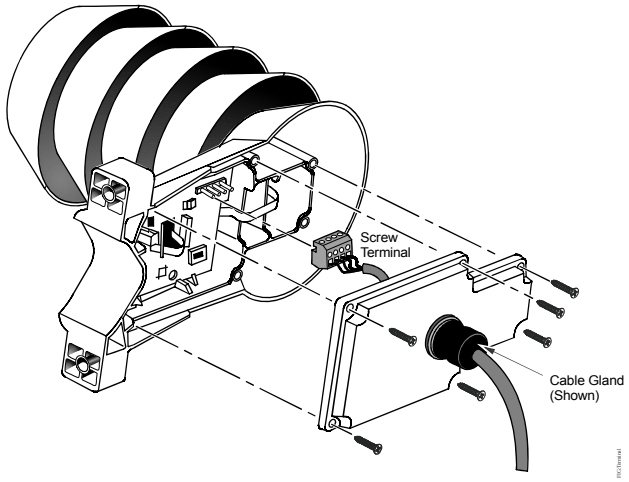


Figure 5: Preparing the Transmitter for Mounting

1. Loosen the six captive screws that hold the transmitter cover in place.
2. Be sure the DIP switches are set to the desired setting. See *DIP Switch Settings*.

3. Route the power and signal cable through the cable gland or the conduit adaptor to the screw terminals, and connect the wires.
4. Disconnect the terminal block by pulling it away from the component board.
5. Adjust the cable length between the cable gland and the terminal block. Make sure the cover closes without leaving a loop within the transmitter.
6. Tighten the cable gland or conduit adaptor.

IMPORTANT: Do not attach the cover to the transmitter until the transmitter has been mounted on the pole or wall.

Pole Mounting

IMPORTANT: We recommend a pole diameter of 2-11/32 to 3-3/32 in. (25 to 60 mm) if you use the supplied clamp and screws.

To mount the Hx-68P3 Series Outside Humidity and Temperature Transmitter to a pole:

1. Attach the clamp to the pole with the set screw. See Figure 6.
2. Align the transmitter mounting bracket with the holes on the clamp, and insert the screws through the holes of the transmitter mounting bracket and into the clamp.

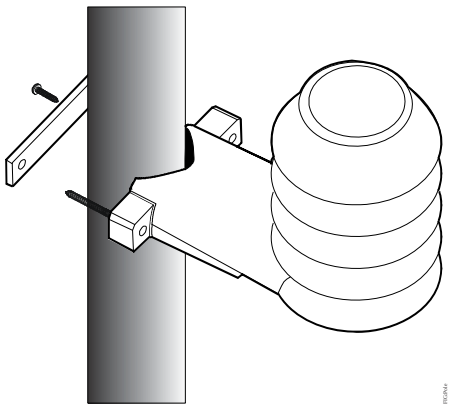


Figure 6: Pole Installation

3. Tighten the screws securing the transmitter assembly onto the pole.
4. Plug in the screw terminal block (terminal screws facing the transmitter cover), close the cover, and tighten the cover screws. See Figure 5 for plugging in the terminal block and attaching the cover.
5. Secure the cable to the pole using cable ties. Incorporate a drip loop below the cable gland to prevent water from running into the transmitter along the cable.

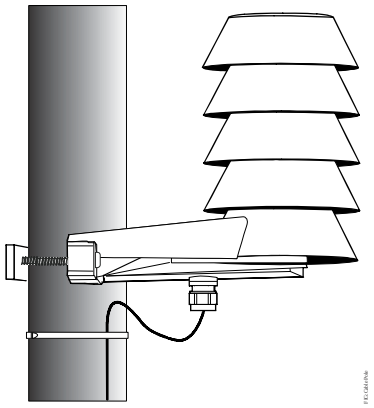


Figure 7: Securing Cable to a Pole

Wall Mounting

To mount the Hx-68P3 Series Outside Humidity and Temperature Transmitter to a wall:

1. Drill two holes for the wall plugs 3-15/16 in. (100 mm) apart.
2. Insert the anchors into the holes.
3. Align the transmitter up to the holes, and insert the screws through the holes and into the anchors.

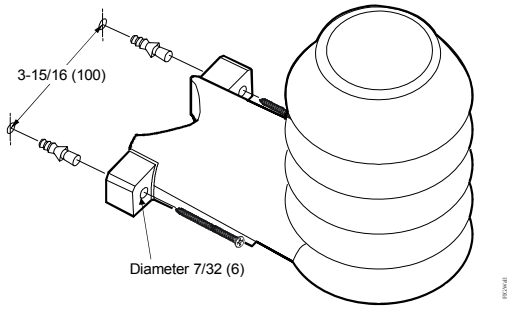


Figure 8: Wall Installation, in. (mm)

4. Tighten the screws securing the transmitter onto the wall.
5. Plug in the screw terminal block (terminal screws facing the transmitter cover), close the cover, and tighten the cover screws. See Figure 5 for plugging in the terminal block and attaching the cover.

6. Secure the cable to the wall using cable ties. Incorporate a drip loop below the cable gland to prevent water from running into the transmitter along the cable.

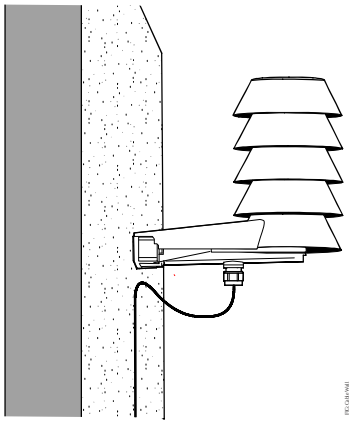


Figure 9: Securing Cable on a Wall

Wiring

CAUTION: Risk of Electric Shock.
Disconnect the power supply before making electrical connections to avoid electric shock.

MISE EN GARDE : Risque de décharge électrique.
Débrancher l'alimentation avant de réaliser tout raccordement électrique afin d'éviter tout risque de décharge électrique.

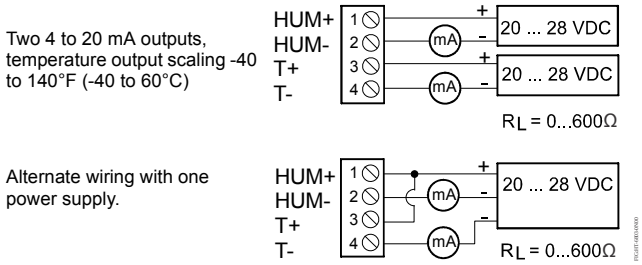


Figure 10: HT-68P3-0N000 Wiring

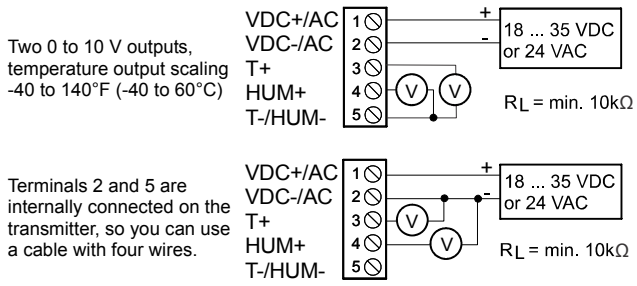


Figure 11: HE-68P3-0N000 Wiring

Calibration

There are no calibration adjustments to make for this device.

Troubleshooting

Analog Output Error State

The output channel is in a defined error level instead of the measured result in two situations.

- The transmitter detects a measurement malfunction such as a damaged sensor or unfavorable environmental conditions.
- The measured values are outside of the scaled output range. See *Analog Output Overrange Behavior*.

The error level depends on the output type.

- For a 0 to 10 V output, the error level is 11 V.
- For a 4 to 20 mA output, the error level is 3.6 mA.

The transmitter resumes normal operation of the analog outputs when the cause of the error state is removed.

Analog Output Overrange Behavior

The Analog outputs have a defined behavior when the values measure by the transmitter are outside the scaled analog output range.

- The output is clipped at the end of the range.
- The output is set to the error state when the measured value is 5% outside of the scaled range.
- The output resumes normal function when the measured value is back on the scaled range.

Repair Information

If the Hx-68P3 Series Outside Humidity and Temperature Transmitter fails to operate within its specifications, replace the unit. For a replacement transmitter, contact the nearest Johnson Controls® representative.

Technical Specifications

Hx-68P3 Series Outside Humidity and Temperature Transmitters (Part 1 of 2)

Operating Conditions	**Temperature**	-40 to 140°F (-40 to 60°C)
	Humidity	0 to 100% RH
Relative Humidity	**Measurement range**	0 to 100% RH
	Accuracy: Temperature Range 50 to 86°F (10 to 30°C): **0 to 90% RH** **90 to 100% RH**	 ±3% RH ±5% RH
	Accuracy: Temperature Range -4 to 50°F (-20 to 10°C) 86 to 140°F (30 to 60°C): **0 to 90% RH** **90 to 100% RH**	 ±5% RH ±7% RH
	Accuracy: Temperature Range -40 to -4°F (-40 to -20°C): **0 to 100% RH**	 ±7% RH
	Stability in typical HVAC app.	±2% RH over 2 years
Temperature	**Measurement range**	-40 to 140°F (-40 to 60°C)
	Accuracy at 68°F (20°C)	±0.54°F (±0.3°C)
	Temperature dependance	±0.01°C/°C
	Temperature sensor	Pt1000 RTD Class F0.1 IEC60751
Dewpoint	**Accuracy at 68°F (20°C) and 80% RH**	±1.6°F (±0.9°C)
Wet Bulb		±1.3°F (±0.7°C)
Enthalpy		±0.9 BTU/lb (±2kj/kg)
Ingress Protection		IP65
Maximum Wind/Flow Speed		98.42 ft/s (30 m/s)
Storage Temperature		-40 to 140°F (-40 to 60°C)
Current Output (HT-68P3-0N000) (Two-Wire)	**Outputs**	4 to 20 mA, loop powered
	Loop resistance	0 to 600 ohm
	Supply voltage	20 to 28 VDC at 600 ohm load; 10 to 28 VDC at 0 ohm load
Voltage Output (HE-68P3-0N000) (Three-Wire)	**Outputs**	0 to 10 V
	Load resistance	10k ohm minimum
	Supply voltage	18 to 35 VDC; 24 VAC ±20%, 50/60 Hz
Wire Size		16 AWG (1.5 mm^2) maximum

Hx-68P3 Series Outside Humidity and Temperature Transmitters (Part 2 of 2)

Electromagnetic Compliance		EN61326-1 Industrial Environment
Standard Housing Color		White (RAL9003)
Compliance	**United States**	FCC compliant to CFR 47, Part 15, Subpart B, Class A
	Canada	Under CAN/CSA-CEI/IEC CISPR 22:02, Class A
CE	**Europe**	CE Mark - Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

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