BAPI 50223 Wireless Duct Temperature and Humidity Sensor Instruction Manual

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BAPI 50223 Wireless Duct Temperature and Humidity Sensor

Product Information

The Wireless Duct Temp/Humidity Sensor by BAPI is designed to measure environmental values and transmit the data via Bluetooth Low Energy to a receiver or gateway. It features a rugged IP66-rated BAPI-Box enclosure, ensuring durability in various conditions.

This wireless sensor is equipped with adjustable settings that can be field adjusted to suit the needs of the installation. These settings can be configured using either the gateway or the receiver.

The sensor can be used with two different devices:

- **Receiver (Wireless-to-Analog):** This wireless receiver from BAPI receives data from one or more wireless sensors. It then transfers the data to analog output modules, converting it into an analog voltage or resistance. The receiver supports up to 32 sensors and up to 127 different analog output modules.
- **Gateway:** The wireless gateway from BAPI receives data from one or more wireless sensors and provides it to the cloud via MQTT. It also sends a confirmation signal to each sensor upon successful reception of data. The gateway supports up to 32 sensors.

To establish communication between the sensors and the gateway or receiver, refer to BAPI's Wireless Quick Start Guide or the gateway/receiver instructions available on the BAPI website.

Product Usage Instructions

Initial Activation:
Battery Power Units:

1. Open the cover of the unit to access the batteries.
2. Find the battery tab insulators and remove them.
3. Press the Service button, and the Service LED should flash once to confirm power.

Wire Power Units:

1. Open the cover of the unit to access the circuit board power terminals.
2. Press the Service button, and the Service LED should flash once to confirm power.

Mounting:

1. Place the sensor in the middle of the duct, away from temperature stratified air, coils, or humidifiers for accurate readings.
2. Drill a 1″ (25mm) diameter probe hole and insert the probe into the duct.
3. Use the enclosure tabs to mark the pilot hole locations and drill 1/8″ (3.2mm) pilot holes.
4. Mount the enclosure to the duct using the provided mounting screws.
5. Tighten the screws until the foam backing is slightly depressed to prevent air leakage.

Note: Do not drill into the enclosure, as it will violate the NEMA and IP rating.

Operation:

Power the unit as described in the Initial Activation section. Follow the gateway or receiver instructions for pairing the unit and changing the adjustable settings. Refer to the instructions available on the BAPI website for detailed guidance.

Overview and Identification

- User adjustable settings
- Onboard memory
- Transmits to a digital Gateway or a wireless-to-analog Receiver

BAPI's Duct Wireless Sensor measures environmental values and transmits the data via Bluetooth Low Energy to a receiver or gateway. This unit features a rugged IP66-rated BAPI-Box enclosure.

Wireless Duct Temperature and Humidity Sensor

Adjustable Settings
BAPI's wireless devices have several settings that can be can be field adjusted to suit the needs of the installation. All settings are configured by either the gateway or the receiver. (See the gateway or receiver instructions documents available on the BAPI website for more information on adjusting the settings.)

- **Sample Rate/Interval** – The time between when the sensor wakes up and takes a reading. The available values are 10 sec, 30 sec, 1 min, 3 min or 5 min with the gateway, or 30 sec, 1 min, 3 min or 5 min with the receiver.
  Transmit Rate/Interval – The time between when the sensor transmits the readings to the gateway or receiver. The available values are 30 sec, 1, 2, 3, 4, 5, 10, 15, 20 or 30 minutes, or 1, 6 or 12 hours with the gateway, or 1, 5, 10 or 30 minutes with the receiver.
- **Delta Temperature** – The change in temperature between sample intervals that will cause the sensor to override the transmit interval and transmit the changed temperature at the next sample interval. The available values are 0.1, 0.2, 0.3, 0.4, 0.5, 1, 2, 3, 4, 5 °F or °C with the gateway, and 1 or 3 °F or °C with the receiver.
- **Delta Humidity –** The change humidity between sample intervals that will cause the sensor to override the transmit interval and transmit the changed humidity at the next sample interval. The available values are 0.5, 1, 2, 3, 4 or 5 %RH with the gateway, and 3 or 5 %RH with the receiver.
- **Temperature Min/Max** – The maximum or minimum temperature that will cause the sensor to override the transmit interval and immediately transmit a reading to the gateway. (Only available when using a gateway.)
- **Temperature Offset** – Adjusts the temperature value being transmitted to match that of a calibrated reference device. The available values are ±0.1, 0.2, 0.5, 1, 2, 3, 4 or 5 °F or °C. (Only available when using a gateway.)

- **Humidity Offset** – Adjusts the humidity value being transmitted to match that of a calibrated reference device. The available values are ±0.5, 1, 2, 3 or 5 %RH. (Only available when using a gateway.)

Associated Receiver or Gateway

RECEIVER (Wireless-to-Analog)
The wireless receiver from BAPI receives the data from one or more wireless sensors. The data is then transferred to the analog output modules and converted to an analog voltage or resistance. The receiver supports up to 32 sensors and up to 127 different analog output modules.

GATEWAY
The wireless gateway from BAPI receives the data from one or more wireless sensors. The gateway then provides the data to the cloud via MQTT. The gateway also sends a confirmation signal to each sensor upon a successful reception of data. The gateway supports up to 32 sensors.

Please see BAPI's Wireless Quick Start Guide, or the gateway or receiver instructions documents available on the BAPI website to establish communication between the sensors and the gateway or receiver.

Wireless Gateway

Please see BAPI's Wireless Quick Start Guide, or the gateway or receiver instructions documents available on the BAPI website to establish communication between the sensors and the gateway or receiver.

Initial Activation

Battery Power Units
The unit comes with two pre-installed batteries. To activate the unit, open the cover to access the batteries. Find the battery tab insulators and pull them out. Press the Service button and the Service LED should flash once to

confirm power.

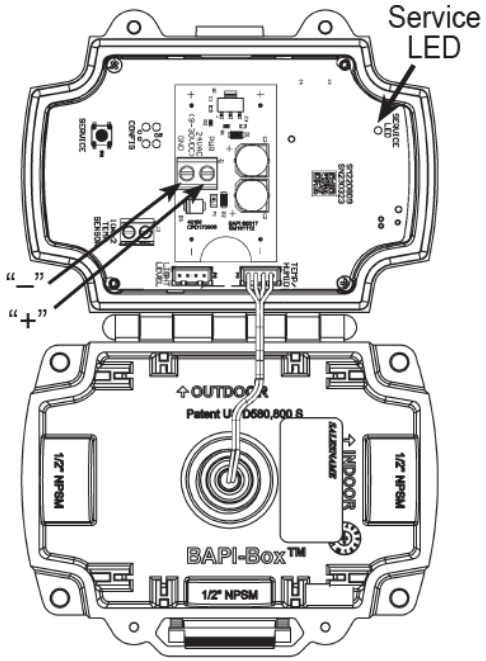


Fig. 2: Wire Power Unit

Wire Power Units

To activate the unit, open the cover to access the circuit board and apply the 9 to 30 VDC or 24 VAC to the power terminals as shown. Press the Service button and the Service LED should flash once to confirm power.

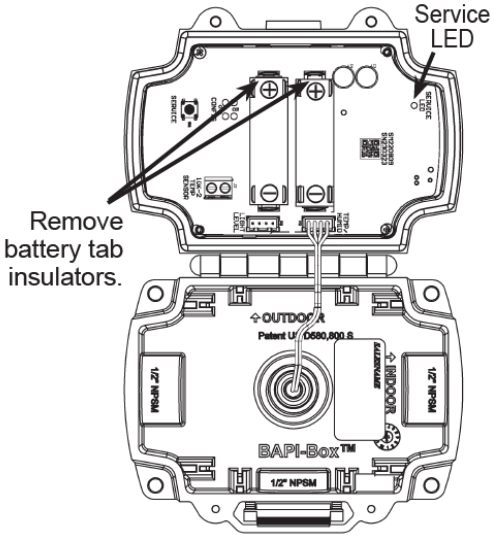


Fig. 1: Battery Power Unit

Mounting

1. Place the sensor in the middle of the duct away from temperature stratified air, coils or humidifiers to achieve the best reading.
2. Drill 1" (25mm) diameter probe hole and insert the probe into the duct. Use the enclosure tabs to mark the pilot hole locations and drill the 1/8" (3.2mm) pilot holes. Mount the enclosure to the duct using the provided mounting screws.
3. Tighten the screws until the foam backing is depressed slightly to prevent air leakage.

Note:

Do not drill into the enclosure which will violate the NEMA and IP rating.

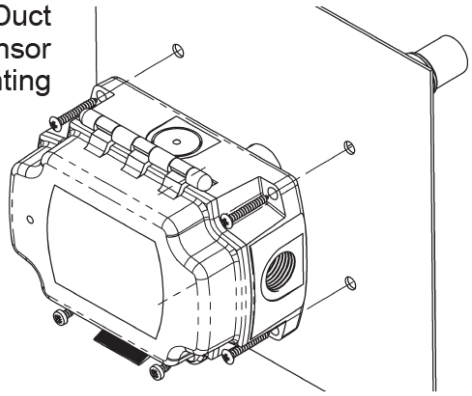
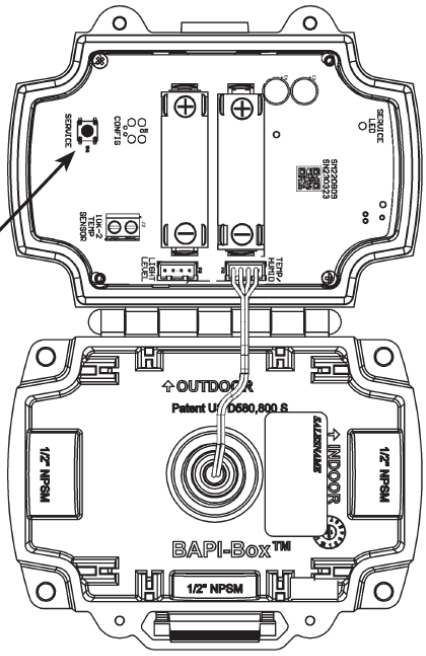


Fig. 3: Duct Sensor Mounting

Operation

Power the unit as described in “Initial Activation” section. Follow the gateway or receiver instructions for pairing the unit and changing the adjustable settings. (The instructions are available on the BAPI website.)



Pressing the “Service” button on the circuit board will force a transmission.

Fig. 4: Battery Power Unit

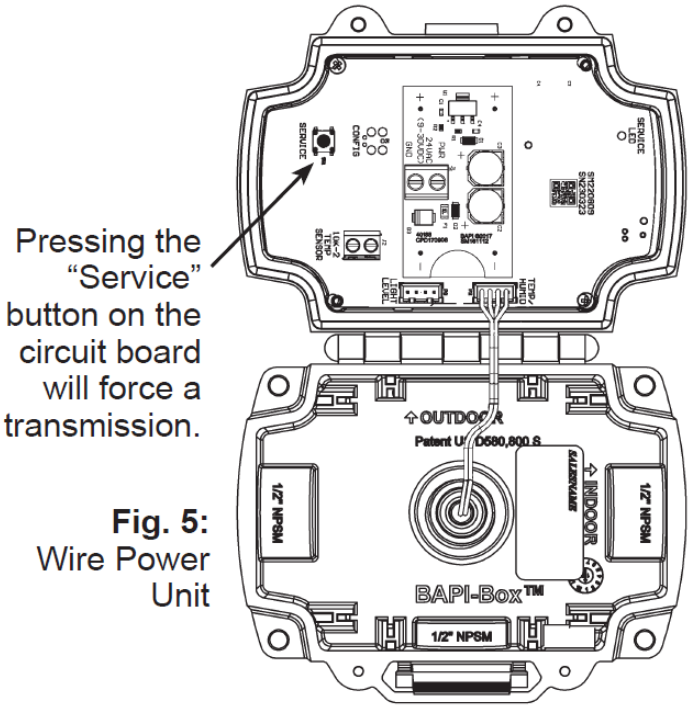


Fig. 5: Wire Power Unit

Wireless Sensor Reset

Sensors remain paired to the gateway or receiver and output modules when power is interrupted or the batteries are removed. To break the bonds between them, the sensors need to be reset. To do this, press and hold the "Service Button" on the sensor for about 30 seconds. During those 30 seconds, the green LED will be off for about 5 seconds, then flash slowly, then begin flashing rapidly. When the rapid flashing stops, the reset is complete. The sensor can now be paired to a new receiver or gateway. To re-pair to the same receiver or gateway, you must reset the receiver or gateway. Output modules that were previously paired to the sensor do not need to be re-paired.

Onboard Memory

Sensor retains up to 16,000 readings should the communication become interrupted. The sensor only stores readings from missed transmissions and only when the sensor is paired to a gateway. Once communication is re-established with the gateway, the stored readings are transmitted and then erased from the sensor. The current reading and nine previous readings are sent at each transmit interval until the sensor is caught up.

Battery Replacement

Open the cover to access the batteries (Fig 6).
Remove the batteries from their holders and discard in an environmentally safe manner. Replace with new batteries in the correct orientation.

Battery Specifications:

Two 3.6V Lithium batteries:
(#14505, 14500 or equivalent)

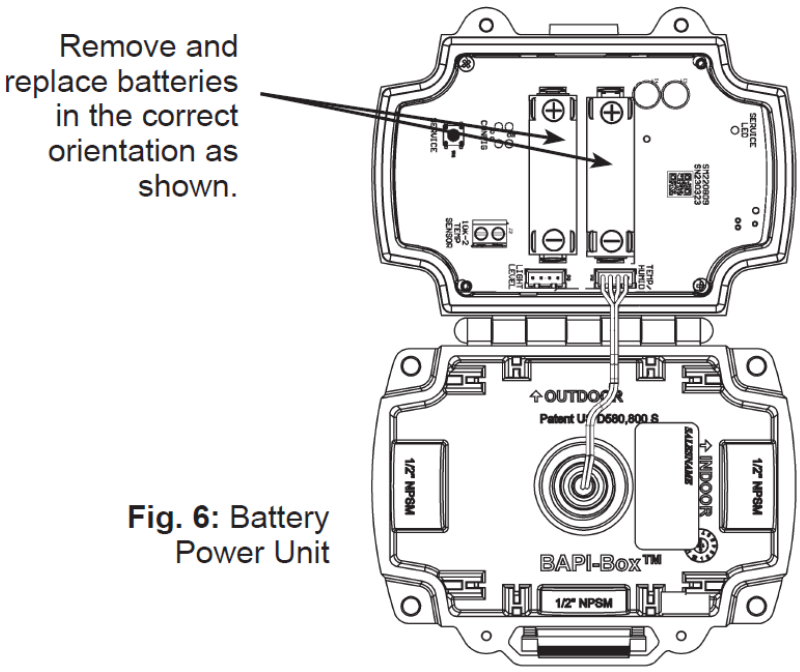


Fig. 6: Battery Power Unit

Diagnostics

- **Possible Problems:**
  Sensor is not communicating with the gateway or receiver, or the transmitted values are incorrect.
- **Possible Solutions:**
  Make sure the sensor is within range of the gateway or receiver.
  Verify that the green LED on the sensor circuit board flashes when the “Service” button is pressed, indicating a transmission. If it does not flash, replace the batteries.
  Verify that the sensor is properly paired to the gateway or receiver and analog output modules as described in the gateway or receiver instructions available on the BAPI website. Re-pair them if needed. If necessary, perform the “Wireless Sensor Reset” procedure as described on the pg 3.

Specifications

- Battery Power: Two included 3.6V 14505, 14500 or equivalent lithium batteries (Note: Standard AA batteries are not compatible)
- Wire Power: 9 to 30 VDC or 24 VAC, halfwave rectified

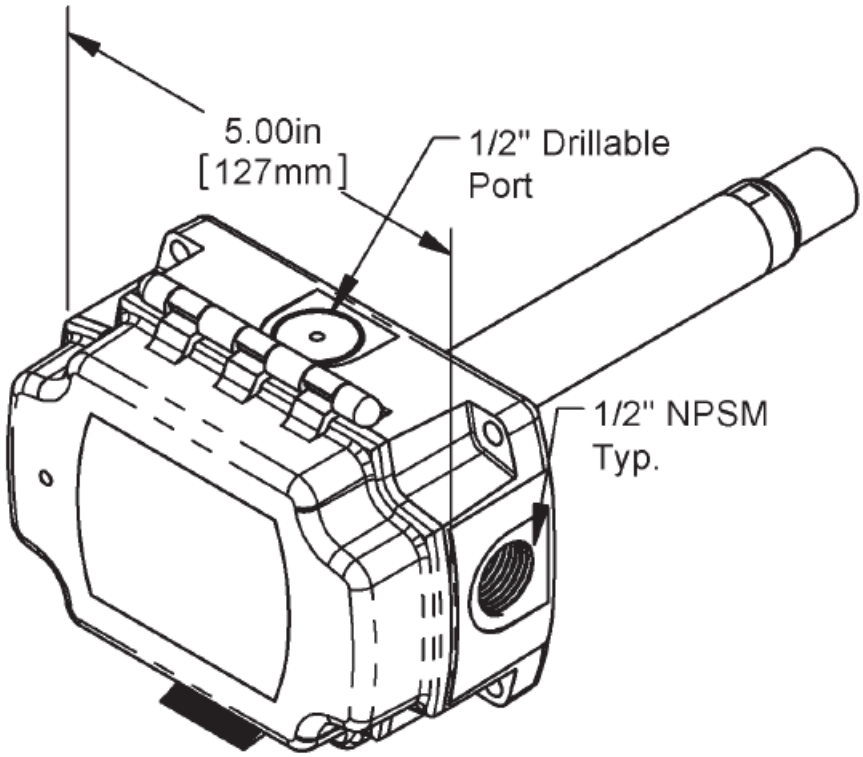
Sensor Accuracy:

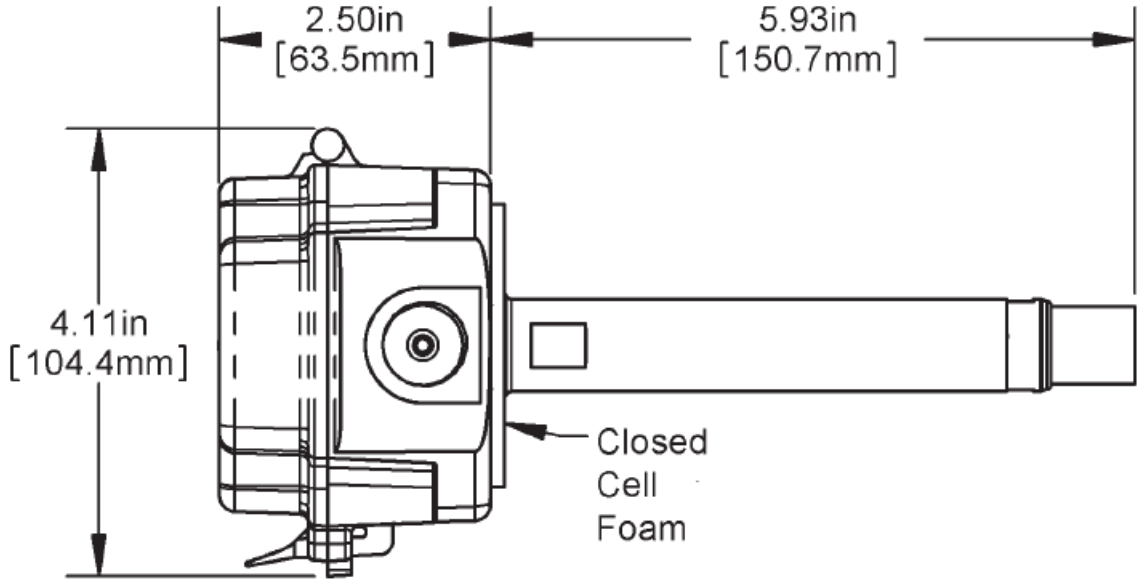
- Temp: ±1.0°F (0.55°C) from 32 to 158°F (0 to 70°C)
- Humidity: ±2%RH @ 77°F (25°C), 20 to 80%RH
- Temperature Range: -4 to 221°F (-20 to 105°C)
- Transmission Distance: Varies by application*

Environmental Operation Range:

- Temp: -4 to 149°F (-20 to 65°C)
- Humidity: 10 to 90%RH, non-condensing

- Enclosure Rating, Material & Material Rating:
- IP66, UV-Resistant Polycarbonate, UL94 V-0
- Frequency: 2.4 GHz (Bluetooth Low Energy)
- Receiver Sensitivity: -97 dBm User Adjustable Settings:
- Delta T (Temp): 0.1°F/C to 5.0°F/C
- Delta T (Humidity): 0.1%RH to 5.0%RH
- Transmit Interval: 30 sec to 12 hour
- Sample Interval: 10 sec to 5 min
- Temp Offset: ±0.1°F/C to ±5.0°F/C
- Humidity Offset: ±0.1%RH to ±3.0%RH
- **Onboard Memory:**
  Sensor retains up to 16,000 readings should the communication become interrupted. If using a Gateway, the data is re-transmitted once communication is re-established.
- Agency: RoHS





*In-building range is dependent on obstructions such as furniture and walls and the density of those materials. In wide open spaces, the distance may be greater; in dense spaces, the distance may be less.
**Actual battery life is dependent on the sensor's adjustable settings and environmental conditions.

Calculated Battery Life**		
Transmit Interval	Sample Rate	Estimated Life (years)
30 sec	30 sec	1.04
1 min	1 min	1.95
3 min	1 min	3.46
5 min	5 min	4.63
10 min	5 min	7.02

Specifications subject to change without notice.

Building Automation Products, Inc., 750 North Royal Avenue, Gays Mills, WI 54631 USA
Tel:+1-608-735-4800 • Fax+1-608-735-4804 • E-mail: sales@bapihvac.com • Web:www.bapihvac.com

Documents / Resources

	BAPI 50223 Wireless Duct Temperature and Humidity Sensor [pdf] Instruction Manual 50223_Wireless_BLE_Duct_Temp_Hum, 50223 Wireless Duct Temperature and Humidity Sensor, 50223, 50223 Sensor, Wireless Duct Temperature and Humidity Sensor, Wireless Temperature and Humidity Sensor, Duct Temperature and Humidity Sensor, Temperature and Humidity Sensor, Wireless Sensor, Sensor, Temperature Sensor, Humidity Sensor

References

- BAPI - Sensor Products for HVAC/R Duct and Room