BUILDING AUTOMATION PRODUCTS INC.

2025 FULL CATALOG

TEST INSTRUMENTS | TEMPERATURE | HUMIDITY | PRESSURE | AIR QUALITY | WIRELESS | ACCESSORIES | ETA



BAPI®

SINCE 1993

Changing the way you think about sensors...

Rev. 01/22/21

BAPI-BACKED Confidence



Most sensor manufacturers will replace their defective products, but only BAPI has the confidence to go beyond the industry standard.

BAPI-BACKED means we stand behind everything we do. We are so confident in the quality of our products that if one fails within the warranty period, we will not only repair or replace it, but we'll provide a product credit to offset your incurred cost.[1]

We stand behind our products, and we also stand behind you with:

- Real-time customer service, sales and technical support
- App notes, instructional videos and documentation available 24/7 online

1. Terms and conditions apply. For more information, visit www.bapihvac.com/terms-conditions/



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

Catalog Table of Contents

Test Instruments ..... Section A

Blü-Test Wireless Temperature, Humidity and Pressure Test Instruments

Temperature Sensors ..... Section B

Room • Button • Wall Plate • Duct • Averaging • Immersion • Thermowells • Strap • Remote • Outside Air • Thermobuffers

Humidity and Combination Temp/Humidity Sensors ..... Section C

Room • Duct • Outside Air • Dew Point • Vivarium Lab

Zone Pressure Sensors ..... Section D

EZ Pressure • ZPM Multi-Pressure • ZPT Touch Pressure • ZPS Pressure
FRP Fixed Range Pressure • Pressure Pickup Ports • Pressure Probes • Pressure Switch

Air Quality Sensors ..... Section E

Volatile Organic Compound (VOC) Room & Duct • CO_2 Room & Duct • CO Sensor • Refrigerant Leak Detectors • CO_2 Calibration Kit • VOC Verification Kit

Wireless Bluetooth Sensors ..... Section F

Room • Duct • Immesion • Remote • Outside Air • Thermobuffer • Food Probe
Wireless Gateway • Wireless Receiver and Analog Output Modules

Accessories for HVAC/R ..... Section G

Voltage Converters • Power Supplies • Water Leak Detectors • BAPI-Guard Thermostat Protectors • Adaptor Plates • Flexible Probe Brackets & More...

Electronic Technician Assistant (ETA) Line ..... Section H

Interface & Communication Devices that Compliment a DDC Installation • Summary Modules • Sequencers • Voltage Converters • Power Supplies • Repeaters • Transceivers & More...

Sensor Specifications and Output Tables ..... Section I

Detailed Specifications and Output Tables for BAPI Thermistors, RTDs, Semiconductors, Temperature Transmitters, Humidity Transmitters and Pressure Sensors

BAPI Application Notes ..... Section J

BAPI Setpoint, Display & Mode Control Ranges • Overview of BAPI Enclosures Styles • Complete listing of App. Notes on our Website that help solve common industry challenges...

Terms and Conditions ..... Section K

Ordering Information • Warranties • Certificates of Accuracy and Calibration

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We make it easy for you.



1. We now offer a 5 year warranty across all of our products.

5 YEAR WARRANTY

Test Instruments | Temperature | Humidity | Air Quality | Pressure | ETA | Accessories | Wireless

*BAPI also offers a lifetime limited warranty on several temperature units. Please contact your sales representative for details.

2. BAPI BACKED

Our products are built to last, which is why we offer a 5 year warranty across all of our products. Of course, all companies offer a warranty, but we take it a step further. If our product fails due to a manufacturing defect, we will not only repair or replace the unit, but we will also provide a product credit to offset your incurred cost. We will do this regardless of whether or not the product is in the warranty period.

3. 0% Restock Fee on all stock sales names within 30 days.

- All items will be inspected when received. BAPI will consider restocking new and unused items only. If an item is in need of relabeling or repackaging it will be considered used.
- Any restock fee is subject to change based on the Technical Product Support Manager's discretion.

4. Advanced Warranty Replacement

BAPI will consider abandoning defective unit(s) when the following are met:

- Product is still under warranty.
- The product was operating in an environment for which it was designed.
- Product was invoiced for less than $100.
- Multiple units will be considered for abandonment; not to exceed $500 per RMA.

For more information on any of these items, please see our terms & conditions: www.bapihvac.com/terms-conditions/

The BAPI Difference

Changing the way you think about sensors . . .

ANOTHER ORIGINAL BAPI

- Original solutions to common HVAC/R problems
- Driven by customer feedback

BAPI Originals are made up of quality vendors, talented employees, and committed customers. These 3 ingredients combined create industry leading, original solutions.



99.94% Manufacturing Efficiency Rate



Live Support



Manufactured in the USA



On-Site, Multi-Step Testing



Computer Aided Workstations

Marketing Support

We offer a wide range of support both physical and digital to help you and your customers including:

- **Catalogs**
- **Line Cards**
- **Data Sheets**
- **Ins/Ops**
- **Application Notes**
- **In Person Training**
- **Webinars**
- **Online Training**
- **Videos**

These resources are available either through our website or by contacting BAPI.

Sales Support

Our sales & customer service team offer the following:

Order Verification:
To ensure accuracy, we verify each order so you don't have to worry. If we see something off, we'll contact you to make sure you get what you need.

Joint Customer Calls & Visits:
When schedules permit, BAPI salespeople are able to travel to your office for in-office training or hold a webinar for your staff.

Product Samples:
Product samples for customer evaluation are available on request. Contact us for details.



Building Automation Products, Inc.
750 North Royal Avenue
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email: sales@bapihvac.com
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website: www.bapihvac.com

Company Overview

Rev. 01/29/21

Company Background

BAPI manufactures sensors and solutions for HVAC/R, and we bring to the table many years of combined experience in all aspects of the industry from product development and engineering to manufacturing and sales. In fact, BAPI introduced many of the products and processes that have become industry standards, and we currently hold the patents for many of these products and processes. Dedication to quality throughout the entire manufacturing process has earned our products a reputation for reliability and longevity.

Website Resources - www.bapihvac.com

Online Ordering - The BAPI website features Online Ordering with easy navigation through the product lines and real time information on pricing, orders, shipping and account history.

Application Notes - Have you ever had a ground loop problem or AC power noise in your sensor cables? BAPI has a wealth of information available online to help you solve these and many other common industry problems.



The BAPI-Guard Video

Instruction Sheets, Datasheets & Price Sheets - Although Installation and Operation Sheets are included in the box of every BAPI product, sometimes these sheets do not make it to the job site. Therefore, BAPI instruction sheets are available online whenever you need them. Printable Datasheets and Price Sheets are also only a click away.

Videos - BAPI has a library of instructional videos available on the website such as how to conduct a wireless building survey with our Field Verifier Kit.

The BAPI Difference

BAPI uses only the highest quality sensing elements and meticulous manufacturing, testing and quality assurance procedures to guarantee that our products perform out of the box and far into the future. Here are a few of the extra steps that we take to protect your reputation and bottom line.

On-Site Multi-Step Testing - Every BAPI product is tested at multiple stages in the manufacturing process using custom designed fixtures and computer aided testing procedures to eliminate the potential for human error and guarantee a quality product.

NIST Traceable Precision Instruments - Product testing and calibration is conducted with precision Instrumentation and state-of-the-art Environmental Chambers, all of which are traceable to National Institute of Standards and Technology (NIST) standards.

Computer Aided Production Stations - Every production station features a large computer monitor and access to a wealth of resources on the BAPI network including product specific build documents, schematics and three dimensional product renderings to assure that each product is built to our engineering specifications.

CE Certified & RoHS Compliant - BAPI holds itself to a higher standard with CE certification on select models of temperature, humidity and pressure sensors. BAPI is also committed to environmentally responsible manufacturing practices and complies with the European Union's RoHS directive, which restricts the use of certain hazardous substances such as lead and mercury.

BAPI-BACKED Confidence - Most sensor manufacturers will replace their defective products, but only BAPI has the confidence to replace our products and provide a product credit to offset your incurred cost.

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NIST Traceable Test Instruments

Blü-Test - Wireless Test Instruments

- NIST traceable test instruments for temperature, %RH and pressure
- Data logging and Bluetooth communication with Android and iOS devices
- Local display for immediate readings
- Each probe stores up to a million readings



GET IT ON Google Play

Download on the App Store



pgs A2-A3

Blü-Test - Wireless Remote Temperature Piercing Tip





- NSP-certified unit with piercing tip probe, perfect for food safety and HACCP applications
- Data logging and Bluetooth communication with Android or iOS devices
- Local OLED display for immediate readings
- Logs are easily emailed
- Each probe body stores up to a million readings
- NIST-traceable calibration certificate included

GET IT ON Google Play

Download on the App Store

pgs A4-A5

Blü-Test - Wireless Test Instruments

Test Instruments

Rev. 08/16/21

Features & Options

- NIST* traceable test instruments for temperature, relative humidity and differential pressure
- Data logging and Bluetooth communication with Android and iOS smart devices
- Local display for immediate readings
- Logs are easily emailed as a CSV
- Each probe stores up to a million readings



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store

5 YEAR WARRANTY

Blü-Test Suite of Testing Probes
(3 probes on the right are shown with Duct Cone for measuring in a duct.)



Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

Charging: Standard USB Charger, 1.5A or greater, Micro-USB cable included

Measurement Range:
Temperature: -40 to 185°F (-40 to 85°C)
%RH: 5 to 95% Non-condensing @ -40 to 158°F (-40 to 70°C)
Differential Pressure: Low Range: -1 to +1" WC (-250 to +250 Pascal) @ -4 to 158°F (-20 to 70°C)
Standard Range: -5 to +5" WC (-1,250 to +1,250 Pascal) @ -4 to 158°F (-20 to 70°C)

Accuracy - Temperature Only Probes: ±0.18°F from -13 to 167°F (±0.1°C from -25 to 75°C)

Accuracy - Temp/Humidity Probes:
Temperature: ±0.36°F @ 77°F (±0.2°C at 25°C)
%RH: ±1%RH @ 77°F (25°C) from 10 to 85%RH

Accuracy - Differential Pressure Probes:
Low Range: ±0.25% of FS Span, -1 to +1" WC (-250 to +250 Pa) @ 77°F (25°C)
Standard Range: ±0.25% of FS Span, -5 to +5" WC (-1,250 to +1,250 Pa) @ 77°F (25°C)

Burst Pressure - Differential Pressure Probes:
Low Range: 415" WC (103 kPa) • Standard Range: 500" WC (124 kPa)

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Environmental Operating Range:
Blü-Test Body: -22 to 158°F (-30 to 70°C)
Temperature Probes: -40 to 185°F (-40 to 85°C)
%RH Probe: 5 to 95% Non-condensing @ -40 to 158°F (-40 to 70°C)
Pressure Probe: -4 to 158°F (-20 to 70°C)

FCC ID: Contains FCC ID 2AA9B04

Agency: CE EN 61326-1:2013 EMC, RoHS, NSF**

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BT-TP	Blü-Test Temperature, 4” length piercing, 1/8” diameter (100 x 3.2mm)	$600
BA/BT-TA	Blü-Test Temperature, 6” length, 1/4” diameter (150 x 6.4mm)	$600
BA/BT-TB	Blü-Test Temperature, 9.5” length, 1/4” diameter (240 x 6.4mm)	$600
BA/BT-TH	Blü-Test Temp/Humidity, 8” length, 3/8” diameter (200 x 9.5mm)	$675
BA/BT-DPLR	Blü-Test Differential Pressure, Low Range, -1 to +1” WC (-250 to +250 Pa)	$800
BA/BT-DPSR	Blü-Test Diff. Pressure, Standard Range, -5 to +5” WC (-1,250 to +1,250 Pa)	$800
BA/BT-HVAC-CASE	Carrying case for Blü-Test probes, holds up to six probes	$125
BA/BT-HVAC-BUNDLE	One of each probe listed above in a carrying case	$4,075
BA/BT-TP-RECERT	Recertification of Blü-Test Piercing Temperature	$50 Net
BA/BT-TA-RECERT	Recertification of Blü-Test 6” Temperature	$50 Net
BA/BT-TB-RECERT	Recertification of Blü-Test 9.5” Temperature	$50 Net
BA/BT-TH-RECERT	Recertification of Blü-Test Temp/Humidity	$100 Net
BA/BT-DPLR-RECERT	Recertification of Blü-Test Differential Pressure Low Range	$100 Net
BA/BT-DPSR-RECERT	Recertification of Blü-Test Differential Pressure Standard Range	$100 Net
BA/BT-TP-REFURB	Refurbishment of Blü-Test Piercing Temperature	$50 Net
BA/BT-TA-REFURB	Refurbishment of Blü-Test 6” Temperature	$50 Net
BA/BT-TB-REFURB	Refurbishment of Blü-Test 9.5” Temperature	$50 Net
BA/BT-TH-REFURB	Refurbishment of Blü-Test Temp/Humidity	$100 Net
BA/BT-DPLR-REFURB	Refurbishment of Blü-Test Differential Pressure Low Range	$50 Net
BA/BT-DPSR-REFURB	Refurbishment of Blü-Test Differential Pressure Standard Range	$50 Net

(Refurbishment includes replacement of the battery on all units and the sensing element on Temperature and Temp/Humidity units.)

Gray shaded items follow the Buy and Resale Multiplier.

Blü-Test App Features

Free App

Android OS 5.1 or Apple iOS 10 or higher required

View live data from multiple probes

Review and email log files

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

GET IT ON Google Play

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*NIST is the National Institute of Standards and Technology

**NSF is the National Sanitation Foundation

A4

Blü-Test - Wireless Remote Temperature Piercing Tip

Test Instruments

Rev. 01/16/25

Features & Options

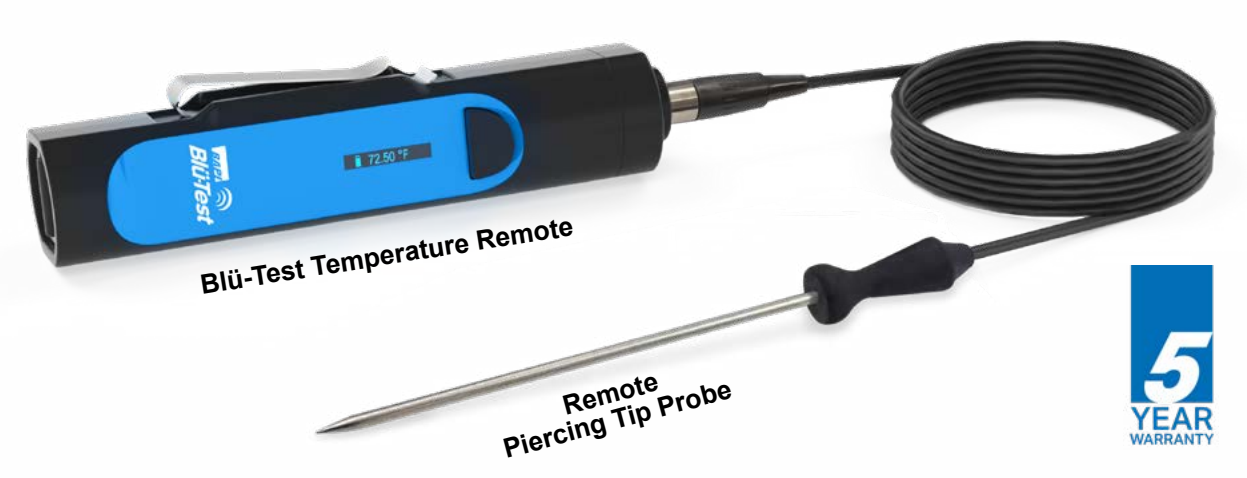
- Piercing tip probe
- NSF certified, perfect for food safety and HACCP applications
- Data logging and Bluetooth communication with Android or iOS smart devices
- User-friendly app with trending and other features
- Local OLED display for immediate readings
- Logs are easily emailed for use in commissioning, troubleshooting or comparing against the BAS
- Each probe body stores up to a million readings
- NIST-traceable calibration certificate included



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store



Blü-Test Base and Probe Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

Charging:
Standard USB Charger, 1.5A or greater, Micro-USB cable included

Operating Range:
Probe Body: -22 to 158°F (-30 to 70°C)
Piercing Probe: -40 to 450°F (-40 to 232°C)
Testing Medium: 32 to 450°F (0 to 232°C)

Entire Measurement Range: -40 to 1112°F (-40 to 600°C)

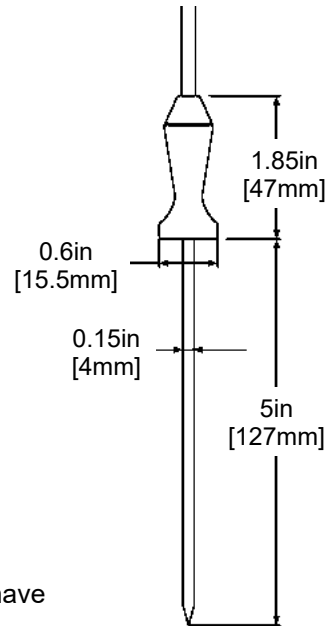
Calibrated System Accuracy*:
±0.45°F @ -13 to 257°F (±0.25°C @ -25 to 125°C)*
±0.90°F @ -103 to 347°F (±0.5°C @ -75 to 175°C)*

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Agency: CE EN 61326-1:2013 EMC, RoHS, NSF

FCC ID: Contains FCC ID 2AA9B04



*Calibrated accuracy only applies to piercing probe and remote body that have matching serial number labels.

BAPI

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Blü-Test - Wireless Remote Temperature Piercing Tip

Test Instruments

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BTR-TPR	Blü-Test Temperature Remote and Remote Piercing Tip Probe	$800
BA/BT-HVAC-CASE	Carrying case for Blü-Test probes, holds up to six probes	$125
BA/BT-A-REFURB	Refurbishment of Blü-Test Temperature Remote (Refurbishment includes replacement of battery and probe.)	$50 Net

Gray shaded items follow the Buy and Resale Multiplier.

Blü-Test Bundle

A complete set of all six Blü-Test units and a handy carrying case is available as a bundle. The bundle includes:

- Blü-Test Temperature, 4” length piercing, 1/8” dia. (100 x 3.2mm)
- Blü-Test Temperature, 6” length, 1/4” diameter (150 x 6.4mm)
- Blü-Test Temperature, 9.5” length, 1/4” diameter (240 x 6.4mm)
- Blü-Test Temp/Humidity, 8” length, 3/8” diameter (200 x 9.5mm)
- Blü-Test Differential Pressure, Low Range, -1 to +1” WC (-250 to +250 Pa)
- Blü-Test Differential Pressure, Standard Range, -5 to +5” WC (-1,250 to +1,250 Pa)

See the Blü-Test Suite datasheet for more information.



Blü-Test App Features

Free App

Android OS 5.1 or Apple iOS 10 or higher required

View live data from multiple probes

Review and email log files

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

GET IT ON Google Play

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NIST is the National Institute of Standards and Technology

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Blü-Test - Wireless Test Instrument Bundle

Test Instruments

Rev. 07/13/21

Features & Options

- NIST* traceable test instruments for temperature, relative humidity and differential pressure
- Data logging and Bluetooth communication with Android and iOS smart devices
- Local display for immediate readings
- Logs are easily emailed as a CSV
- Each probe stores up to a million readings

5 YEAR WARRANTY

Blü-Test Suite of Testing Probes
(3 probes on the right are shown with Duct Cone for measuring in a duct.)



Blü-Test App

The handy app features trending and easy importing of locations to eliminate clipboards and hand recording.



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store

Ordering Information

Part Number	Description	List Price
BA/BT-HVAC-BUNDLE	.. One of each probe listed below in a carrying case	$4,075

BA/BT-TP: Blü-Test Temperature, 4” length piercing, 1/8” dia. (100 x 3.2mm)

BA/BT-TA: Blü-Test Temperature, 6” length, 1/4” diameter (150 x 6.4mm)

BA/BT-TB: Blü-Test Temperature, 9.5” length, 1/4” diameter (240 x 6.4mm)

BA/BT-TH: Blü-Test Temp/Humidity, 8” length, 3/8” diameter (200 x 9.5mm)

BA/BT-DPLR: Blü-Test Differential Pressure, Low Range, -1 to +1” WC (-250 to +250 Pa)

BA/BT-DPSR: Blü-Test Differential Pressure, Standard Range, -5 to +5” WC (-1,250 to +1,250 Pa)



Included Carrying Case

Submittal sheets without List Prices are available on our website at www.bapihvac.com

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Blü-Test - Wireless Test Instrument Bundle

Test Instruments

Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

Charging: Standard USB Charger, 1.5A or greater, Micro-USB cable included

Measurement Range:
Temperature: -40 to 185°F (-40 to 85°C)
%RH: 5 to 95% Non-condensing @ -40 to 158°F (-40 to 70°C)
Differential Pressure Low Range: -1 to +1" WC (-250 to +250 Pascal) @ -4 to 158°F (-20 to 70°C)
Differential Pressure Standard Range: -5 to +5" WC (-1,250 to +1,250 Pascal) @ -4 to 158°F (-20 to 70°C)

Accuracy - Temperature Only Probes: ±0.18°F from -13 to 167°F (±0.1°C from -25 to 75°C)

Accuracy - Temp/Humidity Probes:
Temperature: ±0.36°F @ 77°F (±0.2°C at 25°C) • %RH: ±1%RH @ 77°F (25°C) from 10 to 85%RH

Accuracy - Differential Pressure Probes:
Low Range: ±0.25% of FS Span, -1 to +1" WC (-250 to +250 Pa) @ 77°F (25°C)
Standard Range: ±0.25% of FS Span, -5 to +5" WC (-1,250 to +1,250 Pa) @ 77°F (25°C)

Burst Pressure - Differential Pressure Probes:
Low Range: 415" WC (103 kPa)
Standard Range: 500" WC (124 kPa)

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Environmental Operating Range:
Blü-Test Body: -22 to 158°F (-30 to 70°C)
Temperature Probes: -40 to 185°F (-40 to 85°C)
%RH Probe: 5 to 95% Non-condensing @ -40 to 158°F (-40 to 70°C)
Pressure Probe: -4 to 158°F (-20 to 70°C)

FCC ID: Contains FCC ID 2AA9B04

Agency: CE EN 61326-1:2013 EMC, RoHS, NSF**, NIST* Traceable Certificate

Blü-Test App Features

Free App
Android OS 5.1 or Apple iOS 10 or higher required
View live data from multiple probes
Review and email log files

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

GET IT ON Google Play

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Blü-Test - Temperature

Test Instruments

Rev. 07/13/21

Features & Options

- NIST* traceable certificate of calibration
- Data logging and Bluetooth communication with Android and iOS smart devices
- Local display for immediate readings
- Logs are easily emailed as a CSV
- Each probe stores up to a million readings

Blü-Test Temperature Test Instruments



5 YEAR WARRANTY

Blü-Test App

The handy app features trending and easy importing of locations to eliminate clipboards and hand recording.



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store

Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

Charging: Standard USB Charger, 1.5A or greater, Micro-USB cable included

Accuracy: ±0.18°F from -13 to 167°F (±0.1°C from -25 to 75°C)

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Environmental Operating Range:
Blü-Test Body: -22 to 158°F (-30 to 70°C)
Temperature Probes: -40 to 185°F (-40 to 85°C)

FCC ID: Contains FCC ID 2AA9B04

Agency:
CE EN 61326-1:2013 EMC, RoHS, NSF**,
NIST* Traceable Certificate

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BT-TA	Blü-Test Temperature, 6” length, 1/4” diameter (150 x 6.4mm)	$600
BA/BT-TB	Blü-Test Temperature, 9.5” length, 1/4” diameter (240 x 6.4mm)	$600
BA/BT-TA-RECERT	Recertification of Blü-Test 6” Temperature	$50 Net
BA/BT-TB-RECERT	Recertification of Blü-Test 9.5” Temperature	$50 Net
BA/BT-TA-REFURB	Recertification of Blü-Test 6” Temperature	$50 Net
BA/BT-TB-REFURB	Recertification of Blü-Test 9.5” Temperature	$50 Net

(Refurbishment includes replacement of the battery and the temperature sensing element.)

Blü-Test Bundle

A complete set of all six Blü-Test units and a handy carrying case is available as a bundle. The bundle includes:

- Blü-Test Temperature, 4” length piercing, 1/8” dia. (100 x 3.2mm)
- Blü-Test Temperature, 6” length, 1/4” diameter (150 x 6.4mm)
- Blü-Test Temperature, 9.5” length, 1/4” diameter (240 x 6.4mm)
- Blü-Test Temp/Humidity, 8” length, 3/8” diameter (200 x 9.5mm)
- Blü-Test Differential Pressure, Low Range, -1 to +1” WC (-250 to +250 Pa)
- Blü-Test Differential Pressure, Standard Range, -5 to +5” WC (-1,250 to +1,250 Pa)

See the Blü-Test Suite datasheet for more information.



Blü-Test App Features

Free App
Android OS 5.1 or Apple iOS 10 or higher required
View live data from multiple probes
Review and email log files

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*NIST is the National Institute of Standards and Technology
**NSF is the National Sanitation Foundation

Blü-Test - Piercing Temperature

Test Instruments

Rev. 07/29/21

Features & Options

- NIST* traceable certificate of calibration
- NSF** certified
- Data logging and Bluetooth communication with Android and iOS smart devices
- Local display for immediate readings
- Logs are easily emailed as a CSV
- Each probe stores up to a million readings

Blü-Test App

The handy app features trending and easy importing of locations to eliminate clipboards and hand recording.



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store



Blü-Test Piercing Temperature Test Instrument

5 YEAR WARRANTY

Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

Charging: Standard USB Charger, 1.5A or greater, Micro-USB cable included

Accuracy: ±0.18°F from -13 to 167°F (±0.1°C from -25 to 75°C)

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Environmental Operating Range:
Blü-Test Body: -22 to 158°F (-30 to 70°C)
Piercing Probe: -40 to 185°F (-40 to 85°C)

FCC ID: Contains FCC ID 2AA9B04

Agency:
CE EN 61326-1:2013 EMC, RoHS, NSF**

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Building Automation Products, Inc. • 750 North Royal Avenue, Gays Mills, WI 54631 USA
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Blü-Test - Piercing Temperature

Test Instruments

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BT-TP	Blü-Test Temperature, 4” length piercing, 1/8” dia. (100 x 3.2mm)	$600
BA/BT-TP-RECERT	Recertification of Blü-Test Piercing Temperature	$50 Net
BA/BT-TP-REFURB	Refurbishment of Blü-Test Piercing Temperature	$50 Net

(Refurbishment includes replacement of the battery and the temperature sensing element.)

BA/BT-HVAC-CASE	Carrying case for Blü-Test probes, holds up to six probes	$125

Gray shaded items follow the Buy and Resale Multiplier.

Blü-Test Bundle

A complete set of all six Blü-Test units and a handy carrying case is available as a bundle. The bundle includes:

- Blü-Test Temperature, 4” length piercing, 1/8” dia. (100 x 3.2mm)
- Blü-Test Temperature, 6” length, 1/4” diameter (150 x 6.4mm)
- Blü-Test Temperature, 9.5” length, 1/4” diameter (240 x 6.4mm)
- Blü-Test Temp/Humidity, 8” length, 3/8” diameter (200 x 9.5mm)
- Blü-Test Differential Pressure, Low Range, -1 to +1” WC (-250 to +250 Pa)
- Blü-Test Differential Pressure, Standard Range, -5 to +5” WC (-1,250 to +1,250 Pa)

See the Blü-Test Suite datasheet for more information.



Blü-Test Bundle



Blü-Test App Features

Free App

Android OS 5.1 or Apple iOS 10 or higher required

View live data from multiple probes

Review and email log files

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

GET IT ON Google Play

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**NSF is the National Sanitation Foundation

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Blü-Test - Temperature & Humidity

Test Instruments

Rev. 07/13/21

Features & Options

- NIST* traceable certificate of calibration
- Data logging and Bluetooth communication with Android and iOS smart devices
- Local display for immediate readings
- Logs are easily emailed as a CSV
- Each probe stores up to a million readings

Blü-Test App

The handy app features trending and easy importing of locations to eliminate clipboards and hand recording.



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store



Blü-Test Temperature and Humidity Test Instrument

5 YEAR WARRANTY

Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

Charging: Standard USB Charger, 1.5A or greater, Micro-USB cable included

Measurement Range:
Temperature: -40 to 185°F (-40 to 85°C)
%RH: 5 to 95% Non-condensing @ -40 to 158°F (-40 to 70°C)

Accuracy:
Temperature: ±0.36°F @ 77°F (±0.2°C @ 25°C)
%RH: ±1%RH @ 77°F (25°C) from 10 to 85%RH

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Environmental Operating Range:
Blü-Test Body: -22 to 158°F (-30 to 70°C)
%RH Probe: 5 to 95% Non-condensing @ -40 to 158°F (-40 to 70°C)

FCC ID: Contains FCC ID 2AA9B04

Agency:
CE EN 61326-1:2013 EMC, RoHS, NSF**, NIST* Traceable Certificate

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BT-TH	Blü-Test Temp/Humidity, 8” length, 3/8” diameter (200 x 9.5mm)	$675
BA/BT-TH-RECERT	Recertification of Blü-Test Temp/Humidity	$100 Net
BA/BT-TH-REFURB	Recertification of Blü-Test Temp/Humidity	$100 Net

(Refurbishment includes replacement of the battery and the temperature sensing element.)

Blü-Test Bundle

A complete set of all six Blü-Test units and a handy carrying case is available as a bundle. The bundle includes:

- Blü-Test Temperature, 4” length piercing, 1/8” dia. (100 x 3.2mm)
- Blü-Test Temperature, 6” length, 1/4” diameter (150 x 6.4mm)
- Blü-Test Temperature, 9.5” length, 1/4” diameter (240 x 6.4mm)
- Blü-Test Temp/Humidity, 8” length, 3/8” diameter (200 x 9.5mm)
- Blü-Test Differential Pressure, Low Range, -1 to +1” WC (-250 to +250 Pa)
- Blü-Test Differential Pressure, Standard Range, -5 to +5” WC (-1,250 to +1,250 Pa)

See the Blü-Test Suite datasheet for more information.

Blü-Test Bundle



Blü-Test App Features

Free App

Android OS 5.1 or Apple iOS 10 or higher required

View live data from multiple probes

Review and email log files

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

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*NIST is the National Institute of Standards and Technology

**NSF is the National Sanitation Foundation

Blü-Test - Pressure

Test Instruments

Rev. 02/10/21

Features & Options

- NIST* traceable certificate of calibration
- Data logging and Bluetooth communication with Android and iOS smart devices
- Local display for immediate readings
- Logs are easily emailed as a CSV
- Each probe stores up to a million readings

Blü-Test App

The handy app features trending and easy importing of locations to eliminate clipboards and hand recording.



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store



Blü-Test Low and Standard Range Pressure Test Instruments

Blü-Test Base and Probe Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery (charging cable included)

Measurement Range:
Low Range: -1 to +1" WC (-250 to +250 Pascal) @ -4 to 158°F (-20 to 70°C)
Standard Range:-5 to +5" WC (-1,250 to +1,250 Pascal) @ -4 to 158°F (-20 to 70°C)

Accuracy
Low Range: ±0.25% of FS Span, -1 to +1" WC (-250 to +250 Pa) @ 77°F (25°C)
Standard Range: ±0.25% of FS Span, -5 to +5" WC (-1,250 to +1,250 Pa) @ 77°F (25°C)

Burst Pressure
Low Range: 415" WC (103 kPa) • Standard Range: 500" WC (124 kPa)

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Environmental Operating Range:
Blü-Test Body: -22 to 158°F (-30 to 70°C)
Pressure Probe: -4 to 158°F (-20 to 70°C)

FCC ID: Contains FCC ID 2AA9B04

Agency: CE EN 61326-1:2013 EMC, RoHS, NSF**, NIST* Traceable Certificate

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BT-DPLR	Blü-Test Differential Pressure, Low Range, -1 to +1" WC (-250 to +250 Pa)	$800
BA/BT-DPSR	Blü-Test Diff. Pressure, Standard Range, -5 to +5" WC (-1,250 to +1,250 Pa)	$800
BA/BT-DPLR-RECERT	Recertification of Blü-Test Differential Pressure Low Range	$100 Net
BA/BT-DPSR-RECERT	Recertification of Blü-Test Differential Pressure Standard Range	$100 Net
BA/BT-DPLR-REFURB	Recertification of Blü-Test Differential Pressure Low Range	$100 Net
BA/BT-DPSR-REFURB	Recertification of Blü-Test Differential Pressure Standard Range	$100 Net

(Refurbishment includes replacement of the battery.)

Blü-Test Bundle

A complete set of all six Blü-Test units and a handy carrying case is available as a bundle. The bundle includes:

- Blü-Test Temperature, 4" length piercing, 1/8" dia. (100 x 3.2mm)
- Blü-Test Temperature, 6" length, 1/4" diameter (150 x 6.4mm)
- Blü-Test Temperature, 9.5" length, 1/4" diameter (240 x 6.4mm)
- Blü-Test Temp/Humidity, 8" length, 3/8" diameter (200 x 9.5mm)
- Blü-Test Differential Pressure, Low Range, -1 to +1" WC (-250 to +250 Pa)
- Blü-Test Differential Pressure, Standard Range, -5 to +5" WC (-1,250 to +1,250 Pa)

See the Blü-Test Suite datasheet for more information.



Blü-Test Bundle



Blü-Test App Features

Free App
Android OS 5.1 or Apple iOS 10 or higher required
View live data from multiple probes
Review and email log files

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

GET IT ON Google Play

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*NIST is the National Institute of Standards and Technology
**NSF is the National Sanitation Foundation

Blü-Test - Wireless Remote Temperature

Test Instruments

Rev. 07/30/21

Features & Options

- Remote clamp or remote concave probe styles
- Data logging and Bluetooth communication with Android and iOS smart devices
- Handy App with trending and other features
- Local OLED display for immediate readings
- Logs are easily emailed for use in commissioning, troubleshooting or comparing against the BAS
- Each probe body stores up to a million readings



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store



Blü-Test Temperature Remote

5 YEAR WARRANTY



Remote Clamp Probe

Need New Image



Quick Connect Hose Clamp Included for Remote Concave Probes



Remote GP Probe

Need New Image

Blü-Test Base and Probe Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery (charging cable included)

Charging: Standard USB Charger, 1.5A or greater, Micro-USB cable included

Uncalibrated System Accuracy:
±0.18°F @ 32 to 50°F (±0.10°C @ 0 to 10°C)
±0.45°F @ 32 to 77°F (±0.25°C @ 0 to 25°C)
±0.90°F @ 77 to 221°F (±0.50°C @ 25 to 105°C)

Entire Measurement Range:
-40 to 221°F (-40 to 105°C)

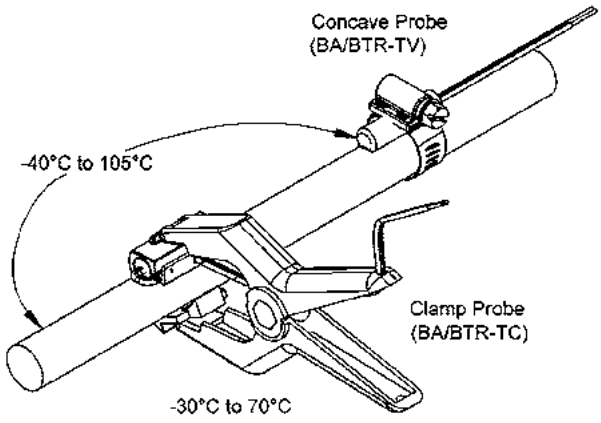
Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Environmental Operating Range:
Probe Body: -22 to 158°F (-30 to 70°C)
Remote GP Probe: -40 to 221°F (-40 to 105°C)
Remote Clamp Probe: -40 to 221°F (-40 to 105°C)

FCC ID: Contains FCC ID 2AA9B04

Agency: RoHS, CE



Need New Image

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Blü-Test - Wireless Remote Temperature

Test Instruments

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BTR	Blü-Test Temperature Remote (for Remote Probes listed below)	$600
BA/BTR-TR	Remote GP Probe, 5' (1.5m) leads, 1/2" x 1/8" dia. (12.7 x 3.2mm)	$75
BA/BTR-TC	Remote Clamp Probe, 5' (1.5m) leads, for pipe diameters from 5/8" to 1-5/8" (16 to 41mm)	$200
BA/BTR-REFURB	Refurbishment of Blü-Test Temperature Remote (Refurbishment includes replacement of battery.)	$50 Net
BA/BT-HVAC-CASE	Carrying case for Blü-Test probes, holds up to six probes	$125

Blü-Test Bundle

A complete set of all six Blü-Test units and a handy carrying case is available as a bundle. The bundle includes:

- Blü-Test Temperature, 4" length piercing, 1/8" dia. (100 x 3.2mm)
- Blü-Test Temperature, 6" length, 1/4" diameter (150 x 6.4mm)
- Blü-Test Temperature, 9.5" length, 1/4" diameter (240 x 6.4mm)
- Blü-Test Temp/Humidity, 8" length, 3/8" diameter (200 x 9.5mm)
- Blü-Test Differential Pressure, Low Range, -1 to +1" WC (-250 to +250 Pa)
- Blü-Test Differential Pressure, Standard Range, -5 to +5" WC (-1,250 to +1,250 Pa)

See the Blü-Test Suite datasheet for more information.

Blü-Test Bundle



Blü-Test App Features

Free App

Android OS 5.1 or Apple iOS 10 or higher required

View live data from multiple probes

Review and email log files

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

GET IT ON Google Play

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Blü-Test - Wireless Piercing Tips

Test Instruments

Rev. 08/26/24

Features & Options

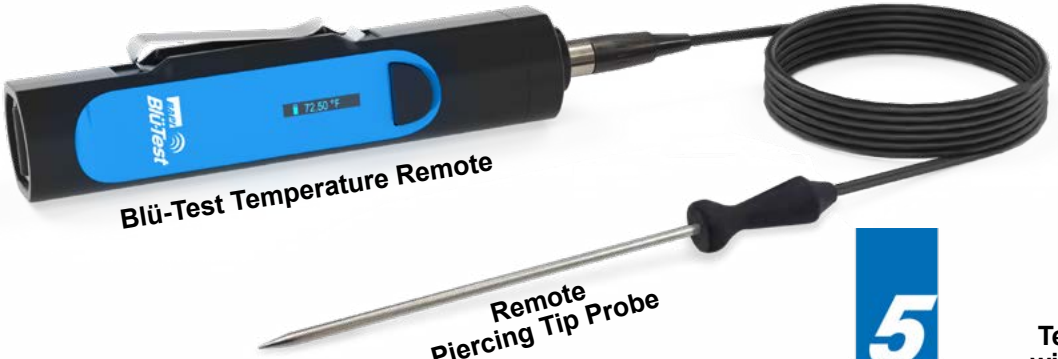
- Remote or attached piercing tip probes
- NSF certified, perfect for food safety and HACCP applications
- Data logging and Bluetooth communication with Android or iOS smart devices
- User-friendly app with trending and other features
- Local OLED display for immediate readings
- Logs are easily emailed for use in commissioning, troubleshooting or comparing against the BAS
- Each probe body stores up to a million readings
- NIST-traceable calibration certificate included



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store



Blü-Test Temperature Remote

Remote Piercing Tip Probe

5 YEAR WARRANTY



Blü-Test Temperature with Attached Piercing Tip Probe

Blü-Test Base and Probe Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

Charging:
Standard USB Charger, 1.5A or greater, Micro-USB cable included

Operating Range:
Probe Body: -22 to 158°F (-30 to 70°C)
Piercing Probe: -40 to 450°F (-40 to 232°C)
Testing Medium: 32 to 450°F (0 to 232°C)

Entire Measurement Range: -40 to 1112°F (-40 to 600°C)

Calibrated System Accuracy*:
±0.45°F @ -13 to 257°F (±0.25°C @ -25 to 125°C)*
±0.90°F @ -103 to 347°F (±0.5°C @ -75 to 175°C)*

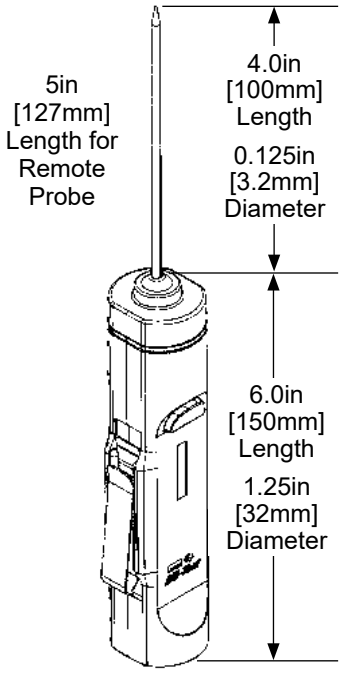
Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Agency: CE EN 61326-1:2013 EMC, RoHS, NSF

FCC ID: Contains FCC ID 2AA9B04

*Calibrated accuracy only applies to piercing probe and remote body that have matching serial number labels.



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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BTR-TPR	Blü-Test Temperature Remote and Remote 5” (127mm) Piercing Tip Probe	$800
BA/BT-TP	Blü-Test Temperature with Attached 4” (100mm) Piercing Tip Probe	$600

Gray shaded items follow the Buy and Resale Multiplier.

Blü-Test App Features

The free Blü-Test App requires Android OS 5.1 or Apple iOS 10 or higher. The App includes a number of handy features including:

- Viewing of the current readings from a single or multiple probes
- Live trending of data from one or multiple probes
- Downloading of log files from the probe
- Easily importable sites and locations so no more hand-recording of readings
- Emailable log files for simple insertion into commissioning reports

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

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A20

Blü-Test - Wireless Remote Temperature Piercing Tip

Test Instruments

Rev. 04/29/24

Features & Options

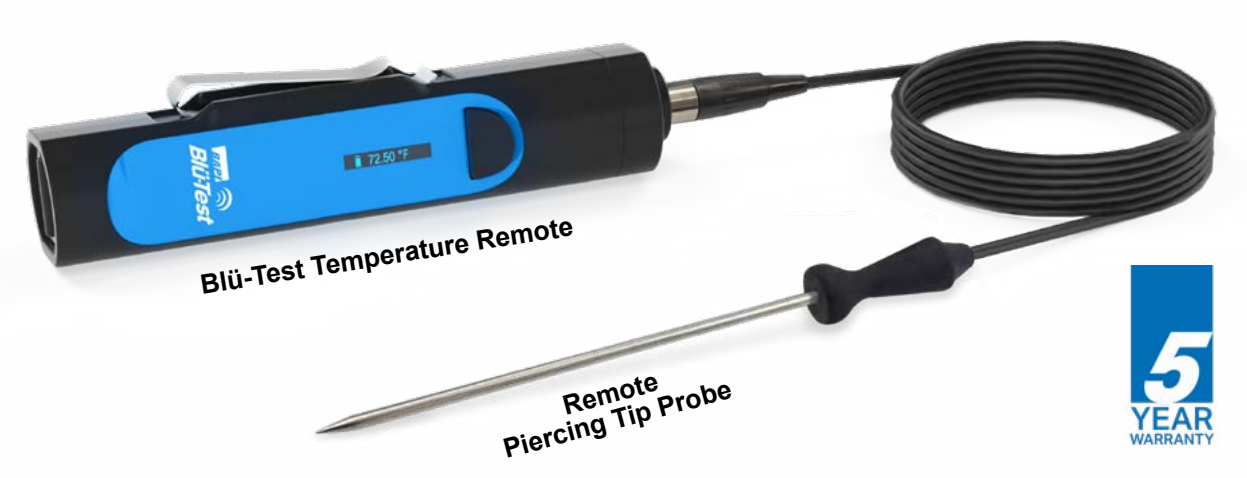
- Piercing tip probe
- NSF certified, perfect for food safety and HACCP applications
- Data logging and Bluetooth communication with Android or iOS smart devices
- User-friendly app with trending and other features
- Local OLED display for immediate readings
- Logs are easily emailed for use in commissioning, troubleshooting or comparing against the BAS
- Each probe body stores up to a million readings
- NIST-traceable calibration certificate included



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store



Blü-Test Base and Probe Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

Charging:
Standard USB Charger, 1.5A or greater, Micro-USB cable included

Operating Range:
Probe Body: -22 to 158°F (-30 to 70°C)
Piercing Probe: -40 to 450°F (-40 to 232°C)
Testing Medium: 32 to 450°F (0 to 232°C)

Entire Measurement Range: -40 to 1112°F (-40 to 600°C)

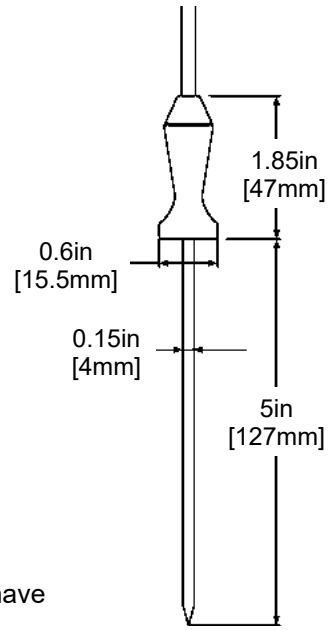
Calibrated System Accuracy*:
±0.45°F @ -13 to 257°F (±0.25°C @ -25 to 125°C)*
±0.90°F @ -103 to 347°F (±0.5°C @ -75 to 175°C)*

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Agency: CE EN 61326-1:2013 EMC, RoHS, NSF

FCC ID: Contains FCC ID 2AA9B04



*Calibrated accuracy only applies to piercing probe and remote body that have matching serial number labels.

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Blü-Test - Wireless Temp/Humidity Test Instrument

Test Instruments

Rev. 02/10/21

Features & Options

- NIST* traceable temperature and humidity test instrument
- Data logging and Bluetooth communication with Android or iOS smart devices
- Handy App with trending and other features
- Local OLED display for immediate readings
- Logs are easily emailed for use in commissioning, troubleshooting or comparing against the BAS
- Each probe stores up to a million readings



Blü-Test App Screens

Download on the App Store

GET IT ON Google Play



Blü-Test Temp & Humidity Testing Probe
(shown with included adjustable duct cone for hands-free measuring in ductwork.)

Blü-Test Base and Probe Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery (charging cable included)

Environmental Range:
Probe Body.....-22 to 158°F (-30 to 70°C)
%RH Probe.....5 to 95% Non-condensing @ -40 to 158°F (-40 to 70°C)

Measurement Range:
Temperature .....-40 to 185°F (-40 to 85°C)
%RH .....5 to 95% Non-condensing @ -40 to 158°F (-40 to 70°C)

Accuracy:
Temperature .....±0.36°F @ 77°F (±0.2°C at 25°C)
%RH .....±1%RH @ 77°F (25°C) from 10 to 85%RH

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Agency: RoHS, CE, NSF, NIST Traceable Certificate

FCC ID: Contains FCC ID 2AA9B04

5 YEAR

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Blü-Test - Wireless Temp/Humidity Test Instrument

Test Instruments

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BT-TH	Blü-Test Temp/Humidity Probe, 8” length, 3/8” dia (203 x 9.5mm)	$675
BA/BT-HVAC-CASE	Carrying case for Blü-Test probes, holds up to six probes	$125
BA/BT-B-RECERT	Recertification of Blü-Test Temp/Humidity Probe	$100 Net
BA/BT-B-REFURB	Refurbishment of Blü-Test Temp/Humidity Probe (Refurbishment includes replacement of battery and probe.)	$100 Net

Gray shaded items follow the Buy and Resale Multiplier.



Blü-Test Carrying Case
(probes not included)

Blü-Test App Specifications

Application Program: Android OS 5.1 or Apple iOS 10 or higher required

Display: Display on probe or device

Measured Data	Temp. (°F or °C) and %RH
Time Stamp	Date and 24 hour time
Location	Uses location of smart phone or tablet
Save	Saves current data, time & location
Log	Shows trending data on screen
Email	Sends data log to any email address

Note: A user supplied Android or iOS device is required to retrieve logged data.

*NIST is the National Institute of Standards and Technology

The Blü-Test App is available for download at Google Play and the App Store.

Download on the App Store

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Blü-Test - Wireless Pressure Test Instruments

Test Instruments

Rev. 02/10/21

Features & Options

- NIST* traceable differential air pressure test instruments
- Standard and low range models
- Data logging and Bluetooth communication with Android or iOS smart devices
- Handy App with trending and other features
- Local OLED display for immediate readings
- Logs are easily emailed for use in commissioning, troubleshooting or comparing against the BAS
- Each test instrument stores up to a million readings



Blü-Test App Screens

Download on the App Store

GET IT ON Google Play



Blü-Test Low and Standard Range Pressure Probes

Blü-Test Base and Probe Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery (charging cable included)

Environmental Temperature Range: 4 to 158°F (-20 to 70°C)

Measurement Range:
Low Range: ..... -1 to +1" WC (-250 to +250 Pascal) @ -4 to 158°F (-20 to 70°C)
Standard Range: ..... -5 to +5" WC (-1,250 to +1,250 Pascal) @ -4 to 158°F (-20 to 70°C)

Accuracy
Low Range: ..... ±0.25% of FS Span, -1 to +1" WC (-250 to +250 Pa) at 77°F (25°C)
Standard Range: ..... ±0.25% of FS Span, -5 to +5" WC (-1,250 to +1,250 Pa) at 77°F (25°C)

Burst Pressure
Low Range: ..... 415" WC (103 kPa)
Standard Range: ..... 500" WC (124 kPa)

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

Agency: RoHS, CE, NSF, NIST Traceable Certificate

FCC ID: Contains FCC ID 2AA9B04

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Blü-Test - Wireless Pressure Test Instruments

Test Instruments

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part Number	Description	List Price
BA/BT-DPLR	Blü-Test Low Range Differential Air Pressure Probe Measurement Range: -1 to +1" WC (-250 to +250 Pa)	$800
BA/BT-DPSR	Blü-Test Standard Range Differential Air Pressure Probe Measurement Range: -5 to +5" WC (-1,250 to +1,250 Pa)	$800
BA/BT-HVAC-CASE	Carrying case for Blü-Test probes, holds up to six probes	$125
BA/BT-C-RECERT	Recertification of Blü-Test Differential Air Pressure Probe	$100 Net
BA/BT-C-REFURB	Refurbishment of Blü-Test Differential Air Pressure Probe (Refurbishment includes replacement of battery.)	$100 Net

Gray shaded items follow the Buy and Resale Multiplier.



Blü-Test Carrying Case
(probes not included)

Blü-Test App Specifications

Application Program: Android OS 5.1 or Apple iOS 10 or higher required

Display: Display on probe or device

Measured Data	Differential air pressure (inches WC or Pascals)
Time Stamp	Date and 24 hour time
Location	Uses location of smart phone or tablet
Save	Saves current data, time & location
Log	Shows trending data on screen
Email	Sends data log to any email address

Note: A user supplied Android or iOS device is required to retrieve logged data.

*NIST is the National Institute of Standards and Technology

The Blü-Test App is available for download at Google Play and the App Store.

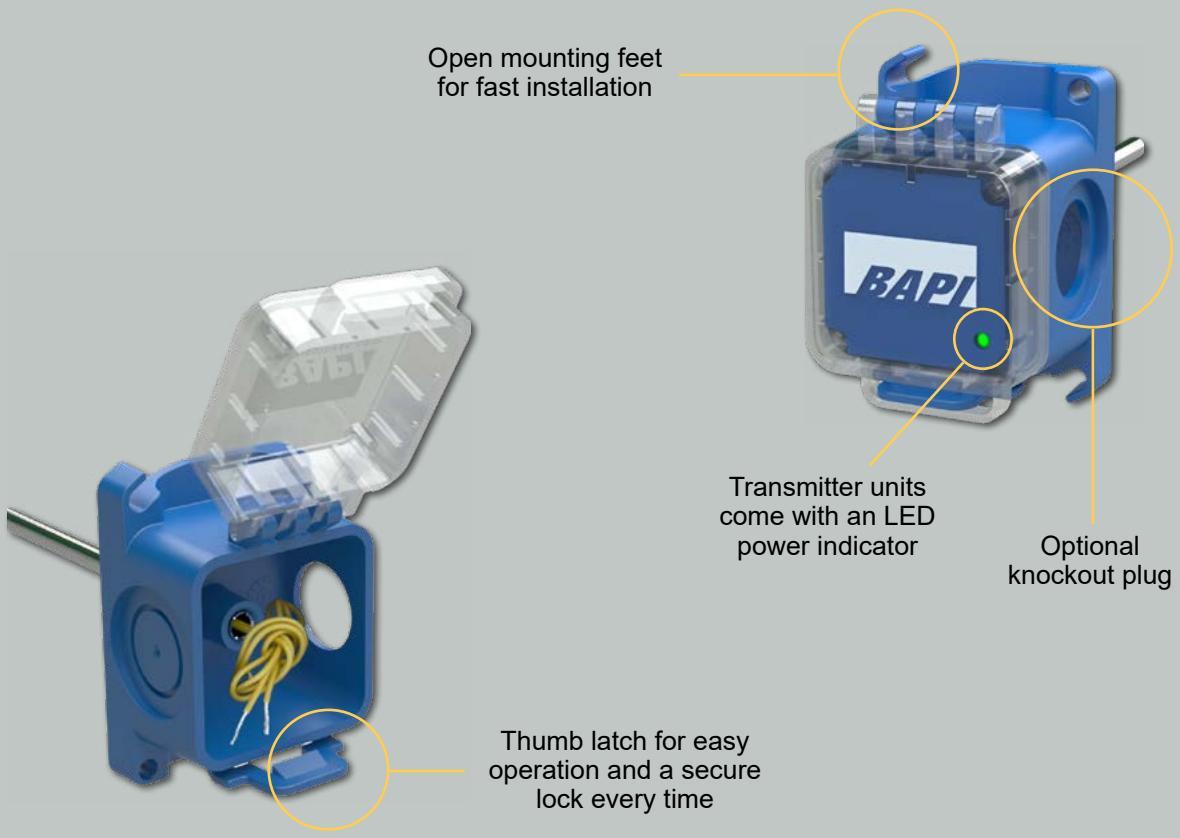
Download on the App Store

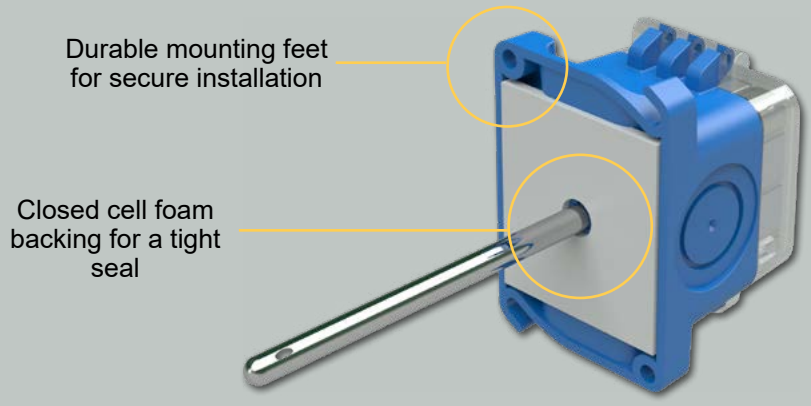
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The BAPI-Box Crossover Enclosure

The BAPI-Box Crossover features a hinged cover with thumb latch for easy termination. It is available with an optional pierceable knockout plug for the open port. The plug increases the enclosure rating from IP10 to IP44. The BAPI-Box Crossover is available for all of BAPI's non-room temperature and humidity sensors.





Room Temperature Sensors

BAPI-Stat "Quantum" Series



"Quantum" Units with Optional Setpoint, Display and Occupancy Override - pg B4



"Quantum Prime" Wipedown Units - pg B6



"Quantum Slim" Units - pg B8

BAPI-Stat 4 with Display



pg B10

RµPS Sensor
Delta Style Enclosure



pg B12

"X-Combo"
BAPI-Stat 4 with Temp & Humidity Setpoint



pg B14

Room Units without Display



pgs B16-B19

Decora Style Sensor
Fits inside a Wall Plate



pg B20

"Button" Sensor
Smaller than a Quarter



pg B22

T1K Transmitters
4 to 20 mA Output



pg B24

Wall Plates
with optional Override



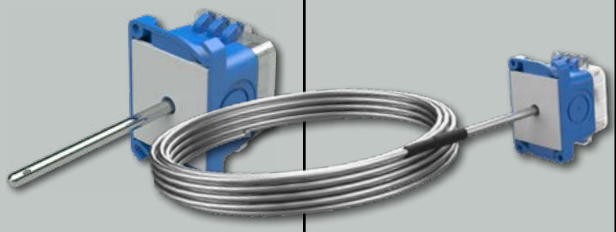
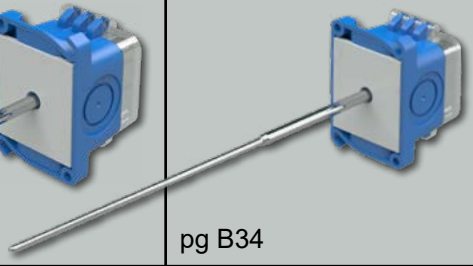
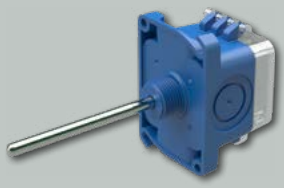
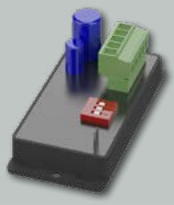
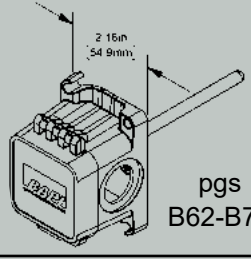
pg B26

BAPI
Sensors for HVAC/R

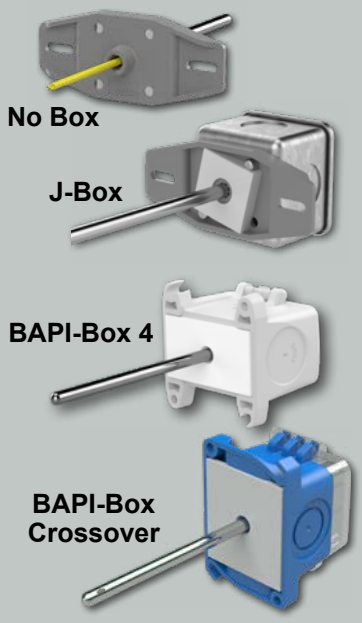
Table of Contents

Temperature Sensors

BAPI Non-Room Temperature Sensors

Duct Sensors  pg B28	**Duct Averaging** pg B30	**Rigid Averaging**  pg B32	**Submersible Duct**  pg B34
Submersible Averaging  pg B36	**Immersion**  pg B38	**Immersion with SS Fitting**  pg B40	**Thermowells for Immersion Sensors**  pg B42
Extreme Temp RTD - Immersion  pg B44	**Extreme Temp RTD - Remote**  pg B44	**Clamp-On Strap**  pg B46	**Strap-On Sensors**  pg B46
Outside Air  pg B48	**Remote Sensors and Probes**  pg B50	**Concave and Remote Probes with Colored Cable**  pg B52	**Surface Sensor**  pg B54
4 to 20mA Transmitters  pg B56	**Thermobuffer for Freezers and Coolers**  pg B58	**Replacement Sensors**  pgs B60	**Non-Room Sensor Dimension Drawings**  pgs B62-B72

BAPI offers seven enclosure styles for our non-room sensors. These enclosure include the No Box, Junction Box, Weatherproof, BAPI-Box, BAPI-Box 2 and BAPI-Box 4 and BAPI-Box Crossover.



Indoor Enclosures

No Box
The No Box features a plastic mounting bracket with a foam gasket. It does not have an IP or NEMA rating.

Junction Box
The Junction Box is made of galvanized steel with an IP20 and NEMA 1 rating. It includes a plastic mounting bracket and foam gasket.

BAPI-Box 4 Enclosure
The BAPI-Box 4 is made of nylon and plastic and carries an IP10 rating (or an IP44 rating with the Pierceable Knockout Plug installed in the open port). It is half the size of the BAPI-Box 2 with a hinged (but not gasketed) cover.

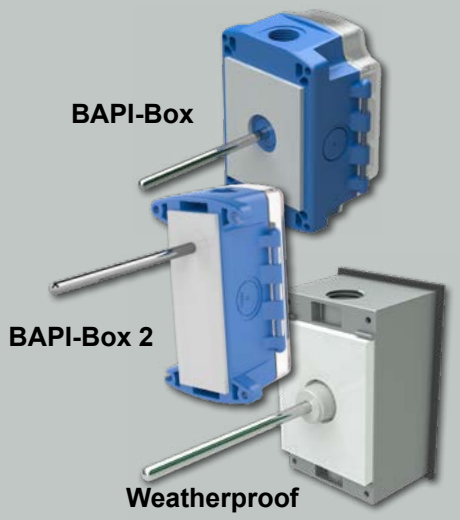
BAPI-Box Crossover
The BAPI-Box Crossover is made of polycarbonate and carries an IP10 rating (or an IP44 rating with the Pierceable Knockout Plug installed in the open port). It features a hinged cover with thumb latch for easy termination.

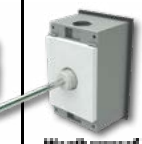
Outdoor Enclosures

BAPI-Box and BAPI-Box 2 Enclosures
The BAPI-Box and BAPI-Box 2 are made of polycarbonate and carry an IP66 and NEMA 4 rating. They remain watertight even after multiple openings of the hinged cover.

Weatherproof Enclosure ("Bell Box")
The Weatherproof Enclosure is made of cast aluminum and carries a NEMA 3R and IP24 rating.

Note: For more information about NEMA and IEC enclosure ratings see BAPI's application notes NEMA Enclosure Ratings and IEC Enclosure Ratings.



BAPI Enclosure Style	 No Box (NB)	 BAPI-Box (BB)	 BAPI-Box 2 (BB2)	 BAPI-Box 4 (BB4)	 BAPI-Box Crossover (BBX)	 Junction Box (JB)	 Weatherproof (WP)
List Price	$0	$12	$12	$0	$0	$3	$12
Rating	N/A	NEMA 4X, IP66	NEMA 4X, IP66	IP10 (IP44 w/ knockout plug installed)	IP10 (IP44 with knockout plug installed)	NEMA 1, IP10	NEMA 3R, IP24
Water Tight	N/A	*Yes	*Yes	No	No	No	**Yes
Outdoor Use	No	*Yes	*Yes	No	No	No	**Yes
Integrated Cover	N/A	Yes	Yes	Yes	Yes	No	No
Cover Screws Required	N/A	*No	*No	No	No	Yes	Yes
Conduit Openings	N/A	5	5	4	3	11	3
Clean-Cut Tool Required	No	Yes	Yes	No	No	No	No
# of Thermistors	0	2	1	0	1	1	1
Custom Branding	N/A	Yes	Yes	Yes	Yes	No	No
Material	Nylon 6/6, UL94-HB	Polycarbonate UL94-V0	Polycarbonate UL94-V0	Nylon 6/6 Base, UL94-HB Polycarb. Cover, UL94-V0	Nylon 6/6 Base, UL94-HB Polycarb. Cover, UL94-V0	Galvanized Steel	Cast Aluminum
Dimensions	N/A	5 x 4.1 x 2.5" (127 x 104 x 63.5mm)	4.9 x 2.8 x 2.35" (125 x 71.6 x 60mm)	2.8 x 2.8 x 2.09" (72 x 71.4 x 52.3mm)	3.1 x 2.2 x 1.9" (79 x 56 x 48mm)	2.15 x 2.15 x 1.94" (54.6 x 54.6 x 49mm)	4.5 x 2.75 x 2.2" (114 x 70 x 55mm)
Weight	N/A	0.44 lbs	0.28 lbs	0.18 lbs	0.10 lbs	0.21 lbs	0.53 lbs

*Cover screws required to achieve NEMA 4X/IP66 rating

**Hot Water Wash - Thermistor is overmolded and sealed in thermoplastic nylon.

BAPI-Stat “Quantum” with Display

Temperature Sensors

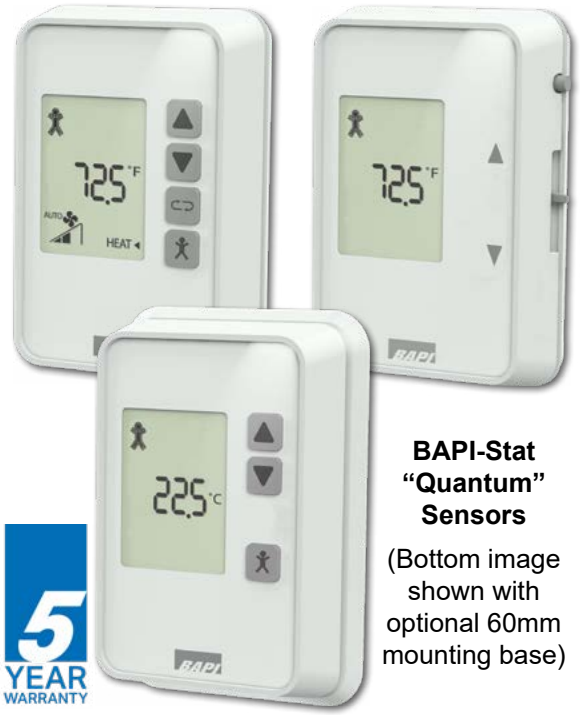
Rev. 01/10/25

Features & Options

- BAPI-Stat “Quantum” Enclosure Style with Higher Contrast Display for Improved Clarity at Greater Distances
- Pushbutton or Slider Setpoint Adjustment
- Large Display with Multiple Indicators and Icons
- Optional Fan Speed and Mode Control

The BAPI-Stat “Quantum” room temperature sensors feature a modern enclosure style with pushbutton or slider setpoint adjustment and override. The LCD can display both temperature as well as room occupancy status. The display has been upgraded for higher contrast, providing improved clarity at greater distances.

The unit is available with optional occupancy override, comm jack and fan speed and mode control for applications with fan coils, heat pumps or unit ventilators. A 60mm mounting base is also available to fit European style junction boxes.



5 YEAR WARRANTY

BAPI-Stat “Quantum” Sensors

(Bottom image shown with optional 60mm mounting base)

Specifications

Power for 24 VDC Power Units (default):
0 to 5 VDC Setpoint or Resistive Setpoint:
9 to 40 VDC (24 VDC nominal)

0 to 10 VDC Setpoint or Resistive Setpoint:
15 to 40 VDC (24 VDC nominal)

Any Allowed Setpoint: 15 to 28 VAC (24 VAC nominal)
Note: AC power requires a separate pair of shielded wires.

Power for Optional 5 VDC Power Units:
0 to 5 VDC Setpoint or Resistive Setpoint:
5VDC, +/-1% nominal, Input regulation affects accuracy

Power Consumption: 13 mA max DC; .32 VA max AC

Sensing Element:
Thermistor or RTD (See Sensors Sect. for Specs.)

Wiring: 2 to 6 pair of 16 to 22AWG*

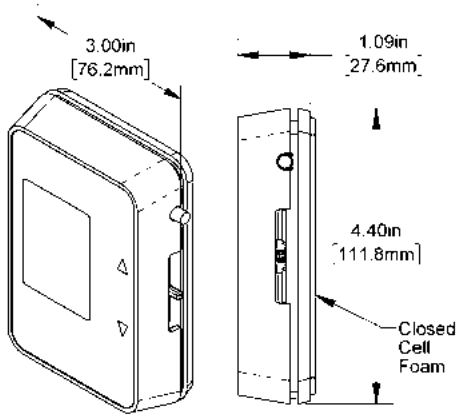
Mounting:
Standard 2”x4” junction box, European junction box or drywall mount (screws provided)

Environmental Operation Range:
Temperature: 32 to 122 °F (0 to 50 °C)
Humidity: 0 to 95%, non-condensing

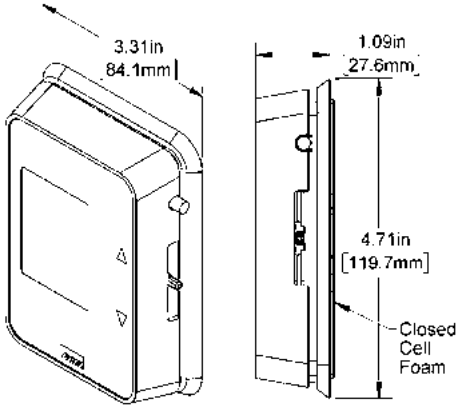
Enclosure Material: ABS Plastic, UL94 V-0

Agency: CE EN 61326-1:2013 EMC, RoHS

*BAPI recommends that you do not run wiring for the Room Units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils. Also, these units are not designed for line voltage applications.



Unit with Standard Mounting Base



Unit with 60mm Mounting Base
(Fits European wall boxes and junction boxes with 60mm mounting centers)

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BAPI-Stat “Quantum” with Display

Temperature Sensors

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection.

BAPI-Stat “Quantum” Temperature Sensor Option Selection Guide:

BA/TQ (**#1**) - (**#2**) - (**#3**) - (**#4**)(**#5**) - (**#6**) - (**#7**) Unit w/ Standard Mounting Base

BA/TQ60 (**#1**) - (**#2**) - (**#3**) - (**#4**)(**#5**) - (**#6**) - (**#7**) Unit w/ 60mm Mounting Base

#1: Display (required)
F .....Temperature Displayed in °F $125
C .....Temperature Displayed in °C.....$125

#2: Temperature Sensor (required)
A .....1K Platinum RTD (385 curve)
B .....10K-2 Thermistor
C .....10K-3 Thermistor
D .....10K-3[11K] Thermistor
E .....20K Thermistor
F .....1.8K Thermistor
G.....1K Ω Nickel RTD $39
H .....3K Thermistor
ES.....External Sensor for Display Only, Order 10K-2 Thermistor Separately

#3: Setpoint Adjustment (required)
1.....Slider Setpoint Adjustment
2.....Pushbutton Setpoint Adjustment
X .....No Setpoint Adjustment

#4: Setpoint Display Range (required)
A .....-3 to +3
B .....-5 to +5
C .....50 to 90°F or 10 to 32°C
D .....55 to 85°F or 13 to 30°C
E .....60 to 80°F or 15 to 27°C
F .....65 to 80°F or 18 to 27°C
X .....No Setpoint Adjustment

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

#5: Setpoint Output Range (required)
00.....0 to 5V
10.....0 to 10V**
40.....0 to 1KΩ
60.....0 to 10KΩ
80.....0 to 20KΩ
81.....4.75K to 24.75KΩ
82.....6.19K to 26.19KΩ
84.....10K to 30KΩ
X .....No Setpoint Adjustment

#6: Occupant Override (required)
J.....Override as a Separate Output
N .....Override in Parallel (//) with Sensor
P .....Override in Parallel (//) with Setpoint
X .....No Override

#7: Optional Selections* (optional)
A .....Differential Ground
B .....Comm Jack C35.....$10
C .....Comm Jack C11 .....$20
D .....Comm Jack C22.....$25
E .....5 Volt Input Power**
F .....Test & Balance Switch.....$7.50
G.....XLD Fan Speed Adjustment
H .....X01 Fan Speed Adjustment
I.....X02 Fan Speed Adjustment
J.....X06 Fan Speed Adjustment
K .....HCF Heat/Cool Mode Control
L.....H01 Heat/Cool Mode Control

*When more than one is selected, put in alphabetical order. Only one Fan Speed or Mode Control option can be selected. Additional Optional Selections and descriptions can be found on page I4.

**0 to 10V Setpoint Output Range is not available if 5 Volt Input Power is selected.

Example Number:
BA/ TQ(**F**) - (**B**) - (**1**) - (**C**)(**80**) - (**J**)

Actual Number (with brackets removed): BA/TQF-B-1-C80-J

Description: BAPI-Stat “Quantum” Room Temperature Sensor with Standard Mounting Plate, °F Display, 10K-2 Thermistor Temperature Sensor, Slider Setpoint Adjustment, 50 to 90°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Override as a Separate Output, No additional optional selections.

List Price: $125 (Base Price) = $125 List Price

Your Number: BA/

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BAPI-Stat “Quantum Prime” Temp & Humidity Sensor

Temp or Temp/Humidity Sensors

Rev. 03/06/24

Features & Options

- BAPI-Stat "Quantum Prime" Enclosure Style with Higher Contrast Display for Improved Clarity at Greater Distances
- Membrane Keypad for Wipedown Cleaning
- Temperature and Humidity Setpoint Adjustment

The BAPI-Stat “Quantum Prime” is designed for operating rooms, clean rooms and elder care facilities. It features a large display and membrane keypad for wipedown cleaning. It is available with temperature and humidity measurement, temperature and humidity setpoint and occupant override.

The unit includes a number of field adjustments including °F or °C display, temperature and humidity offset and setpoint lockout. The display can also be set to show a large temperature and small %RH reading or a large %RH and a small temperature reading when 4 buttons are present.

This unit can be configured with up to four transmitted variables. Contact your BAPI representative for details.

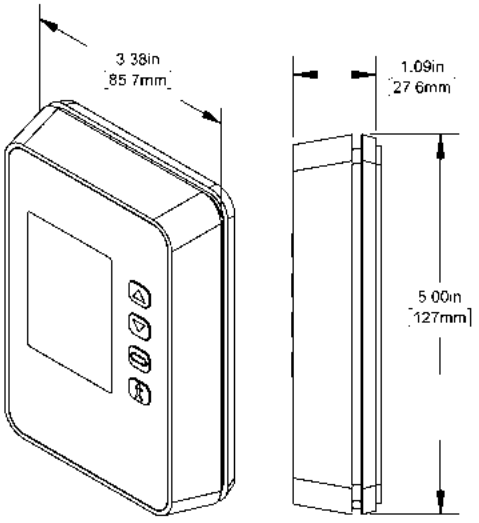
A 60mm mounting base is also available to fit European style junction boxes.



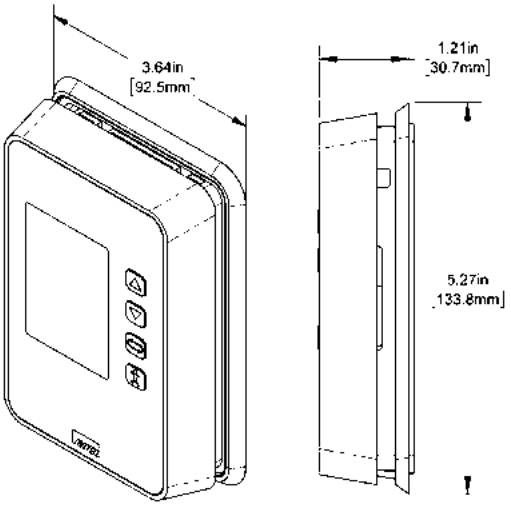
BAPI-Stat “Quantum Prime” Temp & Humidity Sensor

(Image at right shown with optional 60mm mounting base)

Dimensions



Unit with Standard Mounting Base



Unit with 60mm Mounting Base
(Fits European wall boxes and junction boxes with 60mm mounting centers)

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Ordering Information

The BAPI-Stat “Quantum Prime” Wipedown Sensor is a powerful unit with many options. Please call your BAPI representative for ordering. We will provide a quote and keep it on record for future orders.

Specifications

Power Supply:
10 to 40 VDC (15 to 24 VDC Recommended) for 4 to 20 mA or 0 to 5 VDC Outputs
15 to 40 VDC (15 to 24 VDC Recommended) for 0 to 10 VDC Outputs
12 to 28 VAC (Requires a separate pair of shielded wires) for 0 to 5 VDC Outputs
15 to 28 VAC (Requires a separate pair of shielded wires) for 0 to 10 VDC Outputs

Power Consumption:
100 mA max DC ..... 4 to 20 mA Output (<30mA typical)
75 mA max DC ..... 0 to 5 or 0 to 10 VDC Outputs (6mA typical)
1.9 VA max AC..... 0 to 5 or 0 to 10 VDC Outputs (0.2VA typical)

Outputs: 4 active outputs plus 1 passive temp sensor
Volts..... 0 to 5 VDC or 0 to 10VDC, Impedance >10KΩ
Current..... 4 to 20 mA, Impedance <500Ω @ 24 VDC
Resistance..... Setpoint, 5 VDC @ 5 mA max
Relay Contact..... N.O., 500 mA @ 24 VDC max
Temp. Sensor ..... Passive RTD or Thermistor

Inputs:
External Override..... 5 VDC or 24 VDC/VAC
External Sensor..... 10K-2 Themistor purchased separately.

Sensing Elements for Active Outputs and Display:
Temperature ..... 10K-2 Thermistor
Humidity..... Capacitive Polymer, ±2%RH

Mounting: Standard 2”x4” junction box, European junction box or drywall mount (screws provided)

Environmental Ambient:
Temperature ..... 32 to 122ºF (0 to 50ºC)
Humidity..... 0 to 95%, non-condensing
Storage..... 32 to 185°F (0 to 85°C)

Wiring: 2 to 6 pair of 16 to 22 AWG*

Enclosure Material: ABS Plastic, UL94 V-0

Agency: CE EN 61326-1:2013 EMC, RoHS

***BAPI** recommends that you do not run wiring for room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.

BAPI-Stat “Quantum Slim” Sensor

Temperature Sensors

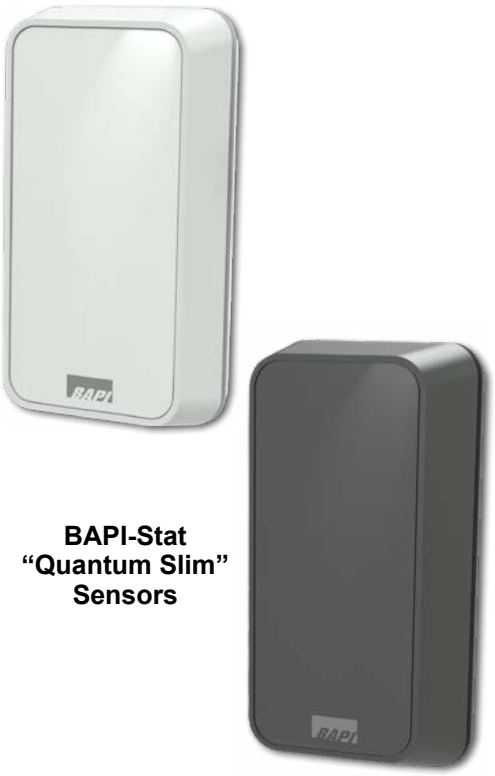
Rev. 12/01/21

Features & Options

- New BAPI-Stat “Quantum Slim” Enclosure Style
- White or Black Color Option
- Wide Selection of Temperature Sensing Elements
- Limited Lifetime Warranty

The BAPI-Stat “Quantum Slim” Temperature Room Sensor is designed for applications where a temperature output is required with a sleek, low profile room enclosure.

The unit is available with thermistor and RTD elements. Ideal for locations where aesthetics are as important as the temperature measurement.



BAPI-Stat “Quantum Slim” Sensors

Specifications

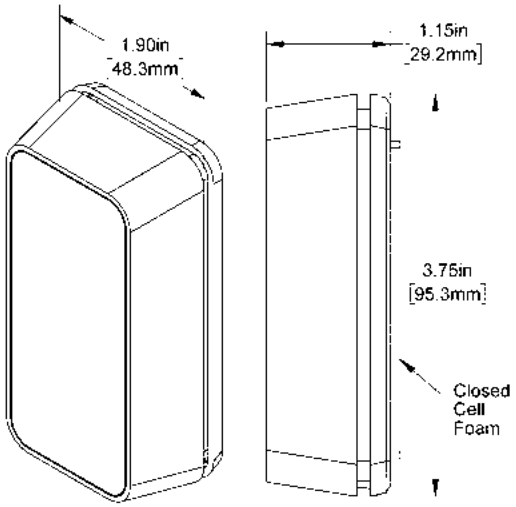
Wiring:
One pair of 16 to 22 AWG wires

Mounting:
Surface or drywall mount (screws provided)

Sensing Element:
Thermistor or RTD (See Sensors Sect. for Specs.)

Environmental Operation Range:
Temperature: 32 to 122 °F (0 to 50 °C)
Humidity: 0 to 95%, non-condensing

Agency: RoHS, CE



Ordering Information

BAPI-Stat 4™ Room Unit with Display

Temperature Sensors

Rev. 12/01/21

Features & Options

- Patented Enclosure Style with Large Display
- Robust Tactile Pushbuttons
- Setpoint Adjust (Slider or Pushbutton)
- Optional Override, Fan Speed & Mode Control
- Optional Communication Jack and Test & Balance

The patented BAPI-Stat 4 Style Enclosure features a large LCD with all the visual indicators on the display itself. It provides local indication of Temperature and Setpoint with Setpoint Adjust and Override.

It also has optional Fan Speed and Mode Control for applications with Fan Coils, Heat Pumps or Unit Ventilators. The Setpoint is available as a slidepot or as pushbuttons and is displayed on the LCD for a short time after an adjustment.

The Override is a momentary signal that can be configured in parallel with the sensor or setpoint, or as a separate output or a latching switch. An optional 3.5mm (1/8”), RJ11 or RJ22 Communication Jack can be mounted in the base to provide direct access to the network.



BAPI-Stat 4 Units

Specifications

Power for 24VDC Power Units:
0 to 5 VDC Setpoint or Resistive Setpoint ..... 9 to 40 VDC (24 VDC nominal)
0 to 10 VDC Setpoint or Resistive Setpoint ... 15 to 40 VDC (24 VDC nominal)
Any Allowed Setpoint..... 15 to 28 VAC (24 VAC nominal)
Note: AC power requires a separate pair of shielded wires.

Power Consumption: 7 mA max DC; .17 VA max AC

Sensing Element:
Thermistor or RTD (See Sensors Sect. for Specs.)

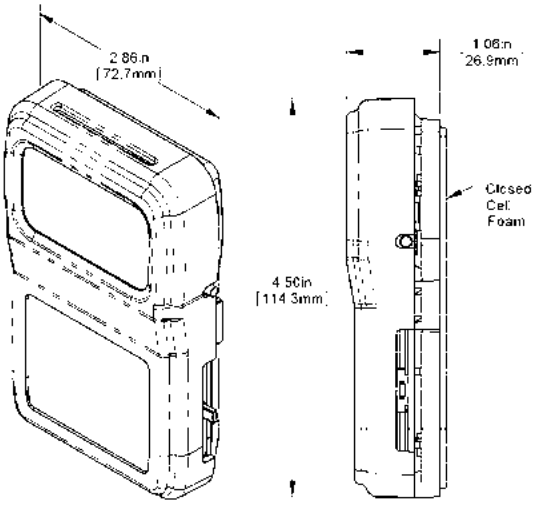
Wiring: 2 to 4 pair of 16 to 22AWG*

Communication Jack:
Optional 3.5mm (1/8”) Phono Jack

Mounting:
Standard 2x4” J-box or drywall mount (screws provided)

Environmental Operation Range:
Temperature: 32 to 122 °F (0 to 50 °C)
Humidity: 0 to 95%RH, non-condensing

Agency: RoHS & CE



*BAPI recommends that you do not run wiring for the Room Units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils. Also, these units are not designed for line voltage applications.

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BAPI-Stat 4™ Room Unit with Display

Temperature Sensors

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Omit the designator and dashes for optional selections that are not required in your configuration.

BAPI-Stat 4 Option Selection Guide:

BA/ (**#1**)(**#2**) - (**#3**)(**#4**) - (**#5**) - (**#6**) - (**24**) - (**#8**) - (**CG**)

#1: Room Sensor Style (required)
BS4M.... BAPI-Stat 4, Pushbutton Setpoint
BS4S .... BAPI-Stat 4, Slider Setpoint

#2: °F or °C Display (required)
F ..... Temperature Displayed in °F
C ..... Temperature Displayed in °C

#3: Setpoint Display Range (optional)
A ..... -3 to +3
B ..... -5 to +5
C ..... 50 to 90 °F or 10 to 32 °C
D ..... 55 to 85 °F or 13 to 30 °C
E ..... 60 to 80 °F or 15 to 27 °C
F ..... 65 to 80 °F or 18 to 27 °C

#4: Setpoint Output Range (optional)
00..... 0 to 5 V
10..... 0 to 10 V
60..... 0 to 10 KΩ
80..... 0 to 20 KΩ
81..... 4.75 K to 24.75 KΩ
82..... 6.19 K to 26.19 KΩ
84..... 10 K to 30 KΩ

#5: Occupant Override (required)
J..... Override as a Separate Output
N..... Override in Parallel (//) with Sensor
P ..... Override in Parallel (//) with Setpoint
Z ..... No Override

#6: Communication Jack (optional)
C35L..... 3.5mm Phono Style Jack

#7: Operating Power (required)
24..... 9 to 40 VDC or 15 to 28 VAC

#8: Temperature Sensor (required)
1375..... 1K Platinum RTD (375 curve)
1NI..... 1K Nickel RTD
1..... 1K Platinum RTD (385 curve)
18..... 1.8K Thermistor
3..... 3K Thermistor
102..... 10K-2 Thermistor
103..... 10K-3 Thermistor
10311.... 10K-3[11K] Thermistor
20..... 20K Thermistor

#9: Common Ground Config. (required)
CG ..... Common Ground

Additional options including Fan Speed and Mode Control are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number:
BA/ (**BS4M**)(**F**) - (**E**)(**80**) - (**N**) - (**C35L**) - (**24**) - (**102**) - (**CG**)

Actual Number (with parenthesis removed): BA/BS4MF-E80-N-C35L-24-102-CG

Description: BAPI-Stat 4 with Pushbutton Setpoint, °F Display, 60 to 80°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Override in Parallel with Sensor, 3.5mm Phono Style Comm. Jack, 24V Operating Power, 10K-2 Thermistor Temperature Sensor, Common Ground Config.

Your Number: BA/

RµPS Room Units

Temperature Sensors

Rev. 01/31/25

Features & Options

- Delta Style Enclosure with Display
- Slider Setpoint Adjustment
- Optional Occupancy Override with LED Indication
- Optional Communication Jack
- Wide Selection of Temperature Sensing Elements

The RµPS unit comes in the popular Delta Style Enclosure with LCD. It provides local indication of temperature with slider setpoint adjustment and optional override with LED and communications jack.



5 YEAR WARRANTY

Specifications

Power:
9 to 40 VDC (15 to 24 VDC recommended)
15 to 28 VAC
(AC voltage requires a separate pair of shielded wires)

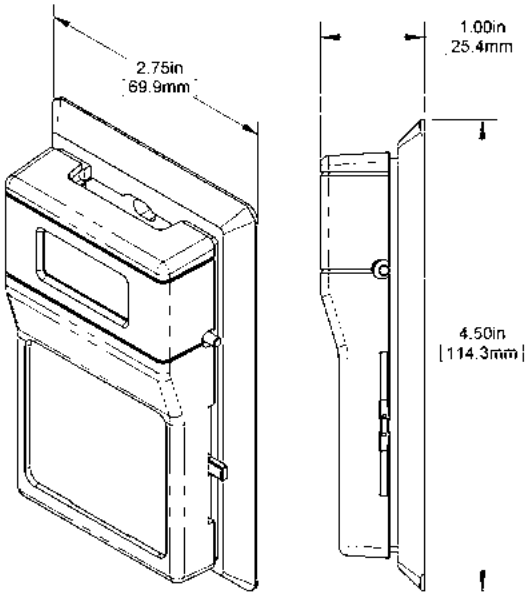
Power Consumption:
10 mA max. DC, .2 VA maximum AC

Sensing Element:
Thermistor or RTD (See Sensors Sect. for Specs.)

Mounting:
Standard 2”x4” J-box or drywall mount
(screws provided)

Environmental Operation Range:
Temp: 32 to 122°F (0 to 50°C)
Humidity: 0 to 95%RH, non-condensing

Enclosure Material & Rating:
ABS Plastic, UL94 HB



Associated Products

The BAPI-Guard

Prevents tampering, physical damage and unauthorized adjustment of thermostats. Available in two sizes to fit most thermostats.



VC350A “EZ” - Voltage Converter

BAPI recommends using DC power on room units for a more stable reading. Our 350mA “EZ” unit is a perfect way to convert 24 VAC to 5, 12, 15 or 24 VDC.



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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Omit the designator and dashes for optional selections that are not required in your configuration.

RμPS Option Selection Guide:

BA/ (**#1**) - (**#2**) - (**#3**)(**#4**) - (**#5**) - (**#6**) - (**24**) - (**#8**) - (**CG**) - (**BW**)

#1: Room Sensor Style (required)
RuPS .... Slider Setpoint Adjustment $125

#2: °F or °C Display (required)
F ..... Temperature Displayed in °F
C ..... Temperature Displayed in °C

#3: Setpoint Display Range (optional)
A ..... -3 to +3
B ..... -5 to +5
C ..... 50 to 90 °F or 10 to 32 °C
D ..... 55 to 85 °F or 13 to 30 °C
E ..... 60 to 80 °F or 15 to 27 °C
F ..... 65 to 80 °F or 18 to 27 °C

#4: Setpoint Output Range (optional)
00..... 0 to 5 V
10..... 0 to 10 V
60..... 0 to 10 KΩ
80..... 0 to 20 KΩ
81..... 4.75 K to 24.75 KΩ
82..... 6.19 K to 26.19 KΩ
84..... 10 K to 30 KΩ

#5: Occupant Override (required)
J..... Override as a Separate Output
N..... Override in Parallel (//) with Sensor
P ..... Override in Parallel (//) with Setpoint
Z ..... No Override

#6: Communication Jack (optional)
C35L ..... 3.5mm Phono Style Jack $10

#7: Operating Power (required)
24..... 9 to 40 VDC or 15 to 28 VAC

#8: Temperature Sensor (required)
1375..... 1K Platinum RTD (375 curve)
1NI ..... 1K Ω Nickel RTD $39
1..... 1K Platinum RTD (385 curve)
18..... 1.8K Thermistor
3..... 3K Thermistor
102..... 10K-2 Thermistor
103..... 10K-3 Thermistor
10311 .... 10K-3[11K] Thermistor
20..... 20K Thermistor

#9: Common Ground Config. (required)
CG ..... Common Ground

#10: Enclosure Color (required)
BW..... Bright White

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/ (**RuPS**) - (**F**) - (**E**)(**80**) - (**N**) - (**C35L**) - (**24**) - (**102**) - (**CG**) - (**BW**)

Actual Number (with parenthesis removed): BA/RuPS-F-E80-N-C35L-24-102-CG-BW

Description: RuPS Unit with Slider Setpoint, °F Display, 60 to 80°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Override in Parallel with Sensor, 3.5mm Phono Style Comm. Jack, 24V Operating Power, 10K-2 Thermistor Temperature Sensor, Common Ground Config., Bright White Enclosure Color

List Price: $125 (RuPS) + $10 (Comm. Jack) = $135 List Price

Your Number: BA/

BAPI-Stat 4 “X-Combo” Room Unit

Temperature Sensors

Rev. 05/23/24

Features & Options

- Temperature and Humidity Setpoint Adjustment
- BAPI-Stat 4 Enclosure Style
- Large Easy-to-Read Display, °F or °C Indication
- Fully Compensated 2% RH Sensor
- Optional Override, Resistive Temperature Sensor and Communication Jack

The BAPI-Stat 4 “X-Combo” Room Unit features local indication of both temperature and humidity with optional Temperature Setpoint, Humidity Setpoint and Local Occupancy Override.

The optional LCD shows room temperature in °C or °F and room humidity in %RH. In addition, the unit has adjustable offsets for both temperature and humidity and the transmitter ranges are field configurable. This unit can be configured with up to four transmitted variables.



BAPI-Stat 4 “X-Combo”

5 YEAR WARRANTY

Specifications

Supply Voltage:
DC Power: .....16 to 30 VDC
AC Power: .....18 to 30 VAC*

Power Consumption: 50mA max. DC, 1.5VA max. AC

RH/Temp Sensor Construction:
Communicating Integrated Circuit

Humidity: Capacitive Polymer,
±2%RH @ 25°C (77°F), 20 to 80%RH

Temp: Semi-conductor Band Gap,
±0.5°C (±0.9°F) @ 20 to 40°C (68 to 104°F)

Optional Direct Temp. Sensor:
Thermistor or RTD (See Sensors Sect. for Specs.)

Available Outputs:
3 Configurable, 1 Passive Sensor

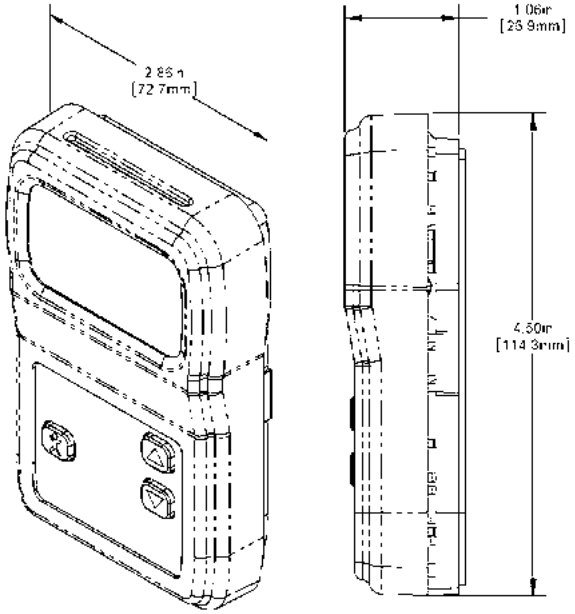
Termination: 8 Terminals, 16 to 22 AWG**

Mounting:
Standard 2x4” J-Box or Drywall, screws provided

Enclosure Material: ABS Plastic, UL94 V-0

Ambient (Enclosure):
Temperature: .32 to 122ºF (0 to 50ºC)
Humidity: .....0 to 95%RH, Non-Cond.

Agency: RoHS



*AC power requires a separate pair of shielded wires.

**BAPI recommends that you do not run wiring for the room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.

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Ordering Information

The “X-Combo” is a very powerful unit with many options. Please call your BAPI representative for ordering. We will provide a quote and keep it on record for future orders

BAPI-Stat “Quantum” Without Display

Temperature Sensors

Rev. 12/01/21

Features & Options

- Optional Setpoint, Override and Communication Jack
- Available Pressure Pickup Port
- Limited Lifetime Warranty

Enclosure Style
The BAPI-Stat “Quantum” sensors without display feature a modern enclosure style with optional slider setpoint adjustment and override. A 60mm mounting base is also available to fit European style junction boxes.

Setpoint
Setpoint is available as a slidepot in various ranges.

Override
Optional discreet momentary signal that can be configured to be compatible with any controller.

Communication Jack
Available with a 3.5mm phono plug style jack.

Pressure Pickup Port
Pressure Pickup Ports are available for units without setpoint or override. See “Pressure Pickup Ports” in the Pressure Section for ordering.



BAPI-Stat “Quantum” (with Standard Base)

BAPI-Stat “Quantum” (with 60mm Base)

Specifications

Sensing Element:
Thermistor or RTD
(See Sensors Section for Specifications.)

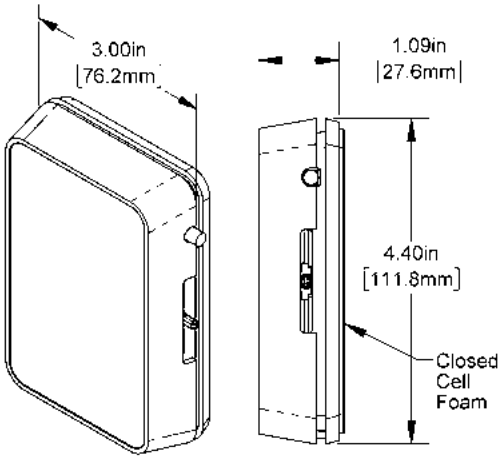
Wiring: 16 to 22 AWG

Environmental Operation Range:
Temperature: 32 to 122 °F (0 to 50 °C)
Humidity: 0 to 95%, non-condensing

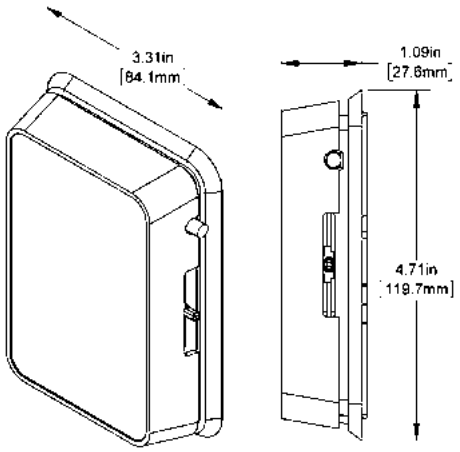
Enclosure Material:
ABS Plastic, UL94 V-0

Mounting:
Standard 2”x4” junction box, European junction box or drywall mount (screws provided)

Agency: CE EN 61000-6-2 EMC, RoHS



BAPI-Stat “Quantum”
(with Standard Mounting Base)



BAPI-Stat “Quantum”
(with 60mm Mounting Base)

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BAPI-Stat “Quantum” Without Display

Temperature Sensors

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

BAPI-Stat “Quantum” Without Display Option Selection Guide:

BA/ (**#1**) - (**#2**)(**#3**)(**#4**) - (**#5**) - (**#6**) - (**#7**)

#1: Temperature Sensor (required)

1K[375]	1K Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18

#2: Room Sensor Style (required)

BQ	BAPI-Stat “Quantum” Standard Base	$7
BQEU	BAPI-Stat “Quantum” 60mm Base	$7

#3: Setpoint Output Range (optional)

60	0 to 10 KΩ	$6
80	0 to 20 KΩ	$6
81	4.75 K to 24.75 KΩ	$6
82	6.19 K to 26.19 KΩ	$6
84	10 K to 30 KΩ	$6

#4: Setpoint Legend

(Required for units with Setpoint)

L8	Up/Down Arrows

#5: Override (required)

J	Override as a Separate Output	$5
N	Override in Parallel with Sensor	$5
P	Override in Parallel w/ Setpoint	$5
Z	No Override	

#6: Communication Jack (optional)

C35	3.5mm Phono Style Jack	$7

#7: Common or Differential Gnd (required)

CG	Common Ground
DF	Differential Inputs

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options.

Pressure Pickup Ports are available for units without Setpoint or Override. See “Pressure Pickup Ports” in the Pressure Section for ordering.

Example Number: BA/ (**10K-2**) - (**BQ**)(**80**)(**L8**) - (**N**) - (**C35**) - (**CG**)

Actual Number (with parenthesis removed): BA/10K-2-BQ80L8-N-C35

Description: 10K-2 Thermistor, BAPI-Stat “Quantum”, 0 to 20K Setpoint Output Range, Override in Parallel with Sensor, C35 Comm. Jack, Common Ground Configuration

List Price:
$18 (Thermistor) + $7 (Enclosure) + $6 (Setpoint) + $5 (Override) + $7 (Comm. Jack) = $43 List Price

Your Number: BA/

BAPI-Stat 4 & Delta Style Units Without Display

Temperature Sensors

Rev. 12/01/21

Features & Options

- Optional Setpoint, Override and Comm. Jack
- Available Pressure Pickup Port
- Limited Lifetime Warranty

Enclosure Style
The BAPI-Stat 4 and Delta Style units without display are available with optional slider setpoint adjustment and override.

Setpoint
Setpoint is available as a slidepot in various ranges.

Override
Optional discreet momentary signal that can be configured to be compatible with any controller.

Communication Jack
Available with a 3.5mm phono plug style jack.

Pressure Pickup Port
Pressure Pickup Ports are available for Delta Style enclosures without setpoint or override. See "Pressure Pickup Ports" in the Pressure Section for ordering.



BAPI-Stat 4

Delta Style

Specifications

Sensing Element:
Thermistor or RTD
(See Sensors Section for Specifications.)

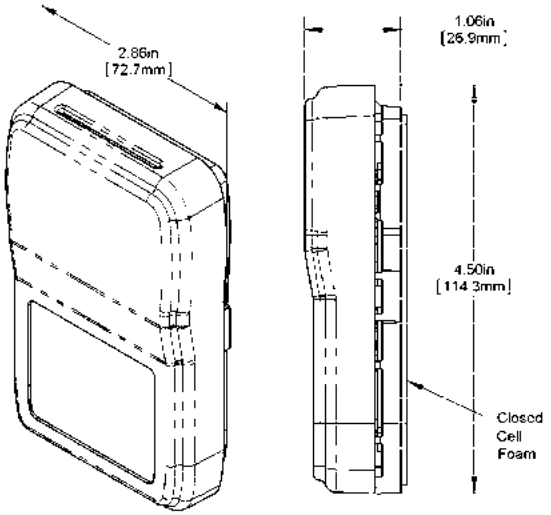
Wiring: 16 to 22 AWG

Environmental Operation Range:
Temperature: 32 to 122 °F (0 to 50 °C)
Humidity: 0 to 95%, non-condensing

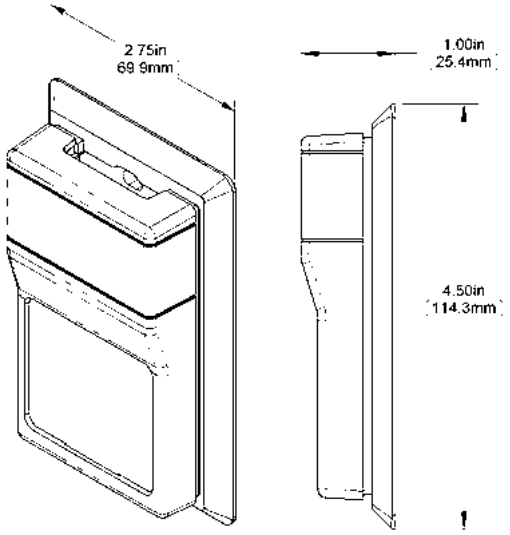
Enclosure Material:
ABS Plastic, UL94 V-0

Mounting:
Standard 2"x4" junction box, European junction box or drywall mount (screws provided)

Agency: CE EN 61000-6-2 EMC, RoHS



BAPI-Stat 4



Delta Style

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BAPI-Stat 4 & Delta Style Units Without Display

Temperature Sensors

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

BAPI-Stat 4 & Delta Style Without Display Option Selection Guide:

BA/ (**#1**) - (**#2**)(**#3**)(**#4**) - (**#5**) - (**#6**) - (**#7**) - (**#8**)

#1: Temperature Sensor (required)

1K[375]	1K Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18

#2: Room Sensor Style (required)

B4	BAPI-Stat 4	$7
R	Delta Style Enclosure	$7

#3: Setpoint Output Range (optional)

60	0 to 10 KΩ	$6
80	0 to 20 KΩ	$6
81	4.75 K to 24.75 KΩ	$6
82	6.19 K to 26.19 KΩ	$6
84	10 K to 30 KΩ	$6

#4: Setpoint Legend

(Required for units with Setpoint)

L6	Cool/Warm
L0	No Legend

#5: Override (required)

J	Override as a Separate Output	$5
N	Override in Parallel with Sensor	$5
P	Override in Parallel w/ Setpoint	$5
Z	No Override	

#6: Communication Jack (optional)

C35	3.5mm Phono Style Jack	$7

#7: Common or Differential Gnd (required)

CG	Common Ground
DF	Differential Inputs

#8: Delta Style Enclosure Color

(required for Delta Style Enclosures)

BW	Bright White Delta Style Enclosure

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options.

Pressure Pickup Ports are available for the Delta Style Enclosures without Setpoint or Override. See "Pressure Pickup Ports" in the Pressure Section for ordering.

Example Number: BA/ (**10K-2**) - (**B4**)(**80**)(**L6**) - (**N**) - (**C35**) - (**CG**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-B480L6-N-C35

Description: 10K-2 Thermistor, BAPI-Stat 4, 0 to 20K Setpoint Output Range, Cool Warm Legend, Override in Parallel with Sensor, C35 Comm. Jack, Common Ground Configuration

List Price:
$18 (Thermistor) + $7 (Enclosure) + $6 (Setpoint) + $5 (Override) + $7 (Comm. Jack) = $43 List Price

Your Number: BA/

Decora Style Room Unit

Temperature Sensors

Rev. 12/01/21

Features & Options

- Sensor Fits Inside a Decora Style Rocker Switch Plate Cover
- LCD Readout of Local Temperature
- Optional Setpoint Adjustment
- °F or °C Indication (Field Selectable)
- Wide Selection of Temperature Sensing Elements

The low profile Decora Style Room Unit fits inside a Decora Style Rocker Switch Wall Plate Cover. It features measurement and display of local temperature with optional pushbutton setpoint adjustment. The room temperature is shown on an easy-to-read LCD with field-selectable °F or °C display.

The Setpoint values are transmitted as resistive values for easy configuration with the controller. The sensor and setpoint outputs can be configured for “common ground” or “differential” controller inputs.



Decora Style Units with and without Setpoint Adjustment

Specifications

Power: 5 VDC to 12 VDC ±5%

Power Consumption: 0.5 mA

Sensing Element:
Thermistor or RTD (See Sensors Sect. for Specs.)

Wiring: 2 to 3 pair of 16 to 22AWG*

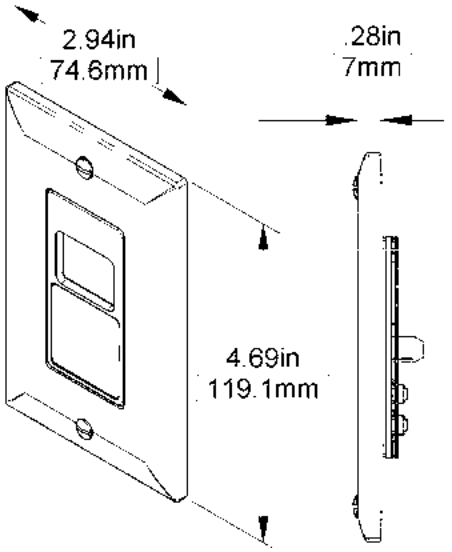
Mounting:
Standard 2”x4” J-box with Decora Style Trim Plate

Environmental Operation Range:
Temperature: 32 to 122 °F (0 to 50 °C)
Humidity: 0 to 95%, non-condensing

Material: ABS Plastic

Material Rating: UL94 V-0

*__BAPI__ recommends that you do not run wiring for the Room Units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.



Associated Products

VC350A “EZ” - Voltage Converter

BAPI recommends using DC power on room units for a more stable reading. Our 350mA “EZ” unit is a perfect way to convert 24 VAC to 5, 12, 15 or 24 VDC.



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Use the Configurator below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

Decora Room Sensors Option Selection Guide:

BA/ (**#1**)(**#2**) - (**#3**)(**#4**) - (**#5**) - (**CG**) - (**#7**)

#1: Room Sensor Style (required)
RuPD .... Pushbutton Setpoint Adjustment

#2: °F or °C Display (required)
F ..... Temperature Displayed in °F
C ..... Temperature Displayed in °C

#3: Setpoint Display Range (optional)
A ..... -3 to +3
B ..... -5 to +5
C ..... 50 to 90 °F or 10 to 32 °C
D ..... 55 to 85 °F or 13 to 30 °C
E ..... 60 to 80 °F or 15 to 27 °C
F ..... 65 to 80 °F or 18 to 27 °C

#4: Setpoint Output Range (optional)
00..... 0 to 5 V
10..... 0 to 10 V
60..... 0 to 10 KΩ
80..... 0 to 20 KΩ
81..... 4.75 K to 24.75 KΩ
82..... 6.19 K to 26.19 KΩ
84..... 10 K to 30 KΩ

#5: Temperature Sensor (required)
1375..... 1K Platinum RTD (375 curve)
1NI..... 1K Nickel RTD
1..... 1K Platinum RTD (385 curve)
18..... 1.8K Thermistor
3..... 3K Thermistor
102..... 10K-2 Thermistor
103..... 10K-3 Thermistor
10311.... 10K-3[11K] Thermistor
20..... 20K Thermistor

#6: Common Ground Config. (required)
CG ..... Common Ground

#7: Cover Plate (required)
NC ..... No Cover
-SWC .... Standard White Cover Plate

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/ (**RuPD**)(**F**) - (**E**)(**80**) - (**102**) - (**CG**) - (**SWC**)

Actual Number (with parenthesis removed): BA/RuPDF-E80-102-CG-SWC

Description: Decora Style Unit with Setpoint and °F Display, 60 to 80°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, 10K-2 Thermistor Temperature Sensor, Common Ground Configuration, Standard White Cover Plate

Your Number: BA/

B22 Low Profile "Button" Sensor

Temperature Sensors

Rev. 12/01/21

Features & Options

- Small Flush Sensor Mounting
- Accurate Direct Air Measurement
- Paintable with Latex or Oil Base
- Wide Selection of Sensing Elements
- Limited Lifetime Warranty

The Low Profile "Button" Sensor is ideal for locations where aesthetics are as important as the temperature measurement. The inconspicuous wall sensor mounts easily by pushing through a 1/2" hole and secured with a peel-off insulating adhesive ring. The only visible portion is a flush 7/8" dot on the wall.

The Low Profile "Button" Sensor is available in white or black with multiple thermistor or RTD sensors as shown in the ordering grid. Other sensor types are available on request.



White and Black "Button" Sensors

Specifications

Thermistor

Temp. Output ..... Resistance
Accuracy (Std) ..... ±0.36ºF, (±0.2ºC)
Stability ..... < 0.036ºF/Year, (<0.02ºC/Year)
Heat dissipation .... 2.7 mW/ºC
Temp. Drift ..... <0.02ºC per year
Probe range ..... -40º to 221ºF (-40º to 105ºC)

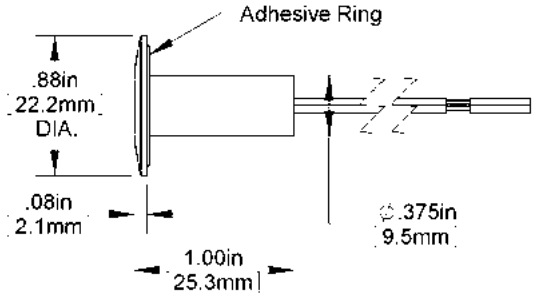
RTD

Platinum (PT)..... 100Ω or 1KΩ @0ºC, 385 curve
Platinum (PT)..... 1KΩ @0ºC, 375 curve
PT Accuracy (Std).. 0.12% @Ref, or ±0.55ºF, (±0.3ºC)
PT Stability ..... ±0.25ºF, (±0.14ºC)
PT Self Heating .... 0.4 ºC/mW @0ºC
PT Probe range .... -40º to 221ºF, (-40 to 105ºC)
Nickel (Ni) ..... 1KΩ @70ºF, JCI curve
Ni Probe range ..... -40º to 221ºF (-40 to 105ºC)

Sensitivity

Thermistor ..... Non-linear
Go to bapihvac.com "Sensor Specs"
RTD (PT) ..... 3.85Ω/ºC for 1KΩ RTD
3.75Ω/ºC for 1KΩ RTD
Nickel (Ni) ..... 2.95Ω/ºF for the JCI RTD

Wiring: One pair of 22 AWG wires



Wire Insulation:
Etched Teflon or Plenum-Rated

Mounting: 1/2" hole, push in plastic sheath with peel-off insulating adhesive ring.

Enclosure Material and Ratings:
Plastic, NEMA 1, UL94

Environmental Operating Range
Unit with Etched Teflon Wire:
-40 to 185°F (-40 to 85°C)

Unit with Plenum-Rated Wire:
-4 to 167°F (-20 to 75°C)

0 to 100% RH, Non-condensing

Agency: RoHS, CE

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Use the Configurator below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

Button Sensor Option Selection Guide:

BA/ (**#1**) - (**#2**) - (**#3**)

#1: Temperature Sensor (required)

1K[375] ..... 1K Platinum RTD (375 curve)
1K[NI]..... 1K Nickel RTD
1K ..... 1K Platinum RTD (385 curve)
1.8K ..... 1.8K Thermistor
3K ..... 3K Thermistor
10K-2 ..... 10K-2 Thermistor
10K-3 ..... 10K-3 Thermistor
20K ..... 20K Thermistor

#2: Button Sensor Color (required)

LPW..... Button Sensor, White
LPB..... Button Sensor, Black

#3: Lead Length (optional, 6” Etched Teflon Leads are Standard)

5..... 5 Feet of Plenum-Rated Cable
10..... 10 Feet of Plenum-Rated Cable
15..... 15 Feet of Plenum-Rated Cable

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/ (**10K-2**) - (**LPW**) - (**5**)

Actual Number (with parenthesis removed): BA/10K-2-LPW-5

Description: 10K-2 Thermistor Temperature Sensor, White Button Sensor, 5 Feet of Plenum-Rated Leads.

Your Number: BA/

T1K Transmitter Room Unit

Temperature Sensors

Rev. 02/28/24

Features & Options

- BAPI-Stat 4 Enclosure
- 4 to 20 mA Temperature Output
- Optional Display
- Optional Setpoint Adjustment, Override and Communication Jack

The T1K Transmitter Room Unit comes in the BAPI-Stat 4 style enclosures. They measure the room temperature and output a 4 to 20mA signal per the custom range selected at the time of order.

The BAPI-Stat 4 Style unit offers a full range of options including setpoint, override, display, communication jack, field offset, field ranging, °F or °C and a new stylish look.



BAPI-Stat 4 Units with and without display, setpoint and override

5 YEAR WARRANTY

Specifications

Power:
12 to 30 VDC (28 VDC max. recommended)

Transmitter Output:
4 to 20mA, 600Ω to 850Ω@24VDC

Power Consumption:
40 mA maximum

Sensing Element:
1KΩ Platinum RTD
(See Sensors Sect. for Specs.)

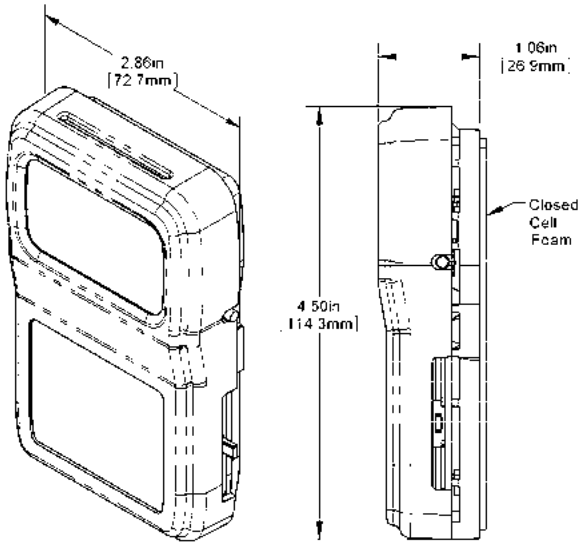
Environmental Operation Range:
Temperature: 15°F to 130°F, (-9° to 54°C)
Humidity: 0 to 95%, non-condensing

Mounting:
2x4" J-box or drywall mount, screws provided

Wiring:
1 to 3 pair of 16 to 22AWG

Material & Rating:
BAPI-Stat 4: ABS Plastic, UL94 V-0

Agency: CE EN 61326-1:2013 EMC, RoHS



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Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

T1K Room Transmitter Option Selection Guide

BA/ T1K (**#1**) - (**#2**) - (**#3**)(**#4**)(**#5**) - (**#6**) - (**#7**) - (**#8**)

#1: Temp Measurement Range (required)

[0 to 100F] ..0 to 100°F Temperature Range
[50 to 90F] ..50 to 90°F Temperature Range
[40 to 90F] ..40 to 90°F Temperature Range
[45 to 96F] ..45 to 96°F Temperature Range
[0 to 130F] ..0 to 130°F Temperature Range
[0 to 150F] ..0 to 150°F Temperature Range

[4 to 35C] ....4 to 35°C Temperature Range
[0 to 35C] ....0 to 35°C Temperature Range
[0 to 50C] ....0 to 50°C Temperature Range
[0 to 100C] ..0 to 100°C Temperature Range

#2: Display (required)

B4SD .....BAPI-Stat 4 with Display $185
B4SX .....BAPI-Stat 4, No Display $150

#3: Setpoint Display Range (required)

(Setpoint is not available for Delta Style Units)

A .....-3 to +3
B .....-5 to +5
C .....50 to 90 °F or 10 to 32 °C
D .....55 to 85 °F or 13 to 30 °C
E .....60 to 80 °F or 15 to 27 °C
F .....65 to 80 °F or 18 to 27 °C
X .....No Setpoint Display

#4: Setpoint Output Range

(Required if a Display Range is selected in #3)

16.....4 to 20 mA (requires “DF” in #8). $60
60.....0 to 10 KΩ $6
80.....0 to 20 KΩ $6
81.....4.75 K to 24.75 KΩ..... $6
82.....6.19 K to 26.19 KΩ..... $6
84.....10 K to 30 KΩ..... $6

#5: Setpoint Legend

(Required if a Display Range is selected in #3)

L6.....Cool/Warm Legend
L0.....No Legend

#6: Occupant Override (required)

J.....Override as a Separate Output $5
N.....Override in Parallel with Sensor.... $5
P .....Override in Parallel with Setpoint.. $5
Z .....No Override

#7: Communication Jack (optional)

C35L.....3.5mm Phono Style Jack $10

#8: Common or Differential Gnd (required)

CG .....Common Ground
DF.....Differential Inputs

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example #: BA/ T1K(**[50 to 90F]**) - (**B4SD**) - (**F**)(**80**)(**L6**) - (**N**) - (**C35L**) - ( )

Actual # (with parenthesis removed): BA/T1K[50 to 90F]-B4SD-F80L6-N-C35L-CG

Description:
BAPI-Stat 4 Temperature Transmitter, 50 to 90°F Temperature Measurement Range, Display, 65 to 80°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Cool/Warm Legend, Override in Parallel with Sensor, 3.5mm Comm. Jack, Common Ground Configuration

List Price:
$185 (BAPI-Stat 4 with Display) + $6 (Setpoint) + $5 (Override) + $10 (Comm. Jack) = $206 List Price

Your Number: BA/

Wall Plate Units

Temperature Sensors

Rev. 12/13/23

Features & Options

- Etched Teflon Leadwires and Foamback Insulator
- Three Override Pushbutton Options
- Wide Selection of Temperature Sensing Elements
- Limited Lifetime Warranty

Wall Plates are ideal for areas where a discreet, rugged zone sensor is required. All Wall Plates feature ¼" closed cell foam backing which covers the plate and insulates it from wall temperature. All units also feature etched Teflon leadwires and double encapsulated sensors to create a watertight package that can perform in the real world.

Override
A momentary Override is available as a Keyswitch or three styles of Pushbutton — Standard and Low Profile. The Standard model features a small, momentary pushbutton. The Low Profile Model is water resistant for washdown/ wipedown applications and is available with a green LED indicator.

Color and Finish Options
Wall Plates are available in aluminum or stainless steel with a metallic finish; however, many other color and finish options are available as special orders. Call BAPI for details.



Plain



Standard Override



Low Profile Override



Low Profile Override with LED Indicator

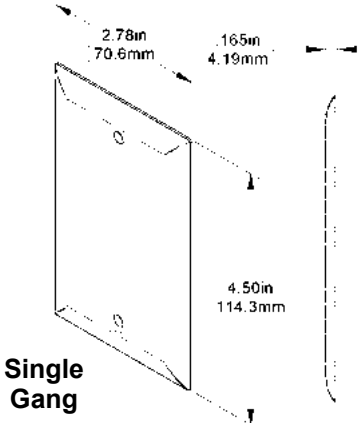
Specifications

Material:
Aluminum or Stainless Steel

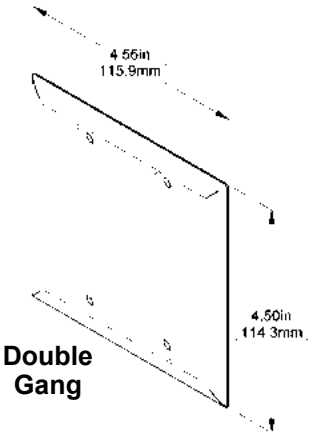
Sensing Element:
Thermistor or RTD
(See Sensors Sect. for Specs.)

Environmental Operation Range:
Temperature:
-40 °C to 100 °C
-20 °C to 70 °C with transmitter

Humidity:
0 to 95%, non-condensing



Single Gang



Double Gang

Associated Products

Spanner Security Screws & Spanner Bit

Spanner Security Screws and the Spanner Bit are available for any Stainless Steel Wall Plate Unit. For more info, see Accessories.



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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Wall Plate Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required) — List Price

1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Material (Required)

SP	Stainless Steel Wall Plate
AP	Aluminum Wall Plate

#3: Override Pushbutton (Optional)

O	Standard Pushbutton	$10
O2	Low Profile Pushbutton	$57
O2G24	Low Profile with Green LED	$100

#4: Security Screws (Optional)

SEC1	Spanner Security Screws	$2

Option Selection Guide

Wall Plate Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**)

#1: Output (Required) — List Price

T1K	4 to 20mA Output	$125
TXS05	0 to 5V Output*	$125
TXS10	0 to 10V Output*	$125
TXS12	2 to 10V Output*	$125
TXS15	1 to 5V Output*	$125

#2: Temperature Range (Required)

[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Material (Required)

SP	Stainless Steel Wall Plate
AP	Aluminum Wall Plate

#4: Security Screws (Optional)

SEC1	Spanner Security Screws	$2

*Voltage outputs are field selectable

Example Number:
BA/(**10K-2**) - (**SP**) - (**O2G24**) - ( )
BA/10K-2-SP-O2G24 (no parenthesis)

Description: 10K-2 Thermistor, Stainless Steel Wall Plate Sensor, Low Profile Pushbutton Override with Green LED

List Price: $18 + $7 + $2 = $27 List Price

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**SP**) - ( )
BA/T1K[32 TO 212F]-SP (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, Stainless Steel Wall Plate Sensor

List Price: $125 = $125 List Price

Your Number: BA/

Duct Units

Temperature Sensors

Rev. 10/05/23

Features & Options

- Series 304 Stainless Steel Probes: 2, 4, 6. 8, 12 & 18”
- Five Enclosure Styles
- Double Encapsulated Sensors & Etched Teflon Leads
- Limited Lifetime Warranty
- Wide Selection of Temperature Sensing Elements

Single Point Duct Units feature closed cell foam to seal the probe insertion hole and to absorb vibration. Mounting tabs allow for easy installation directly to the wall of the duct.

All Duct Units have etched Teflon leadwires and double encapsulated sensors to create a watertight package that can withstand high humidity and condensation and perform under real world conditions. Duct Units have probe lengths from 2” to 18” to accommodate most duct shapes and sizes. Custom probe lengths are also available.

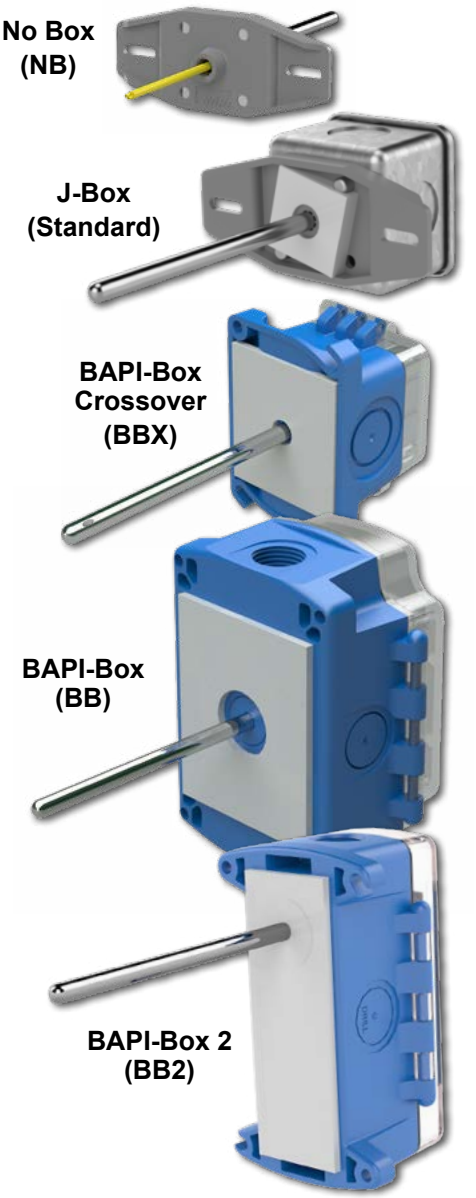
Duct Units come standard with a 2”x2” steel J-Box but are also available with no box, the BAPI-Box, the BAPI-Box 2 or the BAPI-Box Crossover enclosures.

The BAPI-Box Crossover



The BAPI-Box Crossover features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port. See the Accessories section for more info.

(Units shown with knockout plug sold separately.)



Specifications

Environmental Operation Range:
Temperature:
BBX: -40 to 185°F (-40 to 85°C)
Other Enclosures: -40 to 221°F (-40 to 105°C)
No Box w/ Plenum-Rated Wire: -4 to 167°F (-20 to 75°C)
Humidity: 0 to 100%, non-condensing

Sensing Element:
Thermistor or RTD (See Sensors Section for Specs.)

Probe Material: Stainless Steel, 1/4” diameter

Enclosure Material:
J-Box: Galvanized Steel
BBX: Polycarbonate (UL94 V-0) and Nylon (UL94 HB)
BB & BB2: UV-Resistant Polycarbonate (UL94 V-0)

Enclosure Rating:
J-Box: IP20, NEMA 1
BBX: IP10, NEMA 1
IP44 with knockout plug in open port
BB & BB2: IP66, NEMA 4

Enclosure Dimensions: H x W x D
BBX: 3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
J-Box: 2.1 x 2.1 x 1.94” (54.6 x 54.6 x 49mm)
BB: 5 x 4.1 x 2.5” (127 x 104 x 63.5mm)
BB2: 4.9 x 2.8 x 2.35” (125 x 71.6 x 60mm)

(For enclosure dimension drawings, see the end of the section.)

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Duct Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required) — List Price

1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Probe Length (Required)

D-2”	2” (51mm) length	$7
D-4”	4” (102mm) length	$7
D-6”	6” (152mm) length	$7
D-8”	8” (203mm) length	$7
D-12”	12” (305mm) length	$7
D-18”	18” (457mm) length	$7

#3: Enclosure (Optional)
(J-Box comes standard if nothing selected)

BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB	BAPI-Box (IP66, NEMA 4)	$12
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12
NB-18”	No Box, 18” Etched Teflon Leads	$0
NB-5’	No Box, 5’ Plenum-Rated Cable	$2
NB-10’	No Box, 10’ Plenum-Rated Cable	$4
NB-15’	No Box, 15’ Plenum-Rated Cable	$6

#4: Test & Balance or Terminal Strip (Optional)
(requires a BBX, BB or BB2 enclosure above)

TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection	$7

Example Number:
BA/(**10K-2**) - (**D-8”**) - (**NB-5’**) - ( )
BA/10K-2-D-8”-NB-5’ (no parenthesis)

Description: 10K-2 Thermistor, 8” Probe, No Box Enclosure with 5’ Cable

List Price: $18 + $7 + $2 = $27 List Price

Option Selection Guide

Duct Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required) — List Price

T1K	4 to 20mA Output	$125
TXS05	0 to 5V Output*	$125
TXS10	0 to 10V Output*	$125
TXS12	2 to 10V Output*	$125
TXS15	1 to 5V Output*	$125

#2: Temperature Range (Required)

[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Probe Length (Required)

D-2”	2” (51mm) length	$7
D-4”	4” (102mm) length	$7
D-6”	6” (152mm) length	$7
D-8”	8” (203mm) length	$7
D-12”	12” (305mm) length	$7
D-18”	18” (457mm) length	$7

#4: Enclosure (Required)

BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB	BAPI-Box (IP66, NEMA 4)	$12
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

#5: Terminal Strip (Optional)

TS	Terminal Strip Connection	$0

*Voltage outputs are field selectable

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**D-8”**) - (**BBX**) - ( )
BA/T1K[32 TO 212F]-D-8”-BBX (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, 8” Probe, BAPI-Box Crossover Enclosure

List Price: $125 + $7 = $132 List Price

Your Number: BA/

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Duct Averaging Units

Temperature Sensors

Rev. 12/05/24

Features & Options

- Averaging Lengths: 8’, 12’ and 24’
- Five Enclosure Styles

BAPI Duct Averaging Units feature closed cell foam to seal the probe insertion hole and absorb vibration. Mounting tabs allow for easy installation to the duct. All units have etched Teflon leadwires and encapsulated sensors to create a watertight package that can perform under real world conditions.

Averaging probes should be used wherever there is a chance for stratified layers of hot and cold air. Averaging probes are made of bendable aluminum tubing and measure temperature along their entire length. Nylon tie straps are provided for mounting.

Duct Averaging Units come standard with a 2”x2” steel J-Box but are also available with no box, the BAPI-Box, the BAPI-Box 2 or the BAPI-Box Crossover enclosures.

Flexible Probe Bracket

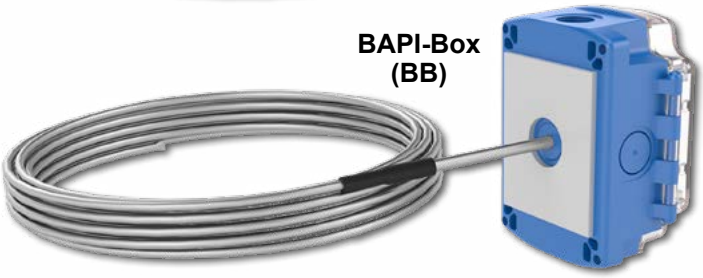
The Flexible Probe Bracket (FPB) simplifies the mounting of averaging sensors. The bracket is used to reverse the direction of the probe with a smooth arc to eliminate the risk of kinking.



(See the Accessories Section for more info.)









Specifications

Environmental Operation Range:
Temperature:
BBX: -40 to 185°F (-40 to 85°C)
Other Enclosures: -40 to 212°F (-40 to 100°C)
Humidity: 0 to 95%, non-condensing

Sensing Element:
Thermistor or RTD (See Sensors Section for Specs.)

Probe Material:
Bendable Aluminum, 3/16” diameter

Enclosure Material:
J-Box: Galvanized Steel
BBX: Polycarbonate (UL94 V-0) & Nylon (UL94 HB)
BB & BB2: UV-Resistant Polycarb. (UL94 V-0)

Enclosure Rating:
J-Box: IP20, NEMA 1
BBX: IP10, NEMA 1
IP44 with knockout plug in open port
BB & BB2: IP66, NEMA 4

Enclosure Dimensions: H x W x D
BBX: 3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
J-Box: 2.1 x 2.1 x 1.94” (54.6 x 54.6 x 49mm)
BB: 5 x 4.1 x 2.5” (127 x 104 x 63.5mm)
BB2: 4.9 x 2.8 x 2.35” (125 x 71.6 x 60mm)

(For enclosure dimension drawings, see the end of the section.)

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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Duct Averaging Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

Call for price.

#1: Temp Sensor (Required)

1.8K ..... 1.8K Thermistor
10K-2 ..... 10K-2 Thermistor
10K-3 ..... 10K-3 Thermistor
10K-3[11K] ... 10K-3[11K] Thermistor
1K ..... 1K Plat. RTD (385 curve)

#2: Probe Length (Required)

A-8' ..... 8' (2.4m) length
A-12' ..... 12' (3.7m) length
A-24' ..... 24' (7.3m) length

#3: Enclosure (Optional)

(J-Box comes standard if nothing selected)
BBX ..... BAPI-Box Crossover (IP10, NEMA 1)
BB ..... BAPI-Box (IP66, NEMA 4)
BB2 ..... BAPI-Box 2 (IP66, NEMA 4)
NB ..... No Box, 6" Etched Teflon Leads

#4: Test & Balance or Terminal Strip (Optional)

(requires a BBX, BB or BB2 enclosure above)
TB ..... Test & Balance Switch
TS ..... Terminal Strip Connection

Example Number:
BA/(**10K-2**) - (**A-8'**) - (**NB**) - ( )
BA/10K-2-A-8'-NB (no parenthesis)

Description: 10K-2 Thermistor, 8' Probe, No Box Enclosure with 6" Etched Teflon Leads

Option Selection Guide

Duct Averaging Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

Call for price.

#1: Output (Required)

T1K ..... 4 to 20mA Output
TXS05 ..... 0 to 5V Output*
TXS10 ..... 0 to 10V Output*
TXS12 ..... 2 to 10V Output*
TXS15 ..... 1 to 5V Output*

#2: Temperature Range (Required)

[32 TO 212F] ... 32 to 212°F Range
[20 TO 120F] ... 20 to 120°F Range
[0 TO 100F] ..... 0 to 100°F Range
[0 TO 100C] ..... 0 to 100°C Range
[-7 TO 49C] ..... -7 to 49°C Range
[-18 TO 38C] .... -18 to 38°C Range

#3: Probe Length (Required)

A-8' ..... 8' (2.4m) length
A-12' .... 12' (3.7m) length
A-24' .... 24' (7.3m) length

#4: Enclosure (Required)

BBX ..... BAPI-Box Crossover (IP10, NEMA 1)
BB ..... BAPI-Box (IP66, NEMA 4)
BB2 ..... BAPI-Box 2 (IP66, NEMA 4)

#5: Terminal Strip (Optional)

TS ..... Terminal Strip Connection

*Voltage outputs are field selectable

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**A-8'**) - (**BBX**) - ( )
BA/T1K[32 TO 212F]-A-8'-BBX (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, 8' Probe, BAPI-Box Crossover Enclosure

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.

Rigid Averaging Units

Temperature Sensors

Rev. 10/05/23

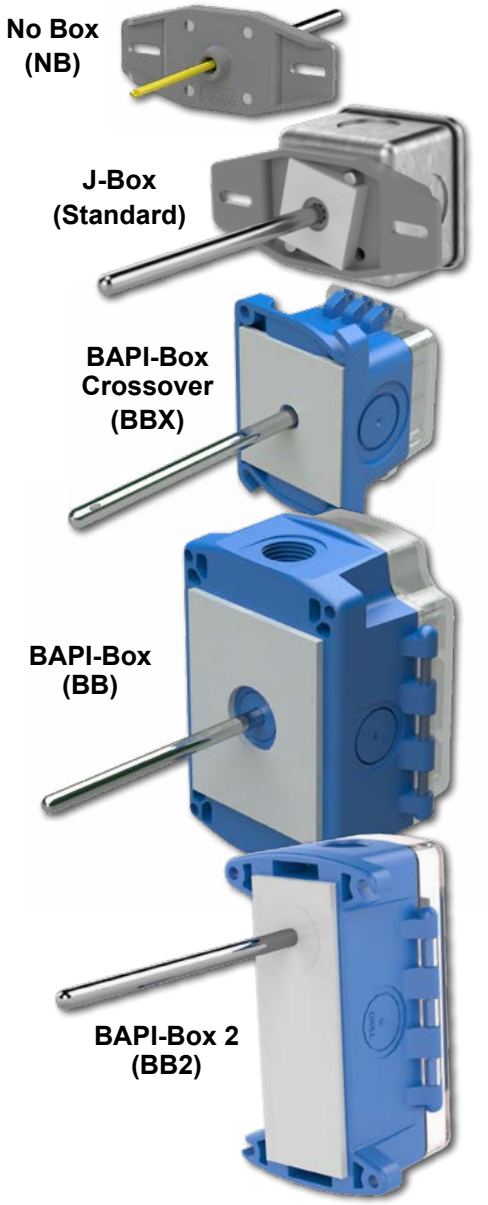
Features & Options

- Averaging Lengths: 12”, 2’, 3’ and 4’
- Five Enclosure Styles including the BAPI-Box Crossover with Hinged Cover

BAPI Rigid Averaging Units feature closed cell foam to seal the probe insertion hole and absorb vibration. Mounting tabs allow for easy installation directly to the wall of the duct. All units have etched Teflon leadwires and encapsulated sensors to create a watertight package that can perform under real world conditions.

Averaging probes should be used wherever there is a chance for stratified layers of hot and cold air. Averaging probes are made of 1/4” diameter stainless steel tubing.

Rigid Averaging Units come standard with a 2”x2” steel J-Box but are also available with no box, the BAPI-Box, the BAPI-Box 2 or the BAPI-Box Crossover enclosures.



The BAPI-Box Crossover



The BAPI-Box Crossover features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port. See the Accessories section for more info.

(Units shown with knockout plug sold separately.)

Specifications

Environmental Operation Range:
Temperature:
BBX: -40 to 185°F (-40 to 85°C)
Other Enclosures: -40 to 212°F (-40 to 100°C)
Humidity: 0 to 95%, non-condensing

Sensing Element:
Thermistor or RTD (See Sensors Section for Specs.)

Probe Material:
Stainless Steel, 1/4” diameter

Enclosure Material:
J-Box: Galvanized Steel
BBX: Polycarbonate (UL94 V-0) & Nylon (UL94 HB)
BB & BB2: UV-Resistant Polycarb. (UL94 V-0)

Enclosure Rating:
J-Box: IP20, NEMA 1
BBX: IP10, NEMA 1
IP44 with knockout plug in open port
BB & BB2: IP66, NEMA 4

Enclosure Dimensions: H x W x D
BBX: 3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
J-Box: 2.1 x 2.1 x 1.94” (54.6 x 54.6 x 49mm)
BB: 5 x 4.1 x 2.5” (127 x 104 x 63.5mm)
BB2: 4.9 x 2.8 x 2.35” (125 x 71.6 x 60mm)

(For enclosure dimension drawings, see the end of the section.)

Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Rigid Averaging Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required)

1.8K .....1.8K Thermistor
3K .....3K Thermistor
10K-2 .....10K-2 Thermistor
10K-3 .....10K-3 Thermistor
10K-3[11K] ...10K-3[11K] Thermistor
20K .....20K Thermistor

1K[375] .....1K Plat. RTD (375 curve)
1K .....1K Plat. RTD (385 curve)
1K[NI].....1K Nickel RTD

#2: Probe Length (Required)

RA-12" ..... 12" (0.3m) Length
RA-2'..... 2' (0.6m) Length
RA-3'..... 3' (0.9m) Length
RA-4'..... 4' (1.2m) Length

#3: Enclosure (Optional)

(J-Box comes standard if nothing selected)

BBX .....BAPI-Box Crossover (IP10, NEMA 1)
BB.....BAPI-Box (IP66, NEMA 4)
BB2.....BAPI-Box 2 (IP66, NEMA 4)

NB-18" ...No Box, 18" Etched Teflon Leads
NB-5'.....No Box, 5' Plenum-Rated Cable
NB-10'....No Box, 10' Plenum-Rated Cable
NB-15'....No Box, 15' Plenum-Rated Cable

#4: Test & Balance or Terminal Strip (Optional)

(requires a BBX, BB or BB2 enclosure above)

TB.....Test & Balance Switch
TS.....Terminal Strip Connection

Example Number:

BA/(**10K-2**) - (**RA-2'**) - (**NB-5'**) - ( )
BA/10K-2-RA-2'-NB-5' (no parenthesis)

Description: 10K-2 Thermistor, 2' Probe, No Box Enclosure with 5' Cable

Option Selection Guide

Rigid Averaging Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required)

T1K..... 4 to 20mA Output
TXS05..... 0 to 5V Output*
TXS10..... 0 to 10V Output*
TXS12..... 2 to 10V Output*
TXS15..... 1 to 5V Output*

#2: Temperature Range (Required)

[32 TO 212F] ...32 to 212°F Range
[20 TO 120F] ...20 to 120°F Range
[0 TO 100F] .....0 to 100°F Range
[0 TO 100C].....0 to 100°C Range
[-7 TO 49C].....-7 to 49°C Range
[-18 TO 38C]....-18 to 38°C Range

#3: Probe Length (Required)

RA-12" ..... 12" (0.3m) Length
RA-2'..... 2' (0.6m) Length
RA-3'..... 3' (0.9m) Length
RA-4'..... 4' (1.2m) Length

#4: Enclosure (Required)

BBX ..... BAPI-Box Crossover (IP10, NEMA 1)
BB..... BAPI-Box (IP66, NEMA 4)
BB2..... BAPI-Box 2 (IP66, NEMA 4)

#5: Terminal Strip (Optional)

TS..... Terminal Strip Connection

*Voltage outputs are field selectable

Example Number:

BA/(**T1K**)(**[32 TO 212F]**) - (**RA-2'**) - (**BBX**) - ( )
BA/T1K[32 TO 212F]-RA-2'-BBX (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, 2' Probe, BAPI-Box Crossover Enclosure

Your Number: BA/

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Submersible Duct Units

Temperature Sensors

Rev. 10/05/23

Features & Options

- 304 Stainless Steel Probes: 12”, 18”, 24”, 36” & 48” lengths
- Very Thin Probe to Fit Between Coil Fins
- Five Enclosure Styles

Submersible Duct Units feature closed cell foam to seal the probe insertion hole and absorb vibration and mounting tabs for easy installation. All units have etched Teflon leadwires and encapsulated sensors to create a watertight package that can perform under real world conditions.

Submersible Duct Units are available in probe lengths of 12”, 18”, 24”, 36” and 48”. Custom probe lengths are also available.

Submersible Duct Units come standard with a 2”x2” steel J-Box but are also available with no box, the BAPI-Box, the BAPI-Box 2 or the BAPI-Box Crossover enclosures.

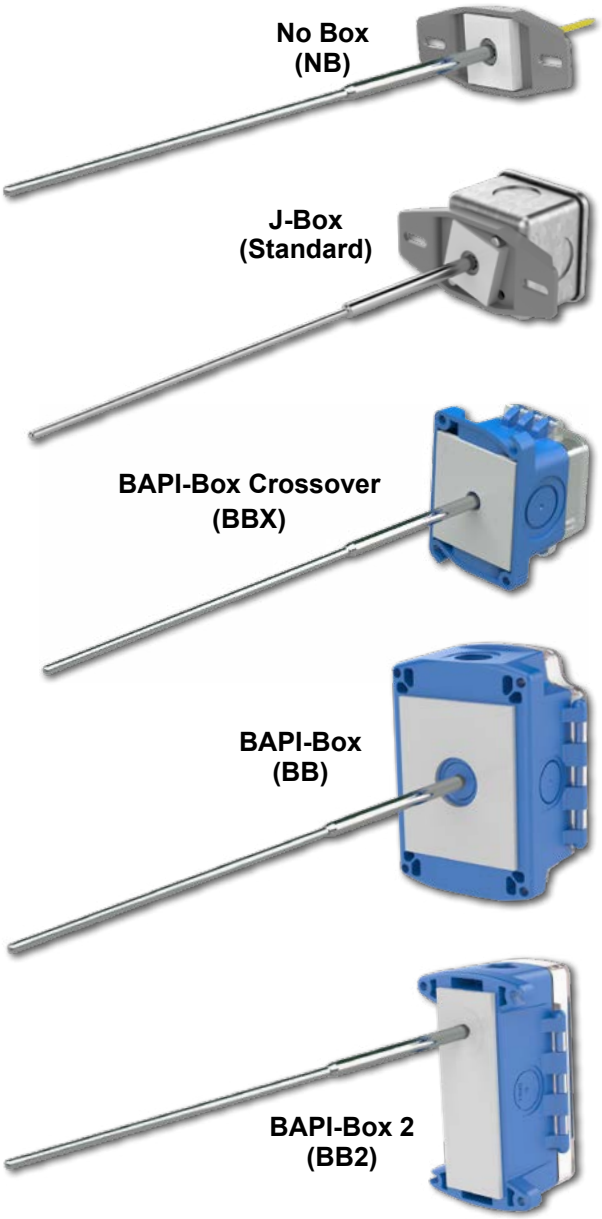
The BAPI-Box Crossover

The BAPI-Box Crossover features a hinged cover with thumb latch for easy termination.



A pierceable knockout plug is available for the open port. See the Accessories section for more info.

(Units shown with knockout plug sold separately.)



Specifications

Environmental Operation Range:
Temperature:
BBX: -40 to 185°F (-40 to 85°C)
Other Enclosures: -40 to 212°F (-40 to 100°C)
Humidity: 0 to 100%, non-condensing

Sensing Element:
Thermistor or RTD (See Sensors Section for Specs.)

Probe Material:
Stainless Steel, 1/8” dia. with 4” sleeve (1/4” dia.)

Enclosure Material:
J-Box: Galvanized Steel
BBX: Polycarbonate (UL94 V-0) & Nylon (UL94 HB)
BB & BB2: UV-Resistant Polycarb. (UL94 V-0)

Enclosure Rating:
J-Box: IP20, NEMA 1
BBX: IP10, NEMA 1
IP44 with knockout plug in open port
BB & BB2: IP66, NEMA 4

Enclosure Dimensions: H x W x D
BBX: 3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
J-Box: 2.1 x 2.1 x 1.94” (54.6 x 54.6 x 49mm)
BB: 5 x 4.1 x 2.5” (127 x 104 x 63.5mm)
BB2: 4.9 x 2.8 x 2.35” (125 x 71.6 x 60mm)

(For enclosure dimension drawings, see the end of the section.)

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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Submersible Duct Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required)

1.8K .....1.8K Thermistor
3K .....3K Thermistor
10K-2 .....10K-2 Thermistor
10K-3 .....10K-3 Thermistor
10K-3[11K] ...10K-3[11K] Thermistor
20K .....20K Thermistor

1K[375] .....1K Plat. RTD (375 curve)
1K .....1K Plat. RTD (385 curve)
1K[NI].....1K Nickel RTD

#2: Probe Length (Required)

SD-12" .....12" (0.3m) length
SD-18" .....18" (0.46m) length
SD-24" .....24" (0.6m) length
SD-36" .....36" (0.9m) length
SD-48" .....48" (1.2m) length

#3: Enclosure (Optional)

(J-Box comes standard if nothing selected)
BBX .....BAPI-Box Crossover (IP10, NEMA 1)
BB.....BAPI-Box (IP66, NEMA 4)
BB2.....BAPI-Box 2 (IP66, NEMA 4)

NB-18" ...No Box, 18" Etched Teflon Leads
NB-5'.....No Box, 5' Plenum-Rated Cable
NB-10'....No Box, 10' Plenum-Rated Cable
NB-15'....No Box, 15' Plenum-Rated Cable

#4: Test & Balance or Terminal Strip (Optional)

(requires a BBX, BB or BB2 enclosure above)
TB .....Test & Balance Switch
TS .....Terminal Strip Connection

Example Number:
BA/(**10K-2**) - (**SD-18"**) - (**NB-5'**) - ( )
BA/10K-2-SD-18"-NB-5' (no parenthesis)

Description: 10K-2 Thermistor, 18" Probe, No Box Enclosure with 5' Cable

Option Selection Guide

Submersible Duct Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required)

T1K..... 4 to 20mA Output
TXS05..... 0 to 5V Output*
TXS10..... 0 to 10V Output*
TXS12..... 2 to 10V Output*
TXS15..... 1 to 5V Output*

#2: Temperature Range (Required)

[32 TO 212F] ...32 to 212°F Range
[20 TO 120F] ...20 to 120°F Range
[0 TO 100F] .....0 to 100°F Range
[0 TO 100C].....0 to 100°C Range
[-7 TO 49C].....-7 to 49°C Range
[-18 TO 38C]....-18 to 38°C Range

#3: Probe Length (Required)

SD-12" .....12" (0.3m) length
SD-18" .....18" (0.46m) length
SD-24" .....24" (0.6m) length
SD-36" .....36" (0.9m) length
SD-48" .....48" (1.2m) length

#4: Enclosure (Required)

BBX ..... BAPI-Box Crossover (IP10, NEMA 1)
BB..... BAPI-Box (IP66, NEMA 4)
BB2..... BAPI-Box 2 (IP66, NEMA 4)

#5: Terminal Strip (Optional)

TS..... Terminal Strip Connection

*Voltage outputs are field selectable

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (S**D-18"**) - (**BBX**) - ( )
BA/T1K[32 TO 212F]-SD-18"-BBX (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, 18" Probe, BAPI-Box Crossover

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.

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Submersible Averaging

Temperature Sensors

Rev. 10/15/24

Features & Options

- Waterproof, Copper-Cased Element
- Continuous Averaging (RTD models only)
- Averaging Lengths: 2', 4' and 8'

Submersible Averaging Units feature closed cell foam to seal the probe insertion hole and absorb vibration and mounting tabs allow for easy installation. All Units have etched Teflon leadwires and encapsulated sensors to create a watertight package that can withstand high humidity and perform in the real world.

Averaging probes should be used wherever there is a chance for stratified layers of hot and cold water. Averaging probes are made of bendable copper tubing and measure temperature along their entire length.

These units come standard with a 2"x2" steel J-Box but are also available with no box, the BAPI-Box, the BAPI-Box 2 or the BAPI-Box Crossover enclosures.

Flexible Probe Bracket

The Flexible Probe Bracket (FPB) simplifies the mounting of averaging sensors. The bracket is used to reverse the direction of the probe with a smooth arc to eliminate the risk of kinking.



(See the Accessories Section for more info.)



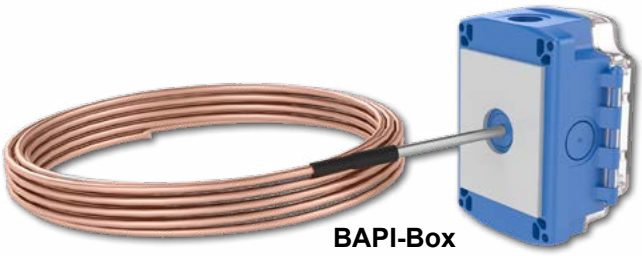
No Box (NB)



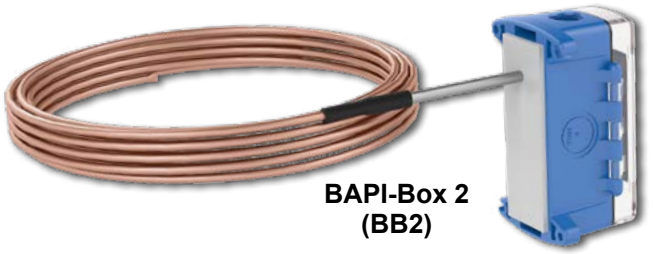
J-Box (Standard)



BAPI-Box Crossover (BBX)



BAPI-Box (BB)



BAPI-Box 2 (BB2)

Specifications

Environmental Operation Range:
Temperature:
BBX: -40 to 185°F (-40 to 85°C)
Other Enclosures: -40 to 212°F (-40 to 100°C)
Humidity: 0 to 100%, non-condensing

Sensing Element:
Thermistor or RTD (See Sensors Section for Specs.)

Probe Material:
Bendable Copper, 3/16" dia. with 4" sleeve

Enclosure Material:
J-Box: Galvanized Steel
BBX: Polycarbonate (UL94 V-0) & Nylon (UL94 HB)
BB & BB2: UV-Resistant Polycarb. (UL94 V-0)

Enclosure Rating:
J-Box: IP20, NEMA 1
BBX: IP10, NEMA 1
IP44 with knockout plug in open port
BB & BB2: IP66, NEMA 4

Enclosure Dimensions: H x W x D
BBX: 3.1 x 2.2 x 1.9" (79 x 56 x 49mm)
J-Box: 2.1 x 2.1 x 1.94" (54.6 x 54.6 x 49mm)
BB: 5 x 4.1 x 2.5" (127 x 104 x 63.5mm)
BB2: 4.9 x 2.8 x 2.35" (125 x 71.6 x 60mm)

(For enclosure dimension drawings, see the end of the section.)

Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Submersible Averaging Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required)

Call for price.

1.8K ..... 1.8K Thermistor
3K ..... 3K Thermistor
10K-2 ..... 10K-2 Thermistor
10K-3 ..... 10K-3 Thermistor
10K-3[11K] ... 10K-3[11K] Thermistor
1K ..... 1K Plat. RTD (385 curve)

#2: Probe Length (Required)

SA-2' ..... 2' (0.6m) length
SA-4' ..... 4' (1.2m) length
SA-8' ..... 8' (2.4m) length

#3: Enclosure (Optional)

(J-Box comes standard if nothing selected)
BBX ..... BAPI-Box Crossover (IP10, NEMA 1)
BB ..... BAPI-Box (IP66, NEMA 4)
BB2 ..... BAPI-Box 2 (IP66, NEMA 4)
NB ..... No Box, 6" Etched Teflon Leads

#4: Test & Balance or Terminal Strip (Optional)

(requires a BBX, BB or BB2 enclosure above)
TB ..... Test & Balance Switch
TS ..... Terminal Strip Connection

Example Number:
BA/(**10K-2**) - (**SA-4'**) - (**NB**) - ( )
BA/10K-2-SA-4'-NB (no parenthesis)

Description: 10K-2 Thermistor, 4' Probe, No Box Enclosure with 6" Etched Teflon Leads

Option Selection Guide

Submersible Averaging Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required)

Call for price.

T1K ..... 4 to 20mA Output
TXS05 ..... 0 to 5V Output*
TXS10 ..... 0 to 10V Output*
TXS12 ..... 2 to 10V Output*
TXS15 ..... 1 to 5V Output*

#2: Temperature Range (Required)

[32 TO 212F] ... 32 to 212°F Range
[20 TO 120F] ... 20 to 120°F Range
[0 TO 100F] ..... 0 to 100°F Range
[0 TO 100C] ..... 0 to 100°C Range
[-7 TO 49C] ..... -7 to 49°C Range
[-18 TO 38C] .... -18 to 38°C Range

#3: Probe Length (Required)

SA-2' ..... 2' (0.6m) length
SA-4' ..... 4' (1.2m) length
SA-8' ..... 8' (2.4m) length

#4: Enclosure (Required)

BBX ..... BAPI-Box Crossover (IP10, NEMA 1)
BB ..... BAPI-Box (IP66, NEMA 4)
BB2 ..... BAPI-Box 2 (IP66, NEMA 4)

#5: Terminal Strip (Optional)

TS ..... Terminal Strip Connection

*Voltage outputs are field selectable

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**SA-4'**) - (**BBX**) - ( )
BA/T1K[32 TO 212F]-SA-4'-BBX (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, 4' Probe, BAPI-Box Crossover Enclosure

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.

Immersion Probes with nylon fitting

Temperature Sensors

Rev. 10/05/23

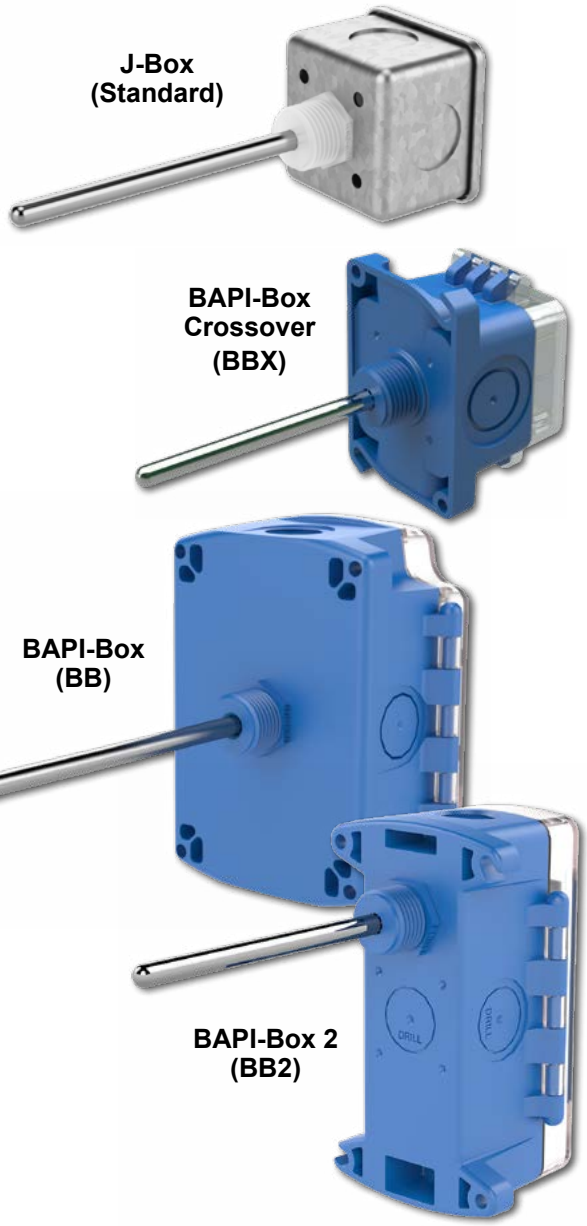
Features & Options

- Probe Lengths: 2”, 4” & 8” (fit standard BAPI Thermowell lengths)
- Series 304 Stainless Steel Probes and four Enclosure Styles
- Double Encapsulated Sensors & Etched Teflon Leadwires

Immersion Units are available in 2”, 4” and 8” probe lengths. The sensor is potted inside a 1/4” stainless steel probe with thermally conductive compound.

All Immersion Units have etched Teflon leadwires and double encapsulated sensors to create a watertight package that can withstand high humidity and condensation.

Immersion Units come standard with a 2”x2” steel J-Box but are also available with no box, the BAPI-Box, the BAPI-Box 2 or the BAPI-Box Crossover enclosures.



BAPI Thermowells

Immersion Unit Probes are designed to be inserted into a Thermowell. For more info on Thermowells, see page B42.



Specifications

Environmental Operation Range:
Temperature:
BBX: -40 to 185°F (-40 to 85°C)
Other Enclosures: -40 to 212°F (-40 to 100°C)
Humidity: 0 to 100%, non-condensing

Sensing Element:
Thermistor or RTD (See Sensors Section for Specs.)

Probe Material:
Stainless Steel, 1/4” diameter

Enclosure Material:
J-Box: Galvanized Steel
BBX: Polycarbonate (UL94 V-0) & Nylon (UL94 HB)
BB & BB2: UV-Resistant Polycarb. (UL94 V-0)

Enclosure Rating:
J-Box: IP20, NEMA 1
BBX: IP10, NEMA 1
IP44 with knockout plug in open port
BB & BB2: IP66, NEMA 4

Enclosure Dimensions: H x W x D
BBX: 3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
J-Box: 2.1 x 2.1 x 1.94” (54.6 x 54.6 x 49mm)
BB: 5 x 4.1 x 2.5” (127 x 104 x 63.5mm)
BB2: 4.9 x 2.8 x 2.35” (125 x 71.6 x 60mm)

(For enclosure dimension drawings, see the end of the section.)

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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Immersion w/ Nylon Fitting Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required)

1.8K ..... 1.8K Thermistor
3K ..... 3K Thermistor
10K-2 ..... 10K-2 Thermistor
10K-3 ..... 10K-3 Thermistor
10K-3[11K] ... 10K-3[11K] Thermistor
20K ..... 20K Thermistor
1K[375] ..... 1K Plat. RTD (375 curve)
1K ..... 1K Plat. RTD (385 curve)
1K[NI] ..... 1K Nickel RTD

#2: Probe Length (Required)

I-2” ..... 2” (51mm) length
I-4” ..... 4” (102mm) length
I-8” ..... 8” (203mm) length

#3: Enclosure (Optional)

(J-Box comes standard if nothing selected)
BBX ..... BAPI-Box Crossover (IP10, NEMA 1)
BB ..... BAPI-Box (IP66, NEMA 4)
BB2 ..... BAPI-Box 2 (IP66, NEMA 4)

#4: Test & Balance or Terminal Strip (Optional)

(requires a BBX, BB or BB2 enclosure above)
TB ..... Test & Balance Switch
TS ..... Terminal Strip Connection

Example Number:
BA/(**10K-2**) - (**I-4”**) - (**BBX**) - ( )
BA/10K-2-I-4”-BBX (no parenthesis)

Description: 10K-2 Thermistor, 4” Probe, BAPI-Box Crossover Enclosure

Option Selection Guide

Immersion w/ Nylon Fitting Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required)

T1K ..... 4 to 20mA Output
TXS05 ..... 0 to 5V Output*
TXS10 ..... 0 to 10V Output*
TXS12 ..... 2 to 10V Output*
TXS15 ..... 1 to 5V Output*

#2: Temperature Range (Required)

[32 TO 212F] ... 32 to 212°F Range
[20 TO 120F] ... 20 to 120°F Range
[0 TO 100F] ..... 0 to 100°F Range
[0 TO 100C] ..... 0 to 100°C Range
[-7 TO 49C] ..... -7 to 49°C Range
[-18 TO 38C] .... -18 to 38°C Range

#3: Probe Length (Required)

I-2” ..... 2” (51mm) length
I-4” ..... 4” (102mm) length
I-8” ..... 8” (203mm) length

#4: Enclosure (Required)

BBX ..... BAPI-Box Crossover (IP10, NEMA 1)
BB ..... BAPI-Box (IP66, NEMA 4)
BB2 ..... BAPI-Box 2 (IP66, NEMA 4)

#5: Terminal Strip (Optional)

TS ..... Terminal Strip Connection

*Voltage outputs are field selectable

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**I-4”**) - (**BBX**) - ( )
BA/T1K[32 TO 212F]-I-4”-BBX (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, 4” Probe, BAPI-Box Crossover Enclosure

Your Number: BA/

Immersion Probes w/ stainless steel fitting

Temperature Sensors

Rev. 10/05/23

Features & Options

- Probe Lengths: 2”, 4” and 8” (fit standard BAPI Thermowell lengths)
- Series 304 Stainless Steel Probes
- Double Encapsulated Sensors
- Three Optional Enclosures

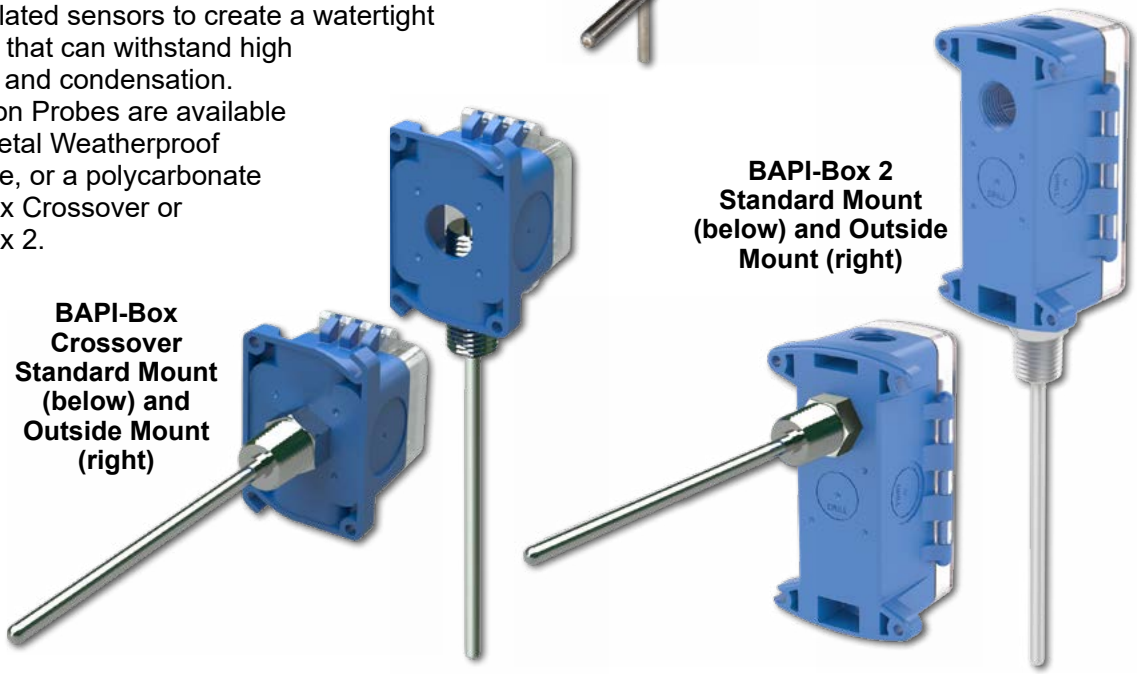
Immersion Units are available in 2”, 4” and 8” probe lengths. This unit is provided with a 1/4” stainless steel probe and a 1/2” NPT double-ended stainless steel fitting.

The sensors are potted inside the probe with a thermally conductive compound. All units have etched Teflon leadwires and double encapsulated sensors to create a watertight package that can withstand high humidity and condensation. Immersion Probes are available with a metal Weatherproof enclosure, or a polycarbonate BAPI-Box Crossover or BAPI-Box 2.



Weatherproof Standard Mount (below) and Outside Mount (left)

No Box



BAPI-Box 2 Standard Mount (below) and Outside Mount (right)

BAPI-Box Crossover Standard Mount (below) and Outside Mount (right)

Specifications

Environmental Operation Range:
Temperature Sensor: -40 to 105 °C
Humidity: 0 to 100%, non-condensing

Enclosure Material:
Weatherproof: Cast Aluminum
BAPI-Box 2: UV-res. Polycarb., UL94 V-0
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 HB

Sensing Element: Thermistor or RTD
(See Sensors Section for Specs.)

Probe Material: Stainless Steel, 1/4” dia.

Enclosure Rating:
Weatherproof: IP24, NEMA 3R

BAPI-Box Crossover:
IP10, NEMA 1
(IP44 with knockout plug in open port)

BAPI-Box 2: IP66, NEMA 4X

Encl. Dimensions: H x W x D
BAPI-Box Crossover:....3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
Weatherproof.....4.5 x 2.75 x 2.2” (114 x 70 x 55mm)
BAPI-Box 2:.....4.9 x 2.8 x 2.35” (125 x 71.6 x 60mm)

(For enclosure dimension drawings, turn to the end of the section.)

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Immersion Probes w/ stainless steel fitting

Temperature Sensors

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Immersion with SS Fitting Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required)		List Price
1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Probe Length (Required)		
I-2”-SS	2” (51mm) length	$42
I-4”-SS	4” (102mm) length	$42
I-8”-SS	8” (203mm) length	$42

#3: Enclosure (Required)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BBXO*	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12
BB2O*	BAPI-Box 2 (IP66, NEMA 4)	$12
WP	Weatherproof (IP24, NEMA 3R)	$12
WPO*	Weatherproof (IP24, NEMA 3R)	$12

#4: Test & Balance or Terminal Strip (Optional)		
TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection	$7

*Outside Mount (probe out the bottom)

Example Number:

BA/(**10K-2**) - (**I-4”-SS**) - (**BBX**) - ( )

BA/10K-2-I-4”-SS-BBX (no parenthesis)

Description: 10K-2 Thermistor, 4” Probe, BAPI-Box Crossover Enclosure

List Price: $18 + $42 = $60 List Price

Option Selection Guide

Immersion with SS Fitting Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required)		List Price
T1K	4 to 20mA Output	$125
TXS05	0 to 5V Output*	$125
TXS10	0 to 10V Output*	$125
TXS12	2 to 10V Output*	$125
TXS15	1 to 5V Output*	$125

#2: Temperature Range (Required)	
[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Probe Length (Required)		
I-2”-SS	2” (51mm) length	$42
I-4”-SS	4” (102mm) length	$42
I-8”-SS	8” (203mm) length	$42

#4: Enclosure (Required)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BBXO**	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12
BB2O**	BAPI-Box 2 (IP66, NEMA 4)	$12
WP	Weatherproof (IP24, NEMA 3R)	$12
WPO**	Weatherproof (IP24, NEMA 3R)	$12

#5: Terminal Strip (Optional)		
TS	Terminal Strip Connection	$0

*Voltage outputs are field selectable

**Outside Mount (probe out the bottom)

Example Number:

BA/(**T1K**)(**[32 TO 212F]**) - (**I-4”-SS**) - (**BBX**) - ( )

BA/T1K[32 TO 212F]-I-4”-SS-BBX (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, 4” Probe, BAPI-Box Crossover

List Price: $125 + $42 = $167 List Price

Your Number: BA/

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Thermowells

Temperature Sensors

Rev. 06/08/23

Features & Options

- Three Lengths: 2”, 4” and 8”
  (Fit standard Immersion Unit lengths)
- Stainless Steel (304 or 316) or Brass
- Other Lengths Available Upon Request
- Limited Lifetime Warranty



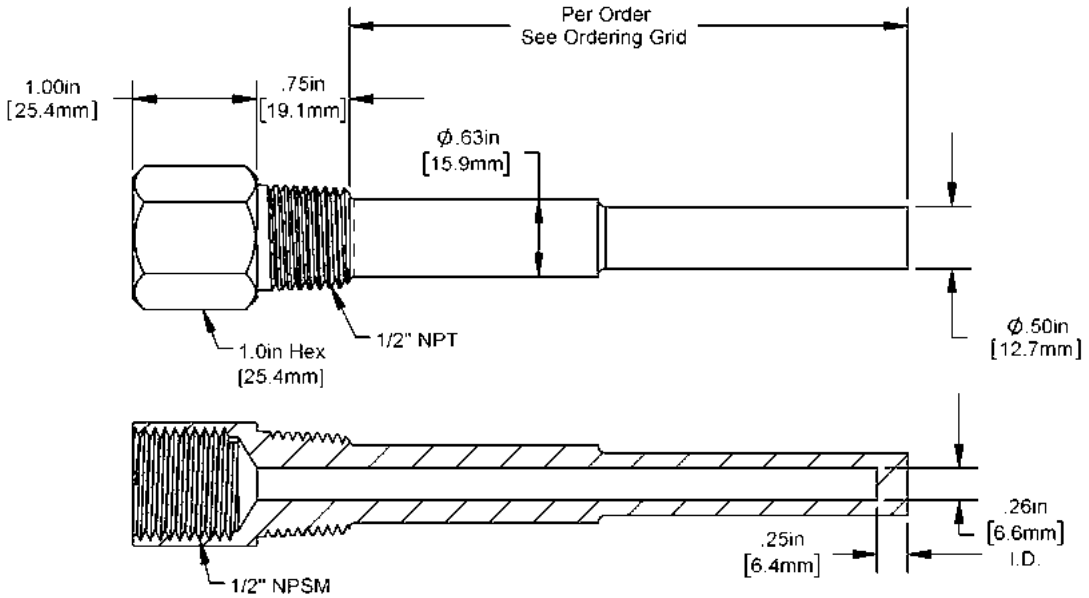
Machined Thermowell

Standard Thermowells available from BAPI include machined 304 stainless steel, 316 stainless steel, brass. These wells are offered in 2”, 4” and 8” lengths with 1/2” NPT external and 1/2” NPSM internal. Other lengths and thread diameters are available upon request.

The Thermowell chosen for an installation is governed mainly by the corrosion conditions the well will face. The machined stainless steel wells all come with a mirror polish to provide maximum corrosion resistance.

Occasionally, the material consideration is one of strength rather than corrosion. For example, a machined stainless steel well may be required for high pressure water service where otherwise a brass thermowell would be satisfactory from a corrosion standpoint.

Specifications



NPT= National Pipe Taper
NPSM=National Pipe Straight Mechanical (not tapered)

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part #	Description	List Price
BA/2"M304	Machined 304 Stainless Steel - 2"	$24
BA/4"M304	Machined 304 Stainless Steel - 4"	$30
BA/8"M304	Machined 304 Stainless Steel - 8"	$46
BA/2"M316	Machined 316 Stainless Steel - 2"	$44
BA/4"M316	Machined 316 Stainless Steel - 4"	$50
BA/8"M316	Machined 316 Stainless Steel - 8"	$80
BA/2"MB	Machined Brass - 2"	$23
BA/4"MB	Machined Brass - 4"	$26
BA/8"MB	Machined Brass - 8"	$45

Note: Standard thread size is ½" NPT external, and ½" NPSM internal. 2" units have an insertion length of 2.5" (5.1 cm). 4" units have an insertion length of 4.5" (11.43 cm). 8" units have an insertion length of 7.5" (19.05 cm).

Gray shaded items follow the Buy and Resale Multiplier.

Comparing the Wake Frequency and the Resonant Frequency

Thermowell failures, in most cases, are not due to the effects of pressure or temperature on the thermowell. The calculations necessary to provide adequate strength, under given conditions, are familiar enough to permit proper choice of wall thickness and material. The values shown in Table 1 are conservative, and intended primarily as a guide.

Less familiar, and more dangerous, are the **vibration effects** to which thermowells are subjected. Fluid, flowing by the thermowell, forms a turbulent wake (called the Von Karman Trail) which has a definite frequency, based on the diameter of the thermowell and the velocity of the fluid. It is important that the thermowell have sufficient stiffness so that the wake frequency will never equal the resonant (natural) frequency of the thermowell itself. If the resonant frequency of the thermowell coincided with the wake frequency, the thermowell would vibrate to destruction and break off in the piping. Thermowells are also safe if the resonant frequency is thermowell **below** the wake frequency or if the fluid velocity is constantly fluctuating through the critical velocity point.

Nevertheless, if the installation is not hampered by the use of a sufficiently stiff thermowell, we recommend the values given in Table 2 not be exceeded.

Table 1: Pressure Rating versus Temperature

Thermowell Material	Temperature in Degrees Fahrenheit						
	70°F	200°F	400°F	600°F	800°F	1000°F	1200°F
	Pressure Rating (Pounds per Square Inch)						
Brass	5000	4200	1000	-	-	-	-
304 S.S.	7000	6200	5600	5400	5200	4500	1650
316 S.S.	7000	7000	6400	6200	6100	5100	2500

Table 2: Maximum Fluid Velocity versus Insertion Length

Thermowell Material	Fluid Type	Insertion Length (inches)		
		I-2"	I-4"	I-8"
		Maximum Fluid Velocity (Feet per Second)		
Brass	Air/Steam	207	75.5	27.3
	Water	59.3	32.2	19.7
304 S.S. 316 S.S.	Air/Steam	300	109	39.5
	Water	148	82.2	-

The values shown in Table 2 are based on operating temperatures of 350°F for brass and 1,000°F for 304 and 316 stainless steel (S.S.). Slightly higher velocities are possible at lower temperatures.

Boiler, Stack or Cryogenic

Features & Options

- Stainless Steel Probe & Industrial Construction
- Double-ended 1/2” NPT Stainless Steel Fitting
- Optional Weatherproof Enclosure
- Standard or Outside Mount Configurations

The Extreme Temperature Platinum RTD Units are designed for use in applications from -200°C to 600°C. They are packaged to handle vibration, moisture, and wide temperature ranges.

The Immersion Unit has a stainless steel probe with a 1/2” NPT double-ended stainless steel fitting. It is available with a cast aluminum Weatherproof enclosure.

The Remote Unit has a stainless steel probe with PTFE jacketed cable or fiberglass insulated leads and is available as a probe alone or with a BAPI-Box Crossover or Weatherproof enclosure.

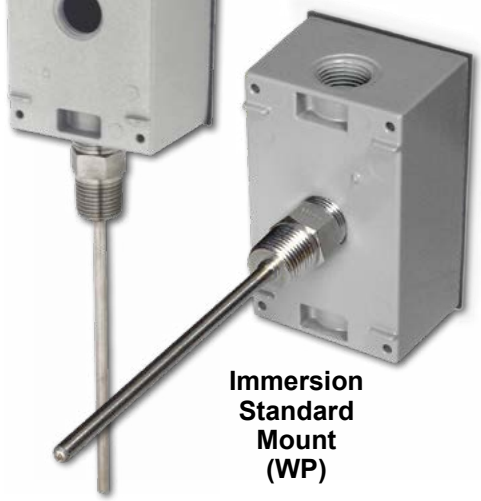
These units can be used with a remote mounted BAPI ruggedized temp transmitter to provide a linear proportional 4 to 20 mA output. For more info, see page A58.



Immersion Without Enclosure



Immersion Outside Mount (WPO)



Immersion Standard Mount (WP)

Specifications

Sensor Type: Platinum 1KΩ RTD (3.85 Ω/°C)
Reference Resistance: 1KΩ at 0°C
Operating Range: -328 to 1,112°F (-200 to 600°C)
Humidity: 0 to 100%, non-condensing
Standard Accuracy: 0.1% at 0°C
Wiring to Probe:
PTFE Jacketed Cable or Fiberglass Insulated Leadwire
[1] PTFE Jacketed, -328 to 32°F (-200 to 0°C)
[2] PTFE Jacketed, 77 to 500°F (25 to 260°C)
[3] Fiberglass Ins., 77 to 1,112°F (25 to 600°C)
Enclosure Material:
Weatherproof: Cast Aluminum
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 HB
Enclosure Operating Range:
Weatherproof: -100 to 1,000 °F (-73 to 538 °C)
BAPI-Box Crossover: -40 to 185 °F (-40 to 85 °C)
Enclosure Rating:
Weatherproof: IP24, NEMA 3R
BAPI-Box Crossover (BBX):
IP10, NEMA 1
IP44 with knockout plug in open port
Encl. Dimensions: H x W x D
BAPI-Box Crossover:... 3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
Weatherproof.....4.5 x 2.75 x 2.2” (114 x 70 x 55mm)

(For enclosure dimension drawings, see the end of the section)



Remote Weatherproof (WP)

Remote Sensor & Cable

BAPI-Box Crossover (BBX)

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

Extreme Temp Immersion Option Selection Guide

BA/ (**#1**) - (**#2**) - (**#3**)

Call for price on all units.

#1: Platinum RTD Temperature Sensor (required)
1K[1] .....1K Plat. RTD, -328 to 32 °F (-200 to 0 °C), PTFE Insulation Leads
1K[2] .....1K Plat. RTD, 77 to 500 °F (25 to 260 °C), PTFE Insulation Leads
1K[3] .....1K Plat. RTD, 77 to 1,112 °F (25 to 600 °C), Fiberglass Insulation Leads

#2: Probe Type and Length (required)
I-2” .....3.5” length of ¼” Diameter, 316 SS Probe, double-ended 1/2” NPT
I-4” .....5.5” length of ¼” Diameter, 316 SS Probe, double-ended 1/2” NPT
I-8” .....8.5” length of ¼” Diameter, 316 SS Probe, double-ended 1/2” NPT

#3: Enclosure Style and Probe Mount (optional)
WP.....Weatherproof (IP24, NEMA 3R)
WPO .....Weatherproof (IP24, NEMA 3R), Outside Mount, (probe out the bottom)

Certain sensor types or lengths may not be available at this time. Please contact your BAPI representative for full availability and pricing.

Extreme Temp Remote Option Selection Guide

BA/ (**#1**) - (**#2**) - (**#3**)

Call for price on all units.

#1: Platinum RTD Temperature Sensor (required)
1K[1] .....1K Plat. RTD, -328 to 32 °F (-200 to 0 °C), PTFE Insulation Leads
1K[2] .....1K Plat. RTD, 77 to 500 °F (25 to 260 °C), PTFE Insulation Leads
1K[3] .....1K Plat. RTD, 77 to 1,112 °F (25 to 600 °C), Fiberglass Insulation Leads

#2: Probe Type and Length (required)
RP-5’.....2” SS Sensor with 5’ PTFE Jacketed Cable or Fiberglass Insulated Leadwires
RP-10’.....2” SS Sensor with 10’ PTFE Jacketed Cable or Fiberglass Insulated Leadwires
RP-15’.....2” SS Sensor with 15’ PTFE Jacketed Cable or Fiberglass Insulated Leadwires

#3: Enclosure Style and Probe Mount (optional)
WP.....Weatherproof (IP24, NEMA 3R)
BBX .....BAPI-Box Crossover (IP10, NEMA 1)

Certain sensor types or lengths may not be available at this time. Please contact your BAPI representative for full availability and pricing.

Example Number: BA/ (**1K[1]**) - (**I-2”**) - (**WP**)

Actual Number (with parenthesis removed): BA/1K[1]-I-2”-WP

Description: 1K Plat. RTD, -328 to 32 °F (-200 to 0 °C), Immersion Sensor with Stainless Steel Fitting, Weatherproof Enclosure, No Test and Balance or Terminal Strip.

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.

Strap Units and Remote Probe Units

Temperature Sensors

Rev. 10/05/23

Features & Options

- Clamp-On, Spring-Loaded or Remote Probes
- Junction Box or BAPI-Box Crossover Enclosure

These units are designed to monitor water temperature in retrofit or filled pipe applications. The strap units fit around the outside of a pipe, while the remote probes are strapped directly onto the pipe. All three units measure the water temperature by sensing the surface temperature of the pipe.

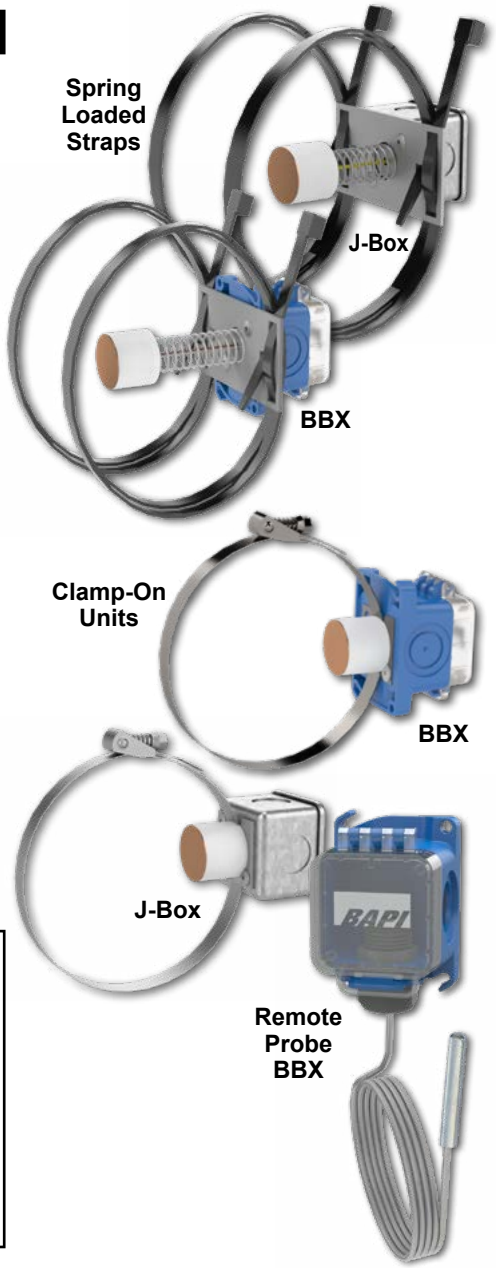
Strap Units and Remote Probes come standard with a Junction Box enclosure but are also available with a BAPI-Box Crossover enclosure.

Clamp-On Strap – This unit has a bendable copper sensing plate which forms to the curvature of the pipe. An adjustable hose clamp holds the unit in place around the pipes from 2 to 4.5” (5 to 11.4 cm) in diameter.

Spring-Loaded Strap – Instead of removing the pipe insulation, the spring loaded sensing pad is held against the pipe through a hole cut in the insulation. It can be used with 5 to 14.5” (13 to 37 cm) dia. pipes with up to 2” of insulation.

Remote Probes - These units have a 1.75” long stainless steel probe with either Plenum-Rated Cable or FEP-Jacketed Cable with a lead length of 18” (Other lengths are available by calling BAPI). Remote Probes are ideal for strap-on applications on any size pipe, or hard-to-access areas.

(See pg A50 for more Remote Probe Options.)





The BAPI-Box Crossover

The BAPI-Box Crossover enclosure features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port. See the Accessories section for more info. *(Shown with knockout plug sold separately.)*

Specifications

Enclosure Material:
Junction Box: Galvanized Steel
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 HB

Environmental Operation Range:
Temperature Sensor:
Clamp On: -40 to 85 °C,
Spring Loaded: -40 to 85 °C
Remote Probe w/ Plen. Cable: -40 to 105ºC
Remote Probe w/ FEP Cable: -20 to 75ºC
Temperature Transmitter: -20 to 70 °C
Humidity: 0 to 95%, non-condensing

Enclosure Rating:
Junction Box: IP20, NEMA 1
BAPI-Box Crossover (BBX):
IP10, NEMA 1
IP44 with knockout plug in open port

Sensing Element:
Thermistor or RTD (See Sensors Section for Specs.)

Encl. Dimensions: H x W x D
BAPI-Box Crossover:..3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
Junction Box:.....2.1 x 2.1 x 1.94” (54.6 x 54.6 x 49mm)

(For encl. dimension drawings, turn to the end of the section.)

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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Strap & Remote Probe Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required)

1.8K ..... 1.8K Thermistor
3K ..... 3K Thermistor
10K-2 ..... 10K-2 Thermistor
10K-3 ..... 10K-3 Thermistor
10K-3[11K] ... 10K-3[11K] Thermistor
20K ..... 20K Thermistor
1K[375] ..... 1K Plat. RTD (375 curve)
1K ..... 1K Plat. RTD (385 curve)
1K[NI] ..... 1K Nickel RTD

#2: Configuration (Required)

S ..... Clamp-On Strap
STP ..... Spring Loaded Strap
RPP ..... Remote Probe, Plenum Cable*
RPPFEP-18" . Remote Probe, FEP Cable*
RPPFEP2-18" .. Remote Pr., Subm. FEP Cable*

#3: Enclosure (Optional)

(J-Box comes standard if nothing selected)
BBX ..... BAPI-Box Crossover (IP10, NEMA 1)

#4: Test & Balance or Terminal Strip (Optional)

(requires a BBX enclosure above)
TB ..... Test & Balance Switch
TS ..... Terminal Strip Connection

*18" cable length

Example Number:
BA/(**10K-2**) - (**S**) - (**BBX**) - ( )
BA/10K-2-S-BBX (no parenthesis)

Description: 10K-2 Thermistor, Clamp-On Strap, BAPI-Box Crossover Enclosure

Option Selection Guide

Strap & Remote Probe Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required)

T1K ..... 4 to 20mA Output
TXS05 ..... 0 to 5V Output*
TXS10 ..... 0 to 10V Output*
TXS12 ..... 2 to 10V Output*
TXS15 ..... 1 to 5V Output*

#2: Temperature Range (Required)

[32 TO 212F] ... 32 to 212°F Range
[20 TO 120F] ... 20 to 120°F Range
[0 TO 100F] ..... 0 to 100°F Range
[0 TO 100C] ..... 0 to 100°C Range
[-7 TO 49C] ..... -7 to 49°C Range
[-18 TO 38C] .... -18 to 38°C Range

#3: Configuration (Required)

S ..... Clamp-On Strap
STP ..... Spring Loaded Strap
RPP ..... Remote Probe, Plenum Cable**
RPPFEP-18" . Remote Probe, FEP Cable**
RPPFEP2-18" .. Remote Pr., Subm. FEP Cable**

#4: Enclosure (Required)

BBX ..... BAPI-Box Crossover (IP10, NEMA 1)

#5: Terminal Strip (Optional)

TS ..... Terminal Strip Connection

*Voltage outputs are field selectable
**18" cable length

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**S**) - (**BBX**) - ( )
BA/T1K[32 TO 212F]-S-BBX (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, Clamp-On Strap, BAPI-Box Crossover Enclosure

Your Number: BA/

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Outside Air Units

Temperature Sensors

Rev. 10/05/23

Features & Options

- Quick-Response Sensor
- IP66/NEMA 4 BAPI-Box 2 Enclosure Style
- Well-Vented Sensor Guard

Outside Air Units are designed to be mounted outdoors. The UV-resistant plastic shield keeps the sensor out of the sunlight and allows for excellent air circulation. The units are available in a BAPI-Box 2 polycarbonate enclosure which carries an IP66/ NEMA 4 rating.

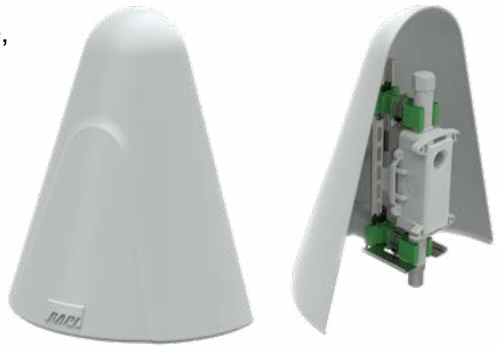
All Outside Air Units have etched Teflon leadwires and can withstand high humidity and condensation and perform under real world conditions. This is especially important in an outside air application which can be exposed to rain, snow and large temperature swings.



Outside Air Temperature Sensor in a BAPI-Box 2 Enclosure

Weather Shade

External temperature, humidity and air quality sensors can be affected by solar heat gain. The BAPI Weather Shade effectively blocks the solar heat gain, improving the accuracy of the sensor.



(See Accessories for more info.)

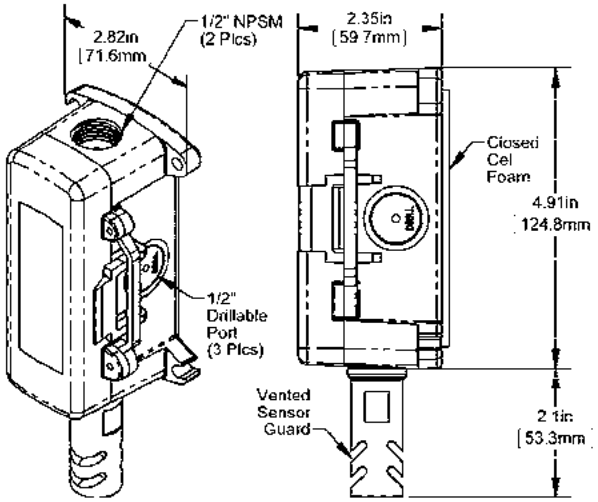
Specifications

Environmental Operation Range:
Temperature Sensor: -40 to 85 °C
Temperature Transmitter: -20 to 70 °C
Humidity: 0 to 100%, non-condensing

Sensing Element:
Thermistor or RTD
(See Sensors Section for Specs.)

Enclosure Rating: IP66, NEMA 4

Enclosure Material:
UV-resistant polycarbonate, UL94 V-0



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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Outside Air Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required)

		List Price
1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Configuration (Required)

O	Outside Air Unit	$0

#3: Enclosure (Required)

BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

#4: Test & Balance or Terminal Strip (Optional)

TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection	$7

Example Number:
BA/(**10K-2**) - (**O**) - (**BB2**) - ( )
BA/10K-2-O-BB2 (no parenthesis)

Description: 10K-2 Thermistor, Outside Air Unit, BAPI-Box 2 Enclosure

List Price: $18 + $12 = $30 List Price

Option Selection Guide

Outside Air Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required)

		List Price
T1K	4 to 20mA Output	$125
TXS05	0 to 5V Output*	$125
TXS10	0 to 10V Output*	$125
TXS12	2 to 10V Output*	$125
TXS15	1 to 5V Output*	$125

#2: Temperature Range (Required)

[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Configuration (Required)

O	Outside Air Unit	$0

#4: Enclosure (Required)

BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

#5: Terminal Strip (Optional)

TS	Terminal Strip Connection	$0

*Voltage outputs are field selectable

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**O**) - (**BB2**) - ( )
BA/T1K[32 TO 212F]-O-BB2 (no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, Outside Air Unit, BAPI-Box 2 Enclosure

List Price: $125 + $12 = $137 List Price

Your Number: BA/

Remote Sensors & Probes

Temperature Sensors

Rev. 10/05/23

Features & Options

- Etched Teflon Leads on Remote Sensors
- Plenum-Rated, FEP-Jacketed or Halogen-Free Cable
- Double Encapsulated Sensors on Remote Probes

BAPI Remote Sensors feature a .75” long encapsulation shell and etched Teflon leads in lengths of 6”, 18”, 5’, 10’, 15’, 20’, and 25’. Remote Sensors are perfect for tight locations. Additional cable options, lead lengths and probe styles are available.

Remote Probes feature a 1.75” long stainless steel probe with either Plenum-Rated Cable, FEP-Jacketed Cable or Halogen-Free Cable. Lead lengths are 18”, 5’, 10’, 15’, 20’, and 25’. Remote Probes are commonly used in refrigerated case or strap-on applications. They are ideal for hard-to-access areas or spaces where the usual Immersion or Duct Sensors do not fit well. Additional cable options, lead lengths and probe styles are available upon request.

Remote Sensors and Probes are available with a BAPI-Box Crossover or the BAPI-Box 2 enclosure.

The BAPI-Box Crossover

The BAPI-Box Crossover enclosure features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port. See the Accessories for more info.



(Shown with knockout plug sold separately.)



Remote Sensor with Epoxy Shell

Remote Stainless Steel Probe



BAPI-Box 2 (BB2)



BAPI-Box Crossover (BBX)

Specifications

Environmental Operation Range:
Temperature Sensor: -40 to 105 ºC
Units w/ Plenum-Rated Cable: -20 to 75 ºC
Units w/ Halogen-Free Cable: -40 to 90 ºC
Temperature Transmitter: -20 to 70 ºC
Humidity: 0 to 100%, non-condensing

Sensing Element: Thermistor or RTD
(See Sensors Section for Specs.)

Round Probe Material: Stainless Steel

Cable Types:
Remote Sensor:
6” Leads: Etched Teflon
18” to 25’ Leads: Plenum-Rated Cable

Remote Probes (selected at time of order):
Plenum-Rated, FEP-Jacketed, Submersible
FEP-Jacketed or Halogen Free

Enclosure Material:
BAPI-Box 2: UV-resistant polycarb., UL94 V-0
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 HB

BAPI-Box Crossover Enclosure Rating:
IP10, NEMA 1 (IP44 with knockout plug in open port)

BAPI-Box 2 Enclosure Rating: IP66, NEMA 4X

Enclosure Dimensions: H x W x D
BAPI-Box Crossover:
3.1 x 2.2 x 1.9” (79 x 56 x 49mm)

BAPI-Box 2: 4.9 x 2.8 x 2.4” (125 x 72 x 60mm)

(For enclosure dimension drawings, turn to the end of the section.)

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Replace the number and parenthesis with the designator for each selection in the Option Selection Guides below. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Remote Probe Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**)

#1: Temp Sensor (Required)		List Price
1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Sensor & Cable Type (Required)		
PP-6”	Remote Sensor, 6” Etched Teflon	$-4
PP-18”	Remote Sensor, 18” Plenum	$-4
PP-5’	Remote Sensor, 5’ Plenum	$-2
PP-10’	Remote Sensor, 10’ Plenum	$0
PP-15’	Remote Sensor, 15’ Plenum	$2
PP-20’	Remote Sensor, 20’ Plenum	$4
PP-25’	Remote Sensor, 25’ Plenum	$6
RPP-6”	Remote Probe, 6” Plenum	$0
RPP-18”	Remote Probe, 18” Plenum	$0
RPP-5’	Remote Probe, 5’ Plenum	$2
RPP-10’	Remote Probe, 10’ Plenum	$4
RPP-15’	Remote Probe, 15’ Plenum	$6
RPP-20’	Remote Probe, 20’ Plenum	$8
RPP-25’	Remote Probe, 25’ Plenum	$10

#3: Enclosure (Optional)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

ADDITIONAL CABLE TYPES: Replace “RPP” with “RPFEP” for FEP-Jacketed Cable, with “RPFEP2” for Submersible FEP-Jacketed Cable and with “RPHALO” for Halogen-Free Cable. ***Call for pricing on additional cable types.***

Remote Probe Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required)		List Price
T1K	4 to 20mA Output	$125
TXS05	0 to 5V Output*	$125
TXS10	0 to 10V Output*	$125
TXS12	2 to 10V Output*	$125
TXS15	1 to 5V Output*	$125

#2: Temperature Range (Required)	
[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Sensor & Cable Type (Required)		
PP-6”	Remote Sensor, 6” Etched Teflon	$-4
PP-18”	Remote Sensor, 18” Plenum	$-4
PP-5’	Remote Sensor, 5’ Plenum	$-2
PP-10’	Remote Sensor, 10’ Plenum	$0
PP-15’	Remote Sensor, 15’ Plenum	$2
PP-20’	Remote Sensor, 20’ Plenum	$4
PP-25’	Remote Sensor, 25’ Plenum	$6
RPP-6”	Remote Probe, 6” Plenum	$0
RPP-18”	Remote Probe, 18” Plenum	$0
RPP-5’	Remote Probe, 5’ Plenum	$2
RPP-10’	Remote Probe, 10’ Plenum	$4
RPP-15’	Remote Probe, 15’ Plenum	$6
RPP-20’	Remote Probe, 20’ Plenum	$8
RPP-25’	Remote Probe, 25’ Plenum	$10

#4: Enclosure (Required)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

ADDITIONAL CABLE TYPES: Replace “RPP” with “RPFEP” for FEP-Jacketed Cable, with “RPFEP2” for Submersible FEP-Jacketed Cable and with “RPHALO” for Halogen-Free Cable. ***Call for pricing on additional cable types.***

*Voltage outputs are field selectable

Example Number: BA/(**10K-2**) - (**RPP-5’**) - (**BB2**)
Parenthesis Removed: BA/10K-2-RPP-5’-BB2
Description: 10K-2 Thermistor, Remote Probe with 5’ Plenum-Rated Cable, BAPI-Box 2 Enclosure
List Price: $18 + $2 + $12 = $32 List Price

Your #: BA/

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Concave & Remote Probes with Colored Cable

Temperature Sensors

Rev. 10/05/23

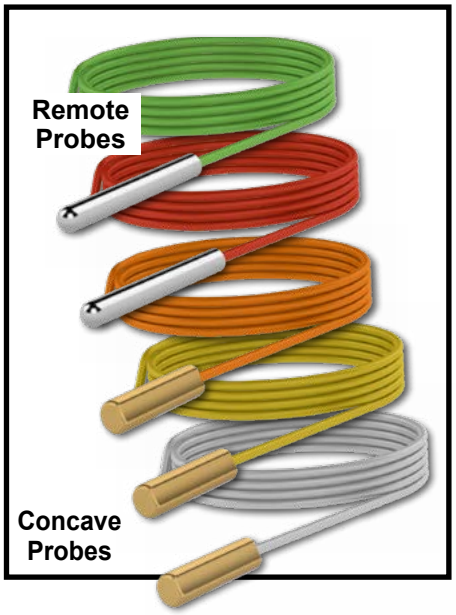
Features & Options

- Waterproof, Double Encapsulated Sensors
- Concave Probe or Remote Probes
- Optional BAPI-Box Crossover or BAPI-Box 2 Enclosure
- FEP-Jacketed Cable in 5 Color Choices

The Concave Probes feature a 1.35” long brass encapsulation shell with a concave indention so that they fit on the outside of pipes such as condensor lines. Remote Probes feature a 1.75” long stainless steel probe without an indention. Both probes come with FEP-jacketed cable in a choice of 5 colors and lead lengths.

Remote probes are commonly used in refrigerators, freezers, dry storage, car wash bays and other hard-to-access areas where immersion or duct sensors do not fit well.

Remote Sensors and Probes are available with a new BAPI-Box Crossover enclosure or BAPI-Box 2 Enclosure.





Specifications

Environmental Operation Range: Temperature: -40 to 105ºC • Humidity: 0 to 100%, non-condensing

Sensing Element:
Thermistor or RTD (See Sensors Sect. for Specs.)

Probe Material:
Remote Probe: Stainless Steel
Concave Probe: Brass

Cable: FEP-Jacketed Cable

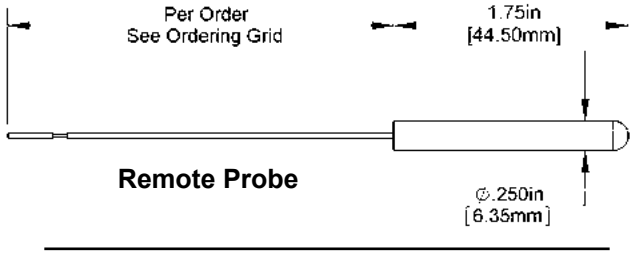
Enclosure Material:
BAPI-Box 2: UV-resistant polycarb., UL94 V-0
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 HB

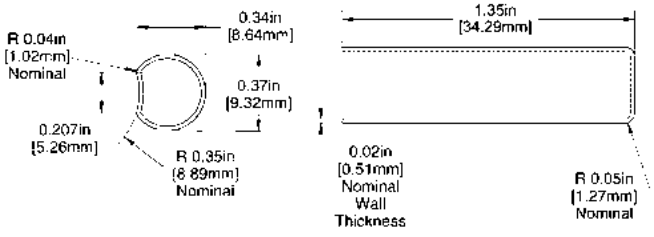
BAPI-Box Crossover Enclosure Rating:
IP10, NEMA 1
(IP44 w/ knockout plug in open port)

BAPI-Box 2 Enclosure Rating: IP66, NEMA 4X

Enclosure Dimensions: H x W x D
BAPI-Box 2: 4.9 x 2.8 x 2.4” (125 x 72 x 60mm)
BAPI-Box Crossover: 3.1 x 2.2 x 1.9” (79 x 56 x 49mm)

(For enclosure dimension drawings, turn to the end of the section.)





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Concave & Remote Probes with Colored Cable

Temperature Sensors

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Replace the number and parenthesis with the designator for each selection in the Option Selection Guides below. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Remote Probe Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)

#1: Temp Sensor (Required) — List Price

1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Probe Type (Required)

RPFEP	Remote Probe	$0
CPFEP	Concave Probe	$4

#3: Cable Color & Length (Required)

18”	Gray Cable, 18” Length	$3
5’	Gray Cable, 5’ Length	$5
10’	Gray Cable, 10’ Length	$10
15’	Gray Cable, 15’ Length	$15
20’	Gray Cable, 20’ Length	$20
ORG-18”	Orange Cable, 18” Length	$3
ORG-5’	Orange Cable, 5’ Length	$10
ORG-10’	Orange Cable, 10’ Length	$20
ORG-15’	Orange Cable, 15’ Length	$30
ORG-20’	Orange Cable, 20’ Length	$40

#4: Enclosure (Optional)

BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

ADDITIONAL CABLE COLORS: Replace “ORG” with “GRN” for Green Cable, with “YEL” for Yellow Cable and with “RED” for Red Cable.

Option Selection Guide

Remote Probe Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required) — List Price

T1K	4 to 20mA Output	$125
TXS05	0 to 5V Output*	$125
TXS10	0 to 10V Output*	$125
TXS12	2 to 10V Output*	$125
TXS15	1 to 5V Output*	$125

#2: Temperature Range (Required)

[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Probe Type (Required)

RPFEP	Remote Probe	$0
CPFEP	Concave Probe	$4

#4: Cable Color & Length (Required)

18”	Gray Cable, 18” Length	$3
5’	Gray Cable, 5’ Length	$5
10’	Gray Cable, 10’ Length	$10
15’	Gray Cable, 15’ Length	$15
20’	Gray Cable, 20’ Length	$20
ORG-18”	Orange Cable, 18” Length	$3
ORG-5’	Orange Cable, 5’ Length	$10
ORG-10’	Orange Cable, 10’ Length	$20
ORG-15’	Orange Cable, 15’ Length	$30
ORG-20’	Orange Cable, 20’ Length	$40

#5: Enclosure (Required)

BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

ADDITIONAL CABLE COLORS: Replace “ORG” with “GRN” for Green Cable, with “YEL” for Yellow Cable and with “RED” for Red Cable.

*Voltage outputs are field selectable

Example Number: BA/(**10K-2**) - (**CPFEP**) - (**ORG-5’**) - (**BBX**)
Parenthesis Removed: BA/10K-2-CPFEP-ORG-5’-BBX
Description: 10K-2 Thermistor, Concave Probe, 5’ Orange Cable, BAPI-Box Crossover
List Price: $18 + $4 + $10 = $32 List Price

Your #: BA/

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B54 Surface Sensor

Temperature Sensors

Rev. 10/05/23

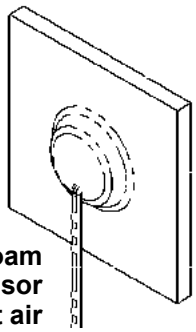
Features & Options

- Copper Encapsulation Shell and Thermal Adhesive for Increased Temperature Transfer
- Easy to Install on Flat Surfaces
- Optional BAPI-Box 2 or Crossover
- FEP-Jacketed Cable

The Surface Sensor features a 0.75” diameter copper encapsulation shell with a thermally adhesive tape to mount on flat surfaces.

Surface Sensors are commonly used on glass windows and doors, solar panel modules, and other hard-to-access areas where a Remote Probe may be difficult to mount.

Surface Sensors are available with a BAPI-Box Crossover or BAPI-Box 2 enclosure. Unit includes a square closed-cell foam cover to isolate the sensor from the ambient air.



Includes square foam cover to insulate sensor from ambient air

Surface Sensor with FEP Cable
(with white adhesive strip on sensing surface)



Surface Sensor with FEP Cable and BAPI-Box 2 Enclosure (right) and BAPI-Box Crossover Enclosure (below)



Specifications

Environmental Operation Range:
Temperature Sensor:
-40 to 221°F (-40 to 105ºC)
Humidity: 0 to 100%, non-condensing

Sensing Element: Thermistor or RTD
(See Sensors Sect. for Specifications)

Surface Sensor Material: Copper 110

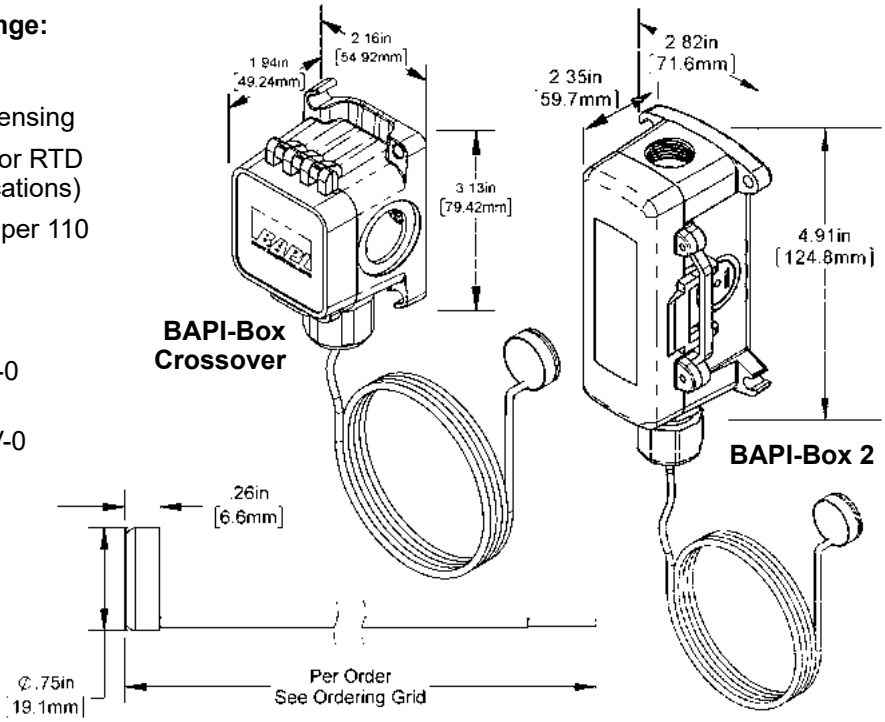
Cable: FEP-Jacketed Cable

Enclosure Material:
BAPI-Box 2:
UV-resistant polycarb., UL94 V-0

BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 HB

Enclosure Rating:
BAPI-Box 2:
IP66, NEMA 4X

BAPI-Box Crossover:
IP10, NEMA 1
(IP44 w/ plug in open port)



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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Surface Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)- (**#5**)

#1: Temp Sensor (Required) — List Price

1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18

#2: Cable Length (Required)

SMFEP-18”	18” Length	$18
SMFEP-5’	5’ Length	$20
SMFEP-10’	10’ Length	$25
SMFEP-15’	15’ Length	$30
SMFEP-20’	20’ Length	$35

#3: Enclosure (Optional)

BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

#4: Test & Balance or Terminal Strip (Optional)

(requires a BBX, BB or BB2 enclosure above)

TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection	$7

Example Number:
BA/(**10K-2**) - (**SMFEP**) - (**5’**) - (**BBX**)
BA/10K-2-SMFEP-5’-BBX (no parenthesis)

Description: 10K-2 Thermistor, Surface Sensor, 5’ Cable, BAPI-Box Crossover

List Price: $18 + $20 = $38 List Price

Option Selection Guide

Surface Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Output (Required) — List Price

T1K	4 to 20mA Output	$125
TXS05	0 to 5V Output*	$125
TXS10	0 to 10V Output*	$125
TXS12	2 to 10V Output*	$125
TXS15	1 to 5V Output*	$125

#2: Temperature Range (Required)

[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Cable Length (Required)

SMFEP-18”	18” Length	$18
SMFEP-5’	5’ Length	$20
SMFEP-10’	10’ Length	$25
SMFEP-15’	15’ Length	$30
SMFEP-20’	20’ Length	$35

#4: Enclosure (Required)

BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

#5: Terminal Strip (Optional)

TS	Terminal Strip Connection	$0

*Voltage outputs are field selectable

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**SMFEP**) - (**5’**) - (**BBX**)
BA/T1K[32 TO 212F]-SMFEP-5’-BBX
(no parenthesis)

Description: 4 to 20mA Transmitter, 32 to 212°F Range, Surface Sensor, 5’ Cable, BAPI-Box Crossover Enclosure

List Price: $125 + $20 = $145 List Price

Your #: BA/

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Temperature Transmitters

Temperature Sensors

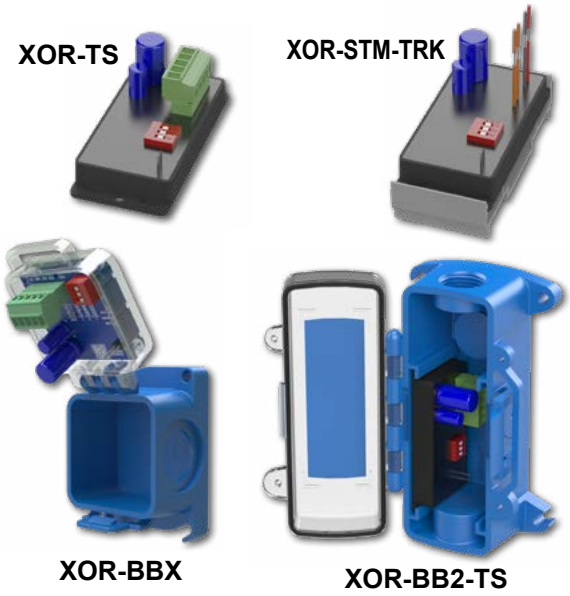
Rev. 02/29/24

Features & Options

BAPI's Temperature Transmitter has a field adjustable output of 4 to 20 mA or 1 to 5, 0 to 5, 2 to 10, 0 to 10 VDC over a selected temperature range. (see min and max temperature ranges below). These adjustable outputs can be set at the factory to order or default set to 4 to 20mA.

These transmitters are available with a wired connection via flying leads or a pluggable terminal block (-TS).

These transmitters can be mounted in a variety of enclosures. The unit is fully encapsulated (ruggedized) with a high thermal conductivity material to prevent circuit overheating and is water resistant. It is available with a BAPI-Box Crossover or BAPI-Box 2 enclosure.



Specifications

Power Required: 12 to 40VDC

Transmitter Output:
4 to 20mA, 0 to 5, 1 to 5, 0 to 10
or 2 to 10VDC, 850Ω@24VDC

Output Wiring: 2 Wire Loop
Flying Leads (4 to 22 AWG)
or 4 Terminal Block (24 to 12 AWG)

Calibration Span:
Min. 30ºF (16.6ºC), Max 1000ºF (555ºC)

Calibration Zero:
Min. -148ºF (-100ºC), Max 900ºF (482ºC)

System Accuracy: ±0.065% of Span

Linearity: ±(0.125 × T-20ºC)/100

RTD Sensor (2 Wire):
1KΩ, 2 Wire Platinum, 385 Curve
Matched (M): 13 to 302°F (-25 to 150°C)
with 3-point certificate (25%, 50% & 75%)

Mounting Shell:
ABS w/ waterproof urethane fill

Transmitter Ambient:
-4 to 158ºF, (-20 to 70ºC)
0 to 95% RH, Non-condensing

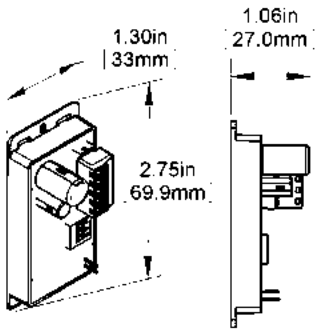
BAPI-Box 2 Enclosure Material:
UV-resistant polycarbonate, UL94 V-0

BAPI-Box 2 Enclosure Rating:
IP66, NEMA 4X

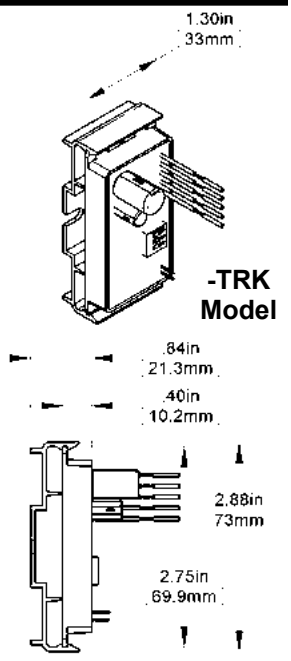
BAPI-Box Crossover Enclosure Material:
Polycarbonate (UL94 V-0) & Nylon (UL94 HB)

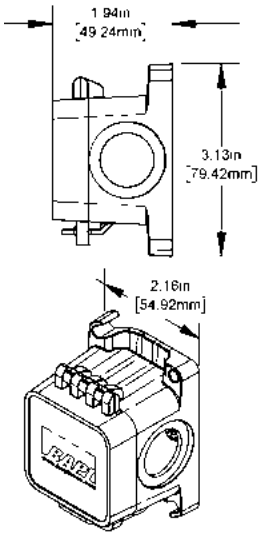
BAPI-Box Crossover Enclosure Rating:
IP10, NEMA 1 (IP44 w/ knockout plug in open port)

Agency: RoHS / JIS C1604-1989 /
PT=DIN43760, IEC Pub 751-1983 /
CE EN 61326-1:2013 EMC

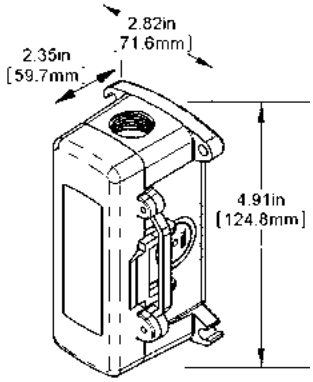


-STM Model
(shown with optional Terminal Strip)





XOR-BBX Model



XOR-BB2 Model

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Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

4 to 20 mA Transmitter Option Selection Guide

BA/ (**#1**)(**#2**)(**#3**) - (**#4**) - (**#5**)

#1: Temperature Transmitter Type (required) — **List Price**

T1K.....1K Platinum RTD, 1KΩ @ 0°C with 4 to 20 mA Output $100
T1KM.....1K Platinum RTD, 1KΩ @ 0°C with 4 to 20mA Output and NIST certification $280

TXS.....1K Plat. RTD, 1KΩ @ 0°C with Field Selectable Voltage Output. $100
TXSM.....1K Plat. RTD, 1KΩ @ 0°C with Field Selectable Voltage Output and NIST certification .. $280

#2: Voltage Output (optional, only applicable if TXS or TXSM is selected in Option #1 above)

05.....0 to 5V
10.....0 to 10V
12.....2 to 10V
15.....1 to 5V

#3: Temperature Transmitter Range (required)

[32 TO 212F] ..... 32 to 212°F Range
[20 TO 120F] ..... 20 to 120°F Range
[0 TO 100F] ..... 0 to 100°F Range
[0 TO 100C] ..... 0 to 100°C Range
[-7 TO 49C] ..... -7 to 49°C Range
[-18 TO 38C] ..... -18 to 38°C Range

#4: Configuration and Optional Enclosure (required)

XOR-STM ..... Transmitter in snaptrack mountable shell, no metal plate
XOR-TRK ..... Transmitter with 1.25” wide piece of 2-3/4” snaptrack $5
XOR-BB2..... Transmitter in a BAPI-Box 2 enclosure (IP66) $12
XOR-BBX ..... Transmitter in a BAPI-Box Crossover enclosure (IP10)..... $0

#5: Screw Terminals (optional)

TS ..... Terminal Strip terminals for RTD, power and signal $0

Additional options and custom ranges are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/(**TXS**)(**10**)(**[0 to 100F]**) - (**XOR-BBX**) - ( )

Actual Number (with parenthesis removed): BA/TXS10[0 to 100F]-XOR-BBX

Description: T1K Transmitter, 0 to 10V Output, 0 to 100°F Range, BAPI-Box Crossover Enclosure.

List Price: $100 (T1K Transmitter) = $100 List Price

Your Number: BA/

B58 Thermobuffer Freezer/Cooler Sensor

Temperature Sensors

Rev. 10/05/23

Features & Options

- Fluid-Filled Chamber Tracks Temperature of Freezer or Cooler Contents, Not Air Temperature, Decreasing False Alarms
- Easy Wall Mount or Wire Shelf Hanger
- Available with Extreme Temp Sensor for -328 to 32°F (-200 to 0°C)

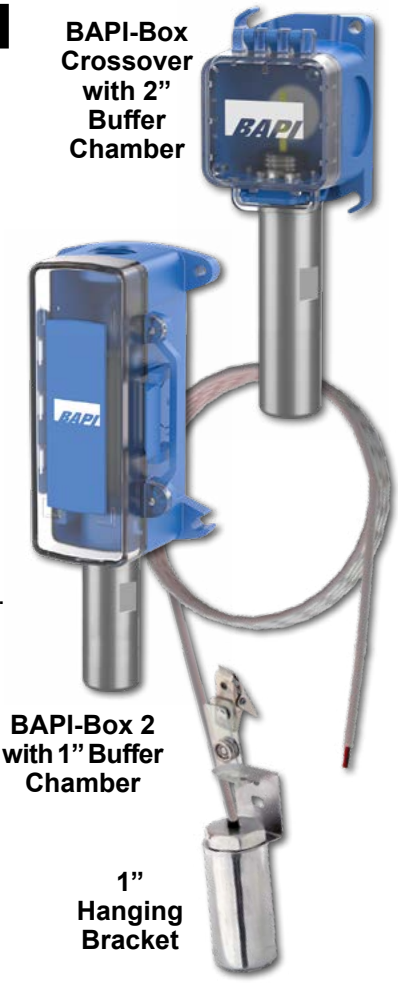
The BAPI Thermobuffer Temperature Sensor is used to simulate the refrigerator contents rather than the refrigerator air temperature. The fluid-filled chamber allows for slower reaction to abrupt temperature changes, yet still maintains long-term accuracy if the change remains permanent. It eliminates the temperature spikes due to frequent refrigerator or freezer door opening and decreases false alarms.

The Thermobuffer comes in three buffer sizes 1", 2" and 4" and is designed to save valuable shelf space by mounting to the wall or by hanger in a refrigerator or freezer. The buffer chamber is machined in 304 Stainless Steel or aluminum and accommodates a variety of temperature sensors or transmitters to interface with all BAS systems.



The BAPI-Box Crossover

The BAPI-Box Crossover enclosure features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port. See the Accessories section for more info. *(Shown with knockout plug sold separately.)*



Specifications

Sensor: Thermistor, RTD or Transmitter
(See Sensors Section for specifications.)

Probe: Stainless steel

Wire: 22 awg stranded, 2 or 3 wires

Insulation:
Etched Teflon or FEP-Jacketed; PTFE for 1K[1]

Wiring to Probe:
Extreme Temp Probe 1K[1]: PTFE-Jacketed Cable, -328 to 32°F (-200 to 0°C)

Buffer Chamber Construction:
M304: Bar stock 304 stainless steel
MAL: Bar stock aluminum
Hanging Bracket: Bar stock 304 stainless steel

Chamber Fluid: Customer supplied
Glycol Mix, Food grade required
1" Chamber: ~5 ml of fluid
2" Chamber: ~24 ml of fluid
4" Chamber: ~32 ml of fluid

Note: Unit requires customer-supplied food grade glycol antifreeze for proper operation.

Enclosure Ratings:
BAPI-Box Crossover:
IP10, NEMA 1 (IP44 with knockout plug in open port)

BAPI-Box 2: IP66, NEMA 4X

Enclosure Material:
BAPI-Box 2: UV-resistant polycarb., UL94 V-0

BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 H

Environmental Operating Range:
Standard Temp Sensor: -40 to 185ºF (-40 to 85ºC)
Extreme Temp Sensor: -328 to 32°F (-200 to 0°C)
Temp. Transmitter: -4 to 158ºF (-20 to 70ºC)
Humidity: 0 to 100%RH, Condensing

Agency: CE, RoHS

Encl. Dimensions: H x W x D
BAPI-Box Crossover: 3.1 x 2.2 x 1.9" (79 x 56 x 49mm)
BAPI-Box 2: 4.9 x 2.8 x 2.35" (125 x 71.6 x 60mm)

(For enclosure and buffer chamber dimension drawings, see the end of the section.)

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Thermobuffer Freezer/Cooler Sensor

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Replace the number and parenthesis with the designator for each selection in the Option Selection Guides below. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Thermobuffer Temperature Sensors

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**) - (**#6**)

#1: Temp Sensor (Required) — List Price

1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Buffer Material & Length (Required)

TB-M304-1	1” 304 SS Buffer	$80
TB-M304-2	2” 304 SS Buffer	$192
TB-M304-4	4” 304 SS Buffer	$192
TB-MAL-2	2” Aluminum Buffer	$132
TB-MAL-4	4” Aluminum Buffer	$132

#3: Hanging Bracket (Optional)

HB	Hanging Bracket, 30” FEP Cable	$7

#4: Enclosure (Required)

BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4)	$12
NB	No Enclosure	$0

#5: Custom Lead Length (Optional, for HB and NB units only)

5	5’ of FEP-Jacketed Cable	$5
10	10’ of FEP-Jacketed Cable	$10
25	25’ of FEP-Jacketed Cable	$25

#6: Test & Balance or Terminal Strip (Optional, requires BBX or BB2 Encl.)

TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection	$7

Thermobuffer Temperature Transmitters

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**) - (**#6**) - (**#7**)

#1: Output (Required) — List Price

T1K	4 to 20mA Output	$125
TXS05	0 to 5V Output*	$125
TXS10	0 to 10V Output*	$125
TXS12	2 to 10V Output*	$125
TXS15	1 to 5V Output*	$125

#2: Temperature Range (Required)

[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Buffer Material & Length (Required)

TB-M304-1	1” 304 SS Buffer	$80
TB-M304-2	2” 304 SS Buffer	$192
TB-M304-4	4” 304 SS Buffer	$192
TB-MAL-2	2” Aluminum Buffer	$132
TB-MAL-4	4” Aluminum Buffer	$132

#4: Hanging Bracket (Optional)

HB	Hanging Bracket, 30” FEP Cable	$7

#5: Enclosure (Required)

BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

#6: Custom Lead Length (Optional, for HB units only)

5	5’ of FEP-Jacketed Cable	$5
10	10’ of FEP-Jacketed Cable	$10
25	25’ of FEP-Jacketed Cable	$25

#7: Terminal Strip (Optional, requires BBX or BB2 Encl.)

TS	Terminal Strip Connection	$0

*Voltage outputs are field selectable

Example Number: BA/(**10K-2**) - (**TB-M304-1**) - ( ) - (**BBX**) - ( ) - ( )

Parenthesis Removed: BA/10K-2-TB-M304-1-BBX

Description: 10K-2 Thermistor, Thermobuffer, 1” 304SS Buffer, BAPI-Box Crossover Enclosure

List Price: $18 + $80 = $98 List Price

Your #: BA/

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B60 Replacement Temperature Probes

Temperature Sensors

Rev. 12/01/21

Features & Options

- Plenum-rated Etched Teflon Leads or Cable
- Probe Lengths from 1.75” to 48”
- 1/4” Stainless Steel Probes
- Fits BAPI Duct, Immersion or Remote Sensor Applications
- Double Encapsulated

BAPI’s Duct, Immersion and Remote temperature replacement probes are easy to field swap to save time and money when the old probe becomes damaged or the sensor requirements have changed.

Replacement Probes feature a standard 1/4” stainless steel probe, double encapsulated temperature sensor with minimum 6” 22 AWG Etched Teflon lead wires. The probes are available in various lengths from 1.75” to 48”. The leads are available in a variety of lengths including 18”, 5’, 10’, 15’, 20’, and 25’.

Additional cable options, lead lengths, and probe styles are available upon request. See the order grid to select the probe replacement for your application.

For detailed specifications on the individual Sensors & Transmitters, turn to “Sensors” Section.

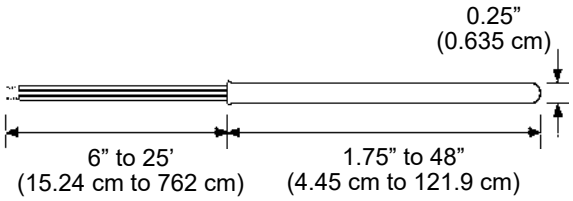


Replacement Probes 1.75”, 4.5”, 6.5” & 8.25” Probes with Etched Teflon Leads (The 1.75” Probe is “No Flare” while the other three are “Flared”)

Specifications

Thermistor:
Temp. Output ..... Resistance
Accuracy ..... ±0.36ºF, (±0.2ºC)
Probe Range ..... -40º to 221ºF (-40º to 105ºC)

RTD:
Platinum (PT) ..... KΩ @0ºC, 385 curve,
Platinum (PT) ..... 1KΩ @0ºC, 375 curve
PT Accuracy (std) .... 0.12% @Ref, or ±0.55ºF, (±0.3ºC)
PT Probe Range ..... -40º to 221ºF, (-40 to 105ºC)
Nickel (Ni) ..... 1KΩ @70ºF, JCI curve
Ni Probe Range ..... -40º to 221ºF (-40 to 105ºC)



Probe Material: Rigid Stainless Steel, 0.25” OD

Probe Length: 1.75 to 48” or custom per order

Lead Wire: Twin lead 22awg stranded

Wire Insulation: Etched Teflon, Plenum-Rated or FEP-Jacketed

Environmental Operating Range:
Probe with Etched Teflon or FEP-Jacketed Wire: -40 to 105°C
Probe with Plenum-Rated Wire: -20 to 75°C

Agency: RoHS

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Use the Option Selection Guide below to create your custom part number. Replace the number and brackets with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

Replacement Temperature Probes Option Selection Guide:

BA/ (**#1**) - (**#2**) - (**#3**)

#1: Temperature Sensor (required)

1K[375] .....1K Platinum RTD (375 curve)
1K[NI].....1K Nickel RTD
1K .....1K Platinum RTD (385 curve)
1.8K .....1.8K Thermistor
3K .....3K Thermistor
10K-2 .....10K-2 Thermistor
10K-3 .....10K-3 Thermistor
10K-3[11K].....10K-3[11K] Thermistor
20K .....20K Thermistor

#2: Probe Type (Required)

P-1.75".....“No Flare” Probe, 1.75” probe
P-4".....“No Flare” Probe, 4.00” probe
P-4.5".....“Flared” Probe, 4.5” probe
P-6.5".....“Flared” Probe, 6.50” probe
P-8.25".....“Flared” Probe, 8.25” probe
P-9.5".....“Flared” Probe, 9.50” probe
P-12.25".....“Flared” Probe, 12.25” probe
P-18.25".....“Flared” Probe, 18.25” probe

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

#3: Leads or Cable (Required)

Etched Teflon Leads

TFE.....6 inch Etched Teflon leads
TFE-18" .....18 inch Etched Teflon leads
TFE-5'.....5 feet Etched Teflon leads
TFE-10'.....10 feet Etched Teflon leads
TFE-15'.....15 feet Etched Teflon leads
TFE-20'.....20 feet Etched Teflon leads
TFE-25'.....25 feet Etched Teflon leads

Plenum-Rated Cable

PL-18".....18 inch Plenum-Rated Cable
PL-5' .....5 feet Plenum-Rated Cable
PL-10' .....10 feet Plenum-Rated Cable
PL-15' .....15 feet Plenum-Rated Cable
PL-20' .....20 feet Plenum-Rated Cable
PL-25' .....25 feet Plenum-Rated Cable

FEP-Jacketed Cable

FEP-18" .....18 inch FEP-Jacketed Cable
FEP-5'.....5 feet FEP-Jacketed Cable
FEP-10'.....10 feet FEP-Jacketed Cable
FEP-15'.....15 feet FEP-Jacketed Cable
FEP-20'.....20 feet FEP-Jacketed Cable
FEP-25'.....25 feet FEP-Jacketed Cable

Example Number: BA/(**10K-2**) - (**P-4.5"**) - (**TFE-18"**)

Actual Number (with brackets removed): BA/10K-2-P-4.5"-TFE-18"

Description: 10K-2 Thermistor, Flared 4.5" Probe, 18" of Etched Teflon Leads.

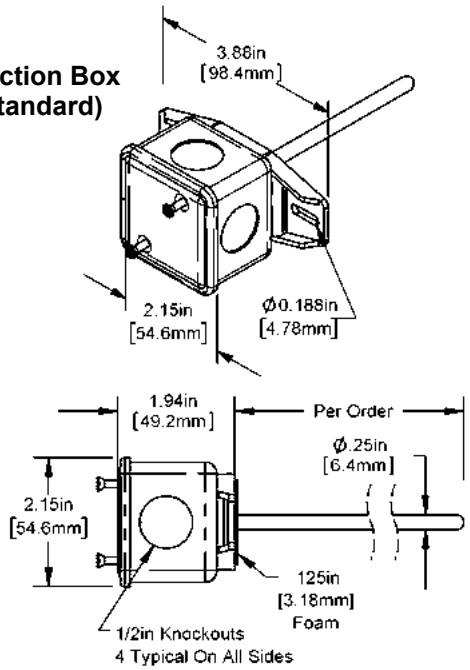
Your Number: BA/

Duct Temperature Sensor Enclosures

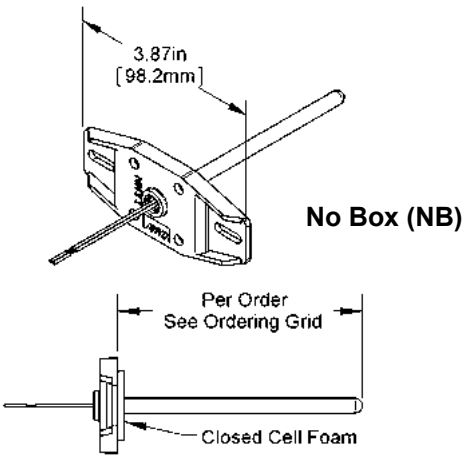
Temperature Sensors

Rev. 05/17/23

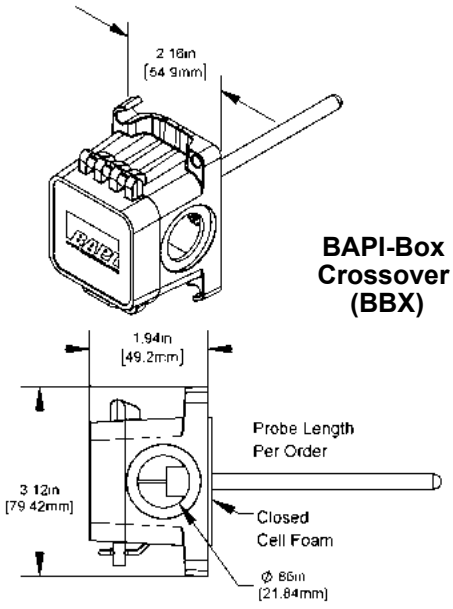
Junction Box (Standard)



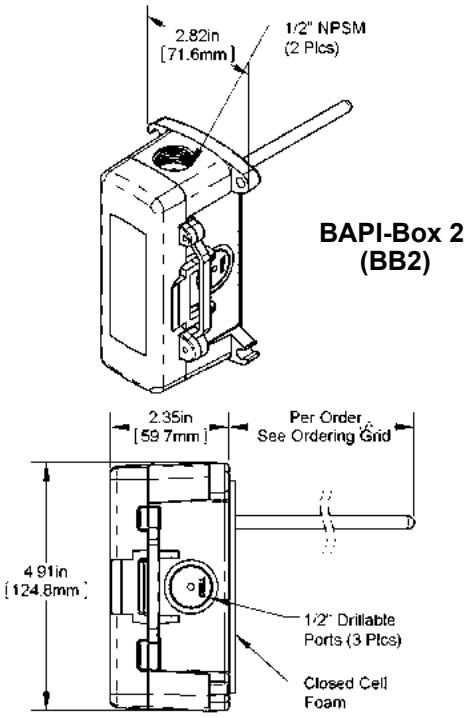
No Box (NB)



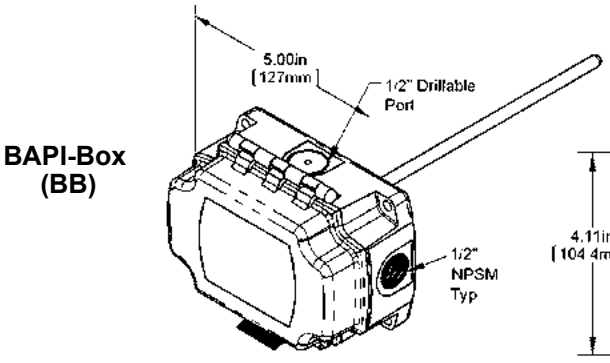
BAPI-Box Crossover (BBX)

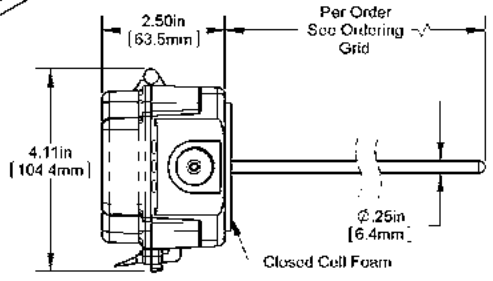


BAPI-Box 2 (BB2)



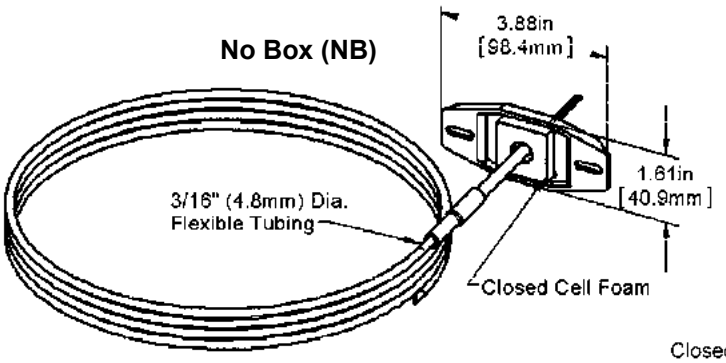
BAPI-Box (BB)



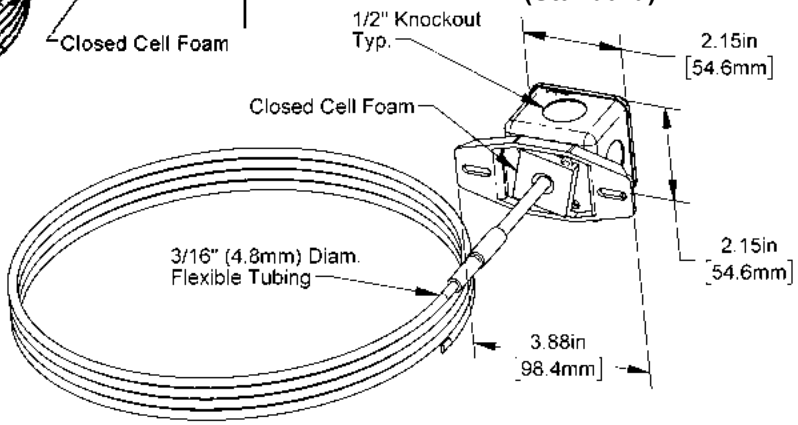


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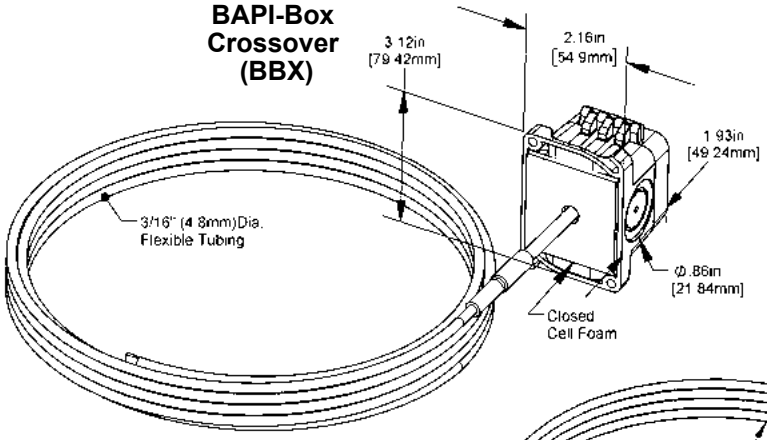
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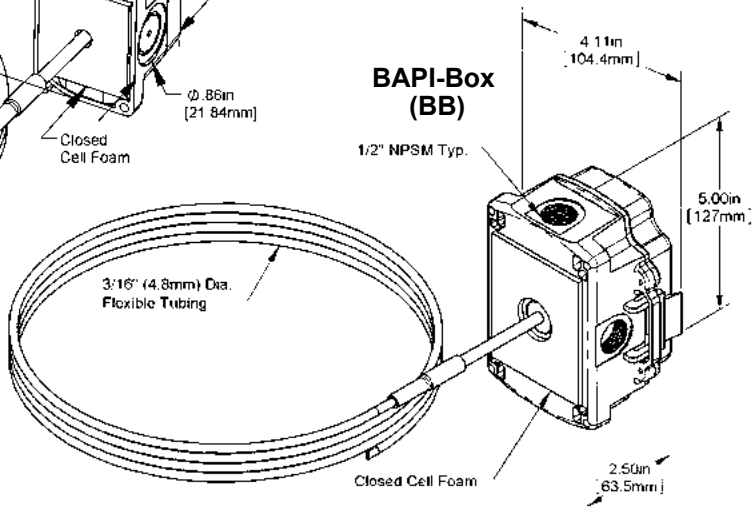
Junction Box (Standard)



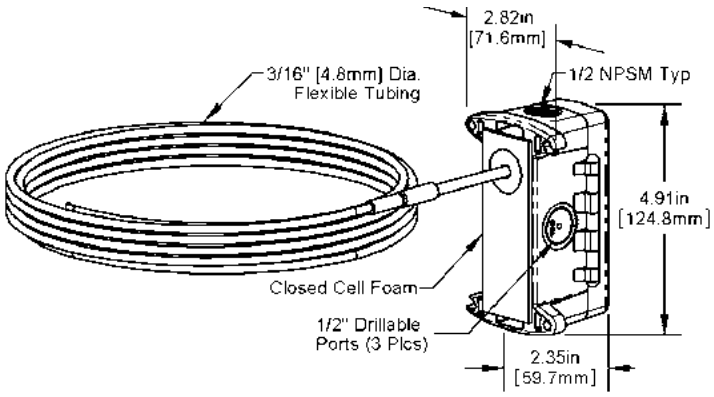
BAPI-Box Crossover (BBX)



BAPI-Box (BB)



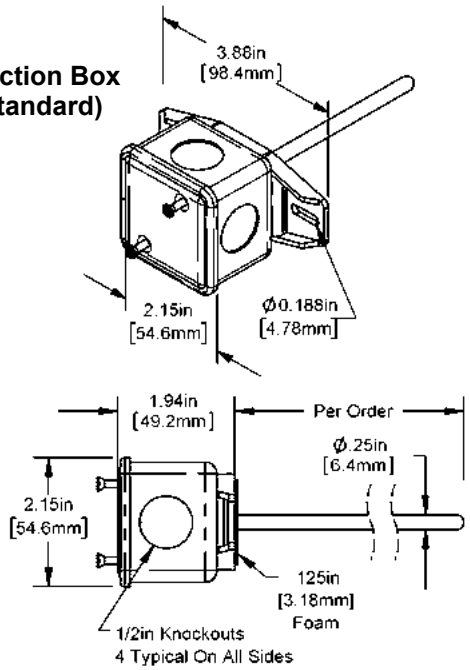
BAPI-Box 2 (BB2)



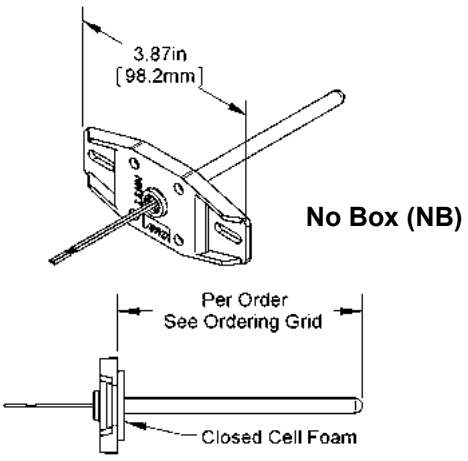
Rigid Averaging Sensor Enclosures

Temperature Sensors

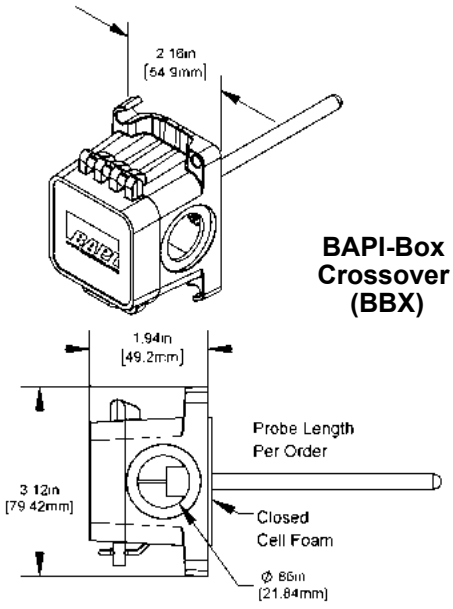
Junction Box (Standard)



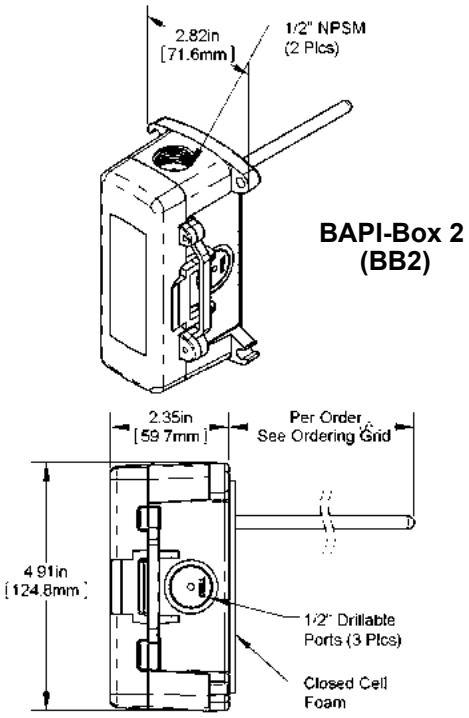
No Box (NB)



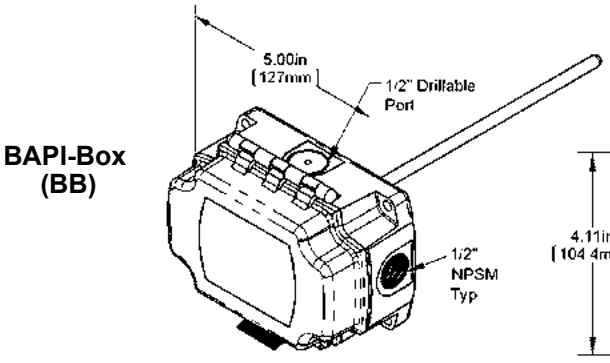
BAPI-Box Crossover (BBX)

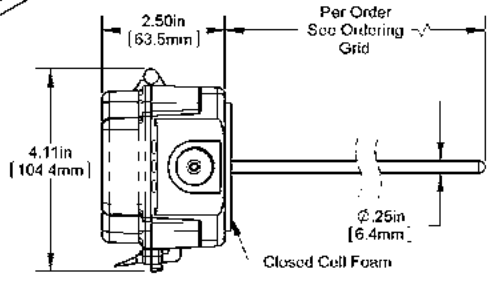


BAPI-Box 2 (BB2)

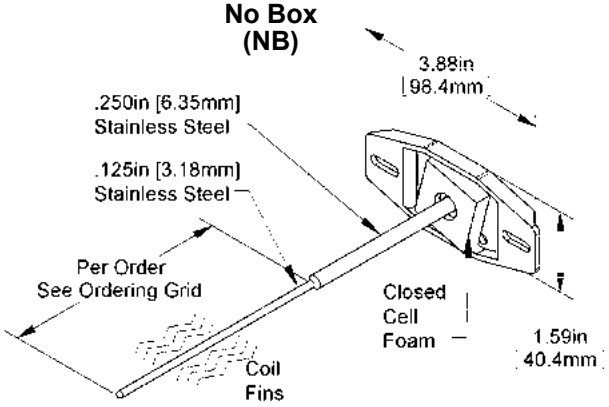


BAPI-Box (BB)

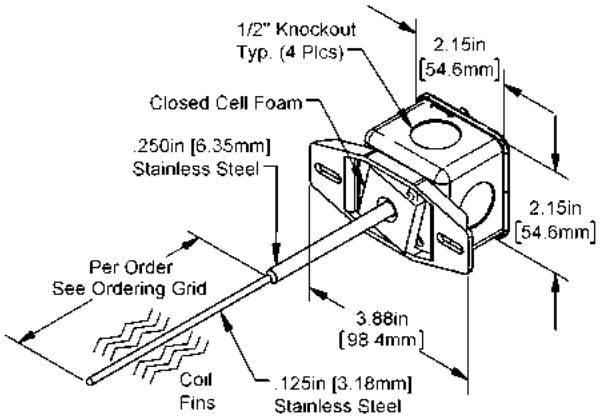




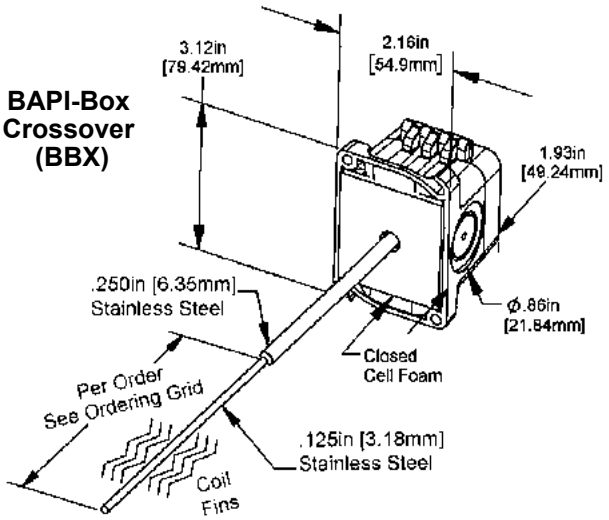
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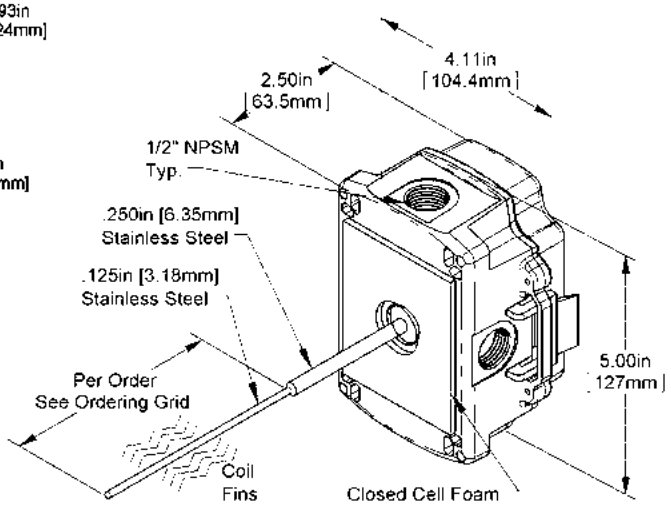
Junction Box (Standard)



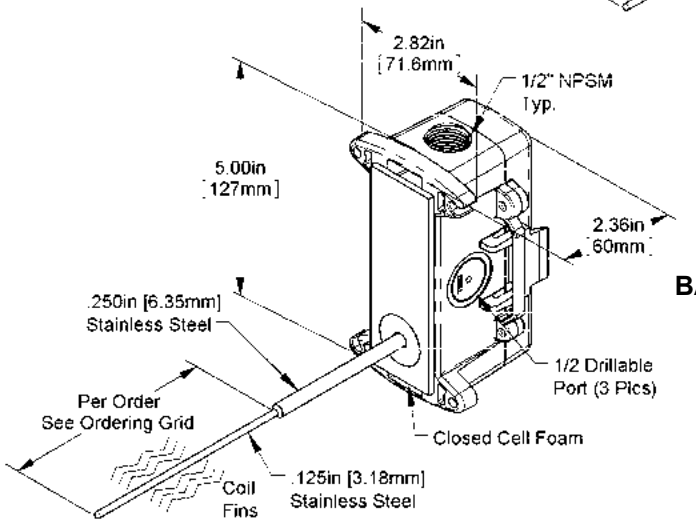
BAPI-Box Crossover (BBX)



BAPI-Box (BB)



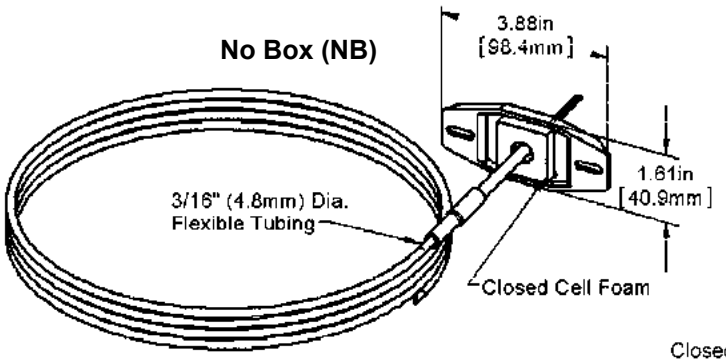
BAPI-Box 2 (BB2)



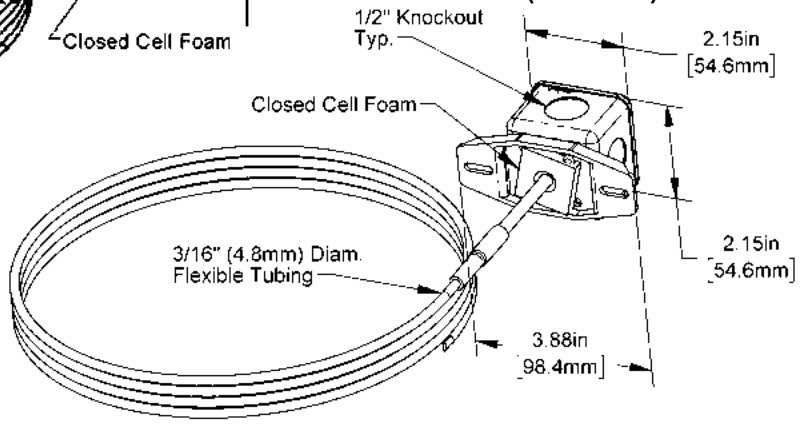
Submersible Averaging Enclosures

Temperature Sensors

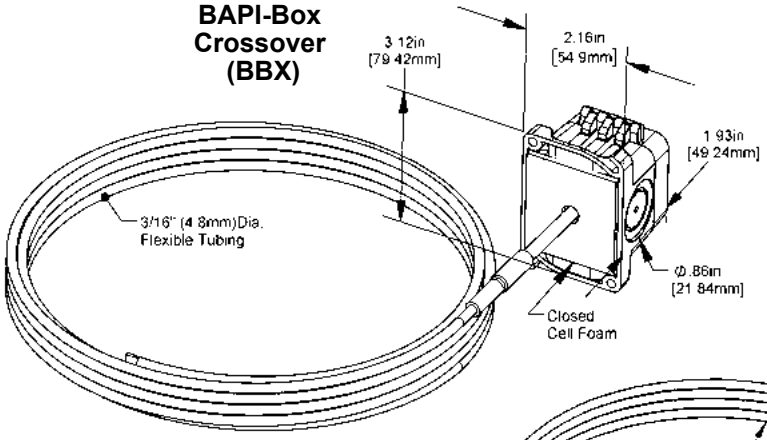
No Box (NB)



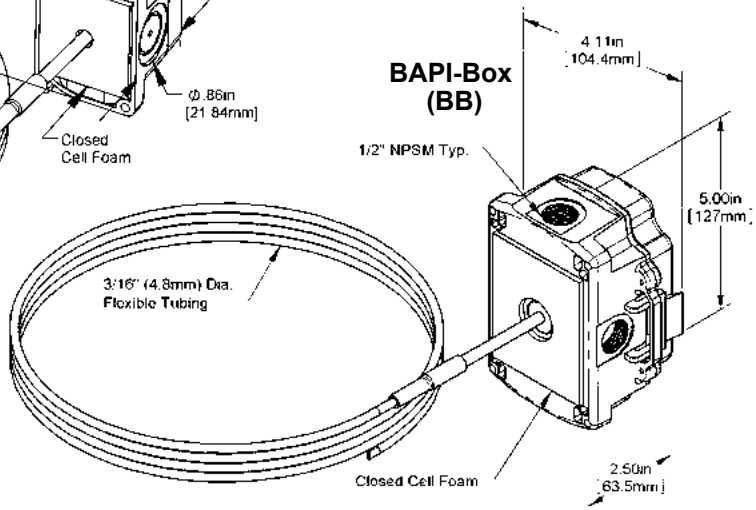
Junction Box (Standard)

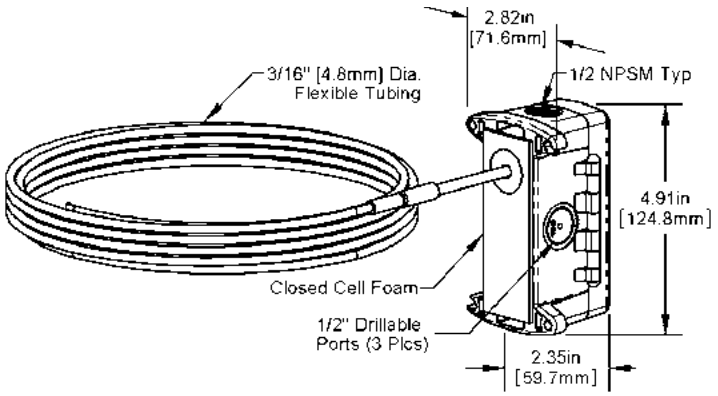


BAPI-Box Crossover (BBX)



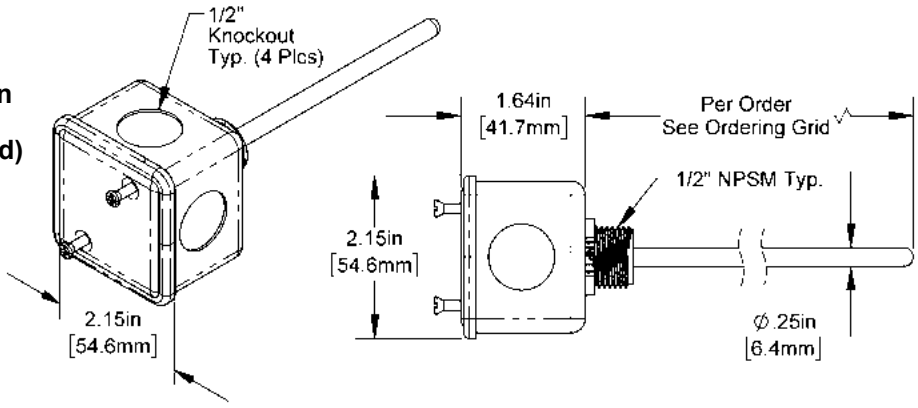
BAPI-Box (BB)



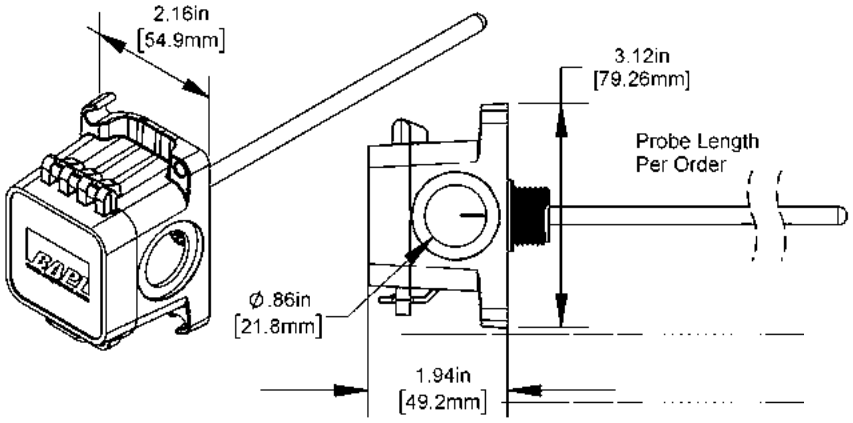


BAPI-Box 2 (BB2)

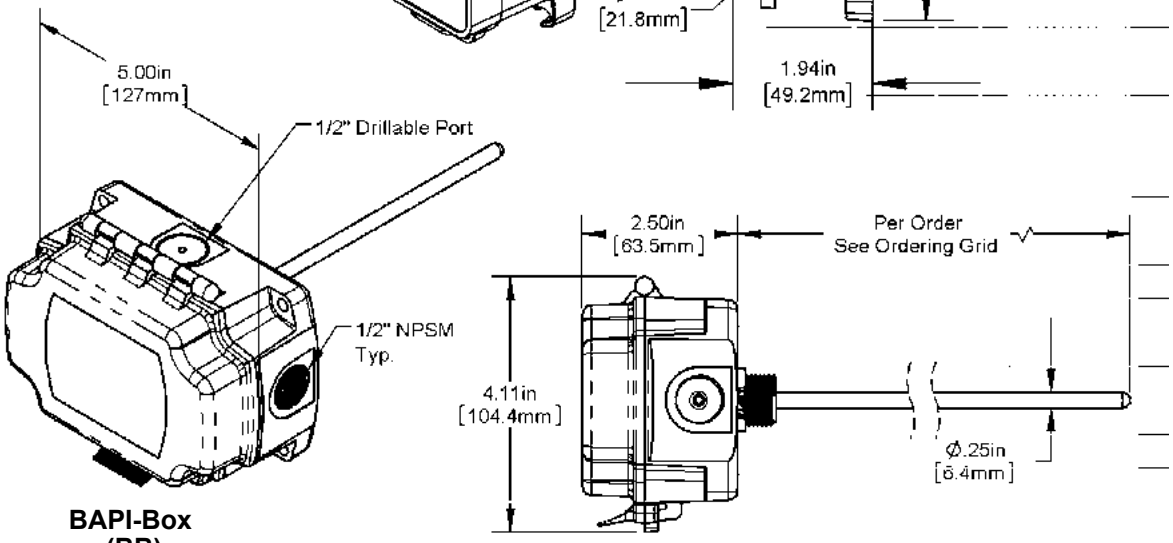
Junction Box (Standard)



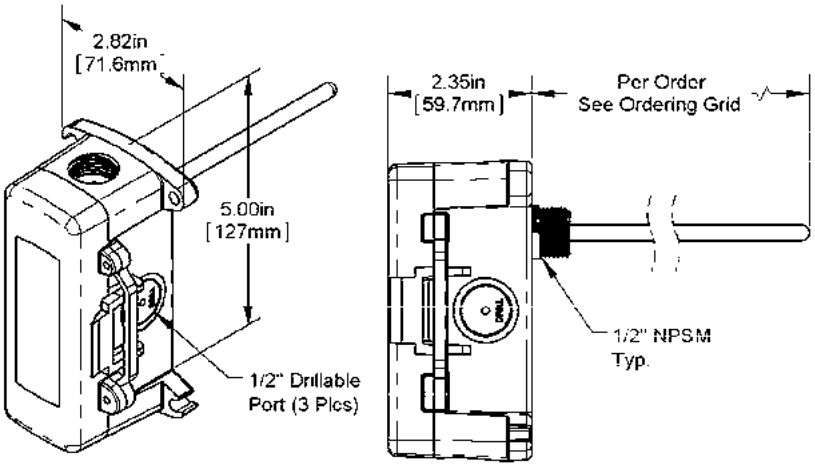
BAPI-Box Crossover (BBX)



BAPI-Box (BB)

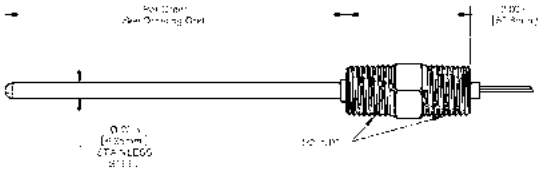


BAPI-Box 2 (BB2)

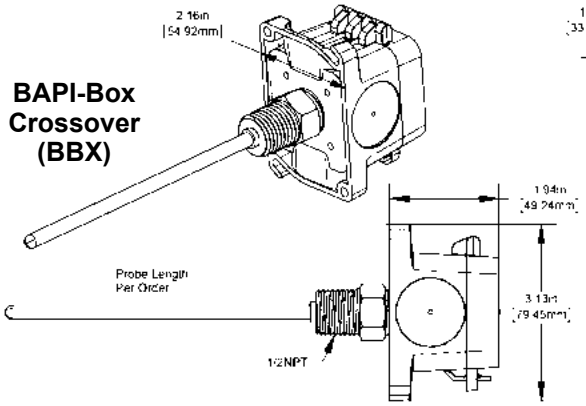


Immersion Probes with Stainless Steel Fittings

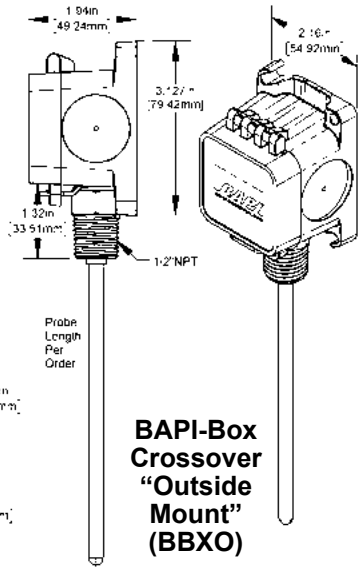
Temperature Sensors



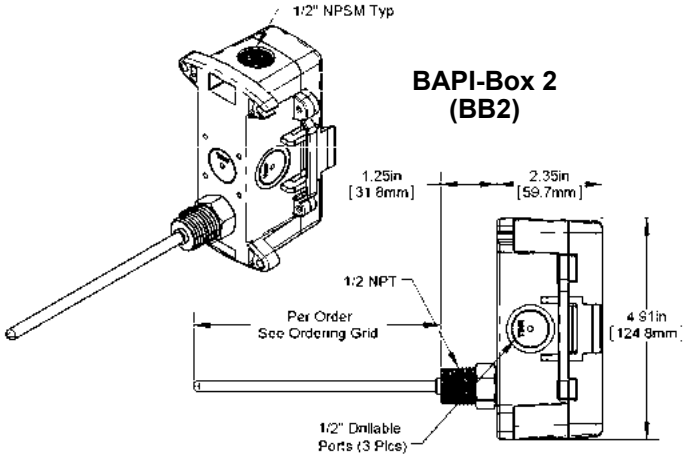
Probe without Enclosure



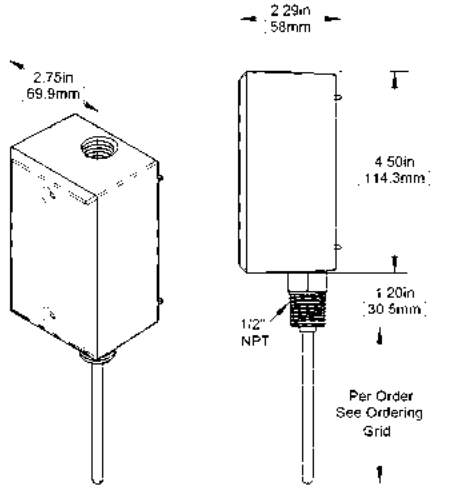
BAPI-Box Crossover (BBX)



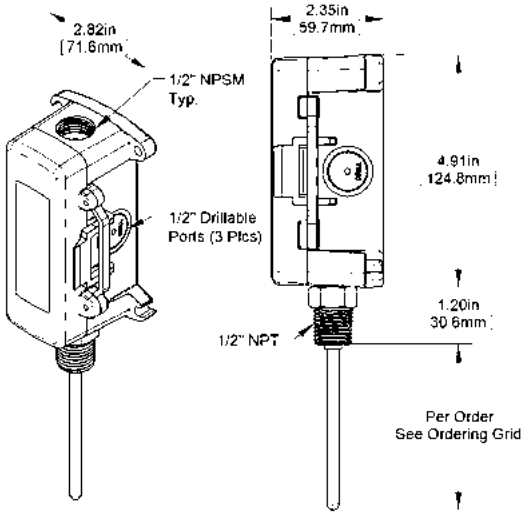
BAPI-Box Crossover "Outside Mount" (BBXO)



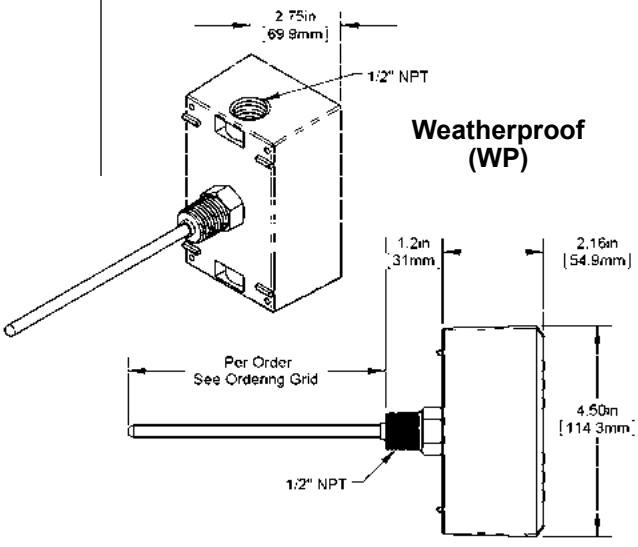
BAPI-Box 2 (BB2)



Weatherproof "Outside Mount" (WPO)

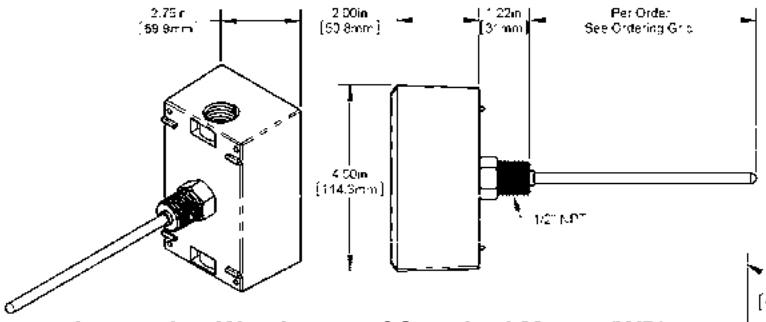


BAPI-Box 2 "Outside Mount" (BB2O)



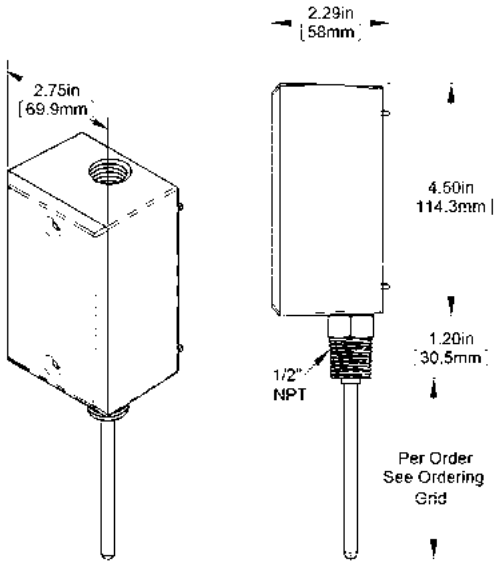
Weatherproof (WP)

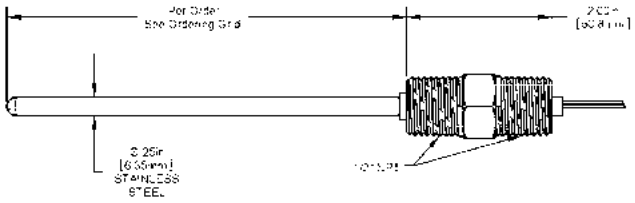
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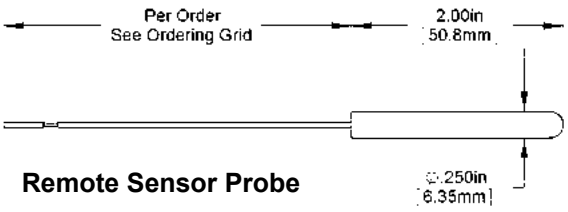
Immersion Weatherproof Standard Mount (WP)

Immersion Weatherproof Outside Mount (WPO)

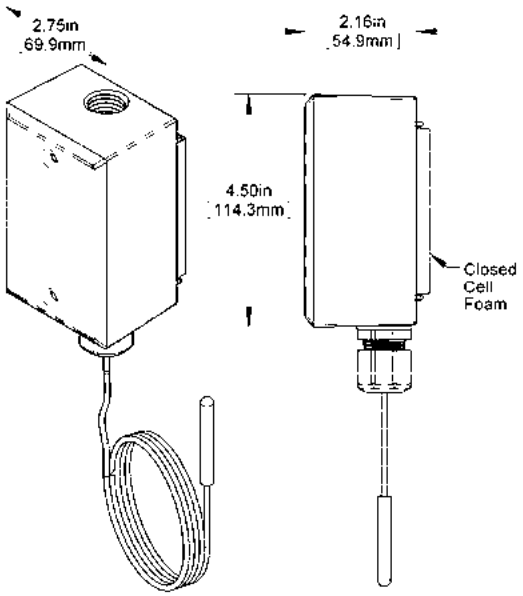




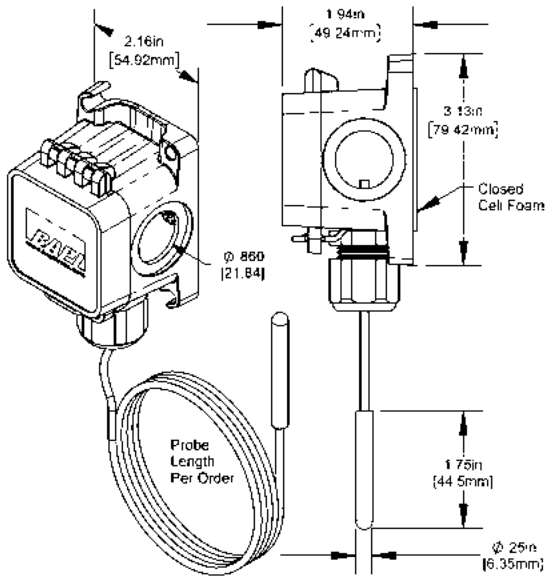
Immersion Probe without Enclosure



Remote Sensor Probe

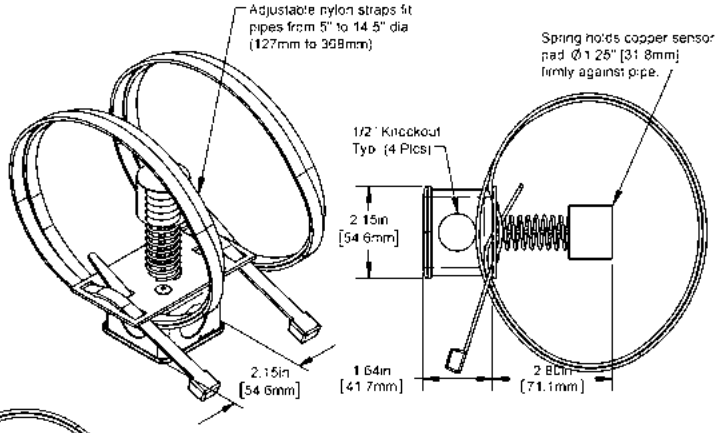


Remote Weatherproof (WP)

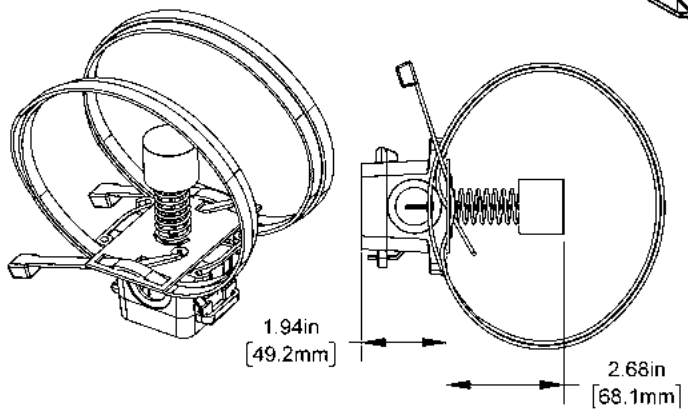


BAPI-Box Crossover (BBX)

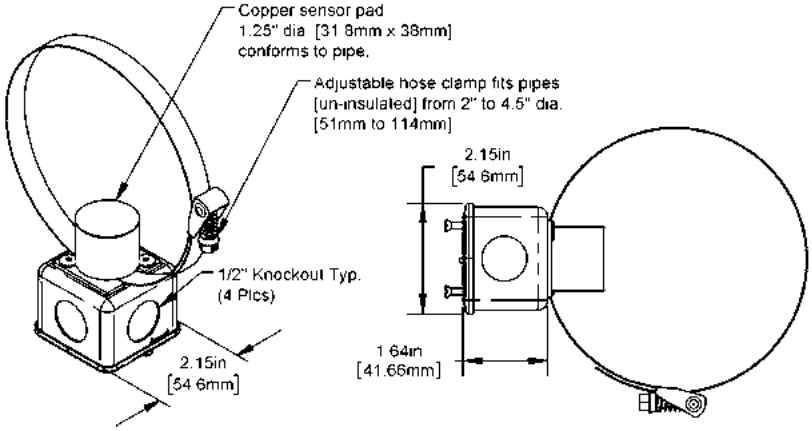
Spring-Loaded Strap Junction Box (JB)



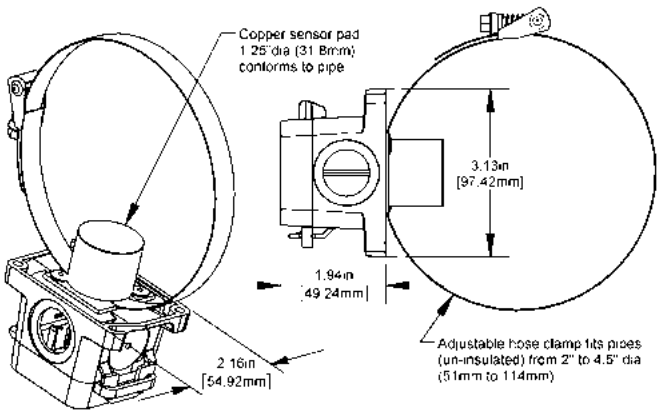
Spring-Loaded Strap BAPI-Box Crossover (BBX)

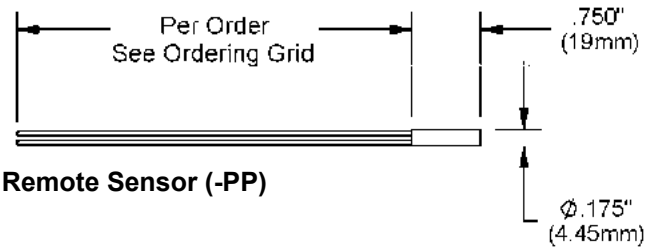


Clamp-On Strap Junction Box (JB)

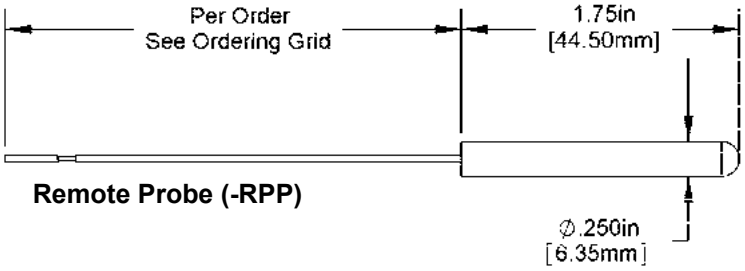


Clamp-On Strap BAPI-Box Crossover (BBX)

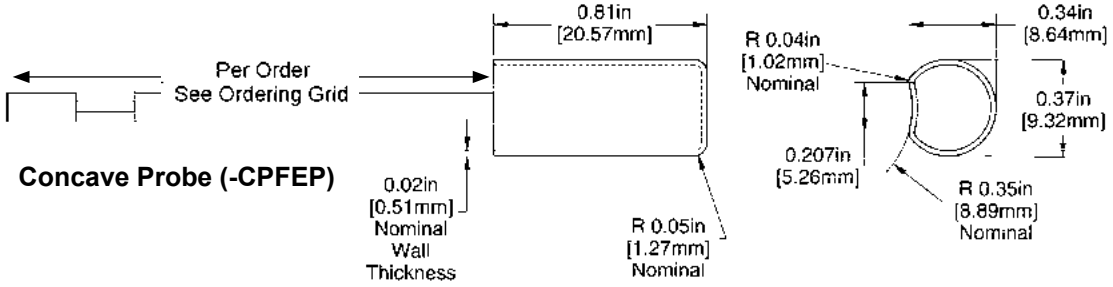




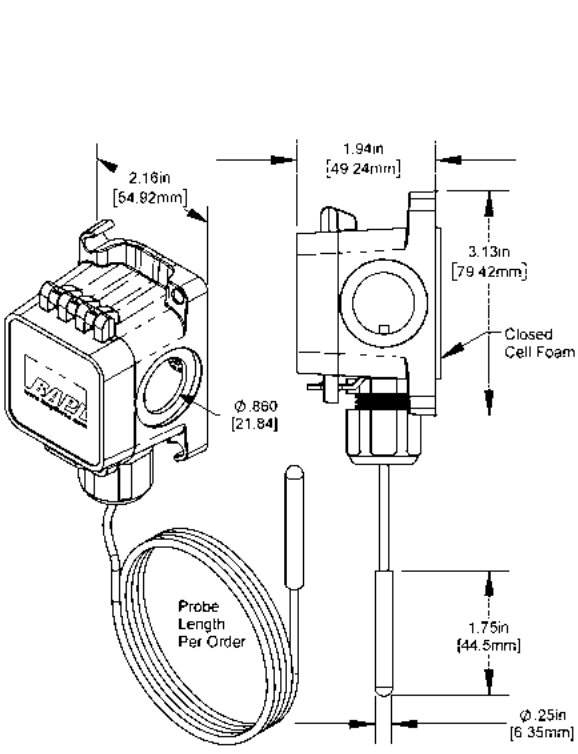
Remote Sensor (-PP)



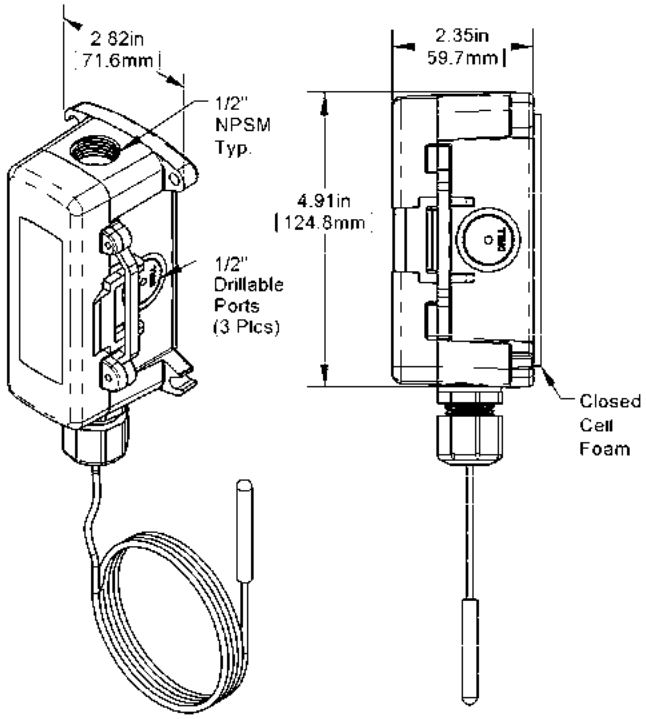
Remote Probe (-RPP)



Concave Probe (-CPFEP)

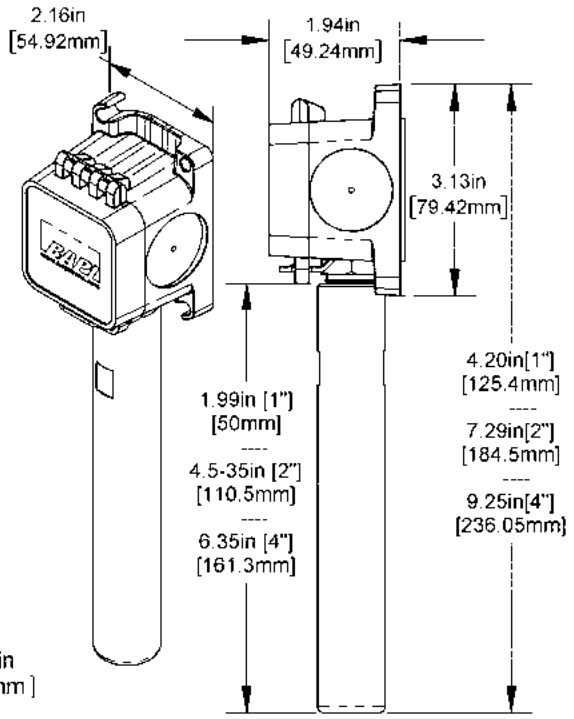


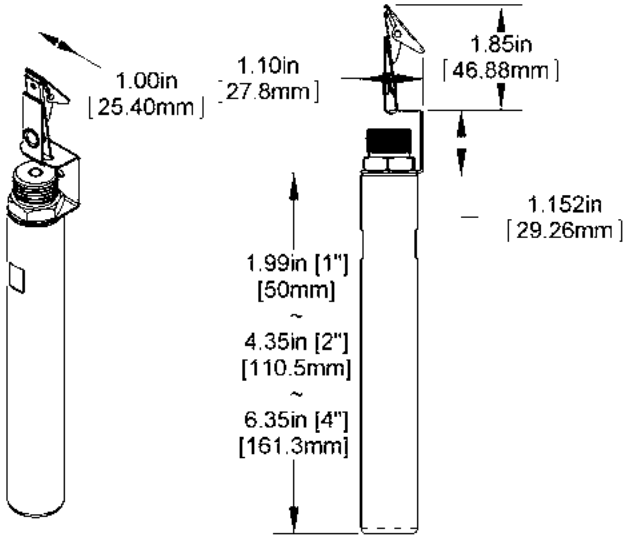
BAPI-Box Crossover (BBX)



BAPI-Box 2 (BB2)

BAPI-Box Crossover (BBX)





Hanging Bracket (HB)

BAPI-Box 2 (BB2)

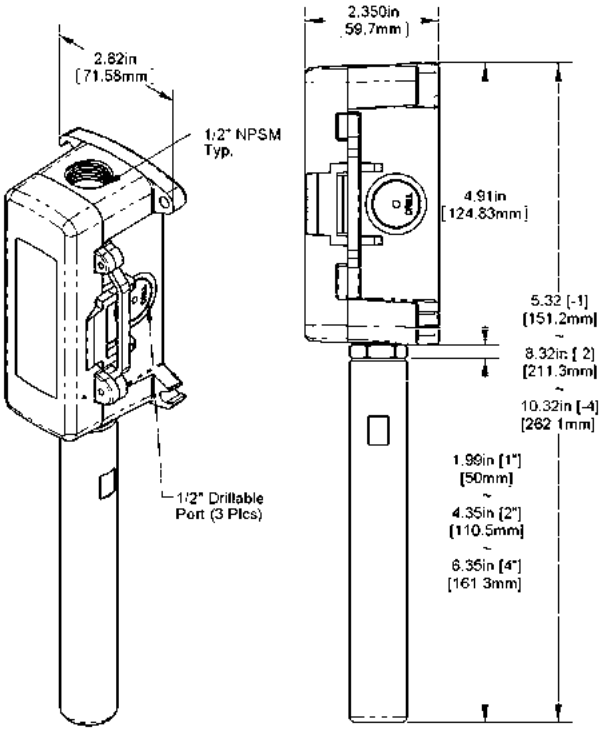


Table of Contents

Humidity & Combination Temp/Humidity Sensors

BAPI Humidity Only or Temperature/Humidity Sensors

BAPI-Stat "Quantum"
The Latest Innovation from BAPI



pg C2

BAPI-Stat 4
Large Display with Setpoint



pg C4

BAPI-Stat "Quantum Prime"
Wipedown Unit for ORs



pg C6

"X-Combo"
Temp & Humidity Setpoint



pg C8

Delta Style Sensors
with Optional Display



pg C10

Modbus Sensor
in the BAPI-Stat 4



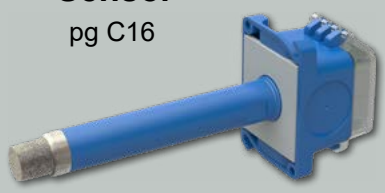
pg C12

Outside Air Sensor
pg C14



Outside Air Dimension Drawings.....C20

Duct Sensor
pg C16



Duct Sensor Dimension Drawings.....C19



Pendant Sensor
pg C18

BAPI-Stat "Quantum" Humidity Sensors

Humidity or Combination Temp/Humidity Sensors

CE Rev. 02/28/24

Features & Options

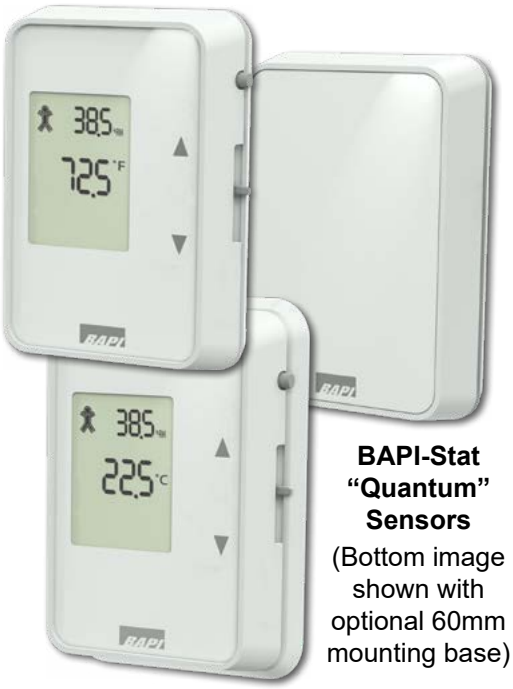
- Optional Temperature Setpoint Adjustment and Occupant Override
- Temp, Humidity and Room Occupancy Status Display
- Higher Contrast Display for Improved Clarity at Greater Distances

BAPI's BAPI-Stat Quantum room sensors feature a modern enclosure style with slider setpoint adjustment and occupancy override.

The optional LCD can display both temperature and humidity as well as room occupancy status. The display has been upgraded for higher contrast, providing improved clarity at greater distances.

5 YEAR WARRANTY

It is available with an optional occupancy override, 3.5mm (1/8"), RJ11 or RJ22 Communication Jack and a 60mm mounting base is also available to fit European style junction boxes.



BAPI-Stat "Quantum" Sensors
(Bottom image shown with optional 60mm mounting base)

Specifications

Power:
12 to 35 VDC for 4 to 20 mA or 0 to 5 VDC Output
15 to 35 VDC for 0 to 10 VDC Output
15 to 28 VAC for 0 to 5 VDC or 0 to 10 VDC Output
(AC power requires a separate pair of shielded wires.)

Power Consumption:
20 mA max. for 4 to 20 mA Output
4 mA max. for 0 to 5 VDC and 0 to 10 VDC Output
0.1 VA max. for 0 to 5 VDC and 0 to 10 VDC Output

Temp/%RH Sensor Construction:
Communicating Integrated Circuit

Humidity: Capacitive Polymer,
±2%RH @ 25°C (77°F), 20 to 80%RH

Temp: Semi-conductor Band Gap,
±0.3°C (±0.54°F) @ 20 to 40°C (68 to 104°F)

Field Calibration Adjustment:
±5% in 0.1% increments (Factory Calibrated)

Optional Passive Temperature Sensor Accuracy:
±0.36°F Thermistor, ±0.5°F RTD (Higher accuracy available)

Wiring: 2 to 5 pair of 16 to 22 AWG*

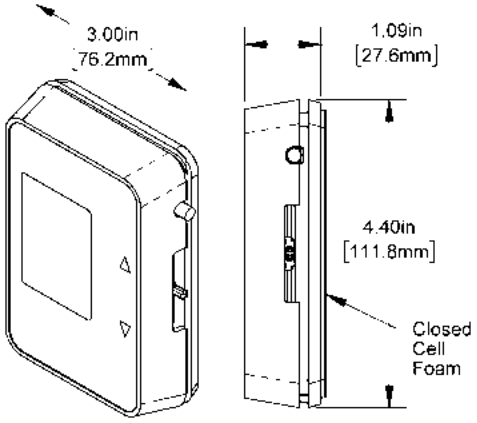
Mounting: Standard 2"x4" junction box, European junction box or drywall mount (screws provided)

Environmental Operation Range:
32 to 122 °F (0 to 50 °C) • 0 to 95%, non-condensing

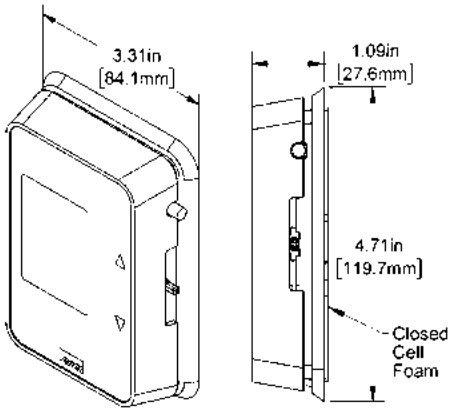
Material & Rating: ABS Plastic, UL 94, V-0

Agency: CE EN 61326-1:2013 EMC, RoHS

*BAPI recommends that you do not run wiring for the Room Units in the same conduit as line voltage wiring or with wiring for highly inductive loads such as motors, generators and coils. Also, these units are not designed for line voltage applications.



Unit with Standard Mounting Base



Unit with 60mm Mounting Base
(Fits European wall boxes and junction boxes with 60mm mounting centers)

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BAPI-Stat "Quantum" Humidity Sensors

Humidity or Combination Temp/Humidity Sensors

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

BAPI-Stat "Quantum" Humidity Sensor Option Selection Guide:

Unit w/ Standard Mounting Base
BA/HQ (**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**)(**#6**) - (**#7**) - (**#8**)

Unit w/ 60mm Mounting Base
BA/HQ60 (**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**)(**#6**) - (**#7**) - (**#8**)

#1: Display (required)
F .....Temperature Displayed in °F $35
C .....Temperature Displayed in °C..... $35
X .....No Display

#2: Temperature Sensor (required)
A .....1K Platinum RTD (385 curve)..... $25
B .....10K-2 Thermistor..... $18
C .....10K-3 Thermistor..... $18
D .....10K-3[11K] Thermistor..... $18
E .....20K Thermistor..... $18
F .....1.8K Thermistor..... $18
G.....1K Ω Nickel RTD $65
H.....3K Thermistor..... $18
X .....No Temperature Sensor

#3: Humidity (%RH) Sensor (required)
A .....4 to 20mA Output $260
B .....0 to 5V Output $260
C .....0 to 10V Output $260

#4: Setpoint Adjustment (required)
1.....Slider Setpoint Adjustment $6
X .....No Setpoint Adjustment

#5: Setpoint Display Range (required)
A .....-3 to +3
B .....-5 to +5
C .....50 to 90°F or 10 to 32°C
D .....55 to 85°F or 13 to 30°C
E .....60 to 80°F or 15 to 27°C
F .....65 to 80°F or 18 to 27°C
X .....No Setpoint Adjustment

#6: Setpoint Output Range (required)
00.....0 to 5V (not available w/ 4 to 20mA %RH output)
10.....0 to 10V (not available w/ 4 to 20mA %RH output)
40.....0 to 1KΩ
60.....0 to 10KΩ
80.....0 to 20KΩ
81.....4.75K to 24.75KΩ
82.....6.19K to 26.19KΩ
84.....10K to 30KΩ
X .....No Setpoint Adjustment

#7: Occupant Override (required)
J.....Override as a Separate Output $5
N.....Override in Parallel (//) with Sensor.... $5
P .....Override in Parallel (//) with Setpoint.. $5
X .....No Override

#8: Optional Selections* (optional)
A .....Differential Ground
B .....Comm Jack C35..... $10
C .....Comm Jack C11** $20
D .....Comm Jack C22** $25
F .....Test & Balance Switch..... $7.50

*When more than one is selected, put in alphabetical order. Additional options and descriptions can be found on pg. I4.

**Comm Jacks C11 and C22 are available for display units only

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/ HQ(**F**) - (**B**) - (**C**) - (**1**) - (**C**)(**80**) - (**J**)

Actual Number (with brackets removed): BA/HQF-B-C-1-C80-J

Description:
BAPI-Stat Quantum Series Room Temp/Humidity Sensor, °F Display, 10K-2 Thermistor Temperature Sensor, 0 to 10 V Humidity Output, Slider Setpoint Adjustment, 50 to 90°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Override in Parallel with Sensor, No additional optional selections.

List Price:
$35 (Display) + $18 (Thermistor) + $260 (%RH) + $6 (Setpoint) + $5 (override) = $324 List Price

Your Number: BA/

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C4

BAPI-Stat 4™ Style Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

Rev. 11/18/20

Features & Options

- Patented BAPI Enclosure Styles
- Humidity Only or Temp./Humidity Combo
- 2% RH Accuracy
- Optional Display, Temperature Setpoint, Override and Comm. Jack
- Full-range Temperature Compensation of RH Signal
- Five Year Warranty

The BAPI-Stat 4 Style room units are available as humidity only sensors or as combination temperature and humidity sensor.

They are available with optional display, temperature setpoint adjustment, occupant override and three styles of communications jack.



BAPI-Stat 4 Units with optional Setpoint and Override

Specifications

Power:
10 to 35 VDC for 4 to 20 mA or 0 to 5 VDC Output
15 to 35 VDC for 0 to 10 VDC Output
12 to 24 VAC for 0 to 5 VDC Output
15 to 28 VAC for 0 to 10 VDC Output
(AC power requires a separate pair of shielded wires.)

Power Consumption:
20 mA max. for 4 to 20 mA Output
4 mA max. for 0 to 5 VDC and 0 to 10 VDC Output
0.1 VA max. for 0 to 5 VDC and 0 to 10 VDC Output

RH/Temp Sensor Construction:
Communicating Integrated Circuit

Humidity: Capacitive Polymer,
±2%RH @ 25°C (77°F), 20 to 80%RH

Temp: Semi-conductor Band Gap,
±0.3°C (±0.54°F) @ 20 to 40°C (68 to 104°F)

Field Calibration Adjustment:
±5% in 0.1% increments (Factory Calibrated)

Optional Passive Temperature Sensor Accuracy:
±0.36°F Thermistor, ±0.5°F RTD
(Higher accuracy available)

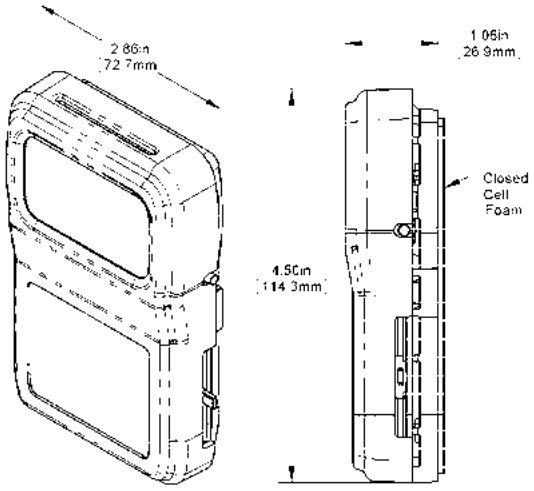
Wiring: 2 to 6 pair of 16 to 22 AWG*

Mounting: Standard 2"x4" J-box or drywall mount
- screws provided

Environmental Operation Range:
Temperature: 32 to 122 °F (0 to 50 °C)
Humidity: 0 to 95%, non-condensing

Material & Rating: ABS Plastic, UL 94, V-0

Agency: RoHS and CE



*BAPI recommends that you do not run wiring for the room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.

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BAPI-Stat 4™ Style Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

BAPI-Stat 4 Humidity Sensor Option Selection Guide:

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**)(**#5**) - (**#6**) - (**#7**) - (**#8**) - (**#9**)

#1: Temperature Sensor (Optional)
1K[375] ..... 1K Platinum RTD (375 curve)
1K ..... 1K Platinum RTD (385 curve)
1.8K ..... 1.8K Thermistor
3K ..... 3K Thermistor
10K-2 ..... 10K-2 Thermistor
10K-3 ..... 10K-3 Thermistor
10K-3[11K]. 10K-3[11K] Thermistor
20K ..... 20K Thermistor

#2: Humidity Output (required)
H220 ..... 4 to 20mA Output
H205 ..... 0 to 5V Output
H210 ..... 0 to 10V Output
H212 ..... 2 to 10V Output

#3: Display and Indication (required)
B4DF ..... Temperature Displayed in °F
B4DC ..... Temperature Displayed in °C
B4X ..... No Display

#4: Setpoint Display Range (optional)
A ..... -3 to +3
B ..... -5 to +5
C ..... 50 to 90°F or 10 to 32°C
D ..... 55 to 85°F or 13 to 30°C
E ..... 60 to 80°F or 15 to 27°C
F ..... 65 to 80°F or 18 to 27°C

#5: Setpoint Output Range (optional)
60..... 0 to 10 KΩ
80..... 0 to 20 KΩ
81..... 4.75 K to 24.75 KΩ
82..... 6.19 K to 26.19 KΩ
84..... 10 K to 30 KΩ

#6: Setpoint Legend (required)
L6..... Cool/Warm
L0..... No Legend

#7: Occupant Override (required)
J..... Override as a Separate Output
N..... Override in Parallel with Sensor
P ..... Override in Parallel with Setpoint
Z ..... No Override

#8: Communication Jack (optional)
C35L.... 3.5mm Phono Style Jack

#9: Common Ground (required)
CG ..... Common Ground

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/ (**10K-2**) - (**H205**) - (**B4DF**) - (**E**)(**80**) - (**L6**) - (**N**) - ( ) - (**CG**)

Actual Number (with parenthesis removed): BA/10K-2-H205-B4DF-E80-L6-N-CG

Description: 10K-2 Thermistor Temperature Sensor, 0 to 5V Humidity Output, BAPI-Stat 4 with °F Display, 60 to 80°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Cool/Warm Setpoint Legend, Override in Parallel with the Sensor, No Comm. Jack, Common Ground Configuration

Your Number: BA/

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BAPI-Stat “Quantum Prime” Temp & Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

CE Rev. 03/06/24

Features & Options

- BAPI-Stat "Quantum Prime" Enclosure Style with Higher Contrast Display for Improved Clarity at Greater Distances
- Membrane Keypad for Wipedown Cleaning
- Temperature and Humidity Setpoint Adjustment

The BAPI-Stat “Quantum Prime” is designed for operating rooms, clean rooms and elder care facilities. It features a large display and membrane keypad for wipedown cleaning. It is available with temperature and humidity measurement, temperature and humidity setpoint and occupant override.

The unit includes a number of field adjustments including °F or °C display, temperature and humidity offset and setpoint lockout. The display can also be set to show a large temperature and small %RH reading or a large %RH and a small temperature reading when 4 buttons are present.

This unit can be configured with up to four transmitted variables. Contact your BAPI representative for details.

A 60mm mounting base is also available to fit European style junction boxes.

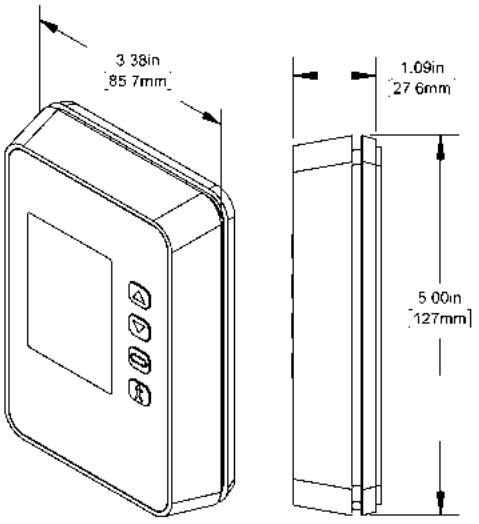


5 YEAR WARRANTY

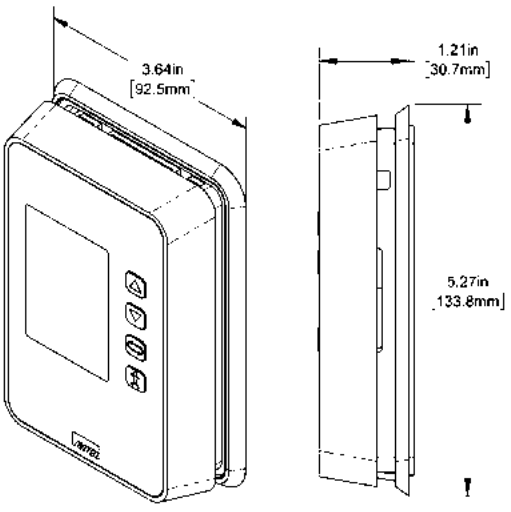
BAPI-Stat “Quantum Prime” Temp & Humidity Sensor

(image at right shown with optional 60mm mounting base)

Dimensions



Unit with Standard Mounting Base



Unit with 60mm Mounting Base
(Fits European wall boxes and junction boxes with 60mm mounting centers)

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Ordering Information

The BAPI-Stat “Quantum Prime” Wipedown Sensor is a powerful unit with many options. Please call your BAPI representative for ordering. We will provide a quote and keep it on record for future orders.

Specifications

Power Supply:
10 to 40 VDC (15 to 24 VDC Recommended) for 4 to 20 mA or 0 to 5 VDC Outputs
15 to 40 VDC (15 to 24 VDC Recommended) for 0 to 10 VDC Outputs
12 to 28 VAC (Requires a separate pair of shielded wires) for 0 to 5 VDC Outputs
15 to 28 VAC (Requires a separate pair of shielded wires) for 0 to 10VDC Outputs

Power Consumption:
100 mA max DC ..... 4 to 20 mA Output (<30mA typical)
75 mA max DC ..... 0 to 5 or 0 to 10 VDC Outputs (6mA typical)
1.9 VA max AC..... 0 to 5 or 0 to 10 VDC Outputs (0.2VA typical)

Outputs: 4 active outputs plus 1 passive temp sensor
Volts..... 0 to 5 VDC or 0 to 10VDC, Impedance >10KΩ
Current..... 4 to 20 mA, Impedance <500Ω @ 24 VDC
Resistance..... Setpoint, 5 VDC @ 5 mA max
Relay Contact..... N.O., 500 mA @ 24 VDC max
Temp. Sensor ..... Passive RTD or Thermistor

Inputs:
External Override..... 5 VDC or 24 VDC/VAC
External Sensor..... 10K-2 Themistor purchased separately.

Sensing Elements for Active Outputs and Display:
Temperature ..... 10K-2 Thermistor
Humidity..... Capacitive Polymer, ±2%RH

Mounting: Standard 2”x4” junction box, European junction box or drywall mount (screws provided)

Environmental Ambient:
Temperature ..... 32 to 122ºF (0 to 50ºC)
Humidity..... 0 to 95%, non-condensing
Storage..... 32 to 185°F (0 to 85°C)

Wiring: 2 to 6 pair of 16 to 22 AWG*

Enclosure Material: ABS Plastic, UL 94, V-0

Agency: CE EN 61326-1:2013 EMC, RoHS

***BAPI** recommends that you do not run wiring for room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.

BAPI-Stat "Quantum Prime" Temp & Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

CE Rev. 02/06/25

Features & Options

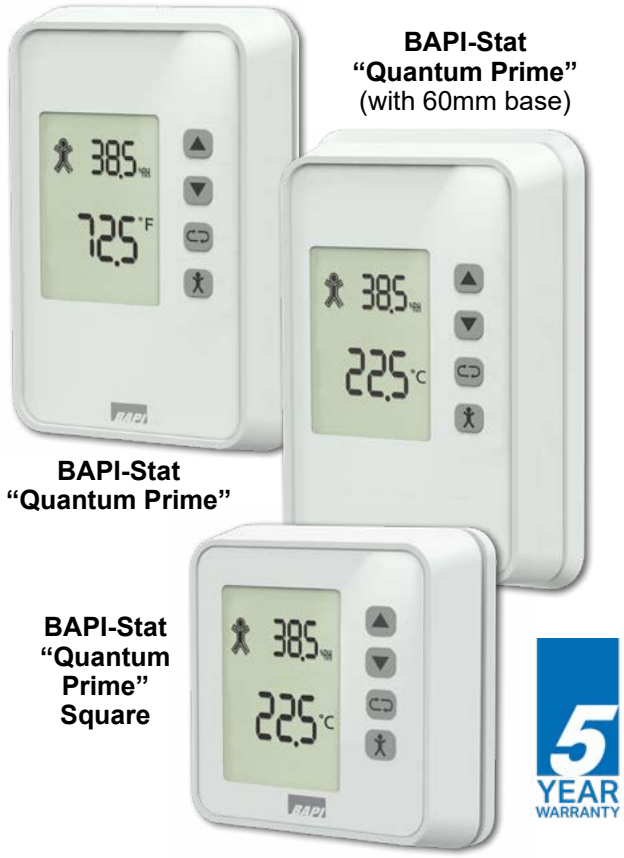
- Standard, Standard with 60mm Mounting Base, or Square Enclosure Styles
- Membrane Keypad for Wipedown Cleaning
- Temperature & Humidity Setpoint Adjustment

The BAPI-Stat "Quantum Prime" is designed for operating rooms, clean rooms and elder care facilities. It features a large display and membrane keypad for wipedown cleaning. It is available with temperature and humidity measurement, temperature and humidity setpoint and occupant override.

The unit includes a number of field adjustments including °F or °C display, temperature and humidity offset and setpoint lockout. The operator's manual includes the complete list of field adjustments.

This unit can be configured with up to four transmitted variables. Contact your BAPI representative for details.

The standard enclosure with 60mm mounting base and the square enclosure fit European style back boxes.



Specifications

Power Supply:
10 to 40 VDC (15 to 24 VDC Recommended) for 4 to 20 mA or 0 to 5 VDC Outputs
15 to 40 VDC (15 to 24 VDC Recommended) for 0 to 10 VDC Outputs
12 to 28 VAC (Requires a separate pair of shielded wires) for 0 to 5 VDC Outputs
15 to 28 VAC (Requires a separate pair of shielded wires) for 0 to 10 VDC Outputs

Power Consumption:
100 mA max DC ..... 4 to 20 mA Output (<30mA typical)
75 mA max DC ..... 0 to 5 or 0 to 10 VDC Outputs (6mA typical)
1.9 VA max AC..... 0 to 5 or 0 to 10 VDC Outputs (0.2VA typical)

Outputs: 4 active outputs plus 1 passive temp sensor
Volts..... 0 to 5 VDC or 0 to 10 VDC, Impedance >10KΩ
Current..... 4 to 20 mA, Impedance <500Ω @ 24 VDC
Resistance..... Setpoint, 5 VDC @ 5 mA max
Relay Contact..... N.O., 500 mA @ 24 VDC max
Temp. Sensor ..... Passive RTD or Thermistor

Inputs: External Override: 5 VDC or 24 VDC/VAC | External Sensor: 10K-2 Themistor purchased separately.

Sensing Elements for Active Outputs and Display:
Temperature: 10K-2 Thermistor | Humidity: Capacitive Polymer, ±2%RH

Mounting: Standard 2"x4" junction box, European back box or drywall mount (screws provided)

Environmental Ambient:
Temp: 32 to 122ºF (0 to 50ºC) | Humidity: 0 to 95%, non-condensing | Storage: 32 to 185°F (0 to 85°C)

Wiring: 2 to 6 pair of 16 to 22 AWG

Enclosure Material: ABS Plastic, UL 94, V-0

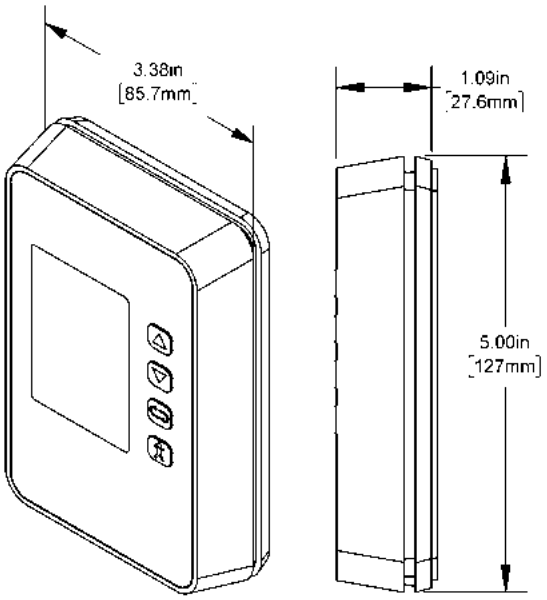
Agency: CE EN 61326-1:2013 EMC, RoHS

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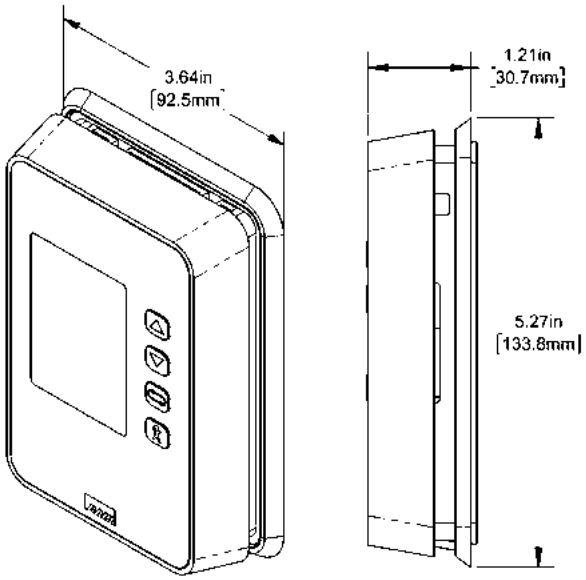
Ordering Information

The BAPI-Stat “Quantum Prime” Wipedown Sensor is a powerful unit with many options. Please call your BAPI representative for ordering. We will provide a quote and keep it on record for future orders.

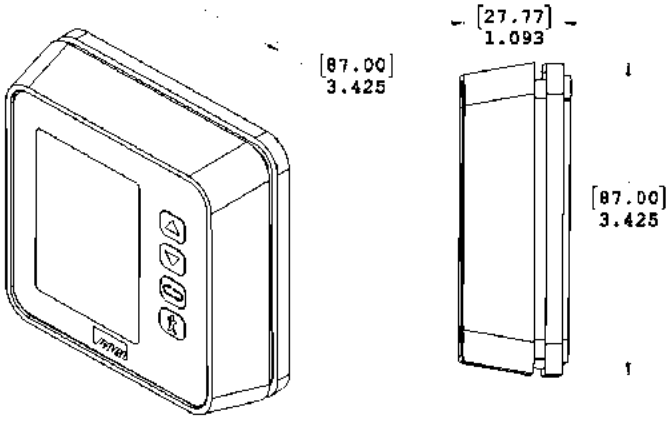
Dimensions



Unit with Standard Mounting Base



BAPI-Stat “Quantum Prime” with 60mm Mounting Base
(Fits European back boxes with 60mm mounting centers)



BAPI-Stat “Quantum Prime” Square
(Fits European back boxes with 60mm mounting centers)

BAPI-Stat 4 “X-Combo” Temp/Humidity Unit

Humidity or Combination Temp/Humidity Sensors

Rev. 10/02/23

Features & Options

- Temperature and Humidity Setpoint Adjustment
- Large Easy-to-Read Display, °F or °C Indication
- Fully Compensated 2% RH Sensor
- Optional Override, Resistive Temperature Sensor and Communication Jack

The BAPI-Stat 4 “X-Combo” Room Unit features local indication of both temperature and humidity with optional Temperature Setpoint, Humidity Setpoint and Local Occupancy Override.

The optional LCD shows room temperature in °C or °F and room humidity in %RH. In addition, the unit has adjustable offsets for both temperature and humidity and the transmitter ranges are field configurable. This unit can be configured with up to four transmitted variables.

Temperature & Humidity Setpoint Adjustment



BAPI-Stat 4 “X-Combo”

5 YEAR WARRANTY

Specifications

Supply Voltage:
DC Power: ..... 16 to 30VDC
AC Power: ..... 18 to 30VAC*

Power Consumption: 50mA max. DC, 1.5VA max. AC

RH/Temp Sensor Construction:
Communicating Integrated Circuit

Humidity: Capacitive Polymer,
±2%RH @ 25°C (77°F), 20 to 80%RH

Temp: Semi-conductor Band Gap,
±0.3°C (±0.54°F) @ 20 to 40°C (68 to 104°F)

Optional Direct Temp. Sensor:
Thermistor or RTD (See Sensors Sect. for Specs.)

Available Outputs: 3 Configurable, 1 Passive Sensor

Termination: 8 Terminals, 16 to 22 AWG**

Mounting:
Standard 2x4” J-Box or Drywall, screws provided

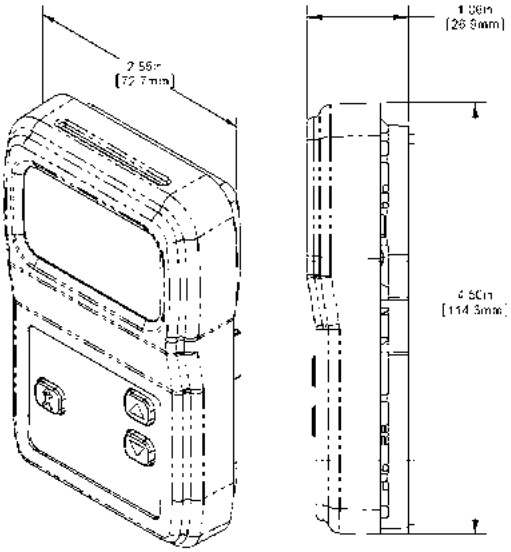
Enclosure Material: ABS Plastic, UL94 V-0

*AC power requires a separate pair of shielded wires.

**BAPI recommends that you do not run wiring for the room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.

Ambient (Enclosure):
Temperature: . 32 to 122ºF (0 to 50ºC)
Humidity: ..... 0 to 95%RH, Non-Cond.

Agency: RoHS



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Ordering Information

The “X-Combo” is a very powerful unit with many options. Please call your BAPI representative for ordering. We will provide a quote and keep it on record for future orders

Delta Style Room Humidity Units

Humidity or Combination Temp/Humidity Sensors

Rev. 11/02/22

Features & Options

- Low Profile Delta Style Enclosure with Optional Display
- Humidity Only or Temperature/Humidity Combo
- 2% and 3% RH Accuracies
- Optional Communications Jack
- User Adjustable Toggle Rate Between Temp & Humidity Display
- Wide Selection of Temperature Sensing Elements
- Full-range Temperature Compensation of RH Signal
- Five Year Warranty

The Delta Style room units are available as Humidity Only sensors or as Combination temperature and humidity sensors. They feature an optional display with a user adjustable toggle rate between humidity and temperature and can display in either °C or °F.

The unit is available with the entire line of BAPI temperature sensors. If a temperature transmitter and humidity transmitter are desired, then see the "X-Combo" Unit on page C9 of this section.



Delta Style Enclosures with and without Display

Specifications

Power:
10 to 35 VDC (0 to 5 VDC or 4 to 20 mA Outputs)
15 to 40 VDC (0 to 10 VDC Output)
12 to 24 VAC (0 to 5 VDC Output)
15 to 28 VAC (0 to 10 VDC Output)

Note: If AC power is used, it must be shielded from the signal wiring

Power Consumption:
22 mA max. DC (0 to 5 VDC or 4 to 20 mA Outputs)
6 mA max DC (0 to 10 VDC Output)
0.53 VA max. AC (0 to 5 VDC Output)
0.14 VA max. AC (0 to 10 VDC Output)

Sensing Elements:
Temperature - Thermistor or RTD
(See "Sensors" section for specs.)

Humidity - Capacitive Type,
±2% or ±3%RH @ 25°C (77°F), 0 to 90%RH

%RH Calibration Adjustment: ±5% POT

Wiring: 2 to 3 pair of 16 to 22 AWG*

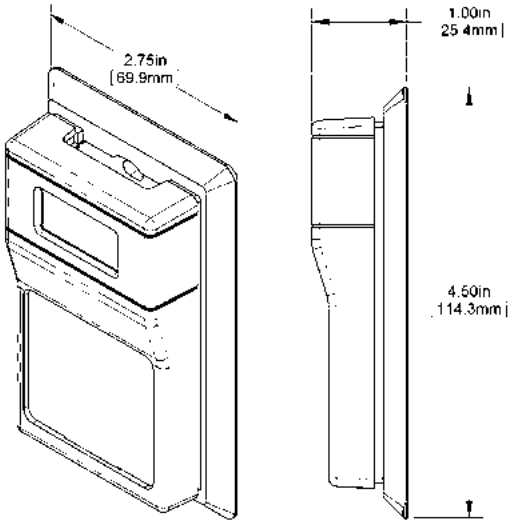
*BAPI recommends that you do not run wiring for the room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.

Mounting: 2"x4" J-box or drywall mount - screws provided

Environmental Operation Range:
Temp: 32 to 122 °F (0 to 50 °C)
Humidity: 5 to 95%, non-condensing

Material & Rating: ABS Plastic, UL94 HB

Agency: RoHS and CE



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Delta Style Room Humidity Units

Humidity or Combination Temp/Humidity Sensors

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

Delta Style Room Humidity Sensor Option Selection Guide:

BA/ (**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Temperature Sensor (optional)		**List Price**
1K[375]	1K Platinum RTD (375 curve)	$25
1K	1K Platinum RTD (385 curve)	$25
1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
#2: Humidity Output (required)		
H200	Interchangeable 4 to 20mA or 0 to 5V Output	$260
H210	0 to 10V Output	$260
#3: Display and Indication (required)		
RD	With Display	$35
R	No Display	
#4: Communication Jack (optional)		
C35L	3.5mm Phono Style Jack	$10
#5: Enclosure Color (required)		
BW	Bright White Enclosure Color	

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/ (**10K-2**) - (**H200**) - (**RD**) - (**C35L**) - (**BW**)

Actual Number (with parenthesis removed): BA/10K-2-H200-RD-C35L-BW

Description: 10K-2 Thermistor Temperature Sensor, 4 to 20mA or 0 to 5V Interchangeable Humidity Output, Delta Style Room Enclosure with Display, 3.5mm Phono Style Comm. Jack, Bright White Enclosure Color

List Price: $18 (Thermistor) + $260 (Humidity) + $35 (Display) + $10 (Comm. Jack) = $323 List Price

Your Number: BA/

BAPI-Stat 4 Modbus Room Sensor

Humidity or Combination Temp/Humidity Sensors

Rev. 11/18/20

Features & Options

- Modbus Serial Communications Protocol
- BAPI-Stat 4 Style Enclosure with Optional Large Display
- Robust Tactile Pushbuttons on Display Units
- Setpoint Adjustment on Display Unit with Optional Humidity Measurement, Fan Speed Control and Occupant Override
- Five Year Warranty

The BAPI-Stat 4MB unit features an optional large LCD with all the visual indicators on the display itself. Display units provide local indication of temperature with temperature setpoint adjustment and optional occupant override.

The unit is also available with humidity measurement and fan speed/mode adjustment for applications with fan coils, heat pumps or unit ventilators.



BAPI-Stat 4MB Units

VC350A "EZ" - Voltage Converter

BAPI recommends using DC power on room units for a more stable reading. Our 350mA "EZ" unit is a perfect way to convert 24 VAC to 5, 12, 15 or 24 VDC. See "Accessories" for more info.



Specifications

Power:
9 to 40 VDC (24 VDC nominal)
24 VAC +20%/-30%.
Note: AC power requires a separate pair of shielded wires.

Power Consumption:
7 mA max DC; .28 VA maximum AC

Sensing Element:
Thermistor or Semiconductor

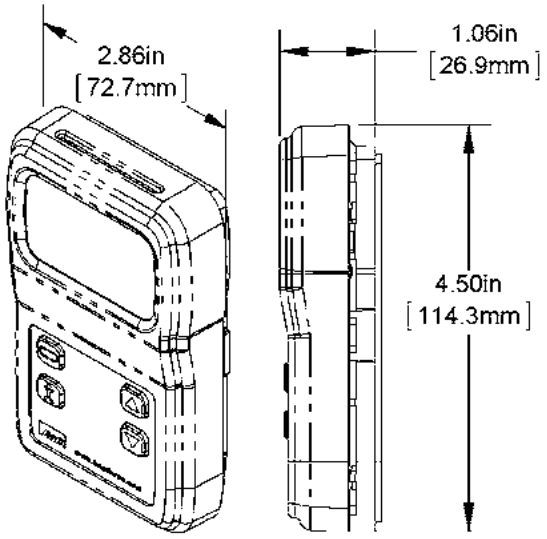
Sensor Accuracy:
Temp: ±0.3°C @ 20 to 40°C (68 to 104°F)
%RH: ±2%RH @ 25°C (77°F), 20 to 80%RH

Wiring: 2 pair of 14 to 22 AWG*

Mounting:
Standard 2" by 4" J-box
or drywall mount (screws provided)

Environmental Operation Range:
Temperature: 32 to 122 °F (0 to 50 °C)
Humidity: 0 to 95%, non-condensing

Agency: RoHS and CE



*__BAPI__ recommends that you do not run wiring for the Room Units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils. Also, these units are not designed for line voltage applications.

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Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

BAPI-Stat 4 Modbus Sensor Option Selection Guide:

BA/BS4MB(**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Display (required)
F ..... Display with Temperature in °F
C ..... Display with Temperature in °C
X ..... No Display

#2: Setpoint (required for display units)
C ..... 50 to 90 °F or 10 to 32 °C
D ..... 55 to 85 °F or 13 to 30 °C
E ..... 60 to 80 °F or 15 to 27 °C
F ..... 65 to 80 °F or 18 to 27 °C
G ..... 45 to 96 °F or 7 to 36 °C
L ..... 70 to 74 °F or 21 to 23 °C

#3: Humidity Measurement (required)
HN ..... No Humidity Measurement
H2 ..... Humidity Measurement

#4: Fan Speed and Mode Control (required)
FN ..... No Fan Speed Adjustment
F0 ..... Fan Speed Mode 0 (available for display units only)
F1 ..... Fan Speed Mode 1 (available for display units only)

#5: Override (required)
J ..... Override Enabled (available for display units only)
Z ..... No Override

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/**BS4MB**(**F**) - (**E**) - (**H2**) - (**FN**) - (**J**)

Actual Number (with parenthesis removed): BA/BS4MBF-E-H2-FN-J

Description: BAPI-Stat 4MB Unit with Pushbutton Setpoint, °F Display, 60 to 80°F Setpoint Display Range, Humidity Measurement, No Fan Speed Adjustment, Override Enabled.

Your Number: BA/

Outside Air Units

Humidity or Combination Temp/Humidity Sensors

Rev. 10/07/24

Features & Options

- 10 Points of Calibration from 10 to 90%RH
- Humidity Only or Temp./Humidity Combination
- Replaceable Filter
- ±2% and ±3%RH Accuracies
- BAPI-Box 2 or BAPI-Box Enclosure Styles
- Wide Selection of Temperature Sensing Elements

Humidity control is an important aspect of any climate control system. Therefore, humidity sensors must be both accurate and dependable. BAPI's humidity transmitters are calibrated at 10 points from 10 to 90% RH for accuracy, eliminating field calibration.

The Outside Air Units are also extremely dependable, featuring two of the most watertight enclosures available today. The BAPI-Box and BAPI-Box 2 are made of UV-resistant polycarbonate and carry an IP66 rating. The BAPI-Box is only available for units with a temperature transmitter and a humidity transmitter.



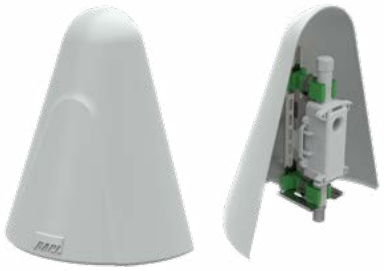
BAPI-Box 2 Enclosure



BAPI-Box Enclosure

Weather Shade

External temperature, humidity and air quality sensors are affected by radiant heat from the surfaces of buildings and parking lots. The BAPI Weather Shade effectively blocks the radiant heat, improving the accuracy of the sensor.



(See Accessories for more info.)

Specifications

Power:

10 to 35 VDC, 22 mA max.....For units with 0 to 5 or 1 to 5 VDC or 4 to 20 mA Humidity Outputs
15 to 35 VDC, 6 mA max.....For units with 0 to 10 or 2 to 10 VDC Humidity Output
12 to 27 VAC, 0.53 VA max .....For units with 0 to 5 or 1 to 5 VDC Humidity Outputs
15 to 27 VAC, 0.14 VA max .....For units with 0 to 10 or 2 to 10 VDC Humidity Output

Enclosure Dimensions: **H x W x D**

BAPI-Box.....5 x 4.1 x 2.5" (127 x 104 x 63.5mm)
BAPI-Box 2:.....4.9 x 2.8 x 2.35" (125 x 71.6 x 60mm)

(For enclosure dimension drawings, turn to the end of the section.)

Sensor:

2% Humidity: Capacitive ±2% (10 to 80% RH @ 25°C)
±3% (80 to 90% RH @ 25°C)

3% Humidity: Capacitive ±3% (10 to 90% RH @ 25°C)

Temp: Thermistor or RTD (See Sensors section for specs)

Enclosure Rating: IP66, NEMA 4

Enclosure Material: UV-resistant Polycarbonate, UL 94, V-0

Environmental Operation Range:

Temp: -40 to 158°F (-40 to 70°C)
Humidity: 0 to 100% RH
Fully Temperature Compensated

Agency: CE EN 61326-1:2013 EMC

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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Outside Air Units with Optional Temperature Sensor

BA/ (**#1**) - (**#2**) - (**#3**)

#1: Temp Sensor (Optional)		**List Price**
1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Humidity Output (Required)		
H200	±2% Accuracy, 0 to 5V Output	$240
H215	±2% Accuracy, 1 to 5V Output*	$240
H210	±2% Accuracy, 0 to 10V Output	$240
H212	±2% Accuracy, 2 to 10V Output*	$240
H220	±2% Accuracy, 4 to 20mA Output	$240
H300	±3% Accuracy, 0 to 5V Output	$240
H315	±3% Accuracy, 1 to 5V Output*	$240
H310	±3% Accuracy, 0 to 10V Output	$240
H312	±3% Accuracy, 2 to 10V Output*	$240
H320	±3% Accuracy, 4 to 20mA Output	$240

#3: Enclosure (Required)		
O-BB2	BAPI-Box 2 (IP66, NEMA 4)	$12
O-BB	BAPI-Box (IP66, NEMA 4)	$12

Example Number:
BA/(**10K-2**) - (**H200**) - (**O-BB2**)
BA/10K-2-H200-O-BB2 (no parenthesis)

Description: 10K-2 Thermistor, ±2%RH with 4 to 20mA Output, BAPI-Box 2 Enclosure

List Price: $18 + $240 + $12 = $270

Option Selection Guide

Outside Air Units with a Temperature Transmitter

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Temp Transmitter (Required)		**List Price**
T1K	4 to 20mA Output*	$125
TXS20	4 to 20mA Output	$125
TXS05	0 to 5V Output	$125
TXS10	0 to 10V Output	$125
TXS12	2 to 10V Output	$125
TXS15	1 to 5V Output	$125

#2: Temperature Range (Required)	
[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Humidity Output (Required)		
H200	±2% Accuracy, 0 to 5V Output	$240
H215	±2% Accuracy, 1 to 5V Output	$240
H210	±2% Accuracy, 0 to 10V Output	$240
H212	±2% Accuracy, 2 to 10V Output	$240
H220	±2% Accuracy, 4 to 20mA Output	$240
H300	±3% Accuracy, 0 to 5V Output	$240
H315	±3% Accuracy, 1 to 5V Output	$240
H310	±3% Accuracy, 0 to 10V Output	$240
H312	±3% Accuracy, 2 to 10V Output	$240
H320	±3% Accuracy, 4 to 20mA Output	$240

#4: BAPI-Box Enclosure (Required)		
O-BB	BAPI-Box (IP66, NEMA 4)	$12

*Output not field selectable

Example Number:
BA/(**T1K**)(**[0 TO 100F]**) - (**H200**) - (**O-BB**)
BA/T1K[0 TO 100F]-H200-O-BB (no parenthesis)

Description: Temperature Transmitter with 4 to 20mA Output and 0 to 100°F Range, ±2%RH with 4 to 20mA Output, BAPI-Box Enclosure

List Price: $125 + $240 + $12 = $377

Your Number: BA/

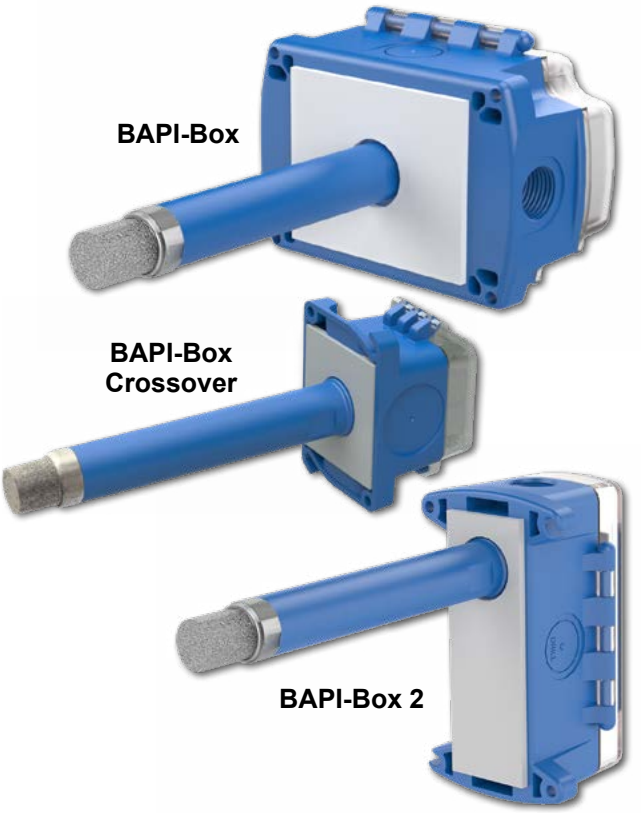
Duct Units

Humidity or Combination Temp/Humidity Sensors

Rev. 08/15/24

Features & Options

- 10 Points of Calibration from 10 to 90% RH
- Humidity Only or Temp./Humidity Combination
- Replaceable Stainless Steel Filter
- Green Power Indication LED on BAPI-Box Crossover Units
- ±2% and ±3% RH Accuracies



Humidity control is an important aspect of any climate control system. Therefore, humidity sensors must be both accurate and dependable. BAPI's humidity transmitters are calibrated at 10 points from 10 to 90% RH for accuracy, eliminating field calibration.

The Duct Units are also extremely dependable, featuring three of the most watertight enclosures available today. The BAPI-Box, BAPI-Box 2 and BAPI-Box Crossover Enclosures are made of UV-resistant polycarbonate and carry an IP66 rating. The BAPI-Box is only available for units with a temperature transmitter and a humidity transmitter.



The BAPI-Box Crossover Enclosure

The BAPI-Box Crossover features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port. See the Accessories section for more info.

(Unit shown with knockplug plug sold separately.)

Specifications

Power:

10 to 35 VDC, 22 mA max.....For units with 0 to 5 or 1 to 5 VDC or 4 to 20 mA Humidity Output
15 to 35 VDC, 6 mA max.....For units with 0 to 10 or 2 to 10 VDC Humidity Output
12 to 27 VAC, 0.53 VA max .....For units with 0 to 5 or 1 to 5 VDC Humidity Output
15 to 27 VAC, 0.14 VA max .....For units with 0 to 10 or 2 to 10 VDC Humidity Output

Enclosure Dimensions: **H x W x D**

BAPI-Box Crossover:.....3.1 x 2.2 x 1.9" (79 x 56 x 49mm)
BAPI-Box.....5 x 4.1 x 2.5" (127 x 104 x 63.5mm)
BAPI-Box 2:.....4.9 x 2.8 x 2.35" (125 x 71.6 x 60mm)

(For enclosure dimension drawings, turn to the end of the section.)

Sensor:

2% Humidity: Capacitive ±2% (10 to 80% RH @ 25°C)
±3% (80 to 90% RH @ 25°C)

3% Humidity: Capacitive ±3% (10 to 90% RH @ 25°C)

Temp: Thermistor or RTD (See Sensors section for specs)

Enclosure Rating:

BAPI-Box Crossover: IP10, NEMA 1 (IP44 with knockout plug)
BAPI-Box and BAPI-Box 2: IP66, NEMA 4X

BAPI-Box and BAPI-Box 2 Material:

UV-resistant Polycarbonate, UL94 V-0

BAPI-Box Crossover Material:

Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 HB

Environmental Operation Range:

Temperature: -40 to 158°F (-40 to 70°C)
Humidity: 0 to 100% RH
Fully Temperature Compensated

Agency: CE EN 61326-1:2013 EMC

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Use the Option Selection Guides below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration. Additional options are available but not shown above. Contact BAPI for the complete list of options.

Option Selection Guide

Duct Units with Optional Temperature Sensor

BA/ (**#1**) - (**#2**) - (**#3**)

#1: Temp Sensor (Optional) — **List Price**

1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
1K[375]	1K Plat. RTD (375 curve)	$25
1K	1K Plat. RTD (385 curve)	$25
1K[NI]	1K Nickel RTD	$65

#2: Humidity Output (Required)

H200	±2% Accuracy, 0 to 5V Output	$240
H215	±2% Accuracy, 1 to 5V Output*	$240
H210	±2% Accuracy, 0 to 10V Output	$240
H212	±2% Accuracy, 2 to 10V Output*	$240
H220	±2% Accuracy, 4 to 20mA Output	$240
H300	±3% Accuracy, 0 to 5V Output	$240
H315	±3% Accuracy, 1 to 5V Output*	$240
H310	±3% Accuracy, 0 to 10V Output	$240
H312	±3% Accuracy, 2 to 10V Output*	$240
H320	±3% Accuracy, 4 to 20mA Output	$240

#3: Enclosure (Required)

D-BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
D-BB2	BAPI-Box 2 (IP66, NEMA 4)	$12

**Not available with the BAPI-Box Crossover*

Example Number:
BA/(**10K-2**) - (**H200**) - (**D-BBX**)
BA/10K-2-H200-D-BBX (no parenthesis)

Description: 10K-2 Thermistor, ±2%RH with 4 to 20mA Output, BAPI-Box Crossover

List Price: $18 + $240 = $258

Option Selection Guide

Duct Units with a Temperature Transmitter

BA/ (**#1**)(**#2**) - (**#3**) - (**#4**) - (**#5**)

#1: Temp Transmitter (Required) — **List Price**

T1K	4 to 20mA Output*	$125
TXS20	4 to 20mA Output	$125
TXS05	0 to 5V Output	$125
TXS10	0 to 10V Output	$125
TXS12	2 to 10V Output	$125
TXS15	1 to 5V Output	$125

#2: Temperature Range (Required)

[32 TO 212F]	32 to 212°F Range
[20 TO 120F]	20 to 120°F Range
[0 TO 100F]	0 to 100°F Range
[0 TO 100C]	0 to 100°C Range
[-7 TO 49C]	-7 to 49°C Range
[-18 TO 38C]	-18 to 38°C Range

#3: Humidity Output (Required)

H200	±2% Accuracy, 0 to 5V Output	$240
H215	±2% Accuracy, 1 to 5V Output	$240
H210	±2% Accuracy, 0 to 10V Output	$240
H212	±2% Accuracy, 2 to 10V Output	$240
H220	±2% Accuracy, 4 to 20mA Output	$240
H300	±3% Accuracy, 0 to 5V Output	$240
H315	±3% Accuracy, 1 to 5V Output	$240
H310	±3% Accuracy, 0 to 10V Output	$240
H312	±3% Accuracy, 2 to 10V Output	$240
H320	±3% Accuracy, 4 to 20mA Output	$240

#4: BAPI-Box Enclosure (Required)

D-BB	BAPI-Box (IP66, NEMA 4)	$12

*Output not field selectable

Example Number:
BA/(**T1K**)(**[32 TO 212F]**) - (**H200**) - (**D-BB**)
BA/T1K[32 TO 212F]-H200-D-BB (no parenthesis)

Description: Temperature Transmitter with 4 to 20mA Output and 32 to 212°F Range, ±2%RH with 4 to 20mA Output, BAPI-Box Enclosure

List Price: $125 + $240 + $12 = $377

Your Number: BA/

C20 Pendant Sensor

Humidity or Combination Temp/Humidity Sensors

Rev. 06/04/25

Features & Options

- 4 to 20mA Temperature Output over a 40 to 120°F (4.5 to 49°C) Range
- 4 to 20mA Humidity Output over a 20 to 90%RH Range
- NIST Certified Temperature at 75, 80 and 85°F (23.9, 26.7 & 29.4°C)
- NIST Certified Humidity at 40, 50 and 60%RH@75°F (23.9°C)
- Sensor Hangs from 12 feet (3.7m) of PVC-Jacketed Cable
- ±2%RH Humidity Accuracy
- ±0.54°F (0.3°C) Temperature Accuracy



BAPI's Pendant Temperature and Humidity Sensor features a BAPI-Box enclosure and 12 feet (3.7m) of PVC-jacketed cable. The temperature measurement has a 4 to 20mA output over a 40 to 120°F (4.5 to 49°C) range with an accuracy of ±0.54°F (0.3°C). The humidity measurement has a 4 to 20mA output over a 20 to 90%RH range.

ORDERING INFO: **List Price**

BA/THP[40 TO 120F]-H220-12'
Pendant Temperature and Humidity Sensor..... $1,440

Specifications

Power: 16 to 40 VDC, 40 mA max (20 mA/loop) DC

Humidity Sensor Type: Capacitive Polymer

Temperature Sensor Type:
1KΩ, 2 Wire Platinum RTD, 385 Curve

Humidity Output: 4 to 20mA over 20 to 90%RH Range

Temperature Output:
4 to 20mA over 40 to 120°F (4.5 to 49°C) Range

Humidity Drift: ±0.5%RH per year

Humidity Accuracy:
±2% (20 to 80%RH @ 77°F (25°C)), Non-condensing
±3% (80 to 90%RH @ 77°F (25°C)), Non-condensing

Temperature Accuracy: ±0.54°F (±0.3°C)

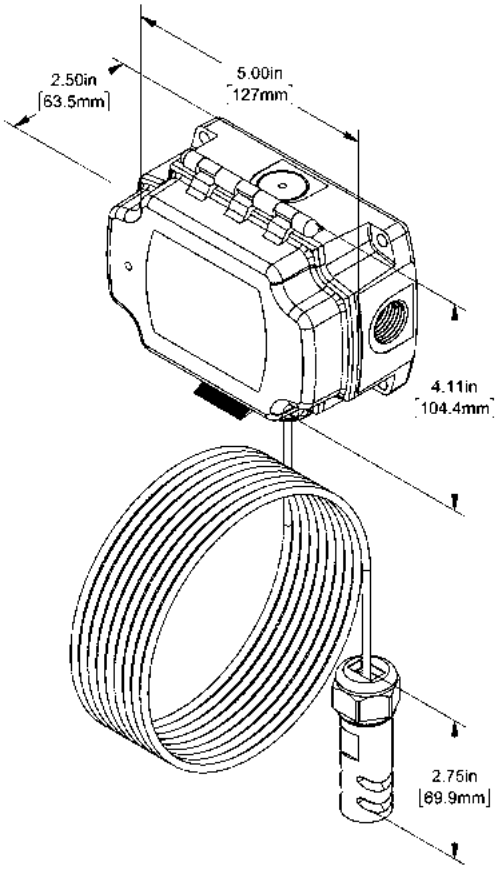
Output Impedance (Max Load/Loop):
700Ω @ 24VDC, Voltage drop is 10VDC
(Supply Voltage – 10VDC) / 0.02 Amps = Max load Impedance

Response Time: < 5 seconds in moving air

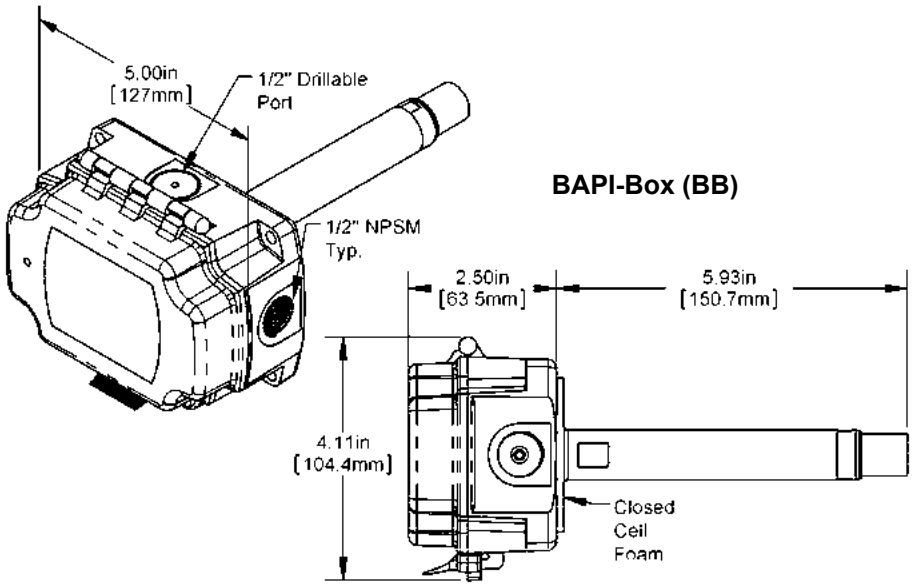
Environmental Operation Range:
Temperature: -40 to 158°F (-40 to 70°C)
Humidity: 0 to 95%RH, non-condensing
Fully Temperature Compensated

BAPI-Box Material: UV-resistant Polycarbonate, UL94 V-0

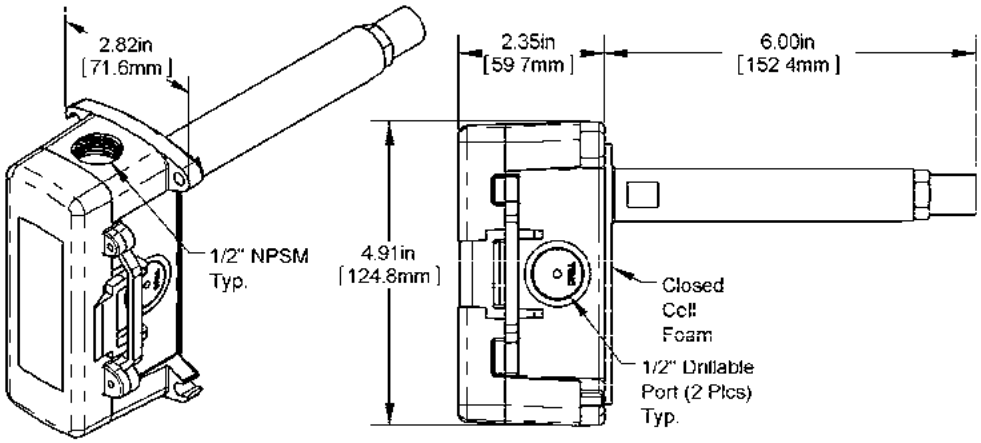
Agency: RoHS



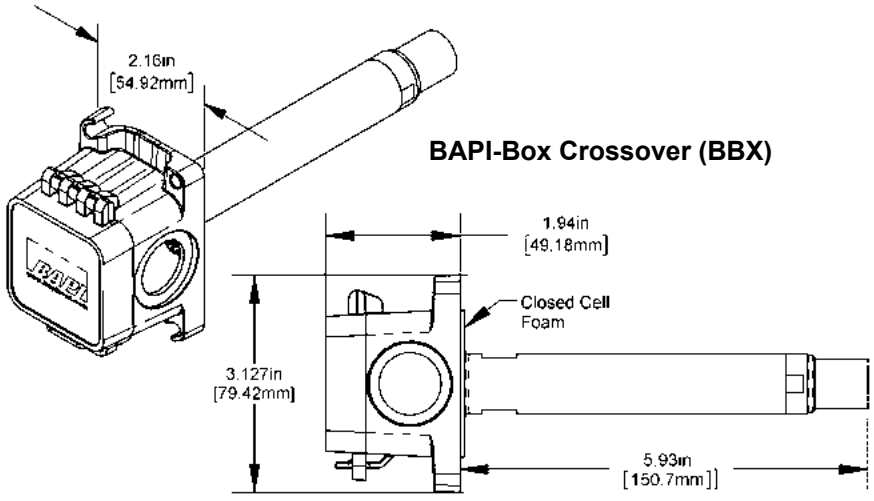
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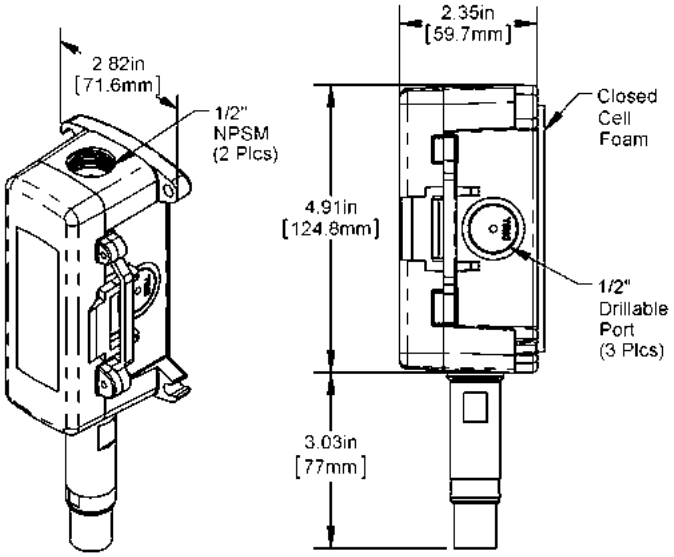
BAPI-Box (BB)



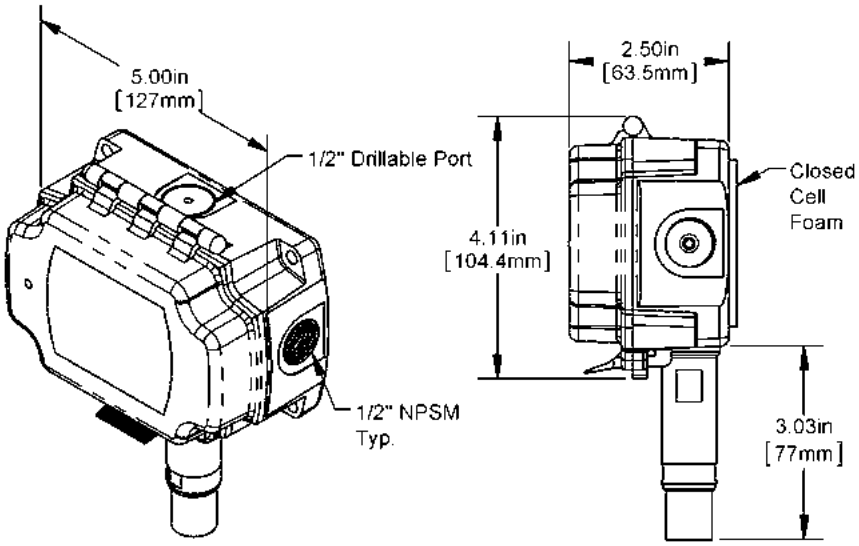
BAPI-Box 2 (BB2)



BAPI-Box Crossover (BBX)



BAPI-Box 2 (BB2)



BAPI-Box (BB)

EZ Pressure
Panel Mount with Low & Standard Ranges

pg D2

ZPM Pressure
IP44-Rated Unit

pg D4

ZPM BAPI-Box -
Standard Accuracy ±1%
IP66-Rated Unit

pg D6

ZPM BAPI-Box -
Precision Accuracy ±0.25%
IP66-Rated Unit

pg D8

Fixed Range Pressure
Low & Standard Ranges

pg D10

Room Pressure
Pickup Ports

pg D12

Ceiling and Wall Plate
Pickup Ports

pg D14

Outside Air
Pickup Port

pg D14

Pressure Probes
and Accessories

pg D16

BAPI-Box
Pressure Switch

pg D18

Beck Adjustable
Pressure Switch

pg D20

D2

EZ Pressure Sensor

Zone Pressure Sensors (ZPS)

CE Rev. 06/09/25

Features & Options

- 10 Pressure Ranges & Five Outputs – All Field Selectable
- Standard Range and Low Range Models (-5 to +5" WC or -1,250 to +1,250 Pascals) (-1 to +1" WC or -250 to +250 Pascals)
- About 1/3rd the Size of Field Mount Pressure Sensors to Save Panel Space
- NIST Traceable Certificate Available at No Extra Charge
- Mounts in DIN Rail, Snaptrack or Directly to the Panel Backplane
- Display That Aids in Troubleshooting by Showing Pressure Over Entire Operational Range



EZ Pressure Sensor

5 YEAR WARRANTY

Specifications

Power:
8 to 40 VDC* (4 to 20 mA Output)
7 to 40 VDC or 6 to 28 VAC (0 to 5 or 1 to 5 VDC Output)
12 to 40 VDC or 9 to 28 VAC (0 to 10 or 2 to 10 VDC Output)

Power Consumption:
20 mA max DC only at 4 to 20 mA Output
4.9 mA max DC at 0 to 5 or 0 to 10 VDC Output
0.12 VA max AC at 0 to 5 or 0 to 10 VDC Output

Load Resistance:
4 to 20 mA Output 850Ω Maximum @ 25 VDC
0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC Output 6KΩ min.

Accuracy: ±0.25% FS at 77°F (25°C) for all units
Low Range: ±0.005" WC (±1.24 Pa)
Standard Range: ±0.025" WC (±6.22 Pa)

Total Error Band:**
Low Range: ±1.25% FS or ±0.025" WC (±6.22 Pa)
Standard Range: ±0.5% FS or ±0.05" WC (±12.44 Pa)

Temp Hysteresis & Stability:
Low Range: ±0.35% at 77°F (25°C) for 1000 Hours
Standard Range: ±0.25% at 77°F (25°C) for 1000 Hours

Overpressure:
Low Range: Proof 270" WC (67 kPa)
Standard Range: Proof 300" WC (74 kPa)

Field Selectable Outputs:
4 to 20 mA, 0 to 5 V, 1 to 5 V, 0 to 10 V, 2 to 10 V

Media: Clean, dry, non-corrosive gases

Wiring: 3 wires (2 wires for 4 to 20 mA output)

Env. Operating Range: 14 to 131°F (-10 to 55°C)

Storage Temp: -4 to 140°F (-20 to 60°C)

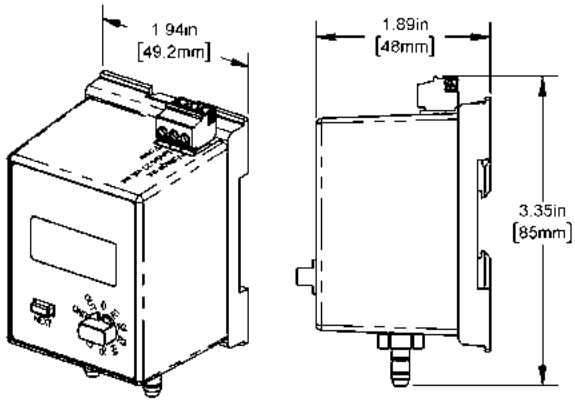
Humidity: 0 to 95% RH, non-condensing

Port Size: 3/16" barb (4.75mm)

Enclosure Material: ABS Plastic, UL94 V-0

Mounting: DIN Rail, Snaptrack or Surface

Agency: RoHS, UL, CE EN 61326-1:2013 EMC



*The minimum input voltage for a 4 to 20 mA unit varies based on the load or input impedance of the controller it is connected to. See the instructions document for more information.

**Total Error Band is the typical accuracy within the compensated temperature range of 32 to 122°F (0 to 50°C). The Total Error Band covers non-linearity, hysteresis and thermal effect on span. This is only valid after the initial startup and auto-zero process has been performed.

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Ordering Information (for units without a factory specified range or output)

PART NUMBER	DESCRIPTION	LIST PRICE
ZPS-SR-EZ-NT-IN	Standard Range Unit, Inches WC, Display, No Tube or Probe included	$360
ZPS-SR-EZ-NT-PA	Standard Range Unit, Pascals, Display, No Tube or Probe included	$360
ZPS-SR-EZ-ST-IN	Standard Range Unit, Inches WC, Display with Static Pressure Probe	$360
ZPS-SR-EZ-ST-PA	Standard Range Unit Pascals, Display with Static Pressure Probe	$360
ZPS-LR-EZ-NT-IN	Low Range Unit, Inches WC, Display, No Tube or Probe included	$360
ZPS-LR-EZ-NT-PA	Low Range Unit, Pascals, Display, No Tube or Probe included	$360
ZPS-LR-EZ-ST-IN	Low Range Unit, Inches WC, Display with Static Pressure Probe	$360
ZPS-LR-EZ-ST-PA	Low Range Unit Pascals, Display with Static Pressure Probe	$360

Note: Pressure Range and Output Range for these units will be selected in the field.

For units with a factory specified range or output, use Selection Guide below

Standard and Low Range EZ Pressure Option Selection Guide

ZPS - **(#1) - (#2) - (#3)**

#1: Pressure Output (required)

20.....4 to 20 mA
05.....0 to 5 V
15.....1 to 5 V
10.....0 to 10 V
12.....2 to 10 V

#2: Pressure Range (required)

LOW RANGES

WC Ranges	Pascal Ranges
LR51..0 to 0.10	LR61.....0 to 30
LR52..0 to 0.25	LR62.....0 to 50
LR53..0 to 0.50	LR63.....0 to 100
LR54..0 to 0.75	LR64.....0 to 175
LR55..0 to 1.00	LR65.....0 to 250
LR56..-0.10 to 0.10	LR66..... -30 to 30
LR57..-0.25 to 0.25	LR67..... -50 to 50
LR58..-0.50 to 0.50	LR68..... -100 to 100
LR59..-0.75 to 0.75	LR69..... -175 to 175
LR60..-1.00 to 1.00	LR70..... -250 to 250

#2: Pressure Range continued...

STANDARD RANGES

WC Ranges	Pascal Ranges
SR71..0 to 1.00	SR81.....0 to 250
SR72..0 to 2.00	SR82.....0 to 300
SR73..0 to 2.50	SR83.....0 to 500
SR74..0 to 3.00	SR84.....0 to 1,000
SR75..0 to 5.00	SR85.....0 to 1,250
SR76..-1.00 to 1.00	SR86..... -250 to 250
SR77..-2.00 to 2.00	SR87..... -300 to 300
SR78..-2.50 to 2.50	SR88..... -500 to 500
SR79..-3.00 to 3.00	SR89.. -1,000 to 1,000
SR80..-5.00 to 5.00	SR90.. -1,250 to 1,250

#3: Static Pressure Tube (required)

EZ-NT .. No Tube included
EZ-ST .. Static Pressure Tube included

Custom Ranges are available for these units. Contact your BAPI representative for ordering. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: ZPS - (**05**) - (**SR72**) - (**EZ-ST**)

Actual Number (with parenthesis removed): ZPS-05-SR72-EZ-ST

Description: 0 to 5 V Output, 0 to 2” WC Pressure Range, EZ Unit with Static Tube.

List Price: $360 for all units

Your Number: ZPS-

ZPM Pressure Sensor

Zone Pressure Multi-Sensors (ZPM)

CE Rev. 06/09/25

Features & Options

- 10 Pressure Ranges and 5 Output Options
- Standard, Low and High Range Models
- Non-Flow-Through Sensor so There's No Cross Contamination of Air



Ranges and Outputs Can Be Set Easily Without Powering the Unit. Just Open the Hinged Cover.

- Outputs, Ranges and Units Easily Set Without Power
- NIST Traceable Certificate Available at No Extra Charge
- Thumb Latch Closure - No Screws to Lose
- Optional Display Aids in Troubleshooting by Showing the Actual Pressure Regardless of the Selected Range
- Three LEDs to Indicate Current Pressure Status Without Having to Access the BAS



IP66-Rated ZPM Unit

An IP66-rated version of the ZPM pressure sensor in a BAPI-Box is also available. See pgs D6-7.



ZPM Pressure Sensor

5 YEAR WARRANTY

Specifications

Power:
7 to 40 VDC (4 to 20 mA Output)
7 to 40 VDC or 18 to 32 VAC (0 to 5 or 1 to 5 VDC Output)
13 to 40 VDC or 18 to 32 VAC (0 to 10 or 2 to 10 VDC Output)

Power Consumption:
20 mA max, DC only at 4 to 20 mA Output
5.2 mA max DC at 0 to 5 or 0 to 10 VDC Output
0.12 VA max AC at 0 to 5 or 0 to 10 VDC Output

Load Resistance:
4 to 20 mA Output 850 Ω Maximum @ 24 VDC
0 to 5 or 0 to 10 VDC Output 6KΩ Minimum

Accuracy: ±0.25% FS at 77°F (25°C) for all units
Low Range: ±0.005" WC (±1.24 Pa)
Standard Range: ±0.025" WC (±6.22 Pa)
High Range: ±0.075" WC (±18.66 Pa)

Total Error Band*:
Low Range: ±1.25% FS or ±0.025" WC (±6.22 Pa)
Standard Range: ±0.5% FS or ±0.05" WC (±12.44 Pa)
High Range: ±0.5% FS or ±0.15" WC (±37.33 Pa)

Temp Hysteresis & Stability (for 1000 hours):
Low Range: ±0.35% at 77°F (25°C)
Standard & High Range: ±0.25% at 77°F (25°C)

Overpressure:
Low Range: Proof 270" WC (67 kPa)
Standard Range: Proof 300" WC (74 kPa)
High Range: Proof 350" WC (87 kPa)

Media: Clean, dry, non-corrosive gases

Wiring:
3 wires (2 wires for 4 to 20mA output)

Environmental Operating Range:
-4 to 140°F (-20 to 60°C)

Storage Temp: -40 to 185°F (-40 to 85°C)

Humidity: 0 to 95% RH, non-condensing

Port Size: 1/4" barb (6.3mm)

Enclosure Material & Rating:
UV-resistant Polycarbonate, UL94 V-0
IP44, NEMA 2

Enclosure Dimensions: L x W x H
4.51 x 3.63 x 2.22" (115 x 92 x 57mm)
(See end of section for full dimensions)

Agency:
CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL, RoHS

*Total Error Band is the accuracy within the compensated temperature range of 32 to 122°F (0 to 50°C). The Total Error Band covers non-linearity, hysteresis and thermal effect on span. This is only valid after the initial startup and auto-zero process has been performed.

Datasheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

STANDARD RANGE UNITS

PART NUMBER	DESCRIPTION	LIST PRICE
BA/ZPM-SR-NT-D	ZPM Standard Range, No Probe included, with Display	$360
BA/ZPM-SR-ST-D	ZPM Standard Range, with Static Pressure Probe and Display	$360
BA/ZPM-SR-AT-D	ZPM Standard Range, with Attached Static Probe and Display	$360
BA/ZPM-SR-NT-ND	ZPM Standard Range, No Probe included, No Display	$360
BA/ZPM-SR-ST-ND	ZPM Standard Range, with Static Pressure Probe, No Display	$360
BA/ZPM-SR-AT-ND	ZPM Standard Range, with Attached Static Probe, No Display	$360

LOW RANGE UNITS

BA/ZPM-LR-NT-D	ZPM Low Range, No Probe included, with Display	$360
BA/ZPM-LR-ST-D	ZPM Low Range, with Static Pressure Probe and Display	$360
BA/ZPM-LR-AT-D	ZPM Low Range, with Attached Static Probe and Display	$360
BA/ZPM-LR-NT-ND	ZPM Low Range, No Probe included, No Display	$360
BA/ZPM-LR-ST-ND	ZPM Low Range, with Static Pressure Probe, No Display	$360
BA/ZPM-LR-AT-ND	ZPM Low Range, with Attached Static Probe, No Display	$360

HIGH RANGE UNITS

BA/ZPM-HR-NT-D	ZPM High Range, No Probe included, with Display	$360
BA/ZPM-HR-ST-D	ZPM High Range, with Static Pressure Probe and Display	$360
BA/ZPM-HR-AT-D	ZPM High Range, with Attached Static Probe and Display	$360
BA/ZPM-HR-NT-ND	ZPM High Range, No Probe included, No Display	$360
BA/ZPM-HR-ST-ND	ZPM High Range, with Static Pressure Probe, No Display	$360
BA/ZPM-HR-AT-ND	ZPM High Range, with Attached Static Probe, No Display	$360

Pressure Range, Output Range and Inches of Water Column or Pascal Operation will be selected in the field for these units. Ranges and Outputs shown below:

Custom Ranges are also available. Contact your BAPI representative for ordering information.

Your Number: BA/ZPM-

Field Selectable Ranges and Outputs

STANDARD RANGE UNITS

Inches WC	Pascals
0 to 1.00	0 to 250
0 to 2.00	0 to 300
0 to 2.50	0 to 500
0 to 3.00	0 to 1,000
0 to 5.00	0 to 1,250
-1.00 to 1.00	-250 to 250
-2.00 to 2.00	-300 to 300
-2.50 to 2.50	-500 to 500
-3.00 to 3.00	-1,000 to 1,000
-5.00 to 5.00	-1,250 to 1,250

LOW RANGE UNITS

Inches WC	Pascals
0 to 0.10	0 to 30
0 to 0.25	0 to 50
0 to 0.50	0 to 100
0 to 0.75	0 to 175
0 to 1.00	0 to 250
-0.10 to 0.10	-30 to 30
-0.25 to 0.25	-50 to 50
-0.50 to 0.50	-100 to 100
-0.75 to 0.75	-175 to 175
-1.00 to 1.00	-250 to 250

HIGH RANGE UNITS

Inches WC	Pascals
0 to 5	0 to 1,250
0 to 10	0 to 2,500
0 to 15	0 to 4,000
0 to 25	0 to 6,000
0 to 30	0 to 7,400

OUTPUTS AVAILABLE

4 to 20 mA
0 to 5 V
0 to 10 V
2 to 10 V
1 to 5 V

ZPM BAPI-Box - Standard Accuracy ±1%

Zone Pressure Multi-Sensor (ZPM) in an IP66 enclosure

Rev. 06/09/25

Features & Options

- 10 Pressure Ranges and 3 Output Options
- Standard, Low and High Range Models
- Non-Flow-Through Sensor

- IP66-rated Enclosure with Hinged Cover
- NIST Traceable Certificate Available at No Extra Charge
- Outputs, Ranges & Units Easily Set Without Power
- Optional Display Aids in Troubleshooting by Showing the Actual Pressure Regardless of the Selected Range
- Three Pressure Status LEDs for “Line of Sight Troubleshooting”
- Simple Auto-Zeroing Process by Dead-Heading Low and High Ports and Pressing Auto-Zero Button



ZPM BAPI-Box

Specifications

Power:
13 to 40 VDC (4 to 20 mA Output)
7 to 40 VDC or 18 to 28 VAC (0 to 5V Output)
13 to 40 VDC or 18 to 28 VAC (0 to 10V Output)

Power Consumption:
20 mA max, DC only at 4 to 20 mA Output
7 mA max DC at 0 to 5 or 0 to 10 VDC Output
0.58 VA max AC at 0 to 5 or 0 to 10 VDC Output

Load Resistance:
4 to 20 mA Output: 850Ω Maximum @ 24 VDC
Voltage Output: 6KΩ Minimum

Accuracy: ±1.0% FS, 32 to 104°F (0 to 40°C)
Low Range: ±0.02” WC (±4.98 Pa)
Standard Range: ±0.1” WC (±24.9 Pa)
High Range: ±0.3” WC (±74.65 Pa)

Total Error Band*:
Low Range: ±1.25% FS or ±0.025” WC (±6.22 Pa)
Standard Range: ±0.5% FS or ±0.05” WC (±12.44 Pa)
High Range: ±0.5% FS or ±0.15” WC (±37.33 Pa)

Temp Hysteresis & Stability: ±1% FS per year

Load Resistance:
4 to 20 mA Output: 550Ω Maximum @ 24 VDC
Voltage Output: 6KΩ Minimum

Overpressure:
Low Range: Proof 300” WC (74 kPa)
Standard Range: Proof 300” WC (74 kPa)
High Range: Proof 500” WC (124 kPa)

Media: Clean, dry, non-corrosive gases

Wiring: 3 wires (2 wires for 4 to 20mA output)

Environmental Operating Range:
-4 to 140°F (-20 to 60°C)

Storage Temp: -40 to 185°F (-40 to 85°C)

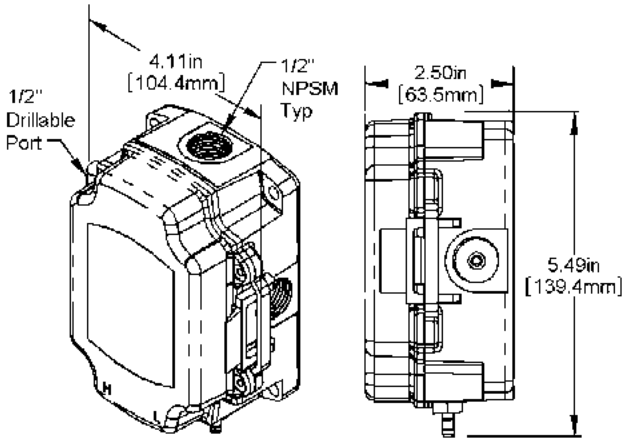
Humidity: 0 to 95% RH, non-condensing

Port Size: 1/4” barb (6.3mm)

Enclosure Material:
UV-resistant Polycarbonate, UL94 V-0

Enclosure Rating: IP66, NEMA 4

Agency:
CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL, RoHS



*Total Error Band is the accuracy within the compensated temperature range of 32 to 122°F (0 to 50°C). The Total Error Band covers non-linearity, hysteresis and thermal effect on span. This is only valid after the initial startup and auto-zero process has been performed.

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ZPM BAPI-Box - Standard Accuracy ±1%

Zone Pressure Multi-Sensor (ZPM) in an IP66 enclosure

Datasheets without List Prices are available on our website at www.bapihvac.com

Standard Accuracy (±1%) Unit Ordering Information

PART NUMBER	DESCRIPTION	LIST PRICE
STANDARD RANGE UNITS		
BA/ZPMB-SR-NT-D-BB	Standard Range, No Probe included, with Display, ±1% Accuracy	$200
BA/ZPMB-SR-AT-D-BB	Standard Range, Attached Static Probe and Display, ±1% Accuracy	$215
BA/ZPMB-SR-NT-ND-BB	Standard Range, No Probe included, No Display, ±1% Accuracy	$200
BA/ZPMB-SR-AT-ND-BB	Standard Range, Attached Static Probe, No Display, ±1% Accuracy	$215
LOW RANGE UNITS		
BA/ZPMB-LR-NT-D-BB	Low Range, No Probe included, with Display, ±1% Accuracy	$200
BA/ZPMB-LR-AT-D-BB	Low Range, Attached Static Probe and Display, ±1% Accuracy	$215
BA/ZPMB-LR-NT-ND-BB	Low Range, No Probe included, No Display, ±1% Accuracy	$200
BA/ZPMB-LR-AT-ND-BB	Low Range, Attached Static Probe, No Display	$215
HIGH RANGE UNITS		
BA/ZPMB-HR-NT-D-BB	High Range, No Probe included, with Display, ±1% Accuracy	$200
BA/ZPMB-HR-AT-D-BB	High Range, Attached Static Probe and Display, ±1% Accuracy	$215
BA/ZPMB-HR-NT-ND-BB	High Range, No Probe included, No Display, ±1% Accuracy	$200
BA/ZPMB-HR-AT-ND-BB	High Range, Attached Static Probe, No Display, ±1% Accuracy	$215
BA/ZPS-ACC07	Static Pressure Probe Assembly, Aluminum 6” long	$28

Your Number: BA/ZPMB-

Note: Pressure Range, Output Range and Inches of Water Column or Pascal Operation will be selected in the field for all ZPM BAPI-Box Pressure Sensors.

Field Selectable Ranges and Outputs

STANDARD RANGE UNITS

Inches WC	Pascals
0 to 1.00	0 to 250
0 to 2.00	0 to 300
0 to 2.50	0 to 500
0 to 3.00	0 to 1,000
0 to 5.00	0 to 1,250
-1.00 to 1.00	-250 to 250
-2.00 to 2.00	-300 to 300
-2.50 to 2.50	-500 to 500
-3.00 to 3.00	-1,000 to 1,000
-5.00 to 5.00	-1,250 to 1,250

LOW RANGE UNITS

Inches WC	Pascals
0 to 0.10	0 to 30
0 to 0.25	0 to 50
0 to 0.50	0 to 100
0 to 0.75	0 to 175
0 to 1.00	0 to 250
-0.10 to 0.10	-30 to 30
-0.25 to 0.25	-50 to 50
-0.50 to 0.50	-100 to 100
-0.75 to 0.75	-175 to 175
-1.00 to 1.00	-250 to 250

HIGH RANGE UNITS

Inches WC	Pascals
0 to 5	0 to 1,250
0 to 10	0 to 2,500
0 to 15	0 to 4,000
0 to 25	0 to 6,000
0 to 30	0 to 7,400

OUTPUTS AVAILABLE

4 to 20 mA
0 to 5 V
0 to 10 V
2 to 10 V
1 to 5 V

D8

ZPM BAPI-Box - Precision Accuracy ±0.25%

Zone Pressure Multi-Sensor (ZPM) in an IP66 enclosure

Rev. 06/09/25

Features & Options

- 10 Pressure Ranges and 5 Output Options
- Standard, Low and High Range Models
- Non-Flow-Through Sensor

- IP66-rated Enclosure with Hinged Cover
- NIST Traceable Certificate Available at No Extra Charge
- Outputs, Ranges & Units Easily Set Without Power
- Optional Display Aids in Troubleshooting by Showing the Actual Pressure Regardless of the Selected Range
- Three Pressure Status LEDs for “Line of Sight Troubleshooting”
- Simple Auto-Zeroing Process by Dead-Heading Low and High Ports and Pressing Auto-Zero Button



ZPM BAPI-Box

Specifications

Power:
7 to 40 VDC (4 to 20 mA Output)
7 to 40 VDC or 18 to 32 VAC (0 to 5 or 1 to 5V Output)
13 to 40 VDC or 18 to 32 VAC (0 to 10 or 2 to 10V Output)

Power Consumption:
20 mA max, DC only at 4 to 20 mA Output
5.2 mA max DC at 0 to 5 or 0 to 10 VDC Output
0.12 VA max AC at 0 to 5 or 0 to 10 VDC Output

Load Resistance:
4 to 20 mA Output: 850Ω Maximum @ 24 VDC
Voltage Output: 6KΩ Minimum

Accuracy: ±0.25% FS at 77°F (25°C)
Low Range: ±0.005” WC (±1.24 Pa)
Standard Range: ±0.025” WC (±6.22 Pa)
High Range: ±0.075” WC (±18.66 Pa)

Total Error Band*:
Low Range: ±1.25% FS or ±0.025” WC (±6.22 Pa)
Standard Range: ±0.5% FS or ±0.05” WC (±12.44 Pa)
High Range: ±0.5% FS or ±0.15” WC (±37.33 Pa)

Temp Hysteresis & Stability (for 1000 hours):
Low Range: ±0.35% at 77°F (25°C)
Standard & High Range: ±0.25% at 77°F (25°C)

Overpressure:
Low Range: Proof 270” WC (67 kPa)
Standard Range: Proof 300” WC (74 kPa)
High Range: Proof 350” WC (87 kPa)

Media: Clean, dry, non-corrosive gases

Wiring: 3 wires (2 wires for 4 to 20mA output)

Environmental Operating Range:
-4 to 140°F (-20 to 60°C)

Storage Temp: -40 to 185°F (-40 to 85°C)

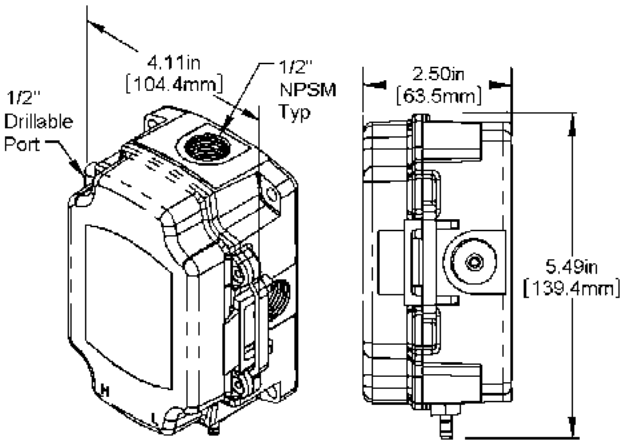
Humidity: 0 to 95% RH, non-condensing

Port Size: 1/4” barb (6.3mm)

Enclosure Material:
UV-resistant Polycarbonate, UL94 V-0

Enclosure Rating: IP66, NEMA 4

Agency:
CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL, RoHS



*Total Error Band is the accuracy within the compensated temperature range of 32 to 122°F (0 to 50°C). The Total Error Band covers non-linearity, hysteresis and thermal effect on span. This is only valid after the initial startup and auto-zero process has been performed.

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ZPM BAPI-Box - Precision Accuracy ±0.25%

Zone Pressure Multi-Sensor (ZPM) in an IP66 enclosure

Datasheets without List Prices are available on our website at www.bapihvac.com

Precision Accuracy (±0.25%) Unit Ordering Information

PART NUMBER	DESCRIPTION	LIST PRICE
STANDARD RANGE UNITS		
BA/ZPM-SR-NT-D-BB	Standard Range, No Probe included, with Display, ±0.25% Accuracy	$425
BA/ZPM-SR-ST-D-BB	Standard Range, Static Probe and Display, ±0.25% Accuracy	$425
BA/ZPM-SR-AT-D-BB	Standard Range, Attached Static Probe and Display, ±0.25% Accuracy	$425
BA/ZPM-SR-NT-ND-BB	Standard Range, No Probe included, No Display, ±0.25% Accuracy	$425
BA/ZPM-SR-ST-ND-BB	Standard Range, Static Probe, No Display, ±0.25% Accuracy	$425
BA/ZPM-SR-AT-ND-BB	Standard Range, Attached Static Probe, No Display, ±0.25% Accuracy	$425
LOW RANGE UNITS		
BA/ZPM-LR-NT-D-BB	Low Range, No Probe included, with Display, ±0.25% Accuracy	$425
BA/ZPM-LR-ST-D-BB	Low Range, Static Probe and Display, ±0.25% Accuracy	$425
BA/ZPM-LR-AT-D-BB	Low Range, Attached Static Probe and Display, ±0.25% Accuracy	$425
BA/ZPM-LR-NT-ND-BB	Low Range, No Probe included, No Display, ±0.25% Accuracy	$425
BA/ZPM-LR-ST-ND-BB	Low Range, Static Probe, No Display, ±0.25% Accuracy	$425
BA/ZPM-LR-AT-ND-BB	Low Range, Attached Static Probe, No Display, ±0.25% Accuracy	$425
HIGH RANGE UNITS		
BA/ZPM-HR-NT-D-BB	High Range, No Probe included, with Display, ±0.25% Accuracy	$425
BA/ZPM-HR-ST-D-BB	High Range, Static Probe and Display, ±0.25% Accuracy	$425
BA/ZPM-HR-AT-D-BB	High Range, Attached Static Probe and Display, ±0.25% Accuracy	$425
BA/ZPM-HR-NT-ND-BB	High Range, No Probe included, No Display, ±0.25% Accuracy	$425
BA/ZPM-HR-ST-ND-BB	High Range, Static Probe, No Display, ±0.25% Accuracy	$425
BA/ZPM-HR-AT-ND-BB	High Range, Attached Static Probe, No Display, ±0.25% Accuracy	$425

Your Number: BA/ZPM-

Note: Pressure Range, Output Range and Inches of Water Column or Pascal Operation will be selected in the field for all ZPM BAPI-Box Pressure Sensors.

Field Selectable Ranges and Outputs

STANDARD RANGE UNITS

Inches WC	Pascals
0 to 1.00	0 to 250
0 to 2.00	0 to 300
0 to 2.50	0 to 500
0 to 3.00	0 to 1,000
0 to 5.00	0 to 1,250
-1.00 to 1.00	-250 to 250
-2.00 to 2.00	-300 to 300
-2.50 to 2.50	-500 to 500
-3.00 to 3.00	-1,000 to 1,000
-5.00 to 5.00	-1,250 to 1,250

LOW RANGE UNITS

Inches WC	Pascals
0 to 0.10	0 to 30
0 to 0.25	0 to 50
0 to 0.50	0 to 100
0 to 0.75	0 to 175
0 to 1.00	0 to 250
-0.10 to 0.10	-30 to 30
-0.25 to 0.25	-50 to 50
-0.50 to 0.50	-100 to 100
-0.75 to 0.75	-175 to 175
-1.00 to 1.00	-250 to 250

HIGH RANGE UNITS

Inches WC	Pascals
0 to 5	0 to 1,250
0 to 10	0 to 2,500
0 to 15	0 to 4,000
0 to 25	0 to 6,000
0 to 30	0 to 7,400

OUTPUTS AVAILABLE

4 to 20 mA
0 to 5 V
0 to 10 V
2 to 10 V
1 to 5 V

Fixed Range Pressure

Zone Pressure Sensors (ZPS)

Rev. 06/09/25

Features & Options

- Single Pressure Range and Single Output Range
- Optional Attached Static Pressure Probe So the Unit Doesn't Require Two Trades to Install
- Simple Auto-Zero Process
- Reverse Wiring Protection
- NIST Traceable Certificate Available at No Extra Charge
- Rugged IP66, NEMA 4 Enclosure with Hinged Cover
- Three Visible LEDs for Pressure Status at a Glance

Patent Pending



5 YEAR WARRANTY

Fixed Range Pressure

Specifications

Power:
4 to 20mA Output: 7 to 40 VDC
0 to 5V Output: 7 to 40 VDC, 12 to 28 VAC
0 to 10V Output: 13 to 40 VDC, 18 to 28 VAC

System Accuracy:
±1%FS +0.003" WC (0.75 Pa),
32 to 104°F (0 to 40°C)

Temp Hysteresis & Stability:
±1% FS per year

Storage Temperature:
-40 to 203°F (-40 to 95°C)

Compensated Temperature Range:
32 to 104°F (0 to 40°C)

Environmental Operating Range:
-4 to 158°F (-20 to 70°C)

Humidity: 0 to 95% RH, non-condensing

Wiring: 3 wires (2 wires for 4 to 20mA output)

Overpressure: Proof 300" WC (74 kPa)

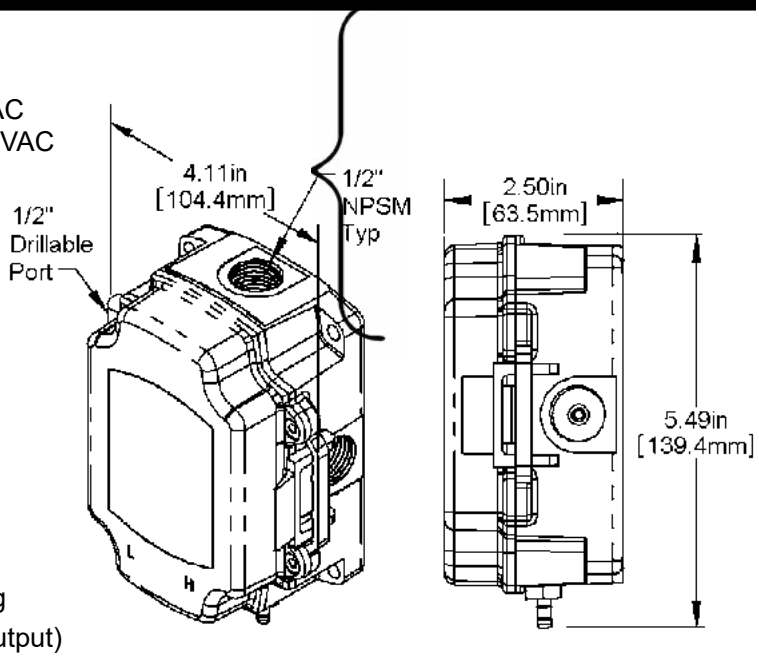
Port Size: 1/4" barb

Enclosure Material: UV-resistant Polycarb., UL94 V-0

Enclosure Rating: IP66, NEMA 4

Media: Clean, dry, non-corrosive gases

Agency: CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), RoHS



*__BAPI__ recommends that you do not run wiring for the pressure transmitter in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators, and coils.

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Datasheets without List Prices are available on our website at www.bapihvac.com

Fixed Range Pressure Option Selection Guide

ZPS - **(#1) - (#2) - (#3)**

#1: Pressure Output (required) **List Price**

05..... 0 to 5 V..... $165
10..... 0 to 10 V..... $165
20..... 4 to 20mA..... $165

#2: Pressure Range (required)

UNIDIRECTIONAL RANGES

WC Ranges	Pascal Ranges
FR51.. 0 to 0.10	FR61.....0 to 30
FR52.. 0 to 0.25	FR62.....0 to 50
FR53.. 0 to 0.50	FR63.....0 to 100
FR55.. 0 to 1.00	FR65.....0 to 250
FR91.. 0 to 1.25	FR82.....0 to 300
FR73.. 0 to 2.50	FR83.....0 to 500
FR74.. 0 to 3.00	FR84.....0 to 1,000
FR75.. 0 to 5.00	FR85.....0 to 1,250

#2: Pressure Ranges continued...

BIDIRECTIONAL RANGES

WC Ranges	Pascal Ranges
FR56.. -0.10 to 0.10	FR66..... -30 to 30
FR57.. -0.25 to 0.25	FR67..... -50 to 50
FR58.. -0.50 to 0.50	FR68..... -100 to 100
FR60.. -1.00 to 1.00	FR70..... -250 to 250
FR96.. -1.25 to 1.25	FR87..... -300 to 300
FR78.. -2.50 to 2.50	FR88..... -500 to 500
FR79.. -3.00 to 3.00	FR89.. -1,000 to 1,000
FR80.. -5.00 to 5.00	FR90.. -1,250 to 1,250

#3: Static Pressure Tube (required) **List Price**

BB-NT.. No Tube included
BB-AT .. Attached Static Pressure Probe.....$15

Factory set Custom Ranges are available for these units. Contact your BAPI representative for ordering.

Example Number: ZPS - (**05**) - (**FR73**) - (**BB-NT**)
Actual Number (with parenthesis removed): ZPS-05-FR73-BB-NT
Description: Fixed Range Pressure Unit, 0 to 5 V Output, 0 to 2.50” WC Pressure Range, No Tube
List Price: $165 = $165 List Price.

Your Number: ZPS-

Static Pressure Probe Assembly

BAPI offers a Static Pressure Probe Assembly that includes the probe, rubber hose, built in surge damper, sheet metal screws and bulkhead fitting.

Part Number	Description	List Price
BA/ZPS-ACC07	...Static Pressure Probe Assembly	$28



Zone Pressure Pickup Ports

Zone Pressure Sensors (ZPS)

Rev. 06/09/25

Features & Options

- Wall and Ceiling Ports That Are Economical & Easy to Install
- Includes 80 Micron Sintered SS Filter To Prevent Insects or Debris from Entering or Plugging the Tubing
- Accommodates 1/8" I.D. to 5/32" I.D. Tubing

- Modern BAPI-Stat "Quantum" Enclosure Style on Room Ports
- Low Profile "Button" Pickup Port That Is Smaller Than a Quarter in Size and Blends In With Its Surroundings



Wall Plate



Low Profile Port



Ceiling Mount Square Cover



BAPI-Stat "Quantum"
(Right unit shown with 60mm mounting base for European wall boxes. Unit is also available with a temp sensor.)

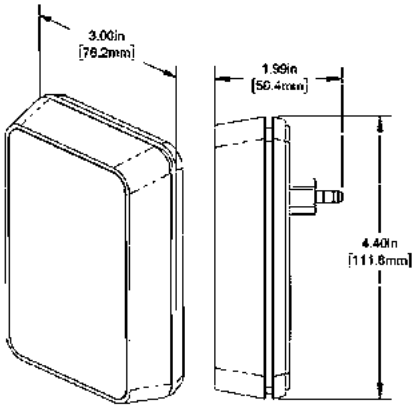
Specifications

Environmental Operating Range:
Wall & Ceiling Plates: 32 to 122°F (0 to 50°C) • 0% to 95% RH, non-condensing
Low Profile Port: -40 to 185ºF (-40 to 85ºC) • 0% to 100% RH, non-condensing

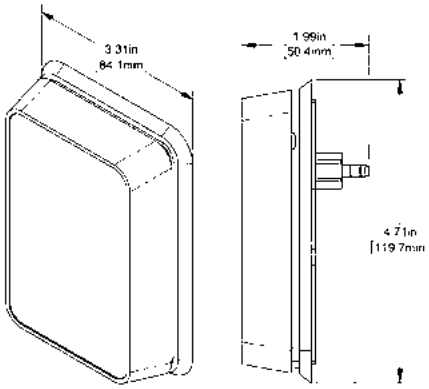
Material:
Quantum, Delta Style & Low Profile:
ABS Plastic, UL 94, V-0

Wall Plate:
Stainless Steel

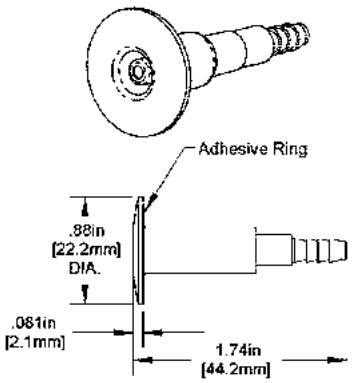
Ceiling Plate:
Galvanized Steel



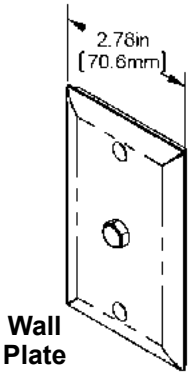
BAPI-Stat "Quantum" Enclosure
(with standard mounting base)



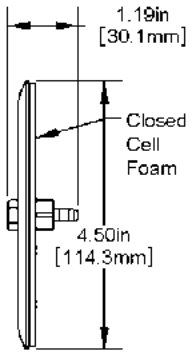
BAPI-Stat "Quantum" Enclosure
(with optional 60mm mounting base for European wall boxes)

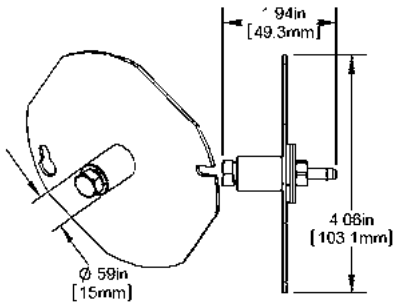


Low Profile Port



Wall Plate





Ceiling Mount Cover

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Use the Option Selection Guide below to create your custom part number. Replace the number and brackets with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

Pressure Pickup Ports Option Selection Guide

ZPS-ACC (**#1**) - (**#2**)

#1: Pickup Port (required)

01	2” X 4” Stainless Steel Wall Plate with Static Pickup	$18
04	BAPI-Stat “Quantum” with Static Pickup, standard mounting base	$15
04-60	BAPI-Stat “Quantum” with Static Pickup, 60mm mounting base	$15
05	Ceiling Mount Square Cover with Static Pickup	$15
20	Low Profile Pressure Pickup Port	$30

#2: Temperature Sensor (optional, not available for 05 and 20 above)

18	1.8K Thermistor	$18
3	3K Thermistor	$18
102	10K-2 Thermistor	$18
103	10K-3 Thermistor	$18
10311	10K-3[11K] Thermistor	$18
20	20K Thermistor	$18
1375	1K Platinum RTD (375 curve)	$25
1	1K Platinum RTD (385 curve)	$25

Additional temperature sensors are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: ZPS-ACC(**04**) - (**102**)

Actual Number (with parenthesis removed): ZPS-ACC04-102

Description: BAPI-Stat “Quantum” Style Enclosure with Static Pickup, 10K-2 Thermistor Temperature Sensor.

List Price: $15 (BAPI-Stat “Quantum” Style Enclosure) + $18 (Thermistor) = $33 List Price

Your Number: ZPS/ACC

Outside Air Pressure Pickup Port

Zone Pressure Sensors (ZPS)

Rev. 01/11/21

Features & Options

- Rooftop and Wall Mount or Vertical Mount for Building Soffits or Ceilings.
- Rugged, UV-Resistant and Flame-Retardant Plastic to Perform and Last Under Harsh Conditions
- Parallel Plate Design Reduces Fluctuations from Wind Gusts for More Stable Readings

REDUCING THE UNWANTED EFFECTS OF WIND GUSTS

Differences in building pressure are caused by the operation of supply fans or exhaust fans and usually measure less than 0.1 inches of water column (WC). A gentle breeze of 10 MPH provides a pressure of 0.048 inches WC, while a strong wind of 40 MPH provides 0.772 inches WC. A gale of 75 MPH can measure over 2.7 inches WC. The parallel plate design of BAPI's Outside Air Pickup Port significantly reduces these unwanted wind pressures for a stable and accurate reading at the pressure sensor and controller.



Rooftop and Wall Mount Unit on an RTU and a Wall
(Conduit and tubing not included)

Specifications

Environmental Operation Range:

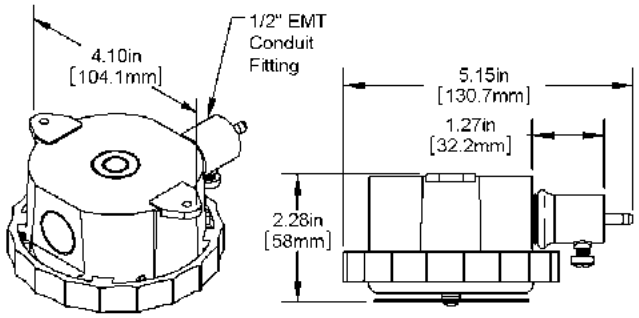
Temperature:
-40 to 212 °F
(-40 to 100 °C)

Humidity:
0% to 100% RH, condensing

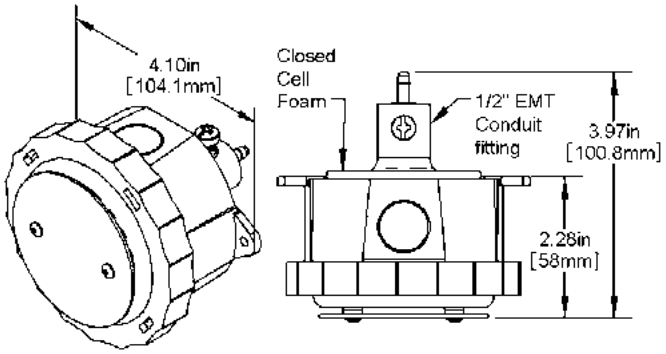
Material:

UV-resistant plastic

Rooftop and Wall Mount



Vertical Mount



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Datasheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

PART NUMBER	DESCRIPTION	LIST PRICE
ZPS-ACC10	Rooftop and Wall Mount Outside Air Pressure Pickup Port	$45
ZPS-ACC10-V	Vertical Mount Outside Air Pressure Pickup Port	$45

Wall & Ceiling Pressure Pickup Ports

Wallplates and BAPI-Stat "Quantum" Style units available as pressure pickups alone or as combination pressure pickup and temperature sensor

Room pressure pickup ports are available as a Wall Plate or a BAPI-Stat "Quantum" enclosure, both sized to fit a common 2" x 4" electrical box. A foam gasket seals the plate or enclosure to the wall. These units are available as a pickup alone or with a temperature sensor.

BAPI also offers a Ceiling Mount Square Cover that fits a standard 3/4" thick suspended ceiling tile, and a Low Profile Port that is ideal for locations where aesthetics are as important as the pressure measurement. The only visible portion is a flush 7/8" dot on the wall.



BAPI-Stat "Quantum" Enclosure



Wall Plate



Low Profile Port



Ceiling Mount Square Cover

For more info, see pages D10-11

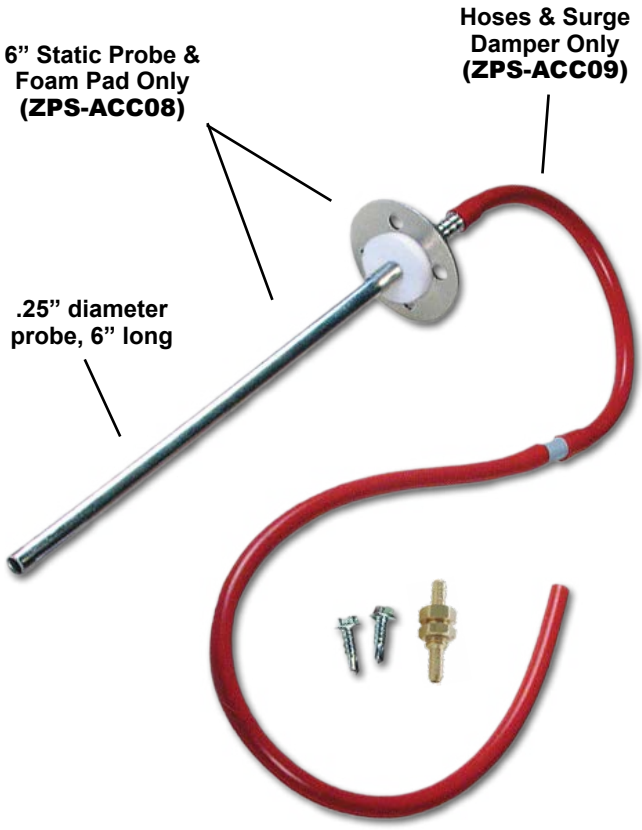
Zone Pressure Probes & Accessories

Zone Pressure Sensors (ZPS)

Rev. 04/05/22

Overview

- Individual Static or Total Pressure Probes, or Probe Assemblies that Include Probe and Rubber Hose with Built-In Surge Damper
- Pitot Pressure Probe Assembly That Includes the Total Probe Assembly and the Static Probe Assembly
- Besides the probe assemblies (which includes all the components), many of the assembly components are available in smaller groupings.
- Barb Accommodates 1/8” ID to 5/32” ID Tubing
- Silicon Tubing on Probe Assemblies is 1/8” ID, 1/4” OD
- All Probe Assemblies Include a Built-In 5 Micron Surge Damper That Absorbs Rapid Pressure Fluctuations, Such As Those Caused By Opening and Closing of Doors



Static Pressure Probe Assembly, 6” (ZPS-ACC07)



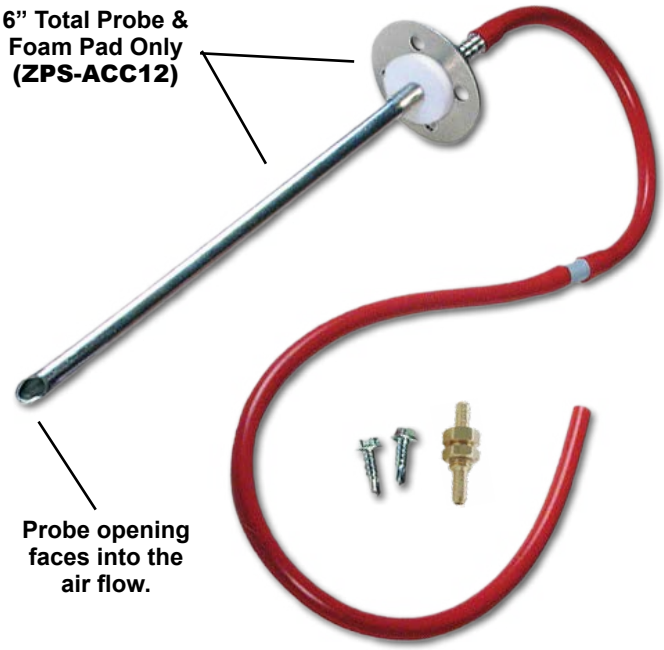
Surge Damper, 5 micron (ZPS-ACC15)



Static Probe Only, Zero Depth (ZPS-ACC22)



Silicone Rubber Tubing (ZPS-SIL-250-125-50)



Total Pressure Probe Assembly, 6”
(**ZPS-ACC12** includes 6” Total Probe Assembly and 6” Static Probe Assembly)

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Ordering Information

PART #	DESCRIPTION	LIST PRICE
ZPS-ACC07	Static Probe Assembly, Aluminum 6” long	$28
ZPS-ACC08	Static Probe & Foam Pad Only, Aluminum 6” long (doesn’t include tubing & damper)	$13
ZPS-ACC09	Rubber Tubing with Built-In Surge Damper (includes a bulkhead fitting)	$15
ZPS-ACC11	Pitot Probe Assembly, Aluminum 3.5” long (includes static & total probe assemblies)	$72
ZPS-ACC12	Pitot Probe Assembly, Aluminum 6” long (includes ZPS-ACC07)	$72
ZPS-ACC13	Total Probe Only, Aluminum 3.5”, w/ Circular Foam (doesn’t include hoses & damper)	$14
ZPS-ACC14	Total Probe Only, Aluminum 6”, w/ Circular Foam (doesn’t include hoses & damper)	$14
ZPS-ACC15	Surge Damper Only, 5 micron	$8
ZPS-ACC17	Static Probe Only, Aluminum 0.5” w/ Circular Foam (doesn’t include hoses & damper)	$10.50
ZPS-ACC18	2 Static Pressure Probe Assemblies, Aluminum 6” long	$56
ZPS-ACC21	Stainless Steel Static Probe Only (6”) with Circular Foam and Mounting Screws (doesn’t include hoses & damper)	$40
ZPS-ACC22	Static Probe Only, Zero Length, with Circular Foam and Mounting Screws	$7.50
ZPS-SIL-250-125-50	Silicone Rubber Tubing, 50’ Roll (1/8” ID, 1/4” OD)	$73.50

Gray shaded items follow the Buy and Resale Multiplier.

D18 Differential Pressure Switch

Zone Pressure Sensors

Rev. 07/05/22

Features & Options

- Easy to Access Field Adjustable Setpoint from 0.1” to 40” WC (20 to 10,000 Pa)
- 5 Amp Silver Contacts, NO and NC
- Built-In Pressure Snubber for More Stable Readings

The BAPI Differential Pressure Switch is ideal for air filter monitoring, static pressure proving, airflow proving or auxiliary fan actuation.

The setpoint is field adjustable from 0.1” to 40” WC (20 to 10,000 Pa), and the unit can measure positive pressure, vacuum or true differential pressure. The six pressure ranges are field selectable by changing a color-coded spring. The spring for the range that you order is preinstalled, and the other five springs are shipped with the unit so that you can change ranges in the field if you choose.

The unit features a rugged plastic enclosure that protects the electrical terminations and pressure adjustment screw which is easily accessed through a port in the front cover using a square screwdriver bit (BA/SQ1BIT). The quick connect wiring terminations are accessed by opening the hinged cover. The unit is very compact and can be mounted directly on a flat surface with the rugged mounting feet.



Differential Pressure Switch

5 YEAR WARRANTY

The unit also features an extremely high proof pressure so that it will continue to function properly even if it is accidently connected to an unusually high or low pressure.

Specifications

Measurement Media:
Air, Combustion Gases

Operating Environment:
-40 to 185°F (-40 to 85°C)
5 to 95% RH non-condensing
Note: Not intended for outdoor use

Contact Ratings:
5 Amp Resistive, 125 VAC

Proof Pressure:
100” WC (3.6 PSI, 24,900 Pa)

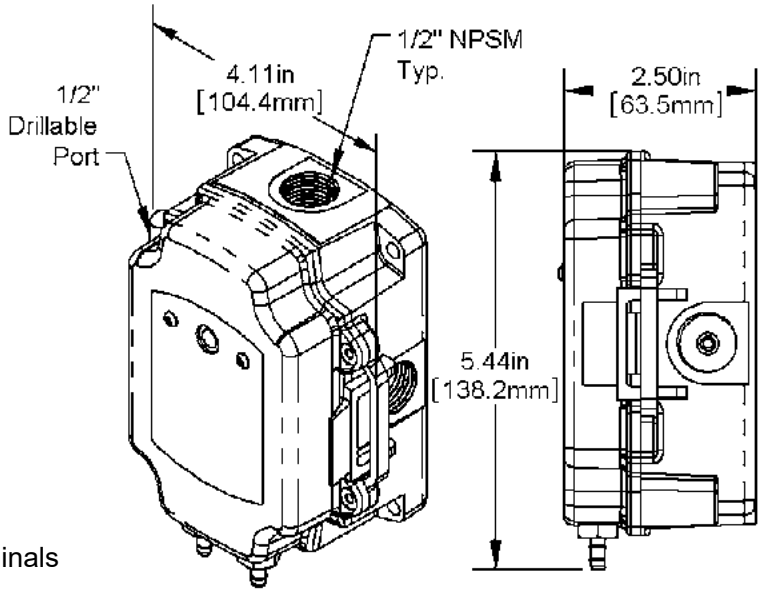
Pressure Ports:
1/4” Barbed Fittings

Switch Type:
SPDT (Silver Contacts)

Repeatability:
<10% of Setting

Wiring:
1/4” (6.4mm) Quick-Disconnect Terminals

Agency: RoHS



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Datasheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

PART #S	DESCRIPTION	LIST PRICE
BA/SW1A	Differential Pressure Switch, 0.1” to 0.8” WC (20 to 200 Pa)	$84
BA/SW2A	Differential Pressure Switch, 0.5” to 1.2” WC (120 to 300 Pa)	$84
BA/SW3A	Differential Pressure Switch, 0.7” to 2.2” WC (180 to 550 Pa)	$84
BA/SW5A	Differential Pressure Switch, 3.2” to 10.4” WC (800 to 2600 Pa)	$98
BA/SW6A	Differential Pressure Switch, 8.8” to 24” WC (2200 to 6000 Pa)	$98
BA/SW7A	Differential Pressure Switch, 12” to 40” WC (3000 to 10000 Pa)	$98
BA/SQ1BIT:	Square Screwdriver Bit to turn the Pressure Adjustment Screw	*$1

*Net Price - Multipliers do not apply on the Square Screwdriver Bit.


Square Screwdriver Bit

Note: If you are using metal tubing, add “-PIB” to the end of the part number so that the High and Low Pressure ports will be located in the base of the unit rather than in the hinged cover.

Wall & Ceiling Pressure Pickup Ports

Wallplates and BAPI-Stat “Quantum” Style units available as pressure pickups alone or as combination pressure pickup and temperature sensor

Room pressure pickup ports are available as a Wall Plate or a BAPI-Stat “Quantum” enclosure, both sized to fit a common 2” x 4” electrical box. A foam gasket seals the plate or enclosure to the wall. These units are available as a pickup alone or with a temperature sensor.

BAPI also offers a Ceiling Mount Square Cover that fits a standard 3/4” (19mm) thick suspended ceiling tile, and a Low Profile Port that is ideal for locations where aesthetics are as important as the pressure measurement. The only visible portion is a flush 7/8” (22mm) dot on the wall.


BAPI-Stat “Quantum” Enclosure


Wall Plate


Low Profile Port


Ceiling Mount Square Cover

For more info, see pages D12-13

D20 Adjustable Pressure Switch

Zone Pressure Sensors

Rev. 01/31/22

Features & Options

- Designed for Monitoring Overpressure, Vacuum and Differential Pressure of Air or Other Non-Combustible, Non-Aggressive Gases
- Ideal for Air Filter and Fan Status Monitoring, Industrial Cooling-Air Circuit Monitoring, Duct Air Flow Monitoring, Air Flow Proving for Heater Control and Frost Prevention Circuits
- Field-Adjustable Dial to Select Any Trip Value Within Each Pressure Range



Adjustable Pressure Switch

5 YEAR WARRANTY

Total Probes and Tubing

Two static pressure probes and two meters of pressure tubing are available as an accessory.



Specifications

Burst Pressure: 40” WC (10 kPa) for all pressure ranges

Medium: Air, non-combustible and non-aggressive gases

Operating Temperature: -4° to +185°F (-20 to +85°C)

Storage Temperature: -40°F to +185°F (-40 to +85°C)

Accuracy:
Deviation: ≤±15%, min. ±0.04” WC (±10 Pa) • Drift: ≤±15%

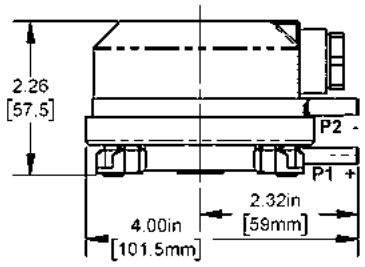
Diaphragm Material:
Silicone, tempered at 392°F (200°C), free of gas emissions

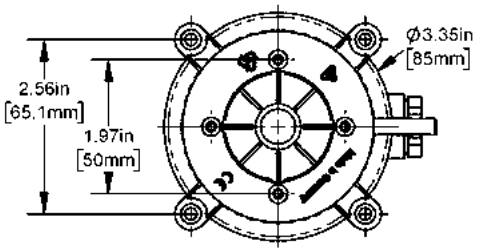
Pressure Connections:
2 plastic pipe connection pieces, external dia. 0.24” (6mm)
Marked “+” to higher pressure, marked “-” to lower pressure

Body and Cover Material: UV-resistant plastic

Mechanical Working Life: Over 1,000,000 switching operations

Electrical Rating:
0.4A Inductive, 250 VAC • 1.5A Resistive, 250 VAC
0.8A Inductive, 125 VAC • 3.0A Resistive, 125 VAC
0.4A, 30VDC • 0.1A, 24 VDC





Electrical connections:
1/4” Spade Plug (AMP flat plug), 0.25” x 0.03” (6.3 x 0.8mm) in accordance with DIN 46244 or push-on screw terminals included

Protection Category: IP54 or IP65

Cable Conduit: M20 threads for 0.25” to 0.375” OD cable (6.5 to 9.5mm)

CE Conformity: Low Voltage Directive 2014/35/EU; RoHS Directive 2011/65/EU

BAPI
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Ordering Information

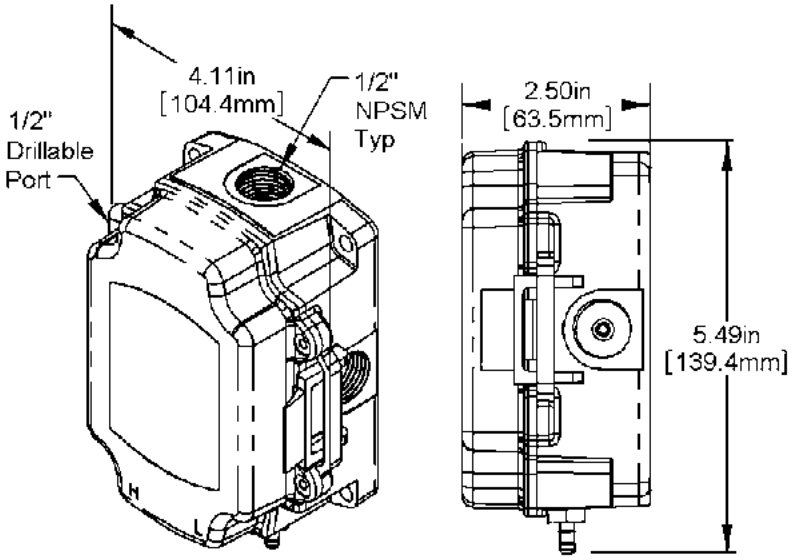
Part Number	Pressure Range	Accuracy/ Repeatability	Encl. Rating	List Price
BA/APSW1	0.08 to 1.2” WC / 20 to 300 Pa	±5% / min. ±0.02” WC (±5 Pa)	IP54	$25
BA/APSW2	0.2 to 2” WC / 50 to 500 Pa	±2.5% / min. ±0.02” WC (±5 Pa)	IP54	$25
BA/APSW3	0.8 to 4” WC / 200 to 1,000 Pa	±1% / min. ±0.02” WC (±5 Pa)	IP54	$25
BA/APSW4	0.12 to 1.6” WC / 30 to 400 Pa	±5% / min. ±0.02” WC (±5 Pa)	IP54	$25
BA/APSW5	2 to 10” WC / 500 to 2,500 Pa	±1%	IP54	$25
BA/APSW6	4 to 20” WC / 1,000 to 5,000 Pa	±1%	IP54	$25
BA/APSW1-65	0.08 to 1.2” WC / 20 to 300 Pa	±5% / min. ±0.02” WC (±5 Pa)	IP65	$37
BA/APSW2-65	0.2 to 2” WC / 50 to 500 Pa	±2.5% / min. ±0.02” WC (±5 Pa)	IP65	$37
BA/APSW3-65	0.8 to 4” WC / 200 to 1,000 Pa	±1% / min. ±0.02” WC (±5 Pa)	IP65	$37
BA/APSW4-65	0.12 to 1.6” WC / 30 to 400 Pa	±5% / min. ±0.02” WC (±5 Pa)	IP65	$37
BA/APSW5-65	2 to 10” WC / 500 to 2,500 Pa	±1%	IP65	$37
BA/APSW6-65	4 to 20” WC / 1,000 to 5,000 Pa	±1%	IP65	$37
BA/APSW-ACC	2 Total Pressure Tubes and 2 Meters of Pressure Tubing			$3.50

Gray shaded items follow the Buy and Resale Multiplier.

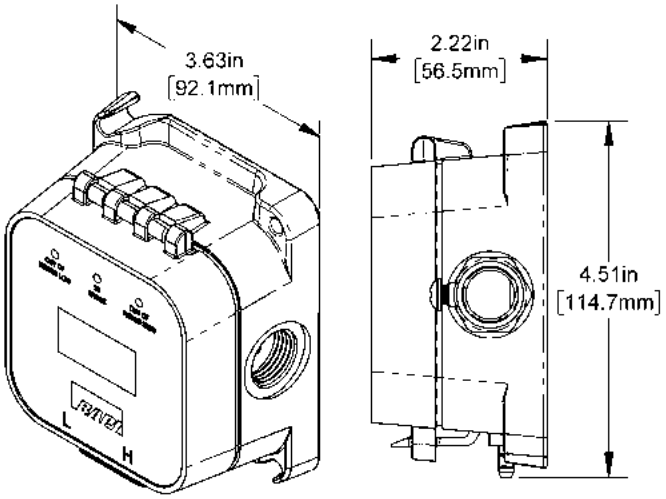
BAPI Pressure Sensor Dimensions

Zone Pressure Sensors (ZPS)

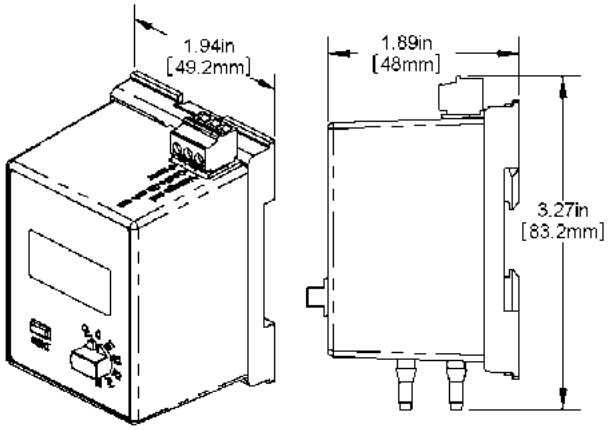
Rev. 02/01/23



BAPI-Box Enclosure Units



ZPM Enclosure Units



EZ Enclosure Units

VOC Sensors

A better way to ensure true Indoor Air Quality

Quantum Prime



pg E2

Quantum



pg E4

Duct & Rough Service



pg E6



Verification Kit, pg E25

CO_2 Sensors

with continuous automatic Barometric pressure compensation

Quantum Prime



pg E8

Quantum



pg E10

Duct & Rough Service



pg E12



Calibration Kit, pg E27

CO Sensors

for Room, Duct or Rough Service

Quantum



pg E14

Programmable Duct & Rough Service



pg E16



Rough Service

pg E18

Programmable NO_2 Duct & Rough Service Sensor



pg E20

Digital CO & NO_2 Sensor



pg E22

Particulate Sensors



pg E24-25

Refrigerant Leak



pg E26

Air Quality Sensor White Papers & App. Notes

- BAPI offers VOC as Alternative to CO_2 for DCV, pg 29
- Using the VOC Sensor for DCV, pgs 30-33
- VOCs Detected by BAPI's VOC Sensor, pgs 34-35
- Effects of Temp & Altitude on CO_2 Measurement, pgs 36-37
- Calibration Methods for CO_2 Sensors, pg 38

VOC Room Sensor, BAPI-Stat "Quantum Prime"

Air Quality Sensors

Rev. 03/20/25

Features & Options

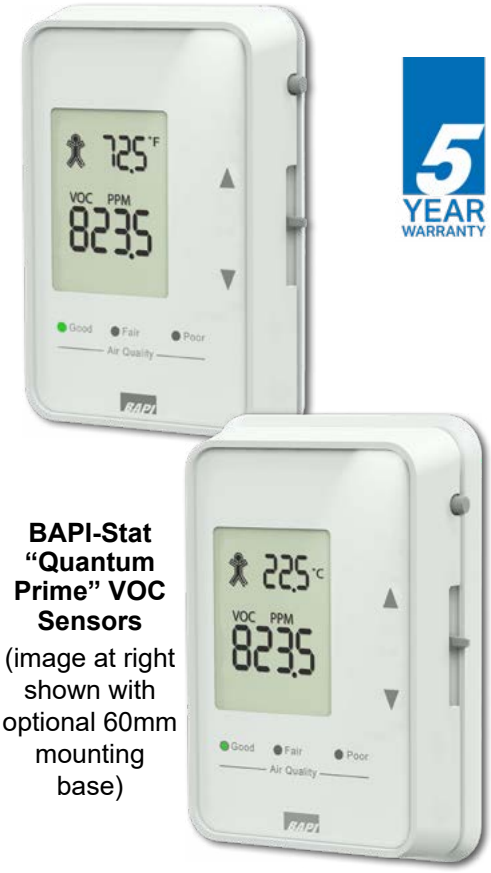
- VOC Alone or Temperature and Humidity Combination
- Achieves True Indoor Air Quality, Not Just CO_2 Dilution
- Output is Correlated to a CO_2 Value Allowing You to Ventilate Using ASHRAE's CO_2-Based VRP Algorithm

Humans respirate Volatile Organic Compounds (VOCs) as well as CO_2. The BAPI sensor is able to measure these VOCs and indicate when a space is occupied just as well as a CO_2 sensor.

The advantage of the VOC sensor is that it measures air contaminants from other sources besides respiration, such as building materials, cleaners, perfumes and furniture and carpet off-gassing. So using this sensor for Demand Controlled Ventilation is a way of achieving true indoor air quality, rather than CO_2 dilution.

A further benefit is that it requires no additional work on your part. That's because the sensor converts the VOC reading to a CO_2 equivalent level. This lets you use ASHRAE's CO_2-based VRP schedule to ventilate.

The unit is available as VOC alone or with temp and humidity sensing, temp setpoint and override. The optional display alternates between the measured values. The VOC level is indicated as "Good, Fair or Poor" by LEDs on the front of the unit. A 60mm mounting base is also available to fit European style junction boxes.



BAPI-Stat "Quantum Prime" VOC Sensors

(image at right shown with optional 60mm mounting base)

Specifications

Power:
15 to 24 VAC, 15 to 40 VDC
4.8 VA @ 24 VAC
40 mA @ 24 VDC

Sensing Elements:
Humidity: Capacitive Polymer, ±2% RH Accuracy
VOCs: Micro-machined Metal Oxide

Temp Sensor: Thermistor or RTD

Mounting: Standard 2"x4" junction box, European junction box or drywall mount (screws provided)

VOC Detection Range: 0 to 2,000 CO_2 ppm equivalent

Response Time: Less Than 60 Sec. (after Start-Up Time)

Operating Environment:
32 to 122°F (0 to 50°C) • 0 to 95% RH non-condensing

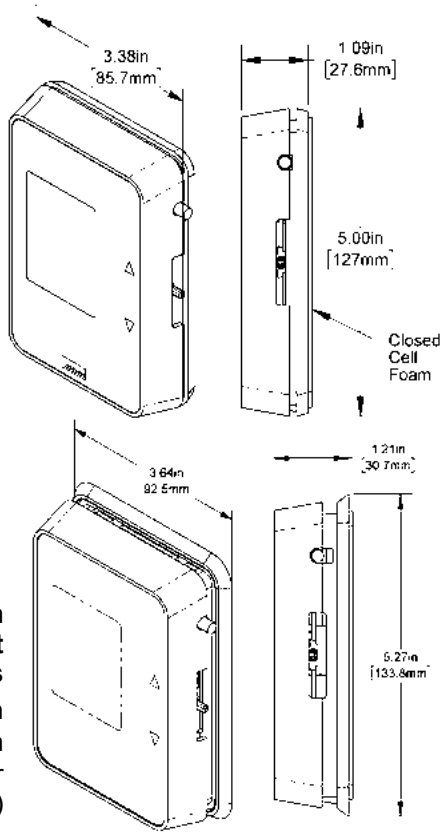
Material: ABS Plastic, Material Rated UL94 V-0

Start-Up Time: 15 minutes

Cover LED VOC/CO_2 Equivalent Level:
Good, Green < 1,000 ppm
Fair, Yellow = 1,000 to 1,500 ppm
Poor, Red > 1,500 ppm

Agency: RoHS

Warranty Period: 5 years



BAPI-Stat "Quantum Prime" VOC Unit Dimensions

(bottom unit shown with optional 60mm mounting base for European wall boxes)

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VOC Room Sensor, BAPI-Stat "Quantum Prime"

Air Quality Sensors

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Use the Option Selection Guide below to create your custom part number. Replace the number and brackets with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.

BAPI-Stat "Quantum Prime" VOC Sensor Option Selection Guide:

Unit w/ Standard Mounting Base
BA/BQP(**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**) - (**#6**)(**#7**) - (**#8**) - (**#9**)

Unit w/ 60mm Mounting Base
BA/BQP60(**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**) - (**#6**)(**#7**) - (**#8**) - (**#9**)

#1: Display Style (required)
F .....Unit with Display and °F indication ... $35
C .....Unit with Display and °C indication... $35
X .....Unit without Display

#2: VOC Output (required)
A .....VOC 0 to 5V Output $475
B .....VOC 0 to 10V Output $475

#3: Temperature Sensor (required)
A .....1K Platinum RTD (385 curve)..... $25
B .....10K-2 Thermistor..... $18
C .....10K-3 Thermistor..... $18
D .....10K-3[11K] Thermistor..... $18
E .....20K Thermistor..... $18
F .....1.8K Thermistor..... $18
G.....1K Ω Nickel RTD $65
H.....3K Thermistor..... $18
X .....No Temperature Sensor

#4: Humidity Output (required)
A .....±2% Accuracy, Output of 0 to 5V..... $80
B .....±2% Accuracy, Output of 0 to 10V.... $80
X .....No Humidity Output

#5: Setpoint Adjustment (required)
1.....Slider Setpoint Adjustment $6
X .....No Setpoint Adjustment

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

#6: Setpoint Display Range (required)
A .....-3 to +3
B .....-5 to +5
C.....50 to 90 °F or 10 to 32 °C
D .....55 to 85 °F or 13 to 30 °C
E .....60 to 80 °F or 15 to 27 °C
F .....65 to 80 °F or 18 to 27 °C
X .....No Setpoint Adjustment

#7: Setpoint Output Range (required)
00.....0 to 5 V
10.....0 to 10 V
40.....0 to 1 K
60.....0 to 10 KΩ
80.....0 to 20 KΩ
81.....4.75 K to 24.75 KΩ
82.....6.19 K to 26.19 KΩ
84.....10 K to 30 KΩ
X .....No Setpoint Adjustment

#8: Occupant Override (required)
J.....Override as a Separate Output $5
N.....Override in Parallel (//) with Sensor.... $5
P .....Override in Parallel (//) with Setpoint.. $5
X .....No Override

#9: Optional Selections* (optional)
A .....Differential Ground
B .....Comm Jack C35..... $10
F .....Test and Balance Switch $7.50

*When more than one is selected, put in alphabetical order. Additional options and descriptions can be found on pg. I4

Example Number: BA/BQP **(F) - (A) - (B) - (A)- (1) - (F)(80) - (N)**

Actual Number (with brackets removed): BA/BQPF-A-B-A-1-F80-N

Description: BAPI-Stat "Quantum Prime" VOC Sensor, °F Display, 0 to 5V VOC Output, 10K-2 Thermistor Temperature Sensor, 0 to 5V Humidity Output, Slider Setpoint Adjustment, 65 to 80 Temp Setpoint Display Range, 0 to 20K Temp Setpoint Output Range, Override in Parallel with the temp sensor, No Additional Options

List Price: $35 (°F Display) + $475 (VOC Unit) + $18 (Thermistor) + $80 (Humidity) + $6 (Setpoint) + $5 (Override) = $619 List

Your Number: BA/

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VOC Room Sensor, BAPI-Stat “Quantum”

Air Quality Sensors

CE Rev. 05/20/21

Features & Options

- Available with a CO_2 Equivalent Output (CO2e) or a Total VOC Output (TVOC)
- Field-Selectable 0 to 5 or 0 to 10 VDC Output

The quality of the air that we breathe is essential to our health and knowing the air quality level is the first step to improving it. BAPI’s VOC sensors provide that critical air quality information.

The CO_2 equivalent (CO2e) units combine the benefits of VOC sensors and the common application of CO2 sensors into one unit. It provides a VOC reading that correlates to a typical indoor CO_2 level of 0 to 2,000 ppm. This allows the sensor’s output to be used for ASHRAE’s CO_2-based VRP ventilation schedule.

The total VOC (TVOC) units provide a VOC reading that is the total concentration of all VOCs present in the space within a range of 0 to 2,500 ppb. This is often needed to meet 3rd party building certifications that require separate CO_2 and VOC readings.

Additional information on VOCs and using the CO2e units in your ventilation strategy is available in the “Application Notes” section of the BAPI website.

A 60mm mounting base is available to fit European style junction boxes.



CO2e Unit with Standard Mounting Base
(includes cover LEDs for air quality levels of “Good”, “Fair” and “Poor”.)

TVOC Unit with 60mm Mounting Base
(cover LEDs not available for TVOC units.)

Specifications

Power: (Half-wave rectified)
12 to 24 VDC, 35 mA max • 18 to 24 VAC, 4 VAmax

CO2e Unit Detection Range: 0 to 2,000 ppm CO_2 equivalent

TVOC Unit Detection Range: 0 to 2,500 ppb

Sensing Element: Micro-machined metal oxide

Start-Up Time: 15 minutes

Response Time: <60 sec (after start-up time)

Cover LEDs for CO2e Models (not available on TVOC Models)**:**
Good, Green < 1,000 ppm
Fair, Yellow = 1,000 to 1,500 ppm
Poor, Red > 1,500 ppm

Selectable Output: 0 to 5 or 0 to 10 VDC > 4KΩ impedance

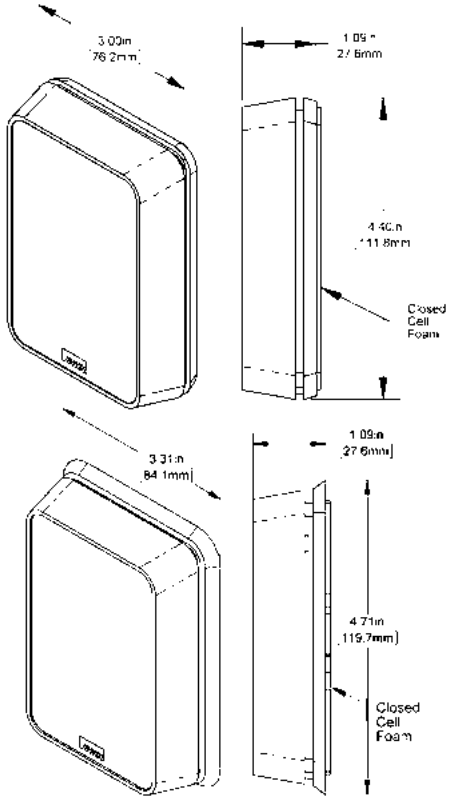
Wiring: 3 wires, 16 to 22 AWG

Operating Environment:
32 to 122°F (0 to 50°C)
5 to 95%RH non-condensing

Enclosure Material: ABS plastic, UL94 V-0

Mounting: Standard 2”x4” junction box, European junction box or drywall (screws provided)

Agency: CE EN 61326-1:2013 EMC, UL, RoHS



Unit with standard Mounting Base (top) and 60mm Mounting Base (bottom)

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Ordering Information:

Units with CO2 Equivalent (CO2e) Output

Part #	Description	List Price
BA/BQX-A	BAPI-Stat “Quantum” VOC (CO2e), 0 to 5V Output, Standard Mounting Base	$425
BA/BQX-B	BAPI-Stat “Quantum” VOC (CO2e), 0 to 10V Output, Standard Mounting Base	$425
BA/BQX60-A	BAPI-Stat “Quantum” VOC (CO2e), 0 to 5V Output, 60mm Mounting Base	$425
BA/BQX60-B	BAPI-Stat “Quantum” VOC (CO2e), 0 to 10V Output, 60mm Mounting Base	$425

Units with Total VOC (TVOC) Output

Part #	Description	List Price
BA/BQX-T-A-BNK	BAPI-Stat “Quantum” TVOC, 0 to 5V Output, Standard Mounting Base	$425
BA/BQX-T-B-BNK	BAPI-Stat “Quantum” TVOC, 0 to 10V Output, Standard Mounting Base	$425
BA/BQX60-T-A-BNK	BAPI-Stat “Quantum” TVOC, 0 to 5V Output, 60mm Mounting Base	$425
BA/BQX60-T-B-BNK	BAPI-Stat “Quantum” TVOC, 0 to 10V Output, 60mm Mounting Base	$425

VOC Duct and Rough Service Sensor

Air Quality Sensors

Rev. 05/06/24

Features & Options

- Available with a CO_2 Equivalent Output (CO2e) or a Total VOC Output (TVOC)
- Ventilated BAPI-Box for Rough Service Areas and BAPI-Box with Aspiration Tube for Ducts
- Field-Selectable 0 to 5 or 0 to 10 VDC Output

The quality of the air that we breathe is essential to our health and knowing the air quality level is the first step to improving it. BAPI's VOC sensors provide that critical air quality information.

The CO_2 equivalent (CO2e) units combine the benefits of VOC sensors and the common application of CO2 sensors into one unit. It provides a VOC reading that correlates to a typical indoor CO_2 level of 0 to 2,000 ppm. This allows the sensor's output to be used for ASHRAE's CO_2-based VRP ventilation schedule.

The total VOC (TVOC) units provide a VOC reading that is the total concentration of all VOCs present in the space within a range of 0 to 2,500 ppb. This is often needed to meet 3rd party building certifications that require separate CO_2 and VOC readings.

Additional information on VOCs and using the CO2e units in your ventilation strategy is available on our website and in the Air Quality section of our catalog.

The Duct unit uses an aspiration tube, while the Rough Service unit uses a ventilated BAPI-Box and is ideal for areas such as outdoor air plenums, equipment rooms, green houses and warehouses.



Duct CO2e Unit
(includes cover LEDs for air quality levels of "Good", "Fair" and "Poor".)

5 YEAR WARRANTY



Rough Service TVOC Unit
(cover LEDs not available for TVOC units.)

Specifications

Power: (Half-wave rectified)
12 to 24 VDC, 35 mA max
18 to 24 VAC, 4 VAmax

CO2e Unit Detection Range:
0 to 2,000 ppm CO_2 equivalent

TVOC Unit Detection Range:
0 to 2,500 ppb

Sensing Element:
Micro-machined metal oxide

Start-Up Time:
15 minutes

Response Time:
<60 sec (after start-up time)

Selectable Output:
0 to 5 or 0 to 10 VDC > 10KΩ impedance

Wiring:
3 wires, 16 to 22 AWG

Cover LEDs for CO2e Models
(not available on TVOC Models):
Good, Green < 1,000 ppm
Fair, Yellow = 1,000 to 1,500 ppm
Poor, Red > 1,500 ppm

Operating Environment:
32 to 122°F (0 to 50°C)
5 to 95%RH non-condensing

Enclosure Material:
UV-Resistant Polycarbonate, UL94 V-0

Agency:
CE EN 61326-1:2013 EMC, UL, RoHS

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Ordering Grids without List Prices are available on our website at www.bapihvac.com

Ordering Information:

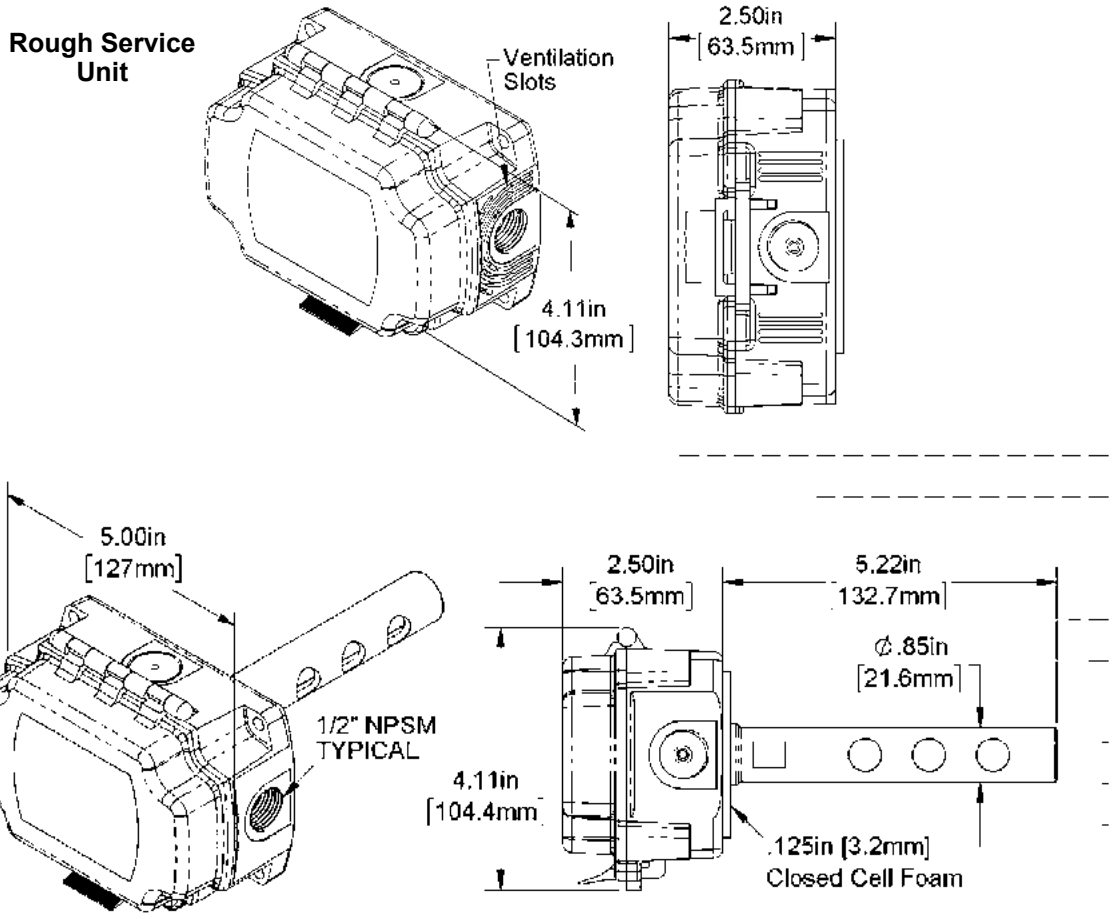
Units with CO2 Equivalent (CO2e) Output

Part #	Description	List Price
BA/VOC05-D-BB	Duct VOC (CO2e), 0 to 5V Output	$487
BA/VOC10-D-BB	Duct VOC (CO2e), 0 to 10V Output	$487
BA/VOC05-V-BB	Rough Service VOC (CO2e), 0 to 5V Output	$555
BA/VOC10-V-BB	Rough Service VOC (CO2e), 0 to 10V Output	$555

Units with Total VOC (TVOC) Output

Part #	Description	List Price
BA/TVOC05-D-BB-BNK	Duct VOC (TVOC), 0 to 5V Output	$487
BA/TVOC10-D-BB-BNK	Duct VOC (TVOC), 0 to 10V Output	$487
BA/TVOC05-V-BB-BNK	Rough Service VOC (TVOC), 0 to 5V Output	$555
BA/TVOC10-V-BB-BNK	Rough Service VOC (TVOC), 0 to 10V Output	$555

Dimensions



CO_2 Room Sensor, BAPI-Stat "Quantum Prime"

Air Quality Sensors

Rev. 01/29/25

Features & Options

- Automatic Barometric Pressure Compensation for Accurate Readings Regardless of Weather or Altitude
- Optional Temperature, Setpoint, Override and Humidity
- Optimized for Continuously Occupied Areas
- Models that Meet California Title 24 and AB 841
- 0 to 2,500 ppm Range Models Meet Addendum ab to ASHRAE Standard 62.1-2022

The BAPI CO_2 Sensor is an accurate and reliable way of incorporating demand controlled ventilation into a building's HVAC strategy. It measures the CO_2 in ranges of 0 to 2,000 or 0 to 2,500 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

BAPI's Dual Channel "24/7" unit has been optimized for continuously occupied areas and features a 3-point calibration process for enhanced accuracy and stability.

Barometric pressure changes can affect CO_2 sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric pressure sensor that continuously compensates the output for accurate readings despite the weather or altitude.

The CO_2 level is indicated by three LEDs on the front of the unit. A 60mm mounting base is available to fit European style junction boxes.



BAPI-Stat "Quantum Prime" CO_2 Sensors
(bottom unit shown with optional 60mm mounting base)

Specifications

Power:
15 to 24 VAC, 15 to 40 VDC
4.8 VA @ 24 VAC
40 mA @ 24 VDC

CO_2 Sensor: Dual Channel Non-Dispersive Infrared (NDIR)

Humidity Sensor: Capacitive Polymer ±2% RH Accuracy

Temperature Sensor: Thermistor or RTD

Operating Environment:
32 to 122°F (0 to 50°C) • 0 to 95%RH non-condensing

Material: ABS Plastic, Material Rated UL94 V-0

CO_2 Detection Range: 0 to 2,000 or 0 to 2,500 ppm

Start-Up Time: <2 Minutes

Response Time: <2 Minutes for 90% step change typical (after start-up)

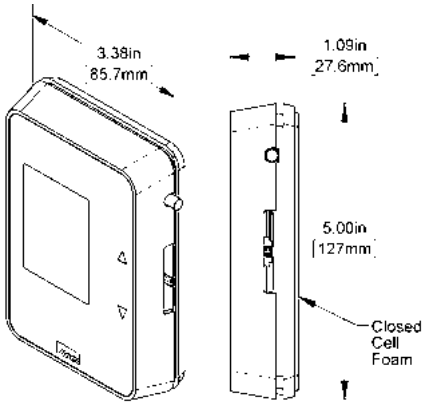
CO_2 Accuracy @ 77°F (25°C) and Sea Level:
<±50 ppm + 3% of measured value
<±75 ppm at 600, 1,000 and 2,500 ppm

CO_2 Drift Stability: ±20 ppm/year

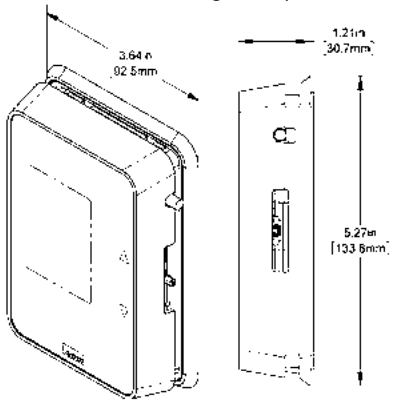
Mounting: Standard 2"x4" junction box, European junction box or drywall mount (screws provided)

LED CO_2 Level Indicator:
Good, Green < 1,000 ppm (1,100 ppm when option "N" chosen)
Fair, Yellow = 1,000 to 1,500 ppm (1,100 to 1,500 ppm when "N" chosen)
Poor, Red > 1,500 ppm

Agency: RoHS, California Title 24 and AB 841,
Addendum ab to ASHRAE Standard 62.1-2022



Unit Dimensions
(bottom unit shown with 60mm mounting base)



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CO_2 Room Sensor, BAPI-Stat "Quantum Prime"

Air Quality Sensors

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Use the guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required.

BAPI-Stat "Quantum Prime" CO_2 Sensor Option Selection Guide:

Unit with Standard Mounting Base
BA/AQP(**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**) - (**#6**)(**#7**) - (**#8**) - (**#9**)

Unit with 60mm Mounting Base
BA/AQP60(**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**) - (**#6**)(**#7**) - (**#8**) - (**#9**)

#1: Display Style (required)
F .....Unit with Display and °F indication $35
C .....Unit with Display and °C indication..... $35
X .....Unit without Display

#2: CO2 Range & Output (required)
C .....0 to 2,000 ppm, 0 to 5V Output $475
D .....0 to 2,000 ppm, 0 to 10V Output $475
E .....0 to 2,500 ppm, 0 to 5V Output $475
F .....0 to 2,500 ppm, 0 to 10V Output $475

#3: Temperature Sensor (required)
A .....1K Platinum RTD (385 curve)..... $25
B .....10K-2 Thermistor..... $18
C .....10K-3 Thermistor..... $18
D .....10K-3[11K] Thermistor..... $18
E .....20K Thermistor..... $18
F .....1.8K Thermistor..... $18
G .....1K Nickel RTD..... $65
H .....3K Thermistor..... $18
X .....No Temperature Sensor

#4: Humidity Output (required)
A .....±2% Accuracy, Output of 0 to 5V..... $80
B .....±2% Accuracy, Output of 0 to 10V..... $80
X .....No Humidity Output

#5: Setpoint Adjustment (required)
1.....Slider Setpoint Adjustment $6
X .....No Setpoint Adjustment

Additional options are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options.

#6: Setpoint Display Range (required)
A .....-3 to +3
B .....-5 to +5
C .....50 to 90 °F or 10 to 32 °C
D .....55 to 85 °F or 13 to 30 °C
E .....60 to 80 °F or 15 to 27 °C
F .....65 to 80 °F or 18 to 27 °C
X .....No Setpoint Adjustment

#7: Setpoint Output Range (required)
00.....0 to 5 V
10.....0 to 10 V
40.....0 to 1 K
60.....0 to 10 KΩ
80.....0 to 20 KΩ
81.....4.75 K to 24.75 KΩ
82.....6.19 K to 26.19 KΩ
84.....10 K to 30 KΩ
X .....No Setpoint Adjustment

#8: Occupant Override (required)
J.....Override as a Separate Output $5
N .....Override in Parallel (//) with Sensor..... $5
P .....Override in Parallel (//) with Setpoint..... $5
X .....No Override

#9: Optional Selections* (optional)
A .....Differential Ground
B .....Comm Jack C35..... $10
F .....Test and Balance Switch $7.50
N .....LED Alert Level for California AB 841 ..... $6
(must have a display to meet AB 841)

*When more than one is selected, put in alphabetical order. Additional options can be found on pg. I4

Example Number: BA/AQP **(F) - (A) - (C) - (A)- (1) - (F)(80) - (N)**

Actual Number (with brackets removed): BA/AQPF-C-B-A-1-F80-N

Description: BAPI-Stat "Quantum Prime" CO_2 Sensor, °F Display, 0 to 5V Dual Channel CO_2 Output, 10K-2 Thermistor Temperature Sensor, 0 to 5V Humidity Output, Sider Setpoint Adjustment, 65 to 80 Temp Setpoint Display Range, 0 to 20K Temp Setpoint Output Range, Override in Parallel with the temp sensor, No Additional Options

List Price: $35 (°F Display) + $475 ($CO_2$ Unit) + $18 (Thermistor) + $80 (Humidity) + $6 (Setpoint) + $5 (Override) = $619 List

Your Number: BA/

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CO_2 Room Sensor, BAPI-Stat "Quantum"

Air Quality Sensors

CE Rev. 01/14/25

Features & Options

- Automatic Barometric Pressure and Temperature Compensation
- Optimized for Continuously Occupied Areas
- 0 to 2,500 ppm Range Models Meet Addendum ab to ASHRAE Standard 62.1-2022

The BAPI-Stat "Quantum" CO_2 Sensor is an accurate and reliable way of incorporating demand controlled ventilation. It measures the CO_2 in ranges of 0 to 2,000, 0 to 2,500, 0 to 5,000, 0 to 10,000 and 0 to 50,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

BAPI's Dual Channel "24/7" unit has been optimized for continuously occupied areas and features a three-point calibration process for enhanced stability, accuracy and reliability.

Barometric pressure changes can affect the output of CO_2 sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric sensor that continuously compensates the output for accurate readings despite the weather or altitude.

The 0 to 2,000 and 0 to 2,500 ppm units include CO_2 level indication by three LEDs on the front of the unit. A 60mm mounting base is also available to fit European style junction boxes.



BAPI-Stat "Quantum" CO_2 Sensors
(Right unit shown w/ optional 60mm mounting base)

Specifications

Power: 12 to 24 VDC, 240 mA • 18 to 24 VAC, 12 VA Peak

CO_2 Sensing Element: Dual Channel Non-Dispersive Infrared (NDIR)

Field Selectable Output: 0 to 5 or 0 to 10 VDC >4KΩ impedance

Termination: 3 Terminals, 16 to 22 AWG

Operating Environment:
32 to 122°F (0 to 50°C) ● 0 to 95%RH non-condensing

Enclosure Material: ABS Plastic, Material Rated UL94 V-0

CO_2 Detection Range (ppm):
0 to 2,000, 0 to 2,500, 0 to 5,000, 0 to 10,000 and 0 to 50,000

Start-Up Time: <2 Minutes

Response Time:
<2 Minutes for 90% step change typical (after start-up)

Mounting: U.S. or European junction boxes or drywall mount

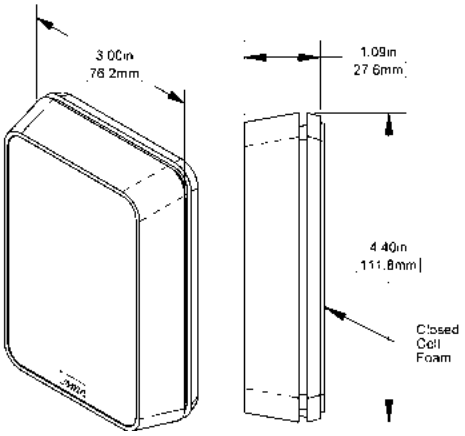
CO_2 Accuracy @ 77°F (25°C) and Sea Level:
0 to 2,000, 2,500 & 5,000 ppm Models:
<±(50 ppm + 3% of measured value)
<±75 ppm at 600, 1,000 and 2,500 ppm

0 to 10,000 ppm Models: <±(100 ppm + 5% of measured value)
0 to 50,000 ppm Models: <±75 ppm or 10% of reading
(whichever is greater)

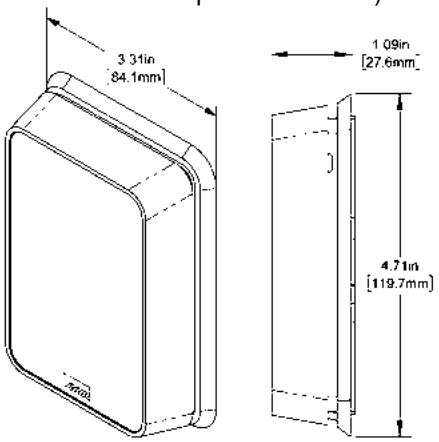
CO_2 Drift Stability:
0 to 2,000, 2,500 and 5,000 ppm Models: ±20 ppm per year
0 to 10,000 ppm Models: ±20 ppm per year
0 to 50,000 ppm Models: <5% of FS (over 10 years)
or <10% of reading annual

LED CO_2 Level Indicator (for 0 to 2,000 or 2,500 ppm units only):
Good <1,000 ppm ● Fair =1,000 to 1,500 ppm ● Poor >1,500 ppm

Agency: RoHS, CE, Title 24 Requirements,
Addendum ab to ASHRAE Standard 62.1-2022



Unit Dimensions
(bottom unit shown w/ 60mm mounting base for European wall boxes)



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Ordering Information: BAPI-Stat "Quantum" CO_2 Sensor

UNITS WITH STANDARD MOUNTING BASE

Part #	Description	List Price
BA/AQX-C	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 2,000 ppm Range	$425
BA/AQX-D	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 2,000 ppm Range	$425
BA/AQX-K	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 2,500 ppm Range	$425
BA/AQX-L	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 2,500 ppm Range	$425
BA/AQX-E	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 5,000 ppm Range	$455
BA/AQX-F	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 5,000 ppm Range	$455
BA/AQX-G	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 10,000 ppm Range	$455
BA/AQX-H	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 10,000 ppm Range	$455
BA/AQX-I	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 50,000 ppm Range	$455
BA/AQX-J	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 50,000 ppm Range	$455

UNITS WITH 60MM MOUNTING BASE

Part #	Description	List Price
BA/AQX60-C	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 2,000 ppm Range	$425
BA/AQX60-D	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 2,000 ppm Range	$425
BA/AQX60-K	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 2,500 ppm Range	$425
BA/AQX60-L	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 2,500 ppm Range	$425
BA/AQX60-E	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 5,000 ppm Range	$455
BA/AQX60-F	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 5,000 ppm Range	$455
BA/AQX60-G	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 10,000 ppm Range	$455
BA/AQX60-H	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 10,000 ppm Range	$455
BA/AQX60-I	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 50,000 ppm Range	$455
BA/AQX60-J	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 50,000 ppm Range	$455

Your Number: BA/

Associated Products

BAPI VC350A or VC350A-EZ VOLTAGE CONVERTERS

The CO_2 unit requires 240mA of current to operate correctly. If this is more current than can be provided by the controller power output, then the unit can be powered by a BAPI VC350A or VC350A-EZ Voltage Converter. See the Accessories section for more info.



VC350A-EZ Voltage Converter

E12

CO_2 Duct and Rough Service Sensor

Air Quality Sensors

Rev. 01/14/25

Features & Options

- Automatic Air Pressure and Temperature Compensation
- Optimized for Continuously Occupied Areas
- 0 to 2,500 ppm Range Models Meet Addendum ab to ASHRAE Standard 62.1-2022

The BAPI CO_2 Duct Sensor is an accurate and reliable way of incorporating demand controlled ventilation. It measures CO_2 in ranges of 0 to 2,000, 0 to 2,500, 0 to 5,000, 0 to 10,000 and 0 to 50,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

BAPI's Dual Channel "24/7" unit is optimized for continuously occupied areas and features a 3-point calibration process for enhanced accuracy and reliability.

Altitude and weather patterns can affect CO_2 sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric pressure sensor that continuously compensates the output for accurate readings despite the weather or altitude.

The Duct unit samples air using an aspiration tube. The Rough Service unit features a ventilated BAPI-Box and is ideal for areas such as outdoor air plenums, equipment rooms, green houses and warehouses. The 0 to 2,000 and 0 to 2,500 ppm units include CO_2 level indication by three LEDs on the front of the unit.



Duct Sensor



Rough Service Sensor

Specifications

Power: 12 to 24 VDC, 240 mA ● 18 to 24 VAC, 12 VA Peak

CO_2 Sensing Element: Dual Channel Non-Dispersive Infrared

Field Selectable Voltage Output: 0 to 5 or 0 to 10 VDC

Termination: 3 Terminals, 16 to 22 AWG

Operating Environment:
32 to 122°F (0 to 50°C) ● 0 to 95%RH non-condensing

CO_2 Detection ppm Range:
0 to 2,000, 0 to 2,500, 0 to 5,000, 0 to 10,000 and 0 to 50,000

Start-Up Time: <2 Minutes

Response Time: <2 Min for 90% step change typical (after start-up)

CO_2 Accuracy @ 77°F (25°C) and Sea Level:
0 to 2,000, 2,500 & 5,000 ppm Models:
<±(50 ppm +3% of measured value)
<±75 ppm at 600, 1,000 and 2,500 ppm

0 to 10,000 ppm Models: <±(100 ppm +5% of measured value)
0 to 50,000 ppm Models: <±75 ppm or 10% of reading
(whichever is greater)

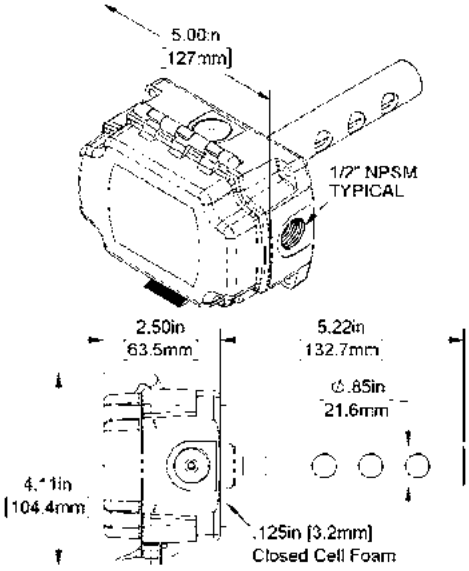
CO_2 Drift Stability:
0 to 2,000, 2,500 and 5,000 ppm Models: ±20 ppm per year
0 to 10,000 ppm Models: ±20 ppm per year
0 to 50,000 ppm Models: <5% of FS (over 10 years)
or <10% of reading annual

Unventilated BAPI-Box Rating: NEMA 4, IP66

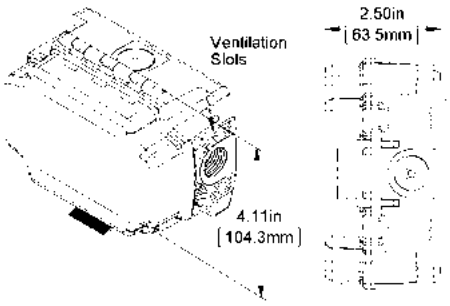
Enclosure Material: Polycarbonate, UL94 V-0

LED CO_2 Level Indicator (for 0 to 2,000 & 2,500 ppm units only):
Good <1,000 ppm ● Fair =1,000 to 1,500 ppm ● Poor >1,500 ppm

Agency: CE EN 61326-1:2013 EMC, RoHS,
Addendum ab to ASHRAE Standard 62.1-2022



CO_2 Duct Sensor



CO_2 Rough Service Sensor

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Ordering Information

	LIST PRICE
BA/DCD05-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 5V Output, 0 to 2,000 ppm Range	$470
BA/DCD05-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 5V Output, 0 to 2,000 ppm Range	$550
BA/DCD10-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 10V Output, 0 to 2,000 ppm Range	$470
BA/DCD10-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 10V Output, 0 to 2,000 ppm Range	$550
BA/DCD05-2.5K-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 5V Output, 0 to 2,500 ppm Range	$470
BA/DCD05-2.5K-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 5V Output, 0 to 2,500 ppm Range	$550
BA/DCD10-2.5K-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 10V Output, 0 to 2,500 ppm Range	$470
BA/DCD10-2.5K-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 10V Output, 0 to 2,500 ppm Range	$550
BA/DCD05-5K-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 5V Output, 0 to 5,000 ppm Range	$500
BA/DCD05-5K-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 5V Output, 0 to 5,000 ppm Range	$580
BA/DCD10-5K-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 10V Output, 0 to 5,000 ppm Range	$500
BA/DCD10-5K-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 10V Output, 0 to 5,000 ppm Range	$580
BA/DCD05-10K-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 5V Output, 0 to 10,000 ppm Range	$500
BA/DCD05-10K-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 5V Output, 0 to 10,000 ppm Range	$580
BA/DCD10-10K-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 10V Output, 0 to 10,000 ppm Range	$500
BA/DCD10-10K-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 10V Output, 0 to 10,000 ppm Range	$580
BA/DC05-50K-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 5V Output, 0 to 50,000 ppm Range	$500
BA/DCD05-50K-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 5V Output, 0 to 50,000 ppm Range	$580
BA/DCD10-50K-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 10V Output, 0 to 50,000 ppm Range	$500
BA/DCD10-50K-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 10V Output, 0 to 50,000 ppm Range	$580

Your Number: BA/

Carbon Monoxide, BAPI-Stat “Quantum”

Air Quality Sensors

Rev. 10/31/23

Features & Options

- 0 to 40 ppm CO Measurement Range
- 30 ppm CO Relay Trip Level with Audible Alarm
- Field Selectable 0 to 5V, 0 to 10V or 4 to 20mA Output
- BAPI-Stat “Quantum” with LED Status Indication
- Automatic Barometric Pressure Compensation

The BAPI-Stat “Quantum” Carbon Monoxide Sensor features a modern enclosure style with green/red status LED. It has a 0 to 40 ppm CO measurement range with a 30 ppm relay/audible alarm trip level. The relay is field selectable for normally closed or normally open, and the CO output level is field selectable for 0 to 5V, 0 to 10V or 4 to 20mA.

The green/red LED indicates unit status of normal, alarm, trouble/service or test. The side pushbutton places the unit into test status to verify audible alarm and LED operation. The sensing element has a typical life of 7 years.



CO Sensor in a BAPI-Stat “Quantum” Enclosure

(Bottom unit shown w/ optional 60mm mounting base)

5 YEAR WARRANTY

Specifications

Power Supply: 24 VAC/VDC ±10%, 1.0 VA Max

CO Sensor Technology: Electrochemical

CO Detection Range: 0 to 40 ppm

CO Accuracy: ±3% of Full Scale

Jumper Selectable Analog Output:
or 4 to 20mA, 0 to 5VDC or 0 to 10VDC

Relay Trip Point: 30 ppm

Relay Output: Form “C”, 0.1A-30VDC, Normally Closed (NC) and Normally Open (NO) contacts

Audible Alarm: 75 dB at 10 feet

Start-Up Time: <10 Minutes

Response Time: < 5 Min (after Start-Up Time)

Termination: 6 Terminals, 16 to 22 AWG

Environmental Operating Range:
40 to 100°F (4.4 to 37.8°C)
0 to 95%RH non-condensing

Altimeter: Mechanical

LED Behavior:
Red/Green LED indicates the unit status of Normal, Alarm, Trouble/Service or Test.

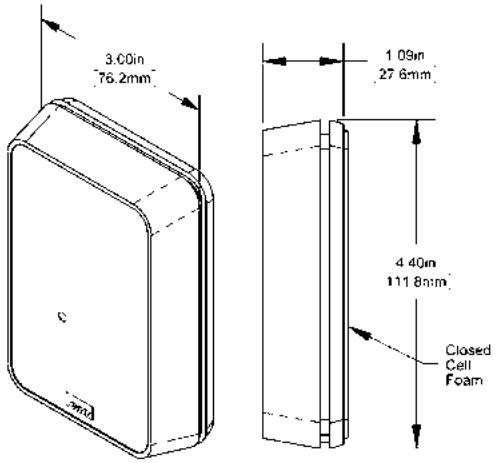
Encl. Material & Rating: ABS Plastic, UL94 V-0

Mounting: 2”x4” J-Box or drywall, screws provided

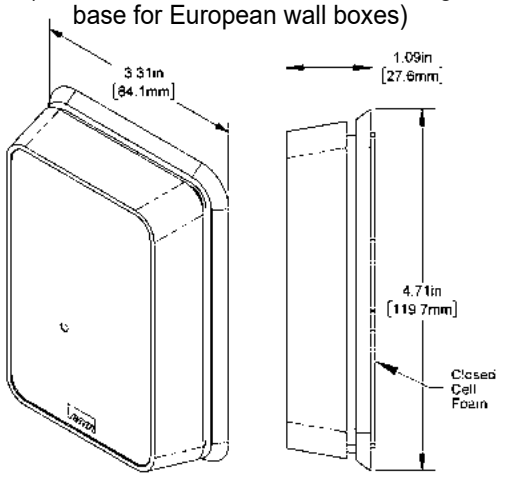
Sensing Element Life: 7 years typical

Agency: RoHS

Warranty Period: 5 years



Unit Dimensions
(bottom unit shown w/ 60mm mounting base for European wall boxes)



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Ordering Information

Part #	Description	LIST PRICE
BA/DQX	BAPI-Stat “Quantum” Carbon Monoxide (CO), Standard Mounting Base	$450
BA/DQX60	BAPI-Stat “Quantum” Carbon Monoxide (CO), 60mm Mounting Base	$450

Note: Sensors must be installed and powered within 4 months of purchase to prevent loss of accuracy.

CO Duct & Rough Service Sensor

Air Quality Sensors

Rev. 07/21/21

Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Field Selectable Ranges and Outputs
- Large Display and Two Independent Alarm Contacts
- Certificate of Calibration Included with Sensors and Replacement Modules

BAPI's Carbon Monoxide Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. The Duct unit samples duct air using an aspiration tube. The Rough Service unit features a ventilated BAPI-Box and is ideal for parking ramps, equipment rooms and warehouses.

The sensor has field selectable CO ranges of 0 to 100, 0 to 200, 0 to 300 and 0 to 500 ppm. It also has field selectable outputs of 0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC and 3-wire 4 to 20 mA output. The large LCD is backlit for 10 seconds after any button push.

Two independent SPDT alarm contacts switch at field selectable CO concentrations of 25, 35, 50, 100 and 200 ppm. An alarm timer can hold the output relays on for one to ten minutes after the CO level has fallen below 80% of setpoint. This allows additional fan run time to be sure that the CO has been purged.

The field replaceable sensor element lasts approximately 7 years and is self tested daily.



Rough Service (top) and Duct CO Sensors

Specifications

Power:
18 to 28 VAC, 7.2 VA Max
18 to 40 VDC, 180 mA Max

Field Selectable Ranges:
0 to 100, 0 to 200, 0 to 300 & 0 to 500 ppm

Alarm Relays:
2 Independent, Dry SPDT (Form C)
2 Amps at 24 VAC/DC, Resistive
140 VA Inrush, 48 VA Holding at 24 VAC

Field Wiring Terminals:
Pluggable Screw Terminals, 14 to 24 AWG

Response Time:
<80 seconds from 10% to 90% of range

Alarm Relay Setpoints:
25, 35, 50, 100 or 200 ppm

Alarm Timer:
0, 1, 5 & 10 minutes

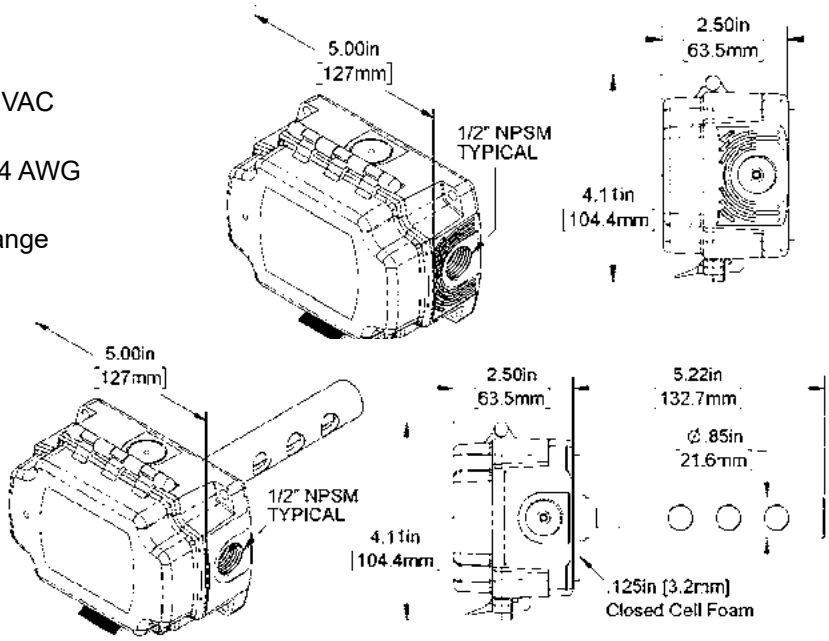
Sensor Element Life:
7 Years Typical

Field Selectable Outputs:
3-wire 4 to 20 mA
0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC

Agency: RoHS, CE

Accuracy:
<200 ppm = ±3% FS, 32 to 122°F (0 to 50°C)
201 to 500 ppm = ±5% FS, 50 to 122°F (10 to 50°C)

Environmental Operation Range
14 to 122°F (-10 to 50°C) • 5 to 95%RH Noncondensing



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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

Part #	Description	List Price
BA/CO-V-BB	Rough Service Carbon Monoxide Sensor	$900
BA/CO-D-BB	Duct Mount Carbon Monoxide Sensor	$832
BA/COS	Factory Calibrated Replacement CO Module (For use with BA/CO-V-BB and BA/CO-D-BB sensors only)	$250

Replacement CO Module

The Replacement CO Module is factory calibrated so no calibration is needed at installation. It has a sensor life of approximately 7 years which doesn't begin until the module is installed in the sensor.



BA/COS: Factory Calibrated Replacement CO Module
(For use with BA/CO-V-BB and BA/CO-D-BB sensors only)

Digital CO and NO_2 Sensor

Air Quality Sensors

Rev. 10/01/24

Features & Options

- Several options for Temperature, Humidity, Carbon Monoxide (CO) and Nitrogen Dioxide (NO_2)
- Field configurable BACnet MS/TP and MODBUS RTU output
- CO measurement range of 0 to 500 ppm
- NO_2 measurement range of 0 to 20 ppm
- CO and NO_2 sensing elements last approximately 7 years and are automatically self-tested daily
- Electronic copies of CO and NO_2 certificates of calibration available upon request at no extra charge
- Rough service wall/ beam mount or duct mount – perfect for parking structures, equipment rooms or warehouses.



Rough Service with Temp and %RH



Rough Service



Duct Mount

5 YEAR WARRANTY

Specifications

Power: 15 to 40VDC, 35mA max | 18 to 24VAC, 2.7VA max

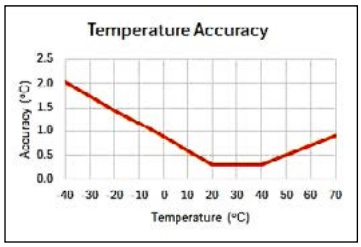
Field Wiring Terminal Blocks: 18 to 24 AWG

Environmental Operation Range:
-4 to 104°F (-20 to 40°C) | 15 to 95%RH Non-condensing

Enclosure Material: UV-resistant Polycarbonate, UL94 V-0

CO and NO_2 Sensor Element Life: 7 years typical

Agency: RoHS

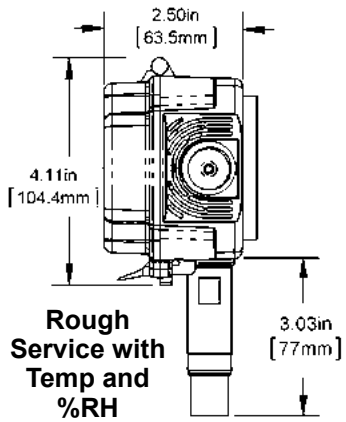


CO Sensor:
Type: Electrochemical
Range: 0 to 500 ppm
Accuracy: ±6 ppm from 0 to 200 ppm | ±25 ppm from 200 to 500 ppm

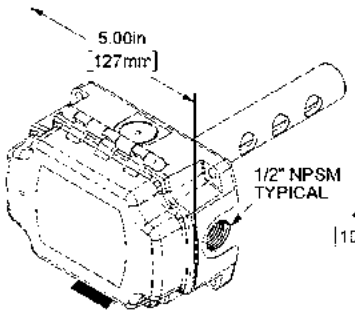
NO_2 Sensor:
Type: Electrochemical
Range: 0 to 20 ppm
Accuracy: ±0.5 ppm from 0 to 10 ppm

Temperature Sensor:
Range: -40 to 158°F (-40 to 70°C)
Accuracy: ±0.54°F (±0.3°C) from 68 to 104°F (20 to 40°C) [see graph]

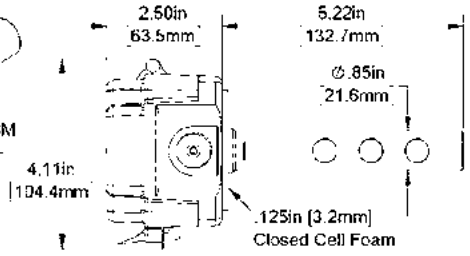
Humidity Sensor:
Range: 0 to 100%RH
Accuracy: ±2%RH from 20 to 80% @ 25°C



Rough Service with Temp and %RH



Duct Mount
(Dimensions are the same for the rough service unit without the aspiration tube)



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Ordering Information

Part #	Description	
BA/D-CO-D-BB	CO Duct Sensor	$419
BA/D-CO-V-BB	CO Rough Service Sensor	$489
BA/D-TH-CO-V-BB	CO Rough Service Sensor with Temp and %RH	$583
BA/D-NO2-D-BB	NO_2 Duct Sensor	$505
BA/D-NO2-V-BB	NO_2 Rough Service Sensor	$575
BA/D-TH-NO2-V-BB	NO_2 Rough Service NO_2 Sensor with Temp and %RH	$670
BA/D-CO-NO2-D-BB	CO & NO_2 Duct Sensor	$720
BA/D-CO-NO2-V-BB	CO & NO_2 Rough Service Sensor	$790
BA/D-TH-CO-NO2-V-BB	CO & NO_2 Rough Service Sensor with Temp and %RH	$885

Note: CO and/or NO_2 sensors must be installed and powered within 4 months of purchase to prevent loss of accuracy.

CO, NO_2 & Particulate Matter Combo Sensor

Air Quality Sensors

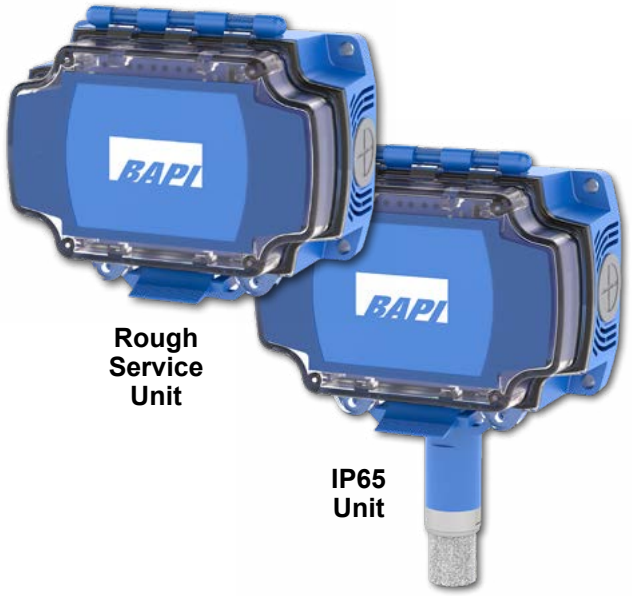
Rev. 03/27/23

Features & Options

- Included CO, NO_2, and Particulate Matter (PM10) sensors
- 0 to 10 VDC Outputs
- Automatic self-test for CO and NO_2 sensors
- Temperature compenstated CO and NO_2 outputs

BAPI's combination sensor contains individual carbon monoxide, nitrogen dioxide and particulate matter (PM10) sensors.

The rough service enclosure allows maximum air circulation for improved response time. The IP65-rated enclosure provides better protection against water and dirt intrusion.



Specifications

Power: 24 VAC or 24 VDC

Output: 0 to 10 VDC

Sensor Type:
CO: Electrochemical
NO_2: Electrochemical
Particulate: Laser Based, Light Scattering

Measurement Range:
CO: 0 to 500 ppm
NO_2: 0 to 10 ppm
Particulate: 0 to 1,000 µg/m3 (PM10)

Sensor Accuracy:
CO: ±0.5 ppm or ±2% of reading whichever is greater

NO_2: ±5% FS (±0.5 ppm)

Particulate: ±25 µg/m3 (0 to 100 µg/m3) or
±25% of reading (100 to 1,000 µg/m3)

Field Wiring Terminals:
Pluggable Screw Terminals, 14 to 22 AWG

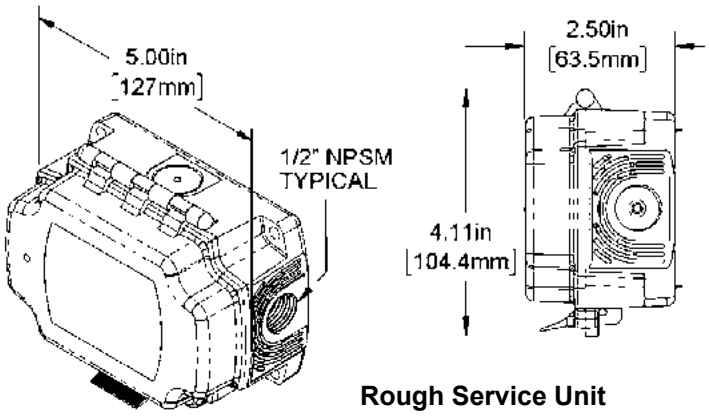
Environmental Operation Range
Continuous: -4 to 104°F (-20 to 40°C),
15 to 95%RH Noncondensing

Intermittent: -22 to 122°F (-30 to 50°C)
15 to 95%RH Noncondensing

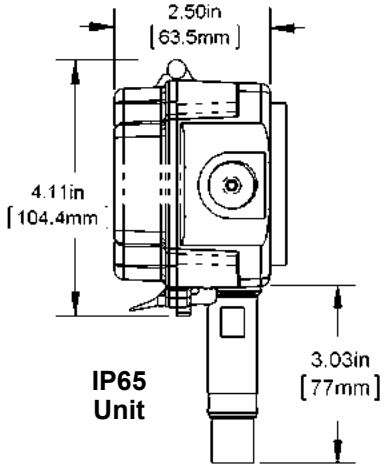
Enclosure Material:
UV-resistant Polycarbonate, UL94 V-0

Sensor Element Life:
7 Years Typical

Agency:
RoHS



Rough Service Unit



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Ordering Information

Part #	Description
BA/CONO2PM10-V-BB	Rough Service CO, NO_2 and Particulate Matter (PM10) Sensor
BA/CONO2PM10-O-BB	IP65 Rough Service CO, NO_2 and Particulate Matter (PM10) Sensor

CO Rough Service with Optional BACnet

Air Quality Sensors

CE Rev. 07/21/21

Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Optional BACnet MS/TP Output of CO, Temp and Humidity
- Field Selectable Voltage Outputs
- Certificate of Calibration Included with Sensors and Replacement Modules

BAPI's Carbon Monoxide Rough Service Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. It features a ventilated BAPI-Box and is ideal for parking ramps, equipment rooms and warehouses.

The sensor has a CO range of 0 to 500 ppm with field selectable outputs of 0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC. It includes optional humidity measurement with one of the above voltage outputs, and temperature via a 10K-2, 10K-3 or 20K Thermistor. The CO, temperature and humidity outputs are also available via BACnet MS/TP.

The field replaceable sensor element lasts approximately 7 years and is self-tested daily.



CO Rough Service Sensors (Bottom unit shown with temp and %RH sensing)

Specifications

Power:
0 to 5 or 1 to 5 VDC Output
9 to 40 VDC, 10 mA Max
12 to 28 VAC, 1.4 VA Max

0 to 10 or 2 to 10 VDC Output
12 to 40 VDC, 10 mA Max
12 to 28 VAC, 1.4 VA Max

BACnet Output
9 to 40 VDC, 35 mA Max
12 to 28 VAC, 1.7 VA Max

CO Measurement Range: 0 to 500 ppm

Field Wiring Terminals:
Flying Leads, 22 AWG

Response Time:
<80 seconds from 10% to 90% of range

Sensor Element Life: 7 Years Typical

Field Selectable Voltage Outputs
0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC

Carbon Monoxide Sensor Accuracy:
<200ppm = ±3% FS, 32 to 122°F (0 to 50°C)
201 to 500 ppm = ±5% FS, 50 to 122°F (10 to 50°C)

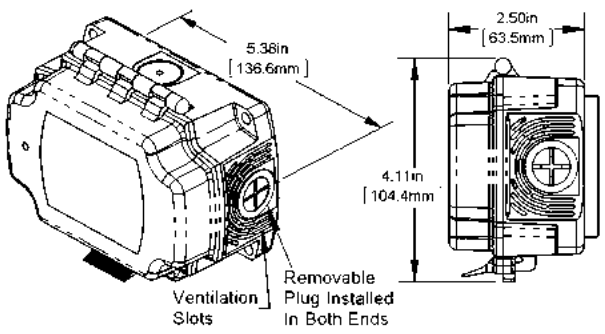
Temperature Sensor Accuracy:
BACnet Units: ±0.3°C from -40 to 257°F (-40 to 125°C)
Thermistor Units: See "Sensors" section for specs

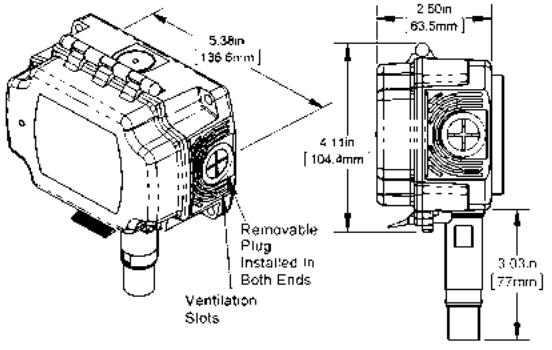
Humidity Sensor Accuracy:
±2% RH (20% to 80%) @ 25°C, Fully Compensated

Environmental Operation Range
Continuous: 32 to 122°F (0 to 50°C)
5 to 95%RH Noncondensing

Intermittent: -40 to 131°F (-40 to 55°C)
5 to 95%RH Noncondensing

Agency: RoHS, CE





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Ordering Information

Part #	Description	List Price
BA/BBV-CO	Rough Service CO Sensor	$345
BA/BBV-COV-102-H	Rough Service CO Sensor with 10K-2 Thermistor Temp and %RH	$446
BA/BBV-COV-103-H	Rough Service CO Sensor with 10K-3 Thermistor Temp and %RH	$446
BA/BBV-COV-20-H	Rough Service CO Sensor with 20K Thermistor Temp and %RH	$446
BA/BBV-COBN	Rough Service CO Sensor with BACnet Output	$489
BA/BBV-COBN-H	Rough Service CO Sensor with Temp, %RH and BACnet Output	$583
BA/BBV-COS	Factory Calibrated Replacement CO Module (For use with BA/BBV version CO sensors only)	$250

Replacement CO Module

The Replacement CO Module is factory calibrated so no calibration is needed at installation. It has a sensor life of approximately 7 years which doesn't begin until the module is installed in the sensor.

BA/BBV-COS: Factory Calibrated Replacement CO Module
(For use with BA/BBV version CO sensors only)



Carbon Monoxide (CO) Rough Service Sensor

Air Quality Sensors

Features & Options

- Electrochemical Sensor with Self-Test
- Optional %RH Measurement
- Field Selectable 0 to 5 or 0 to 10 VDC Outputs
- Certificate of Calibration Available

BAPI's Carbon Monoxide Rough Service Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. It features a ventilated BAPI-Box and is ideal for parking structures, equipment rooms and warehouses.

The unit has a CO measurement range of 0 to 500 ppm. It includes optional %RH measurement. The CO and %RH outputs are field selectable for 0 to 5 or 0 to 10 VDC. The unit can be ordered with flying leads or a terminal strip.



CO Rough Service Sensors
(Right unit shown with %RH sensing)

5 YEAR WARRANTY

Specifications

Power:
12.5 to 40 VDC, 10 mA Max
or 12.5 to 28 VAC, 1.4 VA Max

CO Measurement Range: 0 to 500 ppm

CO Sensor Accuracy:
<200ppm =
±3% FS, 32 to 122°F (0 to 50°C)

201 to 500 ppm =
±5% FS, 50 to 122°F (10 to 50°C)

Optional %RH Sensor Accuracy:
±2%RH (20 to 80%) @ 25°C,
Fully Compensated

Response Time:
<80 seconds from 10 to 90% of range

Sensor Element Life: 7 Years Typical

Field Selectable Outputs:
0 to 5 or 0 to 10 VDC

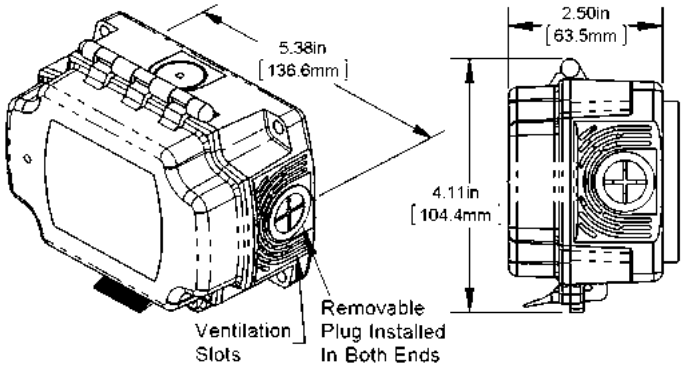
Field Wiring:
Flying Leads (22 AWG) or Terminal Strip

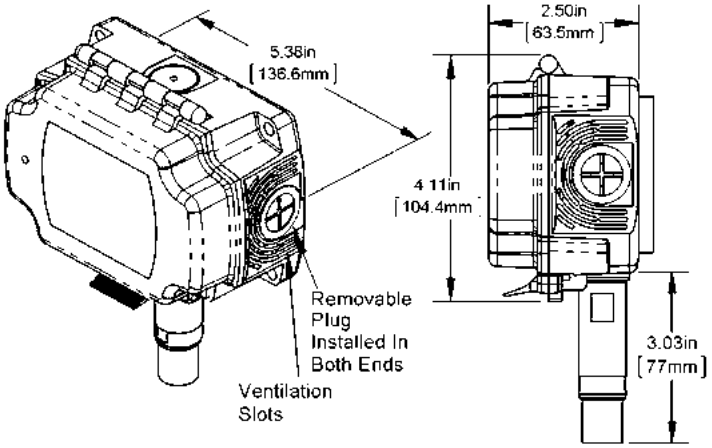
Environmental Operation Range
Continuous: 32 to 122°F (0 to 50°C)
5 to 95%RH Noncondensing

Intermittent: -40 to 131°F (-40 to 55°C)
5 to 95%RH Noncondensing

BAPI-Box Material:
UV-resistant Polycarbonate, UL94 V-0

Agency: RoHS





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Ordering Information

Part #	Description	List Price
BA/BBV-CO	Rough Service CO Sensor, Flying Leads	$235
BA/BBV-CO-TS	Rough Service CO Sensor, Terminal Strip	$235
BA/BBV-COV-H	Rough Service CO Sensor with %RH Measurement, Flying Leads	$336
BA/BBV-COV-H-TS	Rough Service CO Sensor with %RH Measurement, Terminal Strip	$336

Carbon Monoxide (CO) Rough Service

Air Quality Sensors

Rev. 09/27/23

Features & Options

- Field Selectable Voltage Outputs
- Certificate of Calibration Included

BAPI's Carbon Monoxide Rough Service Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. It features a ventilated BAPI-Box and is ideal for parking ramps, equipment rooms and warehouses.

The sensor has a CO range of 0 to 500 ppm with field selectable outputs of 0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC. It includes optional humidity measurement with one of the above voltage outputs, and temperature via a 10K-2, 10K-3 or 20K Thermistor.



CO Rough Service Sensors
(Bottom unit shown with temp and %RH sensing)

5 YEAR WARRANTY

Specifications

Power:
0 to 5 or 1 to 5 VDC Output
9 to 40 VDC, 10 mA Max
12 to 28 VAC, 1.4 VA Max

0 to 10 or 2 to 10 VDC Output
12 to 40 VDC, 10 mA Max
12 to 28 VAC, 1.4 VA Max

CO Measurement Range: 0 to 500 ppm

Field Wiring Terminals:
Flying Leads, 22 AWG

Response Time:
<80 seconds from 10% to 90% of range

Sensor Element Life: 10 Years Typical

Field Selectable Voltage Outputs
0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC

Carbon Monoxide Sensor Accuracy:
<200ppm = ±3% FS, 32 to 122°F (0 to 50°C)
201 to 500 ppm = ±5% FS, 50 to 122°F (10 to 50°C)

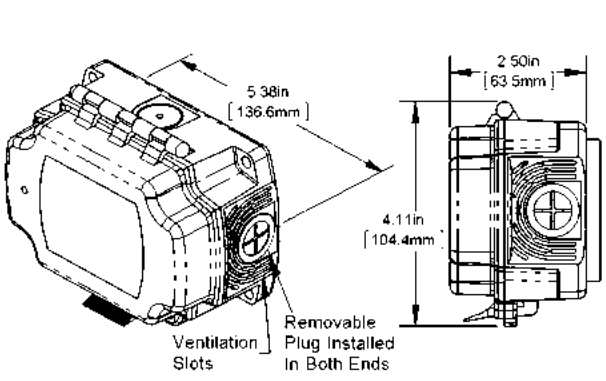
Temperature Sensor Accuracy:
Thermistor Units: See "Sensors" section for specs

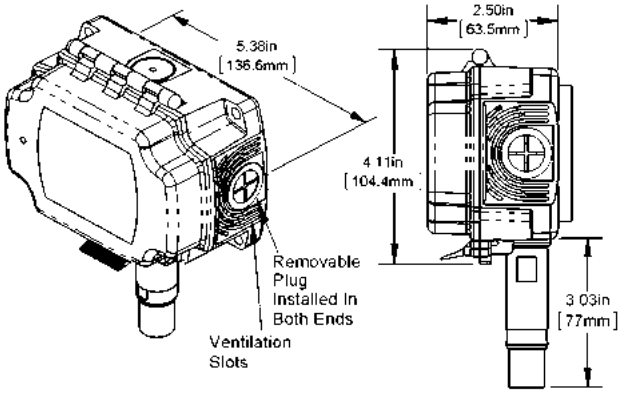
Humidity Sensor Accuracy:
±2% RH (20% to 80%) @ 25°C, Fully Compensated

Environmental Operation Range
Continuous: 32 to 122°F (0 to 50°C)
5 to 95%RH Noncondensing

Intermittent: -40 to 131°F (-40 to 55°C)
5 to 95%RH Noncondensing

Agency:
CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL, RoHS





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Ordering Information

Part #	Description	List Price
BA/BBV-CO	Rough Service CO Sensor	$245
BA/BBV-COV-102-H	Rough Service CO Sensor with 10K-2 Thermistor Temp and %RH	$336
BA/BBV-COV-103-H	Rough Service CO Sensor with 10K-3 Thermistor Temp and %RH	$336
BA/BBV-COV-20-H	Rough Service CO Sensor with 20K Thermistor Temp and %RH	$336

Nitrogen Dioxide Duct & Rough Service Sensor

Air Quality Sensors

CE Rev. 07/21/21

Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Two Independent Alarm Contacts
- Field Selectable NO_2 Ranges and Outputs
- Certificate of Calibration Included with Sensors and Replacement Modules

BAPI's Nitrogen Dioxide Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. The Duct unit samples duct air using an aspiration tube. The Rough Service unit features a ventilated BAPI-Box and is ideal for parking ramps, equipment rooms and warehouses.

The sensor has field selectable NO_2 ranges of 0 to 2.5, 0 to 5, 0 to 7.5 and 0 to 10 ppm. It also has field selectable outputs of 0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC as well as a 3-wire 4 to 20 mA output. The LCD is backlight for 10 seconds after a button push.

Two independent SPDT alarm contacts switch at 5 field-selectable NO_2 concentrations from 1 to 10 ppm. An alarm timer holds the output relays on for a fixed time after the NO_2 level has fallen below 80% of setpoint to allow additional fan time to ensure the NO_2 has been purged. The field replaceable sensor element lasts approximately 7 years and is self-tested daily.



Rough Service (top) and Duct NO_2 Sensors

Specifications

Power:
18 to 28 VAC, 7.2 VA Max
18 to 40 VDC, 180 mA Max

Field Selectable Ranges:
0 to 2.5 ppm • 0 to 5.0 ppm
0 to 7.5 ppm • 0 to 10.0 ppm

Accuracy: ±5.0% FS

Alarm Relays:
2 Independent, Dry SPDT (Form C)
2 Amps at 24 VAC/DC, Resistive
140 VA Inrush, 48 VA Holding at 24 VAC

Field Wiring Terminals:
Pluggable Screw Terminals, 14 to 22 AWG

Response Time:
<80 seconds from 10% to 90% of range

Alarm Relay Setpoints:
1.0, 2.5, 5.0, 7.5 or 10 ppm

Alarm Timer:
0, 1, 5 & 10 minutes

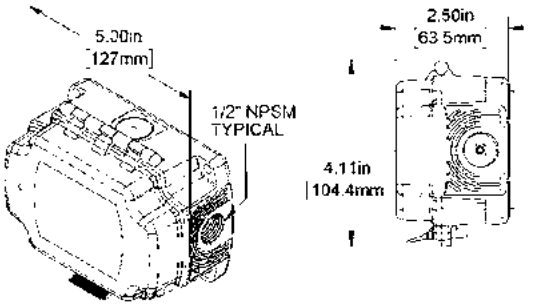
Field Selectable Analog Outputs:
3-wire 4 to 20 mA
0 to 5 VDC, 1 to 5 VDC
0 to 10 VDC, 2 to 10 VDC

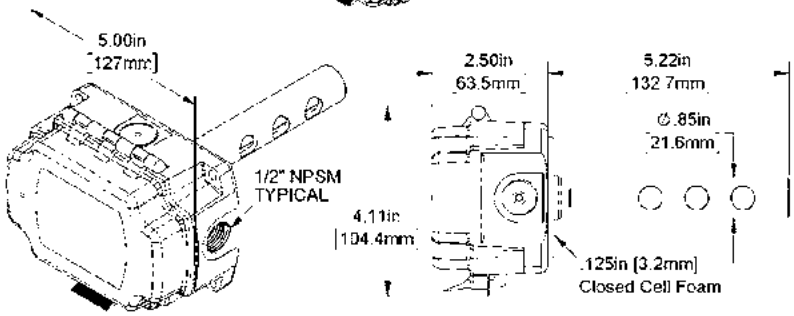
Sensor Element Life:
7 Years Typical

Environmental Operation Range:
Continuous: -4 to 104°F (-20 to 40°C), 15 to 95%RH Non-condensing

Intermittent: -22 to 122°F (-30 to 50°C), 0 to 95%RH Non-condensing

Agency: RoHS • CE: EN 61326-1:2013 EMC





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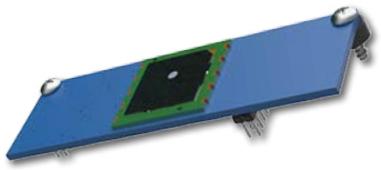
Ordering Information

Part #	Description	List Price
BA/NO2-V-BB	... Rough Service NO_2 Sensor, Ventilated BAPI-Box	$1,170
BA/NO2-D-BB	... Duct Mount NO_2 Sensor	$1,100
BA/NO2S	..... Factory Calibrated Replacement NO_2 Module (For use with BA/NO2-V-BB and BA/NO2-D-BB sensors only)	$570

Note: Sensors and Replacement NO_2 Modules must be installed and powered within 4 months of purchase to prevent loss of accuracy.

Replacement NO_2 Module

The Replacement NO_2 Module is factory calibrated so no calibration is needed at installation. It has a sensor life of approximately 7 years which doesn't begin until the module is installed in the sensor.



BA/NO2S: Factory Calibrated Replacement NO_2 Module
(For use with BA/NO2-V-BB and BA/NO2-D-BB sensors only)

E30

NO_2 Rough Service with Optional BACnet

Air Quality Sensors

Rev. 07/21/21

Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Optional BACnet MS/TP Output of NO_2, Temp and Humidity
- Field Selectable Voltage Outputs
- Certificate of Calibration Included with Sensors and Replacement Modules

BAPI's Nitrogen Dioxide Rough Service Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations.

The ventilated BAPI-Box is ideal for parking ramps, equipment rooms and warehouses. The vents allow maximum air circulation while maintaining the enclosure's strength and minimizing the likelihood that insects will block the airway.

The NO_2 range is 0 to 10 ppm. BACnet models use MS/TP. Analog models are field selectable for 0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC Output. The field replaceable NO_2 sensor element lasts approximately 7 years and is self-tested daily.



NO_2 Rough Service Sensors (Bottom unit shown with temp and %RH sensing)

Specifications

Power:
0 to 5 or 1 to 5 VDC Output
9 to 40 VDC, 10 mA Max
12 to 28 VAC, 1.4 VA Max

0 to 10 or 2 to 10 VDC Output
12 to 40 VDC, 10 mA Max
12 to 28 VAC, 1.4 VA Max

BACnet Output
9 to 40 VDC, 35 mA Max
12 to 28 VAC, 1.7 VA Max

NO_2 Measurement Range: 0 to 10 ppm

NO_2 Sensor Accuracy: ±5.0% FS (±0.5 ppm)

Temperature Sensor Accuracy:
BACnet Units: ±0.3°C from -40 to 125°C (-40 to 257°F)
Thermistor Units: See "Sensors" section for specs

Humidity Sensor Accuracy:
±2%RH (20 to 80%) @ 25°C, Fully Compensated

NO_2 Sensor Response Time:
<80 Seconds from 10% to 90% of Range

Field Wiring Terminals:
3 to 6 Flying Leads, 22 AWG

Sensor Element Life: 7 Years Typical

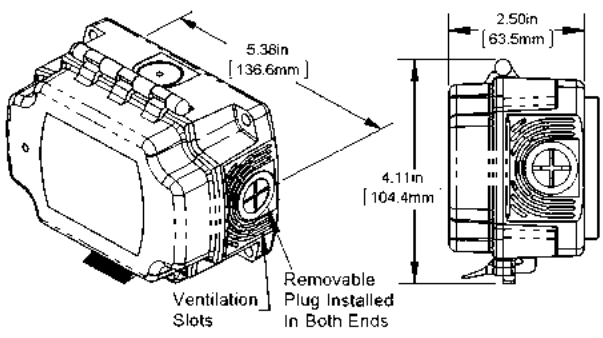
Field Selectable Voltage Outputs
0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC

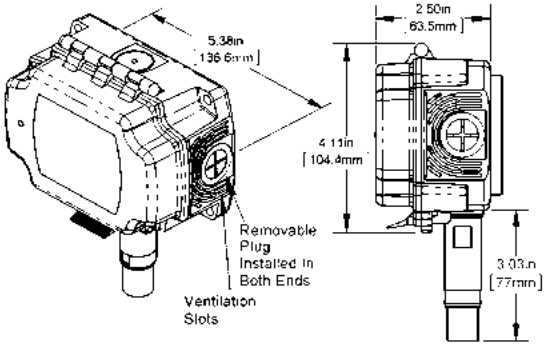
Environmental Operation Range
Continuous: -4 to 104°F (-20 to 40°C)
15 to 95%RH Non-condensing

Intermittent: -22 to 122°F (-30 to 50°C)
0 to 95%RH Non-condensing

Enclosure Material:
UV-resistant Polycarbonate, UL94 V-0

Agency: CE 61326-1:2013 EMC, UL, RoHS





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NO_2 Rough Service with Optional BACnet

Air Quality Sensors

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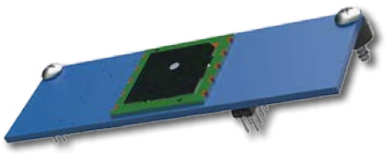
Ordering Information

Part #	Description	List Price
BA/BBV-NO2	Rough Service NO_2 Sensor	$450
BA/BBV-NO2V-102-H	Rough Service NO_2 Sensor with 10K-2 Thermistor Temp and %RH	$580
BA/BBV-NO2V-103-H	Rough Service NO_2 Sensor with 10K-3 Thermistor Temp and %RH	$580
BA/BBV-NO2V-20-H	Rough Service NO_2 Sensor with 20K Thermistor Temp and %RH	$580
BA/BBV-NO2BN	Rough Service NO_2 Sensor with BACnet Output	$635
BA/BBV-NO2BN-H	Rough Service NO_2 Sensor with Temp, %RH and BACnet Output	$750
BA/BBV-NO2S	Factory Calibrated Replacement NO_2 Module (For use with BA/BBV version NO_2 sensors only)	$250

Note: Sensors and Replacement NO_2 Modules must be installed and powered within 4 months of purchase to prevent loss of accuracy.

Replacement NO_2 Module

The Replacement NO_2 Module is factory calibrated so no calibration is needed at installation. It has a sensor life of approximately 7 years which doesn't begin until the module is installed in the sensor.



BA/BBV-NO2S: Factory Calibrated Replacement NO_2 Module
(For use with BA/BBV version NO_2 sensors only)

E32 Particulate Sensor, BAPI-Stat "Quantum"

Air Quality Sensors

Rev. 06/11/21

Features & Options

- Field Selectable Particulate Size of PM1.0, PM2.5 and PM10
- Field Selectable Outputs of 0 to 5V, 0 to 10V and 4 to 20mA
- Laser-based, light scattering particle sensing with 10 year expected lifetime.

The BAPI-Stat "Quantum" Particulate Sensor is an accurate and reliable way of continuously monitoring the concentration of particles in a room. Laser-based sensors provide the highest accuracy for commercial applications and will measure particle concentrations from 0 to 1,000 µg/m^3. A 60mm mounting base is available to fit European style junction boxes.



BAPI-Stat "Quantum" Particulate Sensors
(Right unit shown with 60mm mounting base)

5 YEAR WARRANTY

ORDERING INFORMATION **List Price**

BA/CQX.....Particulate Sensor, Standard Mounting Base..... $475
BA/CQX60.....Particulate Sensor, 60mm Mounting Base $475

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Specifications

Power: (Half-wave rectified)
7 to 40 VDC (4 to 20mA Output)
7 to 40 VDC or 12 to 28 VAC (0 to 5 VDC Output)
15 to 40 VDC or 15 to 28 VAC (0 to 10 VDC Output)

Power Consumption:
75 mA Max @ 24 VDC • 3 VA Max @ 24 VAC

Load Resistance: VDC Output 4K Ohms Min

Sensing Element: Laser-based, Light Scattering

Sensor Element Life: 10 Years Typical

Concentration Range: 0 to 1,000 µg/m^3

Accuracy at 77°F (25°C):

	0 to 100 µg/m^3	100 to 1,000 µg/m^3
PM1.0	±25 µg/m^3	±25% of reading
PM2.5	±15 µg/m^3	±15% of reading
PM10	±25 µg/m^3	±25% of reading

Response Time: <6 Seconds

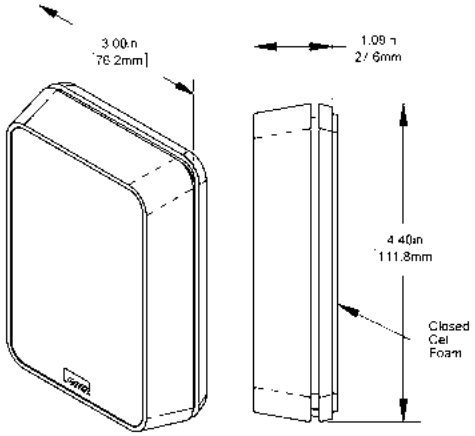
Wiring: 3 Wires, 16 to 22 AWG

Environmental Operating Range:
-4 to 158°F (-20 to 70°C)
0 to 95%RH Non-condensing

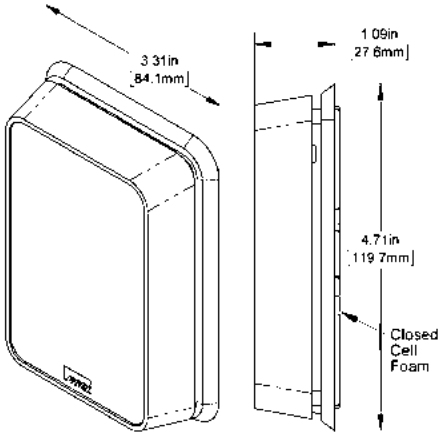
Enclosure Material: ABS Plastic, UL94 V-0

Mounting:
Standard 2"x4" Junction Box, European Junction Box or Drywall Mount (screws provided)

Agency: CE EN 61326-1:2013 EMC, UL94 V-0, RoHS



Unit with Standard Mounting Base



Unit with 60mm Mounting Base

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Features & Options

- Field Selectable Particulate Size of PM1.0, PM2.5 and PM10
- Field Selectable Outputs of 0 to 5V, 0 to 10V and 4 to 20mA
- Laser-based, light scattering particle sensing with 10 year expected lifetime.

The BAPI-Box Duct Particulate Sensor is an accurate and reliable way of continuously monitoring the concentration of particles in a duct. The duct unit samples duct air using an aspiration tube.

Laser-based sensors provide the highest accuracy for commercial applications and will measure particle concentrations from 0 to 1,000 µg/m³.

ORDERING INFORMATION **List Price**

BA/PM-D-BB... Particulate Sensor, Duct.....$750

Submittal sheets without List Prices are available on our website at www.bapihvac.com



Duct Particulate Sensor

5 YEAR WARRANTY

Specifications

Power: (Half-wave rectified)
7 to 40 VDC (4 to 20mA Output)
7 to 40 VDC or 12 to 28 VAC (0 to 5 VDC Output)
15 to 40 VDC or 15 to 28 VAC (0 to 10 VDC Output)

Power Consumption:
75 mA Max @ 24 VDC • 3 VA Max @ 24 VAC

Load Resistance: VDC Output 4K Ohms Min

Sensing Element: Laser-based, Light Scattering

Sensor Element Life: 10 Years Typical

Concentration Range: 0 to 1,000 µg/m³

Accuracy at 77°F ±9°F (25°C ±5°C):

	0 to 100 µg/m³	100 to 1,000 µg/m³
PM1.0	±25 µg/m³	±25% of reading
PM2.5	±15 µg/m³	±15% of reading
PM10	±25 µg/m³	±25% of reading

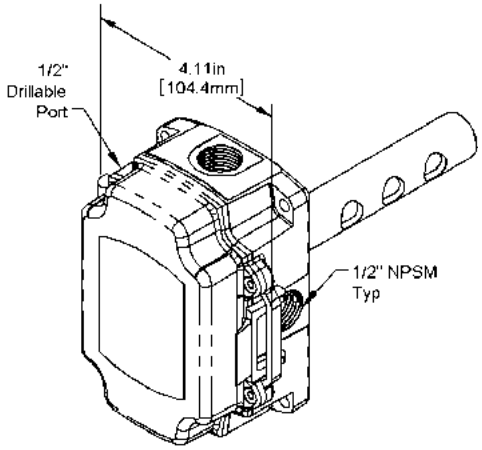
Response Time: <6 Seconds

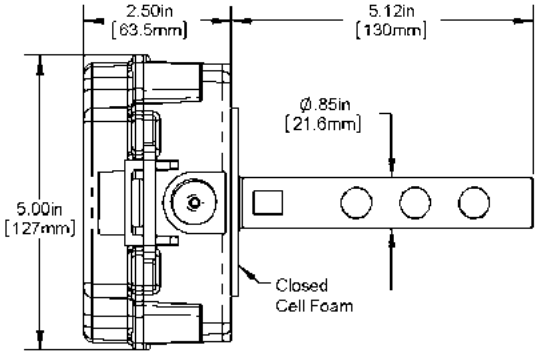
Wiring: 3 Wires, 16 to 22 AWG

Environmental Operating Range:
-4 to 158°F (-20 to 70°C)
0 to 95%RH Non-condensing

Enclosure Material:
UV-resistant Polycarbonate, UL94 V-0

Agency: CE EN 61326-1:2013 EMC, UL94 V-0, RoHS





Refrigerant Leak Detector

Air Quality Sensors

Rev. 03/04/25

Features & Options

- Detects Most Modern Refrigerants
- Area Monitoring for Leaks and Spills
- Provides a Voltage Output
- Rough Service or Duct Models

The BAPI Duct and Rough Service Refrigerant Leak Detectors sense a wide range of refrigerants. The sensor is temperature compensated for improved detection of leaks and spills. The output voltage increases as the concentration of the refrigerant increases in the space.

These units are not intended for critical ppm measurements nor life safety applications.



ORDERING INFORMATION **List Price**

BA/RLD ..... Rough Service Refrigerant Leak Detector in a Blue BAPI-Box Encl. $465
BA/RLD-W ..... Rough Service Refrigerant Leak Detector in a White BAPI-Box Encl. $465
BA/RLD-D-BB..... Duct Refrigerant Leak Detector in a Blue BAPI-Box Enclosure $395
BA/RLD-W-D-BB ... Duct Refrigerant Leak Detector in a White BAPI-Box Enclosure $395
BA/RLD-EL ..... Replacement Element $60

Gray shaded items follow the Buy and Resale Multiplier.

Specifications

Power:
9 to 40 VDC at 120 mA max
19 to 32 VAC at 5 VA

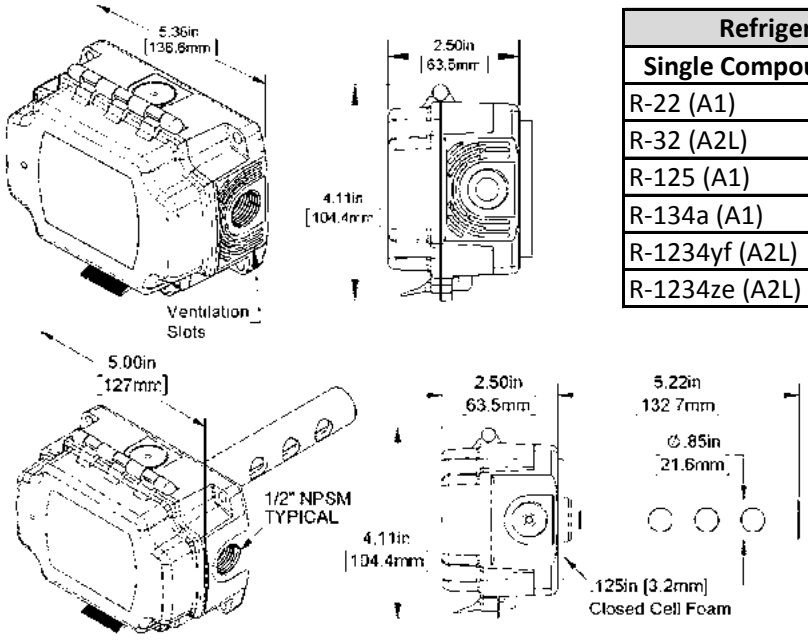
Output Impedance: 680 Ohms

Output Voltage: 0 to 4.8 VDC

Ambient Temp: 32 to 140ºF (0 to 60ºC)

Sensor Element Life: 2 Years Typical

Agency: RoHS, CE EN 61326-1:2013 EMC



Refrigerants Detected by the Sensor		
Single Compound	**Blends**	
R-22 (A1)	R-404a (A1)	R-452a (A1)
R-32 (A2L)	R-407c (A1)	R-452b (A2L)
R-125 (A1)	R-407f (A1)	R-454a (A2L)
R-134a (A1)	R-410a (A1)	R-454b (A2L)
R-1234yf (A2L)	R-424a (A1)	R-454c (A2L)
R-1234ze (A2L)	R-434a (A1)	R-455a (A2L)
	R-447a (A2L)	R-466a (A1)
	R-448a (A1)	R-507 (A1)
	R-449a (A1)	R-513a (A1)
	R-450a (A1)	

Note: For a more complete list of detectable refrigerants, go to Resources on BAPI's website and view the Application Note "Refrigerants detected by the BAPI Refrigerant Leak Detector".

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Features & Options

- Calibrates and verifies proper operation of specified BAPI CO2 Room and Duct Sensors[1]

BAPI's CO_2 Sensor Calibration Kit verifies the proper operation and calibrates all of BAPI's room and duct CO_2 sensors. Two calibration gas concentrations are required to perform a complete calibration[2]. Purchase the single point gas at a CO_2 concentration of 400 to 800 ppm, and the span gas at 1,000 to 1,200 ppm. Only one regulator is required because it can be swapped between gas cylinders.

BAPI's CO_2 Sensor Calibration Kit consists of the following:

- A communications cable that connects a computer to the BAPI CO_2 sensor[3]
- A funnel used as a gas shroud
- A length of tubing to connect the funnel to the test gases
- Rubber bands to secure the funnel to the BAPI CO_2 sensor
- Shunt jumpers to place the BAPI CO_2 sensor into test mode

Notes

[1]Specified BAPI CO_2 sensors available for calibration can be located on our Application Note linked here: https://www.bapihvac.com/application_note/calibration-methods-for-single-and-dual-channel-co2-sensors-application-note/

[2]A single point gas may not be required. If the ambient CO_2 concentration is known, stays stable at ±10 ppm for at least 10 minutes and is in the range of 350 to 800 ppm, you may perform the single point accuracy check & calibration without any test gas.

[3]The test software must be downloaded from the BAPI CO_2 Sensor Calibration Kit webpage at: https://www.bapihvac.com/product/co2-sensor-calibration-kit/



CO_2 Sensor Calibration Kit



CO_2 Sensor Calibration Kit with Optional Case (shown with customer supplied gas cylinders)

ORDERING INFORMATION		List Price
BA/CO2-KIT	CO_2 Sensor Calibration Kit	$155
BA/CO2-KIT-C	CO_2 Sensor Cal. Kit with Case	$600
BA/CO2-C	Empty Case with Foam Cutouts	$455

Submittal sheets without List Prices are available on our website at www.bapihvac.com

VOC Sensor Verification Kit

Overview

The VOC Sensor Verification Kit allows a known VOC sample to be generated and applied to a BAPI room or duct VOC sensor. The sample tests the dynamic range of the sensor to see if the sensor element is working correctly.

The kit consists of a plastic bottle and a 60mL syringe and a comprehensive set of instructions. The customer has to supply 70% minimum Isopropyl Alcohol.

ORDERING INFORMATION		List Price
BA/VOC-KIT	VOC Sensor Verification Kit	$18

Submittal sheets without List Prices are available on our website at www.bapihvac.com



VOC Sensor Verification Kit

Formaldehyde Sensor, BAPI-Stat "Quantum"

Air Quality Sensors

Rev. 10/15/21

Features & Options

- Temperature and humidity compensated
- Field selectable output of 0 to 5 or 0 to 10 volts
- Sensing range from 0 to 1,000 ppb with a 6 year expected lifetime

The BAPI-Stat "Quantum" Formaldehyde (HCHO) Sensor is an accurate and reliable way of continuously monitoring the amount of formaldehyde in a room.

A 60mm mounting base is available to fit European style junction boxes.



BAPI-Stat "Quantum" Formaldehyde Sensors
(Right unit shown with 60mm mounting base)

PRELIMINARY

ORDERING INFORMATION **List Price**

BA/FQX .....Formaldehyde Sensor, Standard Mounting Base..... TBD
BA/FQX60 .....Formaldehyde Sensor, 60mm Mounting Base ..... TBD

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Specifications

Power: (Half-wave rectified)
7 to 40 VDC or 12 to 28 VAC (0 to 5 VDC Output)
15 to 40 VDC or 15 to 28 VAC (0 to 10 VDC Output)

Power Consumption:
75 mA Max @ 24 VDC
3 VA Max @ 24 VAC

Load Resistance: VDC Output 4K Ohms Min

Sensing Element: Electrochemical

Sensor Element Life: 6 Years Typical

Range: 0 to 1,000 ppb

Accuracy at 77°F, ±5°F (25°C, ±3°C):
±20 ppb or ±20% of reading, whichever is greater

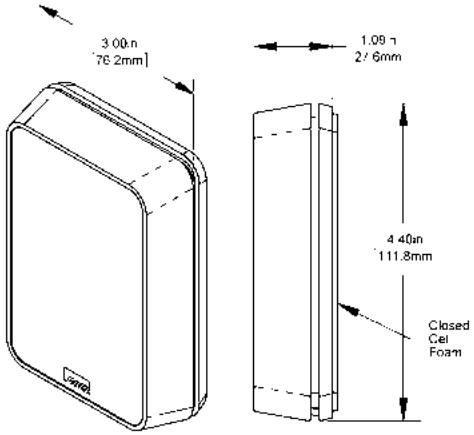
Wiring: 3 Wires, 16 to 22 AWG

Environmental Operating Range:
32 to 122°F (0 to 50°C)
10 to 95%RH Non-condensing

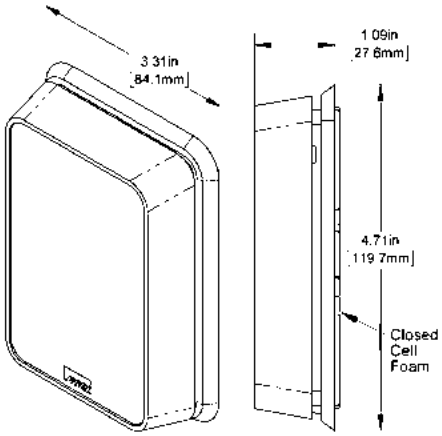
Enclosure Material:
ABS Plastic, UL94 V-0

Mounting:
Standard 2"x4" Junction Box, European Junction Box or Drywall Mount (screws provided)

Agency:
CE EN 61326-1:2013 EMC, UL94 V-0, RoHS



Unit with Standard Mounting Base



Unit with 60mm Mounting Base

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BAPI VOC Sensor is a Reliable Alternative to CO_2 for Demand Controlled Ventilation

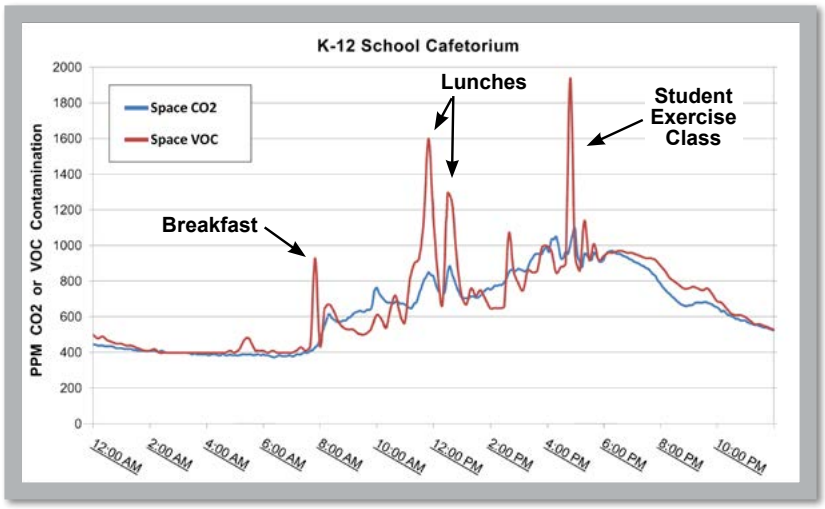
Most system designers use CO_2 sensors as part of their Demand Controlled Ventilation strategy. One drawback with this method is that it ignores the harmful contaminants and other VOCs that may be present in the air even when the CO_2 levels are low. That's why replacing the CO_2 sensor with a VOC sensor is becoming more prevalent within the HVAC industry, and why BAPI recommends using our VOC sensors instead of CO_2.

Because ASHRAE has not written a ventilation procedure as yet for VOCs, BAPI's VOC sensor output is correlated to a CO_2 level of 0 to 2,000 ppm, allowing the use of ASHRAE's CO_2-based ventilation procedure.

But will this correlated output allow for increased ventilation when people are in the room the same as a CO_2 sensor? The answer is yes.

The reason for this is that a large share of VOCs in an indoor space are generated by the people in the room. (See Table 1) The VOCs come from our breath, sweat and skin or from colognes, perfumes and fabric softeners and other chemicals on our skin and clothes. So the VOCs in an occupied space will build up just like the CO_2.

Extensive research was conducted on occupancy and VOC/CO_2 levels in 1,500 offices, schools and homes to determine the relationship between these three factors. The research identified a complex correlation algorithm between VOCs and CO_2, and this algorithm is used to create the correlated output of BAPI's VOC sensor. The accuracy of this output as compared to actual CO_2 levels is shown in the chart above.



Graph showing the VOC and CO_2 levels in a school multi-purpose cafetorium during a typical school day.

The chart shows that the VOC sensor tracks with the CO_2 sensor except when additional VOCs are being generated besides those generated by the people. These include the cooking VOCs at breakfast and lunch and the sweat VOCs from the student exercise class.

Although the cooking and sweat odors are not harmful to human health, odors – especially unpleasant ones – have a negative effect on student and employee productivity so the additional ventilation the VOC sensor allows during these times is a good strategy. And when the VOCs are not from odors, but from some of the hundreds of VOCs in indoor air that are harmful to human health, then the extra ventilation the VOC sensor allows is doubly important.



Table 1 – Typical Indoor Contaminants (VOCs) and Their Source

Contamination Source	Emission Source	VOC
Human Being	Breath	Acetone, Ethanol, Isoprene, CO_2
	Skin Respiration & Perspiration	Nonanal, Decanal, alpha-Pinene
	Flatulence	Methane, Hydrogen,
	Cosmetics	Limonene, Eucalyptol
Consumer Products	Household Supplies	Alcohols, Esters, Limonene
Office Equipment	Printers, Copiers, Computers	Benzene, Styrene, Phonole
Combustion	Engines, Appliances, Smoke	Unburnt Hydrocarbons, CO, CO_2
Building Materials	Paints, Adhesives, Carpets	Formaldehyde, Alkanes, Aldehydes, Ketones
Furniture	Poly Vinyl Chloride (PVC)	Toluene, Xylene, Decane

More information on BAPI's VOC sensors is available on our website at ***www.bapihvac.com***

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E38 Using BAPI's Volatile Organic Compound Sensor for Demand Controlled Ventilation

Rev. 11/11/24

This paper will show how BAPI's Volatile Organic Compound (VOC) sensor is an accurate, reliable and beneficial way of incorporating Demand-Controlled Ventilation into a building's HVAC strategy.

Ventilating by VOCs vs CO_2

Let's begin a brief of overview of what VOCs are and where they come from. VOCs are chemicals that contain carbon and that evaporate into gases at typical room temperature and pressure. Table 1 shows some typical indoor contaminants and their sources. Some VOCs are harmful to human health and some are not, while some have a smell and some do not.

Table 1 – Typical Indoor Contaminants (VOCs) and Their Source

Contamination Source	Emission Source	VOC
Human Being	Breath	Acetone, Ethanol, Isoprene, CO_2
	Skin Respiration & Perspiration	Nonanal, Decanal, alpha-Pinene
	Flatulence	Methane, Hydrogen,
	Cosmetics	Limonene, Eucalyptol
Consumer Products	Household Supplies	Alcohols, Esters, Limonene
Office Equipment	Printers, Copiers, Computers	Benzene, Styrene, Phenole
Combustion	Engines, Appliances, Smoke	Unburnt Hydrocarbons, CO, CO_2
Building Materials	Paints, Adhesives, Carpets	Formaldehyde, Alkanes, Aldehydes, Ketones
Furniture	Poly Vinyl Chloride (PVC)	Toluene, Xylene, Decane

Rather than VOC levels, most system designers use CO_2 levels for their Demand-Controlled Ventilation (DCV) strategy as outlined in the Ventilation Rate Procedure of ASHRAE Standard 62.1. This procedure allows for reduced ventilation rates in unoccupied or minimally occupied rooms to save on heating and cooling costs. The occupancy of the room is determined by CO_2 sensors because people breath out more CO_2 than they breath in, therefore the CO_2 level in a room with minimal ventilation will build up in direct relation to the number of people in it. When the CO_2 level rises, additional ventilation is brought in to keep it at an acceptable level.

One drawback with this CO_2 method is that it ignores the amount of harmful VOCs that may be present in the air even when the CO_2 level is being kept at an acceptable level. That's why replacing the CO_2 sensor with a VOC sensor is becoming more prevalent within the HVAC industry, and why BAPI recommends using our VOC sensors instead of CO_2.

Because ASHRAE has not written a ventilation procedure as yet for VOCs, BAPI's VOC sensor output is correlated to a CO_2 level of 0 to 2,000 ppm, allowing the use of ASHRAE's CO_2-based procedure. But will the VOC sensor's correlated output allow for increased ventilation when people are in the room the same as a CO_2 sensor? The answer is yes.

The reason is that a large share of VOCs in an indoor space are generated by the people in the room. Table 1 shows that VOCs come from our breath, sweat and skin or from colognes, perfumes and fabric softeners and other chemicals on our skin and clothes. Because so many VOCs come from people, the VOCs in an occupied space will build up just like the CO_2. What this looks like in the real world is shown in the following charts comparing the actual CO_2 and VOC levels in a multi-purpose space.

VOC vs CO_2 Levels in a Multi-Purpose Space

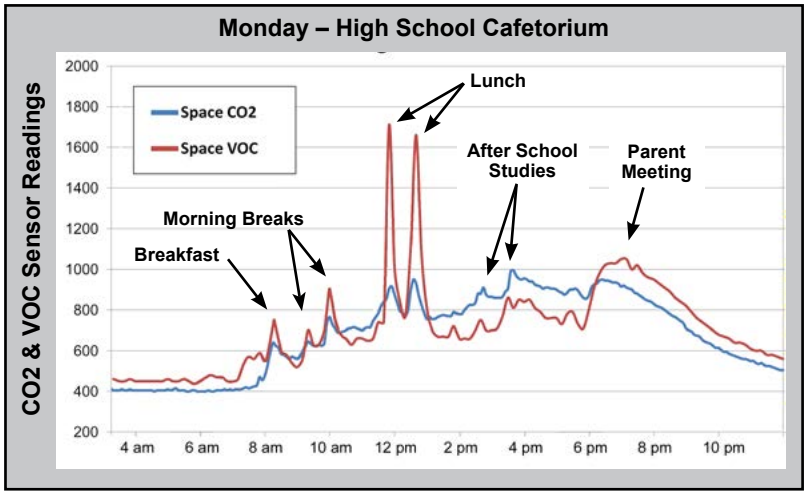
Extensive research was conducted on occupancy and VOC/CO_2 levels in 1,500 offices, schools and homes to determine the relationship between these three factors. The research identified a complex correlation algorithm between VOCs and CO_2, and this algorithm is used to create the correlated output of BAPI's VOC sensor. The accuracy of this output as compared to CO_2 levels is shown in the following six charts.

These charts were taken over the course of a typical week in a cafetorium area of a public school in Wisconsin using side-by-side VOC and CO_2 sensors. The cafetorium is a true multi-purpose area. It is used for breakfast, morning snacks, lunch, and after school studies during the day, and athletic practices, exercise classes and occasional meetings in the evenings.

The six charts show that the VOC sensor tracks with the CO_2 sensor except when additional VOCs are being generated over and above those generated by the people. The HVAC system in the school is using the VOC sensor output to provide the additional ventilation needed when the VOCs are high. Because these VOCs are invisible to the CO_2 sensor, the VOC levels would remain high for much longer if the CO_2 sensor was being used by the HVAC system rather than the VOC sensor.

Using BAPI's Volatile Organic Compound Sensor for Demand Controlled Ventilation

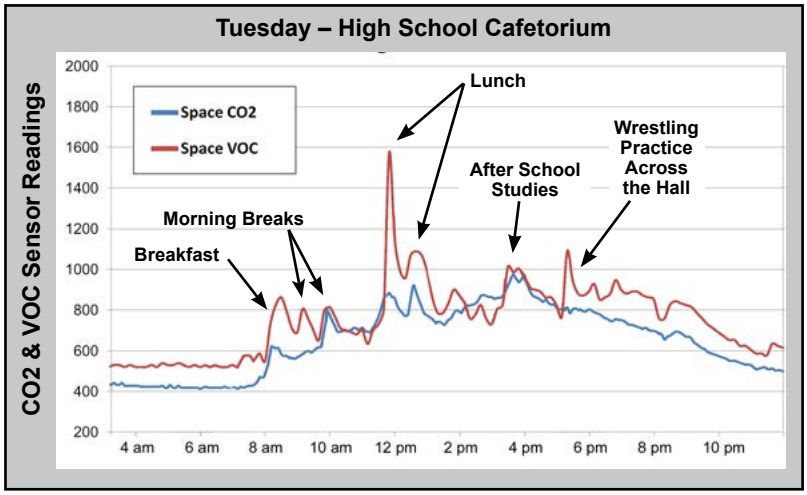
MONDAY:
At 7 am, the VOC sensor picks up the breakfast cooking aromas/ VOCs. The CO_2 sensor climbs a short time later as the students arrive to eat. The VOC sensor has slightly higher readings than the CO_2 sensor during breakfast and the morning breaks because the VOCs from the food are added to the VOCs generated by the people. This is also seen at lunch as cooking of the sausage pizza generated lots of VOCs which are added to the VOCs from the students and staff.



Interestingly there is a parent meeting in the room at 6 pm. Notice how the VOCs track slightly above the CO_2 during this time but slightly below during the "After School Studies" period. That's because it's mostly adults in the space during the "Parent Meeting" and mostly kids in the "After School Studies". Since adults typically use more perfumes and colognes than kids, and therefore generate more VOCs than kids, the correlation algorithm for the VOC sensor is slightly high during the "Parent Meeting" and slightly low during the "After School Studies". But whether the VOC sensor tracks slightly high or slightly low, the chart shows that the VOC sensor output directly correlates to the occupancy in the space and that using the VOC sensor output would result in appropriate ventilation.

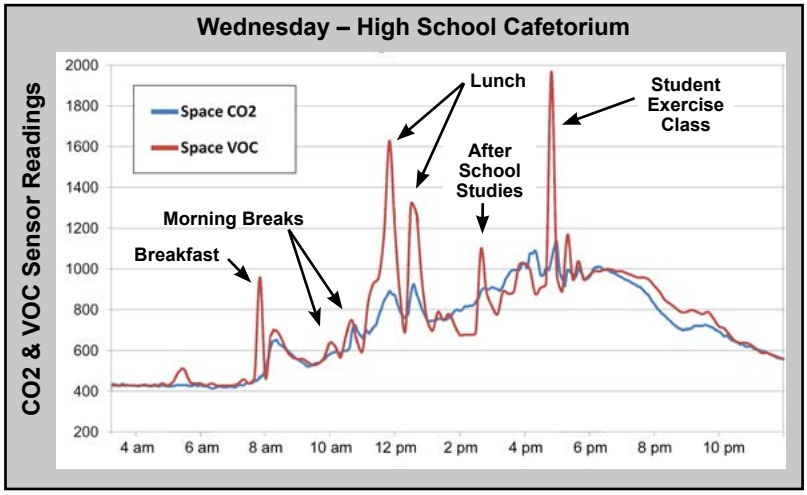
TUESDAY:
There are again increases in VOCs and CO_2 during breakfast, morning breaks, lunch and after school studies.

There is a small spike in VOCs at about 5:45 due to Pee Wee wrestling practice which takes place in a performance area just across the hall from 6 to 8 pm. The dining room is used as a rest area for parents and as a place for the wrestlers to store their gym bags during practice, which accounts for the increase in VOCs at that time.



WEDNESDAY:
The daytime portion of Wednesday is similar to Monday and Tuesday with increases in VOCs and CO_2 during breakfast, morning breaks and after school studies, and spikes in VOCs due to cooking at lunch.

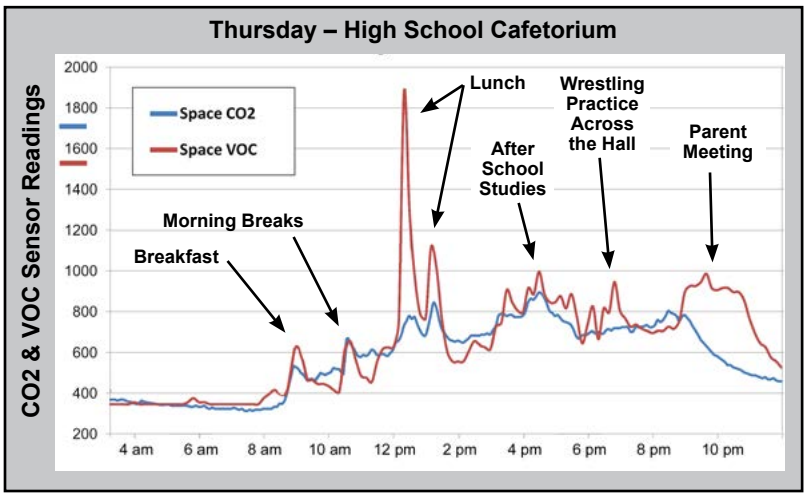
There is a large spike in VOCs at about 4:45 pm due to a general exercise class for students. People generate more VOCs from sweat when they're exercising, and the students also brought in gym bags and put on exercise clothing which added to the VOCs at that time.



Using BAPI's Volatile Organic Compound Sensor for Demand Controlled Ventilation

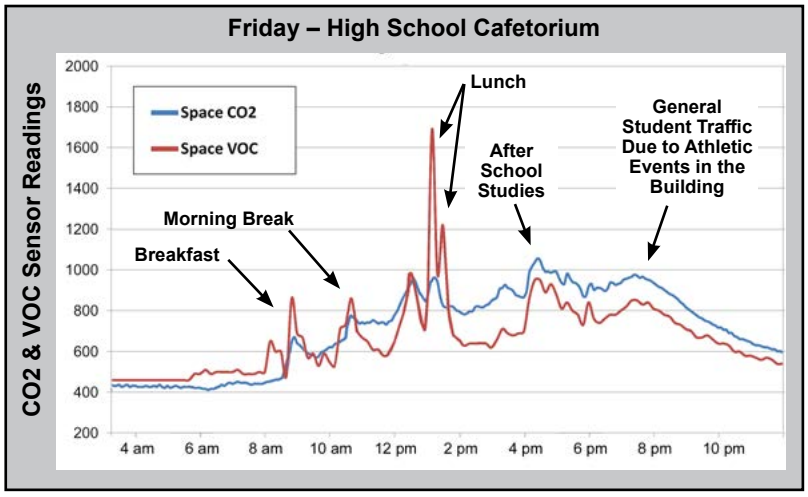
THURSDAY:
The daytime portion of Thursday is similar to the rest of the week with increases in VOCs and CO_2 during breakfast, morning breaks and after school studies, and spikes in VOCs due to cooking at lunch.

There is an increase in VOCs at 6 pm (similar to Tuesday) due to the Pee Wee wrestling practice in the performance area across the hall. There is another increase in VOCs at 8 to 10 pm due to a parents meeting for the wrestlers in the dining area at that time.



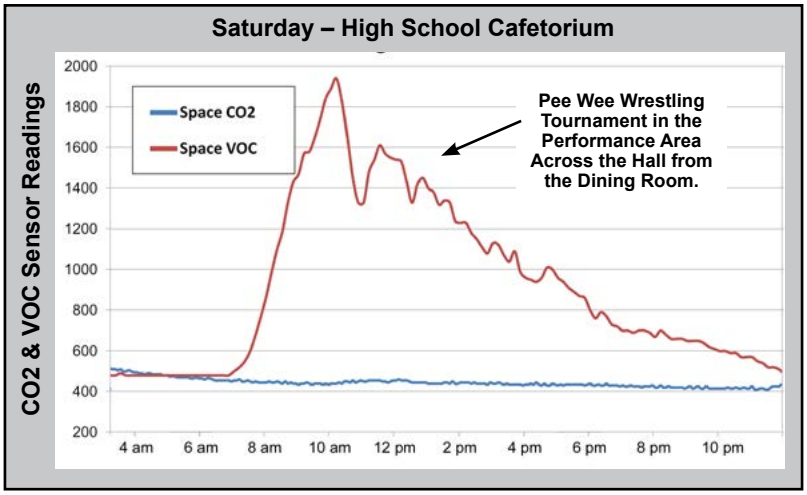
FRIDAY:
The daytime portion of Friday is similar to the rest of the week with increases in VOCs and CO_2 during breakfast, morning breaks and after school studies, and spikes in VOCs due to cooking at lunch.

There is an increase in VOCs from 6:30 to 8:30 pm due to general student traffic in the area from an athletic event in another part of the school building.



SATURDAY:
The space is considered unoccupied on Saturday so the BMS schedule has the space receiving only the minimum background ventilation regardless of the readings from the sensors.

However, VOCs are being generated in the dining room from about 8 am to noon due to a Pee Wee Wrestling Tournament in the performance center across the hall. Wrestlers store their gym bags and other belongings in the dining area during the tournament, which accounts for the VOCs during that time.



Although the VOCs are mainly from sweat odors in this case, the chart would look the same if the VOCs were from potentially harmful sources such cleaning chemicals or flour strippers. These VOCs would be invisible to the CO_2 sensor so they would not be diluted by additional ventilation.

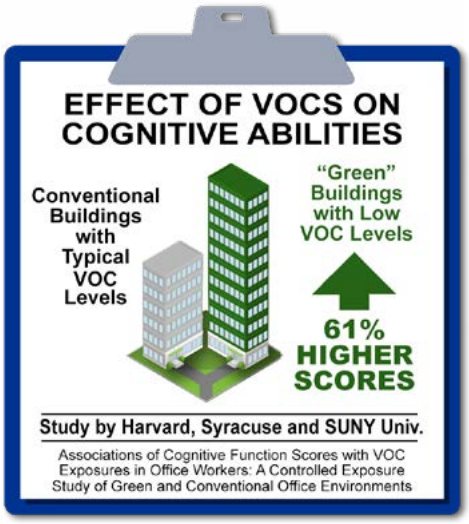
SUNDAY: (NO CHART)
Sunday is the only day with no activity in the kitchen and dining area or the surrounding spaces, so there is only background levels of VOCs and CO_2 throughout the day.

Using BAPI's Volatile Organic Compound Sensor for Demand Controlled Ventilation

The Health and Financial Benefits of Low VOCs

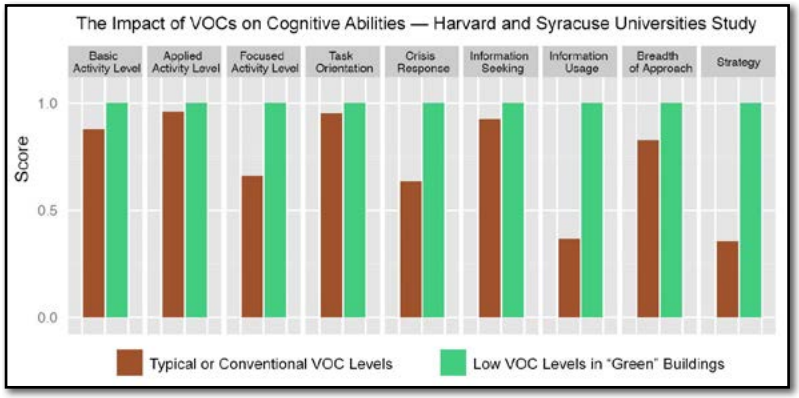
Some VOCs cause irritation to the eyes, nose and throat, as well as headaches, drowsiness, dizziness, nausea and fatigue. Other VOCs are known to cause diseases such as cancer. But the importance of detecting and diluting VOCs goes beyond the health concerns. It's also about productivity and cognitive function.

Although the cooking and sweat odors in the cafetorium charts are not harmful to human health, unpleasant odors – such as burnt microwave popcorn or a stale tuna fish sandwich in a garbage basket – can bring all student productivity to a halt. And the effect is the same in a typical business setting so the additional ventilation to dilute the odors is a good strategy for both schools and businesses.



Besides productivity, a recent study by Harvard, Syracuse and SUNY universities found that VOCs – even in the levels that are typically found in a conventional building – can have a major effect on cognitive abilities.

The study found that on average, cognitive scores were 61% higher on "Low" VOC days versus "Typical" VOC days. And of the nine cognitive areas tested, the largest effects were seen for Crisis Response, Information Usage and Strategy – all of which are indicators of higher level cognitive function and decision making. Specifically the Crisis Response, Information Usage and Strategy scores were 97%, 172% and 183% higher respectively on "Low" VOC days versus "Typical" VOC days.



Another area of the study focused on the financial impact to businesses of ventilating for low VOCs vs typical VOCs. Rather than increased cost, the study found the opposite.

On average, employee salaries account for 90% of the expenses of a typical business, compared to just 10% for utilities, maintenance and mortgage/rent. Because of the low utility costs compared to salaries, the study found that an increase in energy costs of $14 to $40 per person per year to achieve the low VOCs would result in as much as $6,500 in increased productivity per person per year.

According to the principal investigator for study, Dr. Joseph Allen, the study suggests that the health and productivity benefits far outweigh the slightly increased energy costs.

"It is time we move away from ventilation designed for merely acceptable indoor air quality and move towards design for optimal indoor air quality," Dr. Allen said. "We have been presented with the false choice of energy efficiency or healthy indoor environments for too long. We can – and must – have both."

E42 Common Volatile Organic Compounds Detected by BAPI's VOC Sensor

Rev. 10/16/17

Depending on the source of the information, 5,000 to 10,000 unique Volatile Organic Compounds (VOCs) exist. BAPI's VOC sensor reacts to all of them.

VOCs are chemicals that contain carbon and have boiling points below 100°C. Most can be vapors at room temperature. In their liquid form many VOCs can contaminate ground water.

Families of VOCs detected are:

- CO, CH4, LPG
- Alcohols
- Ketones. Ketones are solvents. The best known are Acetone and Methyl Ethyl Ketone or MEK.
- Organic Acids. Common organic acids are Lactic acid, Acetic acid, Formic acid, Citric acid and Oxalic acid
- Amines. Amines are derivatives of ammonia.
  Wikipedia lists 175 compounds as amines, http://en.wikipedia.org/wiki/Category:Amines
- Aliphatic Hydrocarbons. Aliphatic hydrocarbons are flammable hydrocarbons with little or no odor. Examples are hexane, paraffin, methane and acetylene.
- Aromatic Hydrocarbons. Aromatic hydrocarbons are flammable hydrocarbons with a discernable odor. Examples are benzene, furan, pyridine, toluene, asphaltene and picric acid.

A list of some of the most common VOCs and their sources follows.

VOC	Source
1-hexene	Human metabolism
1-isocyanobutane	Coatings
1,1,1-trichloroethane	Ink, Paint, Photo-resist, Photographic film
1,4-dioxane	Spot removers
2-bromopentane	Prescription drugs
(2-methylcyclohexyl) propanedinitrile	Human metabolism
2,2-dimethylbutane	Human metabolism
2,3,3-trimethylpentane	Human metabolism
2,3-dimethylpentane	Human metabolism
2,3,4-trimetylpentane	Human metabolism
3-methylhexane	Human metabolism
3,4-dimethyl-1-pentene	Human metabolism
4-methyl-1-pentene	Human metabolism
5-methyl-1-hexene	Human metabolism
6-methyl-1-heptanol	Human metabolism
Acetaldehyde	Disinfectants, Adhesives, Coatings, Plastics, Lubricants, Ripening of fruit
Acetic acid esters	Surface cleaners
Acetone	Polyester resins, Vinyl, Adhesives, Human metabolism
bis-(1,1-dimethylethyl)nitroxide	Human metabolism
Benzene	Plastics, Building materials, Furniture, Office equipment
Butoxyethanol	Surface cleaners
Butyl acetate	Surface cleaners
C6 - C10 substituted alkanes	Cleaners, Polishers
Carbon Monoxide	Automobile exhaust, Fuel based heating, Cooking appliances, Smoking
Decanal	Artificial flavors, Perfume, Human metabolism
Dichlorobenzene	Deodorizers

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Common Volatile Organic Compounds Detected by BAPI's VOC Sensor

A list of some of the most common VOCs and their sources follows, continued from previous page...

VOC	Source
Dipropylene glycol	Surface cleaners
Ethanol	Disinfectants, Human metabolism
Ethyl Alcohol	Cosmetics, Cleaners, Disinfectants, Detergents, Paints, Human Metabolism
Eucalyptol	Cosmetics, Artificial flavors, Insecticides
Formaldehyde	Biocides, Disinfectants
Heptane	Human metabolism
Hydrocarbons	Waxes, Polishes
Isobutane	Aerosol cleaners
Isobutene	Aerosol cleaners
Isoprene	Synthetic rubber, Human metabolism
Limonene	Cosmetics, Cleaners, Artificial flavors, Prescription drugs
Methane	Natural gas, Human metabolism
Methoxyethanol	Surface cleaners
Methoxyethoxyethanol	Surface cleaners
Methylcyclohexane	Human metabolism
Methylethylketone	Adhesives, coatings, Plastics, Lubricants
Methyl methacrylate	Hard surface cleaners
Naphthalene	Disinfectants, Repellants
Nonanal	Artificial flavors, Perfume, Human metabolism
Organic Chloramines	Combination of general and pool cleaning chemicals and human metabolism
Pentane	Polystyrene foam, Refrigerants
Phenol	Platics, Cosmetics, Disinfectants
Pinene	Perfume, Human metabolism
Propane	Fuel based heating, Cooking appliances, Cleaners
Siloxanes	Waxes, Polishes
Tetrachloroethene	Dry cleaning
Tetrachloroethylene	Spot cleaners
Toluene	Paints, Coatings, Cleaners, Detergents, Smoking, Polyurethane lacquers
Trichloromethane	Human metabolism
r (1-methylethyl)cyclopropane	Adhesives, Coatings, Plastics, Lubricants
Xylene	Plastics, Synthetic Rubber, Polyester clothing

The Effects of Temperature and Barometric Pressure on CO_2 Sensors

Rev. 10/16/12

Carbon Dioxide (CO_2) in air is normally measured in Parts Per Million (ppm). At 1,000 ppm CO_2, a volume or air containing one million air molecules would contain a mixture of 999,000 air molecules and 1,000 CO_2 molecules.

The volume of air necessary to contain one million air molecules is affected by air temperature and air pressure, also called Barometric Pressure. As the pressure decreases, the volume needed to contain one million air molecules increases. The opposite is true of temperature. As the temperature decreases, the volume of air needed to contain one million molecules decreases. Although the volume of air is affected by temperature and pressure, the concentration of CO_2 is not affected. If you started with 1,000 ppm of CO_2, then you finish with 1,000 ppm of CO_2 despite the changes in the air volume.

The most common CO_2 sensors are known by the engineering term Non-Dispersive InfraRed, or NDIR. An NDIR CO_2 sensor shines infrared light through a gas sample in a sample chamber. Sensitive photo-detectors measure the intensity of the infrared light after it passes through the gas sample. CO_2 molecules are opaque to 4.26 micron infrared light while the rest of the air molecules are not. So the intensity of the infrared light is diminished proportionally to the number of CO_2 molecules that are present. Measuring the resultant light intensity measures the number of CO_2 molecules present.

The size of the NDIR sampling chamber is fixed and is open to the atmosphere so that air can move in and out. As explained above, the number of air molecules in a given volume is affected by temperature and air pressure but not the concentration of CO_2. At low pressures or high temperatures, there will be fewer air molecules in the sample chamber, so there will also be fewer CO_2 molecules, even though the ppm of CO_2 hasn't changed. Fewer CO_2 molecules "fools" the sensor into thinking that the CO_2 concentration is lower than it really is. At high pressures or low temperatures, there are more air molecules in the sample chamber and more CO_2 molecules, even though the CO_2 concentration hasn't changed. More CO_2 molecules "fools" the sensor into thinking that the CO_2 concentration is higher than it really is. Therefore a CO_2 sensor calibration will only be accurate at one temperature and one air pressure.

Calculating Temperature and Barometric Pressure Effects on CO_2 Measurement

The following formula derived from the Ideal Gas Law relates changes in air volume to temperature, pressure and the number of molecules present:

$$ppm\ CO_{2\ corrected} = ppm\ CO_{2\ measured} * ((T_{measured} * p_{ref}) / (p_{measured} * T_{ref}))$$

- $p_{measured}$ = Current pressure, in the same units as reference pressure (not corrected to sea level)
- T_{ref} = reference temperature, usually 25°C, 77°F, converted to absolute (298.15 for °C, 536.67 for °F)
- $T_{measured}$ = Current absolute temperature, °C + 273.15, °F +459.67
- p_{ref} = reference Barometric Pressure, usually sea level, 29.92 in Hg, 760mm Hg, 1013.207 hPa or 14.6959 psi

Table 1: CO_2 Measurement Change With Temperature

Temp. in °F	CO_2 Measured in PPM	Temp. in °F	CO_2 Measured in PPM	Temp. in °F	CO_2 Measured in PPM
32	1092	60	1033	85	985
35	1085	65	1023	90	976
40	1074	70	1013	95	968
45	1063	75	1004	100	959
50	1053	77	**1000**	105	950
55	1043	80	994	110	942

Table 1 uses the Ideal Gas Law formula above to show how the uncompensated CO_2 measurement would change with temperatures from 32 °F to 110 °F. Initial conditions are 1,000 ppm CO_2, 77°F and sea level Barometric Pressure. As seen in Table 1, the CO_2 concentration varies by 150 ppm.

Barometric Pressure is directly affected by altitude, and **Table 2** uses the Ideal Gas Law formula to show how the uncompensated CO_2 measurement would change with altitudes of -1,000 to 10,000 feet. Initial conditions are 77°F and 1,000 ppm CO_2 at sea level. As seen in Table 2, the CO_2 concentration varies by 349 ppm.

Table 2: CO_2 Measurement Change with Altitude and Barometric Pressure

Altitude in Feet	Barometric Pressure in inches Hg	CO_2 Measured in PPM
-1000	31.02	1037
0	29.92	**1000**
1000	28.85	964
2000	27.82	930
3000	26.82	896
4000	25.84	864
5000	24.9	832
6000	23.98	801
7000	23.09	772
8000	22.23	743
9000	21.39	715
10000	20.58	688

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The Effects of Temperature and Barometric Pressure on CO_2 Sensors

Weather Effects on Barometric Pressure and CO_2 Measurement

Heat entering our atmosphere creates weather patterns, and these patterns affect the Barometric Pressure by forming high pressure systems and low pressure systems. Fast moving storms can dramatically change the atmospheric pressure and effective altitude in only a few minutes.

About 15 miles from BAPI's headquarters is an internet enabled weather station on the Mississippi River bluffs above the small town of DeSoto. Looking at historical data from that weather station from 2003 to 2011, the highest pressure, the lowest pressure and the biggest one-day pressure swing are shown in Table 3.

If the actual CO_2 level was 1,000 ppm at sea level, then Table 3 shows what the measured CO_2 concentration would be in DeSoto on those days. From January 15, 2005 until October 26, 2010, weather patterns alone changed the CO_2 measurement by 75 ppm, which is the entire accuracy specification for a typical NDIR CO_2 sensor.

On the single day of January 18, 2005, weather patterns changed the CO_2 measurement by 35 ppm, which is almost 50% of the specified accuracy specification of a typical NDIR CO_2 sensor.

Table 3: CO_2 Measurement Change with Weather Patterns

Date	Barometric Pressure in inches Hg	Measured CO_2 in PPM
1/18/2005	30.71	1026
1/18/2005	29.64	991
1/15/2005	30.78	1029
10/26/2010	28.53	954

The Combined Effect of Temperature and Barometric Pressure on CO_2 Measurement

Temperature and Barometric Pressure affect CO_2 measurement individually as well as in combination. **Table 4** shows the measured CO_2 concentration for the range of Barometric Pressures recorded in DeSoto from 2005 to 2010 along with temperatures from 50 to 90°F.

If the actual CO_2 concentration was 1,000 ppm at 77°F and sea level, the measured CO_2 concentration would vary by 161 ppm across the various temperature and Barometric Pressure ranges. That variance is more than the specified accuracy of the NDIR CO_2 sensor.

Table 4: CO_2 Measurement Change with Temperature and Barometric Pressure Combined

		Barometric Pressure in Inches Hg						
		28.5	29	29.5	29.92	30	30.5	31
Temperature in °F	50	1003	1021	1038	1053	1056	1073	1091
	55	993	1011	1028	1043	1046	1063	1080
	60	984	1001	1018	1033	1035	1053	1070
	65	974	991	1009	1023	1026	1043	1060
	70	965	982	999	1013	1016	1033	1050
	75	956	973	990	1004	1006	1023	1040
	77	953	969	986	**1000**	1003	1019	1036
	80	947	964	980	994	997	1014	1030
	85	939	955	971	985	988	1004	1021
	90	930	946	963	976	979	995	1012

Dynamic CO_2 Measurement Compensation

Due to the constantly changing nature of Barometric Pressure and temperature and their effect on CO_2 measurement, the only way to get an accurate CO_2 measurement with an NDIR sensor is through temperature and Barometric Pressure compensation. That's why all BAPI CO_2 sensors have a built in Barometric Pressure sensor and temperature sensor.

Every eight seconds the BAPI sensor takes a CO_2 reading then compensates that value based on the current temperature and Barometric Pressure. That's one reason why BAPI's CO_2 sensors are the most accurate in the HVAC/R industry. There is also no need for an HVAC technician to spend valuable time manually entering the altitude value for the location into each and every sensor when it is installed. This makes the BAPI CO_2 sensor one of the easiest to install, saving time and money.

Calibration Methods for Single and Dual Channel CO_2 Sensors

Rev. 12/09/22

Carbon Dioxide (CO_2) in air is normally measured in Parts Per Million (ppm). At 1,000 ppm CO_2, one million air molecules would contain a mixture of 999,000 air molecules and 1,000 CO_2 molecules. The most common CO_2 sensors are Non-Dispersive InfaRed, or NDIR. An NDIR CO_2 sensor shines infrared light through a gas sample in a sample chamber (see Fig 1). A photo-detector measures the intensity of the infrared light after it passes through the gas sample. CO_2 molecules are opaque to 4.26 micron infrared light while the rest of the air molecules are not. So the intensity of the infrared light is diminished proportionally to the number of CO_2 molecules. Measuring the resultant light intensity measures the number of CO_2 molecules.

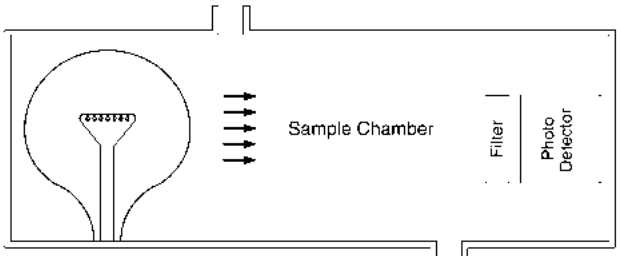


Fig. 1: Single Channel CO_2 Sensor

Sensor Drift

The most common light source for NDIR sensors is an incandescent light bulb. In these bulbs, an electric current passes through a metal filament and heats it until it starts to glow. The glowing filament is extremely hot and some of the metal atoms boil off the filament and fly around inside the bulb. Most of these atoms re-adhere to the filament when the power is turned off, but some move far enough away from the filament that they condense onto the glass envelope. Over time, this thin metal coating slightly reduces the amount of light emitted by the bulb. This reduction is perceived by the sensor as an increase in CO_2 concentration. Also, when the metal atoms condense back onto the filament, they can slowly shift the spectrum of the emitted light which can affect the perceived infrared light intensity and CO_2 concentration.

Automatic Background Calibration

One way to compensate for sensor drift is through automatic background calibration. Outdoor levels of CO_2 are generally around 400 ppm. Since people are the main source of CO_2 inside a building, when a building is unoccupied for 4 to 8 hours the CO_2 levels tend to drop to the outside level. Automatic background calibration uses the sensor's on-board microprocessor to remember the lowest CO_2 concentration that occurs every 24 hours. The sensor assumes this low point is the outside CO_2 level. The sensor is also smart enough to discount periodic elevated readings that occur if a space is occupied for 24 hours a day over a few days. Once the sensor has collected 14 days worth of low CO_2 concentration periods, it performs a statistical analysis to see if there has been any small changes in the background levels readings that could be attributable to sensor drift. If the analysis concludes there is drift, a small correction factor is made to the sensor calibration to adjust for this change. This automatic calibration requires that at least three of the last 14 days have space CO_2 levels that reach 400 ppm for an hour or more.

Reference Channel Calibration

Another way to compensate for sensor drift is through a dual channel design. In this setup, one photo-detector and filter is used for CO_2 measurement and works the same as in a single channel design. The second photo-detector and filter is a reference and uses a wavelength that is not affected by air molecules. About once a day, the sensor takes a reading using the reference channel. Any change in this reference measurement indicates a change in the optics of the sensor which can lead to drift. The sensor then automatically corrects the CO_2 measurement from the first channel to prevent the drift. While the reference channel corrects for changes over time, a field calibration will immediately restore the highest level of accuracy.

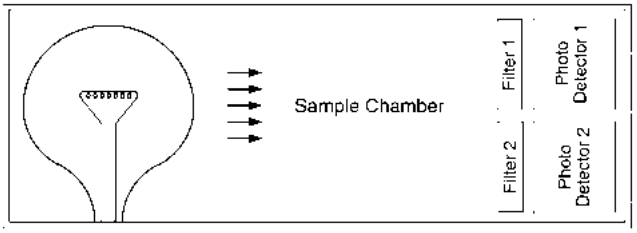


Fig. 2: Dual Channel CO_2 Sensor

BAPI Calibratable vs Non-Calibratable Sensors

Some BAPI CO_2 sensors can be field calibrated and others cannot. The figures at right show the two CO_2 sensor elements that are used on the circuit board of BAPI sensors. The units with Sensor A can be field calibrated. The units with Sensor B cannot be field calibrated. Most BAPI sensors manufactured prior to June of 2022 have Sensor A while most sensors manufactured after June of 2022 have Sensor B.



Sensor A
(Can be field calibrated)



Sensor B
(Cannot be field calibrated)

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BAPI-Stat "Quantum" Sensors



pgs F2-F5

Duct Temp or Temp/Humidity Sensor



pgs F6-F9

Immersion Temp Sensor



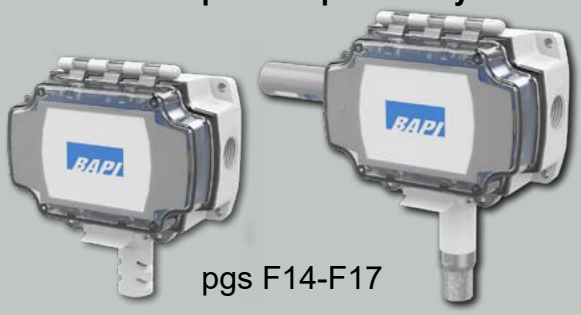
pg F10

Remote Probe Temperature Sensor



pg F12

Outside Air Temp or Temp/Humidity Sensor



pgs F14-F17

Thermobuffer Temperature Sensor



pg F18

BAPI-Stat "Quantum Slim" Sensors



pgs F20-F23

Food Probe Sensor



pg F24

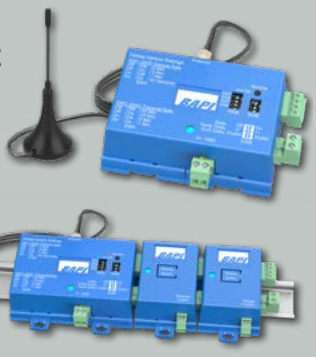
Gateway



pg F26

Receiver & Output Modules

pgs F27-F33



Replacement Batteries



pg F34

F2

BAPI-Stat “Quantum” Temperature Sensor

Wireless System

Rev. 07/08/24

Features & Options

- Optional temperature setpoint and occupant override
- User adjustable settings
- Onboard memory
- Transmits to a digital Gateway or a wireless-to-analog Receiver

The BAPI-Stat “Quantum” Wireless Sensor measures the room temperature and transmits the data via Bluetooth Low Energy to a receiver or gateway. It is available with optional temperature setpoint and occupancy override.

5 YEAR WARRANTY



Sensors with optional Setpoint & Override
(Right image shown with optional 60mm mounting base)

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

Temperature Sensor Accuracy:
±1.7°F (0.95°C) from 32 to 158°F (0 to 70°C)

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 Material & Rating: ABS Plastic, 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
Transmit Interval: 30 sec to 12 hour***
Sample Interval: 30 sec to 5 min***
Temp Offset: ±0.1°F/C to ±5.0°F/C

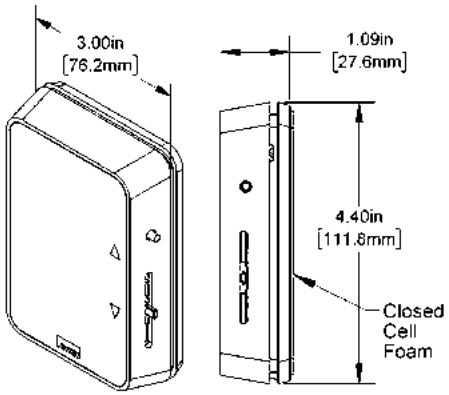
Onboard Memory:
Sensor retains up to 16,000 readings should the communication become interrupted. If using a Gateway,the data is re-transmitted once communication is re-established.

Agency: RoHS / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P

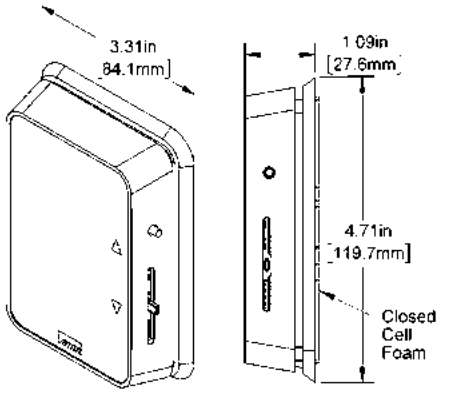
*In-building range is dependent on obstructions such as furniture and walls and the density of those materials. In wide open spaces, the distance may be greater; in dense spaces, the distance may be less.

**Actual battery life is dependent on the sensor’s adjustable settings and environmental conditions.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.



Standard Mounting Base



60mm Mounting Base
(Fits European wall boxes and junction boxes with 60mm mounting centers)

BAPI-Stat "Quantum" Units Calculated Battery Life**		
Transmit Interval	Sample Rate	Estimated Life (years)
30 sec	30 sec	1.12
1 min	1 min	1.89
3 min	1 min	3.83
5 min	5 min	7.08
10 min	5 min	8.93

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Ordering Information

BATTERY POWER UNITS WITH STANDARD MOUNTING BASE

BA/WT-BLE-Q-BAT
Wireless BAPI-Stat “Quantum” Temp Sensor, Battery Power

BA/WT-BLE-Q-S-BAT
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Battery Power

BA/WT-BLE-Q-SO-BAT
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Override, Battery Power

BATTERY POWER UNITS WITH 60MM MOUNTING BASE

BA/WT-BLE-Q60-BAT
Wireless BAPI-Stat “Quantum” Temp Sensor, Battery Power, 60mm Base

BA/WT-BLE-Q60-S-BAT
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Battery Power, 60mm Base

BA/WT-BLE-Q60-SO-BAT
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Override, Battery Power, 60mm Base

BA/LI14505: 3.6V Lithium Battery

WIRE POWER UNITS WITH STANDARD MOUNTING BASE

BA/WT-BLE-Q-PWR
Wireless BAPI-Stat “Quantum” Temp Sensor, Wire Power

BA/WT-BLE-Q-S-PWR
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Wire Power

BA/WT-BLE-Q-SO-PWR
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Override, Wire Power

WIRE POWER UNITS WITH 60MM MOUNTING BASE

BA/WT-BLE-Q60-PWR
Wireless BAPI-Stat “Quantum” Temp Sensor, Wire Power, 60mm Base

BA/WT-BLE-Q60-S-PWR
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Wire Power, 60mm Base

BA/WT-BLE-Q60-SO-PWR
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Override, Wire Power, 60mm Base

Wireless Receiver and 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. If the sensor doesn’t receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



BAPI-Stat “Quantum” Temp/Humidity Sensor

Wireless System

Rev. 07/08/24

Features & Options

- Optional temperature setpoint and occupant override
- User adjustable settings
- Onboard memory
- Transmits to a digital Gateway or a wireless-to-analog Receiver

The BAPI-Stat “Quantum” Wireless Sensor measures the room temperature and humidity and transmits the data via Bluetooth Low Energy to a receiver or gateway. It is available with optional temperature setpoint and occupancy override.

5 YEAR WARRANTY



Sensors with optional Setpoint & Override
(Right image shown with optional 60mm mounting base)

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: ±1.7°F (0.95°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 Material & Rating: ABS Plastic, UL94 V-0

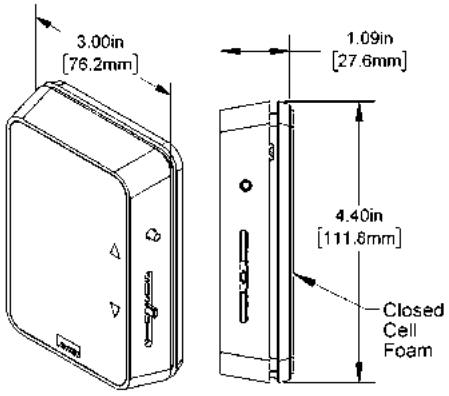
Frequency: 2.4 GHz (Bluetooth Low Energy)

Receiver Sensitivity: -97 dBm

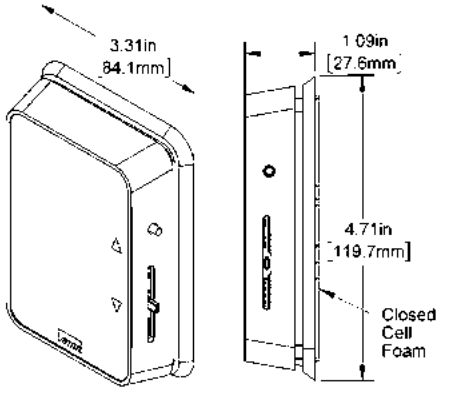
User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Delta T (Humidity): 0.1%RH to 5.0%RH
Transmit Interval: 30 sec to 12 hour***
Sample Interval: 30 sec to 5 min***
Temp Offset: ±0.1°F/C to ±5.0°F/C
Humidity Offset: ±0.1%RH to ±3.0%RH

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 / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P



Standard Mounting Base



60mm Mounting Base
(Fits European wall boxes and junction boxes with 60mm mounting centers)

*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

BAPI-Stat "Quantum" Units Calculated Battery Life**		
Transmit Interval	Sample Rate	Estimated Life (years)
30 sec	30 sec	1.12
1 min	1 min	1.89
3 min	1 min	3.83
5 min	5 min	7.08
10 min	5 min	8.93

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BAPI-Stat “Quantum” Temp/Humidity Sensor

Wireless System

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

BATTERY POWER UNITS WITH STANDARD MOUNTING BASE

List Price

BA/WTH-BLE-Q-BAT
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Battery Power $300

BA/WTH-BLE-Q-S-BAT
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Setpoint, Battery Power $306

BA/WTH-BLE-Q-SO-BAT
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Setpoint, Override, Battery Power $311

BATTERY POWER UNITS WITH 60MM MOUNTING BASE

BA/WTH-BLE-Q60-BAT
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Battery Power, 60mm Base $300

BA/WTH-BLE-Q60-S-BAT
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Setpoint, Battery Power, 60mm Base $306

BA/WTH-BLE-Q60-SO-BAT
Wireless BAPI-Stat “Quantum” Temp/Hum Sensor, Setpoint, Override, Battery Power, 60mm Base ...$311

BA/LI14505: 3.6V Lithium Battery..... $3 (net price)

WIRE POWER UNITS WITH STANDARD MOUNTING BASE

BA/WTH-BLE-Q-PWR
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Wire Power $300

BA/WTH-BLE-Q-S-PWR
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Setpoint, Wire Power $306

BA/WTH-BLE-Q-SO-PWR
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Setpoint, Override, Wire Power $311

WIRE POWER UNITS WITH 60MM MOUNTING BASE

BA/WTH-BLE-Q60-PWR
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Wire Power, 60mm Base $300

BA/WTH-BLE-Q60-S-PWR
Wireless BAPI-Stat “Quantum” Temp/Humidity Sensor, Setpoint, Wire Power, 60mm Base $306

BA/WTH-BLE-Q60-SO-PWR
Wireless BAPI-Stat “Quantum” Temp/Hum Sensor, Setpoint, Override, Wire Power, 60mm Base...$311

Wireless Receiver and 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. If the sensor doesn’t receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



F6

Duct Temperature Sensor

Wireless System

Rev. 07/08/24

Features & Options

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

BAPI's Duct Wireless Sensor measures the temperature and transmits the data via Bluetooth Low Energy to a receiver or gateway. This unit features a rugged IP66-rated BAPI-Box enclosure and ¼" (6.4mm) stainless steel probe with standard probe lengths from 4" to 18" (102 to 457mm).



Wireless Duct Temperature Sensor

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

Temperature Sensor Accuracy:
±1.0°F (0.55°C) from 32 to 158°F (0 to 70°C)

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

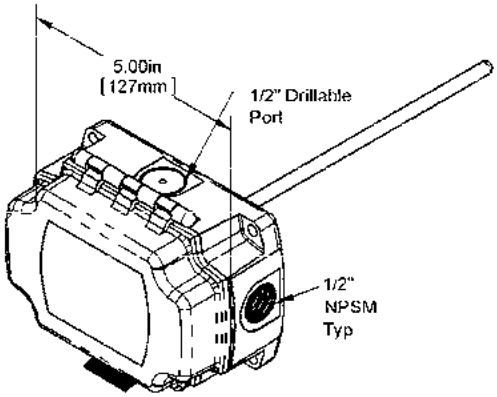
Frequency: 2.4 GHz (Bluetooth Low Energy)

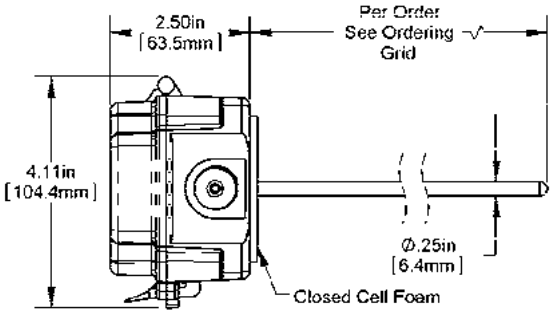
Receiver Sensitivity: -97 dBm

User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour***
Sample Interval: 30 sec to 5 min***
Temp Offset: ±0.1°F/C to ±5.0°F/C

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 / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P





*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

BAPI-Box Units 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

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

BATTERY POWER UNITS

List Price

BA/WT-BLE-D-4-BB-BAT
Wireless Duct Temp Sensor, 4” (102mm) Probe Length, Battery Power $335

BA/WT-BLE-D-8-BB-BAT
Wireless Duct Temp Sensor, 8” (203mm) Probe Length, Battery Power $335

BA/WT-BLE-D-12-BB-BAT
Wireless Duct Temp Sensor, 12” (305mm) Probe Length, Battery Power $335

BA/WT-BLE-D-18-BB-BAT
Wireless Duct Temp Sensor, 18” (457mm) Probe Length, Battery Power $335

BA/LI14505: 3.6V Lithium Battery..... $3 (net price)

WIRE POWER UNITS

BA/WT-BLE-D-4-BB-PWR
Wireless Duct Temp Sensor, 4” (102mm) Probe Length, Wire Power $335

BA/WT-BLE-D-8-BB-PWR
Wireless Duct Temp Sensor, 8” (203mm) Probe Length, Wire Power $335

BA/WT-BLE-D-12-BB-PWR
Wireless Duct Temp Sensor, 12” (305mm) Probe Length, Wire Power $335

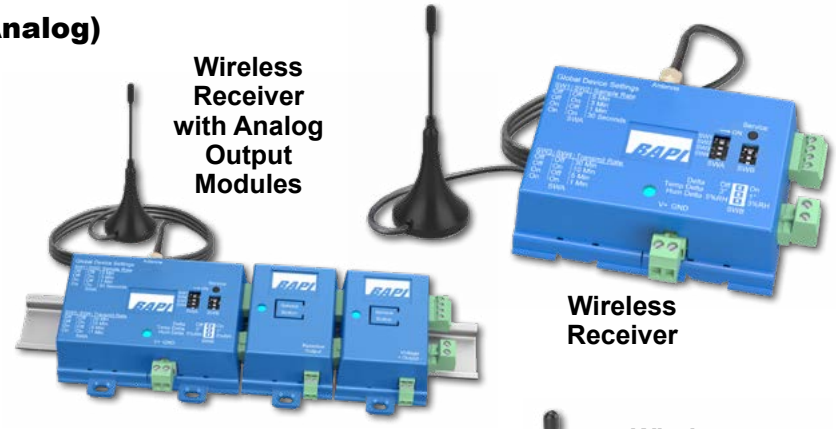
BA/WT-BLE-D-18-BB-PWR
Wireless Duct Temp Sensor, 18” (457mm) Probe Length, Wire Power $335

Custom probe lengths available.

Wireless Receiver and 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. If the sensor doesn’t receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



F8

Duct Temp/Humidity Sensor

Wireless System

Rev. 07/08/24

Features & Options

- 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

5 YEAR WARRANTY

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*

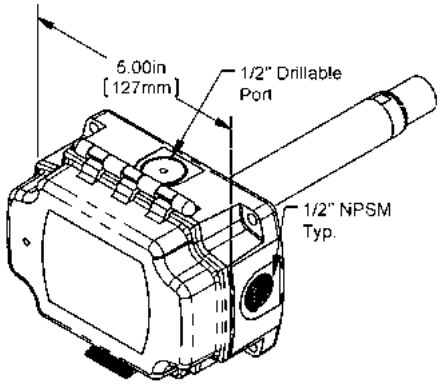
Environmental Operation Range:
Temp: -4 to 149°F (-20 to 65°C)
Humidity: 10 to 90%RH, non-condensing

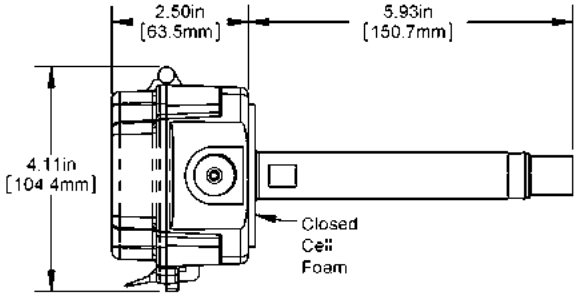
Enclosure Rating, Material & Material Rating:
IP66, UV-Resistant Polycarbonate, UL94 V-0

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: 30 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 / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P

BAPI-Box Units 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

*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

BATTERY POWER UNIT

List Price

BA/WTH-BLE-D-BB-BAT
Wireless Duct Temperature & Humidity Sensor, Battery Power $406

BA/LI14505
3.6V Lithium Battery.....$3 (net price)

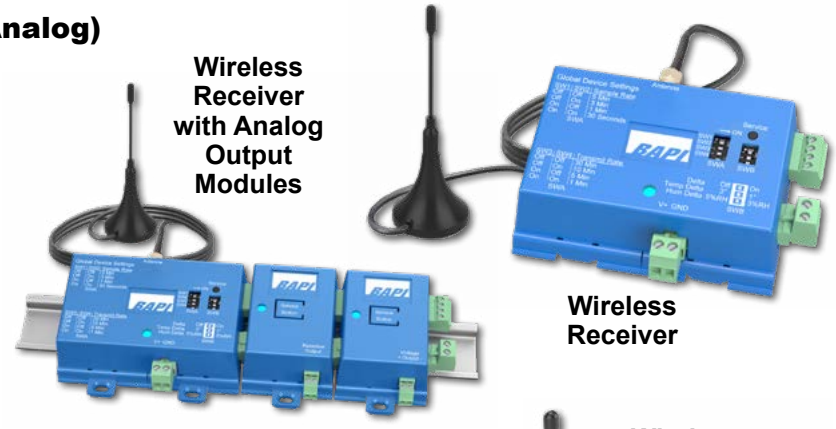
WIRE POWER UNIT

BA/WTH-BLE-D-BB-PWR
Wireless Duct Temperature & Humidity Sensor, Wire Power $406

Wireless Receiver and 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. If the sensor doesn't receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



F10 Immersion Temperature Sensor

Wireless System

Rev. 07/08/24

Features & Options

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

BAPI's Immersion Wireless Sensor measures the temperature and transmits the data via Bluetooth Low Energy to a receiver or gateway. This unit features a rugged IP66-rated BAPI-Box enclosure and stainless steel ¼" (6.4mm) probe with standard probe lengths from 2" to 8" (51 to 203mm).



Wireless Immersion Temperature Sensor

5 YEAR WARRANTY

Specifications

Battery Power: Two included 3.6V 14505, 14500 or equivalent lithium batteries (Standard AA batteries are not compatible)

Wire Power: 9 to 30 VDC or 24 VAC, halfwave rectified

Temperature Sensor Accuracy:
±1.0°F (0.55°C) from 32 to 158°F (0 to 70°C)

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

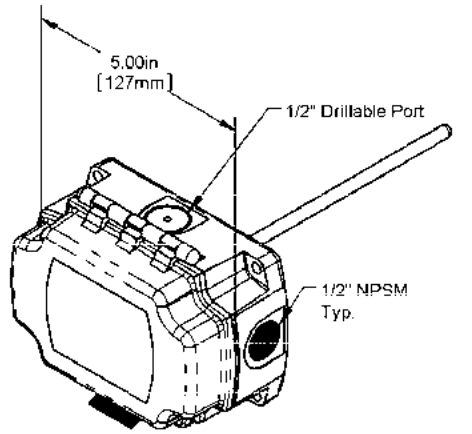
Frequency: 2.4 GHz (Bluetooth Low Energy)

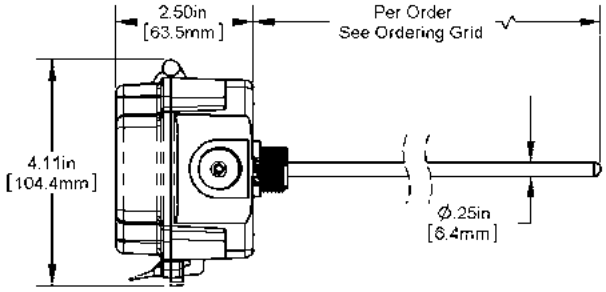
Receiver Sensitivity: -97 dBm

User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour***
Sample Interval: 30 sec to 5 min***
Temp Offset: ±0.1°F/C to ±5.0°F/C

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 / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P





BAPI-Box Units 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

*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

BATTERY POWER UNITS — **List Price**

BA/WT-BLE-I-2-BB-BAT
Wireless Immersion Temp Sensor, 2” (51mm) Probe Length, Battery Power.....$335

BA/WT-BLE-I-4-BB-BAT
Wireless Immersion Temp Sensor, 4” (102mm) Probe Length, Battery Power.....$335

BA/WT-BLE-I-8-BB-BAT
Wireless Immersion Temp Sensor, 8” (203mm) Probe Length, Battery Power.....$335

BA/LI14505
3.6V Lithium Battery.....$3 (net price)

WIRE POWER UNITS

BA/WT-BLE-I-2-BB-PWR
Wireless Immersion Temp Sensor, 2” (51mm) Probe Length, Wire Power.....$335

BA/WT-BLE-I-4-BB-PWR
Wireless Immersion Temp Sensor, 4” (102mm) Probe Length, Wire Power.....$335

BA/WT-BLE-I-8-BB-PWR
Wireless Immersion Temp Sensor, 8” (203mm) Probe Length, Wire Power.....$335

Custom probe lengths are available. Call BAPI for more information.

Thermowells

Immersion Unit Probes are designed to be inserted into a Thermowell and BAPI offers stainless steel thermowells in matching lengths to the immersion sensors. For more info on Thermowells, see the BAPI website or contact your BAPI representative.



Wireless Receiver and 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. If the sensor doesn’t receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



F12 Remote Probe Sensor

Wireless System

Rev. 07/08/24

Features & Options

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

BAPI's Remote Probe Wireless Sensor measures the temperature and transmits the data via Bluetooth Low Energy to a receiver or gateway. It features a 1.75" (44mm) long SS probe with either Plenum-Rated or FEP-Jacketed Cable and an IP66-rated BAPI-Box enclosure. Five lead lengths from 5 to 25 feet (1.5 to 7.6 meters).



Wireless Remote Probe Sensor

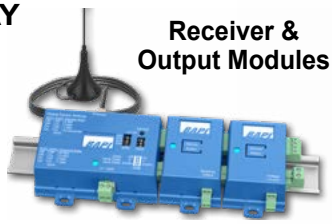
ASSOCIATED RECEIVER OR GATEWAY

- **Receiver (Wireless-to-Analog)** - Receives the data from the wireless sensors. The data is then transferred to the Analog Output Modules and converted to an analog voltage or resistance.
- **Gateway -** Receives the data from the wireless sensors. The Gateway then provides the data to the cloud via MQTT.



Gateway

Receiver & Output Modules



Specifications

Battery Power: Two included 3.6V 14505, 14500 or equivalent lithium batteries (Standard AA batteries are not compatible)

Wire Power: 9 to 30 VDC or 24 VAC, halfwave rectified

Temperature Sensor Accuracy:
±1.0°F (0.55°C) from 32 to 158°F (0 to 70°C)

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: IP66, UV-Resistant Polycarb., UL94 V-0

Frequency: 2.4 GHz (Bluetooth Low Energy)

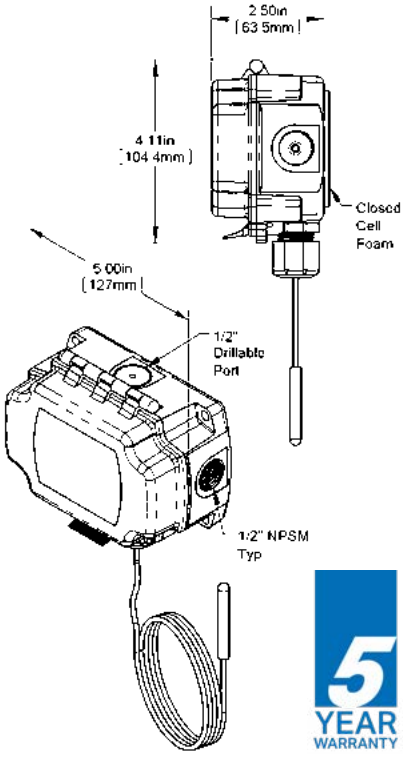
Receiver Sensitivity: -97 dBm

User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour***
Sample Interval: 30 sec to 5 min***
Temp Offset: ±0.1°F/C to ±5.0°F/C

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 / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P

BAPI-Box Units 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



*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

5 YEAR WARRANTY

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

BATTERY POWER UNITS

List Price

BA/WT-BLE-RPP-5-BB-BAT
Wireless Remote Sensor w/ Plenum-Rated Cable, 5' (1.5m) Leads, Battery Power..... $347

BA/WT-BLE-RPP-10-BB-BAT
Wireless Remote Sensor w/ Plenum-Rated Cable, 10' (3.0m) Leads, Battery Power..... $349

BA/WT-BLE-RPP-15-BB-BAT
Wireless Remote Sensor w/ Plenum-Rated Cable, 15' (4.6m) Leads, Battery Power..... $351

BA/WT-BLE-RPP-20-BB-BAT
Wireless Remote Sensor w/ Plenum-Rated Cable, 20' (6.1m) Leads, Battery Power..... $353

BA/WT-BLE-RPP-25-BB-BAT
Wireless Remote Sensor w/ Plenum-Rated Cable, 25' (7.6m) Leads, Battery Power..... $355

BA/WT-BLE-RPFEP-5-BB-BAT
Wireless Remote Sensor w/ FEP-Jacketed Cable, 5' (1.5m) Leads, Battery Power..... $350

BA/WT-BLE-RPFEP-10-BB-BAT
Wireless Remote Sensor w/ FEP-Jacketed Cable, 10' (3.0m) Leads, Battery Power..... $355

BA/WT-BLE-RPFEP-15-BB-BAT
Wireless Remote Sensor w/ FEP-Jacketed Cable, 15' (4.6m) Leads, Battery Power..... $360

BA/WT-BLE-RPFEP-20-BB-BAT
Wireless Remote Sensor w/ FEP-Jacketed Cable, 20' (6.1m) Leads, Battery Power..... $365

BA/WT-BLE-RPFEP-25-BB-BAT
Wireless Remote Sensor w/ FEP-Jacketed Cable, 25' (7.6m) Leads, Battery Power..... $370

BA/LI14505: 3.6V Lithium Battery..... $3 (net price)

WIRE POWER UNITS

BA/WT-BLE-RPP-5-BB-PWR
Wireless Remote Sensor w/ Plenum-Rated Cable, 5' (1.5m) Leads, Wire Power..... $347

BA/WT-BLE-RPP-10-BB-PWR
Wireless Remote Sensor w/ Plenum-Rated Cable, 10' (3.0m) Leads, Wire Power..... $349

BA/WT-BLE-RPP-15-BB-PWR
Wireless Remote Sensor w/ Plenum-Rated Cable, 15' (4.6m) Leads, Wire Power..... $351

BA/WT-BLE-RPP-20-BB-PWR
Wireless Remote Sensor w/ Plenum-Rated Cable, 20' (6.1m) Leads, Wire Power..... $353

BA/WT-BLE-RPP-25-BB-PWR
Wireless Remote Sensor w/ Plenum-Rated Cable, 25' (7.6m) Leads, Wire Power..... $355

BA/WT-BLE-RPFEP-5-BB-PWR
Wireless Remote Sensor w/ FEP-Jacketed Cable, 5' (1.5m) Leads, Wire Power..... $350

BA/WT-BLE-RPFEP-10-BB-PWR
Wireless Remote Sensor w/ FEP-Jacketed Cable, 10' (3.0m) Leads, Wire Power..... $355

BA/WT-BLE-RPFEP-15-BB-PWR
Wireless Remote Sensor w/ FEP-Jacketed Cable, 15' (4.6m) Leads, Wire Power..... $360

BA/WT-BLE-RPFEP-20-BB-PWR
Wireless Remote Sensor w/ FEP-Jacketed Cable, 20' (6.1m) Leads, Wire Power..... $365

BA/WT-BLE-RPFEP-25-BB-PWR
Wireless Remote Sensor w/ FEP-Jacketed Cable, 25' (7.6m) Leads, Wire Power..... $370

F14 Outside Air Temperature Sensor

Wireless System

Rev. 07/08/24

Features & Options

- Included Barometric pressure sensor and optional light level sensor
- User adjustable settings
- Onboard memory
- Transmits to a digital Gateway or a wireless-to-analog Receiver

BAPI's Outside Air 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 with a UV-resistant plastic shield. It is available with optional light level sensing.



Wireless Outside Air Temp Sensor with Light Level Sensor

Wireless Outside Air Temp Sensor

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)
Barometric Pressure: ±2 mbar @ 25°C (0.40"H_2O)
Light Level: 10 Lux + 10% of reading.

Temperature Range: -4 to 221°F (-20 to 105°C)

Light Level Sensing Range: 0 to 64,000 lux

Transmission Distance: Varies by application*

BAPI-Box Units 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

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 ● Transmit Interval: 30 sec to 12 hour***
Sample Interval: 30 sec to 5 min*** ● Temp Offset: ±0.1°F/C to ±3.0°F/C

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 / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P

*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

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Outside Air Temperature Sensor

Wireless System

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

BATTERY POWER UNITS — **List Price**

BA/WT-BLE-O-BB-BAT
Wireless Outside Air Temp and Barometric Pressure Sensor, Battery Power $335

BA/WT-BLE-LL-O-BB-BAT
Wireless Outside Air Temp, Light Level and Barometric Pressure Sensor, Battery Power..... $370

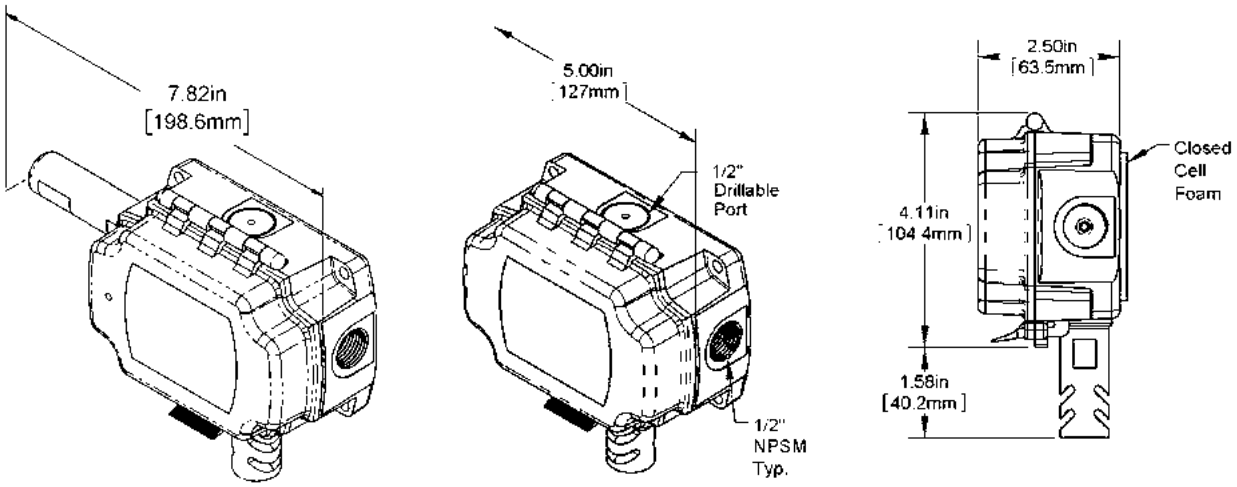
BA/LI14505: 3.6V Lithium Battery.....$3 (net price)

WIRE POWER UNITS

BA/WT-BLE-O-BB-PWR
Wireless Outside Air Temp and Barometric Pressure Sensor, Wire Power $335

BA/WT-BLE-LL-O-BB-PWR
Wireless Outside Air Temp, Light Level and Barometric Pressure Sensor, Wire Power..... $370

Dimensions



Wireless Receiver and 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. If the sensor doesn't receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



F16 Outside Air Temp/Humidity Sensor

Wireless System

Rev. 07/08/24

Features & Options

- Included Barometric pressure sensor and optional light level sensor
- User adjustable settings
- Onboard memory
- Transmits to a digital Gateway or a wireless-to-analog Receiver

BAPI's Outside Air 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 with a UV-resistant plastic shield. It is available with optional light level sensing.



5 YEAR WARRANTY

Wireless Outside Air Temp and Humidity Sensor

Wireless Outside Air Temp and Humidity Sensor with Light Level Sensor

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
Barometric Pressure: ±2 mbar @ 25°C (0.40"H_2O)
Light Level: 10 Lux + 10% of reading.

Temperature Range: -4 to 221°F (-20 to 105°C)

Light Level Sensing Range: 0 to 64,000 lux

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: 30 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 / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P

BAPI-Box Units 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

*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

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Outside Air Temp/Humidity Sensor

Wireless System

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

BATTERY POWER UNITS **List Price**

BA/WTH-BLE-O-BB-BAT
Wireless Outside Air Temp/Humidity and Barometric Pressure Sensor, Battery Power $406

BA/WTH-BLE-LL-O-BB-BAT
Wireless Outside Air Temp/Humidity, Light Level & Barometric Pressure Sensor, Battery Power ... $441

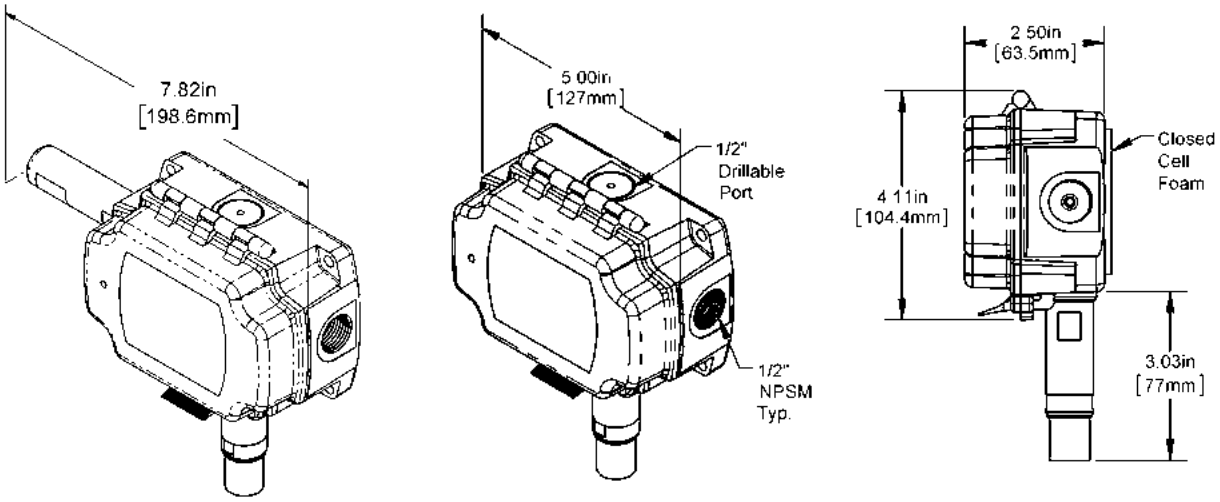
BA/LI14505: 3.6V Lithium Battery.....$3 (net price)

WIRE POWER UNITS

BA/WTH-BLE-O-BB-PWR
Wireless Outside Air Temp/Humidity and Barometric Pressure Sensor, Wire Power $406

BA/WTH-BLE-LL-O-BB-PWR
Wireless Outside Air Temp/Humidity, Light Level & Barometric Pressure Sensor, Wire Power $441

Dimensions



Wireless Receiver and 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. If the sensor doesn't receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



F18 Thermobuffer Temperature Sensor

Wireless System

Rev. 07/08/24

Features & Options

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

BAPI's Wireless Thermobuffer Sensor is designed for freezers and coolers. It measures the temperature and transmits the data via Bluetooth Low Energy to a receiver or gateway. It features a SS thermobuffer hanging bracket probe with an IP66-rated BAPI-Box enclosure and FEP-jacketed cable in 5 or 10 foot (1.5 to 3m) length.



Unit with 1" Hanging Bracket

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

Temperature Sensor Accuracy:
±1.0°F (0.55°C) from 32 to 158°F (0 to 70°C)

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: IP66

Enclosure Material & Material Rating:
UV-Resistant Polycarbonate, UL94 V-0

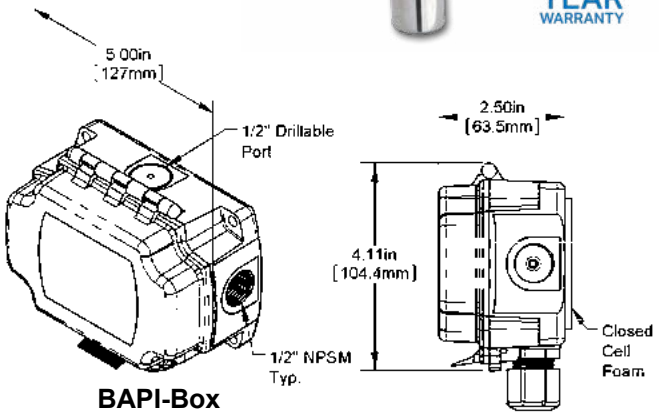
Frequency: 2.4 GHz (Bluetooth Low Energy)

Receiver Sensitivity: -97 dBm

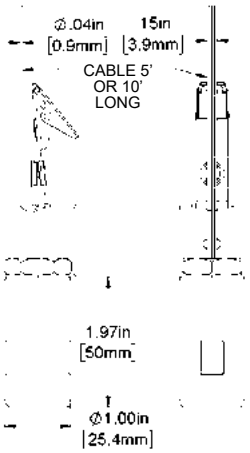
User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour***
Sample Interval: 30 sec to 5 min***
Temp Offset: ±0.1°F/C to ±5.0°F/C

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 / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P



BAPI-Box Dimensions



Hanging Bracket Dimensions

*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

BAPI-Box Units 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

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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

BATTERY POWER UNITS — **List Price**

BA/WT-BLE-TB-M304-1-HB-5-BB-BAT
Wireless Thermobuffer Sensor, 1" (25mm) 304 SS Hanging Bracket w/ 5' (1.5m) FEP-Jacketed Cable, Battery Power $437

BA/WT-BLE-TB-M304-1-HB-10-BB-BAT
Wireless Thermobuffer Sensor, 1" (25mm) 304 SS Hanging Bracket w/ 10' (3m) FEP-Jacketed Cable, Battery Power $442

BA/LI14505: 3.6V Lithium Battery ..... $3 (net price)

WIRE POWER UNITS

BA/WT-BLE-TB-M304-1-HB-5-BB-PWR
Wireless Thermobuffer Sensor, 1" (25mm) 304 SS Hanging Bracket w/ 5' (1.5m) FEP-Jacketed Cable, Wire Power..... $437

BA/WT-BLE-TB-M304-1-HB-10-BB-PWR
Wireless Thermobuffer Sensor, 1" (25mm) 304 SS Hanging Bracket w/ 10' (3m) FEP-Jacketed Cable, Wire Power..... $442

Wireless Receiver and 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. If the sensor doesn't receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



F20

BAPI-Stat “Quantum Slim” Temp Sensor

Wireless System

Rev. 07/08/24

Features & Options

- Built in or remote temperature sensor
- Onboard memory and user adjustable settings
- Transmits to a digital Gateway or a wireless-to-analog Receiver

The BAPI-Stat “Quantum Slim” Wireless Sensor measures the temperature and transmits the data via Bluetooth Low Energy to a receiver or gateway. It is designed to monitor temperature inside refrigerator and freezer cases. The unit mounts on the outside of freezers and can be mounted either inside or outside of refrigerators. It is available with an internal or an external sensor.

The external sensor’s cable fits between the door seal or through a hole without affecting appliance efficiency.



Specifications

Battery Power: One included 3.6V 14505, 14500 or equivalent lithium battery
(Note: Standard AA batteries are not compatible)

Temperature Sensor Accuracy:
±1.25°F (0.7°C) from 32 to 158°F (0 to 70°C)

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 Material & Rating: ABS Plastic, UL94 V-0

Frequency: 2.4 GHz (Bluetooth Low Energy)

Receiver Sensitivity: -97 dBm

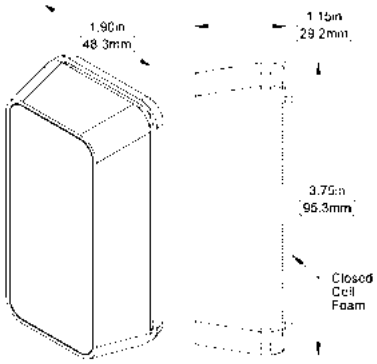
Ext. Probe Material: 304 Stainless Steel
1.75” (44mm) Bullet Probe with FEP Cable
1” (25mm) Thermobuffer with FEP Cable

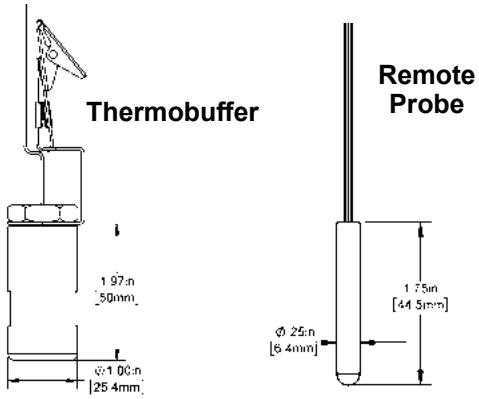
User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour***
Sample Interval: 30 sec to 5 min***
Temp Offset: ±0.1°F/C to ±5.0°F/C

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: Contains FCC ID: QOQGM210P / IC: 5123A-GM210P / RoHS

BAPI-Stat “Quantum Slim”





*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

BAPI-Stat "Quantum-Slim" Calculated Battery Life**		
Transmit Interval	Sample Rate	Estimated Life (years)
30 sec	30 sec	0.58
1 min	1 min	1.04
3 min	1 min	2.03
5 min	5 min	3.02
10 min	5 min	4.01

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BAPI-Stat “Quantum Slim” Temp Sensor

Wireless System

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

List Price

BA/WT-BLE-QS-B-IS-BAT
Black Wireless BAPI-Stat “Quantum Slim”, Internal Temp Sensor, Battery Power $274

BA/WT-BLE-QS-B-RPFEP5-BAT
Black Wireless BAPI-Stat “Quantum Slim”, Remote Probe & 5’ (1.5m) FEP Cable, Battery Power $297

BA/WT-BLE-QS-B-X-BAT
Black Wireless BAPI-Stat “Quantum Slim” without Sensor (sensor is ordered separately), Battery Power.... $274

BA/WT-BLE-QS-B-TB-HB-FEP5-BAT
Black Wireless “Quantum Slim”, 1” (25mm) Hanging Thermobuffer & 5’ (1.5m) FEP Cable, Battery Power.... $384

BA/WT-BLE-QS-W-IS-BAT
White Wireless BAPI-Stat “Quantum Slim”, Internal Temp Sensor, Battery Power $269

BA/WT-BLE-QS-W-RPFEP5-BAT
White Wireless BAPI-Stat “Quantum Slim”, Remote Probe & 5’ (1.5m) FEP Cable, Battery Power..... $292

BA/WT-BLE-QS-W-X-BAT
White Wireless BAPI-Stat “Quantum Slim” without Sensor (sensor is ordered separately), Battery Power.... $269

BA/WT-BLE-QS-W-TB-HB-FEP5-BAT
White Wireless “Quantum Slim”, 1” (25mm) Hanging Thermobuffer & 5’ (1.5m) FEP Cable, Battery Power ... $379

BA/LI14505: 3.6V Lithium Battery ..... $3 (net price)

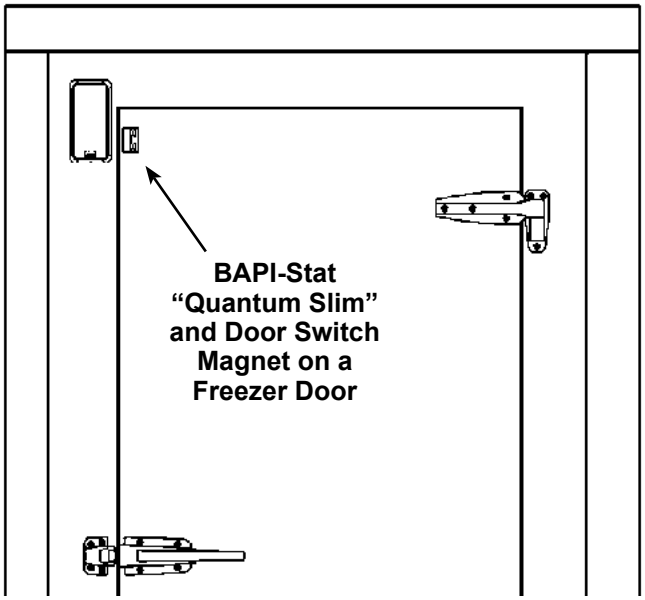
Door Switch Magnet Accessory

The Door Switch Magnet works with BAPI’s Wireless “Quantum Slim” sensor to monitor the status of doors, including refrigerators, freezers, outside doors and garbage gates. The pickup for the Door Switch Magnet is already mounted inside all of the BAPI-Stat “Quantum Slim” units. The magnet works with all “Quantum Slim” units including those with a remote probe or thermobuffer.



Part #	Description	List Price
BA/DSM	Door Switch Magnet	$8

Note: Use only the BAPI Door Switch Magnet. Other magnets may damage the sensor or affect the accuracy of the sensor.



Associated Receiver and Gateway

Receiver (Wireless-to-Analog) - 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.

Gateway - Receives the data from one or more wireless sensors. The Gateway then provides the data to the cloud via MQTT.



Receiver & Output Modules



Gateway

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BAPI-Stat “Quantum Slim” Temp/Humidity Sensor

Wireless System

Rev. 07/08/24

Features & Options

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

The BAPI-Stat “Quantum Slim” Wireless Sensor measures the temperature and humidity and transmits the data via Bluetooth Low Energy to a receiver or gateway.

The unit features a sleek, low profile room enclosure in bright white or black color.

5 YEAR WARRANTY



White and Black BAPI-Stat “Quantum Slim” Sensors

Specifications

Battery Power: One included 3.6V 14505, 14500 or equivalent lithium battery (Note: Standard AA batteries are not compatible)

Sensor Accuracy:
Temp: ±1.25°F (0.7°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 Material & Rating:
ABS Plastic, UL94 V-0

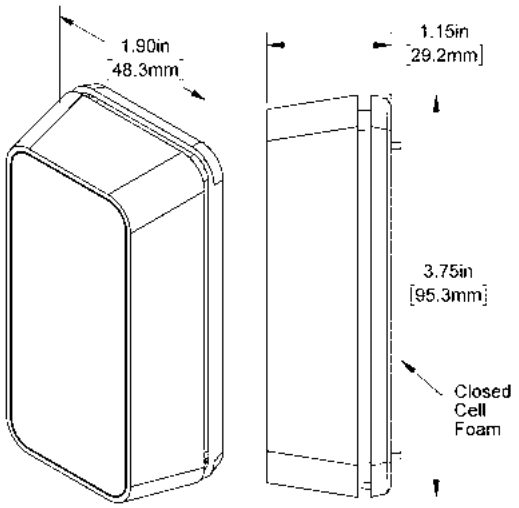
Frequency: 2.4 GHz (Bluetooth Low Energy)

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: 30 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: Contains FCC ID: QOQGM210P / IC: 5123A-GM210P / 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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

BAPI-Stat "Quantum-Slim" Calculated Battery Life**		
Transmit Interval	Sample Rate	Estimated Life (years)
30 sec	30 sec	0.58
1 min	1 min	1.04
3 min	1 min	2.03
5 min	5 min	3.02
10 min	5 min	4.01

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BAPI-Stat “Quantum Slim” Temp/Humidity Sensor

Wireless System

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

List Price

BA/WTH-BLE-QS-B-IS-BAT
Black Wireless BAPI-Stat “Quantum Slim”, Internal Temp/Humidity Sensor, Battery Power $365

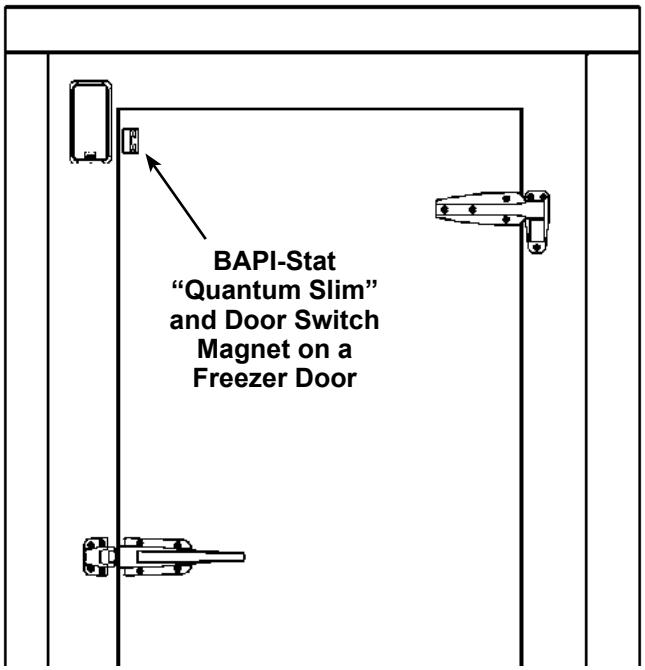
BA/WTH-BLE-QS-W-IS-BAT
White Wireless BAPI-Stat “Quantum Slim”, Internal Temp/Humidity Sensor, Battery Power..... $360

BA/LI14505
3.6V Lithium Battery .....$3 (net price)

Door Switch Magnet Accessory

The Door Switch Magnet works with BAPI’s Wireless “Quantum Slim” sensor to monitor the status of doors, including refrigerators, freezers, outside doors and garbage gates. The pickup for the Door Switch Magnet is already mounted inside all of the BAPI-Stat “Quantum Slim” units. The magnet works with all “Quantum Slim” units including those with a remote probe or thermobuffer.





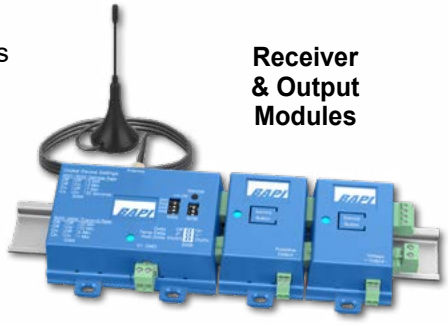
Part #	Description	List Price
BA/DSM	.... Door Switch Magnet	$8

Note: Use only the BAPI Door Switch Magnet. Other magnets may damage the sensor or affect the accuracy of the sensor.

Associated Receiver and Gateway

Receiver (Wireless-to-Analog)
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.

Gateway
Receives the data from one or more wireless sensors. The Gateway then provides the data to the cloud via MQTT.



Receiver
& Output
Modules



Gateway

F24 Wireless Food Temperature Probe

Wireless System

Rev. 07/08/24

Features & Options

- NSF certified[1] with food and dishwasher safe materials
- User adjustable settings and onboard memory
- Transmits to a digital Gateway or a wireless-to-analog Receiver

BAPI's Wireless Food Probe measures the temperature and transmits the data via Bluetooth Low Energy to a receiver or gateway. The food probes eliminate the need for an employee to hand record the temperatures with a thermometer for HACCP compliance. Bin clips are available to fit most food bins. The probe is designed for dishwasher or hand washing.

Because the probes are designed for wet, dusty or dirty environments, there are many additional applications including cooling towers, steam humidifiers or dusty/wet conveyer systems.



Wireless Food Probe with and without optional bin clip

Probe with optional bin clip inside a bin



Specifications

Power: One included Lithium ½AA Battery, 3.6V

Temperature Sensor Accuracy:
(Calibrated using a NIST traceable reference)
±0.7°F (0.4°C) from 32 to 158°F (0 to 70°C)
±1.8°F (1.0°C) from 158 to 212°F (70 to 100°C)

Temperature Range: -4 to 221°F (-20 to 105°C)

Transmission Distance: Varies by application[2]

Environmental Operation Range:
Probe Only: -4 to 230°F (-20 to 110°C)
Entire Unit: -40 to 185°F (-40 to 85°C)
Washing Spike Temp: 212°F (100°C)
Humidity: 0 to 100% RH Condensing

User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour[4]
Sample Interval: 30 sec to 5 min[4]
Temp Offset: ±0.1°F/C to ±5.0°F/C

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.

Enclosure Material: Food Safe Plastic

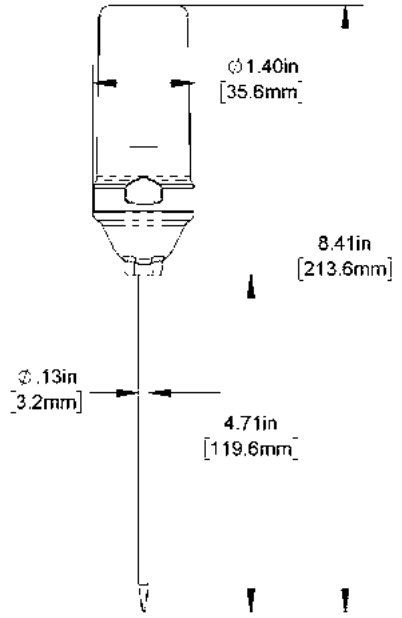
Frequency: 2.4 GHz (Bluetooth Low Energy)

Receiver Sensitivity: -97 dBm

Probe Material: 304 SS, 1/8" (3.2mm) diameter

Agency: RoHS / NSF Certified[1] /
Contains FCC ID: QOQGM210P / IC: 5123A-GM210P

5 YEAR WARRANTY



[1]NSF certification applies to the Wireless Food Probe only.

[2]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.

[3]Actual battery life is dependent on the sensor's adjustable settings and environmental conditions.

[4]The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

Food Probe Calculated Battery Life[3]		
Transmit Interval	Sample Rate	Estimated Life (years)
30 sec	30 sec	0.25
1 min	1 min	0.42
3 min	1 min	0.55
5 min	5 min	1.45
10 min	5 min	1.96

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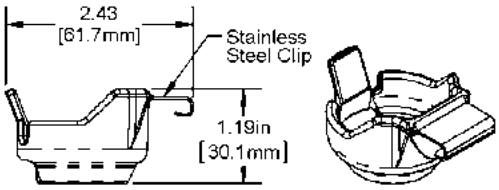
Wireless Food Temperature Probe

Wireless System

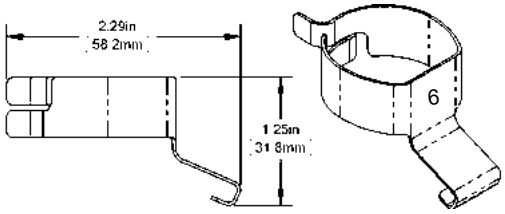
Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

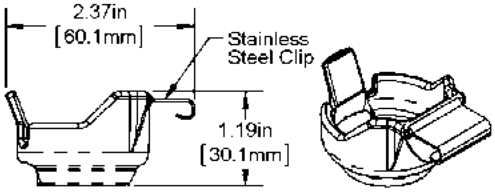
PART NUMBER	List Price
BA/WFP-BLE-PT .. Wireless Food Temperature Probe	$300
BA/BAT-5AA-HIT .. Lithium ½AA Battery, 3.6V, for the Wireless Food Probe	$6 (net price)
BA/FP-CLP4 ..... Fixed Depth Clip for Stainless Steel Square Food Bins (Black Plastic)	$15
BA/FP-CLP5 ..... Fixed Depth Clip for Plastic Square Food Bins (Amber Plastic)	$15
BA/FP-CLP6 ..... Adjustable Depth Clip for Plastic Square Bins (“6” stamp on flat)	$25
BA/FP-CLP7 ..... Adjustable Clip for Stainless Steel Square Bins (“7” stamp on flat)	$25
BA/FP-CLP-KIT ... Clip Kit (includes 1 each of BA/FP-CLP4, BA/FP-CLP5, BA/FP-CLP6, BA/FP-CLP7)	$75



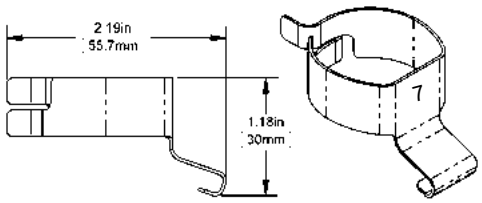
Fixed Depth Clip for Most Plastic Square Bins (Amber Plastic)



Adjustable Depth Bin Clip for Most Plastic Square Bins (“6” stamp on flat)



Fixed Depth Clip for Most Stainless Steel Square Bins (Black Plastic)



Adjustable Depth Bin Clip for Most SS Square Bins (“7” stamp on flat)

Wireless Receiver and 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.



Receiver with Analog Output Modules



Wireless Receiver

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. If the sensor doesn’t receive this confirmation, it will retry its transmission to the Gateway. The Gateway supports up to 32 sensors.



Wireless Gateway

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F26 Wireless Gateway

Wireless System

Rev. 03/14/24

Features & Options

- Gateway provides data via MQTT to the cloud
- Each gateway supports up to 32 sensors that can be configured remotely via the gateway and BAPI's WAM user interface

BAPI's Wireless Gateway receives the data from one or more sensors and provides the data to the cloud via MQTT using your local Wi-Fi connection. Sensors can be configured remotely via the gateway and BAPI's WAM user interface.

The gateway sends a confirmation signal to each sensor upon a successful reception. If the sensor doesn't receive this confirmation, then the sensor retains the readings in its onboard memory and transmits them once communication is re-established.

Wireless Gateway and included USB to Micro USB Cable



ORDERING INFO: **List Price**

BA/GTW-BLE: Wireless Gateway..... $735

Submittal sheets without List Prices are available on our website at www.bapihvac.com

5 YEAR WARRANTY

Associated Sensors

BAPI offers a wide range of sensors that measure and send the data to the gateway.



Specifications

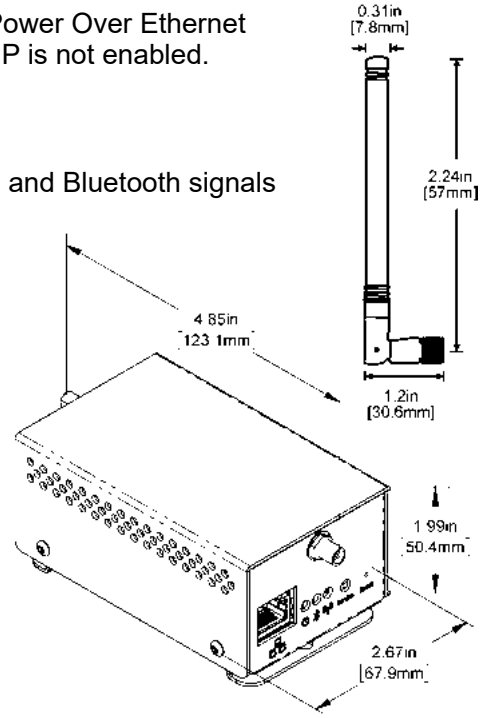
Supply Power: 5 VDC @ 120mA via included USB cable or Power Over Ethernet (POE) via Ethernet Port. Ethernet port is for power only, TCP/IP is not enabled.

Capacity/Unit: Up to 32 sensors

Antenna: Thread-on Whip Antenna, 2.4 GHz**

Reception Distance: Varies by application* for both the Wi-Fi and Bluetooth signals

Security: TLS 1.2 authentication and encryption of Wi-Fi data. 128 AES for Bluetooth data. Configuration settings and device readings are user/password protected.



Environmental Operation Range:
Temp: -4 to 158°F (-20 to 70°C)
Humidity: 10 to 90%RH, non-condensing

Frequency: 2.4 GHz** (Bluetooth Low Energy)

Receiver Sensitivity: -97 dBm

Mounting: Wall or surface mount

Enclosure Material: Powder coated steel

Agency: RoHS / FCC: T4FSM211221 / IC: 9067A-SM211221

*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.

**The gateway communicates with 2.4 GHz Wi-Fi and will not work on 5.0 GHz networks.

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Features & Options

- Receiver output is integrated into the BMS with Analog Output Modules, a BACnet MS/TP or Modbus RTU module or a BACnet IP module
- Receiver supports up to 28 wireless sensors
- User adjustable settings
- Surface, snaptrack or DIN rail mountable

The Wireless Receiver collects the data from up to 28 wireless sensors. The data is then integrated into the BMS by three different types of output modules – analog output modules, a BACnet MS/TP or Modbus RTU module, or a BACnet IP module.

The analog output modules convert to the data to an analog voltage or resistance for direct connection to controller inputs. The receiver supports up to 127 different analog output modules.

The BACnet MS/TP or Modbus RTU module converts the data for integration into the RS-485 field communication network and supports up to 28 wireless sensors.

The BACnet IP module converts the data for integration into the BMS ethernet communication network and supports up to 28 wireless sensors.



Receiver with two Analog Output Modules mounted on DIN rail

ORDERING INFO: **List Price**

BA/RCV-BLE-EZ.... Wireless Receiver $300

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Specifications

Supply Power: 15 to 24 VDC (from half-wave rectified supply)

Power Consumption: 30 mA @ 24 VDC

Safety Current: 400 mA

Capacity/Unit:
Up to 28 sensors
Up to 127 output modules of any type

Reception Distance: Varies by application*

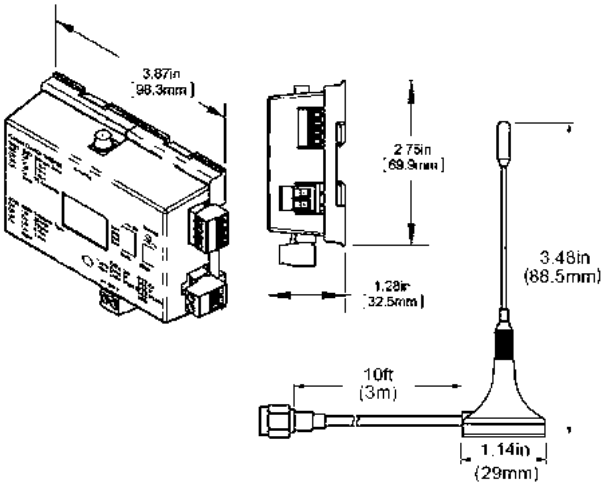
Frequency: 2.4 GHz (Bluetooth Low Energy)

Bus Cable Distance: 4,000 feet (1,200 meters)

Environmental Operation Range:
Temp: 32 to 140°F (0 to 60°C)
Humidity: 5 to 95% RH non-condensing

Enclosure Material & Rating:
ABS Plastic, UL94 V-0 (Indoor use only)

Agency: RoHS / Contains FCC ID: QOQGM210P / IC: 5123A-GM210P



*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.

Resistance Output Module (ROM)

Wireless System

Rev. 05/06/25

Overview

The Resistance Output Module (ROM) converts the temperature data from the BAPI Receiver into a Resistance for the BAS controller. The unit is factory calibrated to output a 10K-2, 10K-3, 10K-3(11K) or 20K thermistor curve.

The ROM receives data from the receiver through a four-wire bus. Up to 127 different Output Modules can be connected to a single receiver to send multiple variables to the controller.

The ROM is easily trained to a single sensor variable with a pushbutton and LED. The ROM is surface, 2.75" snaptrack or 35mm DIN rail mountable.

The ROM is powered by the receiver. Optionally, the ROM may be powered separately when the Pluggable Terminal Block Kit is used for remote connections.

Resistance Output Module - ROM



5 YEAR WARRANTY



Receiver with two Analog Output Modules

Specifications

Supply Power:
15 to 24 VDC (from half-wave rectified supply)

Power Consumption:
20 mA @ 24 VDC

Analog Input Bias Voltage: 10 VDC max

Temperature Output Ranges:
10K-2 Unit:..... 35 to 120ºF (1 to 50ºC)
10K-3 Unit:..... 32 to 120ºF (0 to 50ºC)
10K-3(11K) Unit:... 32 to 120ºF (0 to 50ºC)
20K Unit:..... 53 to 120ºF (12 to 50ºC)

Output Resolution: 100Ω

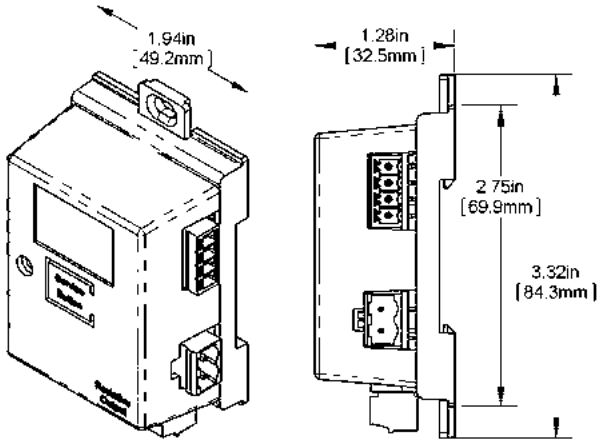
Lost Comm. Timeout: 35 min. (Fast Flash)
Reverts to High Resistance >35KΩ (Low Temp.)

Bus Cable Distance:
4,000 ft with shielded, twisted pair cable

Environmental Operation Range:
Temp: 32 to 140°F (0 to 60°C)
Humidity: 5 to 95% RH non-condensing

Enclosure Material & Rating:
ABS Plastic, UL94 V-0

Agency: RoHS



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Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

PART NUMBERS		**List Price**
BA/ROM-BLE-102-EZ	Resistance Output Module, 10K-2 thermistor curve	$150
BA/ROM-BLE-103-EZ	Resistance Output Module, 10K-3 thermistor curve	$150
BA/ROM-BLE-10311-EZ	Resistance Output Module, 10K-3(11K) thermistor curve	$150
BA/ROM-BLE-20-EZ	Resistance Output Module, 20K thermistor curve	$150

Pluggable Terminal Blocks

Analog Output Modules (AOMs) plug into each other and the receiver as shown above. However, the AOMs may also be mounted remotely using the optional Pluggable Terminal Block Connectors which are available as a 4-connector kit.

PART NUMBER:
BA/AOM-CONN ..Pluggable Terminal Block Kit for AOMs



Optional Pluggable Terminal Block Kit for AOMs (4 Connectors)

F30 Voltage Output Module (VOM)

Wireless System

Rev. 04/28/25

Overview

The Voltage Output Module (VOM) converts the temperature or humidity data from the BAPI Receiver into a linear 0 to 5 or 0 to 10 volt signal for the controller.

The VOM receives the temperature or humidity data from the receiver through a four-wire bus. Up to 127 different Output Modules can be connected to a single receiver to send multiple variables to the controller.

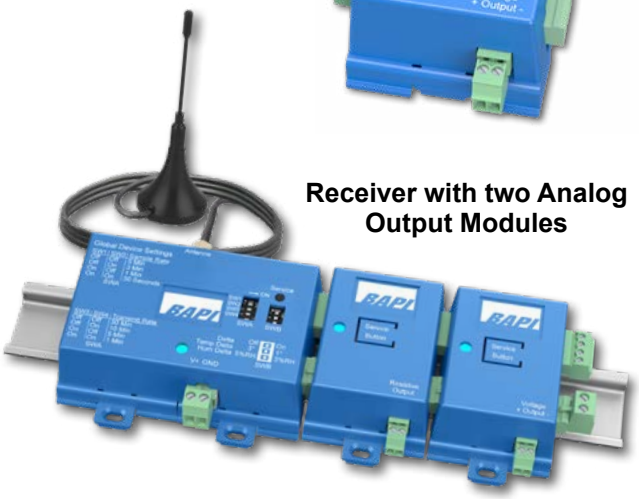
The VOM is easily trained to a single sensor variable with a pushbutton and LED. The VOM is surface, 2.75" snaptrack or 35mm DIN rail mountable.

The VOM is powered by the receiver. Optionally, the VOM may be powered separately when the Pluggable Terminal Block Kit is used for remote connections.

5 YEAR WARRANTY

Voltage Output Module - VOM





Receiver with two Analog Output Modules

PLUGGABLE TERMINAL BLOCK KIT

Analog Output Modules (AOMs) plug into each other and the receiver as shown above. However, the AOMs may also be mounted remotely using the optional Pluggable Terminal Block Connectors which are available as a 4-connector kit.

PART NUMBER:
BA/AOM-CONN ..Pluggable Terminal Block Kit for AOMs



Optional Pluggable Terminal Block Kit for AOMs (4 Connectors)

Specifications

Supply Power:
15 to 24 VDC (from half-wave rectified supply)

Power Consumption:
25 mA @ 24 VDC

Output Current: 2.5 mA @ 4KΩ load

Output Voltage Range:
0 to 5 VDC or 0 to 10 VDC (factory calibrated)

Lost Communication Timeout:
35 min. (Fast Flash)
Temperature output reverts to 0 volts
%RH output reverts to high scale (5 V or 10 V)

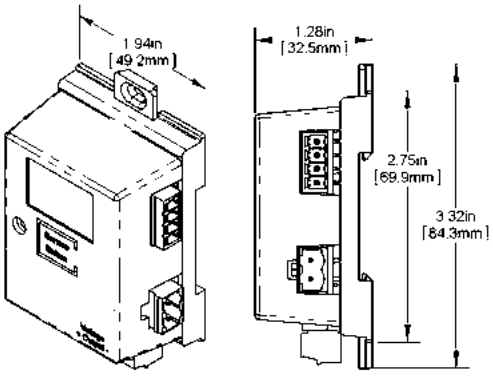
Bus Cable Distance:
4,000 ft with shielded, twisted pair cable

Output Resolution: 150 µV

Environmental Operation Range:
Temp: 32 to 140°F (0 to 60°C)
Humidity: 5 to 95%RH non-condensing

Enclosure Material and Rating:
ABS Plastic, UL94 V-0

Agency: RoHS



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Voltage Output Module (VOM)

Wireless System

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

°F TEMPERATURE PART NUMBERS **List Price**

BA/VOM-BLE-05-C-F-EZ: Voltage Output Module, 0 to 5V Output, 50 to 90ºF Range $150
BA/VOM-BLE-05-D-F-EZ: Voltage Output Module, 0 to 5V Output, 55 to 85ºF Range $150
BA/VOM-BLE-05-E-F-EZ: Voltage Output Module, 0 to 5V Output, 60 to 80ºF Range..... $150
BA/VOM-BLE-05-F-F-EZ: Voltage Output Module, 0 to 5V Output, 65 to 80ºF Range..... $150
BA/VOM-BLE-05-G-F-EZ: Voltage Output Module, 0 to 5V Output, 45 to 96ºF Range $150
BA/VOM-BLE-05-H-F-EZ: Voltage Output Module, 0 to 5V Output, -20 to 120ºF Range $150
BA/VOM-BLE-05-KK-F-EZ: Voltage Output Module, 0 to 5V Output, 32 to 185ºF Range..... $150
BA/VOM-BLE-05-MM-F-EZ: Voltage Output Module, 0 to 5V Output, -40 to 140ºF Range..... $150

BA/VOM-BLE-10-C-F-EZ: Voltage Output Module, 0 to 10V Output, 50 to 90ºF Range $150
BA/VOM-BLE-10-D-F-EZ: Voltage Output Module, 0 to 10V Output, 55 to 85ºF Range $150
BA/VOM-BLE-10-E-F-EZ: Voltage Output Module, 0 to 10V Output, 60 to 80ºF Range..... $150
BA/VOM-BLE-10-F-F-EZ: Voltage Output Module, 0 to 10V Output, 65 to 80ºF Range..... $150
BA/VOM-BLE-10-G-F-EZ: Voltage Output Module, 0 to 10V Output, 45 to 96ºF Range $150
BA/VOM-BLE-10-H-F-EZ: Voltage Output Module, 0 to 10V Output, -20 to 120ºF Range $150
BA/VOM-BLE-10-KK-F-EZ: Voltage Output Module, 0 to 10V Output, 32 to 185ºF Range..... $150
BA/VOM-BLE-10-MM-F-EZ: Voltage Output Module, 0 to 10V Output, -40 to 140ºF Range..... $150

°C TEMPERATURE PART NUMBERS

BA/VOM-BLE-05-C-C-EZ: Voltage Output Module, 0 to 5V Output, 10 to 32ºC Range..... $150
BA/VOM-BLE-05-D-C-EZ: Voltage Output Module, 0 to 5V Output, 13 to 30ºC Range..... $150
BA/VOM-BLE-05-E-C-EZ: Voltage Output Module, 0 to 5V Output, 15 to 27ºC Range..... $150
BA/VOM-BLE-05-F-C-EZ: Voltage Output Module, 0 to 5V Output, 18 to 27ºC Range..... $150
BA/VOM-BLE-05-G-C-EZ: Voltage Output Module, 0 to 5V Output, 7 to 35ºC Range $150
BA/VOM-BLE-05-H-C-EZ: Voltage Output Module, 0 to 5V Output, -29 to 49ºC Range $150
BA/VOM-BLE-05-KK-C-EZ: Voltage Output Module, 0 to 5V Output, 0 to 85ºC Range..... $150
BA/VOM-BLE-05-MM-C-EZ: Voltage Output Module, 0 to 5V Output, -40 to 60ºC Range..... $150

BA/VOM-BLE-10-C-C-EZ: Voltage Output Module, 0 to 10V Output, 10 to 32ºC Range..... $150
BA/VOM-BLE-10-D-C-EZ: Voltage Output Module, 0 to 10V Output, 13 to 30ºC Range..... $150
BA/VOM-BLE-10-E-C-EZ: Voltage Output Module, 0 to 10V Output, 15 to 27ºC Range..... $150
BA/VOM-BLE-10-F-C-EZ: Voltage Output Module, 0 to 10V Output, 18 to 27ºC Range.....$150
BA/VOM-BLE-10-G-C-EZ: Voltage Output Module, 0 to 10V Output, 7 to 35ºC Range $150
BA/VOM-BLE-10-H-C-EZ: Voltage Output Module, 0 to 10V Output, -29 to 49ºC Range $150
BA/VOM-BLE-10-KK-C-EZ: Voltage Output Module, 0 to 10V Output, 0 to 85ºC Range.....$150
BA/VOM-BLE-10-MM-C-EZ: Voltage Output Module, 0 to 10V Output, -40 to 60ºC Range.....$150

HUMIDITY PART NUMBERS:

BA/VOM-BLE-05-M-EZ: Voltage Output Module, 0 to 5V Output, 0 to 100%RH.....$150
BA/VOM-BLE-05-N-EZ: Voltage Output Module, 0 to 5V Output, 35 to 70%RH $150
BA/VOM-BLE-10-M-EZ: Voltage Output Module, 0 to 10V Output, 0 to 100%RH.....$150
BA/VOM-BLE-10-N-EZ: Voltage Output Module, 0 to 10V Output, 35 to 70%RH $150

Note: *Custom Ranges are available. Call BAPI for details.*

Setpoint Output Module (SOM)

Wireless System

Rev. 06/18/25

Overview

The Setpoint Output Module (SOM) converts the Setpoint data from the BAPI Receiver into a Resistance or Voltage for the BAS controller.

The SOM receives data from the receiver through a four-wire bus. Up to 127 different Analog Output Modules can be connected to a single receiver to send multiple variables to the controller.

The Setpoint Output Module is easily trained to a single sensor setpoint with a pushbutton and LED. The SOM is surface, 2.75” snaptrack or 35mm DIN rail mountable.

The units are available with an occupancy override signal in parallel with the setpoint output. For resistance output units, the resistance goes to 0Ω briefly when the override button is pressed. For voltage output units, the voltage goes to 0V briefly when the override button is pressed.

The SOM is powered by the receiver. Optionally, the SOM may be powered separately when the Pluggable Terminal Block Kit is used for remote connections.

Setpoint Output Module - SOM



5 YEAR WARRANTY



Receiver with two Analog Output Modules

Specifications

Supply Power:
15 to 24 VDC (from half-wave rectified supply)

Power Consumption:
Resistance Models: 20 mA @ 24 VDC
Voltage Models: 25 mA @ 24 VDC

Output Current: 2.5 mA @ 4KΩ load

Analog Input Bias Voltage:
10 VDC max (Resistance Output Models only)

Lost Comm. Timeout: 35 min. (Fast Flash)
Reverts to its last command

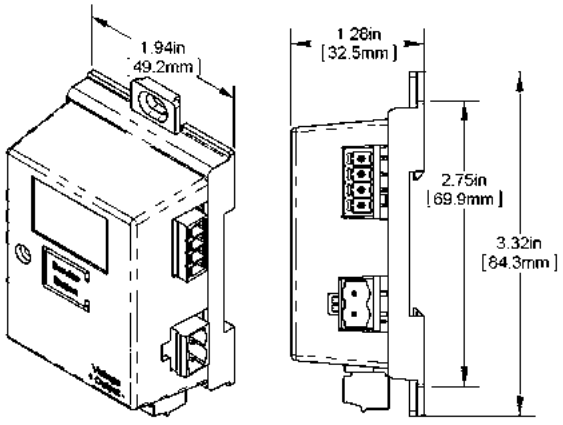
Bus Cable Distance:
4,000 ft with shielded, twisted pair cable

Output Resolution:
Resistance Output: 100Ω
Voltage Output: 150 µV

Environmental Operation Range:
Temp: 32 to 140°F (0 to 60°C)
Humidity: 5 to 95% RH non-condensing

Material & Rating:
ABS Plastic, UL94 V-0

Agency: RoHS



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Setpoint Output Module (SOM)

Wireless System

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

VOLTAGE OUTPUT UNIT		**List Price**
BA/SOM-BLE-00-EZ	Setpoint Output Module, 0 to 5V Output	$150
BA/SOM-BLE-02-EZ	Setpoint Output Module, 3.7 to 0.85V Output	$150
BA/SOM-BLE-04-EZ	Setpoint Output Module, 4.2 to 1.2V Output	$150
BA/SOM-BLE-10-EZ	Setpoint Output Module, 0 to 10V Output	$150
BA/SOM-BLE-11-EZ	Setpoint Output Module, 2 to 10V Output	$150

RESISTANCE OUTPUT UNITS

BA/SOM-BLE-60-EZ	Setpoint Output Module, 0 to 10KΩ Output	$150
BA/SOM-BLE-80-EZ	Setpoint Output Module, 0 to 20KΩ Output	$150
BA/SOM-BLE-81-EZ	Setpoint Output Module, 4.75K to 24.75KΩ Output	$150
BA/SOM-BLE-82-EZ	Setpoint Output Module, 6.19K to 26.19KΩ Output	$150
BA/SOM-BLE-83-EZ	Setpoint Output Module, 7.87K to 27.87KΩ Output	$150

UNITS WITH OVERRIDE IN PARALLEL WITH SETPOINT

VOLTAGE OUTPUT UNITS (Output goes to 0V briefly when Override is pressed)

BA/SOM-BLE-00-EZ-O	Setpoint Output Module, 0 to 5V Output	$150
BA/SOM-BLE-02-EZ-O	Setpoint Output Module, 3.7 to 0.85V Output	$150
BA/SOM-BLE-04-EZ-O	Setpoint Output Module, 4.2 to 1.2V Output	$150
BA/SOM-BLE-10-EZ-O	Setpoint Output Module, 0 to 10V Output	$150
BA/SOM-BLE-11-EZ-O	Setpoint Output Module, 2 to 10V Output	$150

RESISTANCE OUTPUT UNITS (Output goes to 0Ω briefly when Override is pressed)

BA/SOM-BLE-60-EZ-O	Setpoint Output Module, 0 to 10KΩ Output	$150
BA/SOM-BLE-80-EZ-O	Setpoint Output Module, 0 to 20KΩ Output	$150
BA/SOM-BLE-81-EZ-O	Setpoint Output Module, 4.75K to 24.75KΩ Output	$150
BA/SOM-BLE-82-EZ-O	Setpoint Output Module, 6.19K to 26.19KΩ Output	$150
BA/SOM-BLE-83-EZ-O	Setpoint Output Module, 7.87K to 27.87KΩ Output	$150

Note: *Custom Ranges are available. Call BAPI for details.*

Pluggable Terminal Blocks

Analog Output Modules (AOMs) plug into each other and the receiver as shown above. However, the AOMs may also be mounted remotely using the optional Pluggable Terminal Block Connectors which are available as a 4-connector kit.

PART NUMBER:

BA/AOM-CONN ..Pluggable Terminal Block Kit for AOMs



Optional Pluggable Terminal Block Kit for AOMs (4 Connectors)

Relay Output Module (RYOM)

Wireless System

Rev. 04/28/25

Overview

The Relay Output Module (RYOM) converts the data from the wireless receiver into a solid state switch closure for the BAS controller.

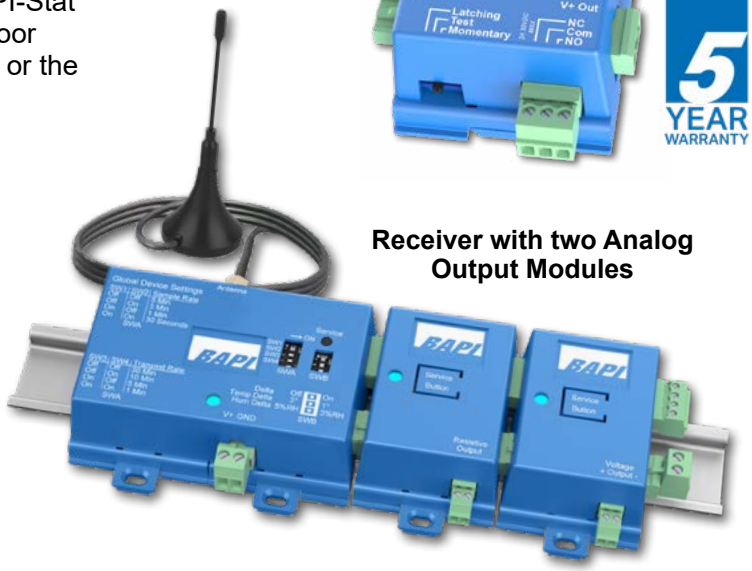
The RYOM is a customer-configured momentary or latching output relay. It can be trained to various BLE wireless sensors such as the override on the BAPI-Stat "Quantum" room sensor, the magnetic door switch on the BAPI-Stat "Quantum Slim" or the output of the water leak detector.

The RYOM receives data from the receiver through a four-wire bus. Up to 127 different Analog Output Modules can be connected to a single receiver to send multiple variables to the controller. The unit is surface, 2.75" snaptrack or 35mm DIN rail mountable.

The module is powered by the receiver. Optionally, the RYOM may be powered separately when the Pluggable Terminal Block Kit is used for remote connections.

Relay Output Module - RYOM





Receiver with two Analog Output Modules

ORDERING INFO: **List Price**

BA/RYOM-BLE-EZ: Relay Output Module.....$?????

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Specifications

Supply Power:
15 to 24 VDC (from half-wave rectified supply)

Power Consumption:
20 mA @ 24 VDC, 1.55 VA @ 24 VAC

Relay Output:
30VDC, 2 A max.
Off state leakage current 1 uA max.
On state resistance 15Ω max.

Operation:
Momentary: 5 second momentary actuation
Latching: Latching actuation

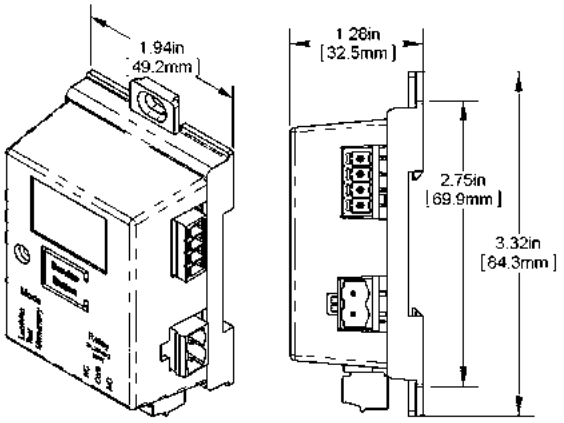
Lost Comm. Timeout: 35 min. (Fast Flash)
Reverts to its last command

Bus Cable Distance:
4,000 ft with shielded, twisted pair cable

Environmental Operation Range:
Temp: 32 to 140°F (0 to 60°C)
Humidity: 5 to 95% RH non-condensing

Material & Rating: ABS Plastic, UL94 V-0

Agency: RoHS



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BACnet MS/TP or Modbus RTU Module

F35

Rev. 06/20/25

Wireless System

Overview

The BACnet MS/TP or Modbus RTU Output Module converts the data from up to 28 wireless sensors for integration into the RS-485 field communication network.

The field-selectable BACnet MS/TP or Modbus RTU output lets customers choose the best protocol for their system without the need for multiple devices. This makes the module perfect for retrofitting older systems or adding new ones.

The module receives the data and power from the receiver through a four-wire bus. The module may also be powered separately using a BAPI Pluggable Terminal Block Kit and a VC350A-EZ power supply.

Configuration is quick and easy with the USB-C port and a computer running the downloadable application.

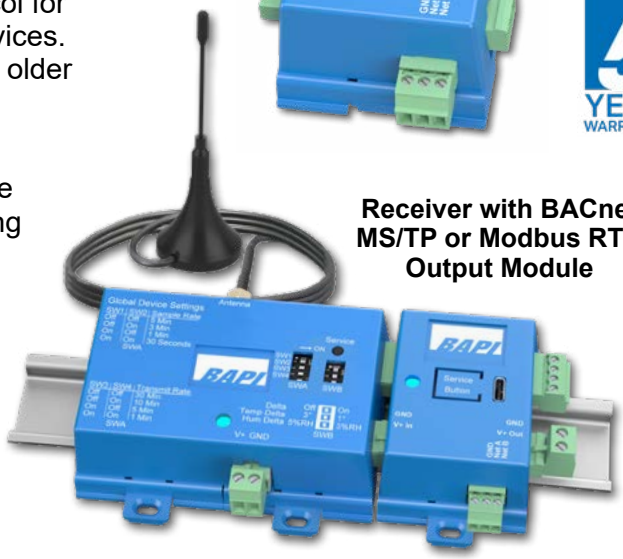
The receiver and module are surface, 2.75” snaptrack or 35mm DIN rail mountable.

BACnet MS/TP or Modbus RTU Output Module



5 YEAR WARRANTY

Receiver with BACnet MS/TP or Modbus RTU Output Module



ORDERING INFO: **List Price**

BA/DOM-BLE-EZ: Field Selectable BACnet MS/TP or Modbus RTU Output Module..... $285

Submittal sheets without List Prices are available on our website at www.bapihvac.com

Specifications

Supply Power:
15 to 24 VDC (from half-wave rectified supply)

Power Consumption:
40 mA max @ 24 VDC

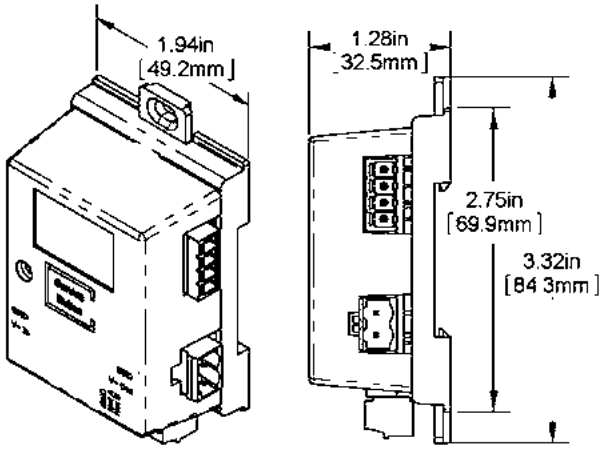
Lost Comm. Timeout:
35 minutes

Bus Cable Distance:
4,000 feet (1,200 meters)

Environmental Operation Range:
Temp: 32 to 140°F (0 to 60°C)
Humidity: 5 to 95% RH non-condensing

Enclosure Material & Rating:
ABS Plastic, UL94 V-0 (Indoor use only)

Agency:
RoHS (CE pending)



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BACnet IP Module

Wireless System

Rev. 06/20/25

Overview

The BACnet IP Output Module converts the data from up to 28 wireless sensors for integration into the BMS ethernet communication network.

Because BACnet IP is a standard protocol, the module is perfect for retrofitting older systems or adding new ones.

The module receives the data and power from the receiver through a four-wire bus. The module may also be powered separately using a BAPI Pluggable Terminal Block Kit and a VC350A-EZ power supply.

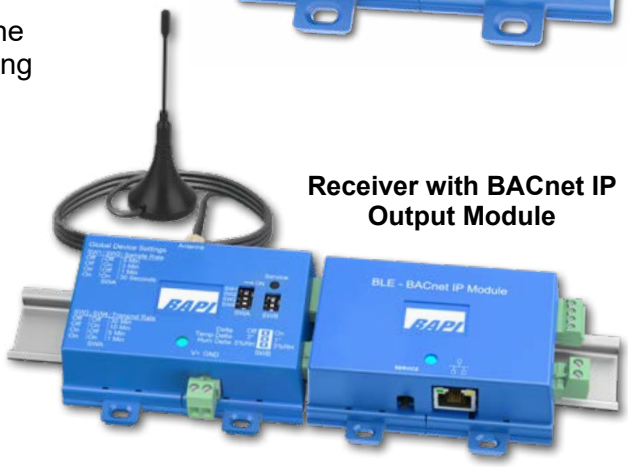
Configuration is quick and easy through a web-based interface, allowing both setup and adjustment without physically accessing the device once it's installed.

The receiver and BACnet IP module are surface, 2.75" snaptrack or 35mm DIN rail mountable.

BACnet IP Output Module



Receiver with BACnet IP Output Module



ORDERING INFO: **List Price**

BA/BIP-BLE-EZ: BACnet IP Output Module.....$285

Submittal sheets without List Prices are available on our website at www.bapihvac.com

5 YEAR WARRANTY

Specifications

Supply Power:
15 to 24 VDC (from half-wave rectified supply)

Power Consumption:
40 mA max @ 24 VDC

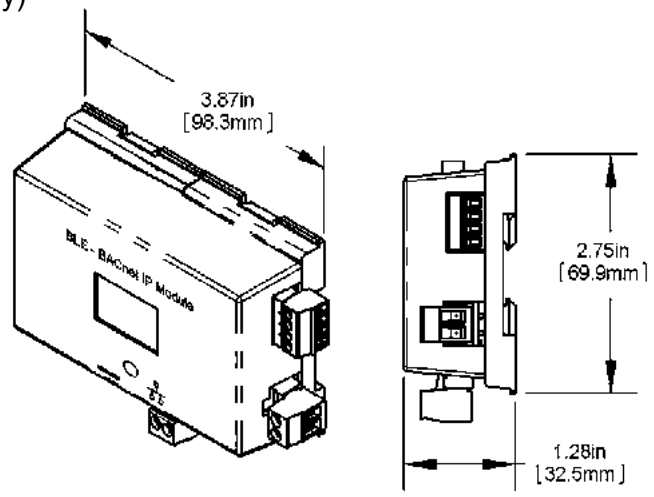
Lost Comm. Timeout:
35 minutes

Ethernet Standard:
10/100BASE-TX

Environmental Operation Range:
Temp: 32 to 140°F (0 to 60°C)
Humidity: 5 to 95% RH non-condensing

Material & Rating:
ABS Plastic, UL94 V-0 (Indoor use only)

Agency:
RoHS (CE pending)



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Replacement Batteries for Wireless Sensors

Rev. 08/23/23

Wireless System

Features & Options

BA/LI14505
The BA/LI14505 Lithium AA battery is the ideal replacement for all BAPI Bluetooth Low Energy wireless sensors (except the Wireless Food Probe). Each unit takes two batteries, except the BAPI-Stat "Quantum Slim" which takes only one battery.

BA/BAT-5AA-HIT
The BA/BAT-5AA-HIT High Temperature Lithium ½AA battery is the ideal replacement for the BAPI Bluetooth Low Energy Wireless Food Probe sensor. Each food probe takes one battery.



BA/LI14505
(for all BAPI Wireless Sensors except the Wireless Food Probe)



BA/BAT-5AA-HIT
(for Wireless Food Probe)

PART NUMBER	DESCRIPTION
BA/LI14505	Lithium AA Battery, 3.6V, for all BAPI Bluetooth Low Energy Wireless sensors except the Wireless Food Probe ..... $3 (Net price)
BA/BAT-5AA-HIT	Lithium ½AA Battery, 3.6V, for the BAPI Bluetooth Low Energy Wireless Food Probe .....$6 (Net Price)

Specifications

BA/LI14505 Battery
Type & Size: Lithium, AA
Nominal Voltage: 3.6V
Nominal Capacity: 2.6 Ah @1mA, to 2V
Operation Temp:
-67 to 185°F (-55 to 85°C)
0 to 95 %RH Non-Condensing
Agency: RoHS

BA/BAT-5AA-HIT Battery
Type & Size: Lithium (High Temp), ½AA
Nominal Voltage: 3.6V
Nominal Capacity: 0.9 Ah @ 1mA, to 2V
Operating Temp:
-67 to 257°F (-55 to 125°C)
0 to 95 %RH Non-Condensing
Agency: RoHS

Pluggable Terminal Blocks Kit

Wireless System

Features & Options

Analog Output Modules (AOMs) plug into each other and the receiver as shown above. However, the AOMs may also be mounted remotely using the optional Pluggable Terminal Block Connectors which are available as a 4-connector kit.

PART NUMBER:		List Price
BA/AOM-CONN	..Pluggable Terminal Block Kit.....	$15



Optional Pluggable Terminal Block Kit for AOMs (4 Connectors)

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F38 Water Leak and Temp/Humidity Sensor

Wireless System

Rev. 04/29/25

Features & Options

- Attached, remote and remote rope sensor options
- User adjustable detection sensitivity and other settings
- Optional audible and visual alarm
- Onboard memory
- Transmits to a digital Gateway or a wireless-to-analog Receiver

The Water Leak Detector senses the presence of water and alerts a central monitoring system of the potentially destructive situation. The unit transmits the data via Bluetooth Low Energy to a receiver or gateway.

The unit also measures the temperature and humidity at the BAPI-Box location.



5 YEAR WARRANTY

Specifications

Battery Power: Two included 3.6 V 14505, 14500 or equivalent lithium batteries
(Note: Standard AA batteries are not compatible)

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

Temp Measurement Range: -4 to 221°F (-20 to 105°C)

Sensor Adjustment Depth:
Attached Sensor: 0.063 to 0.84" (1.60 to 21.34mm)
Remote Sensor: 0.062 to 0.5" (1.57 to 12.70mm)

Rope Sensor Specifications:
Plenum-rated sensor cable, detects at 1/8" (3mm) of water

Transmission Distance: Varies by application*

Environmental Operation Range:
BAPI-Box Unit Temp: -4 to 149°F (-20 to 65°C)
Remote Sensor Temp: -20 to 185ºF (-29 to 85ºC)
Remote Rope Sensor Temp: 32 to 167ºF (0 to 75ºC)
Humidity: 10 to 90%RH, non-condensing

Enclosure Rating, Material & Material Rating:
IP66, UV-Resistant Polycarb., UL94 V-0 (Indoor use only)

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: 30 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 /
Contains FCC ID: QOQGM210P /
IC: 5123A-GM210P

BAPI-Box Units 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

*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.

***The available transmit intervals and sample intervals are different depending on whether the system is using a gateway or a receiver.

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Water Leak and Temp/Humidity Sensor

Wireless System

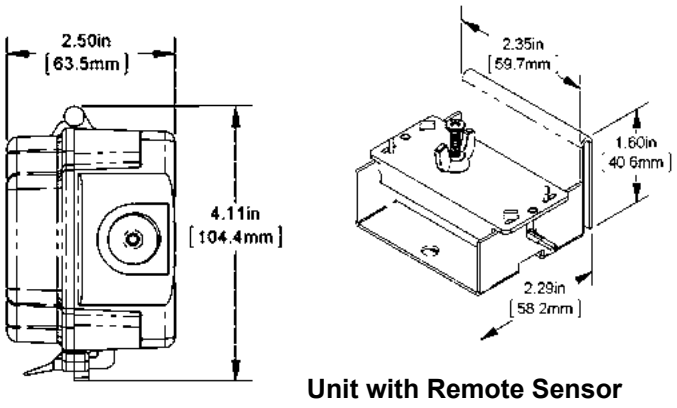
Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

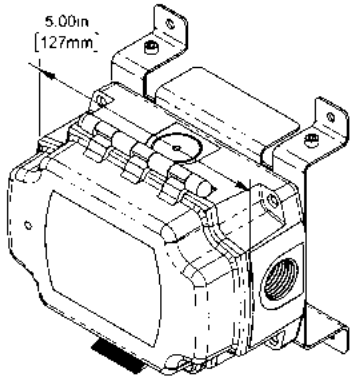
PART NUMBERS		List Price
BA/LDT-BLE-PS	Attached Sensor built into the enclosure	
BA/LDT-BLE-RS5	Remote Sensor with 5' (1.5m) FEP cable	
BA/LDT-BLE-RS10	Remote Sensor with 10' (3m) FEP cable	
BA/LDT-BLE-RS25	Remote Sensor with 25' (7.6m) foot FEP cable	
BA/LDT-BLE-RR10	Remote Rope Sensor with 10' (3m) plenum-rated cable	
BA/LDT-BLE-RR25	Remote Rope Sensor with 25' (7.6m) plenum-rated cable	
BA/LDT-BLE-RR50	Remote Rope Sensor with 50' (15m) plenum-rated cable	
BA/LDT-BLE-RR100	Remote Rope Sensor with 100' (30m) plenum-rated cable	
BA/LDT-RR-MB	Mounting Bracket for Rope Sensor (Pack of 25)	$110

Gray shaded items follow the Buy and Resale Multiplier.

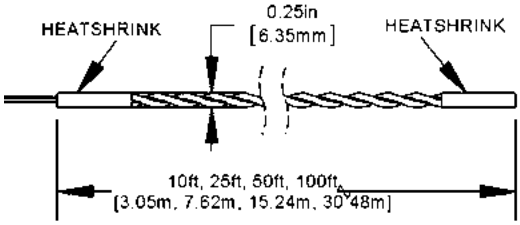
Dimensions



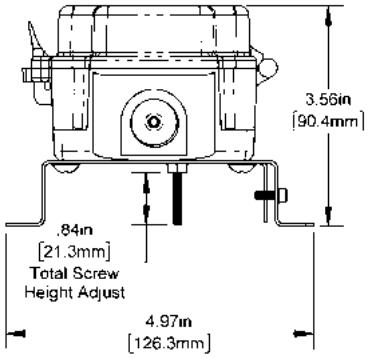
Unit with Remote Sensor



Unit with Attached Sensor



Unit with Remote Sensor



Associated Receiver and Gateway

Receiver (Wireless-to-Analog) - 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.

Gateway - Receives the data from one or more wireless sensors. The Gateway then provides the data to the cloud via MQTT.



Receiver & Output Modules



Gateway

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F40 WAM - Wireless Asset Monitoring

Wireless System

Rev. 11/13/14

Features & Options

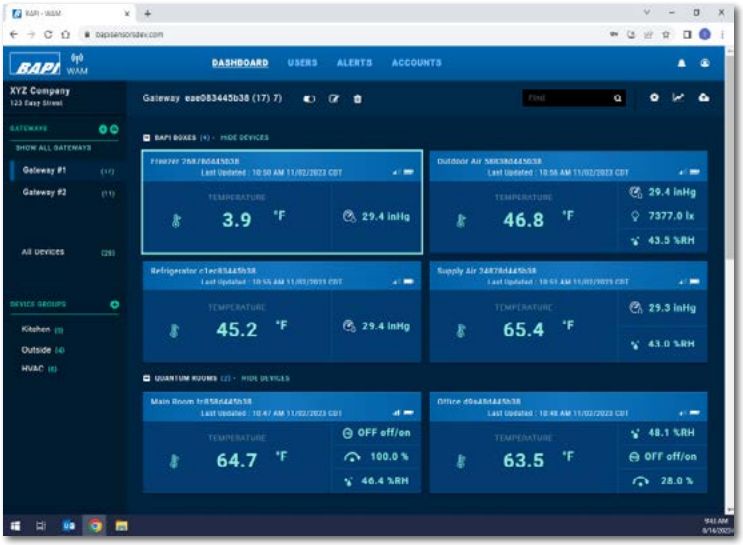
- Remote monitoring of your important assets
- Works with all of BAPI's BLE wireless sensors
- Password protected with live data, trending and easy-to-navigate screens
- Configurable alerts with text and email notifications
- Easily created reports and data export



The Wireless Asset Monitoring (WAM) Website lets you monitor your temperature or humidity sensitive assets with any smart device or computer. The website is password protected and works with all of BAPI's BLE wireless sensors.

The wireless sensors send their data to a BAPI gateway which sends it to the cloud and the WAM Website using your local wi-fi network. Alert parameters – such as high or low temperatures or humidity levels – can be added to each sensor through the website with text or email alert notifications of potential problems.

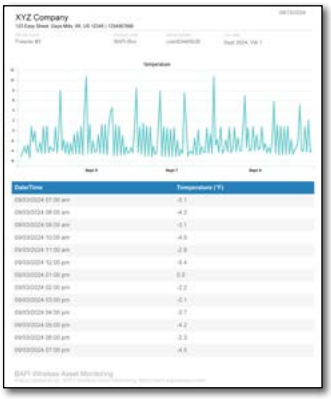
Besides providing peace of mind, WAM can increase efficiency by eliminating the need for hand recording of temperatures for HACCP reports or other safety regulations.



A live system is available for interaction at "Website URL when available". Enter the User name "bapidemo" and password "bapidemo".

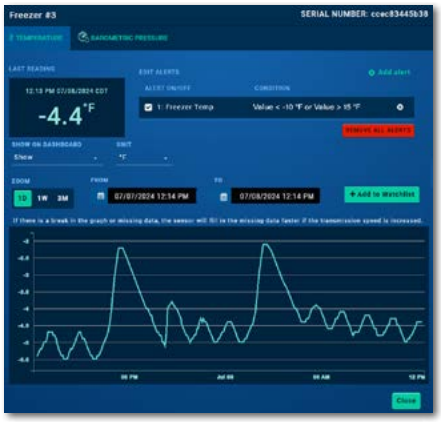
Live Readings

The live readings from all the sensors in your system are available on the Dashboard screen for easy viewing.



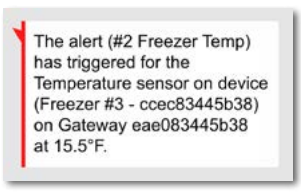
Easy Reports

Data is easily exported as a .pdf or .csv report for HACCP or food safety requirements.



Historical Trends

View the historical trend for any sensor with a single click.



Alert Notifications

Text or email alert notifications of potential problems.

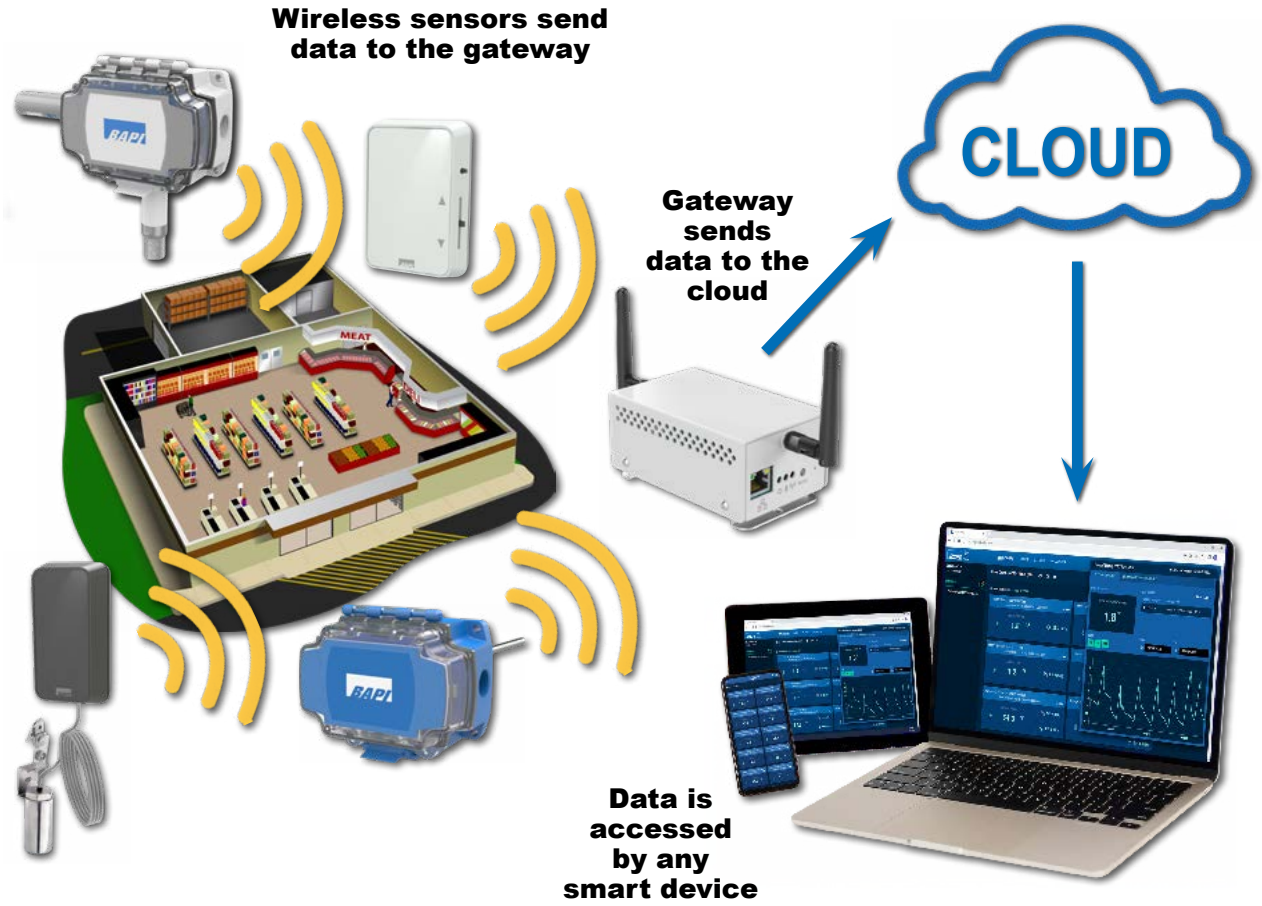
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Ordering Information

Pricing is based on the number of sensors in the system and the number of data transmissions per hour. Call for pricing on all plans.

Part Number	Description
BA/WAM-32-1	....Basic Level For locations with a smaller number of sensors and at least 15 minutes between data transmissions from each sesnsor. Maximum number of data transmission per hour = 12
BA/WAM-32-2	....Urgent Level For locations with a medium number of sensors and at least 5 minutes between data transmissions from each sesnsor. Maximum number of data transmission per hour = 60
BA/WAM-32-3	....Critical Level For locations with a larger number of sensors and at least 30 seconds between data transmissions from each sesnsor. Maximum number of data transmission per hour = 360

WAM – How does it work?



F42 Air Quality Gas Sensor, Duct or Rough Service

Wireless System

CE Rev. 06/21/23

Features & Options

- Individual or Select Combination CO_2, VOCs, CO, NO_2, Particulate Matter, Temperature and Humidity
- Duct Mount or Wall Mount for Rough Service Areas

BAPI's Wireless Air Quality Gas Sensor measures CO_2, VOC, CO, NO_2, Particulate Matter, Temperature and Humidity, either individually or in select combinations, and transmits the data via Bluetooth Low Energy to a receiver or gateway.

The CO_2 sensor is designed for both periodically or continuously occupied areas with a measurement range of 0 to 2,000 ppm. The VOC sensor outputs a CO_2 equivalent (CO2E) value of 0 to 2,000 ppm, or a total VOC (TVOC) value of 0 to 2,500 ppb.

The CO unit has a measurement range of 0 to 500 ppm and the NO_2 unit has a measurement range of 0 to 10 ppm. The Particulate Matter sensor measures in the PM2.5 (≤ 2.5 micrometers) range.



Specifications

Power: 12 to 30 VAC/VDC

Operating Environment:
32 to 122°F (0 to 50°C)
0 to 95%RH intermittent, 15 to 95%RH continuous

Enclosure Material: Polycarbonate, UL94 V-O

Duct Mount Unit Enclosure Rating: NEMA 4, IP66

Accuracy:
CO_2: 400 to 1,000 ppm: ±75 ppm
>1,000 ppm: ±10% of reading

CO: <200 ppm: ±3% FS, 32 to 122°F (0 to 50°C)
201 to 500 ppm: ±5% FS, 50 to 122°F (10 to 50°C)

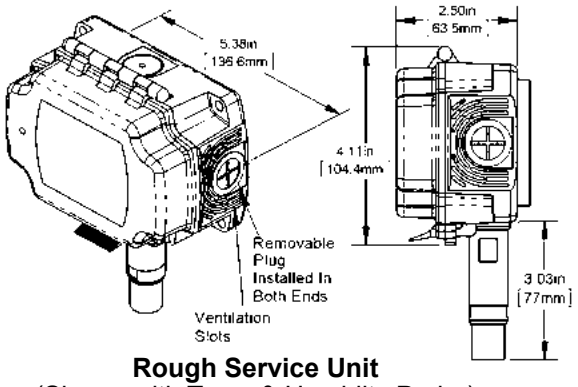
PM: 0 to 100 µg/m³: ±15 µg/m³
100 to 1,000 µg/m³: ±15% of reading

NO_2: ±5.0% FS
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

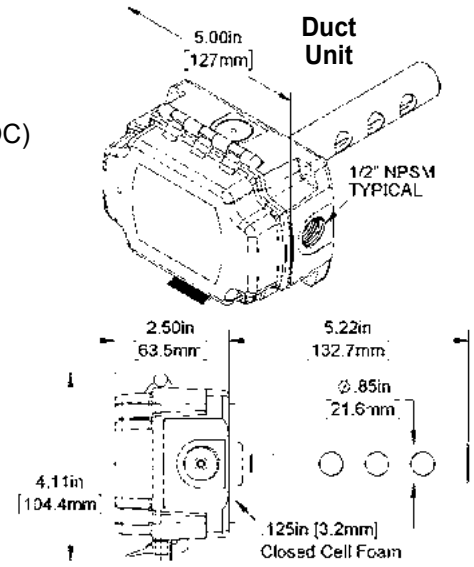
Measurement Range:
VOC: 0 to 2,000 ppm CO_2 equivalent (CO2E) 0 to 2,500 ppb (TVOC)
CO_2: 0 to 2,000 ppm
CO: 0 to 500 ppm
NO_2: 0 to 10 ppm
PM: ≤ 2.5 micrometers (PM2.5)
Temp & Humidity: See "Operating Environment" above

Sensing Element:
VOC: Micro-Machined Metal Oxide
CO_2: Dual Channel Non-Dispersive Infrared (NDIR)
CO and NO_2: Electrochemical
PM: Laser-based, Light Scattering
Temp: Thermistor
Humidity: Capacitive

Agency: RoHS, CE, Title 24 Requirements



Rough Service Unit
(Shown with Temp & Humidity Probe)



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Power Supplies and Voltage Converters

VC350A-EZ 350mA Voltage Converter

pg G2

VC350A 350mA Voltage Converter


PDM - Power Distribution Module

pg G4

VC2000 Voltage Conv.

pg G5

PS17 Power Supplies

pg G6

Water Leak Detector

pgs G8-G11

Door Monitor Alarm (DMA)

pg G12

BAPI-Guard

pg G14

PMPB5 - Pulse Meter Pulse Buffer
TS1 & TS2 - Transient Suppressors

pg G16

FPB - Flexible Probe Bracket

pg G18

BAPI Screwdriver and Allen Wrench

pg G19

Clean Cut Tool for BAPI-Boxes

pg G20

Trim Rings for the BAPI-Stat 4

pg G21

Adaptor Plates for Retrofit Installations

pg G22

Custom Logo Plates


pg G24

Light Level Sensor

pg G25

RJ22 Comm. Jack Adaptor
Security Screws & Spanner Bit

pg G26

Replacement Keys, Foambacks & Humidity filters

pg G27

Sealant Filled Connectors

pg G28

Pierceable Knockout Plugs for Enclosures

pg G29

Replacement Batteries


pg G30

Weather Shade for Outdoor Air Sensors

pg G31

VC350A EZ Voltage Converter

Accessories for HVAC/R

Rev. 05/31/22

Overview

- DIN Rail, Snaptrack or Surface Mount
- Compact & Cost-Effective 350 mA Unit
- Self-resetting Thermal Fuse
- Operation & Fault LED Indicators
- Fixed or Adjustable Outputs
- Output Protected Against Overload and Shorting



VC350A EZ mounted on DIN Rail

BAPI's 350A-EZ is a cost-effective way of converting 24 VAC or VDC to 5, 12, 15 or 24 VDC for use on peripheral devices that require DC voltage. The converter is available with a 350 mA output. The revolutionary mounting system allows for 2.75" snaptrack, DIN rail or surface mounting.

Although most BAPI room units can run on 24 VAC power, converting to DC power eliminates the AC power "noise" which can affect the room sensor readings. BAPI's tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same cable as the signal lines. All fixed outputs of 5, 10, 12 or 15 VDC are adjustable ±10%. The adjustable model has an output of 5 to 24 VDC.

Ordering Information

Part Number	Description	List Price
BA/VC350A-EZ-5	5 VDC Output at 350 mA	$53
BA/VC350A-EZ-10	10 VDC Output at 350 mA	$53
BA/VC350A-EZ-12	12 VDC Output at 350 mA	$53
BA/VC350A-EZ-15	15 VDC Output at 350 mA	$53
BA/VC350A-EZ-ADJ	5 to 24 VDC Adjustable Output at 350 mA	$53

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Output Voltage: 5 to 24 VDC @ 350 mA

Recommended Input Voltage: 18 to 28 VAC, 24 VDC (15 VA)

Input Voltage Limits:

Model of Unit	Minimum (VAC/VDC)	Maximum (VAC/VDC)	Input Current@ Min Input Volts (AC/DC)
5V	5.0/9.0	28.0/35.0	5.2 VA/305 mA
10V	10.0/14.7	28.0/35.0	8.3 VA/315 mA
12V	12.0/16.9	28.0/35.0	9.5 VA/318 mA
15V	15.0/20.5	28.0/35.0	11.2 VA/320 mA
ADJ (24V)	24.0/31.0*	28.0/35.0*	16.7 VA/325 mA*

*These specs are for 24V output. Lower voltage output specs are similar to the fixed model specs above.

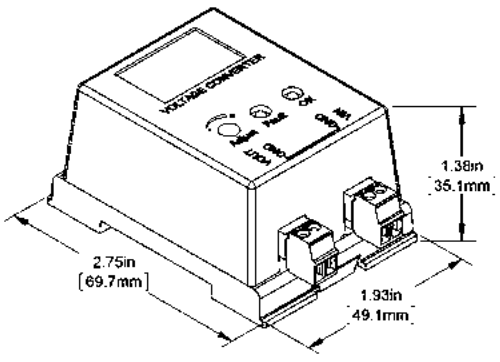
Environmental Operation Range:
0 to 95% RH non-condensing
-40 to 149°F (-40 to 65°C) 350 mA @ any output voltage
-40 to 158°F (-40 to 70°C) 350 mA @ 5 VDC
330 mA @ 10 VDC
280 mA @ 12 VDC
224 mA @ 15 VDC
140 mA @ 24 VDC

Environmental Storage Range:
-40 to 176°F (-40 to 80°C)

Wiring: 4 wires, 16 to 22 gauge

Rectification: Half-Wave Rectified

Grounding:
AC & DC Ground are Common



Note: The VC350A-EZ is a Class 2 circuit when it is powered from a UL Class 2 power supply.

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VC350A Voltage Converter

Accessories for HVAC/R

Overview

- Compact & Cost-Effective 350 mA Unit
- Ruggedized Circuitry, Self-resetting Thermal Fuse, Operation and Fault LEDs
- Fixed or Adjustable Outputs
- Output Protected Against Overload and Shorting



VC350A mounted in optional snaptrack

BAPI's VC350A is a cost-effective way of converting 24 VAC or VDC to 5, 12, 15 or 24 VDC for use on devices that require DC voltage.

Although most BAPI room units can run on 24 VAC power, converting to DC power eliminates the AC power "noise" which can affect the room sensor readings. All fixed outputs of 5, 10, 12 or 15 VDC are adjustable ±10%. The adjustable model has an output of 5 to 24 VDC.

EZ Voltage Converter

BAPI's 350mA EZ Voltage Converter allows for DIN Rail, Snaptrack or surface mounting. (See pg F2.)



Ordering Information

Part Number	Description	List Price
BA/VC350A-5	5 VDC at 350 mA Voltage Converter	$50
BA/VC350A-10	10 VDC at 350 mA Voltage Converter	$50
BA/VC350A-12	12 VDC at 350 mA Voltage Converter	$50
BA/VC350A-15	15 VDC at 350 mA Voltage Converter	$50
BA/VC350A-ADJ	5 to 24 VDC (adj.) at 350 mA Voltage Converter	$50
BA/VC350A-5-TRK	5 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$55
BA/VC350A-10-TRK	10 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$55
BA/VC350A-12-TRK	12 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$55
BA/VC350A-15-TRK	15 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$55
BA/VC350A-ADJ-TRK	5-24 VDC (adj.) at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$55

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Output Voltage: 5 to 24 VDC @ 350 mA

Recommended Input Voltage: 18 to 28 VAC, 24 VDC (15 VA)

Input Voltage Limits:

Model of Unit	Minimum (VAC/VDC)	Maximum (VAC/VDC)	Input Current@ Min Input Volts (AC/DC)
5V	5.0/9.0	28.0/35.0	5.2 VA/305 mA
10V	10.0/14.7	28.0/35.0	8.3 VA/315 mA
12V	12.0/16.9	28.0/35.0	9.5 VA/318 mA
15V	15.0/20.5	28.0/35.0	11.2 VA/320 mA
ADJ (24V)	24.0/31.0*	28.0/35.0*	16.7 VA/325 mA*

*These specs are for 24V output. Lower voltage output specs are similar to the fixed model specs above.

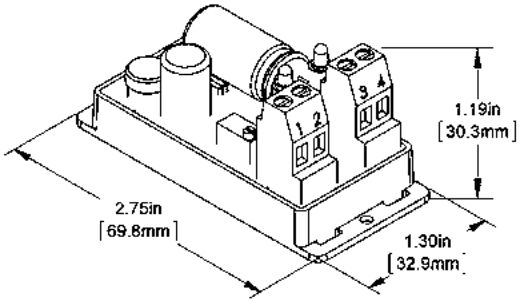
Environmental Operation Range:
0 to 95% RH non-condensing
-40 to 149°F (-40 to 65°C) 350 mA @ any output voltage
-40 to 158°F (-40 to 70°C) 350 mA @ 5 VDC,
330 mA @ 10 VDC,
280 mA @ 12 VDC,
224 mA @ 15 VDC,
140 mA @ 24 VDC

Environmental Storage Range:
-40 to 176°F (-40 to 80°C)

Wiring: 4 wires, 16 to 22 gauge

Rectification: Half-Wave Rectified

Ground: AC & DC Ground are Common



Note: The VC350A is a Class 2 circuit when it is powered from a UL Class 2 power supply.

PDM - Power Distribution Module

Accessories for HVAC/R

Rev. 05/26/21

Features & Options

- 3 or 5 Circuit Power Distribution
- 12 to 30 VAC/VDC Operation
- Master Power Switch w/ 10 Amp Breaker
- Individual Circuit Power Switches
- Individual 3 Amp Circuit Protection
- Power and Fault LEDs



PDM - Power Distribution Module (BA/PDM-5-B)

5 YEAR WARRANTY

The PDM - Power Distribution Module is a low voltage (12 to 30 VAC/VDC) power distribution module designed to take a single power source and distribute that power to multiple circuits. It comes in 3 or 5 circuit models which can be linked together to achieve multiple circuits. A common On/Off switch and 10 amp breaker powers the distributed circuits. Each individual circuit has an On/Off switch, field connection terminals, 3 amp fuse or 3 amp breaker and individual power and fault LEDs.

Ordering Information

Part Number	Description
BA/PDM-5-B	Five circuit Power Distribution Module, with breaker
BA/PDM-3-B	Three circuit Power Distribution Module, with breaker
BA/PDM-5-F	Five circuit Power Distribution Module, with fuse
BA/PDM-3-F	Three circuit Power Distribution Module, with fuse
BA/PDM-5-B-DIN	Five circuit Power Distribution Module, with breaker, DIN mount
BA/PDM-3-B-DIN	Three circuit Power Distribution Module, with breaker, DIN mount
BA/PDM-5-F-DIN	Five circuit Power Distribution Module, with fuse, DIN mount
BA/PDM-3-F-DIN	Three circuit Power Distribution Module, with fuse, DIN mount

Specifications

Supply Voltage: 12 to 30 VAC/VDC, 10 amps max

Circuit Distribution: 3 or 5 circuits

Circuit Protection:
Master Breaker.....10 amp, push to reset
Individual Fuses.....3 amp, slow blow (20mm)
Individual Breakers....3 amp, push to reset

Visual Indicators:
Power .....Green LED, master & individual
Fault.....Red LED, master & individual

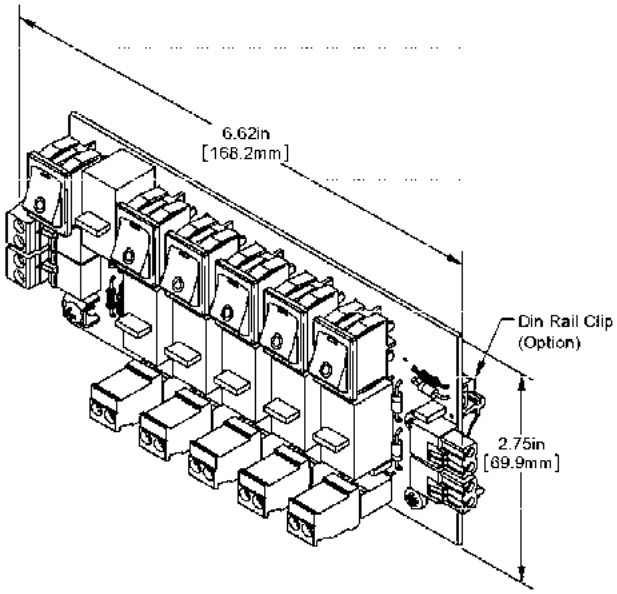
On/Off Switching:
Master.....Common rocker switch
Circuit .....Individual rocker switch

Connection: Plug in terminal strip,
Cage clamp, 28 to 12 AWG

Mounting: 2.75" snaptrack

Ambient: -40 to 158ºF (-40 to 70ºC)

Warranty: 5 years



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Features & Options

- Compact and Cost-Effective
- Regulated and Adjustable 1.2 VDC to 24 VDC Output
- Output Protected Against Overload and Accidental Short Circuit

BAPI's VC2000 Voltage Converters are accurate, rugged and reliable power sources designed for commercial energy management applications.

The 2 Amp Voltage Converter accepts a 24 VAC input which can be field adjusted to a regulated output of 1.2 VDC to 24 VDC (factory set for 24 VDC). The input can be field configured for full or half wave rectification. The unit includes an output fuse to protect against overload and short circuits, a power indication LED, and is available with or without a backplate on the steel mounting bracket. Self-resetting or cartridge fuses may be specified at the time of order.



VC2000 with backplate and cartridge fuse

5 YEAR WARRANTY

Ordering Information

Part Number	Description	List Price
BA/VC2A-F	Converter without backplate, cartridge fuse	$120
BA/VC2A-P	Converter without backplate, self-resetting fuse	$120
BA/VC2B-F	Converter with backplate, cartridge fuse	$120
BA/VC2B-P	Converter with backplate, self-resetting fuse	$120

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Input Voltage Range: 24 VAC (100 VA)

Fuse Protection: 4 Amp, output side

Output Voltage Range: 1.2 VDC to 24 VDC

Maximum Output Current: 2.0 Amps

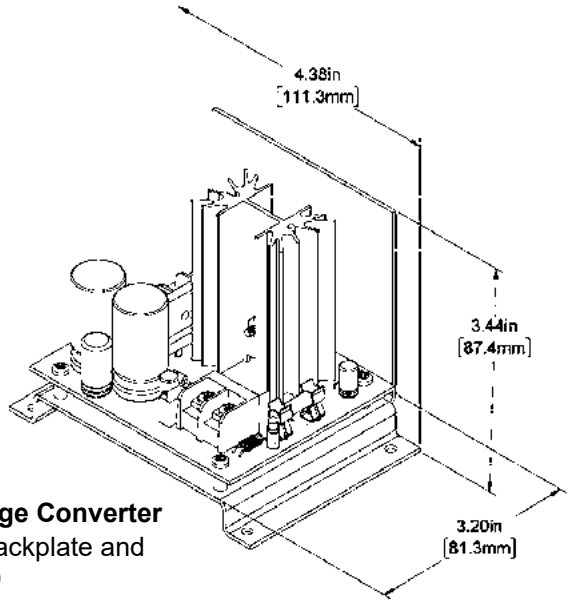
Operating Range: -40 to 158ºF (-40 to 70ºC)

Rectification: Field Selectable as Full or Half Wave

Wiring: 16 to 22 AWG

Warranty: 5 years

Note: The VC2000 is a Class 2 circuit when it is powered from a UL Class 2 power supply.



VC2000 Voltage Converter
(shown with backplate and cartridge fuse)

PS17RF, PS18RF & PS19RF - Power Supplies

Accessories for HVAC/R

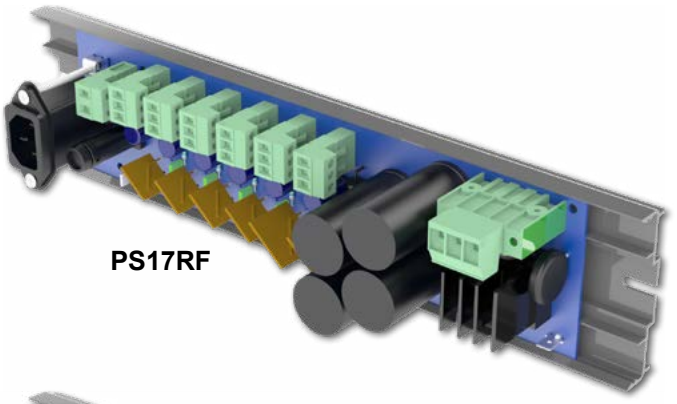
Rev. 5/26/21

Overview

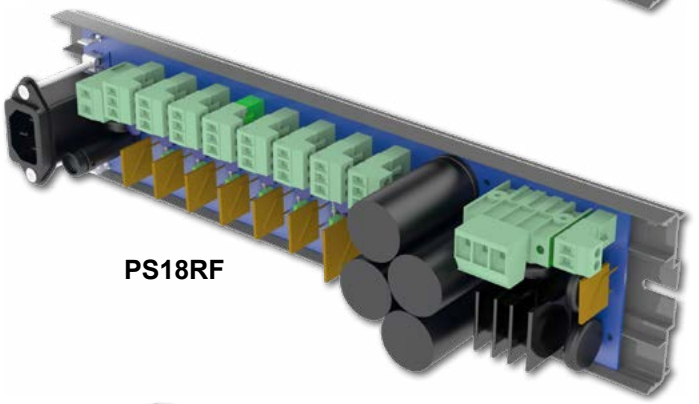
The PS17RF, PS18RF and PS19RF Power Supplies provide multiple 33 VDC* outputs with over-current protection to operate any of BAPI's ETA modules except the RS-485 communication modules. All power supplies are furnished with standard 2.75" snaptrack and include a green LED to indicate when power is supplied to the unit.

The power supplies use a customer-supplied 24 VAC* transformer with a rating of 200 to 600 VA depending upon current consumption (See transformer info below). Pluggable screw terminals allow easy termination of the transformer.

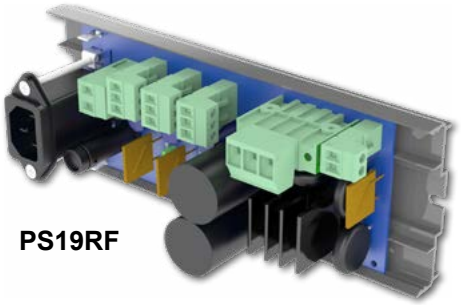
All three units provide a transient line filter for the line voltage input to the transformer. Plug a standard computer power cord into a duplex outlet and then into the line filter to power the units.



PS17RF



PS18RF



PS19RF

5 YEAR WARRANTY

All units shown in the supplied 2.75" snaptrack

Specifications

Input Power
120 to 240 VAC; Amps depend on transformer selected. Standard IEC 320 Line Filter

Output Voltage
Nominal 33 VDC* (using 24 VAC transformer)

PS17RF Outputs (Nominally-Rated)
6 Outputs: Four at 2.5 Amps, two at 3.75 Amps

PS18RF Outputs (Nominally-Rated)
8 Outputs: Six at 2.5 Amps, two at 3.75 Amps

PS19RF Outputs (Nominally-Rated)
3 Outputs: Two at 2.5 Amps, one at 3.75 Amps

Warranty: 5 years

CUSTOMER SUPPLIED TRANSFORMER SPECS

Unit Model	Transformer Power
PS19RF	Nominal 200 VA
PS17RF	Nominal 400 VA
PS18RF	Nominal 600 VA

*The VDC output voltage from the unit is dependent on the VAC input voltage. Generally the output will equal 1.4 times the input.

9 VAC input = 12 VDC output
18 VAC input = 24 VDC output
20 VAC input = 28 VDC output
24 VAC input = 33 VDC output

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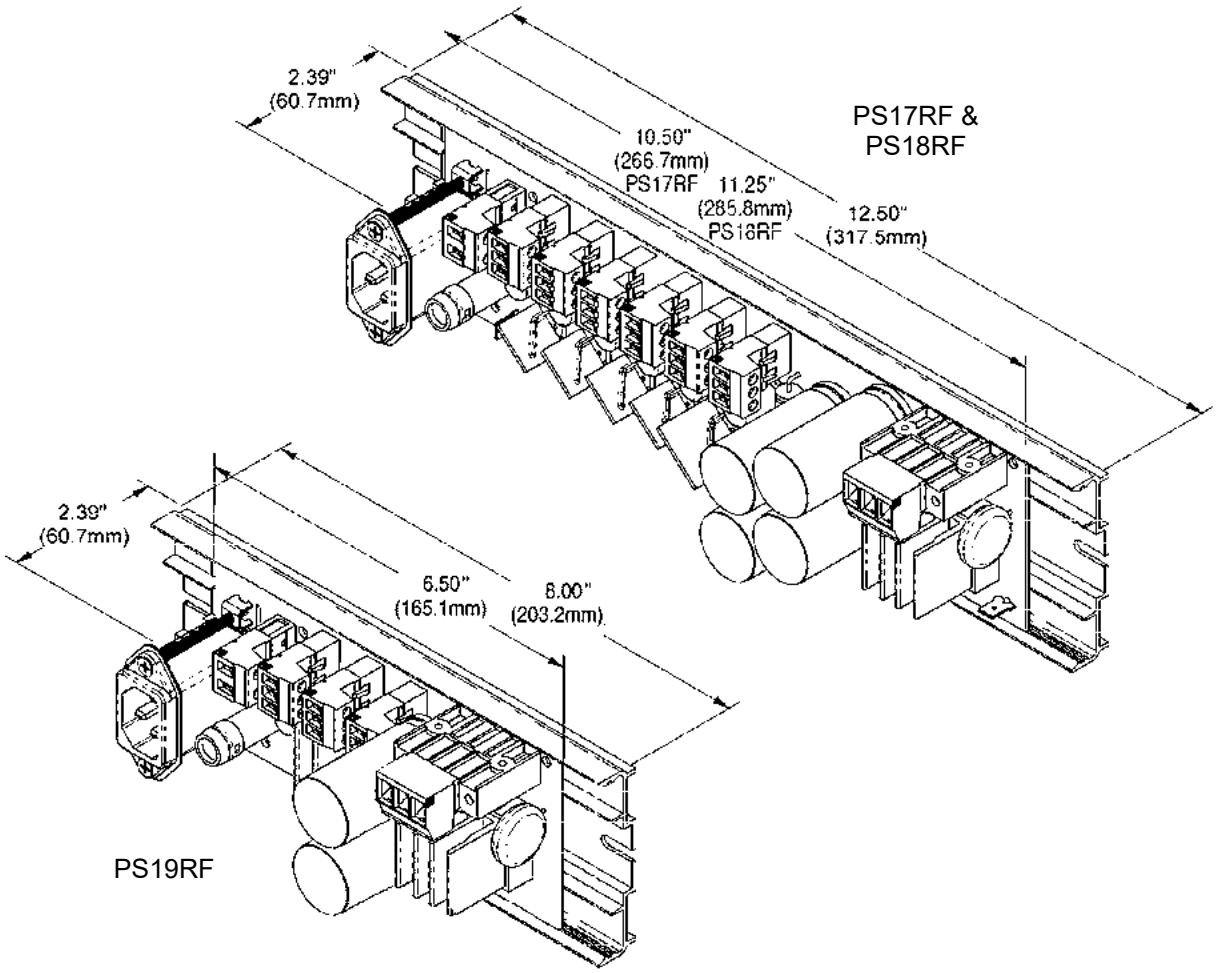
Ordering Information

Part Number	Description	List Price
BA/PS17RF	6 Output Unit with Self-Resetting Fuses	$303
BA/PS18RF	8 Output Unit with Self-Resetting Fuses	$413
BA/PS19RF	3 Output Unit with Self-Resetting Fuses	$265
BA/PWR-CORD-18”	18” Power Cord for PS17 Power Supply	$25
BA/PWR-CORD-36”	36” Power Cord for PS17 Power Supply	$25

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Gray shaded items follow the Buy and Resale Multiplier.

Dimensions



Water Leak Detector – 5 Amp Relays

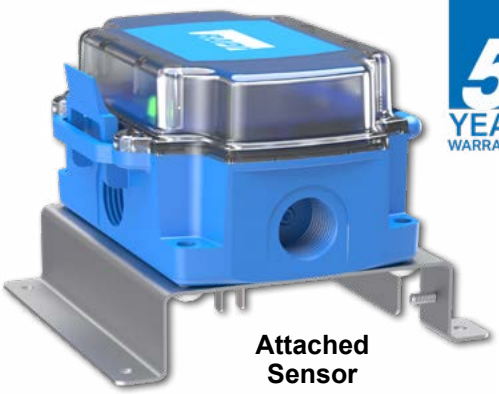
Accessories for HVAC/R

Rev. 03/03/25

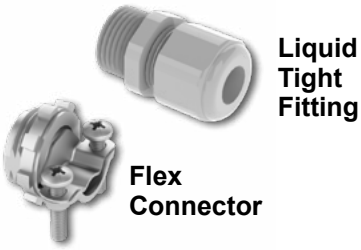
Features & Options

- Detection Within 5 Seconds with Local LED Alarm Indication
- Alarm Output, Two 5 Amp Relays
- Attached Sensor or Remote Sensor
- Automatic or Manual Unit Reset

The Water Leak Detector is designed to sense the presence of water and alert a central monitoring system of the potentially destructive situation. Upon water detection, the alarm output relays change state, and a local red LED illuminates.



Attached Sensor



Liquid Tight Fitting

Flex Connector



Remote Sensor

Specifications

Power: 24VAC/VDC ±10%, 3.9VA max @ 24VAC, 90mA max @ 24VDC (Reverse Polarity Protected)
Note: This unit does not require a separate isolated power supply.

Rectification: Half Wave

Wiring:
Screw Terminals: 2 to 4 pair of 12 to 22AWG (BAPI recommends 16 to 22AWG).
Water Detection Sensor: 2 wires (provided), optional Flex Connector or Liquid Tight Fitting for strain relief

Sensor:
Attached Sensor: Sensor w/ adjustable depth blade from 0.063 to 0.913” (1.60 to 23.19mm)
Remote Sensor: Sensor w/ adjustable depth screw from 0.062 to 0.5” (1.57 to 12.70mm)
(Attached and Remote Sensors are designed to be mounted to flat surfaces or on the rims of drip pans.)

Alarm Reset Action: Field selectable for Auto (Non-Latching) or Manual (Latching**)**

Local Indication: One green power LED, one red alarm LED

Alarm Relay Contacts: Two SPDT, 5 Amp relay outputs

Operating Environment
Remote Sensor: -20 to 185ºF (-29 to 85ºC)
Detector (BB): -4 to 149ºF (-20 to 65ºC), 0 to 95%RH, non-condensing

Enclosure Material and Ratings: NEMA 4 (IP66), UV-resistant polycarbonate, UL94 V-0

Agency: CE 61326-1:2013 EMC (Industrial Electromagnetic Environment), RoHS, UL

Warranty: 5 years

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Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Water Leak Detector Option Selection Guide

BA/ (**#1**) - (**#2**) - (**#3**)

#1: Leak Detector Transmitter (required)		**List Price**
LDT4	Water leak detector with two 5A relays, SPDT contacts	$200

#2: Sensor Type (required)		
PS	Attached Sensor built into the enclosure	$32
RS5	Remote Sensor with 5 foot FEP cable	$36
RS10	Remote Sensor with 10 foot FEP cable	$41
RS25	Remote Sensor with 25 foot FEP cable	$56

#3: Enclosure and Fitting Options (required)		
BB	BAPI-Box enclosure, IP66 rated	$12
BB-LTF	BAPI-Box enclosure, IP66 rated, with liquid tight fitting	$22
BB-GFF	BAPI-Box enclosure, IP66 rated, with flex connector	$13

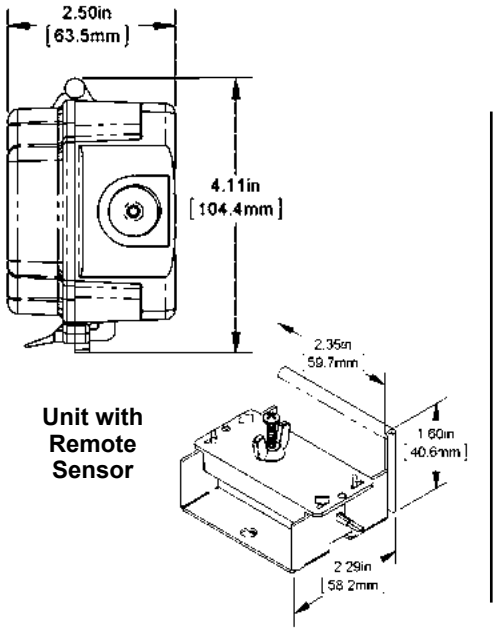
Example Number: BA/ (**LDT4**) - (**RS10**) - (**BB**)
Actual Number (with parenthesis removed): BA/LDT4-RS10-BB
Description: Detector with Two 5A Relays, 10' Remote Sensor and BAPI-Box Enclosure
List Price: $200 (Two 5A Relays) + $41 (10' Remote Sensor) + $12 (BAPI-Box) = $253 List Price

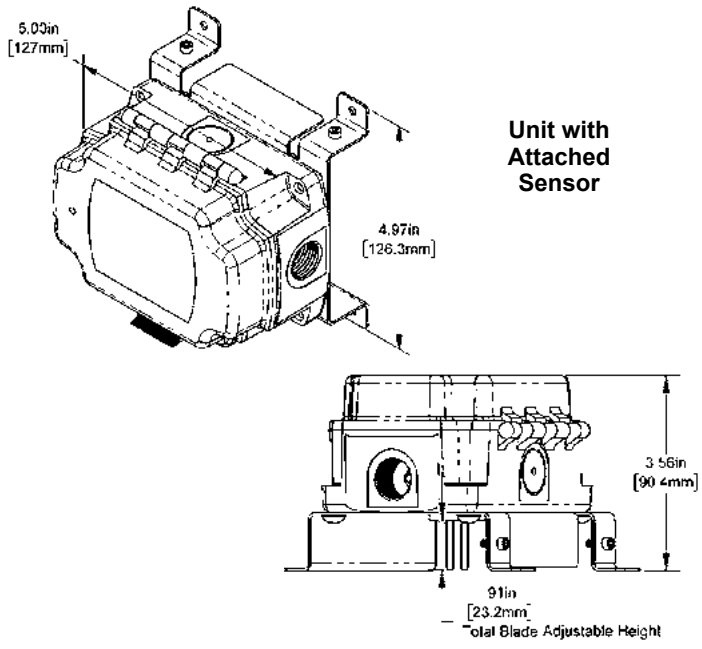
Your Number: BA/

Replacement Remote Sensors (For updates to existing systems)

Part Number	**Sensor Type**	**List Price**
BA/RS5	Remote Sensor only with 5 foot FEP cable (Detector not included)	$36
BA/RS10	Remote Sensor only with 10 foot FEP cable (Detector not included)	$41
BA/RS25	Remote Sensor only with 25 foot FEP cable (Detector not included)	$56

Dimensions





G10 Water Leak Detector w/Rope Sensor – 5 Amp Relays

Accessories for HVAC/R

CE Rev. 12/16/24

Features & Options

- Detection Within 5 Seconds with Local LED Alarm Indication
- Alarm Output, Two 5 Amp Relays
- Rope Detects Water Along Its Entire Length
- Automatic or Manual Unit Reset

The Water Leak Detector is designed to sense the presence of water and alert a central monitoring system of the potentially destructive situation.

Upon water detection, the alarm output relays change state, and a local red LED illuminates.





Flex Connector



Liquid Tight Fitting

Rope Sensor Mounting Bracket

The BAPI Rope Sensor Mounting Bracket is specifically designed to hold the rope taut and prevent rope slippage allowing for maximum contact with the monitored surface. Bracket can be easily mounted to flat surfaces utilizing the industrial adhesive backing or the built in screw holes.

Part Number: BA/LDT-RR-MB (Pack of 25)



Specifications

Power:
24VAC/VDC ±10%, 3.9VA max @ 24VAC, 90mA max @ 24VDC (Reverse Polarity Protected)
Note: This unit does not require a separate isolated power supply.

Rectification: Half Wave

Wiring:
Screw Terminals: 2 to 4 pair of 12 to 22AWG (BAPI recommends 16 to 22AWG).
Rope Sensor: 2 wires (provided), optional Flex Connector or Liquid Tight Fitting for strain relief

Rope Sensor Specifications:
Plenum-rated rope sensor cable, detects 1/8" of water. Max length: 100' (30.5m)
Internal termination rope sensor lead wires, 22 AWG

Alarm Reset Action: Field selectable for Auto (Non-Latching) or Manual (Latching**)**

Local Indication: One green power LED, one red alarm LED

Alarm Relay Contacts: Two SPDT, 5 Amp relay outputs

Operating Environment
Rope Sensor: 32 to 167ºF (0 to 75ºC)
Detector (BB): -4 to 158ºF (-20 to 70ºC), 0 to 95%RH, non-condensing

Enclosure Material and Ratings:
NEMA 4 (IP66), UV-resistant polycarbonate, UL94 V-0

Agency:
CE 61326-1:2013 EMC (Industrial Electromagnetic Environment), RoHS, UL

Warranty: 5 years

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Water Leak Detector w/Rope Sensor – 5 Amp Relays

Accessories for HVAC/R

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Water Leak Detector Option Selection Guide

BA/ (**#1**) - (**#2**) - (**#3**)

#1: Leak Detector Transmitter (required)		**List Price**
LDT4	Water leak detector with two 5A relays, SPDT contacts	$200

#2: Probe Sensor (required)		
RR10	Remote Rope Sensor with 10 foot plenum-rated sensor cable	$174
RR25	Remote Rope Sensor with 25 foot plenum-rated sensor cable	$423
RR50	Remote Rope Sensor with 50 foot plenum-rated sensor cable	$839
RR100	Remote Rope Sensor with 100 foot plenum-rated sensor cable	$1,671

#3: Enclosure and Fitting Options (required)		
BB	BAPI-Box enclosure, IP66 rated	$12
BB-LTF	BAPI-Box enclosure, IP66 rated, with liquid tight fitting	$22
BB-GFF	BAPI-Box enclosure, IP66 rated, with flex connector	$13

Example Number: BA/ (**LDT4**) - (**RR10**) - (**BB**)
Actual Number (with parenthesis removed): BA/LDT4-RR10-BB
Description: Detector with Two 5A Relays, 10' Remote Rope Sensor and BAPI-Box Enclosure
List Price: $200 (Two 5A Relays) + $174 (10' Rope Sensor) + $12 (BAPI-Box) = $386 List Price

Your Number: BA/

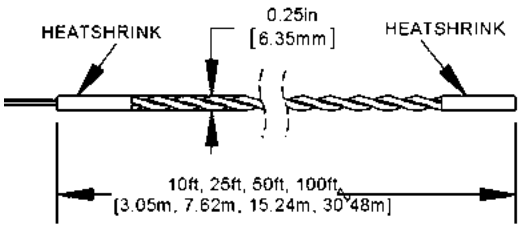
Replacement Sensors and Mounting Brackets

Part Number	**Sensor Type**	**List Price**
BA/RR10	Remote Rope Sensor with 10 foot plenum-rated sensor cable	$174
BA/RR25	Remote Rope Sensor with 25 foot plenum-rated sensor cable	$423
BA/RR50	Remote Rope Sensor with 50 foot plenum-rated sensor cable	$839
BA/RR100	Remote Rope Sensor with 100 foot plenum-rated sensor cable	$1,671
BA/LDT-RR-MB	Mounting Bracket for Rope Sensor (Pack of 25)	$110

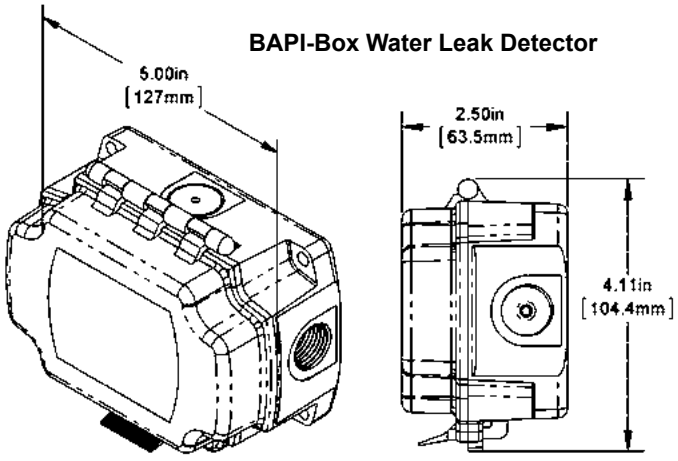
Gray shaded items follow the Buy and Resale Multiplier.

Dimensions

Rope Sensor



BAPI-Box Water Leak Detector



Door Monitor Alarm (DMA)

Accessories for HVAC/R

Rev. 06/05/24

Features & Options

- For Use with Normally Closed (NC) Door Switches
- Door Status LEDs
- Two Auxiliary Relays with Status LEDs
- Audible Annunciator
- User Selectable Time Periods

The BAPI Door Monitor Alarm (DMA) monitors a door switch to alert personnel when the door is closed, open or has exceeded its user-selectable open time period. Green, amber and red LEDs on the face of the unit alert nearby personnel the door's status.

Leaving the door open for longer than the user-selected time will also energize an internal audible annunciator to alert nearby personnel that the door should be closed immediately. The unit also has two auxiliary relays that will energize whenever the door is opened to alert other user-supplied warning devices or a building automation system.



Door Monitor Alarm (DMA)



Green Status

Amber Status

Red Status

Specifications

Power: 24 VAC or 24 VDC (UL Listed Class 2 Power Source only)

Power Consumption (max): 7.5 VA @ 24 VAC, 200 mA @ 24 VDC

Door Switch Contacts:
Normally Closed (NC) = door open is alarm condition
Normally Open (NO) = door closed is alarm condition

Auxiliary Relay Contact Rating: 1.0 Amp @ 30 VAC/VDC

Audible Annunciator: 90dB; 2,730 Hz

Wiring: 16 to 22 AWG

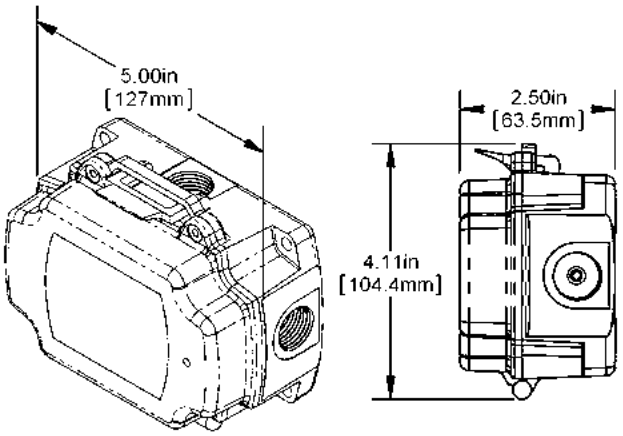
Environmental Operation Range:
Temp: 32 to 140 °F (0 to 60 °C)
Humidity: 5 to 95%, non-condensing

Enclosure Material:
UV-resistant Polycarbonate, UL94 V-0

Enclosure Rating: IP66, NEMA 4

Agency:
CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL94 V-0, RoHS

Warranty: 5 years



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Submittal datasheets without List Prices are available on the BAPI website.

Ordering Information

Part Number	Description	List Price
BA/DMA	Door Monitor Alarm (DMA)	$805

REED SWITCH FOR THE DMA

BA/DMA-RSW1	Press Fit Magnetic Contact, 3/4” (19mm) diameter	$20
BA/DMA-RSW2	Mechanical Surface Mount Switch, 2.5” (64mm) length	$32

Gray shaded items follow the Buy and Resale Multiplier.



DMA-RSW1



DMA-RSW2

BAPI-Guard™ Thermostat Protector

Accessories for HVAC/R

Rev. 05/26/21

Features & Options

- Prevents Tampering, Damage and Unauthorized Adjustment
- Exceptional Airflow for Proper Thermostat Operation
- Made from Thick, Durable Polycarbonate
- Key Lock Protected
- Low Profile Design with Two Sizes to Fit Most Thermostats
- Horizontal or Vertical Mounting with Hardware Included

The BAPI-Guard prevents tampering, physical damage and unauthorized adjustment of thermostats. The attractive design is available in two sizes to fit most thermostats.

The BAPI-Guard is made of thick, durable polycarbonate and features exceptional airflow, key lock protection, horizontal or vertical mounting and easy installation with hardware included.



BAPI-Guard 2 Mounted Over a BAPI-Stat "Quantum" Sensor

Ordering Information

Part Number	Description	List Price
BA/BG	Larger BAPI-Guard Thermostat Protector	$45
BA/BG2	Smaller BAPI-Guard 2 Thermostat Protector	$35
BA/KEY16187	Replacement Key for BAPI-Guard and BAPI-Guard 2 (*Net Price, no multiplier)	$2*

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Material: Polycarbonate

Material Rating: UL94 V-0

The BAPI-Guard fits
these common thermostats

BAPI-Stat "Quantum Prime"
Honeywell T7300, T7350, T7560, T7770 and T7790 Series
Johnson Controls Metastat

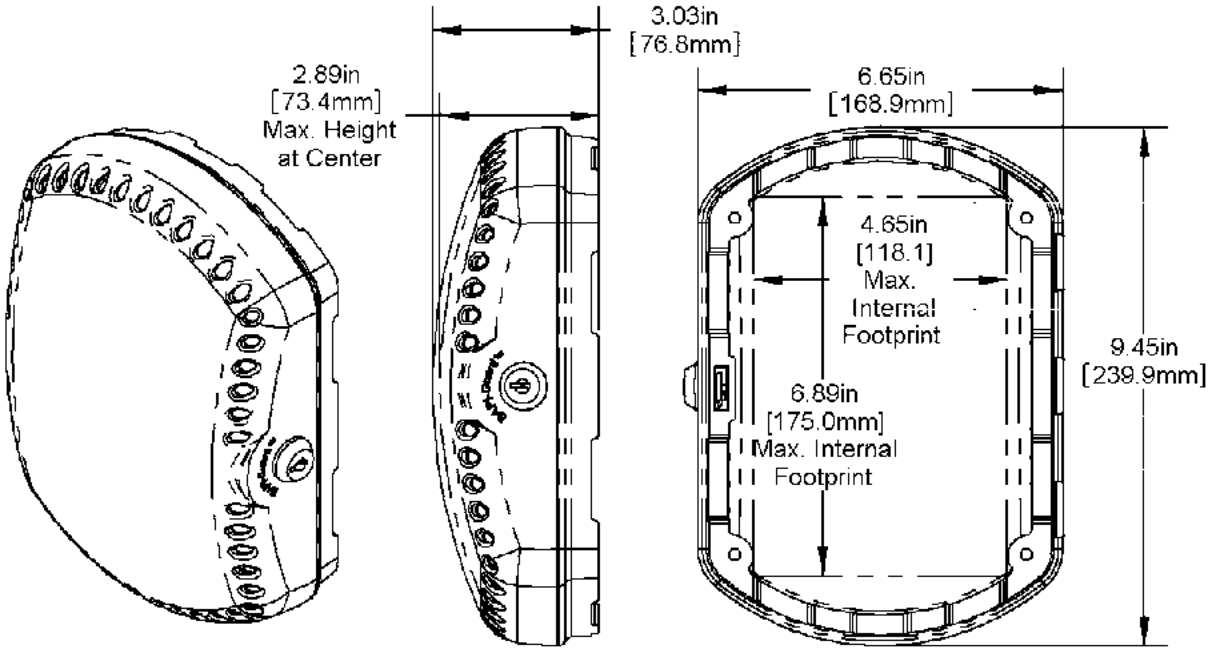
The BAPI-Guard 2 fits
these common thermostats

Delta Style Enclosure
BAPI-Stat "Quantum"
Automated Logic RS Series
York Zone Sensor
Invensys MN series

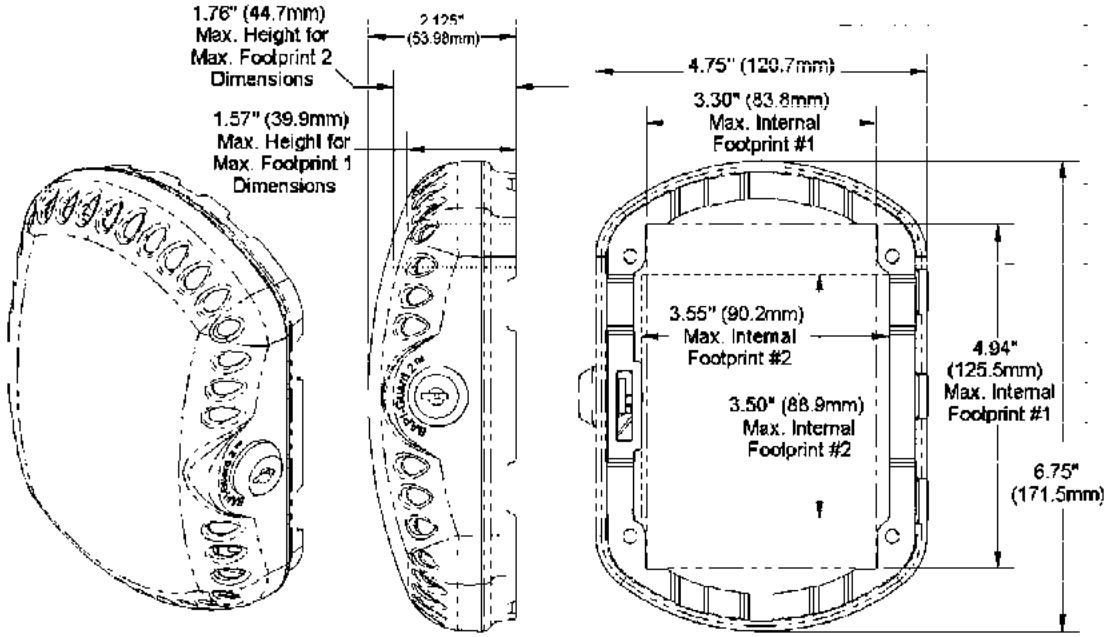
If you have a question about whether a model will fit a specific thermostat, please call BAPI.

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Dimensions



BAPI-Guard



BAPI-Guard 2

PMPB5 - Pulse Meter Pulse Buffer

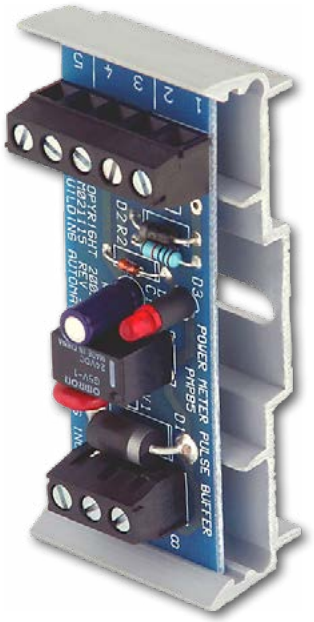
Accessories for HVAC/R

Rev. 07/12/21

Overview

Many electrical, water or gas meters provide a pulse output with each pulse representing a specific quantity of the media being measured. These pulse outputs often need to be electrically isolated from the controller's input by a buffer.

The PMPB5 provides that buffer by receiving the pulses from the meter and recreating them as dry contact closures. An LED lights whenever the buffer contacts are closed. The PMPB5 fits standard 2.75" snaptrack.



PMPB5 mounted in optional 2.75" snaptrack

Ordering Information

Part Number	Description	List Price
BA/PMPB5	PMPB	$27.50
BA/PMPB5-TRK	PMPB with 1.25" piece of 2.75" Snaptrack	$32.50

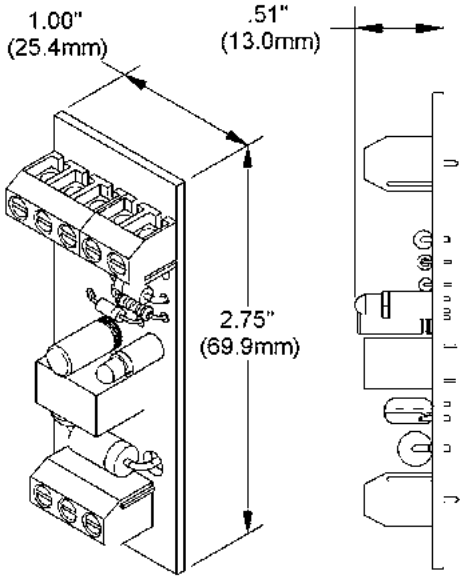
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Power:
24VAC 50/60HZ @ 25mA (0.6VA)

Contact Rating:
1A @ 24VAC maximum, 1mA @ 5VDC minimum)

Contact Repetition Rate:
2 seconds per pulse maximum



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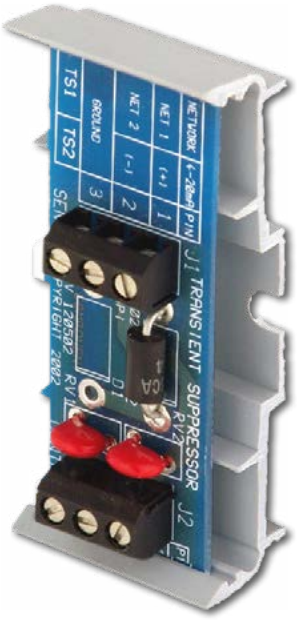
TS1 & TS2 - Transient Suppressor

Overview

HVAC control systems can be subjected to electrical transients (temporary excess voltage) from various sources. Damage to control systems can occur if static electricity, lightning or contractors produce transients of sufficient magnitude and duration to overwhelm the protection built into the control system components. The TS1 and TS2 can significantly increase the transient protection and reduce the possibility of damage to the control system. Both modules fit in standard 2.75" snaptrack

The TS1 is specifically designed for network communications between control system components. The TS1 clamps voltages to 10 VAC or ±14 VDC Line to ground and 7.5 VDC line to line. *Note: The added capacitance of the TS1 may be unsuitable for some combinations of communications line length and high speed data. For best operation you may have to reduce line lengths and add data repeaters.*

The TS2 is designed to protect 4 to 20 mA current loops. The TS2 clamps the signal return line to 5 volts above ground and 1 volt below ground. The voltage supply line is clamped to ±39 VDC Line to ground.



TS1 or TS2 Transient Suppressor with optional 2.75" snaptrack

Ordering Information

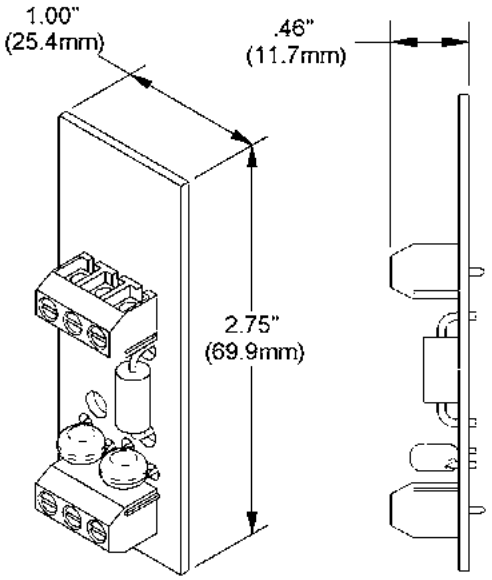
Part Number	Description	List Price
BA/TS1	TS1 Transient Suppressor (voltage)	$7.50
BA/TS2	TS2 Transient Suppressor (current)	$7.50
BA/TS1-TRK	TS1 Transient Suppressor (voltage) with 1.25" piece of 2.75" Snaptrack	$12.50
BA/TS2-TRK	TS2 Transient Suppressor (current) with 1.25" piece of 2.75" Snaptrack	$12.50

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

TS1 Clamping Voltage:
10 VAC or ±14 VDC Line to Ground,
±7.5 VDC Line to Line

TS2 Clamping Voltage:
5 VDC Above Ground, Signal Return Line
1 VDC Below Ground, Signal Return Line
±39 VDC Line to Ground, Power Supply Line



FPB - Flexible Probe Bracket

Accessories for HVAC/R

Rev. 06/03/24

Features & Options

- Makes mounting of averaging sensors quick and easy
- Eliminates risk of kinking and damaging the probe
- Scored break off for 1/4” rigid probe mounting
- Nylon material limits heat/cold conduction to the probe

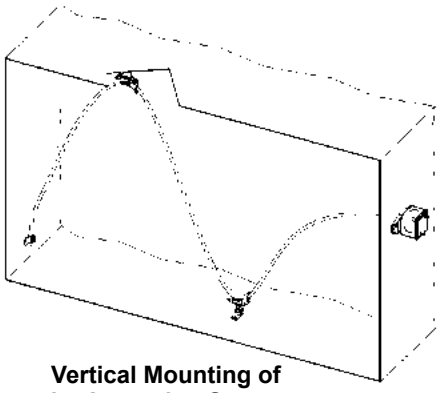
The Flexible Probe Bracket (FPB) is used to mount averaging sensors, low limit thermostats, or liquid fill thermostats in duct applications for probe diameters from 1/8”, 1/4” and 3/8”.

The bracket is used to reverse the direction of the flexible probe with a smooth arc to eliminate the risk of kinking the sensor and damaging the probe.

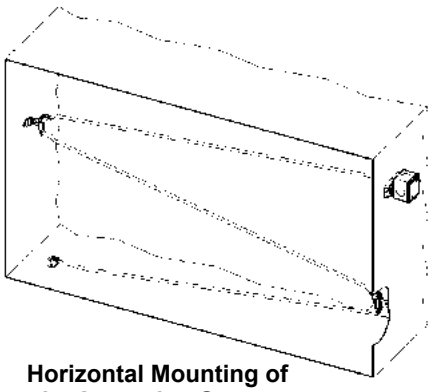
A fixed 1/4” probe may also be mounted as part of the bracket design using the scored break-off. The FPB is made out of tough UL94 V-2 Nylon which limits heat/cold conduction to the probe and has multiple mounting holes to make mounting quick and easy.



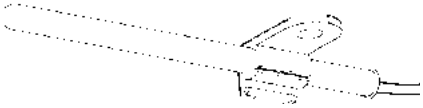
FPB - Flexible Probe Bracket



Vertical Mounting of the Averaging Sensor



Horizontal Mounting of the Averaging Sensor



1/4” Rigid Probe Mounting (using scored break off)

Ordering Information

Part Number	Description	List Price
BA/FPB-50	50 Flexible Probe Brackets	$182

Gray shaded items follow the Buy and Resale Multiplier.

Submittal datasheets without List Prices are available on the BAPI website.

Specifications

Material: Nylon

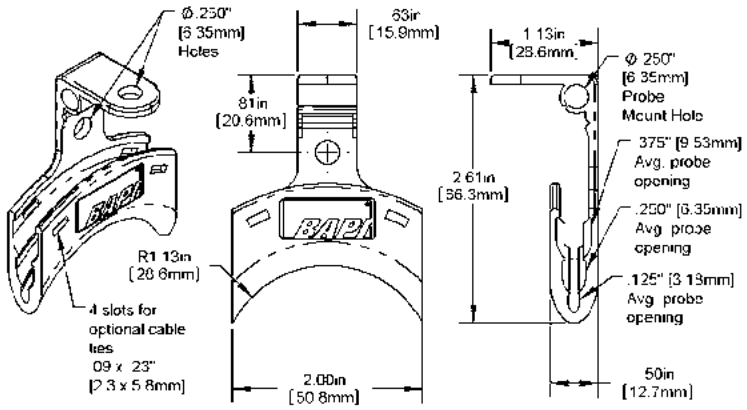
Rating: UL94 V-2 (plenum rated), RoHS Compliant

Mounting: Two ¼” holes, on the top and side.

Probe Size: 1/8”, 1/4”, and 3/8” flexible probes
1/4” rigid probe holder, w/break off score

Bracket Arc: 1.125” radius

Operational Temp: -22 to 167ºF, (-30 to 75ºC)



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BAPI Screwdriver & Allen Wrench

Features & Options

- Flathead Screwdriver for Terminal Block screws
- 1/16” Allen Wrench for Cover Locking Screws
- Works on Delta, PreCon, Powers and all BAPI-Stat Room Unit Enclosures



6.75” model (top) and 6” model (bottom)

BAPI Screwdriver & Allen Wrench Combinations are especially useful for installing BAPI room units. The flathead screwdriver can be used to turn the screws on the circuit board terminal block while the 1/16” Allen wrench is used for the locking screws on the removable cover. One 6” screwdriver (BA/116) is included with every 25 room units ordered. This model is not designed for prolonged use. The 6.75” model (BA/116W) is designed for prolonged use.

Ordering Information

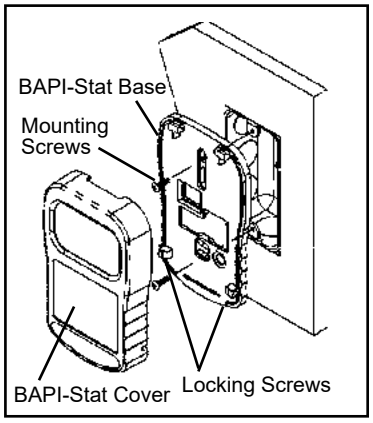
Part Number	Description	List Price
BA/116W	BAPI 6.75” Screwdriver & Allen Wrench Combination	$20
BA/116	BAPI 6” Screwdriver & Allen Wrench Combination	$12

Gray shaded items follow the Buy and Resale Multiplier.

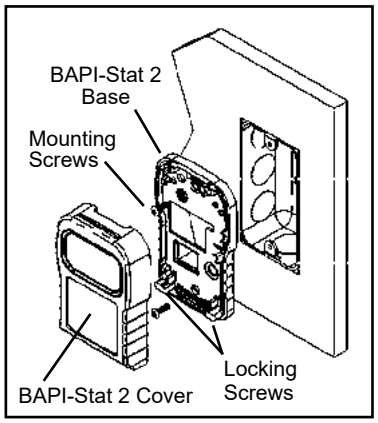
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Allen Wrench Locking Screw Locations for BAPI Room Units

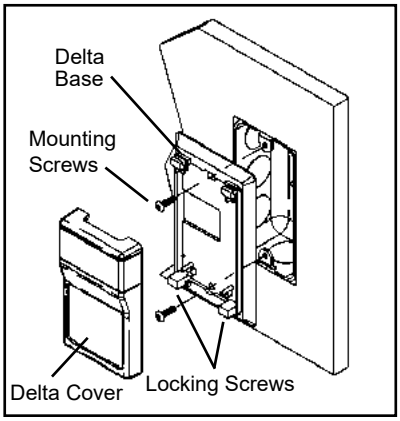
The figures below show the location of the locking screws on 5 of BAPI’s room unit enclosures. The BAPI Screwdriver can be used with all of them. Simply snap the cover in place and turn the locking screws counterclockwise with the Allen wrench, backing them out to lock the cover in place.



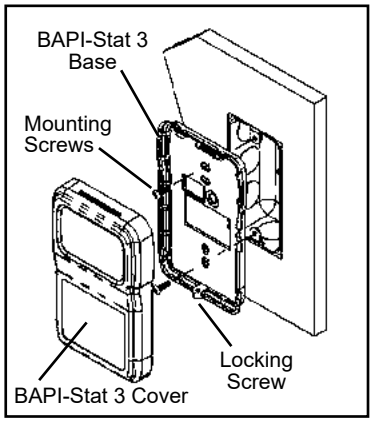
BAPI-Stat Stye Enclosure



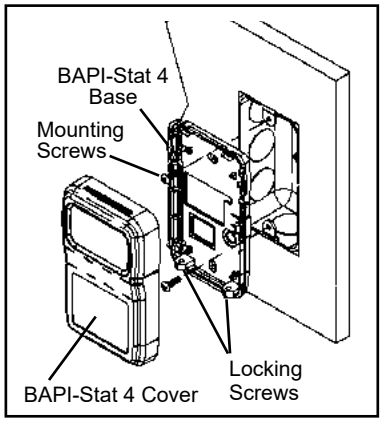
BAPI-Stat 2 Stye Enclosure



Delta Style Enclosure



BAPI-Stat 3 Stye Enclosure



BAPI-Stat 4 Stye Enclosure

G20 Clean-Cut Tool

Accessories for HVAC/R

Rev. 04/10/13

Features & Options

- Quick, Easy and Professional Looking Knockouts for the BAPI-Box, and BAPI-Box 2 Enclosures
- One Step Cutting Bit
- Standard Hex Drill Bit Shaft
- Quick Disconnect Shaft
- Built in Rim Stop Prevents Damage to Internal Components
- Stainless Steel Construction
- Comes with Blade Sheath



Clean-Cut Tool

The Clean-Cut hole cutter is designed to cut out the plastic plugs in the ½" NPSM threaded ports of the BAPI-Box and BAPI-Box 2 polycarbonate enclosures. This tools make removing the plastic plug fast and easy and produce a professional-looking .65" diameter hole.

A built-in stop prevents the tool from pushing through and possibly damaging sensitive electronics within the box, so there's no need to remove the items to drill the hole. The Stainless Steel construction keeps its edge and lasts for over 1,000 operations in both directions. The tool can be sharpened with a hand grinder or file and comes with a protective sheath to protect the blades and user.

Ordering Information

BA/CLN-CUT-50	**List Price**
Clean-Cut - ½" threaded knockout cutting tool for BAPI-Box and BAPI-Box 2	$100

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Material: 316 Stainless Steel

Rim Stop: 0.04" (1mm), in from edge

Shaft Stem: 0.95" (24.1mm) long with quick disconnect shaft

Drill Chuck: Quarter inch Hex

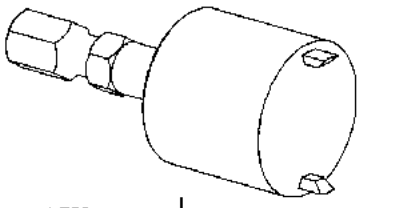
Sharpening: Hand grinder or file (As needed)

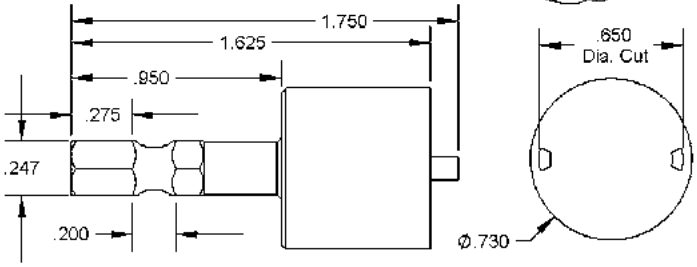
Weight: 0.11lb (50.0g)

Outer Diameter: Smooth 0.73" (18.5mm)

Cutting Blades: 0.125" (3.175mm) long, 0.05" (1.27mm) wide

Hole Cut: 0.65" (16.51mm)





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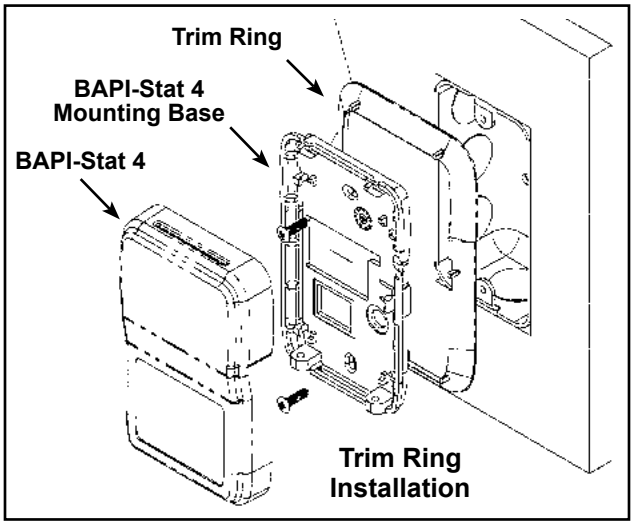
BAPI-Stat 4 Trim Ring

Overview

The BAPI-Stat 4 Trim Ring provides a professionally finished appearance for the BAPI-Stat 4 Room Enclosures. If you are using back boxes, the trim ring covers any wall imperfections between the back box and the wall.

To install, place the trim ring on the wall, nest the BAPI Stat 4 mounting base into the ring and attach everything to the wall with the BAPI-Stat 4 mounting screws. The BS4 trim ring only adds 0.07 inches (1.7mm) to the depth of the BAPI Stat 4.







BAPI-Stat 4 with and without Trim Ring

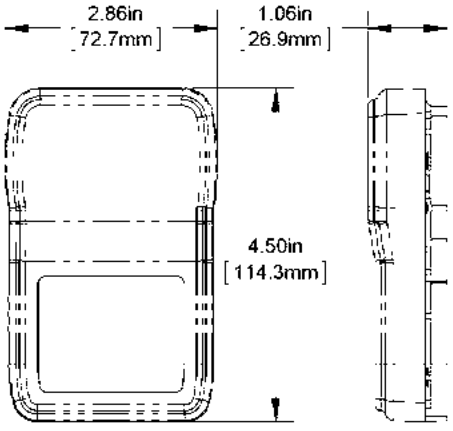
Ordering Information

Part Number	Description	List Price
BA/BS4-TR-BW	BAPI-Stat 4 Trim Ring, Bright White Color	$4
BA/BS4-TR	BAPI-Stat 4 Trim Ring, Beige Color	$4

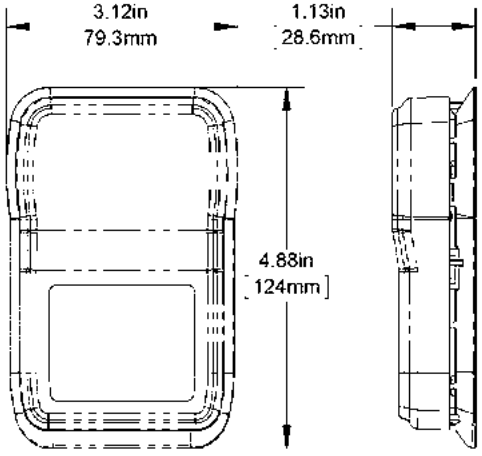
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Material: ABS plastic, Flame-retardant, UL 94, V-0
Humidity: 0 to 95%, non-condensing
Temperature: 32 to 122°F (0 to 50°C)



BAPI-Stat 4 without Trim Ring



BAPI-Stat 4 with Trim Ring

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Adaptor Plates for Retrofits

Accessories for HVAC/R

Rev. 09/15/22

Features & Options

BAPI Adaptor Plates are designed to cover wall imperfections when installing wall sensors or thermostats. They come in three sizes and three colors and can be painted or wall papered in place if desired.



BA/ADP-525-7-BW



BA/ADP-53-53-BW



BA/ADP-37-55-BW



BA/ADP-37-55-BW-UK

Ordering Information

BA/ADP-525-7-BW	Adaptor Plate, 5.25 x 7” Bright White	$18
BA/ADP-525-7-OFW	Adaptor Plate, 5.25 x 7” Off White	$18
BA/ADP-525-7-CDW	Adaptor Plate, 5.25 x 7” Cloud White	$21
BA/ADP-53-53-BW	Adaptor Plate, 5.3 x 5.3” Bright White	$18
BA/ADP-53-53-OFW	Adaptor Plate, 5.3 x 5.3” Off White	$18
BA/ADP-53-53-CDW	Adaptor Plate, 5.3 x 5.3” Cloud White	$21
BA/ADP-37-55-BW	Adaptor Plate, 3.75 x 5.5” Bright White	$18
BA/ADP-37-55-OFW	Adaptor Plate, 3.75 x 5.5” Off White	$18
BA/ADP-37-55-CDW	Adaptor Plate, 3.75 x 5.5” Cloud White	$21
BA/ADP-37-55-BW-UK	Adaptor Plate (Europe), 3.75 x 5.5” Bright White	$18
BA/ADP-37-55-OFW-UK	Adaptor Plate (Europe), 3.75 x 5.5” Off White	$18

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Material:
ABS plastic, Flame-retardant, UL 94, V-0

Application:
Horizontal or Vertical

Mounting:
Drywall, US back box or European back box

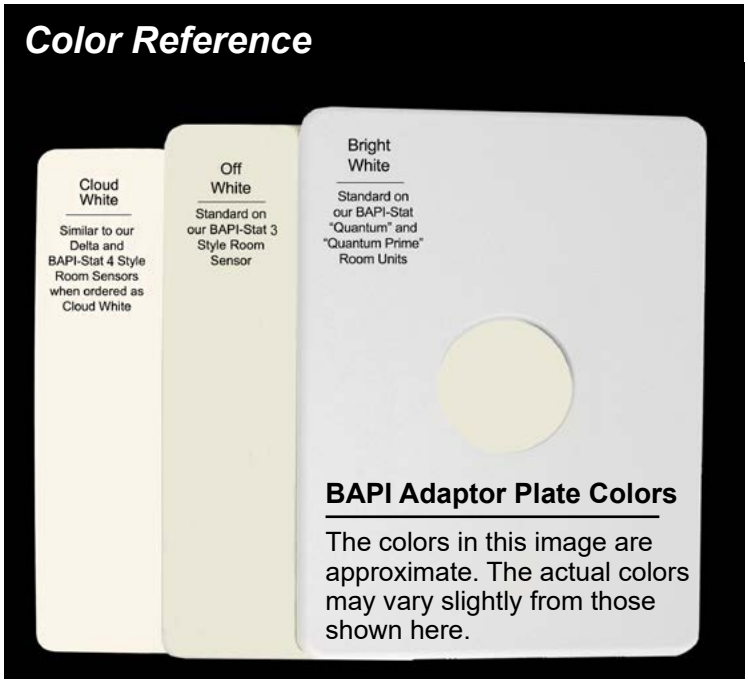
Color Match

• BW, Bright White:
BAPI-Stat “Quantum” and “Quantum Prime” Room Units (Approx. Pantone Bright White) also Delta and BAPI-Stat 4 Units purchased after 2020

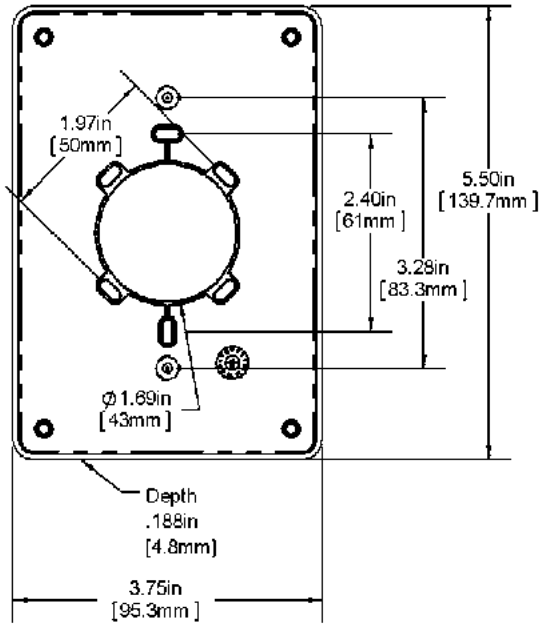
• OFW, Off White:
BAPI-Stat 3 (Approximately Pantone Warm Gray 1)

• CDW, Cloud White:
Delta, BAPI-Stat 4 (Approximately Pantone Cool Gray 1)

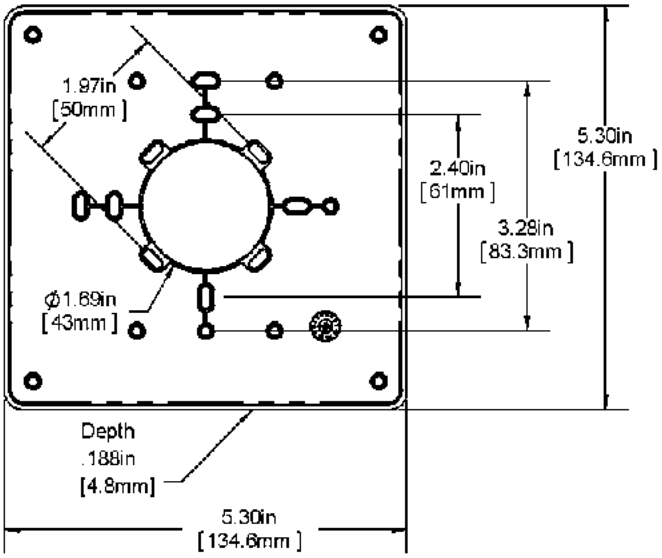
Color Reference



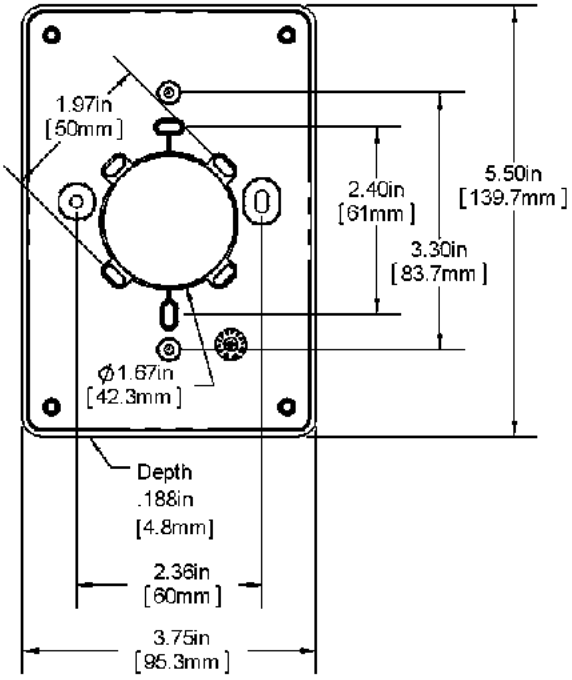
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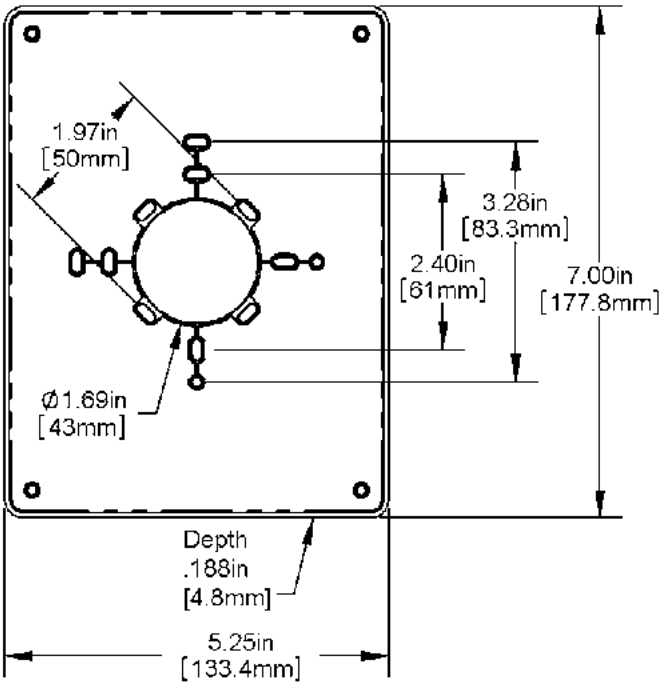
BA/ADP-37-55-BW



BA/ADP-53-53-BW



BA/ADP-37-55-BW-UK



BA/ADP-525-7-BW

Custom Logo Plates

Accessories for HVAC/R

Rev. 07/30/19

Overview

If you'd like to personalize the look of your sensor, the BAPI-Stat "Quantum" and "Quantum Prime" room sensors, the ZPM pressure, the BAPI-Box, BAPI-Box 2 and BAPI-Box Crossover enclosures are available with your company's individual logo printed on the front.

To create the custom logo plate, you will need to provide BAPI with a digital version of your logo, preferably in Adobe Illustrator or another vector-based program format. You will also need to provide your company's Pantone® (PMS) colors if you desire a color match.

Lead time and logo plate costs vary with the style of enclosure, the number of colors and the quantity of logo plates ordered.

Call BAPI for pricing information and lead times on Custom Logo Plates.



BAPI-Stat "Quantum Prime"



BAPI-Stat "Quantum"



BAPI-Box Crossover



BAPI-Box 2



ZPM Pressure



BAPI-Box

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Outdoor Light Level Sensor

Features & Options

- 0 to 2,000 Lux or 0 to 875 Foot Candle Ranges
- Extremely Sensitive, Even in Dim Lighting (<10 Foot Candle or 108 Lux)
- Rugged and Watertight Enclosure

The BAPI Outdoor Light Level Sensor conserves energy by allowing lights to be shut off when the ambient light level exceeds a specified level. The sensor can also help ensure safety by allowing lights to be turned on when the ambient light falls below a specified level.

The unit comes in a rugged and watertight UV-inhibited polycarbonate enclosure with an IP66, NEMA 4 rating. The light level range is available as Foot Candle and Lux with 0 to 5V, 0 to 10V or 4 to 20 mA output. Custom ranges are also available.



Light Level Sensor



Sensor mounted in a parking lot facing north

Ordering Information

Part Number	Description	List Price
BA/LLV-05-LX[0 TO 2000]	Sensor with 0 to 5V Output, 0 to 2,000 Lux Range	$275
BA/LLV-10-LX[0 TO 2000]	Sensor with 0 to 10V Output, 0 to 2,000 Lux Range	$275
BA/LLV-20-LX[0 TO 2000]	Sensor with 4 to 20mA Output, 0 to 2,000 Lux Range	$275
BA/LLV-05-FC[0 TO 875]	Sensor with 0 to 5V Output, 0 to 875 Foot Candle Range	$275
BA/LLV-10-FC[0 TO 875]	Sensor with 0 to 10V Output, 0 to 875 Foot Candle Range	$275
BA/LLV-20-FC[0 TO 875]	Sensor with 4 to 20mA Output, 0 to 875 Foot Candle Range	$275

Custom light level ranges are available in Foot Candle or Lux. Contact BAPI for more info.

Note: 1 Foot Candle = 10.76 Lux • 1 Lux = 0.0929 Foot Candles

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Power Supply:
12 to 28 VDC, 22mA max (for 0 to 5 VDC or 4 to 20 mA Outputs)
15 to 28 VDC, 6 mA max (for 0 to 10 VDC Output)

Factory Selectable Outputs:
0 to 5V, 0 to 10V and 4 to 20 mA

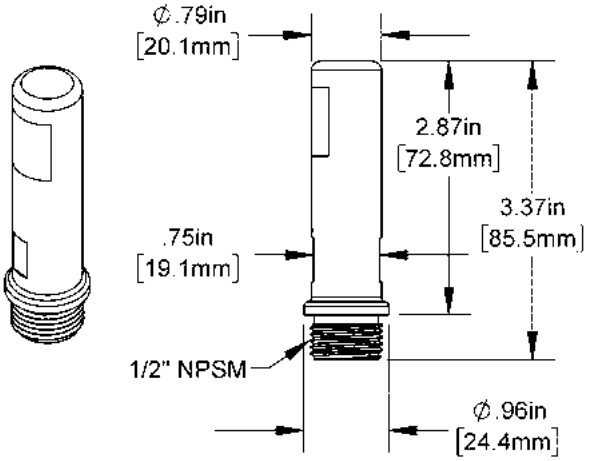
Measurement Range:
0 to 2,000 Lux or 0 to 875 Foot Candle

Accuracy:
10 Lux ±10% of reading

Environmental Operation Range:
Temperature -40 to 185°F (-40 to 85°C)
Humidity: 0 to 100%, non-condensing

Enclosure Material:
UV-Inhibited Polycarbonate

Enclosure Rating and Material Rating:
IP66, NEMA 4 / UL94 V-0



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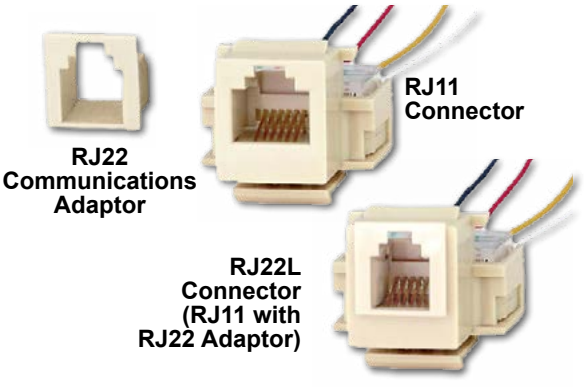
RJ22 Communications Adaptor

Accessories for HVAC/R

Rev. 01/03/23

Overview

Some automation providers use the smaller RJ22 (telephone handset connector) instead of the RJ11 (telephone wall connector) for their in-the-zone network communications devices. The BAPI RJ22 Communications Adapter converts the standard RJ11 jack used in BAPI sensors to the smaller RJ22 dimensions.



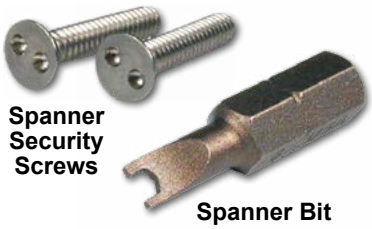
ORDERING INFORMATION

Part Number	Description	List Price
BA/RJ22	Communications Adaptor	$8
BA/RJ22L	Communications Connector	$28

Spanner Security Screws & Spanner Bit

Overview

Spanner Security Screws add an extra level of protection for Wall Plate Units. The Security Screws and associated Spanner Bit are available for any Stainless Steel Wall Plate Unit.



ORDERING INFORMATION

Part Number	Description	List Price
BA/SP632x1	Spanner Security Screws, 6-32x1” (box 50)	$40
BA/SPBIT	Spanner Bit for Spanner Security Screws	$12

Hex Head & Pan Head Screws

Overview

These 1.5” stainless steel #10 screws are used to attach the BAPI-Box or BAPI-Guards to the wall. The Pan Head Screws are used for drywall, sheet metal or wood surfaces. The Hex Head Concrete Screws are used for concrete walls. The screws are sold in packs of 100.





ORDERING INFORMATION

Part Number	Description	List Price
BA/Screw-Pan-1.5x10-SS-100	1.5” #10 Pan Head SS Screw, Pack of 100	$12
BA/Screw-Hex-Concrete-1.5x10-SS-100	1.5” #10 Hex Head SS Concrete Screw, Pack of 100	$12

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Overview

Replacement keys are available for Wall Plate temperature sensors with Keyswitch Occupant Override, and the BAPI-Guard and BAPI-Guard 2 thermostat protectors.



Replacement Key

ORDERING INFORMATION

Part Number	Description	List Price
BA/KEY12718	Key for Wall Plate with Keyswitch Override	$2
BA/KEY16187	Replacement Key for BAPI-Guard and BAPI-Guard 2	$2

Gray shaded items follow the Buy and Resale Multiplier.

BAPI Foamback Insulator

Overview

Made of closed cell foam, the Foamback Insulator ensures that room sensors are reading the temperature of the room, not the temperature of the wall. They also guard against condensation from mixing of room air and wall air around the room unit. The foambacks measure 2.6” wide by 4.4” high and feature an adhesive backing. They are available in a thickness of 0.25” or 0.125”. Note: Several BAPI products come standard with foambacks including wall plates and duct units.



Foamback Insulator

ORDERING INFORMATION

Part Number	Description	List Price
BA/FOAMBACK-25	White Foamback, 0.25” thick, pack of 25	$82
BA/FOAMBACK-50	White Foamback, 0.25” thick, pack of 50	$88
BA/FOAMBACK-100	White Foamback, 0.25” thick, pack of 100	$100
BA/FOAMBACK-ROOM-25	White Foamback, 0.125” thick, pack of 25	$82
BA/FOAMBACK-ROOM-50	White Foamback, 0.125” thick, pack of 50	$88
BA/FOAMBACK-ROOM-100	White Foamback, 0.125” thick, pack of 100	$100

Replacement Humidity Filter for Duct & Outside Air Sensors

Overview

The 80 micron sintered stainless steel filter protects the sensor from contamination while allowing airflow.



Stainless Steel Humidity Filter

ORDERING INFORMATION

Part Number	Description	List Price
BA/HDOFS3	**Stainless Steel Replacement Humidity Filter**	$30

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Sealant Filled Connectors

Accessories for HVAC/R

Rev. 03/12/24

Features & Options

- Creates a Weatherproof Wire Connection
- Crimp-On & Twist-On Styles Available

BAPI's Sealant Filled Connectors (SFC) contain a moisture-excluding sealant which encapsulates the electrical connection protecting it from moisture and oxidation. This encapsulation also reduces the potential for fire, electrocution and flashover.

BAPI offers three types of SFCs: a Crimp-On, a Round Crimp-On and a Twist-On.

The Crimp-On SFC1000 accepts two 22 to 26 AWG wires. It has a voltage rating of 60 volts with a temperature not to exceed 140°F (60ºC), and it is not UL listed.

The Twist-On SFC2000 accepts two 22 AWG wires or one 22 AWG and one 16 or 18 AWG wire. It has a voltage rating of 300 volts and a temperature not to exceed 221°F (105ºC), and it is not UL listed.

The Crimp-On Round SFC3000 is an insulation displacement connector (IDC) that accepts two wires of 19 to 26 AWG. It has a voltage rating of 50 volts with an operating temperature of -40 to 158°F (-40 to 70°C), and it is compliant to RoHS 2011/65/EU. It is not UL listed. To terminate, simply insert your wires and crimp down on the cap with a set of pliers.



Crimp-On SFC1000



Twist-On SFC2000



Crimp-On Round SFC3000

Ordering Information

Part Number	Description	List Price
BA/SFC1000-100	100 Crimp-On Style SFCs	$20
BA/SFC1000-500	500 Crimp-On Style SFCs	$100
BA/SFC1000-1000	1,000 Crimp-On Style SFCs	$200
BA/SFC2000-100	100 Twist-On Style SFCs	$120
BA/SFC2000-500	500 Twist-On Style SFCs	$600
BA/SFC2000-1000	1,000 Twist-On Style SFCs	$1200
BA/SFC3000-100	100 Crimp-On SFC3000 Style SFCs	$20
BA/SFC3000-500	500 Crimp-On SFC3000 Style SFCs	$100
BA/SFC3000-1000	1,000 Crimp-On SFC3000 Style SFCs	$200

Gray shaded items follow the Buy and Resale Multiplier.

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Pierceable Knockout Plugs for Enclosure Ports

Features & Options

- Quick and Easy to Install and Forms an Excellent Cable Seal
- Pierceable Center Membrane for Simple Cable Insertion
- Works in Non-Threaded Ports of the BAPI-Box and Junction Box Enclosures
- Works in Panels with a Metal Thickness of .118” or Smaller

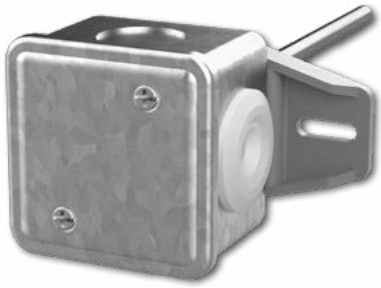


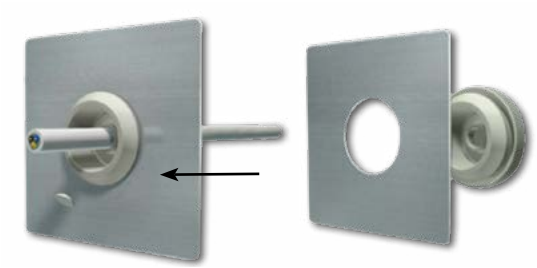
Top and bottom view of a Pierceable Knockout Plug

Pierceable Knockout Plugs are available for the open port in the BAPI-Box Crossover and BAPI-Box 4 Enclosure, as well as the non-threaded ports in the BAPI-Box, BAPI-Box 2 and Junction Box enclosures. The plugs will also work in panels with a metal thickness of 0.118” or smaller.

The plugs are made of TPE (Thermoplastic Elastomer) and feature a pierceable center membrane for easy wire insertion. When used with the proper diameter cable, the plugs form an excellent cable seal after piercing.

When installed in the open port of the BAPI-Box 4 or BAPI-Box Crossover Enclosure, the Pierceable Knockout Plug increases the enclosure rating from IP10 to IP44.





Pierceable Knockout Plug installation and wire insertion.



Pierceable Knockout Plug installed in a J-Box (top) and in the open port of a BAPI-Box Crossover Enclosure (left).

Ordering Information

Part Number	Description	List Price
BA/PKP-100	Pierceable Knockout Plugs for Enclosure Ports, pack of 100	$130

Gray shaded items follow the Buy and Resale Multiplier.

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Specifications

Material: UV-Resistant TPE (Thermoplastic Elastomer)

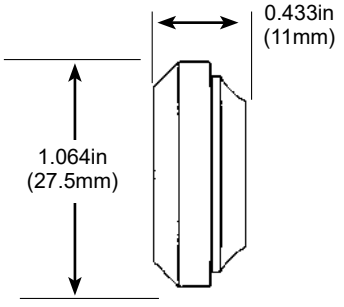
Temperature Operating Range: -58°F to 257°F (-50°C to 125°C)

Protection Rating: IP67

Pierceable Center Membrane Hole Size: 0.807” (20.5mm)

Cable Diameter Range: 0.236” to 0.512” (6 to 13mm)

Panel Thickness: 0.02” to 0.118” (0.5 to 3mm)



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Replacement Batteries for Wireless Sensors

Accessories for HVAC/R

Rev. 08/23/23

Features & Options

BA/LI14505
The BA/LI14505 Lithium AA battery is the ideal replacement for all BAPI Bluetooth Low Energy wireless sensors (except the Wireless Food Probe). Each unit takes two batteries, except the BAPI-Stat "Quantum Slim" which takes only one battery.

BA/BAT-5AA-HIT
The BA/BAT-5AA-HIT High Temperature Lithium ½AA battery is the ideal replacement for the BAPI Bluetooth Low Energy Wireless Food Probe sensor. Each food probe takes one battery.



BA/LI14505
(for all BAPI Wireless Sensors except the Wireless Food Probe)



BA/BAT-5AA-HIT
(for Wireless Food Probe)

PART NUMBER	DESCRIPTION
BA/LI14505	Lithium AA Battery, 3.6V, for all BAPI Bluetooth Low Energy Wireless sensors except the Wireless Food Probe ..... $3 (Net price)
BA/BAT-5AA-HIT	Lithium ½AA Battery, 3.6V, for the BAPI Bluetooth Low Energy Wireless Food Probe .....$6 (Net Price)

Specifications

BA/LI14505 Battery
Type & Size: Lithium, AA
Nominal Voltage: 3.6V
Nominal Capacity: 2.6 Ah @1mA, to 2V
Operation Temp:
-67 to 185°F (-55 to 85°C)
0 to 95 %RH Non-Condensing
Agency: RoHS

BA/BAT-5AA-HIT Battery
Type & Size: Lithium (High Temp), ½AA
Nominal Voltage: 3.6V
Nominal Capacity: 0.9 Ah @ 1mA, to 2V
Operating Temp:
-67 to 257°F (-55 to 125°C)
0 to 95 %RH Non-Condensing
Agency: RoHS

Pluggable Terminal Blocks Kit

Accessories for HVAC/R

Features & Options

Analog Output Modules (AOMs) plug into each other and the receiver as shown above. However, the AOMs may also be mounted remotely using the optional Pluggable Terminal Block Connectors which are available as a 4-connector kit.

PART NUMBER:		List Price
BA/AOM-CONN	..Pluggable Terminal Block Kit.....	$15



Optional Pluggable Terminal Block Kit for AOMs (4 Connectors)

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Features & Options

- Improves Accuracy of Outside Air Sensors by Reducing Solar Heat Gain
- Simple and Sturdy Mounting Method

External temperature, humidity and air quality sensors can be affected by solar heat gain. The BAPI Weather Shade effectively reduces the solar heat gain, improving the accuracy of the sensor.

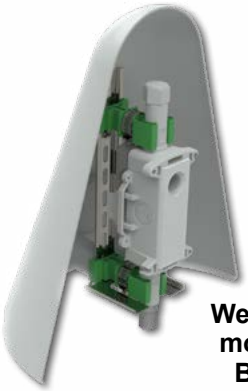
The shape of the cone and spacing from the wall creates a chimney which draws radiant heat from solar gain away from the sensor. The “domed” top also prevents bird nesting while the smooth surface minimizes hosting of insects.

The Weather Shade is constructed of solar stabilized plastic to ensure a long, corrosion-free life. The material also has a high reflectivity rating (87%) and low emissivity rating (0.90) to reduce the radiant heat created from solar gain. Besides reducing solar heat gain, the shade also protects the probe filter from precipitation and grit, extending the life of the filter.

The Weather Shade mounts quickly and securely to the BAPI-Box and BAPI-Box 2 enclosures.



Weather Shade



Weather Shade mounted on a BAPI-Box 2

Ordering Information

Part Number	Description	List Price
BA/WSK	Weather Shade Kit	$150
	(Includes a pre-assembled shade and DIN rail bracket, two capped mount tubes, one adjustable clamp and one adjustable clamp with retention plate.)	

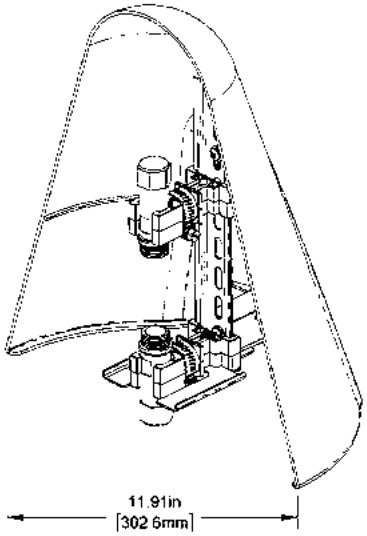
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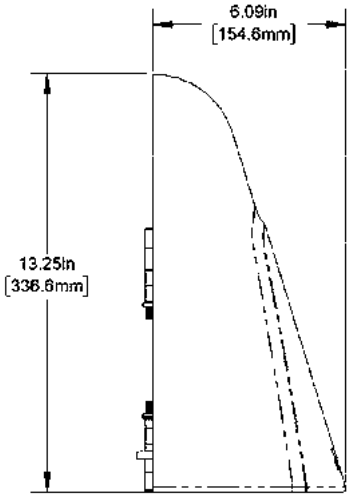
Specifications

Shade Material:
UV-stabilized Polycarbonate

Shade Material Ratings:
Flammability: UL 94
Reflectivity: 87%
Emissivity: 0.90

For more information, see the Application Note “Reducing Solar Heat Gain on Outdoor Air Sensors with the BAPI Weather Shade” on the BAPI website at www.bapihvac.com. Find it by clicking on “Resource Library” and then on “Application Notes”.





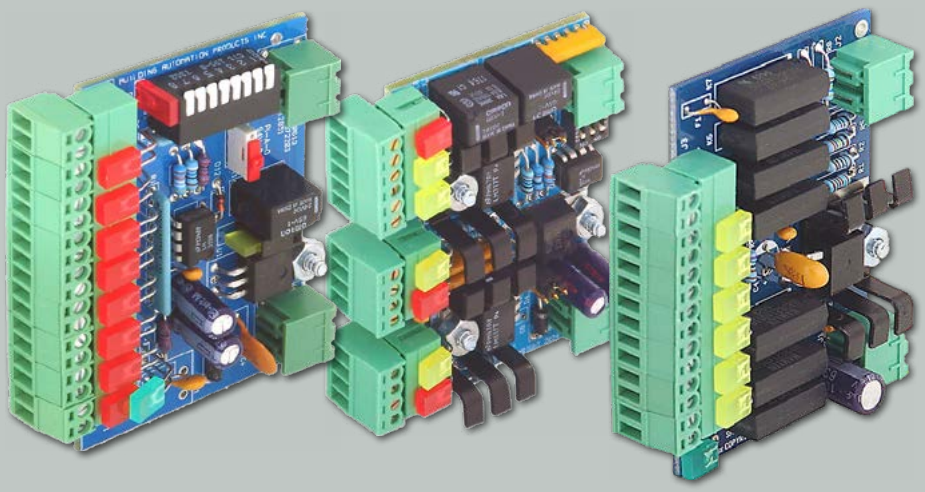
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ETA Product Line Overview

BAPI's **E**lectronic **T**echnician **A**ssistant (ETA) products are a uniform line of interface and communication devices that complement a DDC installation. They consolidate many of the components being used at present and provide a more complete picture of the system than a laptop computer alone.

The ETA devices simplify wiring and troubleshooting by providing a pluggable screw terminal for each and every wire in the system, making it easy to break the system into sections to quickly isolate a problem. The devices cut down on control panel clutter because they plug into specially designed backplanes which distribute power through the mounting connectors, greatly reducing the number of wires in the panel.

The ETA devices are also a practical and inexpensive way to pick up feedback signals which are currently ignored in many systems, such as non-critical alarm points or actuator feedback signals. Having convenient LED display of these signals at the control panel, or summarizing multiple feedback signals into a single input to the controller, provides a more complete picture, helping the facility manager and technicians keep the system performing at its optimum level.



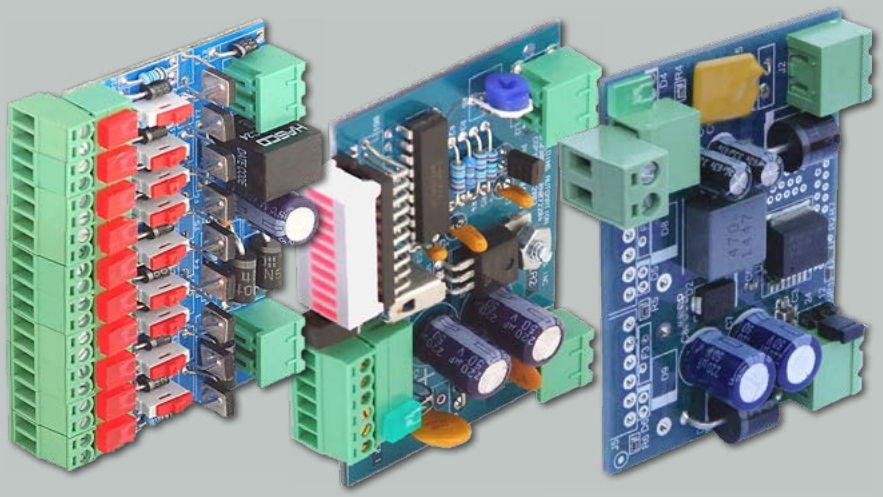


Table of Contents

ETA Line

Rev. 08/23/23

DS8 - Discrete Summary Module ..... pg. H4
Summarizes up to 8 alarm points and sends out a single signal to the controller when the number of alarms reaches a user-defined threshold.

EA1 - 2 Position Actuator Interface ..... pg. H5
Simplifies the wiring and troubleshooting of Belimo® style 2-position actuators with auxiliary switch position feedback.

EA2 - Modulating Actuator Interface ..... pg. H6
Simplifies the wiring and troubleshooting of Belimo style actuators with voltage feedback.

OAM - Output Adjust Module ..... pg. H7
Works with an EA2 module to let you stroke an actuator to any position without additional equipment.

3324VC - Voltage Converter ..... pg. H8
Converts the 33 VDC output from the PS17 Power Suppy into the 12 or 24 VDC required by some ETA modules.

CDSP2 - CO_2 Sensor Power Supply ..... pg. H9
Provides 12 or 24VDC power and terminations for up to two CO_2 sensors.

SQ4 - Four-Step Sequencer ..... pg. H10
Simplifies proportional control by sequencing multiple on-off devices based on a single analog output from the controller.

MXV - Dry Switch Monitor, 5 Input ..... pg. H11
The MXV monitors five dry switch closure devices and provides one 0 to 10V output to the controller.

R49 - Relay Interface, 9 Output ..... pg. H12
Conserves critical controller space by turning on or off up to 9 relays using only one controller output.

DS6R - Dry Switch Monitor ..... pg. H13
Monitors six dry switch closure devices and provides one resistive output to the controller.

PMPB5, TS1 & TS2 Modules ..... pg. H14

PMPB5 - Provides electrical isolation between the controller and the pulse output from electrical, water & gas meters.

TS1 & TS2 - Protects HVAC control systems from electrical transients from various sources.

TURB - Terminal Unit Relay Board ..... pg. H15
Allows convenient interconnection between a Controller and a DX unit thermostat terminal block.

Backplanes ..... pg. H16
The Backplane and Vertical Backplane provide mounting and power for the ETA modules.

TRK Snaptrack ..... pg. H18
Provides easy mounting for the ETA devices.

PAN 16 Panduit ..... pg. H19
Wire guides for the ETA devices.

PS17, PS18 & PS19 - Power Supplies ..... pg. H20
Provide multiple 33 VDC outputs with over-current protection to operate BAPI's ETA modules.

COMBLK & COMBLK2 ..... pg. H22
Small circuit board terminal blocks that simplify the termination.

COMSRG - Comm. Surge Protector ..... pg. H23
The transient protection on the controller terminals is often inadequate. The COMSRG provides the extra protection to prevent damage.

RPTR - RS-485 Repeater and Repeater Kit ..... pg. H24
Standard RS-485 communications are limited to 32 unit loads and 4,000 feet. Each RPTR Module or Kit allows an additional 32 unit loads or 4,000 feet.

FOX - RS-485 Fiber Optic Transceiver and Transceiver Kit ..... pg. H26
Converts RS-485 data from the controller to a fiber optic signal for transmission to other buildings, then converts it back again.

SOX - RS-485 Single-Mode Fiber Optic Transceiver ..... pg. H28
Converts RS-485 data to single-mode fiber optic signal then converts it back again.

TB18 - Pluggable Terminal Block ..... pg. H29
Small circuit board terminal block that simplifies termination.

RBP - Communications Repeater Backplane ..... pg. H30
Distributes power and communications for up to four FOX, SOX or RPTR modules.

RBP Power Bridge & Extender ..... pg. H31
Power Bridge - Bridges power and breaks out the communication lines.
Extender - Raises the connections for easy access

SRBP - Comm. Repeater Backplane ..... pg. H32
Distributes power and communications for a single FOX, SOX or RPTR module.

TUCOM - Term. Unit Comm. Block ..... pg. H33
The **TUCOM** adds 3 pluggable terminals to the Carrier Comfort System controller.

BELCON - Mating Pair Belimo Connectors ..... pg. H33
The **BELCON** allows a 4-pole pluggable connection between a peripheral and controller.

IRM4 - Interposing Relay Module ..... pg. H34
Four independent channels that convert a relay output to a contact output or a voltage output.

LRCA - Link Router Comm. Adapter ..... pg. H35
Adds an RJ jack to a Carrier i-Vu Link/Router.

PSOCL - Power Supply Current Limiter ..... pg. H35
Buffers the output of the BAPI PS17 Power Supply when powering the Carrier i-Vu Link/Router.

UCRB - Universal Controller Relay Board ..... pg. H36
Interconnects a controller's digital outputs to any device that requires a conventional thermostat input.

SS-AC - Selector Switch/Alarm Counter ..... pg. H37
Monitors a multitude of 4-position selector switches to regulate the speed of VFD fans.

SD2 - Status Display, Dual 7 Segment ..... pg. H38
Displays a program error code with a manual reset switch to route a reset signal to a controller.

PE4 - Pulse Extender ..... pg. H39
Takes the input pulse to the board and extends the output down the channel to a controller or monitor.

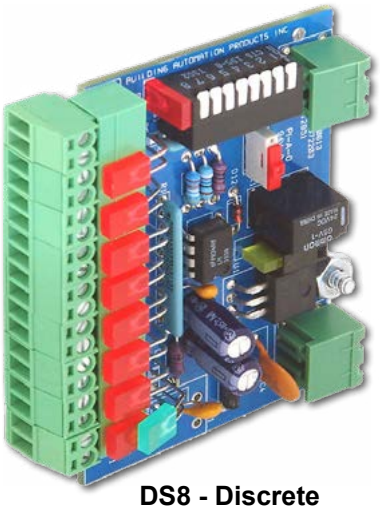
Steel Enclosures and Accessories ..... pg. H40
Steel enclosures in three sizes, Backplates & Cable Guides, designed to accomodate all ETA devices.

DS8 - Discrete Summary Module

ETA Line

Rev. 11/19/19

Overview



DS8 - Discrete Summary Module

The number of discrete switch closure inputs required in an HVAC system often exceeds the number of hardware inputs available (or justifiable) on the controller. Summarizing multiple discrete points into a single system input is an easy and effective solution. The DS8 module accepts up to eight dry contacts and provides a single dry contact signal to the controller when the number of monitored points reaches a user-defined threshold.

The DS8 is great for grouping alarms which you will want to distinguish in the field, but don't need to distinguish on the central computer. Examples include dirty filter alarms, condensate float switches, VFD faults, moisture monitors, door switches, etc. A technician can glance at the DS8 and quickly determine which filter to change; which drain to check or which VFD to inspect.

The DS8 plugs into the BP2, BP4, BP4-V or BP8 backplane and accepts up to eight independent dry switch contacts on easy-to-use connectors at the front of the module. Each input has an LED to indicate when the contact is closed. An eight-position DIP switch allows the user to set the alarm threshold. The output is also user switchable to a NO or NC dry contact.

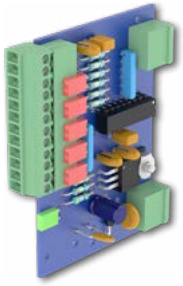
The DS8 can also be used to monitor multiple auxiliary contacts when multiple discrete points are controlled using an R49. Typical applications include lighting controls and small fan controls.

Part Number	Description	List Price
BA/DS8	Discrete Summary Module, 8 Input	$95

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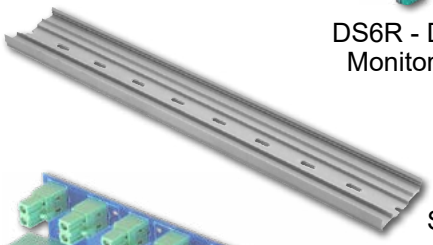
Associated Products

MXV - Dry Switch Monitor, 5 Input (p. H11)

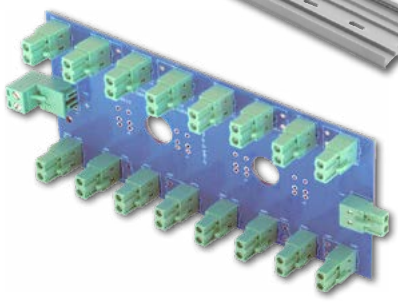




DS6R - Dry Switch Monitor (p. H13)

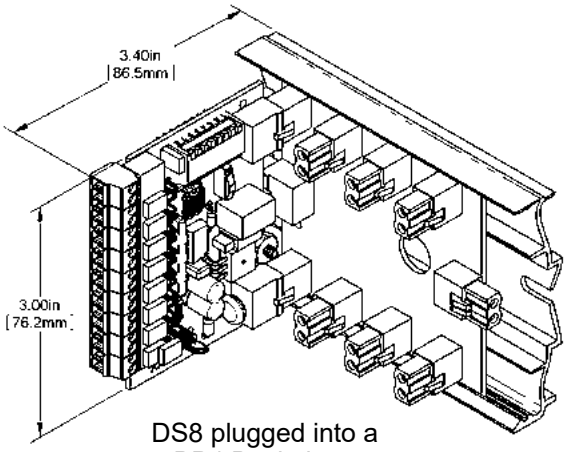


TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications



DS8 plugged into a BP4 Backplane

Power Voltage: 24 to 34 VDC
20 to 24 VAC

Power Current: 35 mA max. (1.2VA max)

Input Sensing Voltage: 24 VDC

Input Sensing Current: 2.4 mA

Output: Dry relay contacts
NEC Class 2 circuits only

Output Current: 1 mA to 1 Amp

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EA1 - Two Position Actuator Interface

Rev. 11/09/20

ETA Line

Overview

The EA1 simplifies the wiring and troubleshooting of Belimo® style two-position actuators with end switch position feedback. Each EA1 module can control two actuators from a single controller output and provide a summary dry contact status when a user-selectable number of end switches close (1, 2 or more). The actuators can move together or in opposite directions based on jumper settings on the module. An additional end switch input allows multiple EA1s to be cascaded together.

The connectors on the front of the EA1 module are readily accessible and make terminations quick and easy for the controller, actuators and actuator end switches. The red and amber LEDs on the EA1 indicate when power is being supplied to the actuators and when they have reached their end states. These LEDs tell the technician the state of the controller output, when power is being sent to the actuators and if the actuator end switch is closed.

The EA1 plugs into a BP2, BP4 or BP8 backplane. A green LED on the EA1 indicates when power is present.



EA1 - Two Position Actuator Interface

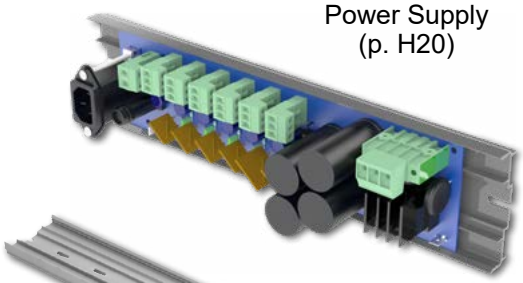
Belimo is a trademark of Belimo Aircontrols (USA) Inc. registered in the United States and other countries.

Part Number	Description	List Price
BA/EA1	2 Position Actuator Interface	$105

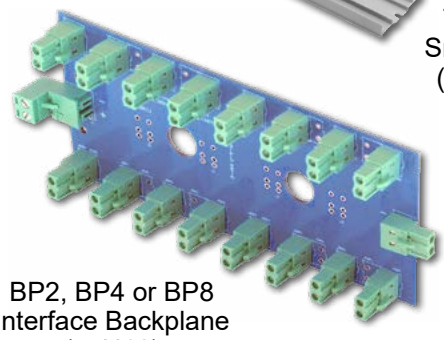
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Associated Products

PS17/18/19RF Power Supply (p. H20)



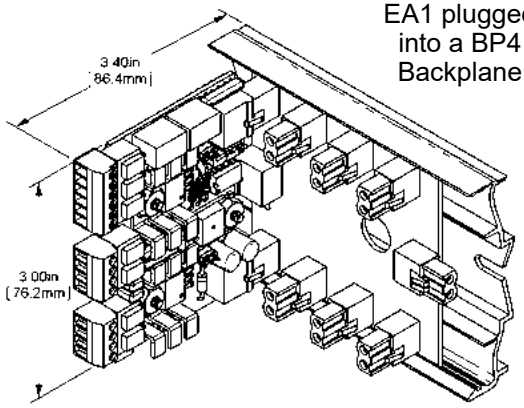
TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications

EA1 plugged into a BP4 Backplane



Power Voltage: 28 to 36 VDC, 24 VAC

Power Current: 50 mA max. plus actuators (1.7 VA max plus actuator)

Actuator Control Voltage: 0 or 24 VDC @ 7mA max

Actuator Power Voltage: 24 VDC

Actuator Power Current: 2 output of 250 mA max. (12 Watts total)

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EA2 - Modulating Actuator Interface

ETA Line

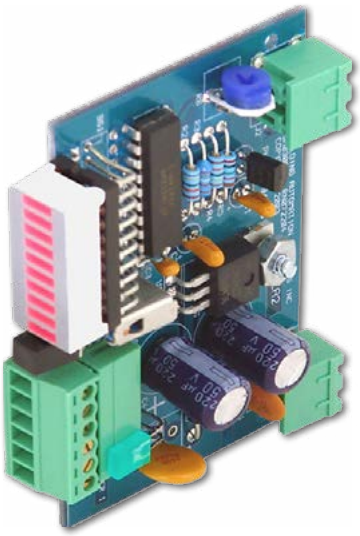
Rev. 11/05/20

Overview

The EA2 simplifies the wiring and troubleshooting of Belimo® style modulating actuators with voltage feedback, saving time and money every time you install or check an actuator. The connector plug on the front of the EA2 module makes terminations quick and easy for the controller and the actuator. The four actuator wires and the controller's output signal terminate on the connector plug. The EA2 provides regulated and fused power for the actuator from the backplane.

The EA2 module is an excellent troubleshooting tool because the technician does not need to gain physical access to the actuator to determine if the actuator is in the correct position. The EA2 display shows the actuator position based on the actuator's feedback signal. An easy push of a button on the EA2 and the display shows the position which the controller is requesting. Troubleshooting is a simple comparison of the two. If they don't match, you have a problem; the actuator is either stuck, manually overridden, not terminated properly or dead.

The EA2 plugs into a BP2, BP4, BP4-V or BP8 backplane. A green LED on the EA2 indicates when power is present.



EA2 - Modulating Actuator Interface

Belimo® is a trademark of Belimo Aircontrols (USA) Inc. registered in the United States and other countries.

Part Number	Description	List Price
BA/EA2	Modulating Actuator Interface	$87

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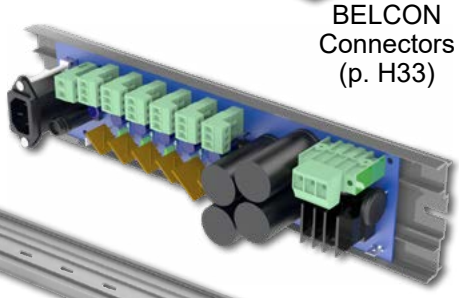
Associated Products

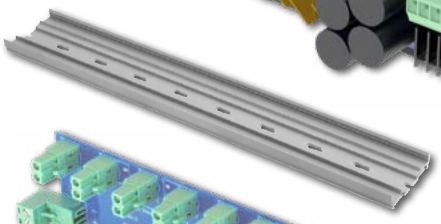
OAM - Output Adjust Module (p. H7)



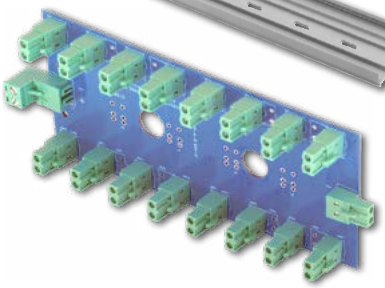
PS17RF Power Supply (p. H20)

BELCON Connectors (p. H33)





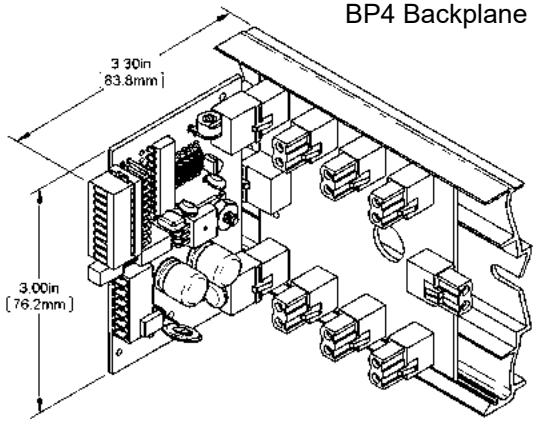
TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 or Interface Backplane (p. H16)

Specifications

EA2 plugged into a BP4 Backplane



Power Voltage: 28 to 35 VDC
20 to 26 VAC

Power Current: 50 mA max. plus actuators
(1.7 VA max plus actuator)

Actuator Control Voltage: 2 to 10 VDC

Actuator Power Voltage: 24 VDC

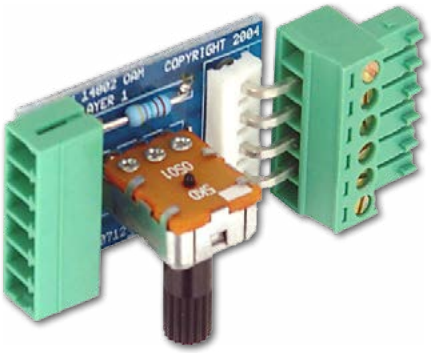
Actuator Power Current:
500 mA max (12 Watts total)

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Overview

Many times, it is necessary to move an actuator throughout its entire range of motion to troubleshoot the mechanical linkage. In DDC systems, this procedure may require a laptop computer, communications interface and special software. Then you have to know which controller to interface with, that controller's individual address and which output connects to the actuator you need to troubleshoot. Now the battery is going dead on your laptop and there is nowhere to plug in the charger.

There is a better way. If you use the EA2 module (p.G6) to drive your modulating actuators, the OAM (Output Adjust Module) accessory allows you to stroke your actuator to any position without any additional equipment. Simply plug the actuator cable into the OAM and then plug the OAM into the EA2. Turning the knob on the OAM allows you to set the actuator's position anywhere in its range. Push the button on the EA2 to see your commanded position, release the button to see the actuator's position.

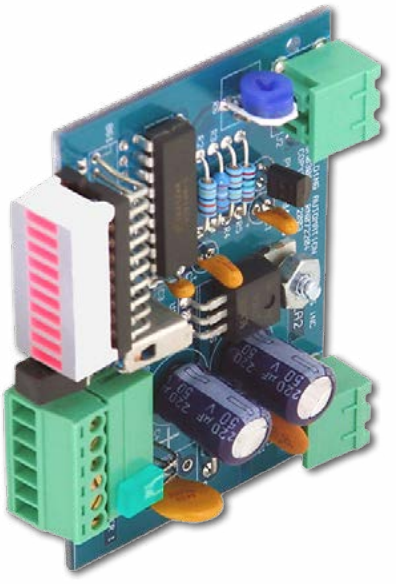


OAM - Output Adjust Module

Part Number	Description	List Price
BA/OAM	Output Adjust Module	$23

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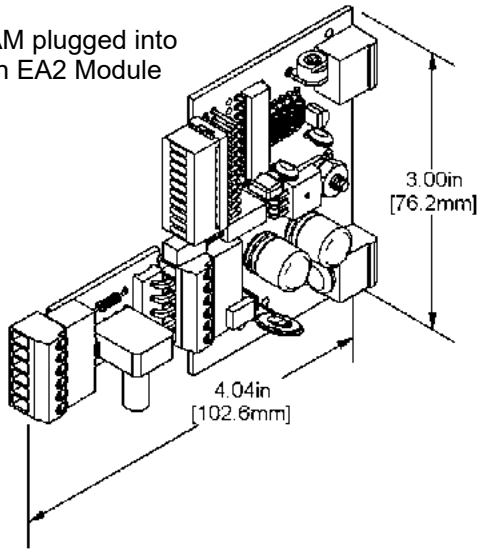
Associated Products



EA2 - Modulating Actuator Interface (p. H6)

Specifications

OAM plugged into an EA2 Module



Input Voltage: 24VDC from the EA2

Output Signal Voltage: 0 to 10 VDC nominal

Output Signal Current: 2 mA

(Actuator power passes through the OAM from the EA2)

3324VC - Voltage Converter

ETA Line

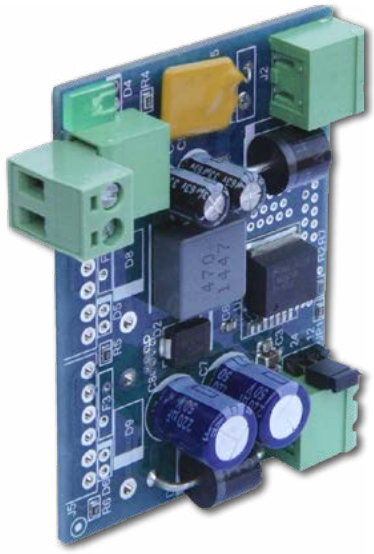
Rev. 08/28/23

Overview

Some of BAPI's ETA products require regulated power of 12 or 24 VDC, including the FOX and SOX - RS-485 Fiber Optic Transceivers and the RPTR - RS-485 Repeater. The 3324VC - Voltage Converter is perfect for these. It converts a 16 to 36 VDC input into a 12 VDC regulated output, or a 28 to 36 VDC input to a 24 VDC regulated output The 12 or 24 VDC outputs are field selectable with a jumper setting.

The 3324VC can be mounted in two ways. As usual, the units plug vertically into a BP2, BP4, BP8 or BP4-V Backplane like other ETA modules. The voltage converter receives its supply power from the Backplane which is supplied by a PS17/18/19RF Power Supply or other suitable power supply.

The 3324VC can also be mounted directly in snaptrack. The unit is then powered with a two-wire connection from a PS17/18/19RF Power Supply or other suitable power supply.

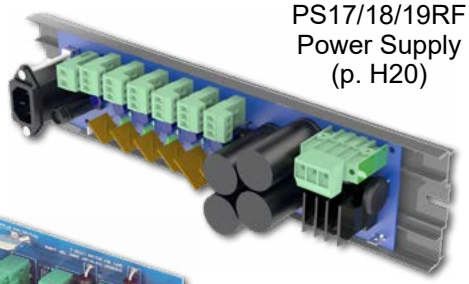


3324VC - Voltage Converter

Part Number	Description	List Price
BA/3324VC	Voltage Converter	$120

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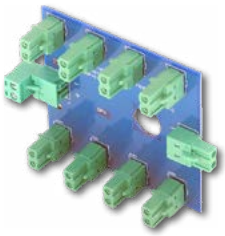
Associated Products



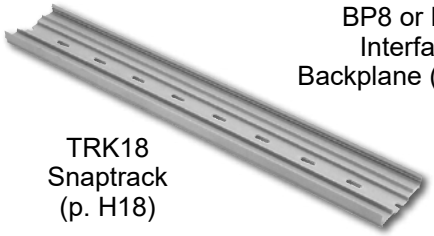
PS17/18/19RF Power Supply (p. H20)



RBP or SRBP Repeater Backplanes (p. H30-32)

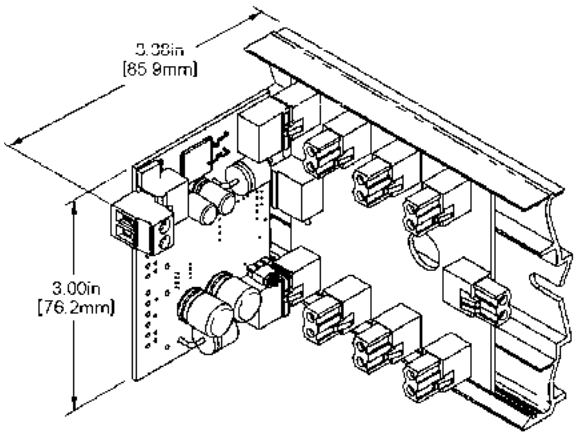


BP8 or BP4 Interface Backplane (p. H16)



TRK18 Snaptrack (p. H18)

Specifications



3324VC plugged into a BP4 Backplane

Input Voltage:
12 VDC Output: 16 to 36 VDC
24 VDC Output: 28 to 36 VDC

Input Current: 1.5A Max at 28 VDC

Output Voltag: 12 or 24 VDC ± 0.25 VDC

Output Current: 1.5 Amp Max (30VA max)

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CDSP2 - Carbon Dioxide Sensor Power Supply

Rev. 11/06/20

ETA Line

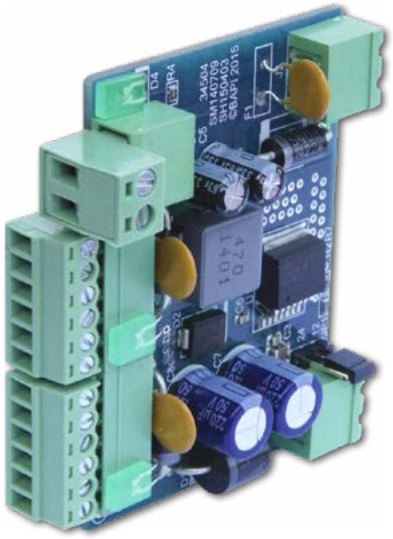
Overview

Many facilities use Carbon Dioxide (CO_2) sensors for demand-controlled ventilation. Although BAPI makes CO_2 sensors that can run on AC or DC power, many sensors require 12 or 24 VDC to operate and additional terminations to land the wiring. The extra power supplies, wiring and terminations can clutter up the control panel or the control room.

The CDSP2 module removes the clutter and the wiring hassles by providing the power and terminations for two CO_2 sensors. Additional CDSP2 modules can be mounted neatly in the associated backplane to accommodate an unlimited number of sensors throughout the facility. The 12 or 24 VDC output power of the module is field selectable with a jumper setting. All three outputs will be the same voltage.

The CDSP2 plugs into the BP2, BP4, BP4-V or BP8 Backplane. The CDSP2 receives power from the backplane which is powered by a BAPI PS17/18/19RF or other suitable power supply.

Three green Output Power LEDs light whenever power is present at the output terminals.

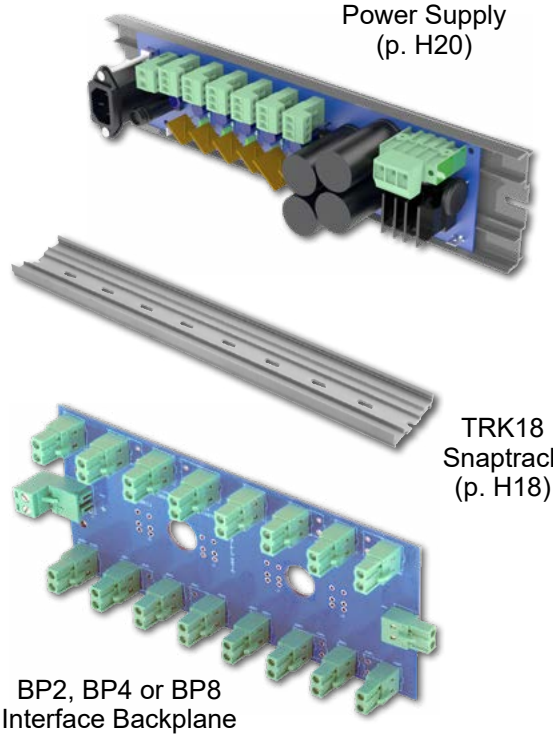


CDSP2 - Carbon Dioxide Sensor Power Supply

Part Number	Description	List Price
BA/CDSP2	Carbon Dioxide Sensor Power Supply	$130

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Associated Products

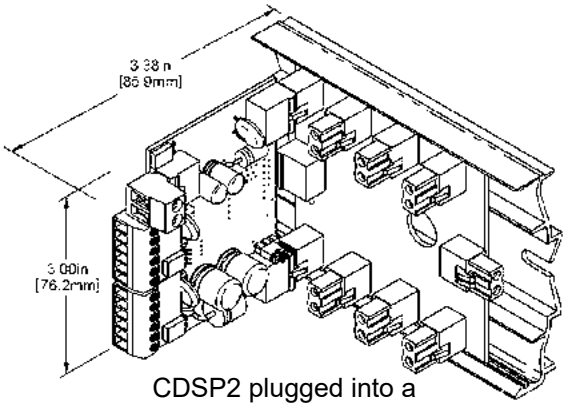


PS17/18/19RF Power Supply (p. H20)

TRK18 Snaptrack (p. H18)

BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications



CDSP2 plugged into a BP4 Backplane

Input Voltage
24VDC Output: 28 to 36 VDC or 24 VAC
12 VDC Output: 16 to 36 VDC or 24 VAC

Input Current: 1.45A max (12VA max)

Output Voltage: 12 or 24VDC

Output Current: 0.5A on each output
1.5A total

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SQ4 - Four-Step Sequencer

ETA Line

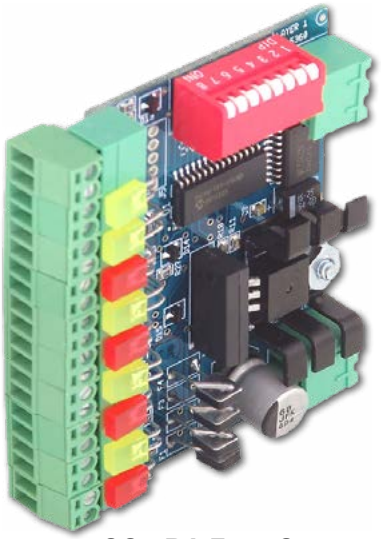
Rev. 11/06/20

Overview

The high cost of energy today makes proportional control of HVAC systems a necessity, not a luxury. With proportional control you use only the energy needed to get the job done.

Proportional control is easy for water valves and air dampers, but more complex and cost prohibitive for electric heat units, fans and refrigeration systems. The SQ4 module simplifies the job by sequencing multiple on-off devices based on a single analog output from the controller. Now items such as cooling towers with multiple two-speed fans, staged electric heaters and multi-compressor chillers can be controlled to provide the utmost efficiency and consistency for the load at hand – all at a reasonable price.

Each SQ4 module provides four outputs that trigger at four fixed voltages across the 0 to 5 or 0 to 10 control voltage range. Two SQ4 modules can be cascaded to provide eight independent output stages. When energized, each output provides 24 VDC at 120 mA. In addition, sequencer modules are available that provide a rotational sequence as well as status contact monitoring with alarm output.

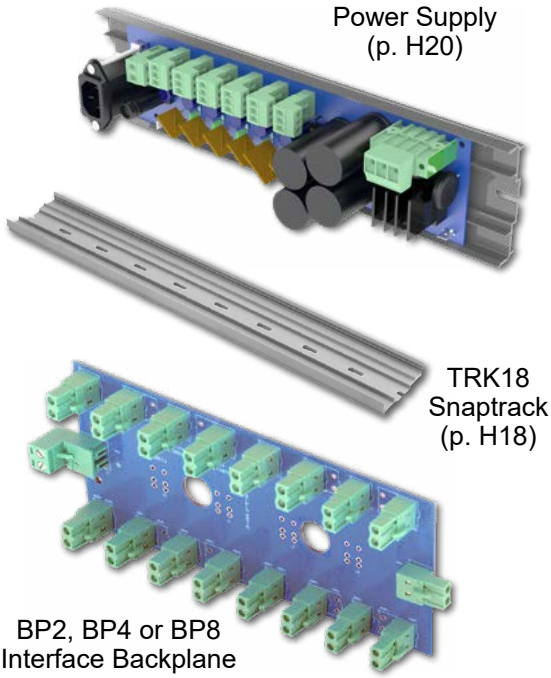


SQ4-RA Four-Step Sequence Module

Part Number	Description	List Price
BA/SQ4	4-Step Sequence Module	$105
BA/SQ4-R	4-Step Sequence Module (Rotational)	$105
BA/SQ4-A	4-Step Sequence Module (with Alarm)	$280
BA/SQ4-RA	4-Step Sequence Module (Rotational with Alarm)	$280

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

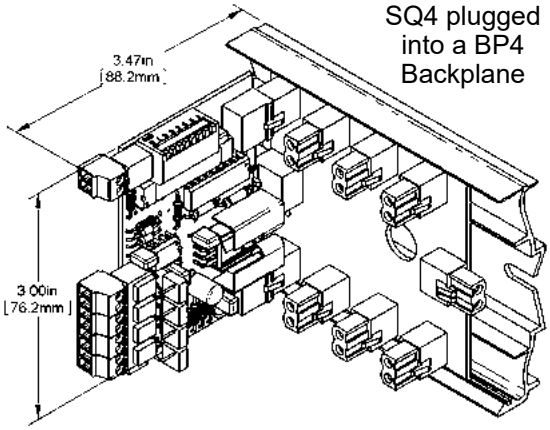


PS17/18/19RF Power Supply (p. H20)

TRK18 Snaptrack (p. H18)

BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications



SQ4 plugged into a BP4 Backplane

Power Voltage: 26 to 36 VDC or 24 VAC

Power Current: 50 mA max. plus output (1.7 VA max plus output)

Input Control Voltage: 0 to 5 or 0 to 10 VDC

Output Power Voltage: Nominal 24 VDC (23 to 32 VDC)

Output Power Current: 4 outputs of 80 mA max. (10 Watts total)

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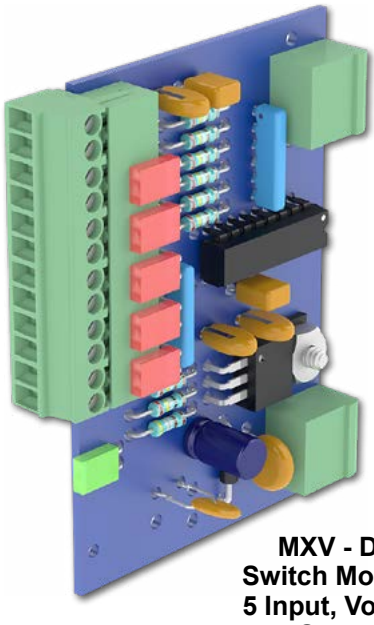
MXV - Dry Switch Monitor, 5 Input

Overview

The MXV monitors five dry switch closure devices and provides one 0 to 10V analog output to the controller. Each switch closure adds a precise voltage to the output so a simple subtraction algorithm lets the controller know which switches are closed at any time.

The MXV plugs into either the BP2, BP4, BP4-V or BP8 backplane and receives its power from the backplane. Each switch terminates on an independent plug on the front of the module and an LED associated with each input indicates when the switch is closed.

The MXV can be combined with other BAPI ETA modules, such as the DS8 Discreet Summary Module, to monitor additional switches.

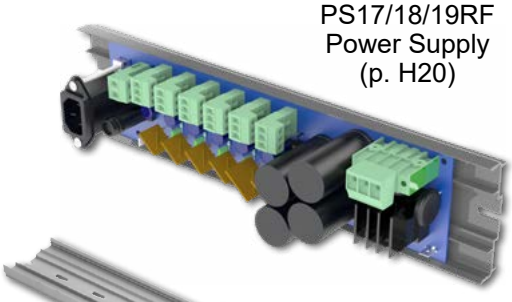


MXV - Dry Switch Monitor, 5 Input, Voltage Output

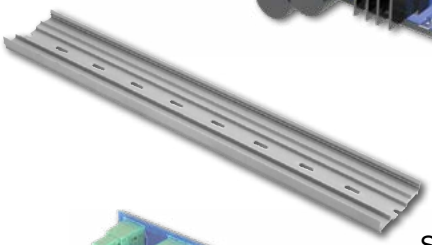
Part Number	Description	List Price
BA/MXV	Dry Switch Monitor, 5 Input, Voltage Output	$303

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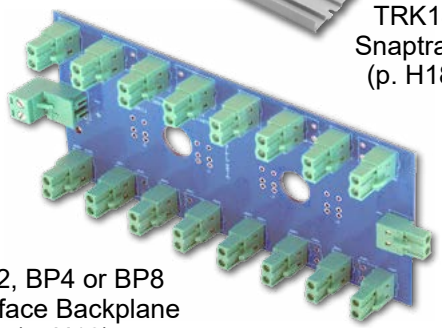
Associated Products



PS17/18/19RF Power Supply (p. H20)

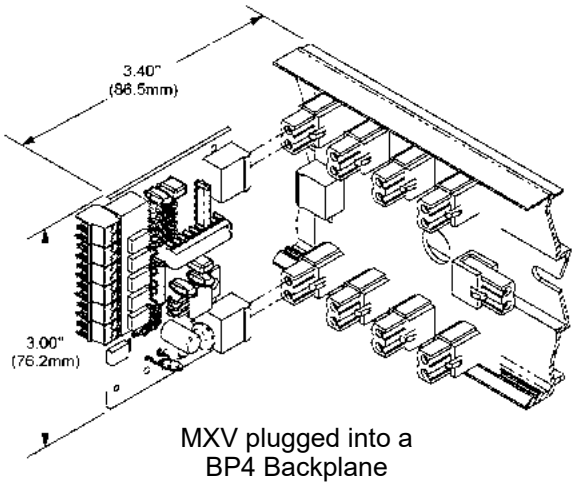


TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications



MXV plugged into a BP4 Backplane

Power Voltage: 24 to 34 VDC, 20 to 24VAC
Power Current: 35mA max (1.2VA max)
Input Sensing Voltage: 15VDC
Input Sensing Current: 2mA
Output Voltage: 0 to 10 VDC
Output Current: 5mA max sourcing, 10KΩ resistance pull down sinking

R49 - Relay Interface, 9 Output

ETA Line

Rev. 11/03/20

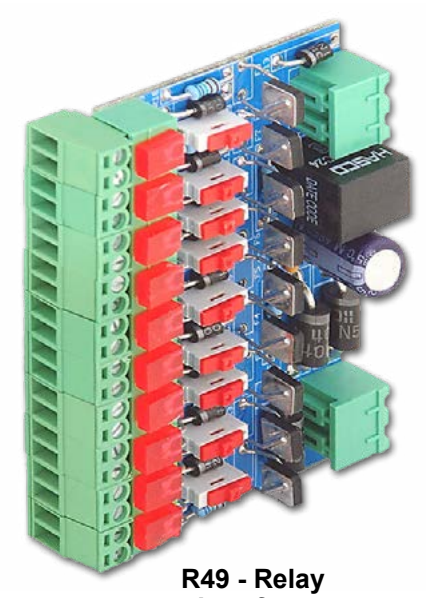
Overview

It is often necessary to perform several tasks simultaneously in an HVAC system – for example, turn on an auxiliary supply fan, turn on an exhaust fan, open purge dampers and close return dampers. Rather than tying up four outputs on the controller to perform these tasks, the BAPI R49 conserves critical controller points by turning on or off up to nine relays using only one controller output.

Each output on the R49 module has a switch so that some loads may be turned off while others are turned on as the input changes state.

Each R49 output supplies a nominal 24 VDC at 120 mA allowing it to control most common relays or small contactors. Each output has a red LED to indicate when power is present.

The R49 plugs into a BP2, BP4 or BP8 Backplane. A green LED indicates that power is present to the module.



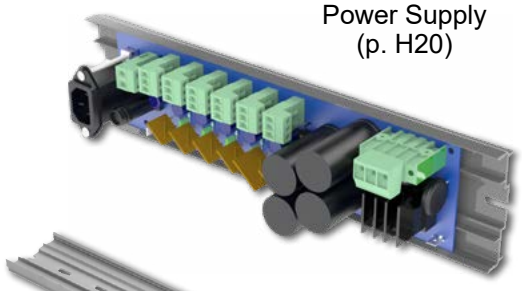
R49 - Relay Interface

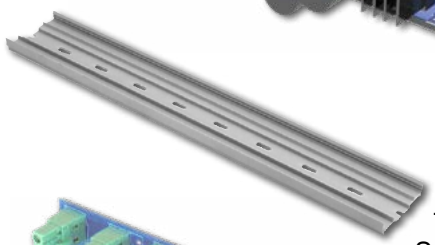
Part Number	Description	List Price
BA/R49	Relay Interface Module, 9 Output	$125

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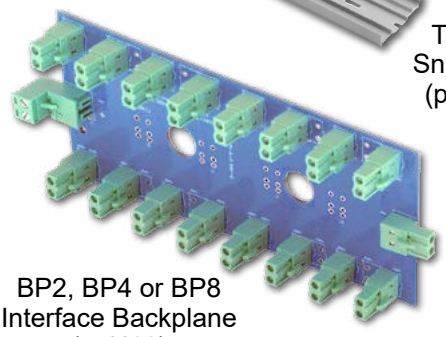
Associated Products

PS17/18/19RF Power Supply (p. H20)





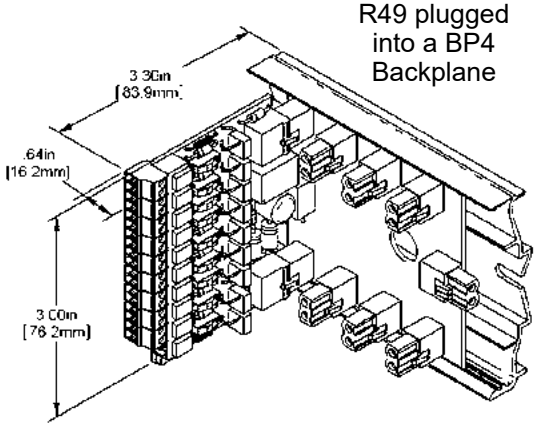
TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications

R49 plugged into a BP4 Backplane



Power Voltage: 26 to 34 VDC; 24 VAC

Power Current: 50 mA max. plus relays (1.7 VA max. plus relays)

Input Control Voltage: 0 or 24 VDC @ 7 mA max.

Output Power Voltage: Nominal 24 VDC (23 to 32 VDC)

Output Power Current: 9 outputs of 120 mA max. (26 Watts total)

DS6R - Dry Switch Monitor

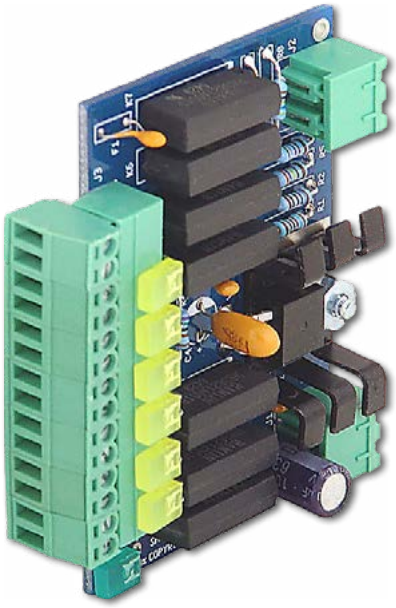
Overview

The DS6R module monitors six dry switch closure devices and provides one resistive output to the controller.

Each switch closure subtracts a precise resistance from the output so a simple subtraction algorithm at the controller decodes which switches are set.

Each switch terminates on an independent plug on the front of the DS6R module and an LED associated with each input indicates switch closure for simple troubleshooting.

The DS6R plugs into the BP2, BP4, BP4-V or BP8 backplane.



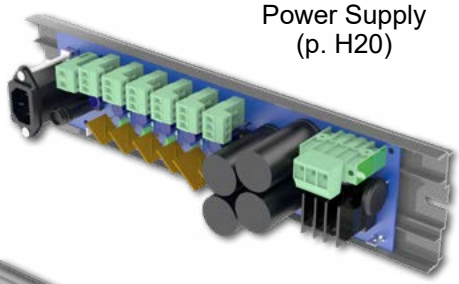
DS6R - Dry Switch Monitor

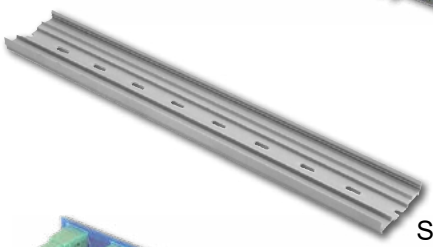
Part Number	Description	List Price
BA/DS6R	Dry Switch Monitor, 30K Output	$95
BA/DS6R-10K	Dry Switch Monitor, 10K Output	$95

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

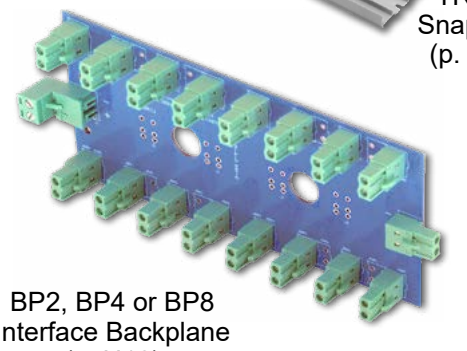
Associated Products

PS17/18/19RF Power Supply (p. H20)





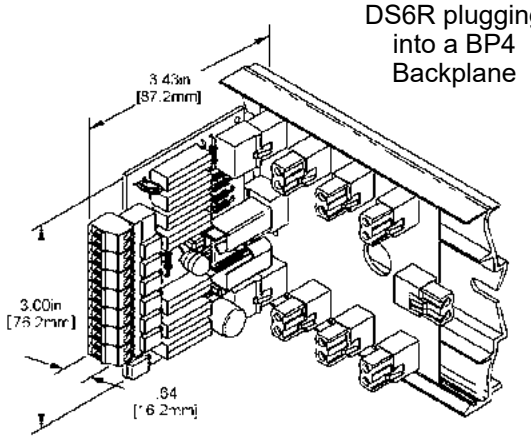
TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications

DS6R plugging into a BP4 Backplane



Power Voltage: 10 to 42 VDC
20 to 26 VAC

Power Current: 70 mA maximum
(2.4 VA maximum)

Switch Voltage: 7 VDC

Switch Current: 10mA

Output Resistance:
DS6R ..... 29.505KΩ - All Switches Open
DS6R-10K .. 9.806KΩ - All Switches Open

(Full output resistance tables are available in the installation and operation instructions)

PMPB5 - Pulse Meter Pulse Buffer

ETA Line

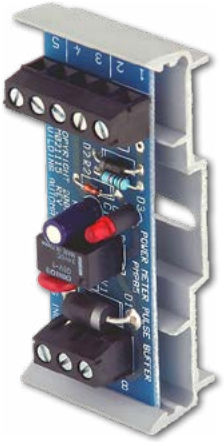
Rev. 11/06/20

Overview

Many electrical, water or gas meters provide a pulse output with each pulse representing a specific quantity of the media being measured. These pulse outputs often need to be electrically isolated from the controller's input by a buffer. The PMPB5 provides that buffer by receiving the pulses from the meter and recreating them as dry contact closures. An LED lights whenever the buffer contacts are closed. The PMPB5 fits standard 2.75" snaptrack.

Part Number	Description	List Price
BA/PMPB5	Pulse Meter Pulse Buffer	$27.50

Submittal datasheets without List Prices are available on our website at www.bapihvac.com



PMPB5 mounted in the optional 2.75" snaptrack

Specifications

Power ..... 24VAC 50/60HZ @ 25mA (0.6VA)
Contact rating ..... 1A @ 24VAC/DC max, 1mA @ 5VDC min*
Contact repetition rate ..... 2 seconds per pulse maximum

*Return pulse from the relay contact is clamped at 5V to ground.

TS1 & TS2 - Transient Suppressor

Overview

HVAC control systems can be subjected to electrical transients (temporary excess voltage) from various sources. Damage to control systems can occur if static electricity, lightning or contactors produce transients of sufficient magnitude and duration to overwhelm the protection built into the control system components. The TS1 and TS2 can significantly increase the transient protection and reduce the possibility of damage to the control system. Both modules fit in standard 2.75" snaptrack

The TS1 is specifically designed for network communications between control system components. The TS1 clamps voltages to 10 VAC or ±14 VDC Line to ground and 7.5 VDC line to line. *Note: The added capacitance of the TS1 may be unsuitable for some combinations of communications line length and high speed data. Line lengths may have to be reduced or repeaters added for best operation.*

The TS2 is designed to protect 4 to 20 mA current loops. The TS2 clamps the signal return line to 5 volts above ground and 1 volt below ground. The voltage supply line is clamped to ±39 VDC Line to ground.

Part Number	Description	List Price
BA/TS1	Transient Suppressor (voltage)	$7.50
BA/TS2	Transient Suppressor (current)	$7.50

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TS1 & TS2 - Transient Suppressors mounted in optional 2.75" snaptrack

Specifications

TS1 Clamping Voltage..... 10 VAC or ±14 VDC Line to Ground, ±7.5 VDC Line to Line

TS2 Clamping Voltage..... 5 VDC Above Ground, Signal Return Line
1 VDC Below Ground, Signal Return Line
±39 VDC Line to Ground, Power Supply Line

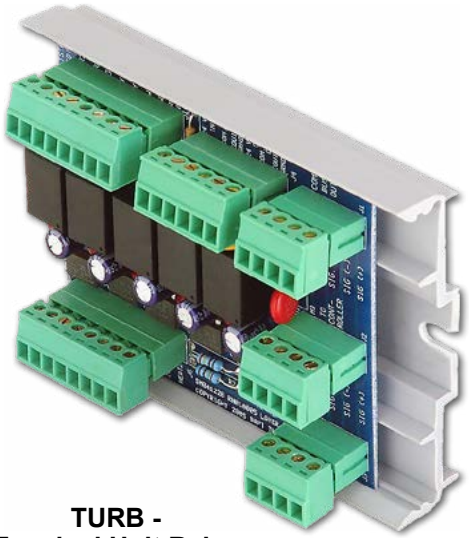
TURB - Terminal Unit Relay Board

Overview

Today's energy costs are forcing older buildings to be retrofitted with Building Management Systems - keeping the occupied spaces comfortable while reducing the overall energy use. The TURB - Terminal Unit Relay Board is an interface board that allows convenient interconnection between a Digital Controller and a DX unit's conventional thermostat terminal block. The TURB eliminates the wiring mess and provides a neat professional look that simplifies maintenance to eliminate costly callbacks.

The TURB provides an easily pluggable interface between the modules and provides fused power to the controller from the "R" terminal of the DX unit. Dry-contact pilot duty relays interface between the Digital Controller and the conventional thermostat inputs of the DX unit.

The TURB also provides a "mini communications block" with surge protection to provide a clean and easily pluggable connection to the controller. All this is packaged on a board that mounts in a 2.75" snaptrack in one orientation, or a 3.25" snaptrack in the other orientation, depending on how you want to install the module.



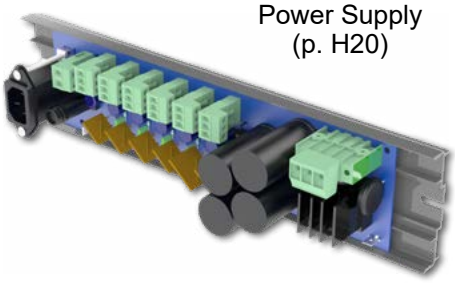
TURB - Terminal Unit Relay Board mounted in the optional 2.75" snaptrack

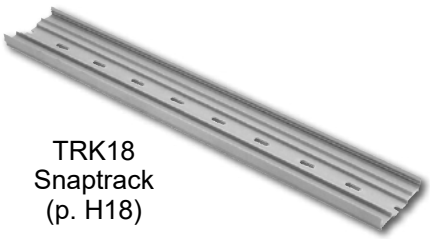
Part Number	Description	List Price
BA/TURB	Terminal Unit Relay Board	$57
BA/TURB-TRK	TURB with 4" piece of 2.75" snaptrack	$65

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Associated Products

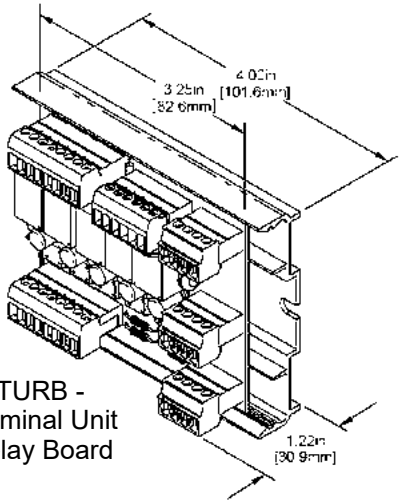
PS17/18/19RF Power Supply (p. H20)





TRK18 Snaptrack (p. H18)

Specifications



TURB - Terminal Unit Relay Board

Relay Input Power: 24 VAC @ 10mA each

Relay Output Contacts:
2 Amps @ 24 VAC, 24 VDC

Communications Clamping Voltage:
7.5 V positive, 1 V negative

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BP2, BP4 or BP8 Backplane

ETA Line

Rev. 11/06/20

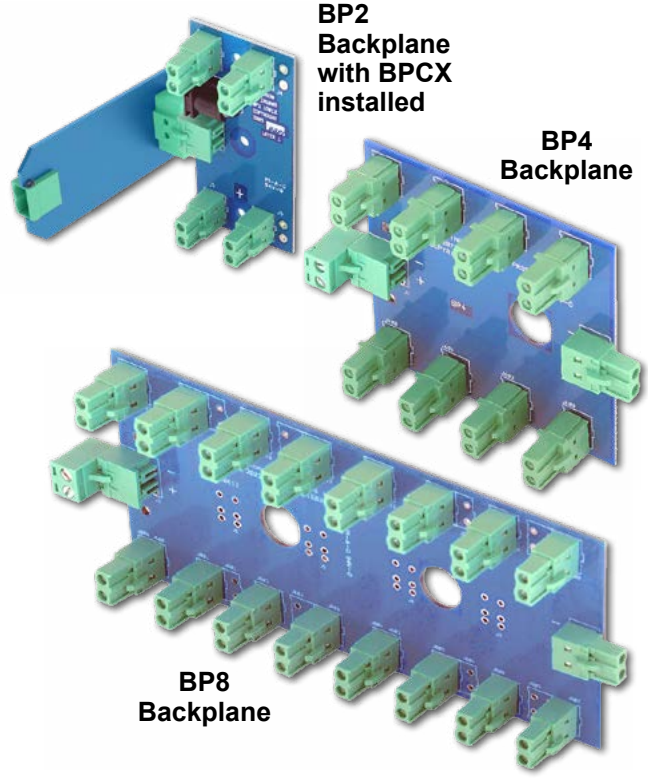
Overview

The BP2, BP4 and BP8 Backplanes provide a convenient way to mount and power the BAPI ETA devices and eliminate control panel clutter. All backplanes fit standard 2.75" snaptrack.

ETA modules plug into the sockets on the face of the backplane. BP2, BP4, and BP8 backplanes accommodate 2, 4, and 8 ETA modules, respectively.

The Backplanes receive power from PS17/18/19RF or a customer-furnished power supply. The Backplanes can be plugged together using the end-to-end connectors to handle many modules. The BP2 and BP4 can receive power from BAPI's VC350 voltage converter depending on the application (in Accessories section). While DC is recommended, most ETA modules will work with 24VAC input.

The BPCX extends the backplane power input plug to make it more accessible for service.



BP2 Backplane with BPCX installed

BP4 Backplane

BP8 Backplane

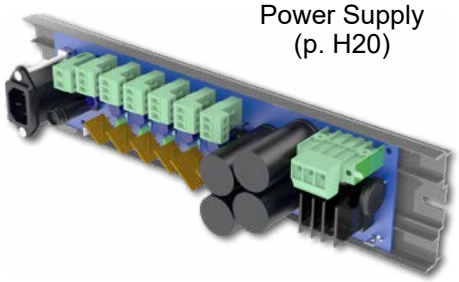
Part Number	Description	List Price
BA/BP2	2-Position Interface Backplane	$30
BA/BP4	4-Position Interface Backplane	$40
BA/BP8	8-Position Interface Backplane	$65
BA/BPCX	Backplane Power Input Extender	$10.70

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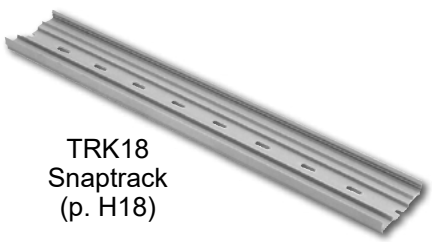


BPCX extender for the Backplane power input

Associated Products

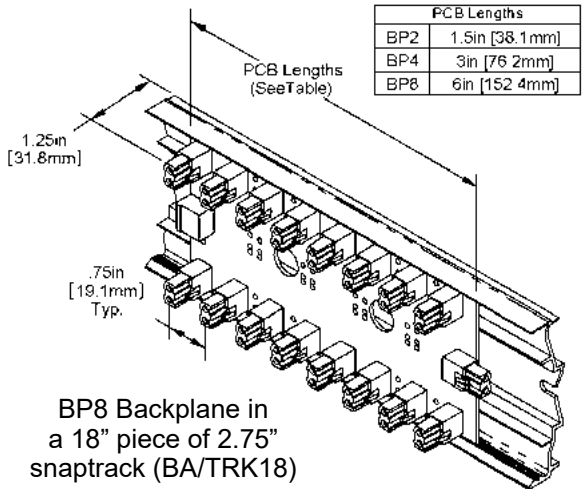


PS17/18/19RF Power Supply (p. H20)



TRK18 Snaptrack (p. H18)

Specifications



BP8 Backplane in a 18" piece of 2.75" snaptrack (BA/TRK18)

Power Voltage: 34 VDC or 24 VAC, max

Power Current: 4 Amp max.

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BP4-V - Vertical Backplane & BP-BR - Power Bridge

Overview

The BP4-V - Vertical Backplane was designed to add additional ETA boards into a congested panel where the only space for the snaptrack is vertical. The BP4-V allows the use of any vertical spaces that may go unused. Each BP4-V accommodates four ETA modules.

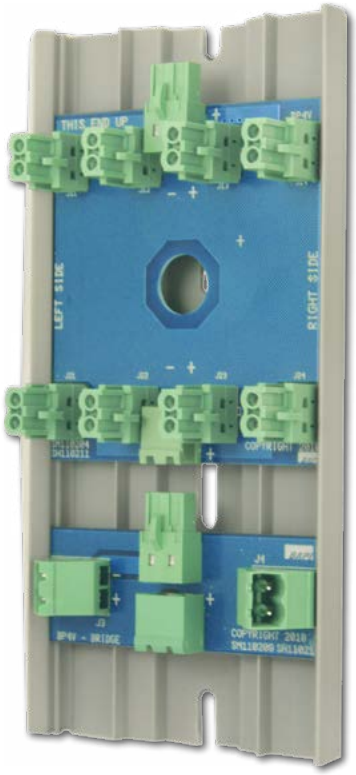
If more than one BP4-V is needed, they should be connected together with a BP-BR -Power Bridge. The BP-BR bridges the power between the backplanes and provides clearance from one BP4-V to the other for easy insertion of the ETA modules. The BP-BR also provides two additional power entry points in case the bottom plug location is not easily accessible.

For large control systems, the BP4-V receives power from a PS17/18/19RF Power Supply. For small control systems, the BP4-V can receive power from BAPI's VC350 voltage converters. While not recommended, most ETA modules will also work with 24VAC input.

Note: Do not use the BP4-V in horizontal snaptrack. Use the BP2, BP4 or BP8 instead.

Part Number	Description	List Price
BA/BP4-V	Vertical Backplane	$40
BA/BP-BR	Bridge (to connect Vertical Backplanes)	$22

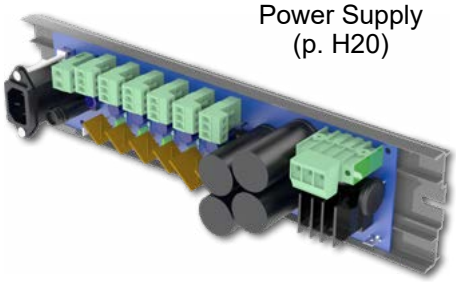
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

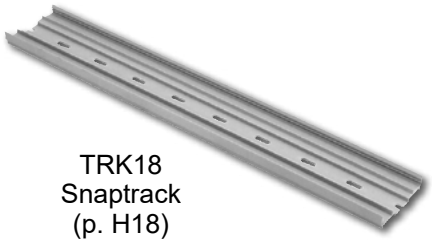


BP4-V - Vertical Backplane and a BP-BR - Power Bridge in a 2.75" wide piece of snaptrack (sold separately)

Associated Products

PS17/18/19RF Power Supply (p. H20)

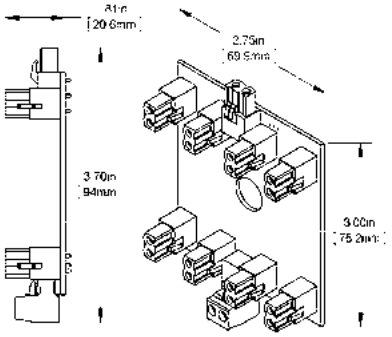




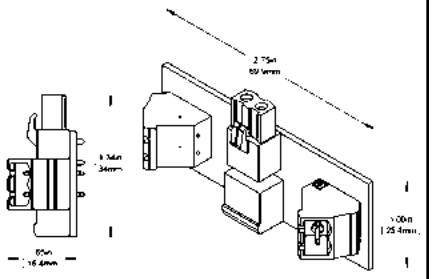
TRK18 Snaptrack (p. H18)

Specifications

BP4-V - Vertical Backplane



BA/BP-BR - Power Bridge



Power Voltage: 34 VDC max, 24 VAC max
Power Current: 4 Amp max.

TRK - 2.75” Snaptrack (TR2)

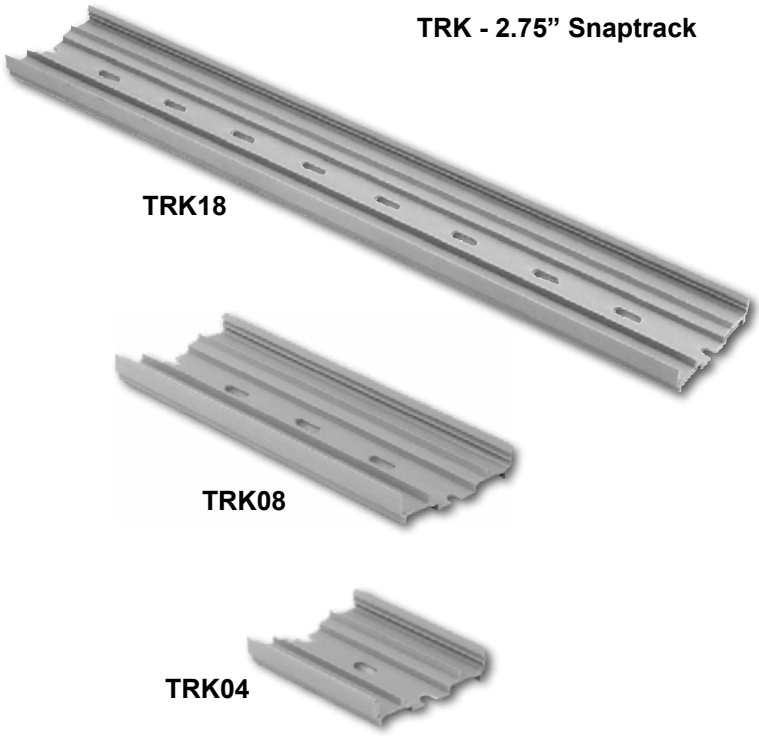
ETA Line

Rev. 11/06/20

Overview

All good projects need to start out with a proper foundation and BAPI’s ETA modules are no exception. The TRK - Snaptrack provides a sturdy, secure and easy mounting method for many products in the ETA line. The standard 2.75” snaptrack is available in several convenient lengths to accommodate all ETA products and enclosures.

The snaptrack firmly holds the ETA interface and communications backplanes, terminal blocks and other products in place so you can build neat, accurate and cost effective control panels. The plastic track is easy to cut in the field to fit any application.



Part Number	Description	List Price
BA/TRK01	TR2 Snaptrack, 1.25” length	$5
BA/TRK02	TR2 Snaptrack, 2” length	$6
BA/TRK04	TR2 Snaptrack, 4” length	$8
BA/TRK08	TR2 Snaptrack, 8” length	$10
BA/TRK12	TR2 Snaptrack, 12” length	$12
BA/TRK18	TR2 Snaptrack, 18” length	$14
BA/TRK48	TR2 Snaptrack, 48” length	$40

Gray shaded items follow the Buy and Resale Multiplier.

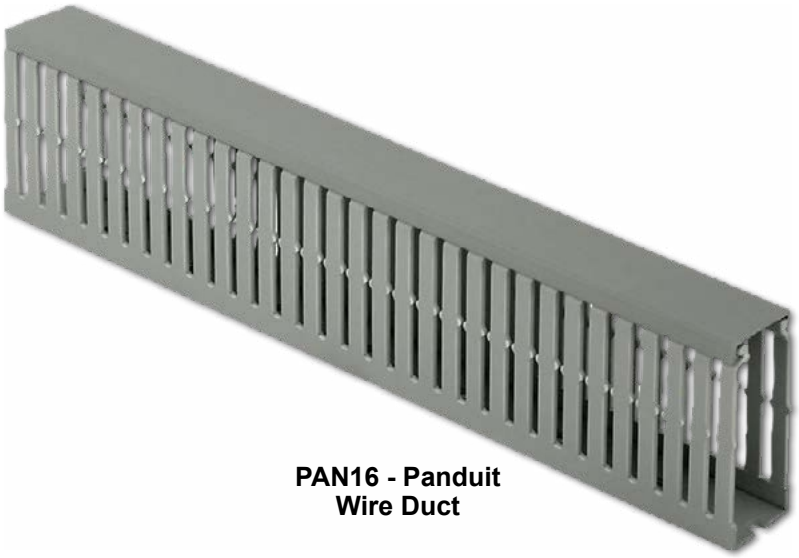
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

PAN16 - Panduit 1x3x16” Wire Duct

Overview

BAPI’s PAN16 - Panduit wire duct easily mounts in any control panel with a few #8 machine screws.

The PAN16 guides the wire around the control panel for a very neat installation.



PAN16 - Panduit Wire Duct

Part Number	Description	List Price
BA/PAN16	Panduit 1x3x16” Wire Duct	$39

Gray shaded items follow the Buy and Resale Multiplier.

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

PS17RF, PS18RF & PS19RF - Power Supplies

ETA Line

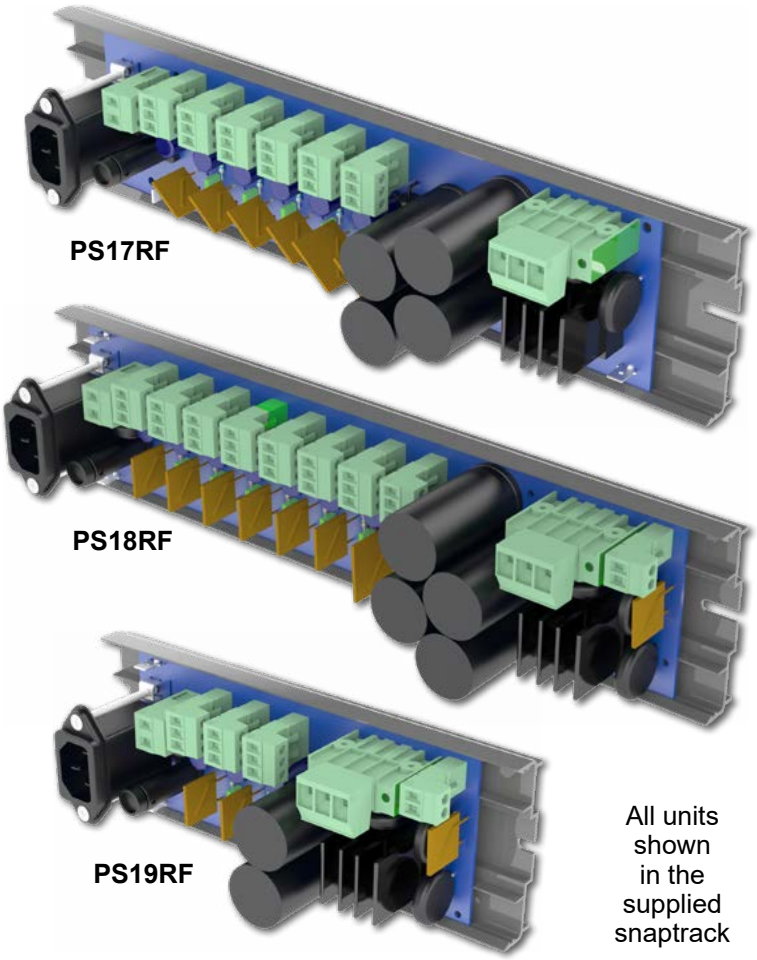
Rev. 11/06/20

Overview

The PS17RF, PS18RF and PS19RF Power Supplies provide multiple 33 VDC* outputs with over-current protection to operate any of BAPI's ETA modules except the RS-485 communication modules. All power supplies are furnished with standard 2.75" snaptrack and include a green LED to indicate when power is supplied to the unit.

The power supplies use a customer-supplied 24 VAC* transformer with a rating of 200 to 600 VA depending upon current consumption (See Transformer Specs). Pluggable screw terminals allow easy termination of the transformer.

All three units provide a transient line filter for the line voltage input to the transformer. Plug a standard computer power cord into a duplex outlet and then into the line filter to power the units.



All units shown in the supplied snaptrack

Part Number	Description	List Price
BA/PS17RF	6 Output Unit with Self-Resetting Fuses	$303
BA/PS18RF	8 Output Unit with Self-Resetting Fuses	$413
BA/PS19RF	3 Output Unit with Self-Resetting Fuses	$265

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Input Power
120 to 240 VAC; Amps depend on transformer selected. Standard IEC 320 Line Filter

Output Voltage
Nominal 33 VDC* (using 24 VAC transformer)

PS17RF Outputs (Nominally-Rated)
Six Outputs: Four at 2.5 Amps, two at 3.75 Amps

PS18RF Outputs (Nominally-Rated)
8 Outputs: Six at 2.5 Amps, two at 3.75 Amps

PS19RF Outputs (Nominally-Rated)
3 Outputs: Two at 2.5 Amps, one at 3.75 Amps

Customer Supplied Transformer Specs

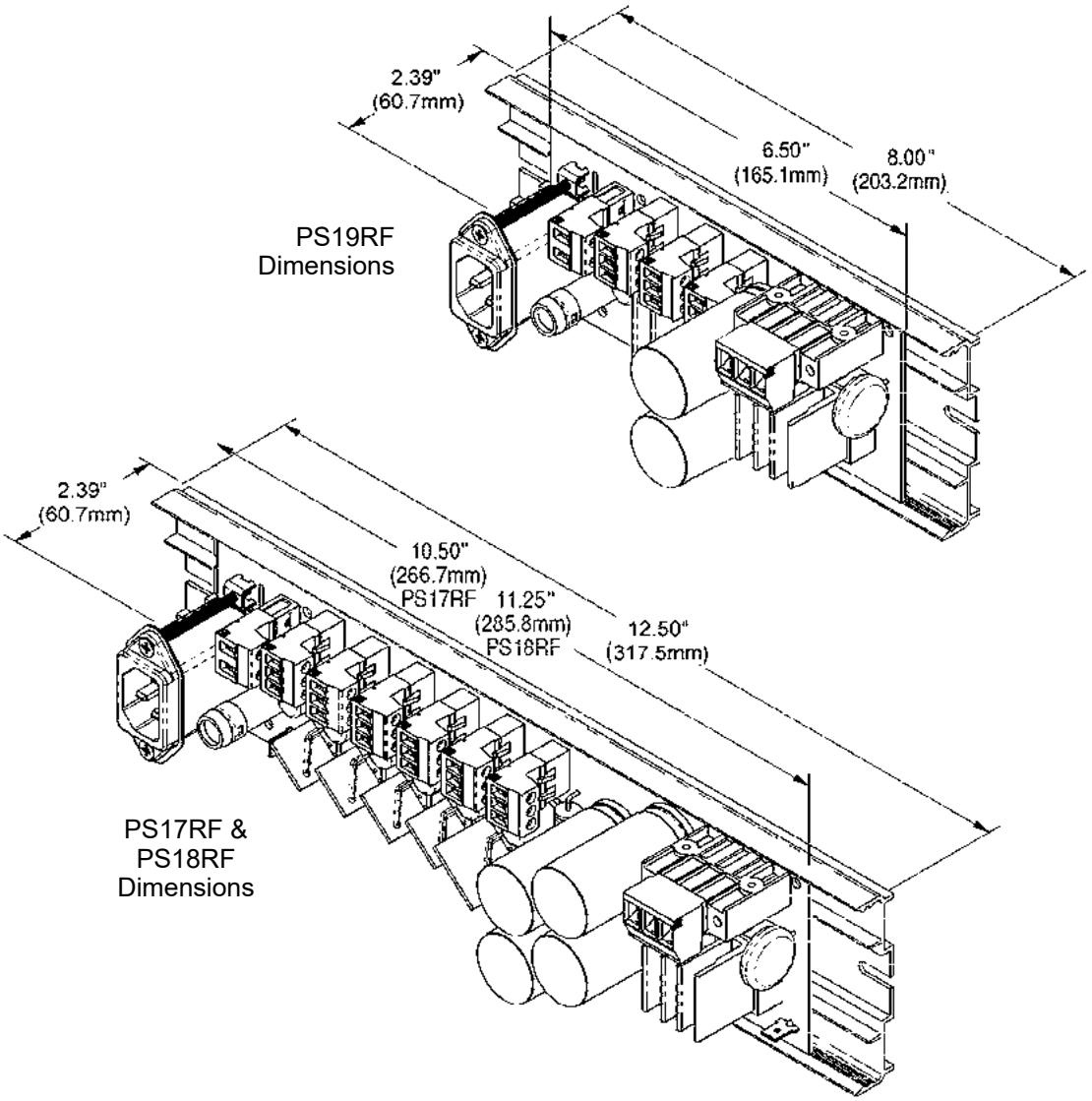
Unit Model	Transformer Power
PS19RF	Nominal 200 VA
PS17RF	Nominal 400 VA
PS18RF	Nominal 600 VA

*The VDC output voltage from the unit is dependent on the VAC input voltage. Generally the output will equal 1.4 times the input.

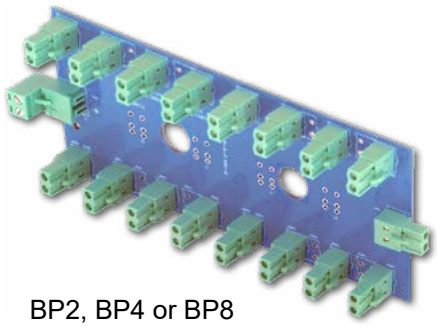
9 VAC input = 12 VDC output
18 VAC input = 24 VDC output
20 VAC input = 28 VDC output
24 VAC input = 33 VDC output

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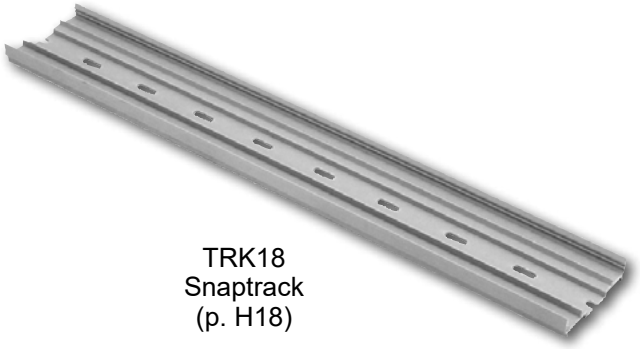
Dimensions



Associated Products



BP2, BP4 or BP8
Backplane (p. H16)



TRK18
Snaptrack
(p. H18)

COMBLK - Comm. Cable Terminal Block

ETA Line

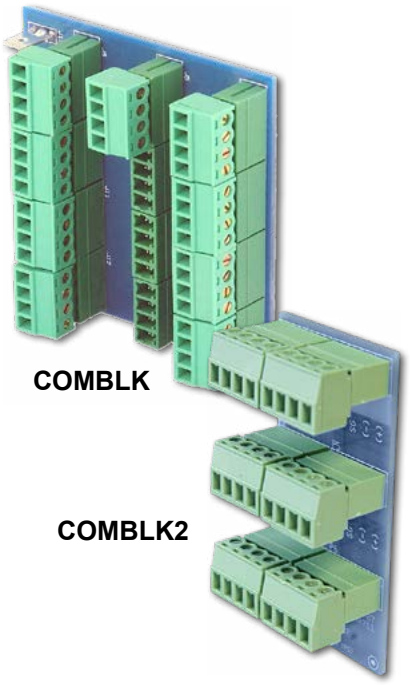
Rev. 03/17/21

Overview

The COMBLK and COMBLK2 Communication Terminal Blocks simplify the task of terminating communications wiring.

The COMBLK has four independent circuits and the COMBLK2 two independent circuits. Each independent circuit includes three connectors — bus in, bus out and wiring to the controller. Either COMBLK allows the in and out bus segments to be quickly isolated and tested, thus greatly simplifying the troubleshooting. A common ground connector provides an easy way to ground all shield drain wires. Also, both COMBLKs accommodate the COMSRG surge suppressor, which plugs directly inline between the COMBLK and the communications bus segment terminated on the plug.

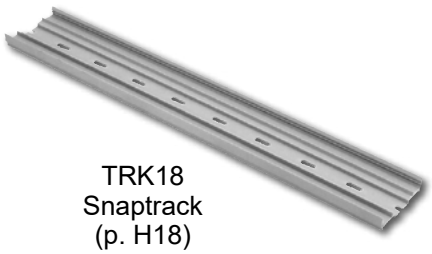
Either COMBLK is suitable for RS-485 wiring, Modbus, BACnet or virtually any other communications standard that talks over two or three wires. The small size of the COMBLK2 makes it ideal for installing within VFD enclosures, power meter cabinets, etc. where Modbus or other protocol communication must be connected to a remote communicating device. Both fit into industry standard 2.75" snaptrack and COMBLK2 is furnished with a TRK02.



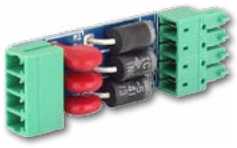
Part Number	Description	List Price
BA/COMBLK	Comm. Cable Terminal Block (NEC Class 2 Circuits, 4 Amp max.)	$65
BA/COMBLK2	Comm. Cable Terminal Block (NEC Class 2 Circuits, 4 Amp max.)	$53

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

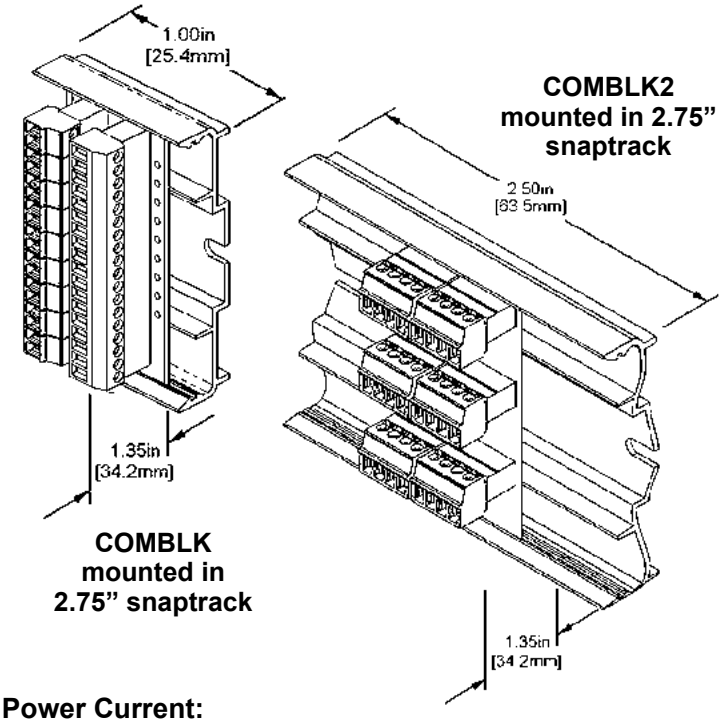


TRK18
Snaptrack
(p. H18)



COMSRG
- Communication Surge Protector
(p. H21)

Specifications



Power Current:
NEC Class 2 Circuits, 4 Amp max.

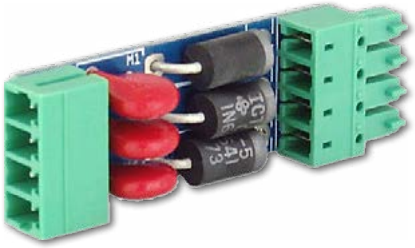
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COMSRG - Comm. Surge Protector

Overview

In some applications, the transient protection on the communications terminals of DDC controllers is inadequate. Examples are roof mounted air handlers, pad mounted air conditioners or chillers – or anything attached to the building's HVAC system but outside the building envelope.

BAPI's COMSRG provides the extra muscle necessary to prevent damage. The COMSRG plugs between the communications network and any of BAPI's RS-485 communication products, including COMBLK, COMBLK2, TUCOM, TUCOM2, LRCA, RPTR, RBP4, RBP8, RBP-PB, RBP-CX, RBP-CX2, and SRBP.



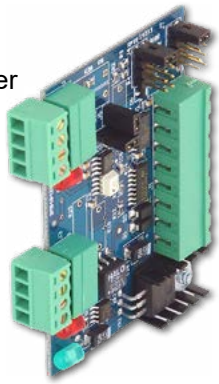
COMSRG
- Communication Surge Protector

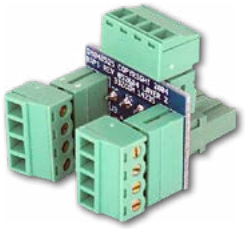
Part Number	**Description**	**List Price**
BA/COMSRG	Communications Surge Protector	$55

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

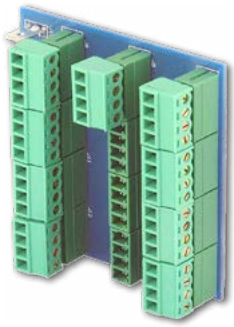
Associated Products

RPTR
RS-485 Repeater
(p. H24)





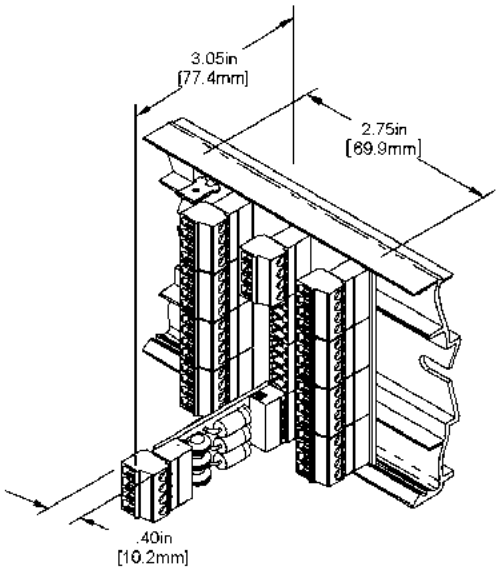
TUCOM - Terminal Unit Comm. Block
(p. H33)



COMBLK
Comm. Cable
Terminal Block
(p. H22)

Specifications

COMSRG module plugged into a COMBLK Communications Cable Terminal Block



Clamp Voltage: 6 VDC

Clamp Energy: 2.3 Joules

RPTR - RS-485 Repeater

ETA Line

Rev. 11/08/20

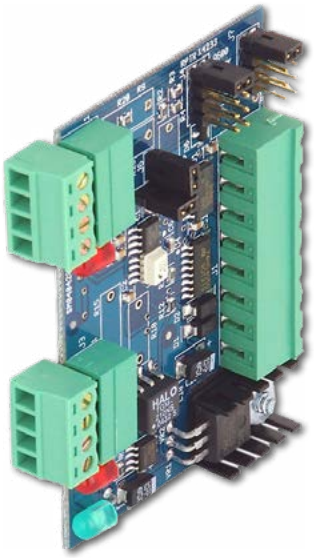
Overview

RS-485 is the most common communications standard for DDC controllers; however, it is limited to 32 unit loads and 4,000 feet. Extending the network beyond 32 unit loads or 4,000 feet requires repeaters.

BAPI's RPTR connects two RS-485 segments together. Data from one segment repeats to the other segment and vice versa. Each RPTR module allows an additional 32 unit loads or 4,000 feet.

The RPTR module plugs into the communications repeater backplanes (RBP4, RPB8, SRBP). Additional RPTR modules plugged into the backplane will form a star network, allowing multiple segments to connect to the same point. Each repeater module consumes one unit load for the primary RS-485 network and one unit load for the repeated network.

A green power LED indicates that 12 VDC is present to the module. A red LED at each RS-485 network connector flashes when data is transmitted.



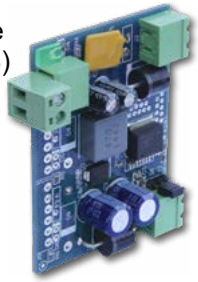
RPTR - RS-485 Repeater

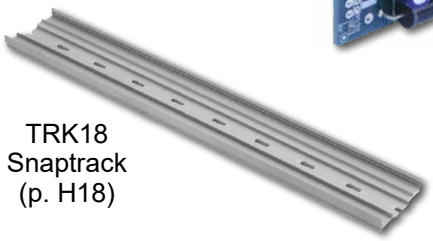
Part Number	Description	List Price
BA/RPTR	RS-485 Repeater	$215
BA/RPTR-KIT	RS-485 Repeater Communication Kit (see page G25)	$335
	Kit includes one RS-485 Repeater (RPTR) Module, a 350 mA voltage converter (VC350A), a Single Repeater Backplane (SRBP) and a 4" piece of 2.75" snaptrack	

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

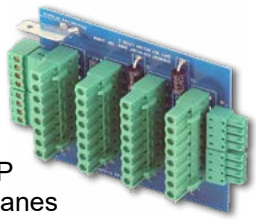
Associated Products

3324VC Voltage Converter (p. H8)





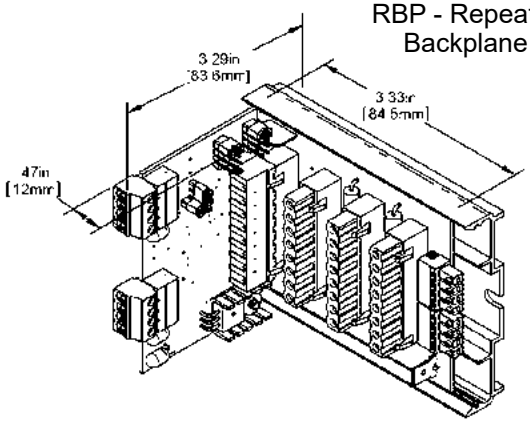
TRK18 Snaptrack (p. H18)



RBP or SRBP Repeater Backplanes (p. H30-32)

Specifications

RPTR module plugged into a RBP - Repeater Backplane



Power Voltage: 11 to 13 VDC

Power Current: 250 mA max. (3 VA max.)

Communications Rates:
9.6K, 19.2K and 38.4K Baud

Network Load: 1 unit load

Network Length: 4,000 ft (1.2 Km)

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RS-485 Repeater Communication Kit

Overview

RS-485 is the most common communications standard for DDC controllers; however, it is limited to 32 unit loads and 4,000 feet. Extending the network beyond 32 unit loads or 4,000 feet requires repeaters.

The RS-485 Repeater Communication Kit provides all the functions for one repeater and remote RS-485 network, plus it comes in a self-contained, easy-to-apply and cost effective assembly. The kit also aids in troubleshooting because LEDs indicate when power is applied and communications are present.

The RS-485 Repeater Communication Kit includes:

- One RS-485 Repeater (RPTR) module which connects two RS-485 segments together. Data from one segment repeats to the other segment and vice versa. Each RPTR module allows an additional 32 unit loads and 4,000 feet;
- A 350 mA voltage converter (VC350) to provide the higher current necessary for flawless communications;
- A Single Repeater Back Plane (SRBP) to mount the RPTR module and provide pluggable connectors for power and three RS-485 cables;
- A four inch long piece of 2.75” snaptrack to easily mount the entire assembly.



RS-485 Repeater Communication Kit
(includes one RS-485 Repeater Module, a 350 mA voltage converter, a Single Repeater Backplane and a 4” piece of 2.75” snaptrack)

Part Number	Description	List Price
BA/RPTR-KIT	RS-485 Repeater Communication Kit (see page G25)	$335
	Kit includes one RS-485 Repeater (RPTR) Module, a 350 mA voltage converter (VC350A), a Single Repeater Backplane (SRBP) and a 4” piece of 2.75” snaptrack	

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Input Voltage: 18 to 30 VAC, 15 to 28 VDC

Input Current Max: 760mA (18.25 VA)

Environmental Operation Range:
0 to 50°C (32 to 122°F)
0 to 95%RH Non-Condensing

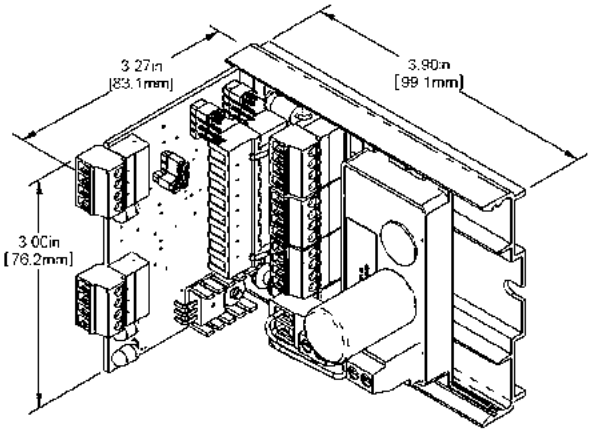
Rectification: Half-Wave Rectified

Grounding: AC and DC Ground are common

Communication Rates:
9.6K, 19.2K and 38.4K Baud

Network Load:
1 unit load on each RS-485 bus

RS-485 Network Length: 4,000ft (1.2Km)



RS-485 Repeater Communication Kit

FOX - RS-485 Fiber Optic Transceiver

ETA Line

Rev. 09/24/24

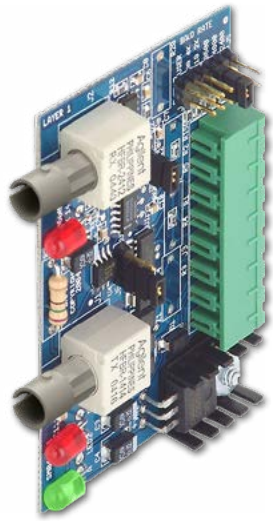
Overview

BAPI recommends fiber optic cable for HVAC communications networks that travel between buildings.

The FOX - Fiber Optic Transceiver converts the RS-485 data from the copper network to a fiber optic signal for transmission to other buildings. A FOX in the other building converts the fiber optic signal back into RS-485 for the remote copper network.

The FOX module accepts the multi-mode fiber (50/125um or 62.5/126um) cable on standard ST connectors. The copper RS-485 connection is made on the 8-pole plug along with the power and ground connections. The FOX also plugs into the communications repeater backplanes (RBP4, RBP8, SRBP). Each FOX module consumes one unit load on the RS-485 bus.

A green power LED indicates that 12 VDC is present to the module. A red LED at each fiber cable connection flashes when data is transmitted or received.



FOX - RS-485 Fiber Optic Transceiver

Part Number	Description	List Price
BA/FOX	RS-485 Fiber Optic Transceiver	$732
BA/FOX-KIT	FOX Communication Kit (see page G25)	$891
	Kit includes one Fiber Optic Transceiver (FOX) Module, a 350 mA voltage converter (VC350A), a Single Repeater Backplane (SRBP) and a 4" piece of 2.75" snaptrack	

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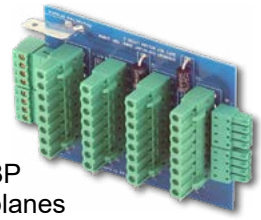
Associated Products

3324VC Voltage Converter (p. H8)





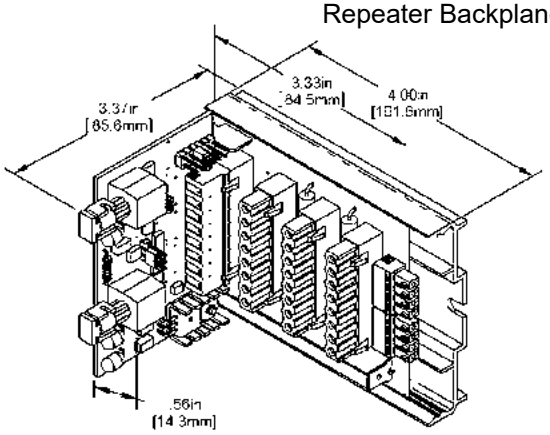
TRK18 Snaptrack (p. H18)



RBP or SRBP Repeater Backplanes (p. GH0-32)

Specifications

FOX module plugged into an RBP4 - Repeater Backplane



Power Voltage: 11 to 13 VDC

Power Current: 250 mA max. (3 VA max)

Communications Rates:
2.4K, 4.8K, 9.6K, 19.2K and 38.4K Baud

Network Load: 1 unit load (RS-485 side)

Optical Network Length:
10,500 ft (3,200 meters)
(max. attenuation of 4 dB/Km)

RS-485 Network Length: 4,000 ft (1.2Km)

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Overview

BAPI recommends fiber optic cable for HVAC communications networks that travel between buildings.

The FOX Communication Kit provides all the functions for one fiber optic and remote RS-485 network, plus it comes in a self-contained, easy-to-apply and cost effective assembly. The kit also aids in troubleshooting because LEDs indicate when power is applied and communications are present.

The FOX Communications Kit includes:

- One Fiber Optic Transceiver (FOX) module which converts RS-485 data to a fiber optic signal or converts a fiber optic signal to RS-485 data;
- A 350 mA voltage converter (VC350) to provide the higher current necessary for flawless communications;
- A Single Repeater Back Plane (SRBP) to mount the FOX module and provide pluggable connectors for power and three RS-485 cables;
- A four inch long piece of 2.75” snaptrack to easily mount the entire assembly.



FOX Communication Kit
(includes one Fiber Optic Transceiver Module, a 350 mA voltage converter, a Single Repeater Backplane and a 4” piece of 2.75” snaptrack)

Part Number	Description	List Price
BA/FOX-KIT	FOX Communication Kit (see page G25)	$891
	Kit includes one Fiber Optic Transceiver (FOX) Module, a 350 mA voltage converter (VC350A), a Single Repeater Backplane (SRBP) and a 4” piece of 2.75” snaptrack	

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Input Voltage: 18 to 30 VAC, 15 to 28 VDC

Input Current Max: 760mA (18.25 VA)

Environmental operation Range:
0 to 50°C (32 to 122°F)
0 to 95 %RH Non-Condensing

Rectification: Half-Wave Rectified

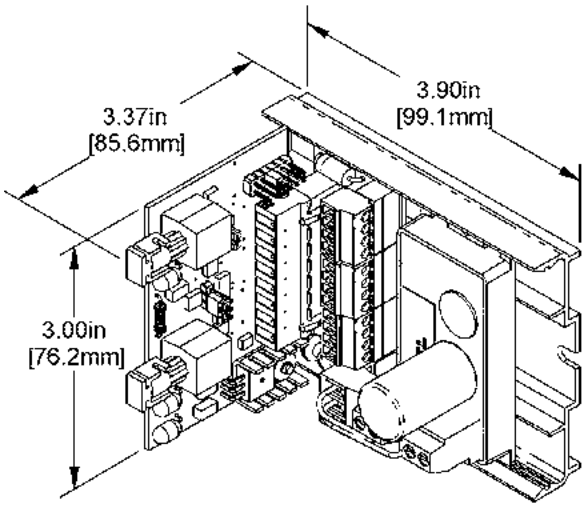
Grounding: AC and DC Ground are common

Communication Rates:
2.4K, 4.8K, 9.6K, 19.2K and 33.4K Baud

Network Load: 1 unit load (RS-485 side)

Optical Network Length:
10,500 Ft (3,200 meters)
(Maximum attenuation of 4db/Km)

RS-485 Network Length: 4,000ft (1.2Km)



FOX Communication Kit

SOX - RS-485 Fiber Optic Transceiver

ETA Line

Rev. 11/06/20

Overview

BAPI recommends fiber optic cable for HVAC communications networks that travel between buildings.

The SOX - Fiber Optic Transceiver converts the RS-485 data from the copper network to a fiber optic signal for transmission to other buildings. A SOX in the other building converts the fiber optic signal back into RS-485 for the remote copper network.

The SOX module accepts single-mode fiber (9/125um) cable on standard ST connectors. The copper RS-485 connection is made on the 8-pole plug along with the power and ground connections. The SOX also plugs into the communications repeater backplanes (RBP4, RBP8, SRBP).

A green power LED indicates that 12 VDC is present to the module. Red LEDs flash when data is transmitted or received.



SOX - RS-485 Fiber Optic Transceiver

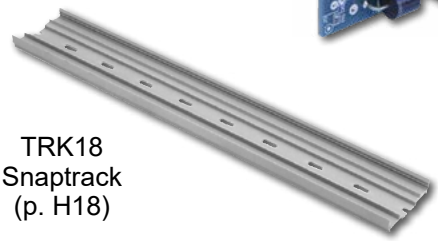
Part Number	Description	List Price
BA/SOX RS-485	Fiber Optic Transceiver (for single-mode fiber cable)	$315

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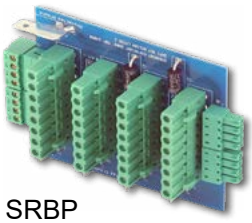
Associated Products



3324VC Voltage Converter (p. H8)



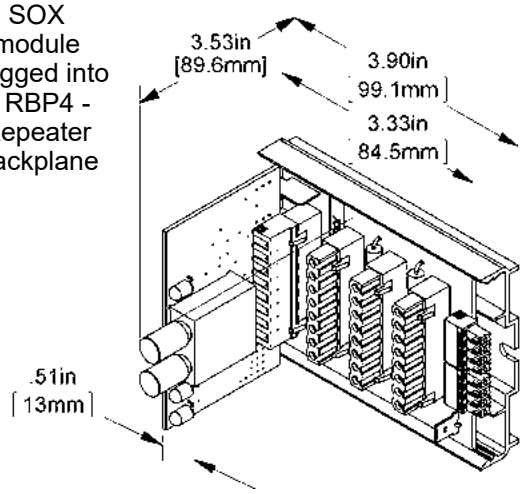
TRK18 Snaptrack (p. H18)



RBP4, RBP8 or SRBP Repeater Backplanes (p. H30-32)

Specifications

SOX module plugged into a RBP4 - Repeater Backplane



Power Voltage: 7 to 18 VDC

Power Current: 50 mA max.

Communications Rates:
Auto-sensing 1200 to 115.2K Auto Baud

Optical Network Length:
65,600 ft (20,000 meters)

RS-485 Network Length: 4,000 ft (1.2Km)

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TB18 - Pluggable Terminal Block

Overview

The TB18 - 18-Pole Pluggable Terminal Block is a small circuit board designed to simplify the task of wire termination. The TB18 is easier to apply and troubleshoot than a bunch of wires under a large wire nut or the typical barrier strip.

The TB18 board fits into the ETA line TRK Snaptrack or any other industry standard 2.75” snaptrack, and provides a straight through connection for nine pairs of wire on individual plugs.

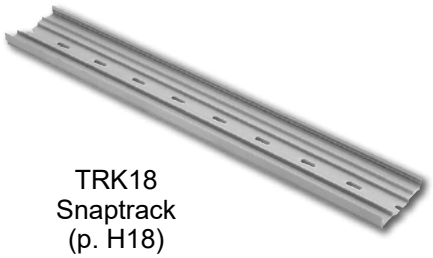


TB18 Pluggable Terminal Block

Part Number	Description	List Price
BA/TB18	Pluggable Terminal Block (NEC Class 2 Circuits, 4 Amp max.)	$55
BA/TB18C	Pluggable Terminal Block (NEC Class 2 Circuits, 4 Amp max.) All odd numbered terminals are common	$90
BA/TB18C2	Pluggable Terminal Block (NEC Class 2 Circuits, 4 Amp max.) All odd numbered terminals are common and all even numbered terminals are common (furnished w/ 18 2-pole plugs)	$125

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

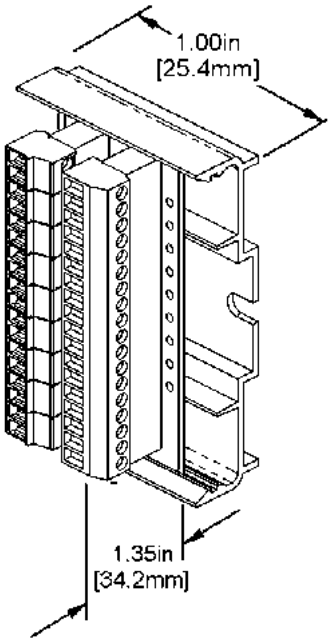
Associated Products



TRK18
Snaptrack
(p. H18)

Specifications

TB18 mounted in 2.75” snaptrack



Power Current:
NEC Class 2 Circuits, 4 Amp max.

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RBP - Comm. Repeater Backplane

ETA Line

Rev. 11/06/20

Overview

The RBP - Communications Repeater Backplane fits into 2.75” snaptrack (TRK18) and provides power, communications and convenient mounting for the RPTR, FOX and SOX modules.

Connectors on the face of the RBP mate with connectors on the RPTR, FOX and SOX. The RPTR, FOX and SOX share data across the RBP backplane which provides transient protection for the communications network and power connection. Several RBP backplanes can be plugged together to share data and power through the backplane end connectors, allowing all the RPTR, FOX and SOX to form a large communications hub.

The RBP backplane receives 12 VDC power from a 3324VC voltage converter.



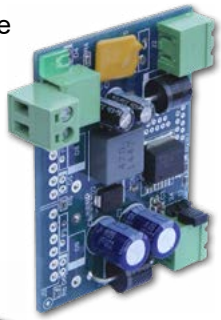
RBP4 - Communications Repeater Backplane

Part Number	Description	List Price
BA/RBP4	Comm. Repeater Backplane, supports 4 communication modules	$90
BA/RBP4-TRK	Comm. Repeater Backplane with 4” piece of 2.75” snaptrack	$98
BA/RBP8	Comm. Repeater Backplane, supports 8 communication modules	$145
BA/RBP8-TRK	Comm. Repeater Backplane with 6” piece of 2.75” snaptrack	$155

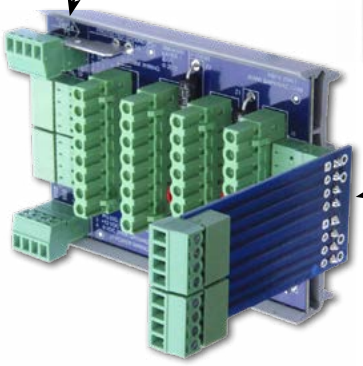
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

3324VC Voltage Converter (p. H8)



RBP-PB - Power Bridge Module (p. H31)



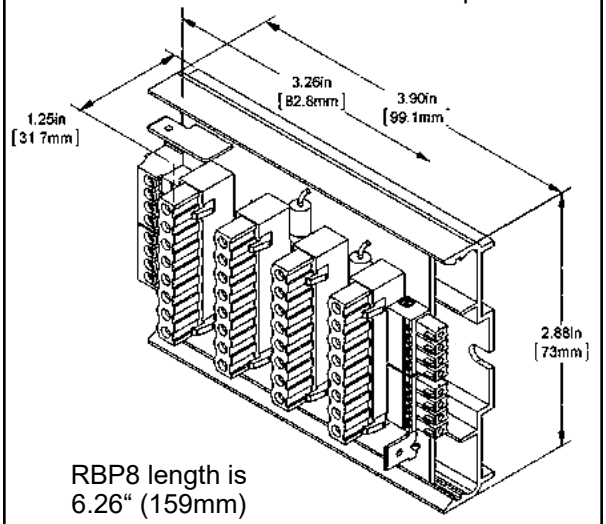
RBPCX2 - Extender (p. H31)



TRK18 Snaptrack (p. H18)

Specifications

RBP4 - Repeater Backplane mounted in 2.75” snaptrack



RBP8 length is 6.26“ (159mm)

Power Voltage: 11 to 13 VDC

Power Current: 4 Amp max.

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RBP-PB - Repeater Backplane Power Bridge

Rev. 11/06/20

ETA Line

Overview

The Repeater Backplane Power Bridge (RBP-PB) is used between Communication Repeater Backplanes (RBP4, RBP8) to bridge the power but break the RS-485 communications between the backplanes. The Power Bridge snaps into the same snaptrack as the Backplanes it bridges.

This allows simplified power wiring of a multi-protocol communications hub such as the BACnet and Modbus. The upper communcations plug connects to the bus on the right; the lower plug connects to the bus on the left.



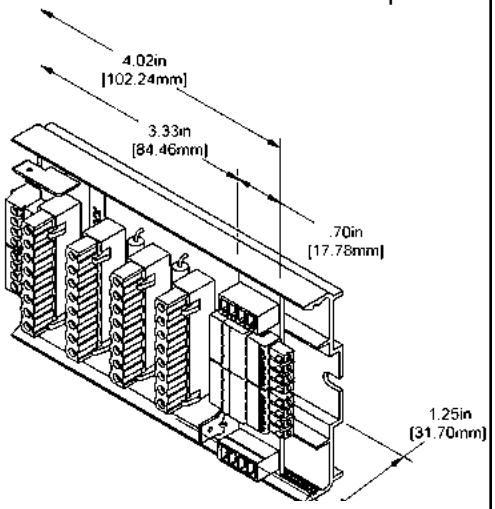
RBP-PB Power Bridge

Part #	Description	List Price
BA/RBP-PB	Repeater Backplane Power Bridge	$62

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

RBP-PB plugged into a RBP4 in snaptrack



Power Voltage: 12 VDC
Power Current: 4 Amp Maximum

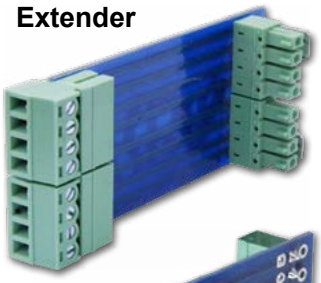
RBPCX, RBPCX2 - Connector Extenders

Overview

In some congested panels it is difficult to reach the connectors on the ends of the RBP - Repeater Backplanes.

The RBPCX and RBPCX2 - Repeater Backplane Connector Extenders bring the connectors out from deep in the panel to be level with the front edge of comm. modules that are plugged into the Repeater Backplane where they are easy to access.

RBPCX Extender

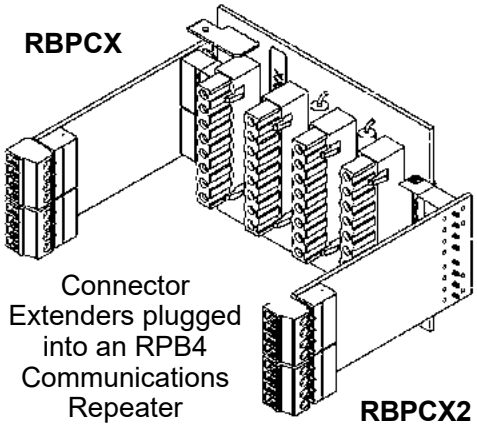




RBPCX2 Extender

Specifications

RBPCX



Connector Extenders plugged into an RPB4 Communications Repeater Backplane

RBPCX2

Power Voltage: 12 VDC
Power Current: 4 Amp Maximum

Part #	Description	List Price
BA/RBPCX	Left Side Repeater Backplane Extender	$55
BA/RBPCX2	Right Side Repeater Backplane Extender	$55

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

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SRBP - Single Repeater Backplane

ETA Line

Rev. 11/09/20

Overview

Many times you need to place only one communications repeater at a specific point in a communications network. A four-position Communications Repeater Backplane (RBP4) and it's associated power supplies is clearly overkill. The BAPI SRBP - Single Repeater Back Plane teamed with a BAPI VC350 voltage converter (in Accessories section) and a FOX, SOX or RPTR module provides a convenient single repeater solution.

The SRBP fits into the standard 2.75" snaptrack. Pluggable connectors on the face of the SRBP allow quick and easy connections for power and RS-485 communications buses. One FOX, SOX or RPTR module plugs into a mating connector. Built-in surge suppression protects the network and power connections.

The SRBP receives 12VDC power from either a 3324VC or a BAPI VC350 voltage converter (shown in the Accessories section).

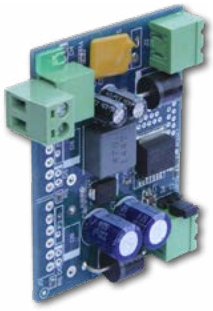


SRBP - Single Repeater Backplane

Part Number	Description	List Price
BA/SRBP	Single Repeater Backplane	$50
BA/SRBP-TRK	SRBP with 2" piece of 2.75" snaptrack	$56

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products



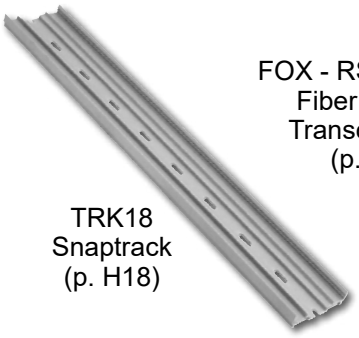
3324VC Voltage Converter (p. H8)



SOX - RS-485 Fiber Optic Transceiver (p. H26)



RPTR - RS-485 Repeater (p. H22)



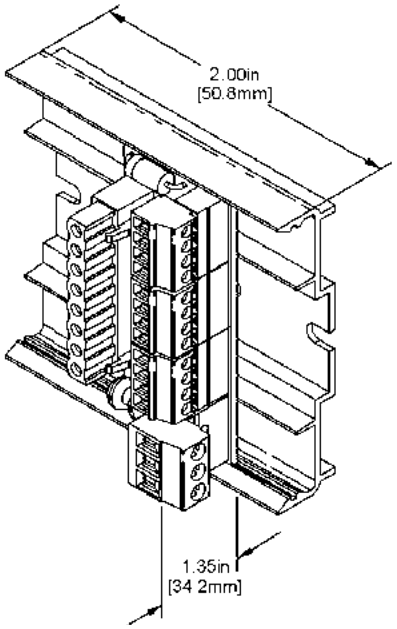
TRK18 Snaptrack (p. H18)

FOX - RS-485 Fiber Optic Transceiver (p. H24)



Specifications

SRBP - Single Repeater Backplane mounted in the optional 2.75" snaptrack



Power Voltage: 12 VDC

Power Current: 250mA max.

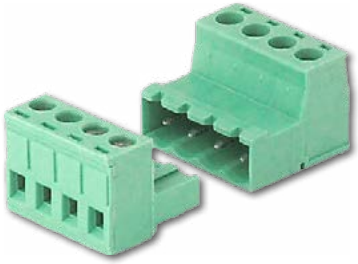
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BELCON - Mating Pair Belimo® Connectors

Overview

Many HVAC peripherals come with a short pigtail wire for connecting to the rest of your system. Running wire from your control panel to the peripheral and connecting them together is your headache. Most of the time it's twist the wires together and apply wire nuts. Later, when you need to disconnect the peripheral for troubleshooting, the inconvenient wire nuts get lost and the loose wires short out ruining the controller.

BAPI's BELCON connector pair allows a four-pole pluggable connection between your peripheral and the control wiring. You can quickly disconnect any peripheral without fear of wires shorting together or to any conductive surface.



BELCON
Mating Pair of
Belimo® Connectors

Belimo® is a trademark of Belimo Aircontrols (USA) Inc. registered in the United States and other countries.

Part Number	Description	List Price
BA/BELCON	Mating Pair of Belimo® Connectors (NEC Class 2 Circuits, 4 Amp max.)	$12

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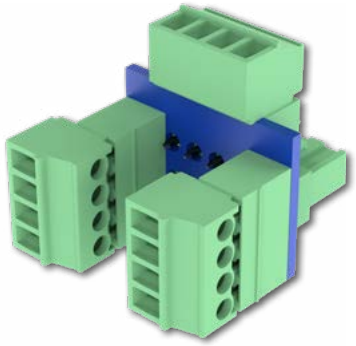
TUCOM - Terminal Unit Comm. Block

Overview

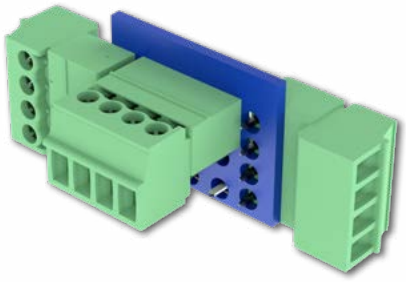
The TUCOM and TUCOM2 are specific purpose connectors that add pluggable screw terminals for any zone or unitary controller having a 3P, 5mm or 5.08mm communication connection. Two options are available to fit in the tightest spaces.

The zone or other unitary controller only provides one communications plug, whereas you often need to terminate three cables on it. The TUCOM plugs into the controller's communications port and expands it into three pluggable screw terminals. Now you have one a separate plug for each segment in the network (comm in, comm out and zone sensor). Troubleshooting a communications problem becomes vastly easier.

The TUCOM and TUCOM2 will accept the COMSRG for surge protection in extreme environments.



TUCOM - Terminal Unit Communications Block



TUCOM2 - Terminal Unit Communications Block

Part Number	Description	List Price
BA/TUCOM	Terminal Unit Communications Block (NEC Class 2 Circuits, 4 Amp max.)	$22
BA/TUCOM2	Terminal Unit Communications Block with alternate plug arrangement (NEC Class 2 Circuits, 4 Amp max.)	$22

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IRM4 - Interposing Relay Module

ETA Line

Rev. 11/06/20

Overview

The IRM4 - Interposing Relay Module has four independent channels that can be used for three typical interposing relay applications: Voltage in, Contact Out; Voltage In, Voltage Out; and Contact In, Contact out. The relay is energized by an external power source for the “Voltage In” options and from the IRM4 Module for the “Contact In” option. “Voltage Output” is always sourced via the backplane. Jumpers are used to set the mode for each individual channel and the wiring for each channel terminates via 4-pole 3.5mm connectors.

The unit is mounted in a BP2, BP4, BP8 or BP4-V Backplane with power provided by the Backplane. The Backplane is typically powered by a PS17/18/19RF Power Supply.

Each relay on the IRM4 Module has a 24VDC coil switching Form C contacts. A SPDT switch allows each output to be configured as NO/NC. LEDs provide power status of the unit as well as the state of each individual relay.

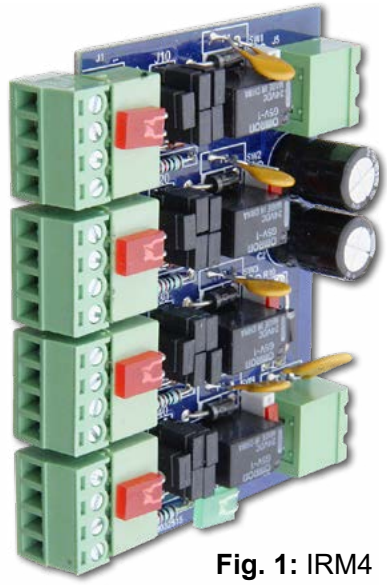
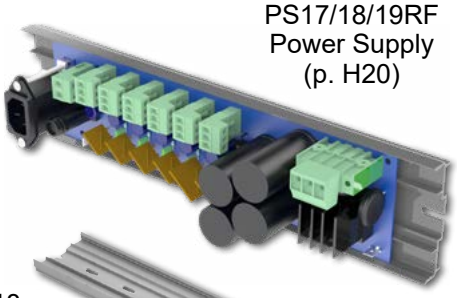


Fig. 1: IRM4 Interposing Relay Module

Part Number	Description	List Price
BA/IRM4	Interposing Relay Module	$153

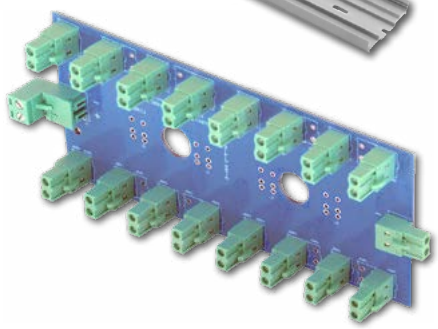
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products



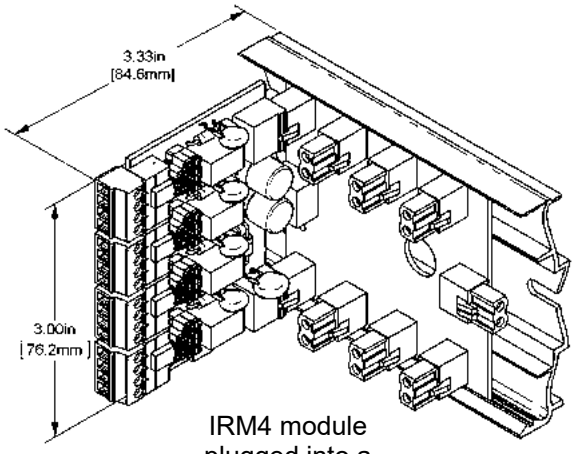
PS17/18/19RF Power Supply (p. H20)

TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications



IRM4 module plugged into a BP4 Backplane

Power Voltage: 26 to 30VDC; 20 to 24VAC

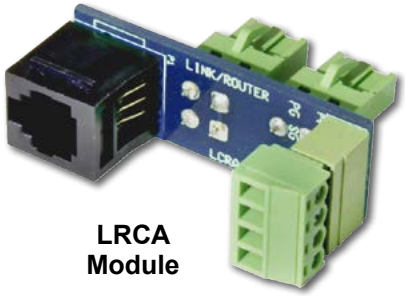
Power Current: 1 Amp Max

Contact sensing voltage is the same is the power input voltage.

Overview

LRCA Module

The Link Router Communications Adapter (LRCA) replaces the 5-pole CCN plug on a Carrier® i-Vu Link/Router. It also provides an RJ jack for local laptop access and a BAPI standard comm plug for network termination. This will accept a COMSRG surge suppressor.



LRCA Module

PSOCL Module

The Power Supply Output Current Limiter (PSOCL) is used to buffer the output of the BAPI PS17/18/19RF Power Supplies when used to power the Carrier® i-Vu Link/Router. BAPI recommends that only one Link/Router be powered from each PSCOL. Do not power any other load through the PSCOL.



PSOCL Module

Part Number	Description	List Price
BA/LRCA	Link Router Communications Adapter	$31.75
BA/PSOCL	Power Supply Output Current Limiter	$32.15

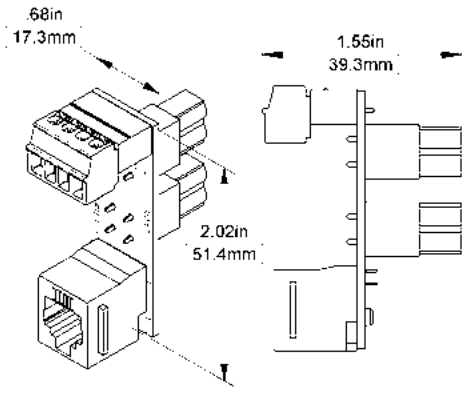
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

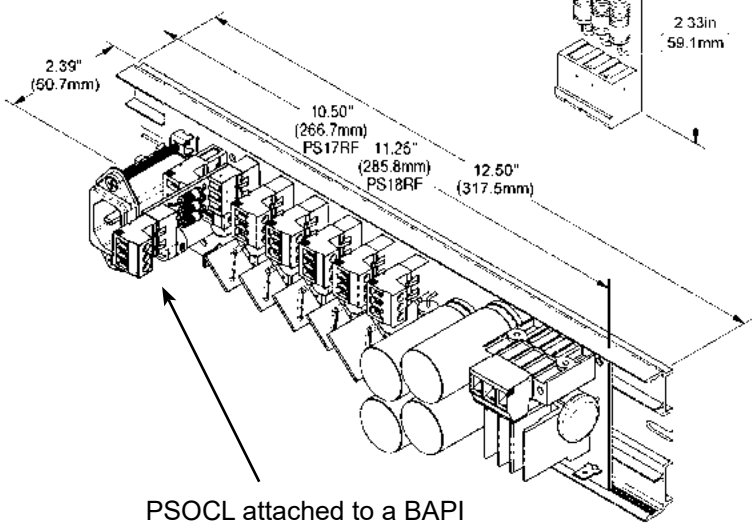
LRCA Specifications

Connectors:
Screw terminals, 16 to 22 AWG

Computer:
RJ11 Communications Jack



LRCA Module



PSOCL attached to a BAPI PS17 Power Supply

UCRB2 - Universal Controller Relay Board

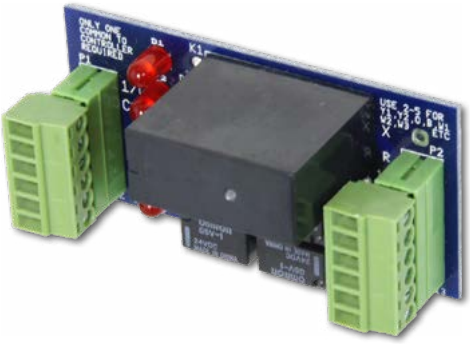
ETA Line

Rev. 11/06/20

Overview

The Universal Controller Relay Board (UCRB2) is used to interconnect a DDC controller's digital outputs to any device that requires a conventional thermostat input. The output plug has terminals for R, G, Y1, Y2, W1, W2.

There are five inputs that control five relays. The first relay's output (1/G) is an interlock for the other four, outputs 2, 3, 4 or 5 will not change state until output 1/G is on. In other words, heating/cooling will be disabled if the fan is turned off. The UCRB2 fits into 2.75" snaptrack and requires 1.4" of track.



UCRB2 Module

Part Number	Description	List Price
BA/UCRB2	Universal Controller Relay Board	$100

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Input Voltage
23 to 26 VDC (1/G, 2, 3, 4 & 5)

Input Current
1/G ..... 22 mA @ 24 VDC
2, 3, 4 & 5..... 6.25 mA @ 24 VDC

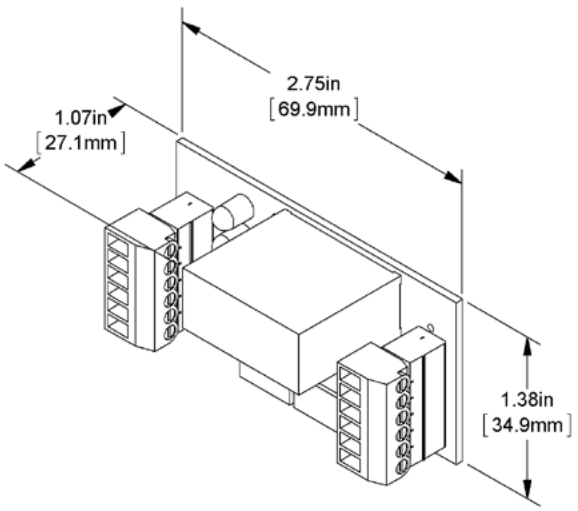
Output Current
1/G ..... 8A @ 24 VAC
2, 3, 4 & 5..... 0.8A @ 24 VAC

Temperature
Operating ..... -40°F to 158°F (-40°C to 70°C)
Storage ..... -40°F to 158°F (-40°C to 70°C)

Humidity
0 to 95% RH noncondensing

Screw Terminals
16 to 28 AWG (1.29mm to 0.32mm)

PCB
FR4 94V0



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SS-AC Selector Switch/Alarm Counter 8

Overview

The SS-AC Selector Switch/Alarm Counter will monitor up to 8 dry contacts and output one or two voltage or mA signals. The output signals are based on the highest-ranked contact when the module is in Selector Mode, or the number of closed contacts with the module is in Counter Mode.

Outputs are switch selectable as 0 to 10V, 2 to 10V, 0 to 20mA, or 4 to 20mA. Switch counter may be one output based on 8 contact inputs or 2 outputs (upper and lower) based on 4 contact inputs each. Selector mode is always 2 outputs based on 4 input contacts.

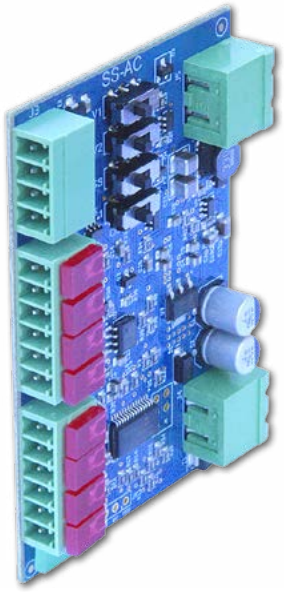
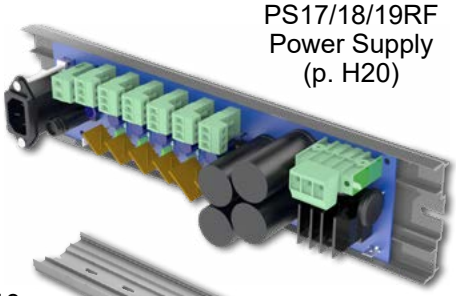


Fig. 1:
SS-AC Selector Switch/Alarm Counter Module

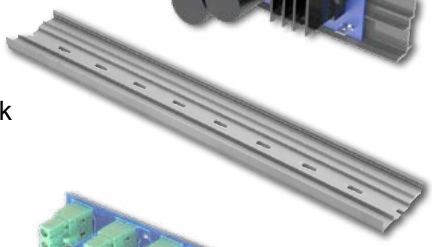
Part Number	Description	List Price
BA/SS-AC	Selector Switch/Alarm Counter	$225

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

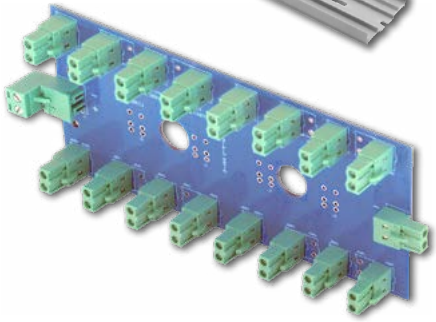
Associated Products



PS17/18/19RF Power Supply (p. H20)

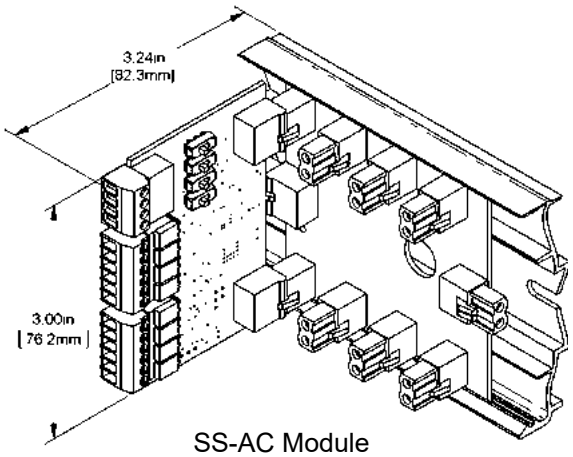


TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications



SS-AC Module plugged into a BP4 Backplane

Input Power Voltage: 0 to 40 VAC or VDC
Power Current: 50mA Maximum
Contact Sensing Voltage: 5VDC

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SD2 Status Display, Dual 7-Segment Display

ETA Line

Rev. 12/07/20

Overview

The SD2 is an ETA module that is used to indicate a program error code which may require a manual reset by a local maintenance technician or operator in the field. The module includes a manual reset switch that can be pressed to send a dry contact reset signal to a controller or other device.

The output of the reset switch can be set to Normally Open (NO) or Normally Closed (NC). The value of the signal from the controller is displayed on two 7-segment displays on the front edge of the module, scaled from 0 to 10 up to 0 to 50, depending on a jumper setting. It can accept a current input of either 0 to 20mA or 4 to 20mA or a voltage input of 0 to 10V or 2 to 10V depending on switch settings.

The unit is typically mounted in a BP2, BP4, BP8 or BP4-V Backplane with power provided by a PS17RF, PS18RF, PS19RF, or other DC supply. The green LED indicates that power is available to the module.

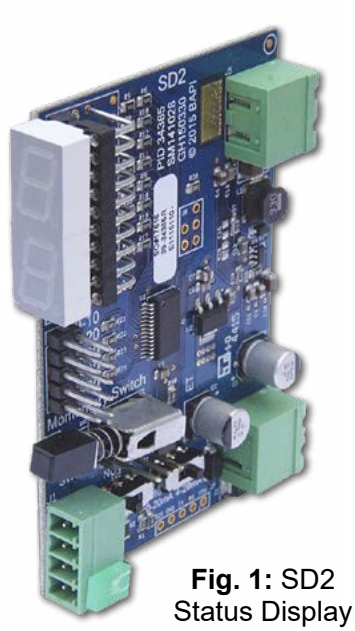


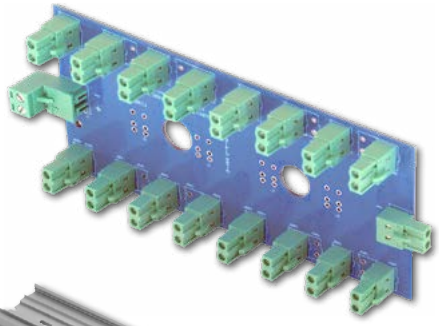
Fig. 1: SD2 Status Display Module

Part Number	Description	List Price
BA/SD2	Status Display, Dual 7 Segment Display	$295

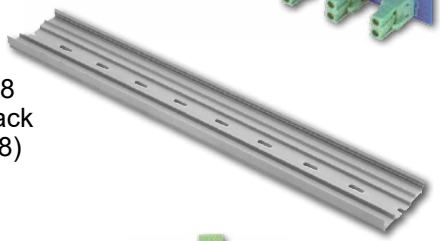
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

BP2, BP4 or BP8 Interface Backplane (p. H16)



TRK18 Snaptrack (p. H18)

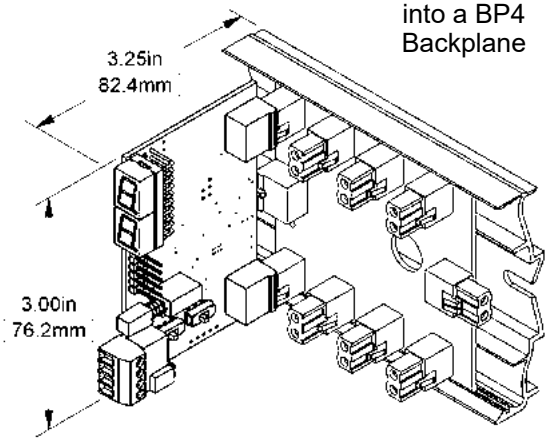


BP4-V Vertical Backplane (p. H17)



Specifications

SD2 plugged into a BP4 Backplane



Output Display: 5 Ranges up to 0 to 50

Input Signals:
0 to 20 mA, 4 to 20 mA, 0 to 10 V, 2 to 10 V

Power Voltage: 16 to 35 VDC or 24 VAC

Power Current: 50mA Max

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PE4 - Pulse Extender, 4 Output

Overview

The PE4 takes up to four input pulses to the board and extends the outputs to a controller or monitor. The pulses can be extended two different ways, split or divided.

Extender Option 1:
Extends the pulse to 100ms. This is the basic pulse meter isolation mode.

Extender Option 2:
Extends the pulse to 10 seconds. This can be used as a time delay signal, but generally it converts a pulsing status signal to a solid closed contact.

Split:
Takes one input and then produces two isolated output pulses.

Divider:
Takes the input pulse and divides it by 2, 4, 8 or 16 to create an output pulse with lower frequency.

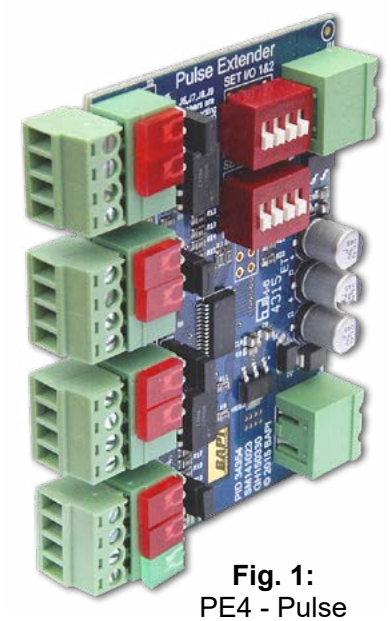


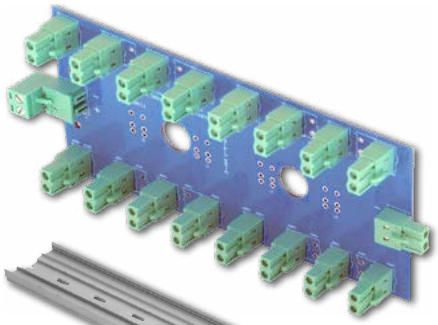
Fig. 1:
PE4 - Pulse Extender

Part Number	Description	List Price
BA/PE4	PE4 - Pulse Extender, 4 Output	$180

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

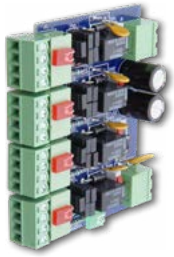
Associated Products

BP2, BP4 or BP8 Interface Backplane (p. H16)



TRK18 Snaptrack (p. H18)

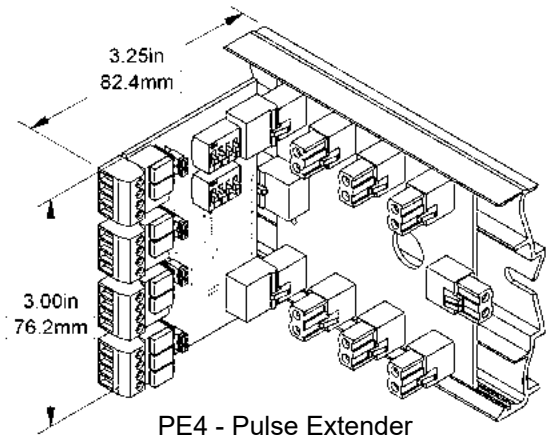
IRM4 - Interposing Relay Module (p. H34)



PMPB5 - Pulse Meter Pulse Buffer (p. H14)



Specifications



PE4 - Pulse Extender plugged into a BP4 Backplane

Power Voltage: 18 to 34VDC, 20 to 24VAC
Power Current: 125 mA Maximum
Input Pulse Sensing Voltage: 5VDC
Output Pulse: Opto-isolated open collector (proper polarity is required)

44”x20”x8” Steel Enclosures

ETA Line

Rev. 06/08/17

Overview

BAPI makes a NEMA 1 and NEMA 4X 14-gauge painted steel enclosure in the 44”x20”x8” size. The NEMA 1 model weighs approximately 90 pounds, while the NEMA 4X watertight model features a door seal with latches and weighs approximately 95 pounds.

Two permanent dividers provide a wireway for input and output conduit connections at the top of the enclosure and a high voltage compartment at the bottom of the enclosure for the power supply.

Flipping the enclosure 180 degrees accommodates left and right hand door openings. No knockouts are provided; drill and punch where you need conduit openings.

Each NEMA 1 and NEMA 4X models come with a Large Backplate (BP185X285), a Small Backplate (BP6X185) and two Bracket Cable Guides (BCG).



44208N1S - NEMA 1 Steel Enclosure 44”x20”x8”

Part Number	Description	List Price
BA/44208N1S	NEMA 1X Steel Enclosure, 44”x20”x8”	Call for Pricing
BA/44208N4XS	NEMA 4X Steel Enclosure, 44”x20”x8”	Call for Pricing

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

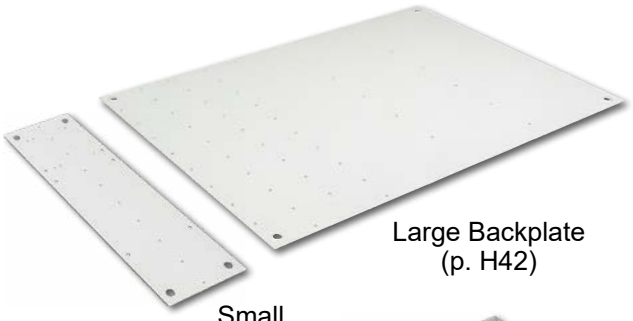
Associated Products

Enclosure Backplates and Bracket Cable Guides

The appropriate size backplate(s) and two Bracket Cable Guides are included with each BAPI enclosure.

The Backplates are made of 12-gauge painted steel and pierced with a hole pattern that accommodates the various components which will be installed in the enclosure including snaptrack, panduit wire duct, bracket cable guides, transformers and DDC controllers.

More information on the Backplates and Bracket Cable Guides is found on page G44.



Large Backplate (p. H42)

Small Backplate (p. H42)



BCG - Bracket Cable Guide (p. H42)

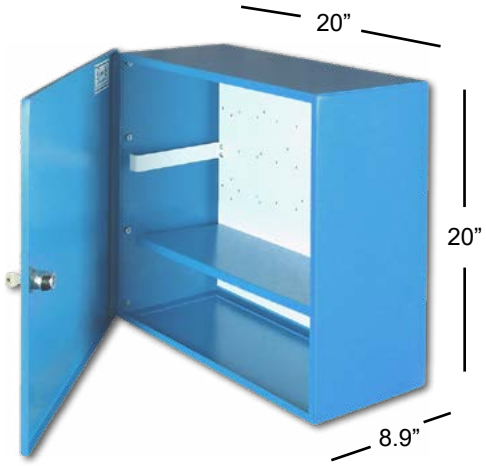
20x20x8 Steel Enclosure

Overview

The BAPI 20208N1S is a NEMA 1, 14-gauge painted steel enclosure that weighs approximately 47 pounds. One field-installed divider provides a high voltage compartment in the enclosure to isolate a power supply.

Flipping the enclosure 180 degrees accommodates left and right hand door openings. Mount the enclosure by drilling holes in the back to fit your application. No knockouts are provided; drill and punch where you need conduit openings.

Each BAPI 20208N1S comes with a backplate and two Bracket Cable Guides (BCG).



20208N1S - Painted Steel Enclosure 20x20x8

Part Number	Description	List Price
BA/20208N1S	Steel Enclosure, 20x20x8	Call for Pricing

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

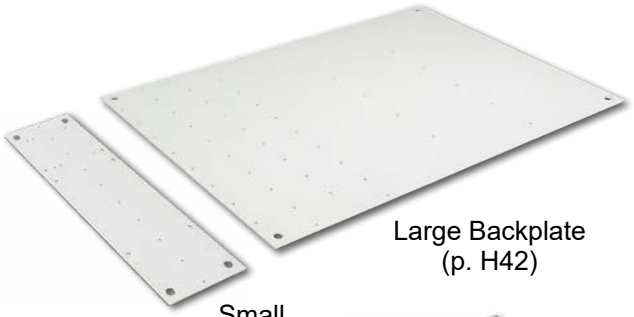
Associated Products

Enclosure Backplates and Bracket Cable Guides

The appropriate size backplate(s) and two Bracket Cable Guides are included with each BAPI enclosure.

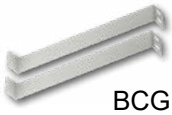
The Backplates are made of 12-gauge painted steel and pierced with a hole pattern that accommodates the various components which will be installed in the enclosure including snaptrack, panduit wire duct, bracket cable guides, transformers and DDC controllers.

More information on the Backplates and Bracket Cable Guides is found on page G44.



Large Backplate (p. H42)

Small Backplate (p. H42)



BCG - Bracket Cable Guide (p. H42)

BP185X285 - Large Backplate (for 44x20x8)

ETA Line

Rev. 10/16/12

Overview

The BP185x285 - Large Backplate is made of 12-gauge painted steel and pierced with a hole pattern that accommodates the BAPI TRK18, PAN16 and the Carrier® Comfort Controller 1600 and 6400.

The Large Backplate mounts to the enclosure with four threaded studs welded to the back of the enclosure.



BP185X285
Large Backplate
(for 44x20x8 Enclosure)

Part Number	Description	List Price
BA/BP185X285	Large Backplate (for 44x20x8 Encl.)	$80

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Carrier® is a trademark of Carrier Corporation, Registered in the United States and other countries.

BP6X185 - Small Backplate

Overview

The BP6x185 - Small Backplate is made of 12-gauge painted steel and pierced with a hole pattern that accommodates the BAPI TRK18 and power transformers.

The Small Backplate mounts to the enclosure with four threaded studs welded to the back of the enclosure.



BP6X185
Small Backplate

Part Number	Description	List Price
BA/BP6X185	Small Backplate	$35

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

BCG - Bracket Cable Guide

Overview

The BCG - Bracket Cable Guide screws to the edge of the enclosure backplate. The non-pierced ear is placed against the enclosures lip forming a wire holding loop with the enclosure side. The 14-gauge BCG will hold all but the largest wire. The BCG measures 7” long by .79” high.



BCG -
Bracket Cable Guide

Part Number	Description	List Price
BA/BCG	Bracket Cable Guide (Set of 2)	$16

Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Temperature, Humidity & Pressure Sensor Overview

There are many facilities and locations today that rely on temperature, pressure and humidity sensors and transmitters to provide a stable, secure environment, such as hospitals, clean rooms and data centers. The sensor or transmitter itself can make or break the system, therefore they must be dependable, accurate and 100% compatible with the building control system. More demanding environments, advances in technology, and changing customer needs keep the industry striving for new and improved sensors and transmitters. As the industry continues to change, BAPI will be at the forefront providing high performance solutions for real world applications.

BAPI offers a wide range of temperature, humidity and pressure sensors and transmitters in all of our room, duct, immersion and outside air units so that they are 100% compatible with the facility's control system.

Temperature Sensors & Transmitters

THERMISTORS - pages H2 - H8

Thermistors are thermally sensitive resistors known for exhibiting a large change in resistance with only a small change in temperature. A thermistor's change in resistance is non-linear. It follows a pre-defined curve which is provided by the thermistor manufacturer.

RTDs - pages H9 - H12

RTDs (Resistance Temperature Detectors) are thermally sensitive resistive elements that exhibit a small change in resistance per degree of temperature change. RTDs are especially recognized for excellent linearity throughout their temperature range with a high degree of accuracy and repeatability.

TEMPERATURE TRANSMITTERS - pages H13 - H14

Temperature transmitters incorporate a 10KΩ thermistor or a 1KΩ platinum RTD and an amplifier. These devices provide an accurate and predictable 4 to 20mA output over a specified temperature range. They are specifically designed for temperature sensing and transmission over long distances without degradation of the 4 to 20mA signal.

Humidity Transmitters & Pressure Sensors

HUMIDITY TRANSMITTERS - pages H15 - H16

Humidity transmitters provide a high accuracy 4 to 20mA, 0 to 5V or 0 to 10V humidity measurement. Accuracies of 2% or 3% Relative Humidity (RH) are available. BAPI room units are protected by a molded housing with an integral filter, while duct and outside air units come with a removeable 80 micron sintered stainless steel filter. The sensor is unaffected by volatile organic compounds (VOC's) or surface contamination.

PRESSURE SENSORS - pages H17

The heart of every BAPI Pressure Sensor is a micro-machined, single-crystal silicon, piezoresistive pressure sensor that changes resistance as a function of applied pressure. Each sensor is fabricated using the same integrated circuit technology used to make millions of cell phones, game machines and personal computers. Since silicon strain gauges have high output levels in relation to the pressure applied, the pressure levels in the BAPI diaphragm can be lower than in other non-silicon strain gauges. This means a more accurate measurement of lower pressure levels.

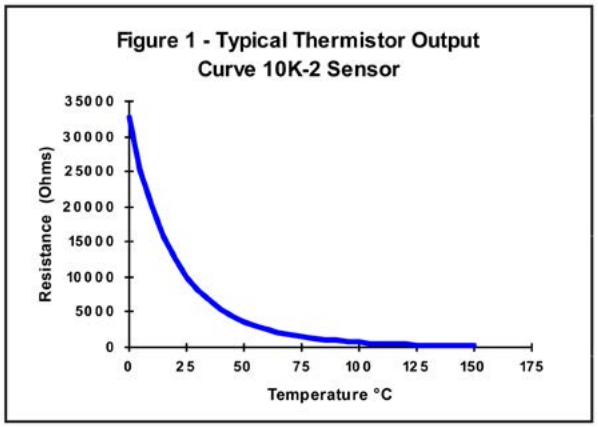
Thermistor Overview

BAPI Sensor Specifications

Rev. 05/07/21

Thermistor Description

BAPI Thermistors are thermally sensitive resistors known for exhibiting a large change in resistance with only a small change in temperature. It is important to note that a thermistor's change in resistance is non-linear. It follows a pre-defined curve which is provided by the thermistor manufacturer. An example of a thermistor output curve can be seen in **Figure 1**.



Thermistors are manufactured to follow a specific curve with a high degree of accuracy. All BAPI thermistors have a standard accuracy of ± 0.2 °C throughout the commercial temperature range of 0 to 70 °C. BAPI also has available a higher accuracy sensor for meeting tougher specs. The extra precision [XP] line has an initial accuracy of ± 0.1 °C throughout the commercial temperature range of 0 to 70 °C. Please call for availability and pricing on [XP] line thermistors. Both accuracy levels allow BAPI thermistors to be interchanged without the extra expense of offsetting the controller.

* All Passive Thermistors 10K Ω and smaller are CE compliant.

Thermistor Specifications

DEFINITION OF SPECIFICATION TERMS

Interchangeability Tolerance (Accuracy):
The maximum amount that thermistors following the same curve will differ from each other.

Dissipation Constant:
The power needed to raise the thermistor's body temperature by 1°C. At the heart of all BAPI thermistor products is a sensor with a 2.7 mW/°C dissipation constant to ensure that self-heating stays at an absolute minimum.

Stability (drift):
The amount that the resistance characteristics of a thermistor will change. BAPI uses only the highest quality, "pre-aged" thermistors with very small drift values. Over a ten year span, BAPI thermistors will not change more than 0.1°C.

Operating Range:
The operating range shown is for the thermistor only. The mounting package may further limit the operating range and is described on each mounting type specification. The thermal time constant will also be affected based on the added mass of the stainless steel probe and moisture protection encapsulation.

Thermal Time Constant
Bare sensors are typically measured and specified in still air and are timed at the statistical 63.2% of the step temperature change. A stirred liquid test will typically result in a much faster response time and is also timed at 63.2% of the step temperature change. The time constant is always the same whatever the temperature step change may be.

Thermistor Specifications

Interchangeability Tolerance (Accuracy):
Standard Sensor: ± 0.2 °C (0 to 70 °C)
High Accuracy [XP] Sensor: ± 0.1 °C (0 to 70 °C)

Dissipation Constant: 2.7 mW/°C

Stability (drift): Less than 0.02 °C / year

Thermal Time Constant: 5 seconds (bead in still air)
.5 seconds (stirred liquid)

Sensor Type	Reference Resistance	Operating Range
1.8K	1.8 KΩ @ 25 °C	-55 to 150 °C
2.2K	2.2 KΩ @ 25 °C	-55 to 150 °C
3K**	3 KΩ @ 25 °C	-55 to 150 °C
3.3K	3.3 KΩ @ 25 °C	-55 to 150 °C
10K-2**	10 KΩ @ 25 °C	-55 to 150 °C
10K-3**	10 KΩ @ 25 °C	-55 to 150 °C
10K-3(11K)**	5.2 KΩ @ 25 °C	-55 to 150 °C
10K-4	10 KΩ @ 25 °C	-55 to 150 °C
20K**	20 KΩ @ 25 °C	-55 to 150 °C
47K	47 KΩ @ 25 °C	-55 to 150 °C
50K	50 KΩ @ 25 °C	-80 to 150 °C
100K**	100 KΩ @ 25 °C	-55 to 150 °C

Other Thermistors are available. Contact BAPI for availability and specifications of additional thermistors.

**Available as an [XP] high accuracy sensor. Minimum quantities and long lead times may apply. 10K-2[XP] and 10K-3[XP] thermistors are typically stocked items

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1.8K Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	37793	37	2.78	4493	113	45.00	869
-37	-38.33	35455	39	3.89	4279	115	46.11	836
-35	-37.22	33277	41	5.00	4077	117	47.22	805
-33	-36.11	31248	43	6.11	3886	119	48.33	775
-31	-35.00	29356	45	7.22	3705	121	49.44	747
-29	-33.89	27591	47	8.33	3534	123	50.56	720
-27	-32.78	25945	49	9.44	3371	125	51.67	693
-25	-31.67	24408	51	10.56	3216	127	52.78	668
-23	-30.56	22972	53	11.67	3070	129	53.89	644
-21	-29.44	21619	55	12.78	2932	131	55.00	622
-19	-28.33	20365	57	13.89	2801	133	56.11	600
-17	-27.22	19193	59	15.00	2676	135	57.22	578
-15	-26.11	18096	61	16.11	2558	137	58.33	558
-13	-25.00	17069	63	17.22	2445	139	59.44	539
-11	-23.89	16107	65	18.33	2339	141	60.56	520
-9	-22.78	15205	67	19.44	2237	143	61.67	502
-7	-21.67	14360	69	20.56	2140	145	62.78	485
-5	-20.56	13568	71	21.67	2048	147	63.89	469
-3	-19.44	12818	73	22.78	1961	149	65.00	453
-1	-18.33	12120	75	23.89	1878	151	66.11	437
1	-17.22	11466	77	25.00	1799	153	67.22	423
3	-16.11	10850	79	26.11	1724	155	68.33	409
5	-15.00	10272	81	27.22	1653	157	69.44	395
7	-13.89	9728	83	28.33	1585	159	70.56	382
9	-12.78	9217	85	29.44	1520	161	71.67	370
11	-11.67	8736	87	30.56	1457	163	72.78	358
13	-10.56	8283	89	31.67	1398	165	73.89	346
15	-9.44	7853	91	32.78	1342	167	75.00	335
17	-8.33	7451	93	33.89	1289	169	76.11	324
19	-7.22	7073	95	35.00	1237	171	77.22	314
21	-6.11	6716	97	36.11	1189	173	78.33	304
23	-5.00	6379	99	37.22	1142	175	79.44	295
25	-3.89	6062	101	38.33	1097	177	80.56	285
27	-2.78	5762	103	39.44	1055	179	81.67	277
29	-1.67	5479	105	40.56	1014	181	82.78	268
31	-0.56	5212	107	41.67	975	183	83.89	260
33	0.56	4957	109	42.78	938	185	85.00	252
35	1.67	4718	111	43.89	903	187	86.11	244

* All Passive Thermistors 10K Ω and smaller are CE compliant.

3K Thermistor Output Table

BAPI Sensor Specifications

Rev. 10/16/12

3K Thermistor Output Table

°F	°C	Ohms
-39	-39.44	96941
-37	-38.33	90108
-35	-37.22	83804
-33	-36.11	77983
-31	-35.00	72607
-29	-33.89	67637
-27	-32.78	63041
-25	-31.67	58789
-23	-30.56	54851
-21	-29.44	51173
-19	-28.33	47795
-17	-27.22	44663
-15	-26.11	41756
-13	-25.00	39059
-11	-23.89	36553
-9	-22.78	34225
-7	-21.67	32061
-5	-20.56	30047
-3	-19.44	28157
-1	-18.33	26414
1	-17.22	24790
3	-16.11	23277
5	-15.00	21865
7	-13.89	20549
9	-12.78	19320
11	-11.67	18173
13	-10.56	17101
15	-9.44	16091
17	-8.33	15155
19	-7.22	14280
21	-6.11	13461
23	-5.00	12694
25	-3.89	11975
27	-2.78	11302
29	-1.67	10671
31	-0.56	10079
33	0.56	9519
35	1.67	8999
37	2.78	8510
39	3.89	8050
41	5.00	7619
43	6.11	7213
45	7.22	6831
47	8.33	6472
49	9.44	6134
51	10.56	5813
53	11.67	5513
55	12.78	5231
57	13.89	4965
59	15.00	4714
61	16.11	4478
63	17.22	4254
65	18.33	4043
67	19.44	3844
69	20.56	3655
71	21.67	3477
73	22.78	3309
75	23.89	3150
77	25.00	3000
79	26.11	2858
81	27.22	2723
83	28.33	2596
85	29.44	2475
87	30.56	2360
89	31.67	2252
91	32.78	2149
93	33.89	2051
95	35.00	1959
97	36.11	1871
99	37.22	1788
101	38.33	1709
103	39.44	1634
105	40.56	1562
107	41.67	1494
109	42.78	1430
111	43.89	1368
113	45.00	1310
115	46.11	1255
117	47.22	1202
119	48.33	1151
121	49.44	1104
123	50.56	1058
125	51.67	1014
127	52.78	973
129	53.89	933
131	55.00	895
133	56.11	860
135	57.22	825
137	58.33	793
139	59.44	761
141	60.56	731
143	61.67	703
145	62.78	676
147	63.89	650
149	65.00	625
151	66.11	601
153	67.22	578
155	68.33	556
157	69.44	536
159	70.56	516
161	71.67	496
163	72.78	478
165	73.89	461
167	75.00	444
169	76.11	428
171	77.22	413
173	78.33	398
175	79.44	384
177	80.56	370
179	81.67	357
181	82.78	345
183	83.89	333
185	85.00	321
187	86.11	310

* All Passive Thermistors 10K Ω and smaller are CE compliant.

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10K-2 Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	323839	37	2.78	28365	113	45.00	4367
-37	-38.33	300974	39	3.89	26834	115	46.11	4182
-35	-37.22	279880	41	5.00	25395	117	47.22	4006
-33	-36.11	260410	43	6.11	24042	119	48.33	3838
-31	-35.00	242427	45	7.22	22770	121	49.44	3679
-29	-33.89	225809	47	8.33	21573	123	50.56	3525
-27	-32.78	210443	49	9.44	20446	125	51.67	3380
-25	-31.67	196227	51	10.56	19376	127	52.78	3242
-23	-30.56	183068	53	11.67	18378	129	53.89	3111
-21	-29.44	170775	55	12.78	17437	131	55.00	2985
-19	-28.33	159488	57	13.89	16550	133	56.11	2865
-17	-27.22	149024	59	15.00	15714	135	57.22	2751
-15	-26.11	139316	61	16.11	14925	137	58.33	2642
-13	-25.00	130306	63	17.22	14180	139	59.44	2538
-11	-23.89	121939	65	18.33	13478	141	60.56	2438
-9	-22.78	114165	67	19.44	12814	143	61.67	2343
-7	-21.67	106939	69	20.56	12182	145	62.78	2252
-5	-20.56	100218	71	21.67	11590	147	63.89	2165
-3	-19.44	93909	73	22.78	11030	149	65.00	2082
-1	-18.33	88090	75	23.89	10501	151	66.11	2003
1	-17.22	82670	77	25.00	10000	153	67.22	1927
3	-16.11	77620	79	26.11	9526	155	68.33	1855
5	-15.00	72911	81	27.22	9078	157	69.44	1785
7	-13.89	68518	83	28.33	8653	159	70.56	1718
9	-12.78	64419	85	29.44	8251	161	71.67	1655
11	-11.67	60592	87	30.56	7866	163	72.78	1594
13	-10.56	57017	89	31.67	7505	165	73.89	1536
15	-9.44	53647	91	32.78	7163	167	75.00	1480
17	-8.33	50526	93	33.89	6838	169	76.11	1427
19	-7.22	47606	95	35.00	6530	171	77.22	1375
21	-6.11	44874	97	36.11	6238	173	78.33	1326
23	-5.00	42317	99	37.22	5960	175	79.44	1279
25	-3.89	39921	101	38.33	5697	177	80.56	1234
27	-2.78	37676	103	39.44	5447	179	81.67	1190
29	-1.67	35573	105	40.56	5207	181	82.78	1149
31	-0.56	33599	107	41.67	4981	183	83.89	1109
33	0.56	31732	109	42.78	4766	185	85.00	1070
35	1.67	29996	111	43.89	4561	187	86.11	1034

* All Passive Thermistors 10K Ω and smaller are CE compliant.

10K-3 Thermistor Output Table

BAPI Sensor Specifications

CE*

Rev. 10/16/12

10K-3 Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	232032	37	2.78	25948	113	45.00	4656
-37	-38.33	217394	39	3.89	24670	115	46.11	4473
-35	-37.22	203774	41	5.00	23462	117	47.22	4298
-33	-36.11	191093	43	6.11	22320	119	48.33	4131
-31	-35.00	179281	45	7.22	21241	121	49.44	3971
-29	-33.89	168275	47	8.33	20220	123	50.56	3817
-27	-32.78	158013	49	9.44	19254	125	51.67	3671
-25	-31.67	148442	51	10.56	18332	127	52.78	3532
-23	-30.56	139511	53	11.67	17467	129	53.89	3398
-21	-29.44	131100	55	12.78	16648	131	55.00	3271
-19	-28.33	123317	57	13.89	15872	133	56.11	3149
-17	-27.22	116045	59	15.00	15136	135	57.22	3032
-15	-26.11	109247	61	16.11	14439	137	58.33	2920
-13	-25.00	102889	63	17.22	13778	139	59.44	2812
-11	-23.89	96941	65	18.33	13151	141	60.56	2709
-9	-22.78	91374	67	19.44	12556	143	61.67	2610
-7	-21.67	86160	69	20.56	11987	145	62.78	2516
-5	-20.56	81276	71	21.67	11451	147	63.89	2425
-3	-19.44	76659	73	22.78	10942	149	65.00	2339
-1	-18.33	72371	75	23.89	10459	151	66.11	2256
1	-17.22	68348	77	25.00	10000	153	67.22	2176
3	-16.11	64574	79	26.11	9564	155	68.33	2099
5	-15.00	61031	81	27.22	9149	157	69.44	2026
7	-13.89	57703	83	28.33	8754	159	70.56	1955
9	-12.78	54578	85	29.44	8379	161	71.67	1887
11	-11.67	51641	87	30.56	8019	163	72.78	1822
13	-10.56	48879	89	31.67	7679	165	73.89	1760
15	-9.44	46259	91	32.78	7355	167	75.00	1700
17	-8.33	43817	93	33.89	7047	169	76.11	1642
19	-7.22	41519	95	35.00	6754	171	77.22	1587
21	-6.11	39354	97	36.11	6474	173	78.33	1534
23	-5.00	37316	99	37.22	6208	175	79.44	1483
25	-3.89	35395	101	38.33	5954	177	80.56	1433
27	-2.78	33585	103	39.44	5712	179	81.67	1386
29	-1.67	31878	105	40.56	5479	181	82.78	1341
31	-0.56	30267	107	41.67	5258	183	83.89	1297
33	0.56	28735	109	42.78	5048	185	85.00	1255
35	1.67	27302	111	43.89	4847	187	86.11	1214

* All Passive Thermistors 10K Ω and smaller are CE compliant.

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10K-3 (11K) Thermistor Output Table

°F	°C	Ohms
-39	-39.44	10502
-37	-38.33	10470
-35	-37.22	10437
-33	-36.11	10401
-31	-35.00	10364
-29	-33.89	10325
-27	-32.78	10284
-25	-31.67	10241
-23	-30.56	10196
-21	-29.44	10148
-19	-28.33	10099
-17	-27.22	10048
-15	-26.11	9994
-13	-25.00	9938
-11	-23.89	9879
-9	-22.78	9818
-7	-21.67	9755
-5	-20.56	9689
-3	-19.44	9620
-1	-18.33	9549
1	-17.22	9475
3	-16.11	9399
5	-15.00	9320
7	-13.89	9239
9	-12.78	9155
11	-11.67	9068
13	-10.56	8979
15	-9.44	8887
17	-8.33	8793
19	-7.22	8696
21	-6.11	8597
23	-5.00	8496
25	-3.89	8392
27	-2.78	8286
29	-1.67	8178
31	-0.56	8068
33	0.56	7955
35	1.67	7841
37	2.78	7725
39	3.89	7608
41	5.00	7489
43	6.11	7369
45	7.22	7247
47	8.33	7124
49	9.44	7001
51	10.56	6875
53	11.67	6749
55	12.78	6623
57	13.89	6497
59	15.00	6370
61	16.11	6244
63	17.22	6117
65	18.33	5990
67	19.44	5863
69	20.56	5736
71	21.67	5611
73	22.78	5486
75	23.89	5361
77	25.00	5238
79	26.11	5116
81	27.22	4995
83	28.33	4875
85	29.44	4756
87	30.56	4638
89	31.67	4522
91	32.78	4408
93	33.89	4295
95	35.00	4185
97	36.11	4076
99	37.22	3968
101	38.33	3863
103	39.44	3760
105	40.56	3657
107	41.67	3558
109	42.78	3460
111	43.89	3365
113	45.00	3271
115	46.11	3180
117	47.22	3090
119	48.33	3003
121	49.44	2918
123	50.56	2834
125	51.67	2753
127	52.78	2673
129	53.89	2596
131	55.00	2521
133	56.11	2448
135	57.22	2377
137	58.33	2307
139	59.44	2240
141	60.56	2173
143	61.67	2110
145	62.78	2048
147	63.89	1987
149	65.00	1929
151	66.11	1872
153	67.22	1817
155	68.33	1763
157	69.44	1711
159	70.56	1660
161	71.67	1611
163	72.78	1563
165	73.89	1517
167	75.00	1472
169	76.11	1429
171	77.22	1387
173	78.33	1346
175	79.44	1307
177	80.56	1268
179	81.67	1231
181	82.78	1195
183	83.89	1160
185	85.00	1126
187	86.11	1094

* All Passive Thermistors 10K Ω and smaller are CE compliant.

20K Thermistor Output Table

BAPI Sensor Specifications

Rev. 10/16/12

20K Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	776470	37	2.78	60451	113	45.00	8260
-37	-38.33	719538	39	3.89	57005	115	46.11	7886
-35	-37.22	667144	41	5.00	53777	117	47.22	7531
-33	-36.11	618900	43	6.11	50750	119	48.33	7194
-31	-35.00	574453	45	7.22	47912	121	49.44	6874
-29	-33.89	533481	47	8.33	45249	123	50.56	6567
-27	-32.78	495691	49	9.44	42750	125	51.67	6278
-25	-31.67	460818	51	10.56	40383	127	52.78	6004
-23	-30.56	428619	53	11.67	38180	129	53.89	5742
-21	-29.44	398615	55	12.78	36111	131	55.00	5494
-19	-28.33	371140	57	13.89	34165	133	56.11	5258
-17	-27.22	345732	59	15.00	32336	135	57.22	5033
-15	-26.11	322223	61	16.11	30615	137	58.33	4819
-13	-25.00	300459	63	17.22	28996	139	59.44	4616
-11	-23.89	280301	65	18.33	27472	141	60.56	4420
-9	-22.78	261622	67	19.44	26037	143	61.67	4235
-7	-21.67	244304	69	20.56	24674	145	62.78	4059
-5	-20.56	228239	71	21.67	23400	147	63.89	3892
-3	-19.44	213201	73	22.78	22200	149	65.00	3732
-1	-18.33	199368	75	23.89	21068	151	66.11	3579
1	-17.22	186518	77	25.00	20001	153	67.22	3434
3	-16.11	174575	79	26.11	18994	155	68.33	3295
5	-15.00	163471	81	27.22	18043	157	69.44	3163
7	-13.89	153140	83	28.33	17145	159	70.56	3035
9	-12.78	143526	85	29.44	16297	161	71.67	2914
11	-11.67	134575	87	30.56	15488	163	72.78	2799
13	-10.56	126236	89	31.67	14731	165	73.89	2689
15	-9.44	118397	91	32.78	14016	167	75.00	2584
17	-8.33	111156	93	33.89	13339	169	76.11	2484
19	-7.22	104402	95	35.00	12699	171	77.22	2388
21	-6.11	98099	97	36.11	12092	173	78.33	2296
23	-5.00	92214	99	37.22	11519	175	79.44	2208
25	-3.89	86719	101	38.33	10975	177	80.56	2123
27	-2.78	81583	103	39.44	10461	179	81.67	2043
29	-1.67	76783	105	40.56	9969	181	82.78	1966
31	-0.56	72294	107	41.67	9507	183	83.89	1892
33	0.56	68057	109	42.78	9069	185	85.00	1822
35	1.67	64129	111	43.89	8654	187	86.11	1754

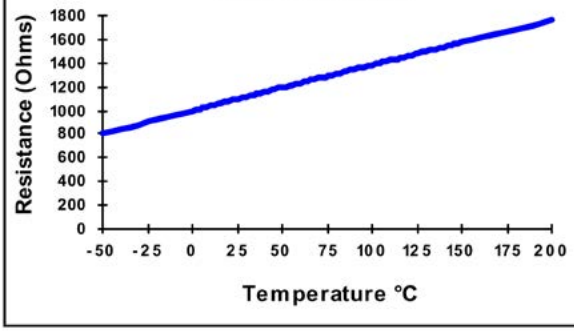
RTD Description

BAPI RTDs (Resistance Temperature Detectors) are thermally sensitive resistive elements that exhibit a small change in resistance per degree of temperature change. RTDs are especially recognized for excellent linearity throughout their temperature range with a high degree of accuracy and repeatability. An example of an RTD output curve can be seen in **Figure 2**.

RTDs supplied in BAPI products feature a standard interchangeability tolerance of ±0.3°C measured at 0°C. Higher accuracy sensors are also available. The Class A line [A] has an interchangeability tolerance of ± 0.15°C measured at 0°C. Please call for availability and pricing on Class A RTDs. Whether standard or Class A, BAPI RTDs have such a high accuracy that they can be interchanged without the expense of offsetting the controller.

Most RTD sensing elements can be packaged to withstand an extremely broad temperature range (-200 to 600°C). For most purposes, the standard operating range should be sufficient, but we also have RTDs with a higher or lower operating temperature range. BAPI offers 1KΩ Platinum RTDs with the ranges shown in the table at right.

Figure 2 - Typical RTD Output Curve
1000 Ohm Sensor



Standard & Extreme Temperature Ranges for the 1 KΩ Platinum RTD

Range	°C	°F
Standard	-60 to 150	-76 to 302
Low Temp **[1]**	-200 to 0	-328 to 32
High Temp **[2]**	25 to 260	77 to 500
Very High Temp **[3]**	25 to 600	77 to 1,112

When ordering a sensor with an “extreme” temperature range, include the number in brackets **[ ]** after the sensor type. Ex: **BA/1K[2]** is a 1KΩ RTD with an operating range of 25 to 260°C.

RTD Specifications

Definition of Specification Terms

Tolerance of Resistance (Accuracy)

The maximum amount any RTD will differ from the standard resistance curve.

Stability (drift)

The amount that the resistance characteristics of a RTD will change over time under certain conditions.

Operating Range

The operating range shown is for the RTD sensor only. The mounting package may further limit the operating range and is described on each mounting type specification.

RTD Specifications

Tolerance of Resistance (Accuracy):
Single Point Standard: 0.12% at 0°C
Single Point Class A: 0.06% at 0°C
Averaging Standard: 0.2% at 0°C

Tolerance in °C:
Single Point Standard: ±(0.3 + 0.005T); T= Temp in °C
Single Point Class A: ±(0.15 + 0.002T); T= Temp in °C
Averaging Standard: ±(0.5 + 0.005(T-25)); T= Temp in °C

Stability (drift):
0.14°C with 6,000 continuous hours at 400°C

Sensitivity:
1KΩ: 3.85Ω/°C (2.14Ω/°F)

Self Heating (1K RTD only):
0.4°C/mW at 0°

Standardization:
DIN 43760-1980, IEC Pub 751-1983, JIS C1604-1989

Sensor Type	Reference Resistance	Temp. Coefficient	Operating Range
BA/1K[375]	1KΩ @ 0°C	3.75Ω/°C	-60 to 150°C
BA/1K[Ni]	1KΩ @ 21°C	5.68Ω/°C	-60 to 200°C
BA/1K*	1KΩ @ 0°C	3.85Ω/°C	-60 to 150°C

*Available as an [A] high accuracy sensor.
Example: BA/1K[A]-I-2” (high accuracy immersion sensor)

1K (375) Platinum RTD Output Table

BAPI Sensor Specifications

Rev. 10/16/12

1K (375) Platinum RTD Output Table

°F	°C	Ohms
-40	-40.00	846.64
-38	-38.89	850.92
-36	-37.78	855.20
-34	-36.67	859.48
-32	-35.56	863.76
-30	-34.44	868.07
-28	-33.33	872.34
-26	-32.22	876.62
-24	-31.11	880.89
-22	-30.00	885.16
-20	-28.89	889.43
-18	-27.78	893.69
-16	-26.67	897.96
-14	-25.56	902.22
-12	-24.44	906.52
-10	-23.33	910.79
-8	-22.22	915.04
-6	-21.11	919.30
-4	-20.00	923.56
-2	-18.89	927.81
0	-17.78	932.07
2	-16.67	936.32
4	-15.56	940.57
6	-14.44	944.86
8	-13.33	949.11
10	-12.22	953.35
12	-11.11	957.60
14	-10.00	961.84
16	-8.89	966.08
18	-7.78	970.32
20	-6.67	974.56
22	-5.56	978.80
24	-4.44	983.07
26	-3.33	987.31
28	-2.22	991.54
30	-1.11	995.77
32	0.00	1,000.00
34	1.11	1,004.23
36	2.22	1,008.46
38	3.33	1,012.68
40	4.44	1,016.90
42	5.56	1,021.16
44	6.67	1,025.39
46	7.78	1,029.61
48	8.89	1,033.82
50	10.00	1,038.04
52	11.11	1,042.25
54	12.22	1,046.47
56	13.33	1,050.68
58	14.44	1,054.89
60	15.56	1,059.14
62	16.67	1,063.35
64	17.78	1,067.55
66	18.89	1,071.76
68	20.00	1,075.96
70	21.11	1,080.16
72	22.22	1,084.36
74	23.33	1,088.56
76	24.44	1,092.76
78	25.56	1,096.99
80	26.67	1,101.18
82	27.78	1,105.38
84	28.89	1,109.57
86	30.00	1,113.76
88	31.11	1,117.95
90	32.22	1,122.13
92	33.33	1,126.32
94	34.44	1,130.50
96	35.56	1,134.72
98	36.67	1,138.90
100	37.78	1,143.08
102	38.89	1,147.26
104	40.00	1,151.44
106	41.11	1,155.61
108	42.22	1,159.79
110	43.33	1,163.96
112	44.44	1,168.13
114	45.56	1,172.33
116	46.67	1,176.50
118	47.78	1,180.67
120	48.89	1,184.83
122	50.00	1,189.00
124	51.11	1,193.16
126	52.22	1,197.32
128	53.33	1,201.48
130	54.44	1,205.63
132	55.56	1,209.83
134	56.67	1,213.98
136	57.78	1,218.13
138	58.89	1,222.28
140	60.00	1,226.43
142	61.11	1,230.58
144	62.22	1,234.73
146	63.33	1,238.87
148	64.44	1,243.02
150	65.56	1,247.20
152	66.67	1,251.34
154	67.78	1,255.48
156	68.89	1,259.61
158	70.00	1,263.75
160	71.11	1,267.89
162	72.22	1,272.02
164	73.33	1,276.15
166	74.44	1,280.28
168	75.56	1,284.45
170	76.67	1,288.57
172	77.78	1,292.70
174	78.89	1,296.82
176	80.00	1,300.95
178	81.11	1,305.07
180	82.22	1,309.19
182	83.33	1,313.31
184	84.44	1,317.42
186	85.56	1,321.58

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1K (Ni) Nickel RTD Output Table

°F	°C	Ohms
-40	-40.00	699.28
-38	-38.89	704.37
-36	-37.78	709.47
-34	-36.67	714.58
-32	-35.56	719.70
-30	-34.44	724.84
-28	-33.33	729.98
-26	-32.22	735.14
-24	-31.11	740.31
-22	-30.00	745.49
-20	-28.89	750.68
-18	-27.78	755.89
-16	-26.67	761.11
-14	-25.56	766.35
-12	-24.44	771.60
-10	-23.33	776.86
-8	-22.22	782.14
-6	-21.11	787.44
-4	-20.00	792.75
-2	-18.89	798.07
0	-17.78	803.41
2	-16.67	808.76
4	-15.56	814.13
6	-14.44	819.52
8	-13.33	824.92
10	-12.22	830.34
12	-11.11	835.77
14	-10.00	841.22
16	-8.89	846.69
18	-7.78	852.17
20	-6.67	857.66
22	-5.56	863.18
24	-4.44	868.71
26	-3.33	874.25
28	-2.22	879.81
30	-1.11	885.39
32	0.00	890.98
34	1.11	896.59
36	2.22	902.21
38	3.33	907.85
40	4.44	913.51
42	5.56	919.18
44	6.67	924.87
46	7.78	930.57
48	8.89	936.29
50	10.00	942.02
52	11.11	947.77
54	12.22	953.53
56	13.33	959.31
58	14.44	965.11
60	15.56	970.92
62	16.67	976.74
64	17.78	982.59
66	18.89	988.44
68	20.00	994.31
70	21.11	1000.20
72	22.22	1006.10
74	23.33	1012.02
76	24.44	1017.95
78	25.56	1023.89
80	26.67	1029.86
82	27.78	1035.83
84	28.89	1041.82
86	30.00	1047.83
88	31.11	1053.85
90	32.22	1059.89
92	33.33	1065.94
94	34.44	1072.00
96	35.56	1078.08
98	36.67	1084.18
100	37.78	1090.29
102	38.89	1096.42
104	40.00	1102.56
106	41.11	1108.71
108	42.22	1114.89
110	43.33	1121.07
112	44.44	1127.27
114	45.56	1133.49
116	46.67	1139.72
118	47.78	1145.97
120	48.89	1152.24
122	50.00	1158.52
124	51.11	1164.81
126	52.22	1171.12
128	53.33	1177.45
130	54.44	1183.79
132	55.56	1190.15
134	56.67	1196.53
136	57.78	1202.92
138	58.89	1209.33
140	60.00	1215.75
142	61.11	1222.19
144	62.22	1228.65
146	63.33	1235.12
148	64.44	1241.62
150	65.56	1248.13
152	66.67	1254.65
154	67.78	1261.20
156	68.89	1267.76
158	70.00	1274.34
160	71.11	1280.93
162	72.22	1287.55
164	73.33	1294.18
166	74.44	1300.83
168	75.56	1307.50
170	76.67	1314.19
172	77.78	1320.89
174	78.89	1327.62
176	80.00	1334.36
178	81.11	1341.12
180	82.22	1347.90
182	83.33	1354.70
184	84.44	1361.52
186	85.56	1368.36

1KΩ Platinum RTD Output Table

BAPI Sensor Specifications

Rev. 10/16/12

1KΩ Platinum RTD Output Table

°F	°C	Ohms
-40.00	-40.00	842.75
-38.00	-38.89	847.14
-36.00	-37.78	851.53
-34.00	-36.67	855.91
-32.00	-35.56	860.30
-30.00	-34.44	864.72
-28.00	-33.33	869.10
-26.00	-32.22	873.48
-24.00	-31.11	877.86
-22.00	-30.00	882.24
-20.00	-28.89	886.61
-18.00	-27.78	890.99
-16.00	-26.67	895.36
-14.00	-25.56	899.73
-12.00	-24.44	904.14
-10.00	-23.33	908.51
-8.00	-22.22	912.88
-6.00	-21.11	917.24
-4.00	-20.00	921.61
-2.00	-18.89	925.97
0.00	-17.78	930.33
2.00	-16.67	934.69
4.00	-15.56	939.05
6.00	-14.44	943.45
8.00	-13.33	947.80
10.00	-12.22	952.16
12.00	-11.11	956.51
14.00	-10.00	960.86
16.00	-8.89	965.21
18.00	-7.78	969.56
20.00	-6.67	973.91
22.00	-5.56	978.25
24.00	-4.44	982.64
26.00	-3.33	986.98
28.00	-2.22	991.32
30.00	-1.11	995.66
32.00	0.00	1000.00
34.00	1.11	1004.34
36.00	2.22	1008.67
38.00	3.33	1013.01
40.00	4.44	1017.34
42.00	5.56	1021.71
44.00	6.67	1026.04
46.00	7.78	1030.37
48.00	8.89	1034.70
50.00	10.00	1039.02
52.00	11.11	1043.35
54.00	12.22	1047.67
56.00	13.33	1051.99
58.00	14.44	1056.31
60.00	15.56	1060.67
62.00	16.67	1064.99
64.00	17.78	1069.30
66.00	18.89	1073.62
68.00	20.00	1077.93
70.00	21.11	1082.24
72.00	22.22	1086.55
74.00	23.33	1090.86
76.00	24.44	1095.17
78.00	25.56	1099.51
80.00	26.67	1103.81
82.00	27.78	1108.12
84.00	28.89	1112.42
86.00	30.00	1116.72
88.00	31.11	1121.02
90.00	32.22	1125.31
92.00	33.33	1129.61
94.00	34.44	1133.90
96.00	35.56	1138.24
98.00	36.67	1142.53
100.00	37.78	1146.82
102.00	38.89	1151.11
104.00	40.00	1155.39
106.00	41.11	1159.68
108.00	42.22	1163.96
110.00	43.33	1168.25
112.00	44.44	1172.53
114.00	45.56	1176.85
116.00	46.67	1181.12
118.00	47.78	1185.40
120.00	48.89	1189.68
122.00	50.00	1193.95
124.00	51.11	1198.22
126.00	52.22	1202.49
128.00	53.33	1206.76
130.00	54.44	1211.03
132.00	55.56	1215.34
134.00	56.67	1219.60
136.00	57.78	1223.87
138.00	58.89	1228.13
140.00	60.00	1232.39
142.00	61.11	1236.65
144.00	62.22	1240.91
146.00	63.33	1245.17
148.00	64.44	1249.42
150.00	65.56	1253.72
152.00	66.67	1257.97
154.00	67.78	1262.22
156.00	68.89	1266.47
158.00	70.00	1270.72
160.00	71.11	1274.97
162.00	72.22	1279.21
164.00	73.33	1283.46
166.00	74.44	1287.70
168.00	75.56	1291.98
170.00	76.67	1296.22
172.00	77.78	1300.46
174.00	78.89	1304.69
176.00	80.00	1308.93
178.00	81.11	1313.16
180.00	82.22	1317.40
182.00	83.33	1321.63
184.00	84.44	1325.86
186.00	85.56	1330.12

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Temperature Transmitter Description

BAPI's temperature transmitters incorporate a 1KΩ RTD sensor and an amplifier. These devices provide an accurate two-wire, 4 to 20mA output over a specified range. They are specifically designed for temperature sensing and transmission over long distances without degradation of the 4 to 20mA signal. BAPI also offers outputs of 0 to 5, 0 to 10, 1 to 5 and 2 to 10 Volts. All outputs can be ordered as field selectable by choosing the TXS option on the ordering grid.

Each temperature transmitter is first calibrated with simulated RTD resistances for the specified range. Then an RTD is connected to the transmitter and the output is verified at one temperature.

BAPI has verified over 200 temperature ranges for the transmitters. If we don't offer the exact range you're looking for, call your BAPI representative to see if we can create a special range.

Additionally, BAPI can provide matched RTD-based units. Matched (sensor-transmitter pair) units utilize the tight tolerance of Class A RTDs to improve overall accuracy. The matched unit is tested in an environmental chamber against an NIST traceable reference thermometer. Each matched pair is provided with a "Certificate of Calibration" which lists the tested and calculated offset values, and identifies the equipment, products and people involved in the calibration process. The overall accuracy of the matched pair now becomes a function of the transmitter linearity, RTD linearity and reference thermometer uncertainty.

T1K Transmitter Specifications

Sensor: 1KΩ Platinum RTD

Supply Voltage: 12 to 40 VDC

Output: 4 to 20 mA, 0 to 5V, 1 to 5V, 0 to 10V, 2 to 10V

Max. Loop Resistance: 850Ω at 24VDC

Span: Min 16.6°C (30°F), Max 555°C (1000°F)

Zero: Min -100°C (-148°F), Max 482°C (900°F)

Field Adjustments: Each transmitter is calibrated to the specified temperature range that is ordered and is not field adjustmentable.

System Accuracy: ±0.065% of Span

Linearity: ±(0.125 x T-20ºC)/100

Operational Humidity:
0 to 95%, non-condensing

Output Current limits:
Less than 1mA and 22.35 ±0.15 mA

Power Output Shift:
±0.009% of Span to 40VDC

Connections: Four 22-gauge etched Teflon leads or terminal blocks

Operating Temperature:
Transmitter: -20 to 70°C
Sensor: -65 to 105°C (standard)
-200 to 600°C (available)

Matched errors are
±((Span * Linearity Error) + (Reference Thermometer uncertainty)
Where Linearity Error = Square Root((Transmitter Linearity)^2 + (RTD Linearity)^2) =
Square Root((0.125%)^2 + (0.2%)^2) = 0.234%

Examples:
BA/T1K(-30 to 130F)
Span = 130 - (-30) = 160
Matched error = ±((160*0.234%) + (0.05°F) = ±0.42°F

BA/T1K(45 to 95F)
Span = 95 - 45 = 50
Matched error = ±((50*0.234%) + (0.05°F) = ±0.17°F

These accuracies are for the entire range of the sensor, although the accuracies in the midband of the sensor will be tighter than those near the endpoints of the specified range. Other matching and/or certification options may be available, please contact your BAPI representative for details.

BAPI temperature transmitters come in a ruggedized package for all configurations where moisture or condensation may be a problem. The potting material used to ruggedize the transmitters has high thermal conductivity to eliminate circuit overheating and low thermal expansion to minimize the stress on the circuit components. Due to the extremely low moisture absorption properties of the potting material, a ruggedized transmitter will remain operational even if temporarily immersed in water.

Temp. Transmitter Output Table

BAPI Sensor Specifications

Rev. 01/04/22

0-100 ºF Temp. Transmitter Output Table

°F	°C	mA
0	-17.78	4.000
1	-17.22	4.160
2	-16.67	4.320
3	-16.11	4.480
4	-15.56	4.640
5	-15.00	4.800
6	-14.44	4.960
7	-13.89	5.120
8	-13.33	5.280
9	-12.78	5.440
10	-12.22	5.600
11	-11.67	5.760
12	-11.11	5.920
13	-10.56	6.080
14	-10.00	6.240
15	-9.44	6.400
16	-8.89	6.560
17	-8.33	6.720
18	-7.78	6.880
19	-7.22	7.040
20	-6.67	7.200
21	-6.11	7.360
22	-5.56	7.520
23	-5.00	7.680
24	-4.44	7.840
25	-3.89	8.000
26	-3.33	8.160
27	-2.78	8.320
28	-2.22	8.480
29	-1.67	8.640
30	-1.11	8.800
31	-0.56	8.960
32	0.00	9.120
33	0.56	9.280
34	1.11	9.440
35	1.67	9.600
36	2.22	9.760
37	2.78	9.920
38	3.33	10.080
39	3.89	10.240
40	4.44	10.400
41	5.00	10.560
42	5.56	10.720
43	6.11	10.880
44	6.67	11.040
45	7.22	11.200
46	7.78	11.360
47	8.33	11.520
48	8.89	11.680
49	9.44	11.840

°F	°C	mA
50	10.00	12.000
51	10.56	12.160
52	11.11	12.320
53	11.67	12.480
54	12.22	12.640
55	12.78	12.800
56	13.33	12.960
57	13.89	13.120
58	14.44	13.280
59	15.00	13.440
60	15.56	13.600
61	16.11	13.760
62	16.67	13.920
63	17.22	14.080
64	17.78	14.240
65	18.33	14.400
66	18.89	14.560
67	19.44	14.720
68	20.00	14.880
69	20.56	15.040
70	21.11	15.200
71	21.67	15.360
72	22.22	15.520
73	22.78	15.680
74	23.33	15.840
75	23.89	16.000
76	24.44	16.160
77	25.00	16.320
78	25.56	16.480
79	26.11	16.640
80	26.67	16.800
81	27.22	16.960
82	27.78	17.120
83	28.33	17.280
84	28.89	17.440
85	29.44	17.600
86	30.00	17.760
87	30.56	17.920
88	31.11	18.080
89	31.67	18.240
90	32.22	18.400
91	32.78	18.560
92	33.33	18.720
93	33.89	18.880
94	34.44	19.040
95	35.00	19.200
96	35.56	19.360
97	36.11	19.520
98	36.67	19.680
99	37.22	19.840
100	37.78	20.000

Humidity Transmitter Description

BAPI humidity transmitters provide a high accuracy 4 to 20mA, 0 to 5V or 0 to 10V humidity measurement. Accuracies of 2% or 3% RH are available. Duct and outside air units come with a removeable sintered stainless steel filter. On duct and outside air units, the filter may be cleaned with warm, distilled water.

These units are microprocessor based and do not require any field calibration.

For all non-room configurations, BAPI humidity transmitters come standard in a ruggedized package. Ruggedized transmitters are suitable for locations where moisture or condensation may be a problem. The potting material used to ruggedize the transmitters has a high thermal conductivity to eliminate circuit overheating and a low thermal expansion to minimize the stress on the circuit components. Due to the extremely low moisture absorption properties of the epoxy, a ruggedized transmitter will remain operational even if temporarily immersed in water.

Many tests and studies have been conducted on the sensor incorporated into these humidity transmitters to assure that they provide long-term accuracy and durability. For applications requiring even higher accuracy, however, certified units are available which have been tested and offset against an NIST traceable reference. Please call for details or with specific requirements.

General Specifications

Output Ranges:
4 to 20 mA, 0 to 5 V, or 0 to 10 V

Power:
10 to 35 VDC (0 to 5 VDC or 4 to 20 mA outputs)
15 to 35 VDC (0 to 10 VDC Output)
12 to 27 VAC (0 to 5 VDC Output)
15 to 27 VAC (0 to 10 VDC Output)

Power Consumption:
22 mA max. DC (0 to 5 VDC or 4 to 20 mA Outputs)
6 mA max. DC (0 to 10 VDC Output)
0.53 VA max. AC (0 to 5 VDC or 4 to 20 mA Outputs)
0.14 VA max. AC (0 to 10 VDC Output)

Sensing Element:
Capacitive type humidity sensor

Operating RH Range:
0 to 100 %RH (non-condensing)

Operating Temperature Range:
Room: 0 to 70°C (32 to 158°F)
Duct & Outside: -20 to 70°C (-4 to 158°F)

Accuracy Range: from 10 to 90% RH at 25°C

Response Time: 8 seconds in moving air for a 63% step

Drift: <0.5%RH per year

Humidity Transmitter Output Table

%RH	5V	10V	mA	%RH	5V	10V	mA
0	0.00	0.00	4.000	50	2.50	5.00	12.000
1	0.05	0.10	4.160	51	2.55	5.10	12.160
2	0.10	0.20	4.320	52	2.60	5.20	12.320
3	0.15	0.30	4.480	53	2.65	5.30	12.480
4	0.20	0.40	4.640	54	2.70	5.40	12.640
5	0.25	0.50	4.800	55	2.75	5.50	12.800
6	0.30	0.60	4.960	56	2.80	5.60	12.960
7	0.35	0.70	5.120	57	2.85	5.70	13.120
8	0.40	0.80	5.280	58	2.90	5.80	13.280
9	0.45	0.90	5.440	59	2.95	5.90	13.440
10	0.50	1.00	5.600	60	3.00	6.00	13.600
11	0.55	1.10	5.760	61	3.05	6.10	13.760
12	0.60	1.20	5.920	62	3.10	6.20	13.920
13	0.65	1.30	6.080	63	3.15	6.30	14.080
14	0.70	1.40	6.240	64	3.20	6.40	14.240
15	0.75	1.50	6.400	65	3.25	6.50	14.400
16	0.80	1.60	6.560	66	3.30	6.60	14.560
17	0.85	1.70	6.720	67	3.35	6.70	14.720
18	0.90	1.80	6.880	68	3.40	6.80	14.880
19	0.95	1.90	7.040	69	3.45	6.90	15.040
20	1.00	2.00	7.200	70	3.50	7.00	15.200
21	1.05	2.10	7.360	71	3.55	7.10	15.360
22	1.10	2.20	7.520	72	3.60	7.20	15.520
23	1.15	2.30	7.680	73	3.65	7.30	15.680
24	1.20	2.40	7.840	74	3.70	7.40	15.840
25	1.25	2.50	8.000	75	3.75	7.50	16.000
26	1.30	2.60	8.160	76	3.80	7.60	16.160
27	1.35	2.70	8.320	77	3.85	7.70	16.320
28	1.40	2.80	8.480	78	3.90	7.80	16.480
29	1.45	2.90	8.640	79	3.95	7.90	16.640
30	1.50	3.00	8.800	80	4.00	8.00	16.800
31	1.55	3.10	8.960	81	4.05	8.10	16.960
32	1.60	3.20	9.120	82	4.10	8.20	17.120
33	1.65	3.30	9.280	83	4.15	8.30	17.280
34	1.70	3.40	9.440	84	4.20	8.40	17.440
35	1.75	3.50	9.600	85	4.25	8.50	17.600
36	1.80	3.60	9.760	86	4.30	8.60	17.760
37	1.85	3.70	9.920	87	4.35	8.70	17.920
38	1.90	3.80	10.080	88	4.40	8.80	18.080
39	1.95	3.90	10.240	89	4.45	8.90	18.240
40	2.00	4.00	10.400	90	4.50	9.00	18.400
41	2.05	4.10	10.560	91	4.55	9.10	18.560
42	2.10	4.20	10.720	92	4.60	9.20	18.720
43	2.15	4.30	10.880	93	4.65	9.30	18.880
44	2.20	4.40	11.040	94	4.70	9.40	19.040
45	2.25	4.50	11.200	95	4.75	9.50	19.200
46	2.30	4.60	11.360	96	4.80	9.60	19.360
47	2.35	4.70	11.520	97	4.85	9.70	19.520
48	2.40	4.80	11.680	98	4.90	9.80	19.680
49	2.45	4.90	11.840	99	4.95	9.90	19.840
				100	5.00	10.00	20.000

Pressure Sensor Description

The focal point of any sensor is the sensing element itself, and BAPI has gone to great lengths to produce one of the best sensors on the market today. The heart of every BAPI unit is a micro-machined, single-crystal silicon, pressure sensor. Each sensor is fabricated using the same integrated circuit technology used to make millions of cell phones, game machines and personal computers. To control and maintain the quality of these sensors, BAPI is involved in all phases of production from design to use.

Silicon does bring with it one undesired trait—thermal sensitivity. The traditional method of compensating for this thermal sensitivity is an external circuit with discreet resistors, some of which have their own temperature dependencies, introducing more error. BAPI uses a different, unique approach. We employ a custom compensation ASIC (Application Specific Integrated Circuit) that uses digital compensation while maintaining an analog signal path, producing a sensor that is precise and interchangeable. The result is a pressure sensor that offers the ultimate in high accuracy, while preserving the fast response and smooth output inherent to silicon sensors.

Because of the innovative sensor and digital temperature compensation circuit, we are able to produce a highly accurate and stable product. This accuracy is verified during final calibration at our factory using a pressure-controlled source accurate to 0.00015 inch of water and traceable to NIST standards.

Specifications

Output Ranges:
4 to 20 mA, 0 to 5 V or 0 to 10V

Power:
7 to 45 VDC *(4-20 mA output)*
7 to 45 VDC or 7 to 32 VAC (*0-5 VDC output)*
13 to 45 VDC or 13 to 32 VAC (*0-10 VDC output)*

Power Consumption:
4.9 mA max DC at 0-5 VDC or 0-10 VDC Output
0.12 VA max AC at 0-5 VDC or 0-10 VDC Output
20 mA max, DC only at 4-20 mA Output

Pressure Ranges
Inches W.C.
Low Range Unidirectional
0 to 0.10”, 0 to 0.25”, 0 to 0.50”, 0 to 0.75”, 0 to 1.00”
Low Range Bi-directional
±0.10”, ±0.25”, ±0.50”, ±0.75”, ±1.00”
Standard Range Unidirectional
0 to 1.00”, 0 to 2.00”, 0 to 2.50”, 0 to 3.00”, 0 to 5.00”
Standard Range Bi-directional
±1.00”, ±2.00”, ±2.50”, ±3.00”, ±5.00”
High Range Unidirectional
0 to 5”, 0 to 10”, 0 to 15”, 0 to 25”, 0 to 30”

Pascals
Low Range Unidirectional
0 to 30, 0 to 50, 0 to 100, 0 to 175, 0 to 250
Low Range Bi-directional
±30, ±50, ±100, ±175, ±250
Standard Range Unidirectional
0 to 250, 0 to 300, 0 to 500, 0 to 1,000, 0 to 1,250
Standard Range Bi-directional
±250, ±300, ±500, ±1,000, ±1.250
High Range Unidirectional
0 to 1,250, 0 to 2,500, 0 to 4,000, 0 to 6,000, 0 to 7,400

Accuracy at 72°F (22.2°C)
Low Range
±0.5% of W.C. ranges 0 to 0.1”, 0 to 0.25”, ±0.1” and ±0.25”
±0.5% of Pa ranges 0 to 30, 0 to 50, ±30 and ±50 Pa
±0.25% of range all other ranges

Standard and High Range
±0.25% of range

Temperature Limits
Storage: -40°F to 203°F (-40°C to 95°C)
Operational: 32°F to 140°F (0°C to 95°C)
Compensated: 50°F to 104°F (10°C to 40°C)

Operating RH Range:
0 to 95% non-condensing

Media:
Non-Ionic, Non-Corrosive, Clean, Dry Gasses

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Table of Contents

Additional Setpoint Output Ranges I2
Additional Setpoint Display Ranges I3
BAPI-Stat “Quantum” Unit Options..... I4
BAPI Non-Room Enclosure Styles I5
IEC Enclosure Ratings I6
NEMA Enclosure Ratings I7
UL94 Flammability Rating I8
Why Use DC Power Instead of AC I9
BAPI Certification Form Overview I10-11
Temperature Transmitter Certification I12
Pressure Transmitter Certification I13
Humidity Trans Certification (Non Room).. I14
Humidity Trans Certification (Room Units) I15
Full Wave or Half Wave Power Supplies ... I16
BAPI Commits to RoHS Compliance..... I17
Pressure Sensor Terms Defined..... I18
BAPI Recommended Wire Lengths..... I19
Mounting Outdoor Sensors..... I20
Measuring the Temp. of Small Pipes I21

Additional Application Notes Available at www.bapihvac.com

In addition to the Application Notes available in this catalog, BAPI also has many Application Notes available online at our website at www.bapihvac.com. Below is a list of some of the Application Notes available online:

Ground Loops
Understanding Grounds Loops and Avoiding Ground Loops

Current Loops
4 to 20 mA Configurations
Understanding 4 to 20 mA Current Loops
Designing 4 to 20 mA Current Loops

Other Application Notes
Understanding Full Wave and Half Wave Power Supplies
Determining Air Flow in Cubic Feet per Minute (CFM)
Understanding Noise from AC Power
Thermobuffer Temperature Sensing

Setpoint Output Ranges for BAPI Room Sensors

				BAPI Room Sensors													
				Units Without Display			Units With Display								Units With or Without Display		
	Designator	Output Range	Span	Delta Style	"Quantum" without Display	BAPI-Stat 4 without Display	RµP	RµPS	Decora	"Quantum" Pushbutton Setpoint & BAPI-Stat 4M	"Quantum" Slider Setpoint & BAPI-Stat 4S	X-Combo***	T1K Room Trans	"Quantum Prime" and BAPI-Stat 3* Temp or Humidity Units	BAPI-Stat 4* with Humidity or Dew Point	"Quantum Prime" and BAPI-Stat 3* VOC or CO2 Units	BAPI-Com
Volts	00	0 to 5 V	5 Volts	x		x	x	x	x	x	x	Ch 1,2,3		x	x		x
	01	1 to 5 V	4 Volts	x		x	x		x	x				x			x
	02	3.7 to 0.85 V	2.85 Volts	x		x	x		x	x				x			x
	03	5 to 0 V	5 Volts	x		x	x	x	x	x	x	Ch 3		x		x	x
	04	4.2 to 1.2 V	3 Volts	x		x	x		x	x				x			x
	07	2.773 to 0.43 V	2.343 Volts	x		x	x		x	x				x			x
	10	0 to 10 V	10 Volts	x		x			x	x	x			x	x	x	x
	11	2 to 10 V	8 Volts	x		x			x	x				x			x
Current	16	4 to 20 mA	16 mA									Ch 1,2	x	x			
<1KΩ Span	20	889 to 111 Ω	778 Ω				x		x	x				x			x²
	21	792 to 208 Ω	584 Ω				x		x	x				x			x²
	22	695 to 305 Ω	390 Ω				x		x	x				x			x²
	23	674 to 274 Ω	400 Ω	x	x	x	x	x	x	x	x		x	x	x	x	x²
	24	597 to 305 Ω	292 Ω				x		x	x				x			x²
	25	800 to 1200	400 Ω	x	x	x	x	x	x	x	x		x	x	x	x	x²
	26	909 to 1309	400 Ω	x	x	x	x	x	x	x	x		x	x	x	x	x²
	27	1800 to 2200	400 Ω	x	x	x	x	x	x	x	x		x	x	x	x	x²
	28	865 to1286	400 Ω	x	x	x	x	x	x	x	x		x	x	x	x	x²
	29	700 to 300	400 Ω	x	x	x	x	x	x	x	x		x	x	x	x	x²
1KΩ Span	40	0 to 1 KΩ	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	41	500 to 1500 Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	42	2 to 3 KΩ	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	43	249 to 1249 Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	44	10 to 11 KΩ	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	45	12.5K-11.5K Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	46	1K to 0 Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	47	182 to 1182 Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
2KΩ Span	48	0 to 2 KΩ	2 KΩ							x		x					x
	55	0 to 1.5 KΩ	2 KΩ														x
5KΩ Span	50	0 to 5 KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
	51	7.87K to 2.87KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
	52	10.0K to 15.0KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
	53	2.5K to 7.5KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
	54	1K to 6KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
10KΩ Span	60	0 to 10 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	61	15K to 5 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	62	9577 to 1422 Ω	8.16K				x		x	x		x		x			x
	63	1 to 11 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	64	200 to 10.2 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	65	10.4K to 400Ω	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	66	10 KΩ to 0	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	67	5K to 15 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	68	9629 to 806 Ω	10 KΩ[1]				x	x	x	x		x	x	x	x		x
	[XL]**	10.6K to 600Ω	9.62 KΩ	x		x	x	x	x	x	x	x					x
20KΩ Span	80	0 to 20 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	81	4.75 to 24.75 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	82	6.19 to 26.19 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	83	7.87 to 27.87 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	84	10 to 30 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	85	24.75 to 4.75 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
100KΩ	90	0 to 100 KΩ	100 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	
50KΩ	91	25K to 75 KΩ	50 KΩ				x		x	x				x			

*Setpoint range must be within displayed temperature range

**XL10 Option

***The X-Combo unit uses a unique set of designators for the ranges, not the designators listed on this page. See the X-Combo ordering grid for the designators.

[1]Only available with pushbutton style setpoint sensors.

[2]The resolution is 40Ω per step with 250 steps.

Note: RuP options 60, 61 and 62 are not available for large display spans. Contact your BAPI representative for additional information.

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Setpoint Display Ranges for BAPI Room Sensors

Designator	Setpoint Display Range**				BAPI Room Sensors With Display							
	°F	°C	Humidity	Generic	RµP	RµPS	"Quantum", Decora & BAPI-Stat 4	X-Combo*	T1K Room Trans	"Quantum Prime" or BAPI-Stat 3* Temp & Humidity	"Quantum Prime" or BAPI-Stat 3* VOC & CO2	BAPI-Com**
A				-3 to +3	x	x	x	x	x	x	x	x
B				-5 to +5	x	x	x	x	x	x	x	x
C	50 to 90°F	10 to 32°C			x	x	x	x	x	x	x	x
D	55 to 85°F	13 to 30°C			x	x	x	x	x	x	x	x
E	60 to 80°F	15 to 27°C			x	x	x	x	x	x	x	x
F	65 to 80°F	18 to 27°C			x	x	x	x	x	x	x	x
G	45 to 96°F	7 to 35°C			x		x	x	x	x	x	x
H	-20 to 120°F	-29 to 49°C							x	x	x	x
J	68 to 78°F	20 to 26°C			x	x	x	x	x	x	x	x
K	65 to 95°F	18 to 35°C			x		x	x	x	x	x	x
L	70 to 74°F	21 to 23°C			x	x	x	x	x	x	x	x
M			0 to 100%RH					x		x		x
N			35 to 70%RH					x		x		x
P				-2 to +2	x	x	x	x	x	x	x	x
X	40 to 80°F	4 to 27°C			x	x	x	x	x	x	x	x
AA	60 to 85°F	15 to 30°C			x		x	x	x	x	x	x
BB	54 to 90°F	12 to 32°C			x		x	x	x	x	x	x
CC	41 to 85°F	5 to 30°C			x		x	x	x	x	x	x
DD	32 to 100°F	0 to 38°C			x		x	x	x	x	x	x
EE	67 to 77°F	19 to 25°C			x		x	x	x	x	x	x
FF				-10 to +10	x		x	x	x	x	x	x
GG	0 to 100°F	-18 to 38°C							x	x	x	x
JJ	40 to 90°F	4 to 32°C			x		x	x	x	x	x	x
KK	32 to 185°F	0 to 85°C							x	x	x	x
MM	-40 to 140°F	-40 to 60°C							x	x	x	x
NN	69 to 75°F	21 to 24°C			x		x	x	x	x	x	x
PP				-4 to +4	x		x	x	x	x	x	x
QQ	55 to 95°F	13 to 35°C			x		x	x	x	x	x	x
RR	32 to 212°F	0 to 100°C							x			
SS	25 to 50°F	-4 to 10°C							x	x	x	x
TT	50 to 86°F	10 to 30°C			x	x	x	x	x	x	x	x
	Maximum Temperaure Display Range ->				32 to 110°F 0 to 43°C	32 to 110°F 0 to 43°C	32 to 99°F 0 to 60°C	32 to 158°F 0 to 70°C	-147 to 999°F -99 to 999°C	-40 to 185°F -40 to 85°C	-40 to 140°F -40 to 60°C	-40 to 140°F -40 to 60°C

An "x" in the box indicates that the output range is available for that room unit.
*Setpoint range must be within displayed temperature range
**Range describes the Output Module Range as well as the Display Range if used with the BAPI-Com.

Resistance Output Values for Units with Fan Speed Control

Designator	Fan Speed Control Selection & Resistance Output Value						Room Sensor Models
	OFF	AUTO	LO	MED	HI	ON	
XLD	5K	10K	15K	20K	25K		RuPM, BAPIStat 2 & 4
X01	4.89K	2.33K	10.63K	13.24K	16.33K		RuPM, BAPIStat 2 & 4
X02	2K	4K	6K	8K	10K		RuPM, BAPIStat 2 & 4
X03	5K	10K				15K	RuPM, BAPIStat 2 & 4
X05	4.89K	2.33K				15.8K	RuPM, BAPIStat 2 & 4
X06	6.5K		8.5K	10.5K	12K		BAPIStat 2 & 4 Only
X07	5K					15K	BAPIStat 2 & 4 Only
X08	12.686K	11.86K				13.86K	RuPM, BAPIStat 2 & 4

Resistance Output Values for BAPI-Stat 2 & 4 Units with Heat/Cool and Off/Auto Control

Designator	Mode Control Selection & Resistance Output Value						Room Sensor Models
		Heat	Cool	Auto	Off		
H02		5K	10K	15K	20K		BAPIStat 2 & 4 Only

Resistance Output Values for Units with Heat/Off/Cool Mode and On/Auto Fan Control

Designator	Mode Control Selection & Resistance Output Value						Room Sensor Models
	Heat/Auto	Off/Auto	Cool/Auto	Heat/On	Off/On	Cool/On	
HCF	5K	10K	15K	20K	25K	30K	RuPM, BAPIStat 2 & 4
H01	0K	2K	4K	6K	8K	10K	RuPM, BAPIStat 2 & 4

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BAPI-Stat “Quantum” Optional Selections

BAPI Application Notes

Rev. 01/08/21

Below is a complete list of the “Optional Selections” available for the BAPI-Stat “Quantum” and “Quantum Prime” room units.

BAPI-Stat "Quantum" and "Quantum Prime" Available Options								
Designator	Option Description	"Quantum" No Display Unit - Temp Only	"Quantum" Display Unit - Temp Only, Pushbutton Setpoint	"Quantum" Display Unit - Temp Only, Slider Setpoint	"Quantum" Display or No Display Unit - Temp & Humidity, or Humidity Only	"Quantum Prime" Unit - Temp Only, Humidity Only or Temp & Humidity	"Quantum" Unit - CO2 or VOC Only	"Quantum Prime" Unit - Temp and/or Humidity with CO2 or VOC
A	Differential Ground	X	X	X	X	X		X
B	Comm Jack C35	X	X	X	X	X		X
C	Comm Jack C11		X	X	X*	X		
D	Comm Jack C22		X	X	X*	X		
E	5 Volt Power		X	X				
F	Test & Balance	X	X	X	X	X		X
G	XLD Fan Speed		X					
H	X01 Fan Speed		X					
I	X02 Fan Speed		X					
J	X06 Fan Speed		X					
K	HCF Fan Speed		X					
L	H01 Fan Speed		X					
M	LED Override Indicator	X						

*Comm Jacks C11 and C22 are not available for No Display Units

ADDITIONAL DESCRIPTIONS

Comm Jack C35: 3.5mm Phono Style Jack with Leads Attached

Comm Jack C11: RJ11 (4 pin) Style Jack with Leads Attached

Comm Jack C22: RJ22 (4 pin) Style Jack with Leads Attached

5 Volt Power: Unit can operate on 5 VDC power (0 to 5V or resistive outputs only)

Test & Balance: Three-Position Switch - “Low” & “High” values vary, “Normal” is live sensor value

XLD Fan Speed: Pushbutton Fan Speed Adjustment [Off (5K), Auto (10K), Lo (15K), Med (20K), Hi (25K)] with LCD Indication

X01 Fan Speed: Pushbutton Fan Speed Adjustment [Off (4.89K), Auto (2.33K), Lo (10.63K), Med (13.24K), Hi (16.33K)] with LCD Indication

X02 Fan Speed: Pushbutton Fan Speed Adjustment [Off (2K), Auto (4K), Lo (6K), Med (8K), Hi (10K)] with LCD Indication

X06 Fan Speed: Pushbutton Fan Speed Adjustment [Off (6.5K), Lo (8.5K), Med (10.5K), Hi (12K)] with LCD Indication

HCF Fan Speed: Pushbutton Mode [Heat/Auto (5K), Off/Auto (10K), Cool/Auto (15K), Heat/On (20K), Off/On (25K), Cool/On (30K)] with LCD Indication

H01 Fan Speed: Pushbutton Mode [Heat/Auto (0Ω), Off/Auto (2K), Cool/Auto (4K), Heat/On (6K), Off/On (8K), Cool/On (10K)] with LCD Indication

Building Automation Products, Inc. • 750 North Royal Avenue, Gays Mills, WI 54631 USA
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BAPI offers six enclosure styles for our non-room sensors. These include the BAPI-Box Crossover, Junction Box, BAPI-Box, BAPI-Box 2, BAPI-Box 4 and the Weatherproof Enclosure (“Bell Box”).

INDOOR ENCLOSURES

BAPI-Box Crossover

The BAPI-Box Crossover is made of UV-resistant polycarbonate and nylon and carries an IP10 rating. It is IP44 with a pierceable knockout plug installed in the open port.

IP10: Protected against solid foreign objects greater than 50mm diameter

IP44: Protected against solid foreign objects greater than 1mm diameter and protected against splashing water.



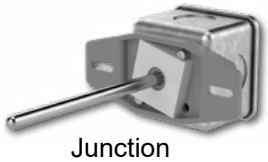
BAPI-Box Crossover

Junction Box

The Junction Box is made of galvanized steel with an IP20 and NEMA 1 rating.

IP20: Protected against solid objects greater than 12.5mm diameter.

NEMA 1: Constructed for indoor use to provide a degree of protection against falling dirt.



Junction Box (JB)

BAPI-Box 4 Enclosure

The BAPI-Box 4 is made of nylon and plastic and carries an IP10 rating or IP44 with the Pierceable Knockout Plug installed. It is half the size of the BAPI-Box 2 with a hinged (but not gasketed) cover.

IP10: Protected against solid foreign objects greater than 50mm diameter

IP44: Protected against solid foreign objects greater than 1mm diameter and protected against splashing water.



BAPI-Box 4 (BB4)

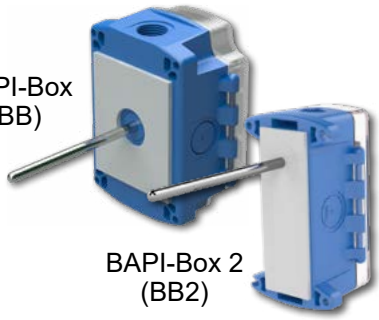
INDOOR/OUTDOOR ENCLOSURES

BAPI-Box and BAPI-Box 2 Enclosures

The BAPI-Box and BAPI-Box 2 are made of polycarbonate and carry an IP66 and NEMA 4 rating.

IP66: Dust tight & protected against powerful water jets from any direction.

NEMA 4: Constructed for indoor or outdoor use to provide a degree protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water; and that will be undamaged by the external formation of ice.



BAPI-Box (BB)

BAPI-Box 2 (BB2)

Weatherproof Enclosure (“Bell Box”)

The Weatherproof Enclosure is made of cast aluminum and carries an IP24 and NEMA 3R rating.

IP24: Protected against solid foreign objects greater than 12.5mm diameter, and protected against splashing water.

NEMA 3R: Constructed for indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow; and that will be undamaged by the external formation of ice.

Note: The Weatherproof Enclosure is not watertight. If this enclosure will be subjected to driving rain, sprinkler systems or jets of water, then it may need a 3/16” weep hole drilled in the lowest horizontal face of the box.



Weatherproof (WP)

Note: For more information about NEMA and IEC enclosure ratings see BAPI’s application notes NEMA Enclosure Ratings and IEC Enclosure Ratings.

IEC Enclosure Ratings

BAPI Application Notes

Rev. 10/16/12

The IEC (International Electrotechnical Commission) is an international committee that develops and publishes its recommendations for standardizing international wiring devices and products. Ingress Protection (IP) is the grades of protection against external solids contacting the conductors of a wiring device and against the penetration of liquids into the wiring device.

The IP designation consists of the letters IP followed by two numerals. The first characteristic numeral indicates the degree of protection provided by the enclosure with respect to persons and solid foreign objects entering the enclosure. The second characteristic numeral indicates the degree of protection provided by the enclosure with respect to the harmful ingress of water. The degrees of protection are listed below:

1st IP#	Degree of protection against access to hazardous parts and ingress of solid objects
0	No protection
1	Protected against solid foreign objects greater than 50mm diameter
2	Protected against solid foreign objects greater than 12.5mm diameter
3	Protected against solid foreign objects greater than 2.5mm diameter
4	Protected against solid foreign objects greater than 1.0mm diameter
5	Dust Protected
6	Dust tight

2nd IP#	Degree of protection against the ingress of water
0	No protection
1	Protected against vertically falling water drops
2	Protected against vertically falling water drops when enclosure titled up 15°
3	Protected against spraying water
4	Protected against splashing water
5	Protected against water jets
6	Protected against powerful jets from any direction
7	Protected against the effects of total water immersion up to 1M
8	Protected against the effects of total water immersion beyond 1M

Therefore an IP66 rated enclosure is “dust tight and protected against powerful jets of water from any direction.”

If you have any questions about BAPI enclosures please call your BAPI representative.

Reference: IEC Publication 60529 - Classification of Degrees of Protection Provided by Enclosures

The **N**ational **E**lectrical **M**anufacturers **A**ssociation **(NEMA)** Standards Publication No. 250 defines 13 different enclosure "types" for non-hazardous locations. These NEMA types define the applications and the environmental conditions that enclosures are designed to protect against when properly installed.

Type 1: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment, and to provide a degree of protection against falling dirt.

Type 2: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment, to provide a degree of protection against falling dirt, and to provide a degree of protection against dripping and light splashing of liquids.

Type 3: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and that will be undamaged by the external formation of ice on the enclosure.

Type 3R: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow; and that will be undamaged by the external formation of ice on the enclosure.

Type 3S: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and in which the external mechanism(s) remain operable when ice laden.

Type 4: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.

Type 4X: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water; and corrosion; and that will be undamaged by the external formation of ice on the enclosure.

Type 5: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against settling airborne dust, lint and fiber flyings; and to provide a degree of protection against dripping and light splashing of liquids.

Type 6: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose directed water and the entry of water during occasional temporary submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.

Type 6P: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose directed water and the entry of water during prolonged submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.

Type 12: Enclosures constructed (without knockouts) for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint and fiber flyings; and against dripping and light splashing of liquids.

Type 12K: Enclosures constructed (with knockouts) for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint, fiber flyings; and against dripping and light splashing of liquids.

Type 13: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint and fiber flyings; and against spraying splashing, and seepage of water, oil and noncorrosive coolants. If you have any questions about BAPI enclosures or NEMA ratings, please call your BAPI representative.

Reference: NEMA Standard 250-1997, "Enclosures for Electrical Equipment (1000 Volts Maximum)"

UL94 Flammability Rating

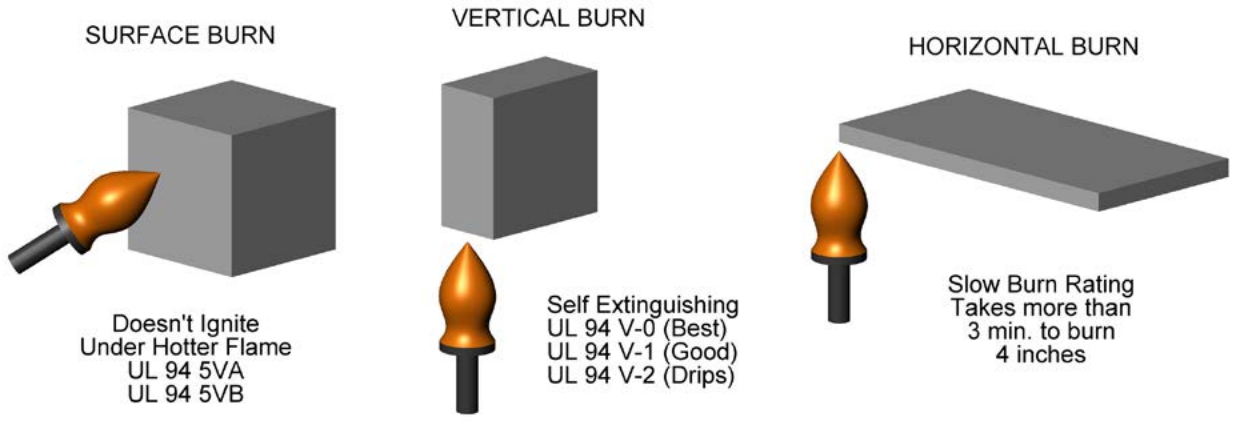
BAPI Application Notes

Rev. 06/24/21

All of BAPI's indoor sensor bodies and transmitter enclosures are made from UL94 V-0 rated plastics.

UL94 serves as a preliminary indication of a plastic's acceptability for use as part of a device or appliance with respect to its flammability. It is not intended to reflect the hazards of a material under actual fire conditions.

The UL94 HB test describes the Horizontal Burn method. Method UL94 V is used for Vertical Burn, a more stringent test than UL94 HB. The UL94 5V test is for enclosures for products that are not easily moved or are attached to a conduit system.



UL 94 Flammability Rating Summary	
5VA Surface Burn	Burning stops within 60 seconds after five applications of five seconds each of a flame (larger than that used in Vertical Burn testing) to a test bar. Test specimens MAY NOT have a burn-through (no hole). This is the highest (most flame retardant) UL94 rating.
5VB Surface Burn	Burning stops within 60 seconds after five applications of five seconds each of a flame (larger than that used in Vertical Burn testing) to a test bar. Test specimens MAY HAVE a burn-through (a hole).
V-0 Vertical Burn	Burning stops within 10 seconds after two applications of ten seconds each of a flame to a test bar. NO flaming drips are allowed.
V-1 Vertical Burn	Burning stops within 60 seconds after two applications of ten seconds each of a flame to a test bar. NO flaming drips are allowed.
V-2 Vertical Burn	Burning stops within 60 seconds after two applications of ten seconds each of a flame to a test bar. Flaming drips ARE allowed.
HB Horizontal Burn	Slow horizontal burning on a 3mm thick specimen with a burning rate is less than 3"/min or stops burning before the 5" mark. H-B rated materials are considered "self-extinguishing". This is the lowest (least flame retardant) UL94 rating.

If you have any questions about BAPI enclosures please call your BAPI representative.

Why Use DC Power Instead of AC Power on a Sensor?

Most modern HVAC control systems have 24 VAC available, and most of BAPI's products can run on 24 VAC, yet BAPI recommends powering them with DC voltage. Why?

Twisted wire cables have high wire-to-wire capacitance. Capacitors totally block DC voltage, but allow a little bit of AC voltages to couple from wire to wire. A portion of the 50 Hz or 60 Hz, 24 VAC running through one pair of wires in a multi-wire cable will combine with the normal signals on all the other wires in the cable. The Laws of physics mandate that this will happen no matter whose sensor is used.

The AC noise coupled into a sensor signal in a multi-wire cable may cause the controller to think that the measured parameter is changing back and forth rapidly. The controller may drive the mechanical equipment into an oscillation that overdrives the actuators and causes the mechanical equipment to wear out prematurely. For example, in a room at 72°F, BAPI's tests show that for a nominal 25-foot sensor wire length, the 60Hz noise in a multi-wire cable can change a 10K thermistor's temperature measurement from 69.4°F to 74.7°F. The controller thinks that the zone temperature is fluctuating by 5°F and drives the output actuators more than necessary.

There are two ways to avoid this situation. The first way is to convert the AC power to DC power with a voltage converter (such as BAPI's VC350A or VC350A-EZ) at the controller end of the cable. If you power the sensor with DC voltage, then there is no AC noise within the multi-wire cable to influence the temperature reading. But remember, the DC converter has to be mounted at the controller end of the wire, not at the sensor end, otherwise there will still be AC power within the multi-wire cable.

If you choose to power the sensor with 24 VAC, then the second way to avoid the AC noise is to run the AC power in a separate, shielded cable with the shield connected to a good building ground at the controller end. In this situation, the capacitance from the 24 VAC wires to the sensor's signal wires is so low it is effectively ZERO. No AC voltage combines with your sensor's signal, but you must run two separate cables.

Either of these methods will prevent the AC noise from influencing the sensor's signal, but BAPI recommends converting the AC power to DC power because we feel it is easier and more economical to install a low cost voltage converter rather than making two cable runs.

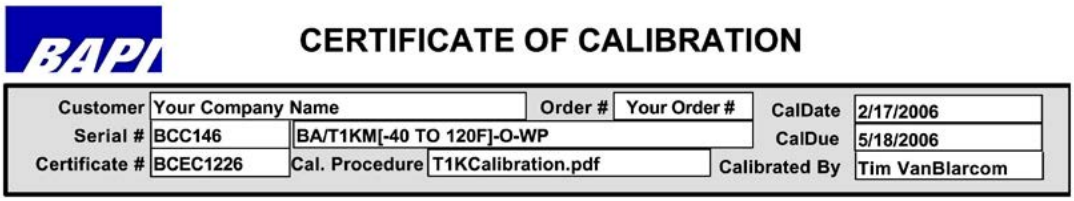
If you need further information about this topic, request the application note Understanding Noise from AC Power from your BAPI representative or download it from our website at bapihvac.com.

BAPI Certification Form Overview

BAPI Application Notes

Rev. 10/16/12

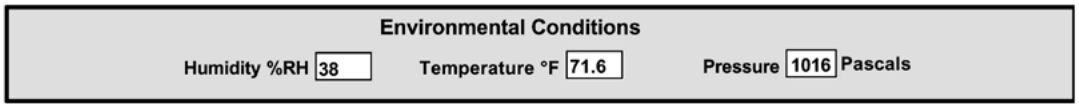
Recently BAPI changed its certification form to match the requirements of the National Institute of Standards and Technology data reporting standard.



CERTIFICATE OF CALIBRATION

Customer	Your Company Name	Order #	Your Order #	CalDate	2/17/2006
Serial #	BCC146	BA/T1KM[-40 TO 120F]-O-WP		CalDue	5/18/2006
Certificate #	BCEC1226	Cal. Procedure	T1KCalibration.pdf	Calibrated By	Tim VanBlarcom

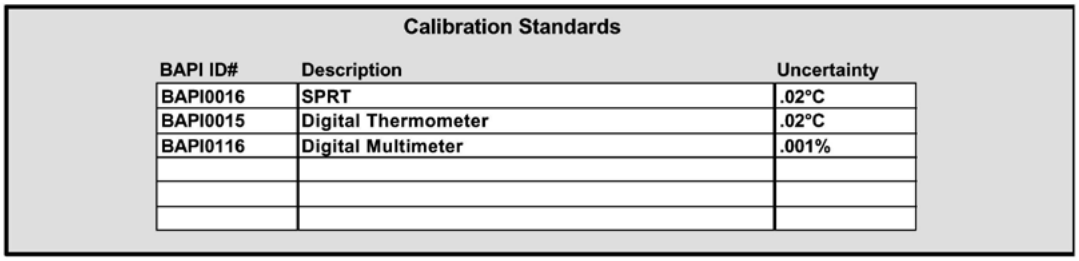
The first section (shown above) indicates the product being certified, the customer and the order number.



Environmental Conditions

Humidity %RH 38 Temperature °F 71.6 Pressure 1016 Pascals

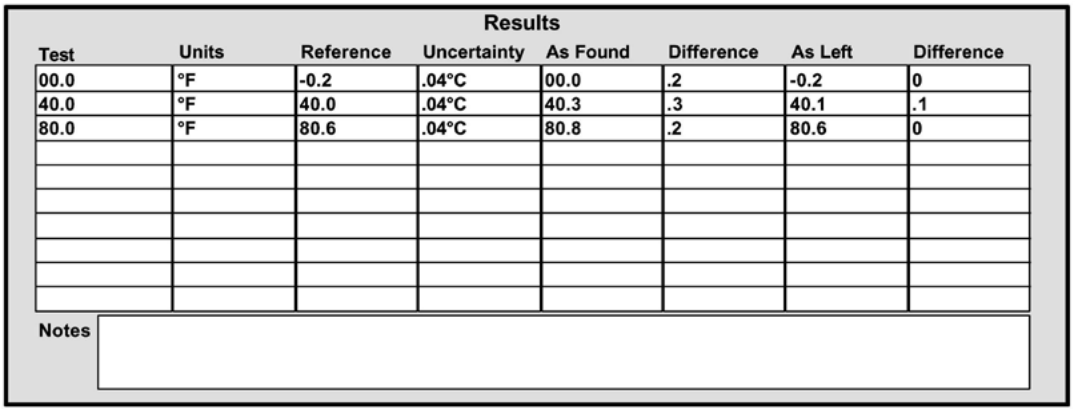
The second section (shown above) records the relative humidity, temperature and atmospheric pressure of the test laboratory.



Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0016	SPRT	.02°C
BAPI0015	Digital Thermometer	.02°C
BAPI0116	Digital Multimeter	.001%

The third section (shown above) is an inventory of the equipment used to perform the certification. Uncertainty is the tolerance of the instrument's measurement as determined during its last calibration at a NIST certified calibration center.



Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
00.0	°F	-0.2	.04°C	00.0	.2	-0.2	0
40.0	°F	40.0	.04°C	40.3	.3	40.1	.1
80.0	°F	80.6	.04°C	80.8	.2	80.6	0

Notes

The fourth section (shown above) details the certification results. The column labeled Test defines the test procedure or procedures that were used to certify the product. The column labeled Units defines the units of measure used for the test. The three test conditions for this certification were 0°F, 40°F and 80°F.

The column labeled Reference is the actual test condition as measured by the Calibration Standards referenced in the inventory described above. For the test shown, the test condition at 0°F was actually -0.2°F, we achieved 40°F and 80°F was actually 80.6°F. The next column labeled Uncertainty is the tolerance of Calibration standards used to measure the test condition temperature.

The column labeled As Found is the transmitters output before any corrections are made to the transmitter. If the output is a 4 to 20mA current loop, the output is changed to the units of the parameter being measured, in this case Fahrenheit temperature. The next column labeled Difference is the difference or offset of the As Found to the Reference.

The column labeled As Left is the transmitters output after any corrections are made to the transmitter. This is how the equipment is sent to you. If the output is a 4 to 20mA current loop, the output is changed to the units of the parameter being measured, in this case Fahrenheit temperature. The next column labeled Difference is the difference or offset of the As Left to the Reference. This last Difference column is the offset you should use in your controller to correct the temperature.

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

The last section (shown above) notifies you that all instruments used to certify the equipment are properly calibrated and traceable to NIST.

Additional information on specific Temperature, Pressure and Humidity Certification documents is found on the following three pages.

If you have any questions about the certification documents, please contact your BAPI representative.

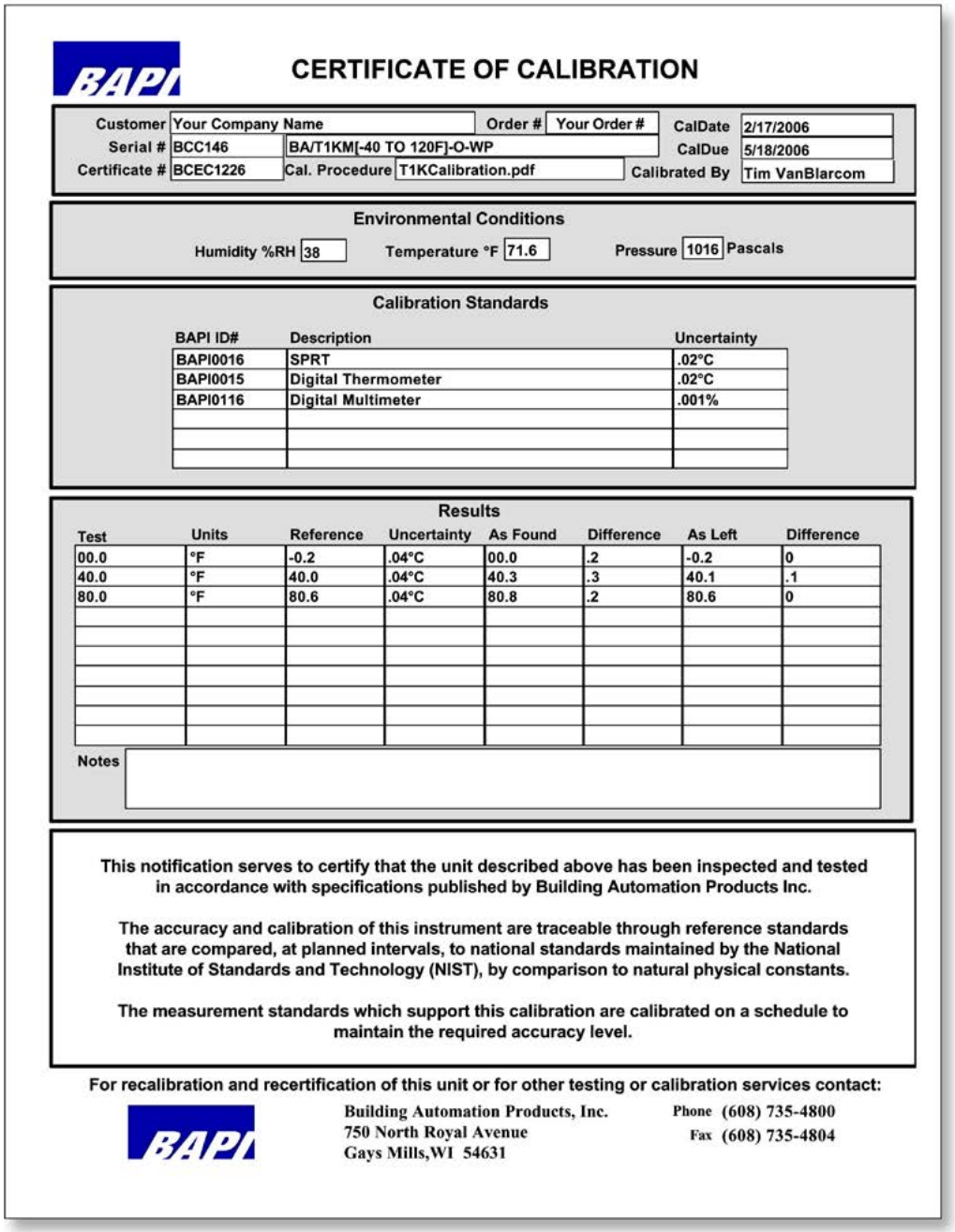
Temperature Transmitter Certification

BAPI Application Notes

Shown below is an NIST Traceable Certificate of Calibration for a recent T1K order.

Each transmitter is calibrated for its range using precision resistors. A Class A RTD is given a unique serial number and attached to the transmitter. The RTD is subjected to each temperature certification point and the temperature transmitter's output is recorded at each point. BAPI normally tests at 25%, 50% and 75% of temperature span. BAPI will test at any temperature that you specify. BAPI can generate and certify temperatures between -45°C and 150°C.

If you require the temperature transmitter to be certified at more than the three standard temperatures, please contact your BAPI representative for pricing. If you have any questions about the certification document, please contact your BAPI representative.



CERTIFICATE OF CALIBRATION

Customer	Your Company Name	Order #	Your Order #	CalDate	2/17/2006
Serial #	BCC146	BA/T1KM[-40 TO 120F]-O-WP		CalDue	5/18/2006
Certificate #	BCEC1226	Cal. Procedure	T1KCalibration.pdf	Calibrated By	Tim VanBlarcom

Environmental Conditions

Humidity %RH 38 Temperature °F 71.6 Pressure 1016 Pascals

Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0016	SPRT	.02°C
BAPI0015	Digital Thermometer	.02°C
BAPI0116	Digital Multimeter	.001%

Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
00.0	°F	-0.2	.04°C	00.0	.2	-0.2	0
40.0	°F	40.0	.04°C	40.3	.3	40.1	.1
80.0	°F	80.6	.04°C	80.8	.2	80.6	0

Notes

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

BAPI measures and records the output of every ZPS pressure transmitter at several points before we send them to our customers. For calibration, BAPI has a digital pressure controller that produces pressures accurate to ±0.0011 inches of water. When a customer requests an NIST Traceable Certificate of Calibration, the data for that specific sensor is collected from our calibration database. Because the data is kept in our calibration database, customers may request certifications at any time. Please provide the transmitter serial number for ease of retrieval. The figure below is actual data from an order. If you have any questions about the certification documents, please contact your BAPI representative.

CERTIFICATE OF CALIBRATION

Customer	Your Company Name	Order #	Your Order #	CalDate	2/17/2006
Serial #	BCC146	ZPS-20-SR07-NT-250-FMK		CalDue	5/18/2006
Certificate #	BCEC1226	Cal. Procedure	Test calibration filename	Calibrated By	Tim VanBlarcom

Environmental Conditions

Humidity %RH 38 Temperature °F 71.6 Pressure 1016 Pascals

Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0002	Digital Pressure Controller	0.0011" h2o
BAPI0119	Digital Multimeter	.001%
BAPI0018	Power supply	1%

Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
0 To .10	in W.C.	.070	.001%	.0697	-.0003	.0697	-.0003
-0.10 to 0.10	in W.C.	.070	.001%	.0698	-.0002	.0698	-.0002
-0.25 to 0.25	in W.C.	.070	.001%	.0704	.0004	.0704	.0004
0 to 0.25	in W.C.	.070	.001%	.0709	.0009	.0709	.0009
0 to 1.00	in W.C.	.50	.001%	.5007	.0007	.5007	.0007
-1.00 to 1.00	in W.C.	.50	.001%	.5011	.0011	.5011	.0011
-2.5 to 2.5	in W.C.	2.00	.001%	2.0115	.0115	2.0115	.0115
0 to 2.50	in W.C.	2.00	.001%	2.0070	.007	2.0070	.007
0 to 5.00	in W.C.	2.00	.001%	2.0065	.0065	2.0065	.0065
-5.00 to 5.00	in W.C.	2.00	.001%	2.0220	.022	2.0220	.022

Notes

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The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

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Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

Humidity Transmitter Certification (Non-Room)

BAPI Application Notes

Rev. 06/11/19

BAPI's standard product accuracy for Duct and Outside Air Humidity units is either ±2.0% or ±3.0% relative humidity. BAPI can provide a NIST Traceable Certificate of Calibration for each transmitter assembly as shown in the figure below. Each certified sensor/ transmitter pair has a unique certification and BAPI retains certification data for future reference.

Each sensor is placed into a precision humidity chamber that can hold a relative humidity condition to within ±0.5%RH. The humidity transmitter's output is recorded at each humidity certification point. BAPI normally tests at 25%, 50% and 75% relative humidity at 23°C (73°F). BAPI's humidity chamber has temperature test limits of 10 to 60°C (50 to 140°F) and humidity test limits of 15%RH to 85%RH. BAPI will test at any relative humidity and temperature that you specify within the humidity chambers capability.

If you require the humidity reading to be certified at more than one temperature, please contact your BAPI representative for pricing. Please allow additional lead time when ordering certified units. If you have any questions about the certification documents, please contact your BAPI representative.

CERTIFICATE OF CALIBRATION

Customer	Your Company Name	P.O.	Your P.O. #	Order #	Your Order #
Serial #	994459	BA/H200-D-BB		CalDate	6MAY2019
Certificate	BCEC69122	Cal. Procedure	CA0052	CalDue	No Recal
				Calibrated By	Tim Van Blarcom

Environmental Conditions

Humidity %RH 38% Temperature °F 74 Pressure 1016 Pascals

Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0003	Environmental Chamber	0.5%RH 0.1°C

Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
25%	%RH	25%	0.5000	23.92	1.08	23.92	1.08
50%	%RH	50%	0.5000	49.75	0.25	49.75	0.25
75%	%RH	75%	0.5000	74.30	0.70	74.30	0.70

Notes

Cal Tech:_____ Date: _____

Certified By: _____ Date: _____

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

Humidity Transmitter Certification (Room Units)

BAPI's standard product accuracy for Humidity Room Sensors is ±2.0%. BAPI can provide a NIST Traceable Certificate of Calibration for each sensor assembly as shown in the figure below. Each certified sensor has a unique certification and BAPI retains certification data for future reference.

Each sensor is placed into a precision humidity chamber that can hold a relative humidity condition to within ±0.5%RH. The humidity sensors output is recorded at each humidity certification point. BAPI normally tests at 25%, 50% and 75% relative humidity at 25°C (77°F). BAPI's humidity chamber has temperature test limits of 10 to 60°C (50 to 140°F) and humidity test limits of 15%RH to 85%RH. BAPI will test at any relative humidity and temperature that you specify within the sensors operating range and humidity chambers capability.

If you require the humidity reading to be certified at more than one temperature, please contact your BAPI representative for pricing. Please allow additional lead time when ordering certified units. If you have any questions about the certification documents, please contact your BAPI representative.

CERTIFICATE OF CALIBRATION

Customer	Your Company Name	P.O.	Your P.O. #	Order #	Your Order #
Serial #	994459	BA/HQF-B-C-1-C80-J		CalDate	6MAY2019
Certificate	BCEC69122	Cal. Procedure	CA0052	CalDue	No Recal
				Calibrated By	Tim Van Blarcom

Environmental Conditions

Humidity %RH 38% Temperature °F 74 Pressure 1016 Pascals

Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0003	Environmental Chamber	0.5%RH 0.1°C

Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
25%	%RH	25%	0.5000	23.92	1.08	23.92	1.08
50%	%RH	50%	0.5000	49.75	0.25	49.75	0.25
75%	%RH	75%	0.5000	74.30	0.70	74.30	0.70

Notes

Cal Tech:_____ Date: _____

Certified By: _____ Date: _____

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

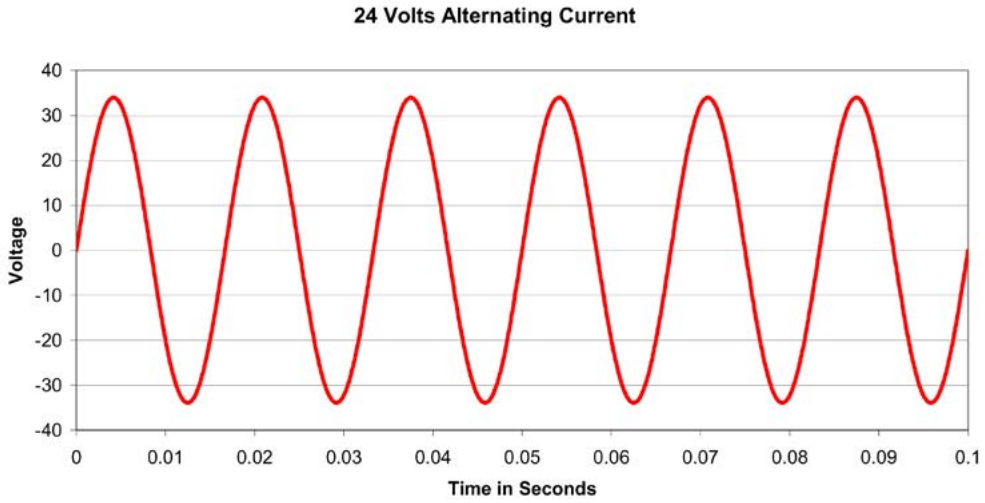
For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
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Phone (608) 735-4800
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24 VAC

If you were to connect an oscilloscope to the output of a 24 VAC transformer, you would see the waveform below.



The voltage starts at zero, climbs to a peak, returns to zero, falls to a negative peak and returns to zero; sixty times a second for 60Hz and 50 times a second for 50Hz.

HALF-WAVE POWER SUPPLY

Half-wave power supplies only take power from the AC line during the positive half of the AC waveform. Most controllers use half-wave power supplies.

BAPI's VC350A EZ and VC350A are half-wave power supplies. Half-wave power supplies may be powered from the same transformer that powers the controller if the controller has a half-wave power supply and the capacity of the transformer is not exceeded.

Transformers used in half-wave power supplies have one of their output leads connected to ground. When powering multiple half-wave power supplies from one transformer, be sure to check for proper transformer connections.

Since only half of the incoming AC is used, half-wave power supplies in 24 VAC systems can only source approximately 1.5 amps of DC maximum.

FULL-WAVE POWER SUPPLY

Full-wave power supplies take power during both halves of the AC waveform.

BAPI's PS17 and PS17CB are full-wave power supplies. The VC2700-STM and VC3000 are available as full-wave or half-wave (specified at time of order).

Transformers used in full-wave power supplies cannot have either of their output leads connected to ground. DO NOT try to power half-wave power supplies and full-wave power supplies from the same transformer. If you do, you will short out the transformer.

Half-wave and full-wave power supplies can coexist in the same control system but they must be powered by separate transformers.

Since both halves of the incoming AC are used, full-wave power supplies in 24 VAC systems can source approximately 3 amps of DC maximum.

If you need more information, please call your BAPI representative and ask for Application Note Understanding Full or Half Wave Power Supplies or find it online at www.bapihvac.com.

BAPI Commits to RoHS Compliance

Building Automation Products, Inc. (BAPI), a leading manufacturer of HVAC/R control system sensors and peripherals, is committed to environmentally responsible manufacturing practices. BAPI has been working since early 2005 to remove environmentally harmful materials from our products and we support the European Union's RoHS directive, which restricts the use of certain hazardous substances, such as lead and mercury, in electrical and electronic equipment.

Even though many manufacturers of HVAC/R monitoring and control equipment are claiming exemption from RoHS compliance, BAPI is developing its new products and revising current products to comply with the RoHS directive.

As of June 29, 2021, BAPI certifies that, to the best of our knowledge, product lines including Temperature, Humidity, Pressure, Air Quality, Wireless, ETA, and Accessories are compliant to the following EU Directives:

- RoHS 3 (EU Directive 2015/863) Restriction of the use of certain Hazardous Substances in electrical and electronic equipment;
- WEEE, Waste Electrical and Electronic Equipment, Directive 2002/96/EC

European Union's RoHS Directive

RoHS is the shorthand for the European Union's legislation, Reduction of Hazardous Substances in Electronics Manufacturing. The RoHS directive places restrictions on the use of six hazardous substances in electrical and electronic equipment. These substances are lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers.

The intent of RoHS is to reduce the amount of these hazardous substances which enter the waste stream where they can impact soils and groundwater. In general, the RoHS directive is aimed at consumer-level finished electronic products that have relatively short life spans and enter the waste stream at high rates. The directive does not target electrical and electronic equipment that is permanently mounted in a fixed installation inside a building, such as HVAC/R control system equipment. Such items have very long lives and are not disposed of in quantities that significantly impact the concentration of hazardous substances in the community waste stream. Therefore, many manufacturers of such equipment have claimed exemption from the RoHS directive. BAPI, however, has chosen to comply with the RoHS directive because of our commitment to environmentally responsible manufacturing practices.

Pressure Sensor Terms Defined

BAPI Application Notes

Rev. 10/16/12

Below is a list of Pressure Sensor Terms and their definitions:

1. **Burst pressure**
   Maximum pressure that may be applied to the sensor without rupture. No physical damage is allowed to the sensor, but it may need factory recalibration as it may strain the sensors internal mounting. BAPI's ZPS burst pressure is 10psi. To date, no ZPS unit has required factory recalibration when subjected to these pressures.
2. **Proof pressure**
   Maximum pressure that may be applied without changing the transducer performance beyond specified tolerances. BAPI's ZPS proof pressure is 5psi.
3. **Bidirectional**
   Takes the specified range and turns it into plus or minus of that range. The output signal is at the center of the range at zero pressure. The procedure used to turn the ZPS into a bidirectional unit is in the ZPS Installation and Operation document 13086_ins_zps_display.pdf available through your friendly BAPI representative.
4. **Auto Zero**
   Field calibration of the zero pressure output. The procedure used to auto zero the ZPS is in the ZPS Installation and Operation document 13086_ins_zps_display.pdf available through your friendly BAPI representative.
5. **Range**
   Specified endpoint pressures
6. **Span**
   Arithmetic difference between two pressure endpoints
7. **Sensitivity**
   Ratio of output signal change to a corresponding input pressure change
8. **Pressure**
   Force per unit area
9. **Velocity**
   Displacement per unit time
10. **Absolute Pressure**
    Pressure measured relative to a perfect vacuum
11. **Differential Pressure**
    Pressure difference measured between two pressure sources
12. **Gauge Pressure**
    Differential pressure between the local ambient pressure and another pressure source
13. **Static pressure**
    Pressure on the walls of a vessel at right angle to any flow. Static pressure is usually measured with a static pressure probe. ZPS/ACC07 or ZPS/ACC08
14. **Velocity pressure**
    Pressure caused by the momentum of moving air Velocity pressure is usually measured with a Pitot tube assembly. ZPS/ACC11 or ZPS/ACC12
15. **Total pressure**
    Arithmetic sum of static pressure and velocity pressure. Total pressure is usually measured with a total pressure tube.

If you have any additional questions, please contact your BAPI representative.

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BAPI Recommended Wire Lengths

Recommended wire lengths for various power loads

When an electric current flows through a wire there is a drop in voltage due to the resistance of the wire. The voltage drop is found from Ohm's Law: ***E=IR***, or ***Voltage Drop = Wire Resistance x Amps of Current***.

The wire length recommendations below represent a 10% voltage drop in a 24 VAC or VDC circuit for various wire gauges and maximum currents. The voltage drop is linear, therefore cutting the wire length in half would result in a 5% voltage drop rather than a 10% voltage drop. The currents in the two tables represent the various models of power supplies and voltage converters available from BAPI.

Wire length recommendations in Table 1 are based on a wire temperature of 70 ºF. If the wire is run in a portion of the building where temperatures can increase to 140 ºF, such as an unventilated attic, then decrease the recommended wire length by 5%, as shown in Table 2.

The minimum wire gauge is determined by the maximum worst-case load. When in doubt, use the next larger size wire. All wiring must comply with the National Electric Code (NEC) and local codes.

Table 1: Recommended wire lengths at 70 ºF and below (10% maximum drop in voltage)

Wire gauge	Ω/1000 ft (305 M) @ 70ºF	Distance @ 75 mA	Distance @ 100 mA	Distance @ 350 mA	Distance @ 1.5 Amp	Distance @ 3 Amps
22	16.8	1905 ft (581 M)	1429 ft (435 M)	408 ft (124 M)	95 ft (29 M)	48 ft (15 M)
20	10.5	3048 ft (929 M)	2286 ft (697 M)	653 ft (199 M)	152 ft (46 M)	76 ft (23 M)
18	6.6	4848 ft (1478 M)	3636 ft (1109 M)	1039 ft (317 M)	242 ft (74 M)	121 ft (37 M)
16	4.2	7619 ft (2322 M)	5714 ft (1742 M)	1633 ft (498 M)	381 ft (116 M)	190 ft (58 M)

Table 2: Recommended wire lengths above 70 ºF (10% maximum drop in voltage)

Wire gauge	Ω/1000 ft (305 M) @ 70ºF	Distance @ 75 mA	Distance @ 100 mA	Distance @ 350 mA	Distance @ 1.5 Amp	Distance @ 3 Amps
22	16.8	1810 ft (522 M)	1357 ft (414 M)	388 ft (118 M)	90 ft (27 M)	45 ft (14 M)
20	10.5	2895 ft (882 M)	2171 ft (662 M)	620 ft (189 M)	145 ft (44 M)	72 ft (22 M)
18	6.6	4606 ft (1404 M)	3455 ft (1053 M)	987 ft (301 M)	230 ft (70 M)	115 ft (35 M)
16	4.2	7238 ft (2206 M)	5429 ft (1655 M)	1551 ft (473 M)	362 ft (110 M)	181 ft (55 M)

If you have any additional questions, please contact your BAPI representative.

J20

Mounting Outdoor Sensors

BAPI Application Notes

Rev. 09/23/20

The physical placement of BAPI outdoor temperature and humidity sensors depends on its application.

If the outside air is being used for economizing, the sensor should be placed close to the economizer damper without being in the air draft. If the economizer damper is on the roof, the sensor should be on the roof. If the economizer damper comes through the building wall, the sensor should be on the wall. If you want meteorological data, showing building occupants the outdoor weather conditions, mount the sensor on the side of building.

Place the sensor in a location where it does not receive direct sunlight because this can cause solar heat gain and affect readings. BAPI's tests show that readings can be affected by as much as 30% from solar heat gain. In far northern or southern latitudes, be aware that at sunrise or sunset the sun can illuminate all sides of a building.

The BAPI Weather Shade effectively reduces the solar heat gain, improving the accuracy of outdoor sensors. The shape of the cone and spacing from the wall creates a chimney which draws radiant heat from solar gain away from the sensor. The "domed" top also prevents bird nesting while the smooth surface minimizes hosting of insects. On humidity sensors, the Weather Shade also protects the probe filter from precipitation and grit, extending the life of the filter.

When mounting the sensor, drill the mounting holes as shown in the sensor's installation instructions. The best practice is to mount the unit with the sensor probes pointing down at a minimum of four feet above the ground or roof. Four feet isolates the sensor from any water puddles that would cause erroneous readings.

Water is the enemy of building materials and electrical connections. Carefully seal everything to get a good watertight seal. Be sure to seal the box plugs, conduit and conduit fittings.

Attach the sensor with the mounting hardware provided. **DO NOT** drill through the back of weatherproof boxes. Holes destroy the integrity of the box and may void the warranty.

Route the wires into the box and terminate with sealant filled connectors. BAPI's sealant filled connectors prevent water from attacking the connection, thereby preventing costly callbacks. The best practice is to seal the wiring hole after the wires are installed.

If you need any help mounting BAPI products or have any additional questions, please call your BAPI representative.

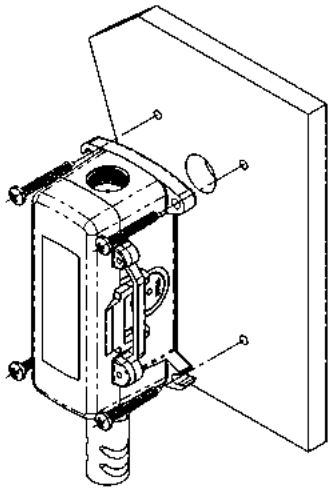


Fig. 1: The BAPI-Box 2 enclosure outside mounting. The probe and shield should be pointing downward.

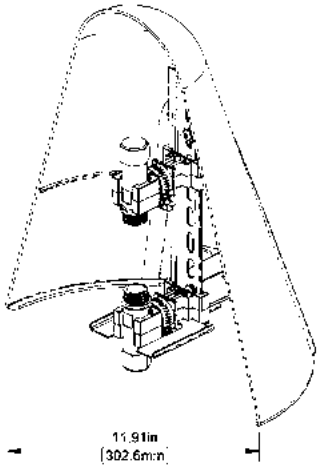


Fig. 2: Weather Shade Kit.

References

http://weather.gov/om/coop/standards.htm

The State Climatologist (1985) Publication of the American Association of State Climatologists: Heights and Exposure Standards for Sensors on Automated Weather Stations, v. 9, No. 4 October, 1985.

EPA (1987). On-Site Meteorological Program Guidance for Regulatory Modeling Applications, EPA-450/4-87-013. Office of Air Quality Planning and Standards, Research Triangle Parks, North Carolina 27711.

WMO (1983). Guide to Meteorological Instruments and Methods of Observation. World Meteorological Organization No. 8, 5th edition, Geneva Switzerland.

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When thermowells are too big to fit into small pipes, you can still measure water temperature by strapping a small, wired temperature probe to the pipe. BAPI recommends using the remote probe with FEP jacketed cable because of its moisture resistance and because of the higher temperatures encountered in this application.

There are two ways to mount the sensor to the pipe.

Figure 1 shows the probe strapped to the pipe with cable ties. Hose clamps may be used too.

Make sure the probe is securely touching the pipe before clipping the ends off the cable ties. Secure the sensor lead to the pipe for strain relief. Wrap insulation a minimum of 1/2 inch thick around the probe and 4 inches to either side of it. Polyester quilt batting, purchased at a craft store, makes a good insulation that won't make your skin itch. Preformed, molded rubber or fiberglass pipe insulation works well too. Spray foam insulation is another alternative. Any standard insulation material may be used. If necessary, protect the insulation with an over-wrap of tape.

Using BAPI's Foamback Insulator (as shown in Figure 2 below) is another easy way to mount and insulate the probe. The Foamback Insulator is made from medical grade, closed cell foam, insuring that the probe is reading the pipe temperature, not the room temperature.

Clean and dry the pipe. Peel off the protective cover from the foamback's adhesive side and stick the probe to the adhesive. Stick the foamback/probe assembly to the pipe. Add cable ties or hose clamps to ensure that the sensor always stays attached to the pipe, avoiding costly callbacks.

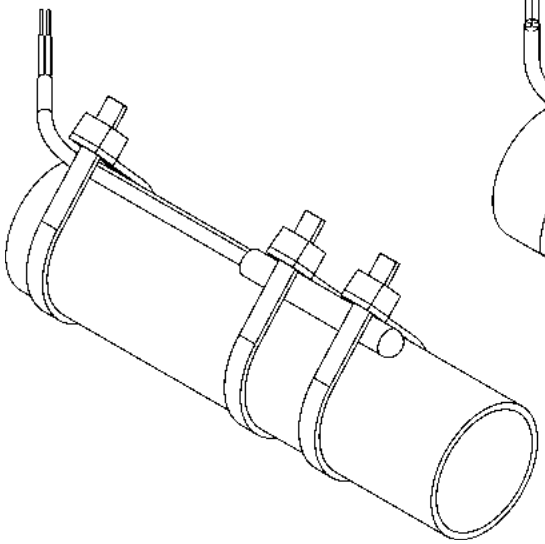


Figure 1: Remote probe with FEP jacketed cable strapped directly to pipe.

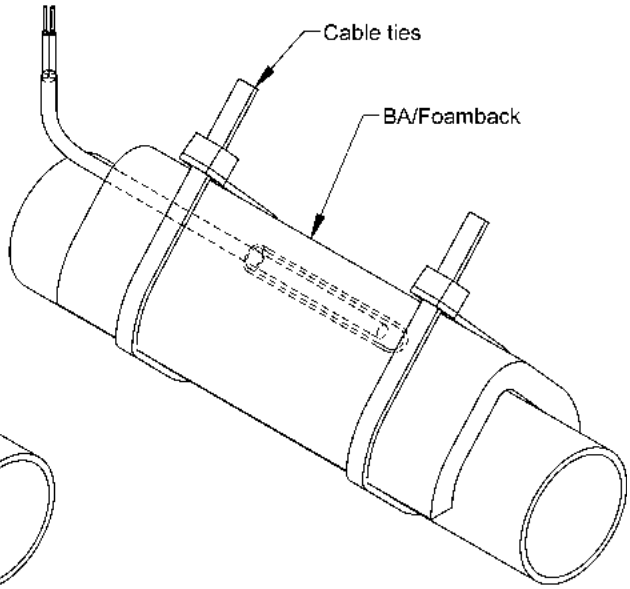


Figure 2: Remote probe with FEP jacketed cable applied beneath a FOAMBACK insulator.

Note: 1.25 inch diameter pipe shown, this technique may be used for any diameter pipe.

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Building Automation Products, Inc. (BAPI) sells its products under the following terms and conditions. Any different or additional terms must be specifically agreed to in writing prior to any sale.

Ordering

To place an order, contact an authorized BAPI distributor or contact BAPI directly by phone or email. You can also order products from our website/webstore at www.bapihvac.com. There is no minimum order amount.

Please be sure the purchase order contains the following information:

- Purchase Order number
- Bill and Ship to address
- Customer name, contact person & telephone number
- Quantity & unit price
- Part number
- Desired ship date
- Desired ship method*

*Available selection of carrier is dependent on shipping location and stated service preference.

Upon receipt of your order, BAPI will email a confirmation of the order, including current pricing, estimated ship date and assigned Order Number. Please refer to this order number in further communications regarding this order. The confirmation will be emailed to the predetermined contact specified when the customer account was created.

INTERNATIONAL ORDERS

International shipments may be subject to additional handling, export documentation and shipping charges, as well as any appropriate duties, taxes or fees. If you deal through a Customs Broker, please provide BAPI with the Broker's name, address, telephone number and a copy of their import documents so we may process your order as quickly as possible. Terms of payment are prepaid in US dollars by Electronic Funds Transfer to our bank or your bank check in US dollars unless an "Open Account" has been established. See Payment Terms in this section for more information.

DELIVERY

Promises of delivery from stock are subject to prior sale. Delivery dates are not guaranteed, but are estimated on the basis of BAPI's immediate receipt of all needed information supplied by the customer. We will, in good faith, attempt to meet estimated delivery dates, but BAPI does not accept responsibility for delays resulting from circumstances beyond our reasonable control.

BACK ORDERS

BAPI ships complete orders whenever possible to keep freight charges to a minimum. In the event that an order cannot be completely filled as scheduled, BAPI will contact the customer with information regarding the delay and advise a new ship date whenever possible. At that time a customer may elect to accept a partial shipment. Back orders will be shipped as soon as possible.

FREIGHT

Customer is responsible for all shipping charges billed on each invoice. Any discrepancies in shipments must be brought to the attention of our Sales Department within ten (10) working days of receipt of shipment. Deductions from remittances will not be allowed unless authorized by BAPI in writing. Please notify BAPI of Goods Damaged in Transit within 5 business days of receipt. Also, take photos upon receipt for proper case documentation. DO NOT return the

Continued on next page...

Terms & Conditions

Ordering continued...

shipment to BAPI.

PARCEL INSURANCE

All packages ship FOB ORIGIN from BAPI. Insurance can be added to any package at the buyers expense. Insurance will need to be denoted on the purchase order in order to be added. All charges will be billed at BAPI's negotiated rate and added to the final invoice for payment.

Domestic Shipping Terms & Conditions

BAPI offers ground and expedited shipping options on orders being shipped within the contiguous United States as well as orders to Hawaii, Alaska, Guam and Puerto Rico. We ship at a discounted shipping rate that will be added to the invoice. There will be a $15 minimum for all orders. BAPI will not bill third party or bill the recipient on a customer's shipping account for domestic shipments. International customers shipping to a freight forwarder within the contiguous United States will qualify for BAPI's discounted shipping rate. Any required additional expedited costs will be added to the invoice. Customers may request a preference for one of BAPI's three preferred carriers: UPS, Fed Ex, or SpeeDee. Customers who provide invalid addresses will have additional charges added to their invoice. BAPI's shipping policy is subject to change without notice.

International Shipping Terms & Conditions

International shipping and expedited charges will be at a discounted International shipping rate. International customers whose product ships directly to their location may request to have shipping costs billed to their respective shipping account. International customers shipping to a freight forwarder within the contiguous United States will qualify for a discounted shipping rate.

Payment Terms

NEW ACCOUNTS

Payment terms are prepaid unless an open account is established. A credit application must be submitted for open account consideration. (Please allow up to two weeks for credit approval.)

OPEN ACCOUNTS

Terms are Net 30 days for open accounts.

- To ensure proper credit to your account, the invoice number must appear on your check stub
- Accounts with balances beyond 60 days from the invoice date will be subject to credit hold until the account is brought within 45 days from the invoice date.

In the event that it becomes necessary for BAPI to take legal action to enforce the provisions of this agreement or to obtain redress for the breach of any provision hereof, the buyer shall pay the costs of such action, including reasonable attorney fees. All legal proceedings that arise in any way related to this agreement shall be conducted in a court of competent jurisdiction in Crawford County, Wisconsin.

Pricing

Price of goods sold is that in effect at the time of sale. Contact BAPI Sales for current pricing and discount information. All prices are subject to change without notice and exclude any taxes, shipping and handling charges. BAPI will be pleased to furnish written quotations by email or mail upon request. Quoted prices and conditions are valid until the expiration date on the formal written quote.

Returns

Only new and unused products are considered for credit. All returns must have a BAPI Return Material Authorization (RMA) number. Debit memos will not be accepted without written authorization and an RMA number. Returns resulting from errors by BAPI will not be subject to a restock fee. Any items specified as Non-Cancellable/Non-Returnable (NCNR) are not returnable for credit. Restock fees will be applied as follows:

- Stock items returned within 30 days from the original ship date will not be subject to a restock fee.
- Stock items returned 31 to 180 days from the ship date will be subject to a 25% restock fee.
- Non-stock items are subject to 20% restock fee if returned within 30 days from the original ship date.
- Non-stock items returned 31 to 180 days from shipment will be subject to a 25% restock fee.
- No items will be accepted for return after 180 days.

Warranty

BAPI warrants its products to be free from defects in materials and workmanship, subject to the following terms and conditions. Without charge, BAPI will repair or replace products found to be defective in materials or workmanship within the warranty period and also provide a product credit* to offset the incurred costs to repair or replace them with BAPI products; provided that:

a. The product has not been subjected to abuse, neglect, accident, incorrect wiring, improper installation or servicing, or used in violation of instructions furnished by BAPI;

b. The product has not been repaired or altered by anyone except BAPI or its authorized service agencies;

c. The serial number or date code has not been removed, defaced, or otherwise changed;

d. Examination discloses, in the judgment of BAPI, the defect in materials or workmanship which developed under normal installation, use and service;

e. BAPI is notified in advance and the product is returned with a valid RMA number, transportation prepaid.

Unless otherwise specified or agreed to in writing signed by a BAPI officer, BAPI products shall be warranted for five years from the date of sale with clauses “a” through “e” above still applicable**. In addition, there is a lifetime limited warranty on all single point non-room temperature sensors and some room temperature sensors including: Wall Plates, Low Profile, Quantum Slim and the Quantum No Display sensors. Batteries are not covered under warranty.

BAPI will pay the freight for all units being returned to the customer where a defect was found. In the case that no defect was found with the units received, or the defect was determined to be caused by customer error or abuse, the customer will be responsible for the payment of the shipping charge to return the units. The customer will need to supply a FED-EX of UPS account number for shipping charges if units are to be returned. Purchase orders will not be accepted for return shipping. In cases where units are repairable but not covered under BAPI’s warranty, customers may elect to have BAPI repair the unit.

The foregoing warranty is in lieu of all warranties, express, implied or statutory, including but not limited to, any implied warranty of merchantability for a particular purpose. BAPI’s liability for

Continued on next page...

Warranty continued...

breach of warranty is limited to repair or replacement. If the goods cannot be replaced, warranty is limited to a refund of the purchase price. In no instance shall BAPI be liable for incidental or consequential damages arising from a breach of warranty or from the use or installation of its products. Under no circumstance does BAPI agree to provide a product credit to repair or replace our product without prior specific written authorization.

No representative or person is authorized to give any warranty other than as set out above or to assume for BAPI any other liability in connection with the sale of its products.

This warranty is limited to the original customer only. It cannot be transferred or assigned to third parties unless the intent to transfer to a third party is expressly indicated in a purchase order and/or warranty processing arrangements have been agreed upon in writing by BAPI.

***Product Credit**

BAPI Backed product credits beyond the repair or replacement of the failed product are issued in the form of a product credit only[1]. Requests for BAPI Backed product credits must be submitted to BAPI in writing. Under no circumstance does BAPI agree to provide a product credit associated with the repair or replacement of our products without prior specific written authorization from a BAPI officer[2]. BAPI reserves the right to refute or refuse BAPI Backed product credits that do not meet the specified terms and conditions. Please contact BAPI for further details and requirements.

[1]Product credits may vary depending on product type and quantity.

[2]BAPI may refute or refuse product credit requests when it relates to a component vendor issue.

****Warranties**

Recommended product calibration intervals are excluded from the warranty period. Devices that are used frequently or in non-standard environments may require more frequent calibration than what is recommended by BAPI.

Blü-Test rechargeable battery life is excluded from the warranty period. The battery in the Blü-Test products are rated to be recharged 300 times before performance degrades. Batteries can be replaced via BAPI's Blü-Test refurbishment service.

Design and Specifications

BAPI reserves the right to make changes in the design, specifications, and/or support documentation of any product as technological advances or necessity requires without notification. Please contact BAPI for updated product information.

Information in our descriptive literature is based on product specifications that are current at the time of publication. Product specifications, designs and descriptive literature are subject to change as improvements are introduced. Although we announce changes as they occur, we cannot guarantee notification to every customer. BAPI warrants delivered product to conform to the most current specifications, designs and descriptive literature.

Custom Products

In many cases, BAPI products can be modified to meet your custom requirements. Additional charges and longer lead times may apply. Contact your salesperson for a quote on your special requirements.

NIST Traceable Certificates of Accuracy & Calibration

BAPI offers NIST Traceable Certificates of Accuracy & Calibration for its temperature, humidity and pressure products.

Part Number	Net Price
CERT-HUM-AMBIENT	**$20.00**

NIST Traceable Certification of Accuracy for Humidity at Ambient – Price includes one point.

CERT-HUM-SPEC **$50.00**
NIST Traceable Certification of Calibration for Humidity at Specific Points (Customer Specified) – Price includes one, two or three humidity points at one temperature.

CERT-TEMP-AMBIENT **$20.00**
NIST Traceable Certification of Accuracy for Temperature Sensor at Ambient – Price includes one point.

CERT-TEMP-SPEC **$50.00**
NIST Traceable Certification of Calibration for Temperature Sensor at Specific Points (Customer Specified) – Price includes one, two or three points.

CERT-PRESS-SR ..... **No Additional Charge**
NIST Traceable Certification of Accuracy for Pressure – All Standard Ranges verified at one point.

CERT-PRESS-SPECIFIC **$50.00**
NIST Traceable Certification of Calibration for Pressure at Specific Points (Customer Specified) – Price includes one, two or three points.

CAL-420CO-AMBIENT **$50.00**
Calibration of BAPI's Carbon Monoxide Sensor (BA/420CO) at ambient temperature.

All prices are **NET**. Multipliers do not apply to certificate pricing. For information on special requests and pricing on Certificates with more than three points, please call your BAPI Key Account Specialist.

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