

BUILDING AUTOMATION PRODUCTS INC.

2023 FULL CATALOG



TEST INSTRUMENTS



TEMPERATURE



HUMIDITY



PRESSURE



AIR QUALITY



WIRELESS



ACCESSORIES



ETA



Changing the way you think about sensors...



Rev. 01/22/21

BAPI-BACKED Confidence



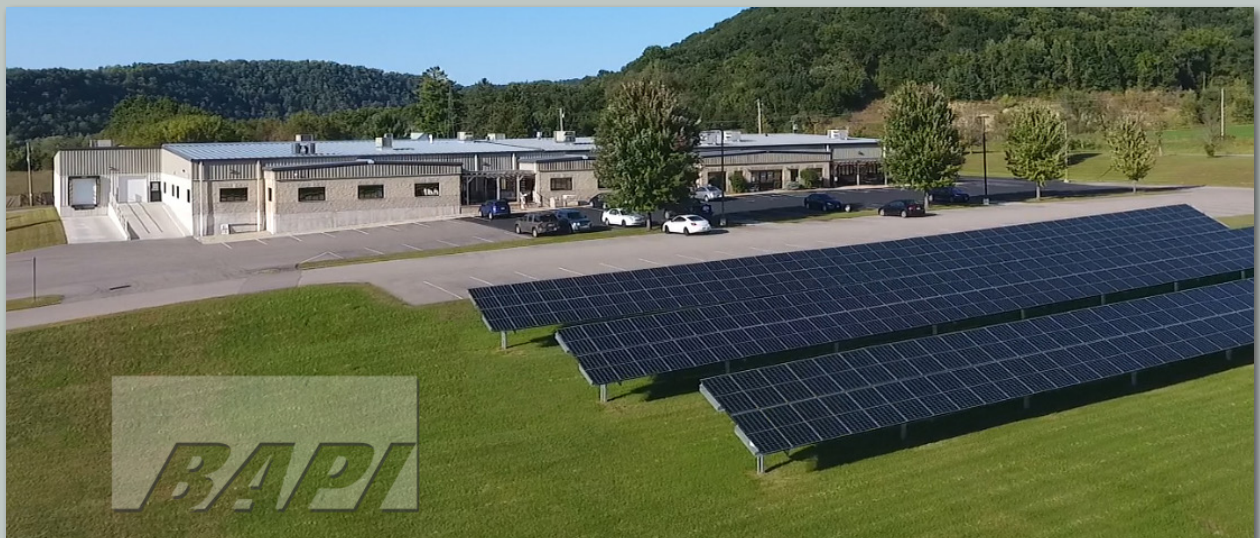
Most sensor manufacturers will replace their defective products, but only BAPI has the confidence to go beyond the industry standard.

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/



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We make it easy for you.



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



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.



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.

The BAPI Difference

Changing the way you think about sensors ...



- 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.



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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.

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-Guard Video

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.





NIST Traceable Test Instruments - pgs A2-A3

BUILDING AUTOMATION PRODUCTS INC.



NIST-traceable test instruments for temp, %RH and air pressure. Data-logging with wireless smart device communication.



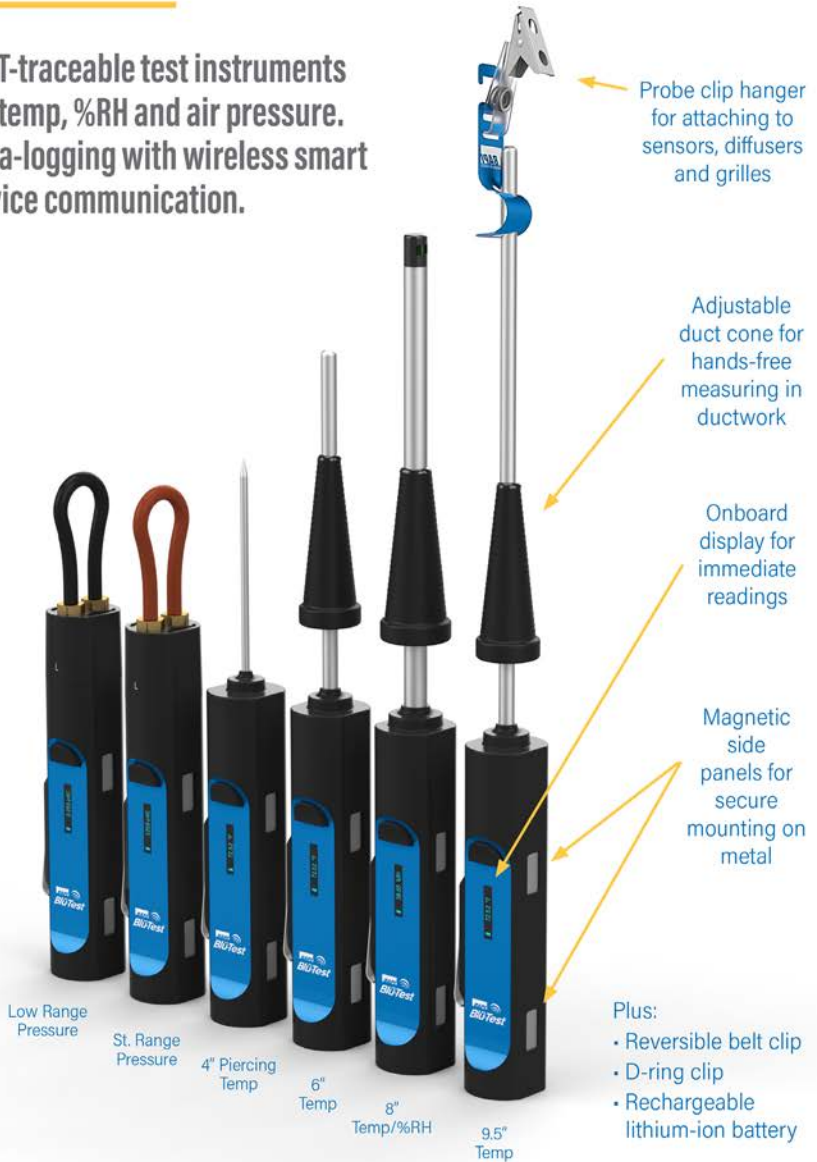
Handy App with trending and other features



Each probe stores up to a million readings!



Probes are sold individually or as a suite with carrying case.



Low Range Pressure

St. Range Pressure

4" Piercing Temp

6" Temp

8" Temp/%RH

9.5" Temp

- Plus:
- Reversible belt clip
 - D-ring clip
 - Rechargeable lithium-ion battery



Sensors for HVAC/R
Building Automation Products, Inc.
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website www.bapihvac.com

Give us a call or visit our website to find out why Blu-Test is the next generation of test instrument!

"Changing the way you think about ~~sensors~~ test instruments..."





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 Suite of Testing Probes

(3 probes on the right are shown with Duct Cone for measuring in a duct.)



Blü-Test App Screens



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**





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.



Google Play and the Google Play logo are trademarks of Google LLC. Apple and the Apple logo are trademarks of Apple Inc., registered in the U.S. and other countries and regions. App Store is a service mark of Apple Inc.

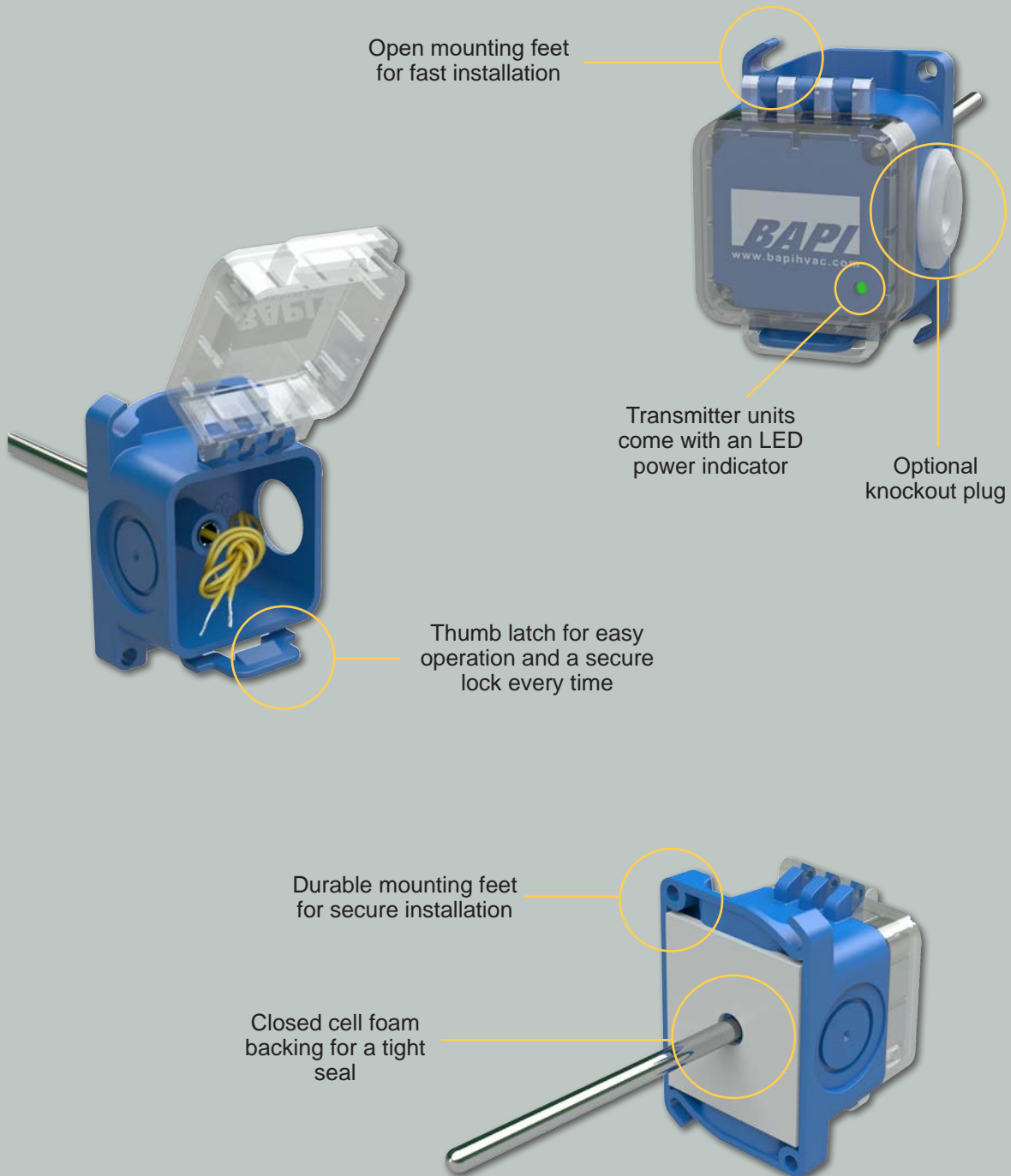
*NIST is the National Institute of Standards and Technology
**NSF is the National Sanitation Foundation



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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" of Room Sensors

The Latest Sensor Innovation from BAPI



"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 LCD

Large Display with Temp Setpoint



pg B10

RuP Sensors

Display & Temp Setpoint



pg B12

BAPI-Stat 3

for Operating Rooms



pg B14

"X-Combo"

Temp & Humidity Setpoint



pg B15

Room Units w/o LCD



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

w/ optional Override



pg B26





BAPI Non-Room Temperature Sensors

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



02/28/23

BAPI Enclosures Overview

B3

Temperature Sensors

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

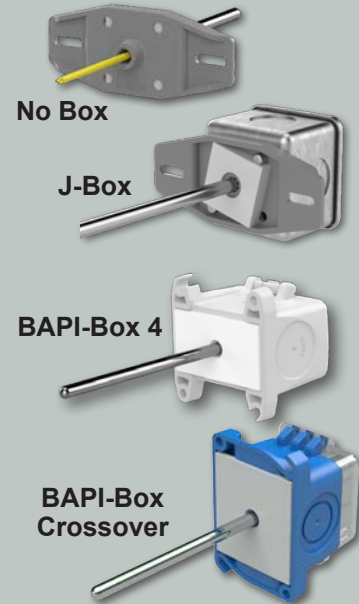
The Junction Box is made of galvanized steel with an IP20 and NEMA 1 rating. It includes a plastic mounting bracket and foam gasket.

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

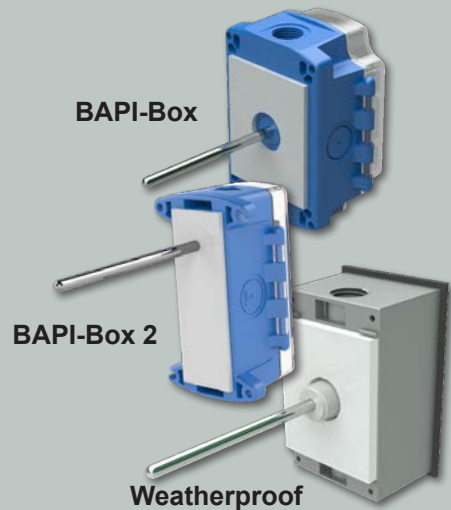
BAPI-Box and BAPI-Box 2 Enclosures

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	\$0	\$12
Rating	N/A	NEMA 4X, IP66	NEMA 4X, IP66	IP10 (IP44 w/ knockout plug installed)	IP10 (IP44 with knockout plug installed)	NEMA 1, IP20	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 Transmitters	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 2.06" (72 x 71.4 x 52.3mm)	3.1 x 2.2 x 1.9" (79 x 56 x 49mm)	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

**Not Watertight. May require a weep hole to be drilled in box to drain water.



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.



**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)

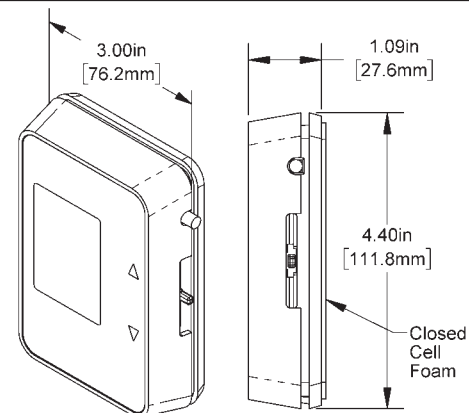
Environmental Operation Range:

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

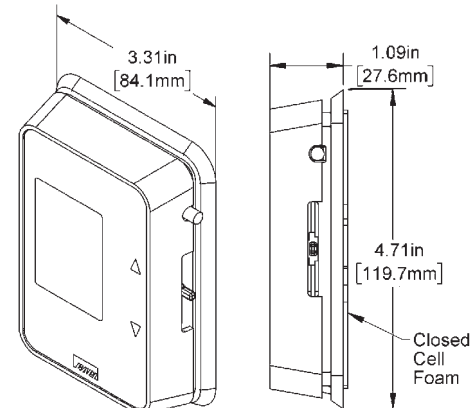
Enclosure Material: ABS Plastic, UL94 V-0

Agency: 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)





BAPI-Stat "Quantum" with Display

B5

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 5 V
10 0 to 10 V
40 0 to 1 KΩ
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

#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.

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/





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.

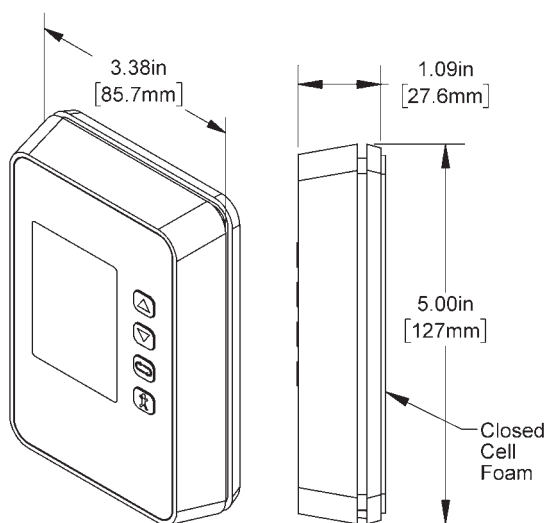
A 60mm mounting base is also available to fit European style junction boxes.



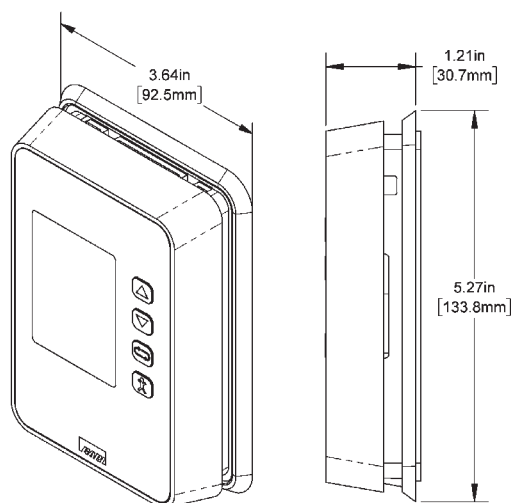
**BAPI-Stat
"Quantum
Prime" Temp
& Humidity
Sensor**

(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)



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:

- 60 mA max DC 4 to 20 mA Output (<30mA typical)
- 36 mA max DC 0 to 5 or 0 to 10 VDC Outputs (6mA typical)
- 0.9 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 122°F (0 to 50°C)
- 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: 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.

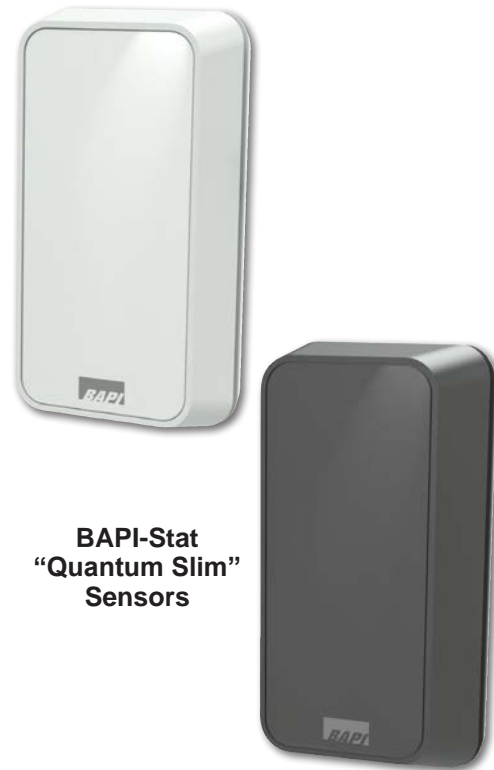


Features & Options

- 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:

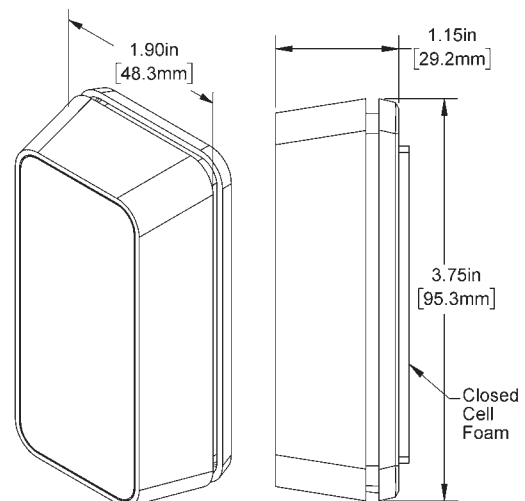
Thermistor or RTD (See Sensors Sect. for Specs.)

Environmental Operation Range:

Temperature: 32 to 122 °F (0 to 50 °C)

Humidity: 0 to 95%, non-condensing

Agency: RoHS, CE





BAPI-Stat “Quantum Slim” Sensor

Ordering Information

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/QS-W-A.....	White BAPI-Stat “Quantum Slim” with 1K Platinum RTD (385 curve).....	\$32
BA/QS-W-B	White BAPI-Stat “Quantum Slim” with 10K-2 Thermistor	\$25
BA/QS-W-C	White BAPI-Stat “Quantum Slim” with 10K-3 Thermistor	\$25
BA/QS-W-D	White BAPI-Stat “Quantum Slim” with 10K-3[11K] Thermistor.....	\$25
BA/QS-W-E	White BAPI-Stat “Quantum Slim” with 20K Thermistor	\$25
BA/QS-W-F.....	White BAPI-Stat “Quantum Slim” with 1.8K Thermistor	\$25
BA/QS-W-G	White BAPI-Stat “Quantum Slim” with 1K Ω Nickel RTD	\$72
BA/QS-W-H	White BAPI-Stat “Quantum Slim” with 3K Thermistor	\$25
BA/QS-W-V	White BAPI-Stat “Quantum Slim” with 10K-4 Thermistor	\$25
BA/QS-B-A.....	Black BAPI-Stat “Quantum Slim” with 1K Platinum RTD (385 curve).....	\$37
BA/QS-B-B	Black BAPI-Stat “Quantum Slim” with 10K-2 Thermistor	\$30
BA/QS-B-C	Black BAPI-Stat “Quantum Slim” with 10K-3 Thermistor	\$30
BA/QS-B-D	Black BAPI-Stat “Quantum Slim” with 10K-3[11K] Thermistor	\$30
BA/QS-B-E	Black BAPI-Stat “Quantum Slim” with 20K Thermistor	\$30
BA/QS-B-F.....	Black BAPI-Stat “Quantum Slim” with 1.8K Thermistor	\$30
BA/QS-B-G	Black BAPI-Stat “Quantum Slim” with 1K Ω Nickel RTD.....	\$77
BA/QS-B-H	Black BAPI-Stat “Quantum Slim” with 3K Thermistor	\$30
BA/QS-B-V	Black BAPI-Stat “Quantum Slim” with 10K-4 Thermistor	\$30





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

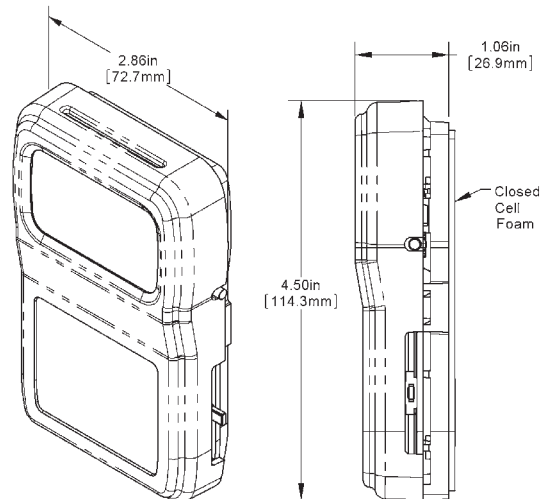
Mounting:

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.





BAPI-Stat 4™ Room Unit with Display

B11

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. 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...\$125
BS4S BAPI-Stat 4, Slider Setpoint.....\$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

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.

List Price: \$125 (BAPI-Stat 4M) + \$10 (Comm. Jack) = \$135 List Price

Your Number: BA/





Features & Options

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

The R μ P and R μ PS units come in the popular Delta Style Enclosure with LCD. They provides local indication of temperature with pushbutton or slider Setpoint Adjustment and optional Override with LED and Communications Jack.

This unit is also available with Fan Speed and Mode Control for applications with Fan Coils, Heat Pumps or Unit Ventilators.



R μ P (above)
and R μ PS
(right)

Specifications

Power R μ P:

7 to 35 VDC (15 to 24 VDC recommended)
12 to 30 VAC (requires a separate pair of shielded wires)

Power R μ PS:

9 to 40 VDC (15 to 24 VDC recommended)
15 to 28 VAC (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:

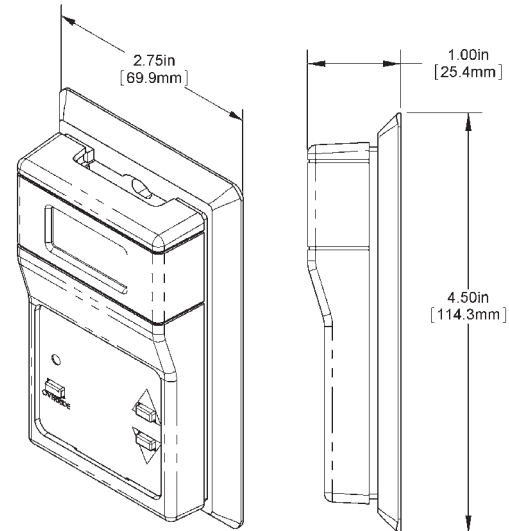
Standard 2"x4" J-box or drywall mount (screws provided)

Environmental Operation Range:

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

Enclosure Material & Rating:

ABS Plastic, UL94 HB



*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

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.





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.



RuP & RuPS Option Selection Guide:

BA/ (#1) - (#2) - (#3) (#4) - (#5) - (#6) - (24) - (#8) - (#9) - (CG)

#1: Room Sensor Style (required)

RuP..... Pushbutton Setpoint..... \$125

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: Setpoint Lockout

(required for RuP Units, not available for RuPS)

NL No Setpoint Lockout

SL Setpoint Lockout Enabled

#10: Common Ground Config. (required)

CG Common Ground

#11: Enclosure Color (required)

BW Bright White

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/ (RuP) - (F) - (E) (80) - (N) - (C35L) - (24) - (102) - (NL) - (CG) - (BW)

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

Description: RuP Unit 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, No Setpoint Lockout, Common Ground Config., Bright White Enclosure Color

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

Your Number: BA/





Features & Options

- Designed for Operating Rooms and Clean Rooms
- Temperature and Humidity Setpoint Adjustment
- Membrane Pushbuttons for Wipedown Cleaning

The BAPI-Stat 3 is designed for operating rooms, clean rooms and elder care facilities. It features a large display and membrane pushbuttons 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, a large %RH and a small temperature reading, or to alternate between the two. This unit can be configured with up to four transmitted variables. Contact your BAPI representative for details.



BAPI-Stat 3 Units (shown with optional humidity setpoint)

Ordering Information

The BAPI-Stat 3 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

Specifications

Power:

- 10 to 35 VDC for 4 to 20 mA or 0 to 5 VDC Outputs
- 15 to 35 VDC for 0 to 10 VDC Output
- 12 to 28 VAC for 0 to 5 VDC Output*
- 15 VAC to 28 VAC for 0 to 10 VDC Output*

Note: 15 to 24 VDC recommended for VDC unit.

Power Consumption:

- 60 mA max. DC: 4 to 20 mA or 0 to 5 VDC Outputs
- 10 mA max. DC: 0 to 10 VDC Output
- 1.44 VA max. AC: 0 to 5 VDC Outputs
- 0.2 VA max. AC: 0 to 10 VDC Output

RH/Temp Sensor Construction:

- Communicating Integrated Circuit
- Humidity: Capacitive Polymer, ±2% RH (10% to 90%) @25°C, Fully Compensated

Temp: Semiconductor Band Gap, ±0.3°C @ 25°C

Optional Direct Temp. Sensor:

Thermistor or RTD (See Sensors Sect. for Specs.)

Mounting:

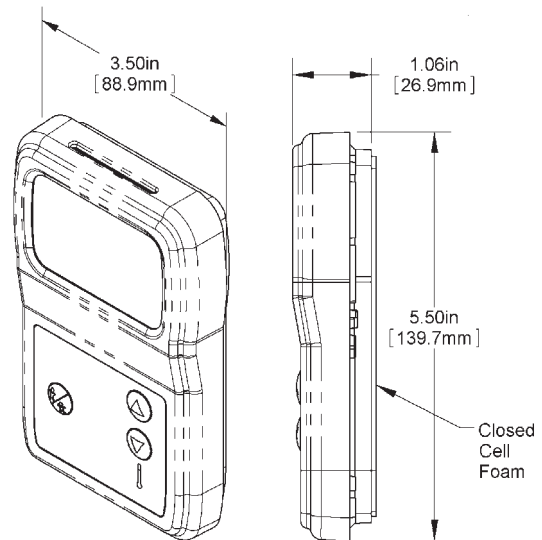
2" x 4" J-box or drywall mount - screws provided

Environmental Specifications:

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

Wiring: 2 to 5 pair of 16 to 22 AWG**

Material & Rating: ABS Plastic - UL 94, V-0



*AC power requires a separate pair of shielded wires.

**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.





Rev. 11/18/20

BAPI-Stat 4 "X-Combo" Room Unit

B15

Temperature Sensors

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.



**BAPI-Stat 4
"X-Combo"**



Temp & Humidity Setpoint Adjustment

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

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,
±0.5°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

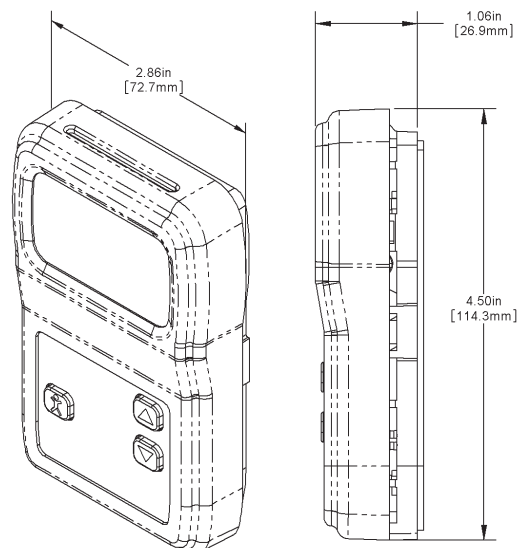
Enclosure Material: ABS Plastic, UL94 V-0

Ambient (Enclosure):

Temperature: . 32 to 122°F (0 to 50°C)

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.



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.



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

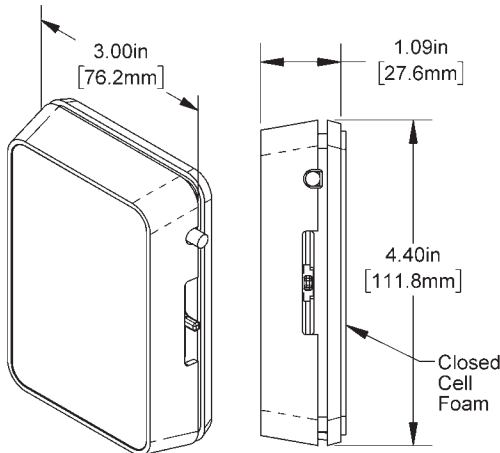
Enclosure Material:

ABS Plastic, UL94 V-0

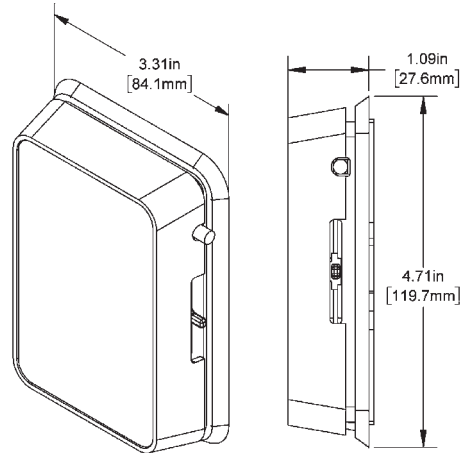
Mounting:

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)



BAPI-Stat "Quantum" Without Display

B17

Temperature Sensors

Submittal sheets without List Prices are available on our website at www.bapivac.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)

- BQBAPI-Stat "Quantum" Standard Base.\$7
- BQEUBAPI-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/





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

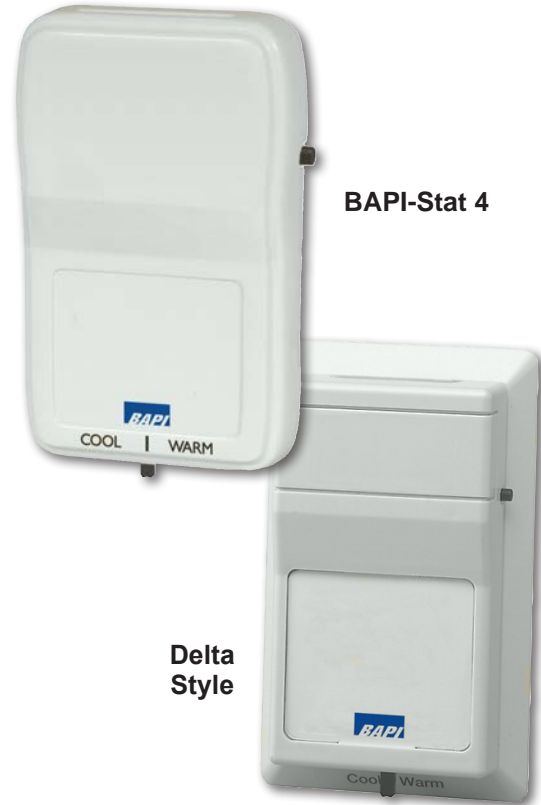
Optional discreet momentary signal that can be configured to be compatible with any controller.

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

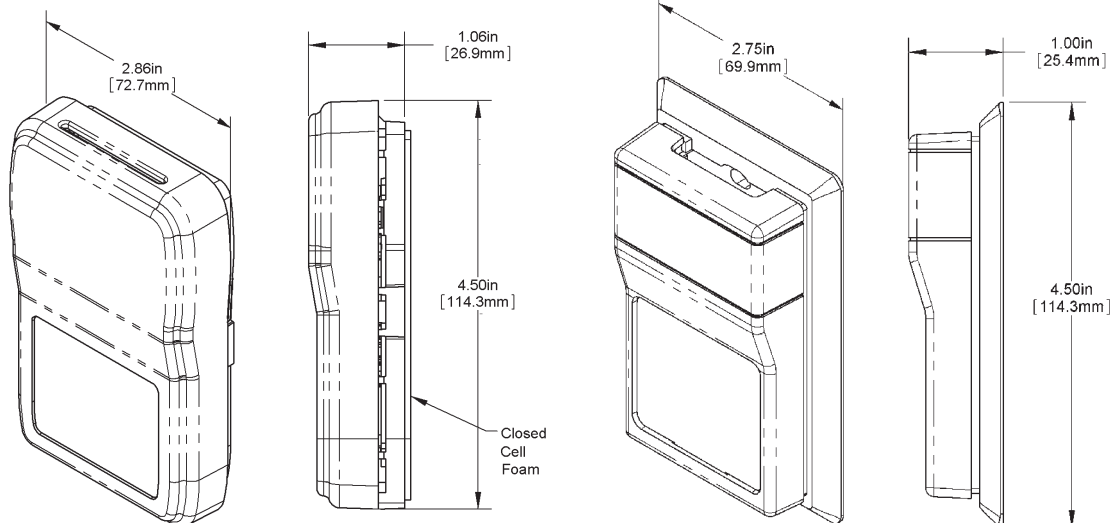
Enclosure Material:

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



BAPI-Stat 4 & Delta Style Units Without Display

Submittal sheets without List Prices are available on our website at www.bapivac.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/





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 $\pm 5\%$

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:

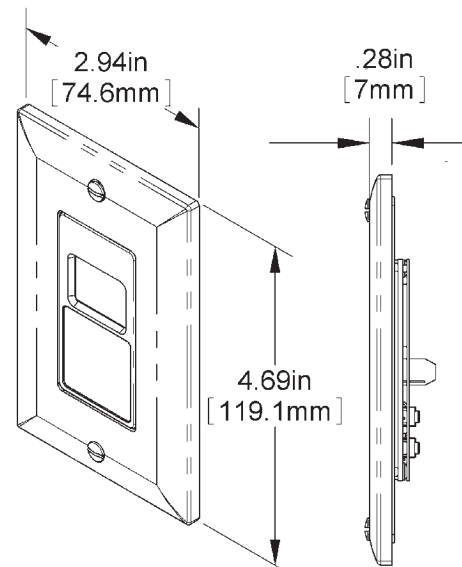
Temperature: 32 to 122 °F (0 to 50 °C)

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.





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

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... \$150

#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 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

#6: Common Ground Config. (required)

CG Common Ground

#7: Cover Plate (required)

NC No Cover -\$10
-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

List Price: \$150 (Decora Style Unit) = \$150 List Price

Your Number: BA/

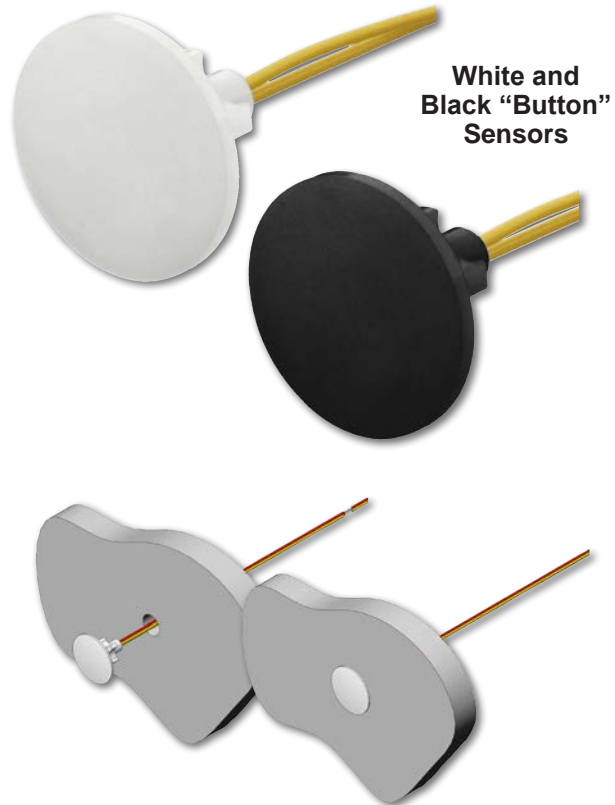


Features & Options

- 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) $\pm 0.36^{\circ}\text{F}$, ($\pm 0.2^{\circ}\text{C}$)
 Stability $< 0.036^{\circ}\text{F}/\text{Year}$, ($< 0.02^{\circ}\text{C}/\text{Year}$)
 Heat dissipation 2.7 mW/ $^{\circ}\text{C}$
 Temp. Drift $< 0.02^{\circ}\text{C}$ per year
 Probe range -40° to 221°F (-40° to 105°C)

RTD

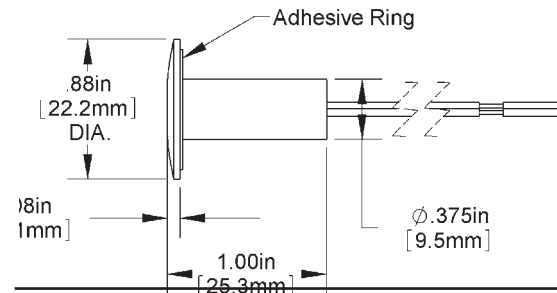
Platinum (PT)..... 100 Ω or 1K Ω @0 $^{\circ}\text{C}$, 385 curve
 Platinum (PT)..... 1K Ω @0 $^{\circ}\text{C}$, 375 curve
 PT Accuracy (Std).. 0.12% @Ref, or $\pm 0.55^{\circ}\text{F}$, ($\pm 0.3^{\circ}\text{C}$)

PT Stability $\pm 0.25^{\circ}\text{F}$, ($\pm 0.14^{\circ}\text{C}$)
 PT Self Heating 0.4 $^{\circ}\text{C}/\text{mW}$ @0 $^{\circ}\text{C}$
 PT Probe range -40° to 221°F , (-40 to 105°C)
 Nickel (Ni) 1K Ω @70 $^{\circ}\text{F}$, JCI curve
 Ni Probe range -40° to 221°F (-40 to 105°C)

Sensitivity

Thermistor Non-linear
 Go to bapihvac.com "Sensor Specs"
 RTD (PT) 3.85 $\Omega/^{\circ}\text{C}$ for 1K Ω RTD
 3.75 $\Omega/^{\circ}\text{C}$ for 1K Ω RTD
 Nickel (Ni) 2.95 $\Omega/^{\circ}\text{F}$ 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



Low Profile "Button" Sensor

B23

Temperature Sensors

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

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).....	\$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
20K.....	20K Thermistor	\$18

#2: Button Sensor Color (required)

LPW.....	Button Sensor, White.....	\$7
LPB.....	Button Sensor, Black	\$12

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

5.....	5 Feet of Plenum-Rated Cable	\$2
10.....	10 Feet of Plenum-Rated Cable	\$4
15.....	15 Feet of Plenum-Rated Cable	\$6

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.

List Price: \$18 (Thermistor) + \$7 (White Button Sensor) + \$2 (5' Leads) = \$27 List Price

Your Number: BA/





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



Specifications

Power:

12 to 30VDC (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:

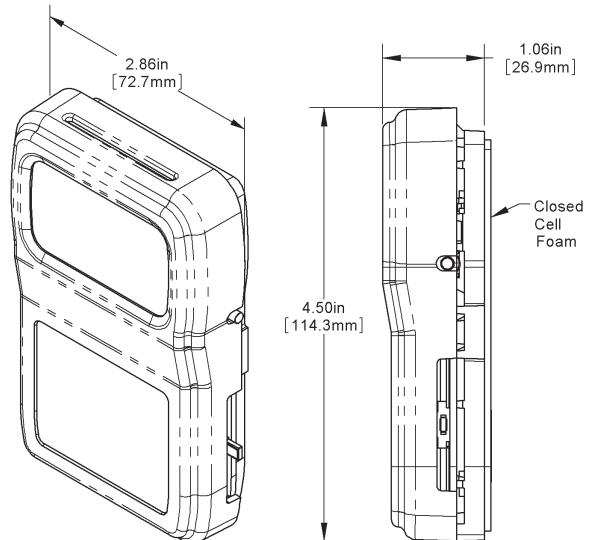
1 to 3 pair of 16 to 22AWG

Material & Rating:

BAPI-Stat 4: ABS Plastic, UL94 V-0

Delta Style: ABS Plastic, UL94 HB

Agency: RoHS





T1K Transmitter Room Unit

B25

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.



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)

- B4SDBAPI-Stat 4 with Display \$185
- B4SXBAPI-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
- C50 to 90 °F or 10 to 32 °C
- D55 to 85 °F or 13 to 30 °C
- E60 to 80 °F or 15 to 27 °C
- F65 to 80 °F or 18 to 27 °C
- XNo 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/





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.

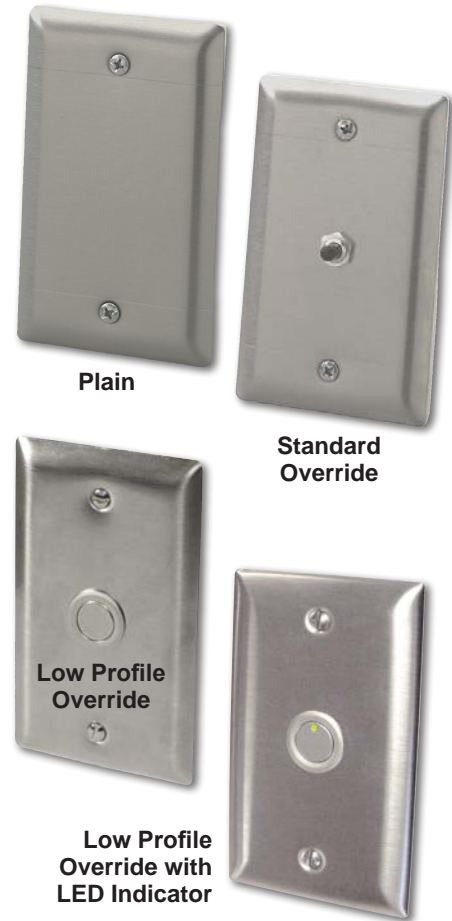
Override

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.



Specifications

Material:

Aluminum or Stainless Steel

Sensing Element:

Thermistor or RTD

(See Sensors Sect. for Specs.)

Environmental Operation Range:

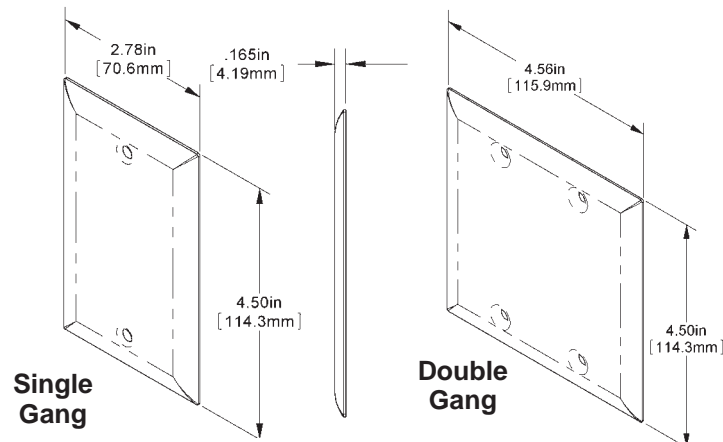
Temperature:

-40 °C to 100 °C

-20 °C to 70 °C with transmitter

Humidity:

0 to 95%, non-condensing



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.





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
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/





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



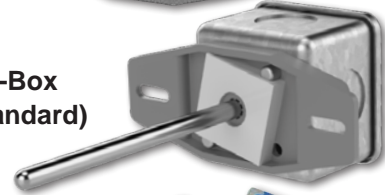
The BAPI-Box Crossover features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port. See the Accessories section for more info.

(Units shown with knockout plug sold separately.)

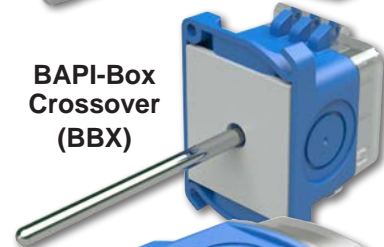
No Box
(NB)



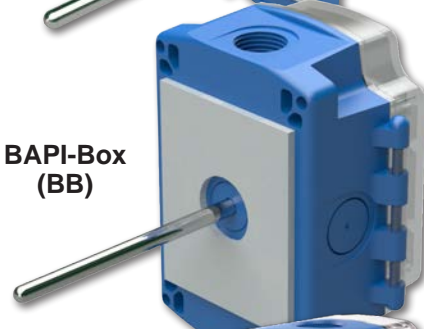
J-Box
(Standard)



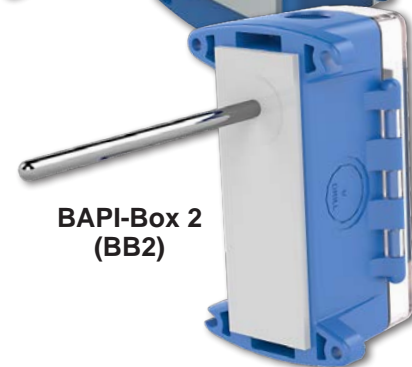
BAPI-Box
Crossover
(BBX)



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 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.bapivac.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
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*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/





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.)



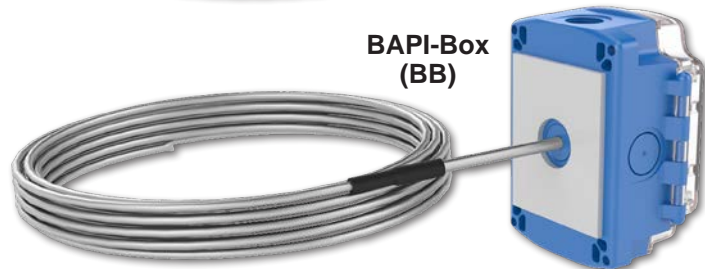
No Box
(NB)



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 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.)





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)

#1: Temp Sensor (Required)

1.8K	1.8K Thermistor	Call for price.
3K	3K Thermistor	
10K-2	10K-2 Thermistor	
10K-3	10K-3 Thermistor	
10K-3[11K]... 20K	10K-3[11K] Thermistor 20K 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)

#1: Output (Required)

T1K	4 to 20mA Output	Call for price.
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
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*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.





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



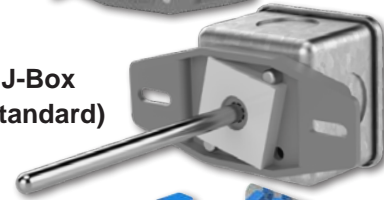
The BAPI-Box Crossover features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port. See the Accessories section for more info.

(Units shown with knockout plug sold separately.)

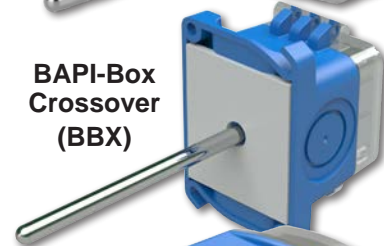
No Box
(NB)



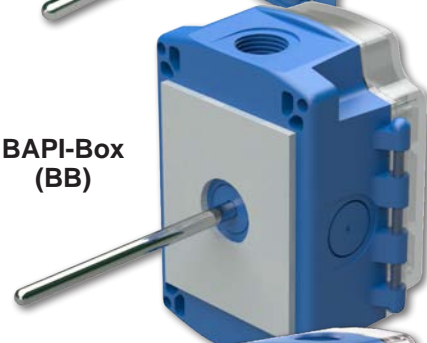
J-Box
(Standard)



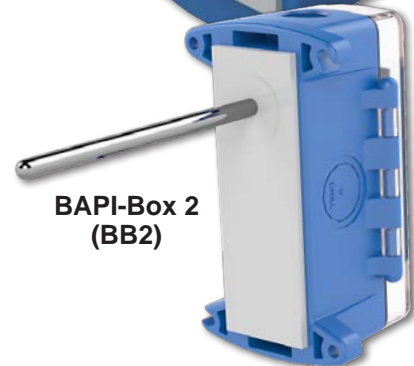
BAPI-Box
Crossover
(BBX)



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 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.)



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
Rigid Averaging 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)

RA-12".....	12" (0.3m) Length.....	\$68
RA-2'.....	2' (0.6m) Length.....	\$68
RA-3'.....	3' (0.9m) Length.....	\$102
RA-4'.....	4' (1.2m) Length.....	\$136

#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

Option Selection Guide
Rigid Averaging 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)

RA-12".....	12" (0.3m) Length.....	\$68
RA-2'.....	2' (0.6m) Length.....	\$68
RA-3'.....	3' (0.9m) Length.....	\$102
RA-4'.....	4' (1.2m) Length.....	\$136

#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
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*Voltage outputs are field selectable



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

List Price: \$18 + \$102 + \$2 = \$122 List Price

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

List Price: \$125 + \$102 = \$227 List Price

Your Number: BA/





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.

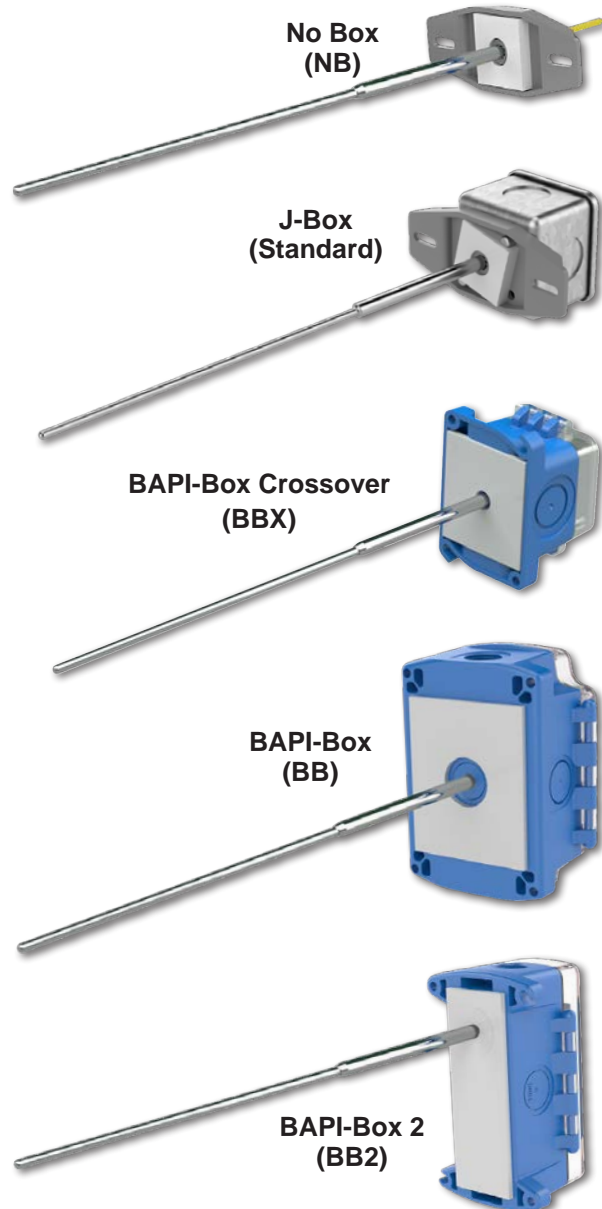
The BAPI-Box Crossover

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.)





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

Submersible 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)

SD-12"	12" (0.3m) length	\$117
SD-18"	18" (0.46m) length.....	\$120
SD-24"	24" (0.6m) length.....	\$138
SD-36"	36" (0.9m) length.....	\$142
SD-48"	48" (1.2m) length.....	\$150

#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) - (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

List Price: \$18 + \$120 + \$2 = \$140 List Price

Option Selection Guide

Submersible 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)

SD-12"	12" (0.3m) length	\$117
SD-18"	18" (0.46m) length.....	\$120
SD-24"	24" (0.6m) length.....	\$138
SD-36"	36" (0.9m) length.....	\$142
SD-48"	48" (1.2m) length.....	\$150

#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
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*Voltage outputs are field selectable

Example Number:

BA/(T1K)([32 TO 212F]) - (SD-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

List Price: \$125 + \$120 = \$245 List Price

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.





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.

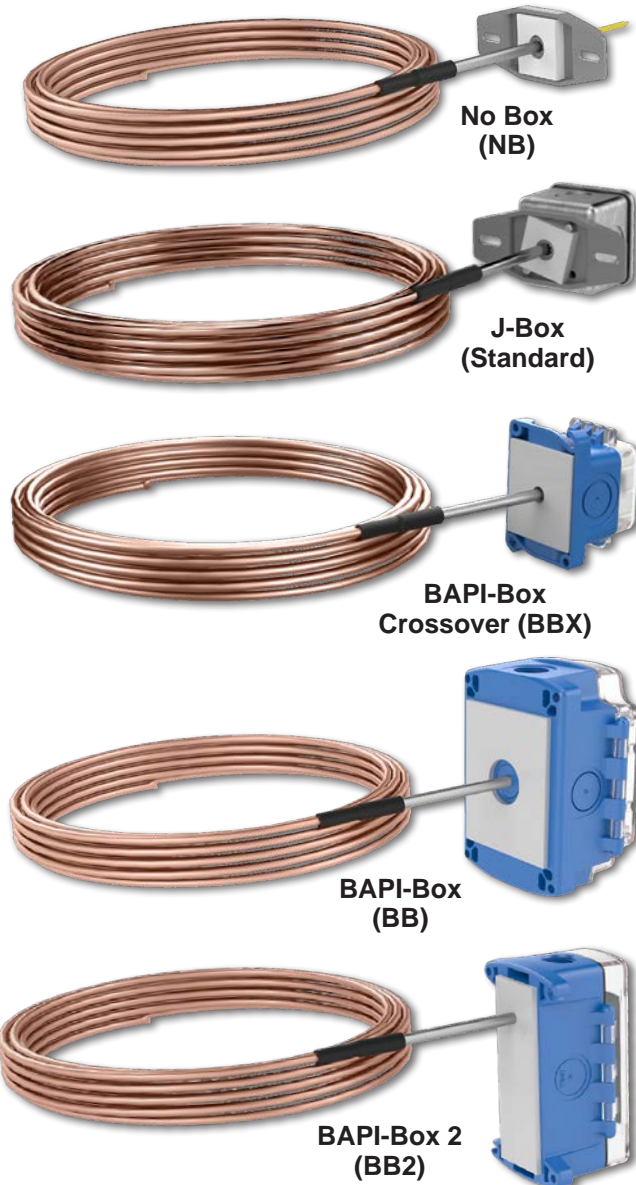
These units come standard with a 2"x2" steel J-Box but are also available with no box, the BAPI-Box, the BAPI-Box 2 or the BAPI-Box Crossover enclosures.

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.)



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)

1.8K	1.8K Thermistor	Call for price.
3K	3K Thermistor	
10K-2	10K-2 Thermistor	
10K-3	10K-3 Thermistor	
10K-3[11K]...	10K-3[11K] Thermistor	
20K	20K Thermistor	
1K	1K Plat. RTD (385 curve)	
SA-2'	8' (0.6m) length	
SA-4'	12' (1.2m) length	
SA-8'	24' (2.4m) length	
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	
TB	Test & Balance Switch	
TS	Terminal Strip Connection	

Option Selection Guide
**Submersible Averaging
Temperature Transmitters**

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

#1: Output (Required)

T1K	4 to 20mA Output	Call for price.
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'	8' (0.6m) length
SA-4'	12' (1.2m) length
SA-8'	24' (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
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*Voltage outputs are field selectable

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

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.



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

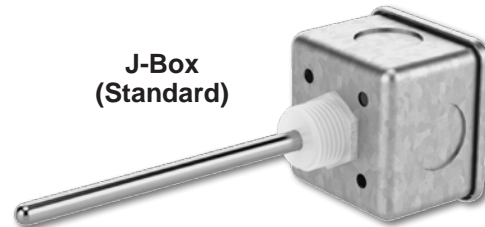
Immersion Units are available in 2", 4" and 8" probe lengths. The sensor is potted inside a 1/4" stainless steel probe with thermally conductive compound.

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

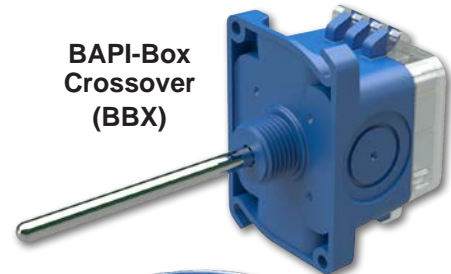
Immersion Units come standard with a 2"x2" steel J-Box but are also available with no box, the BAPI-Box, the BAPI-Box 2 or the BAPI-Box Crossover enclosures.

BAPI Thermowells

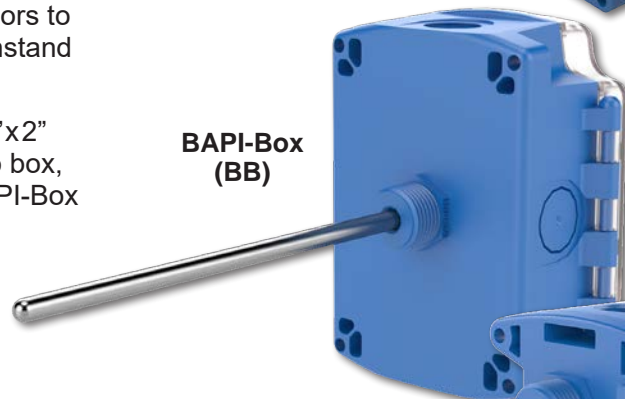
Immersion Unit Probes are designed to be inserted into a Thermowell. For more info on Thermowells, see page B42.



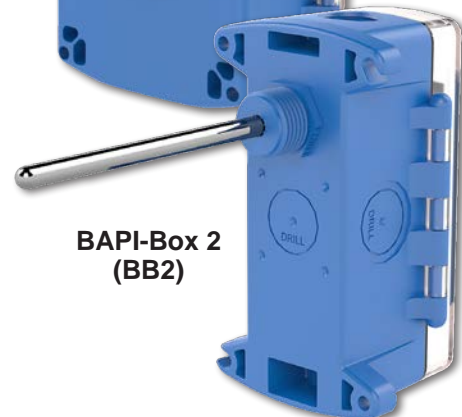
J-Box
(Standard)



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:

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.)



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 w/ Nylon 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"	2" (51mm) length.....	\$7
I-4"	4" (102mm) length.....	\$7
I-8"	8" (203mm) 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

#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) - (I-4") - (BBX) - ()
BA/10K-2-I-4"-BBX (no parenthesis)

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

List Price: \$18 + \$7 = \$25 List Price

Option Selection Guide

Immersion w/ Nylon 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"	2" (51mm) length.....	\$7
I-4"	4" (102mm) length.....	\$7
I-8"	8" (203mm) 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
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*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

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

Your Number: BA/





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.



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.)



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)

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
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*Voltage outputs are field selectable
**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

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/





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



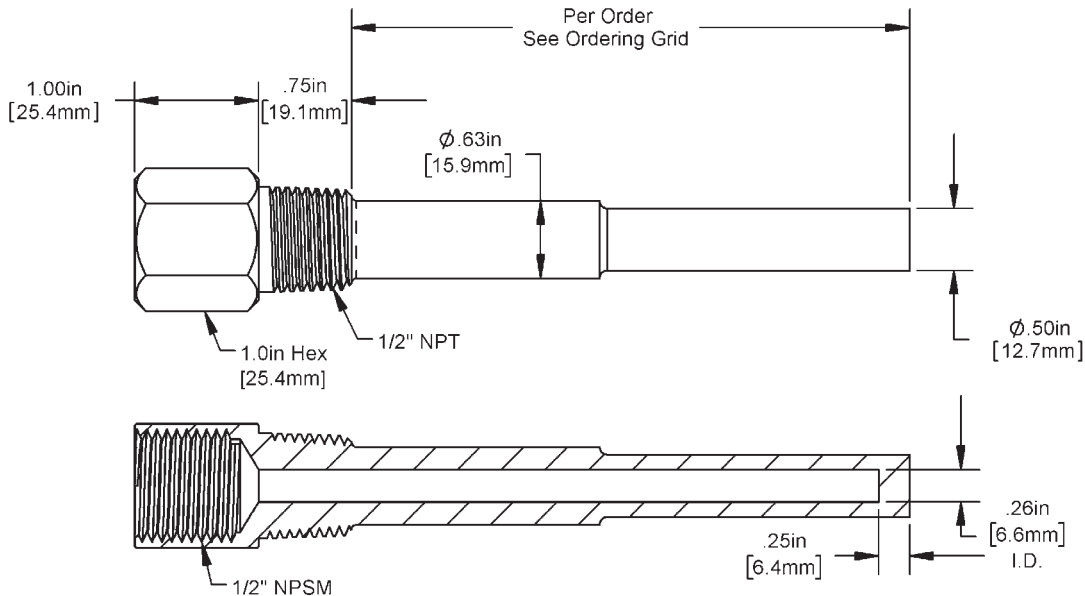
Machined Thermowell

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 1/2" NPT external, and 1/2" 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)		
		1-2"	1-4"	1-8"
		Maximum Fluid Velocity (Feet per Second)		
Brass	Air/Steam	207	75.5	27.3
	Water	59.3	32.2	19.7
304 S.S.	Air/Steam	300	109	39.5
316 S.S.	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.

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

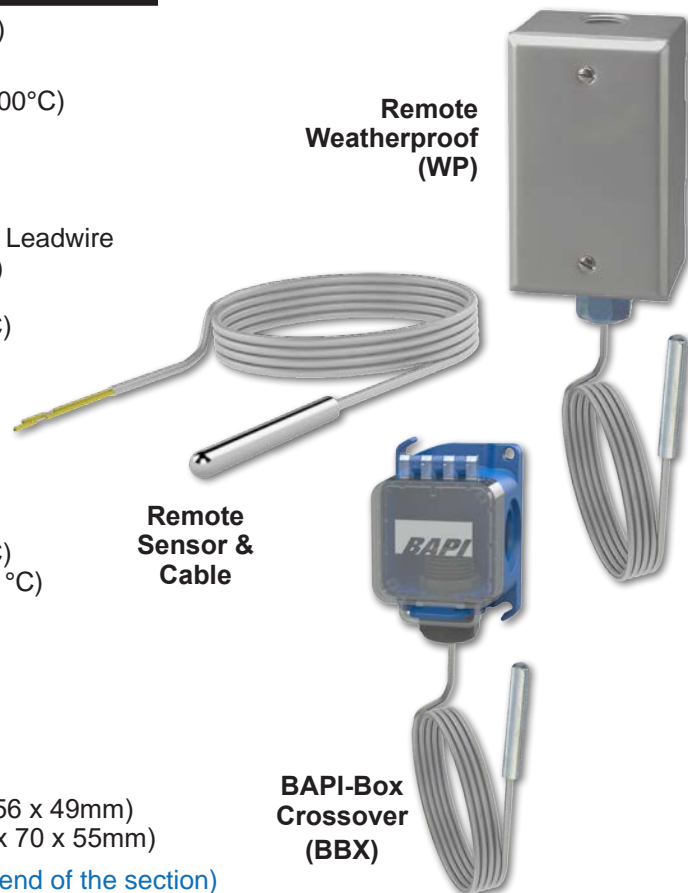
IP44 with knockout plug in open port

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)





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 1/4" Diameter, 316 SS Probe, double-ended 1/2" NPT
- I-4" 5.5" length of 1/4" Diameter, 316 SS Probe, double-ended 1/2" NPT
- I-8" 8.5" length of 1/4" 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.



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.

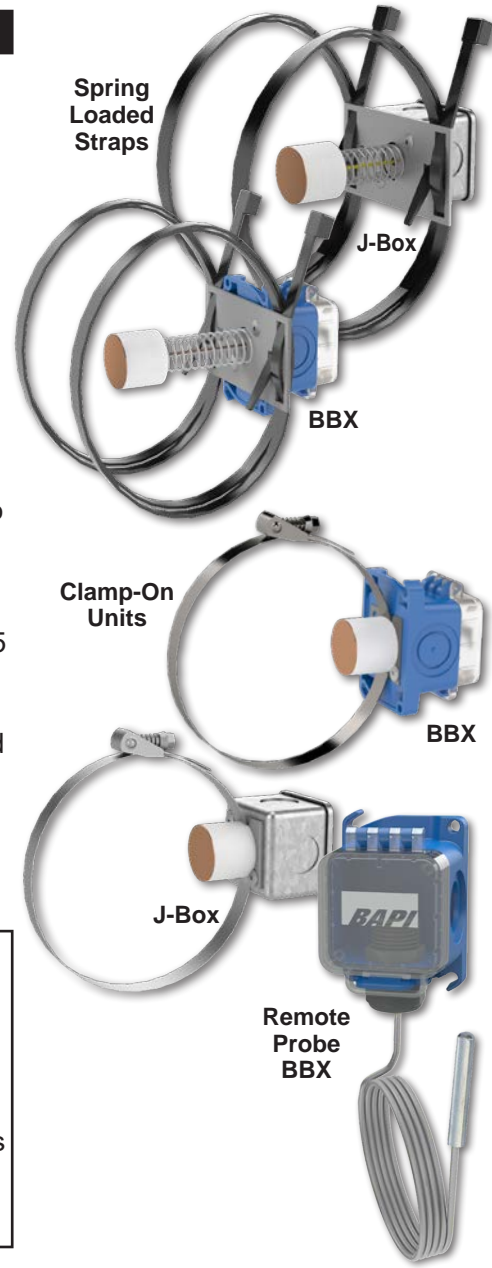
Strap Units and Remote Probes come standard with a Junction Box enclosure but are also available with a BAPI-Box Crossover enclosure.


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 105°C
 Remote Probe w/ FEP Cable: -20 to 75°C
 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)

[\(For encl. dimension drawings, turn to the end of the section.\)](#)



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

Strap & 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: Configuration (Required)

S	Clamp-On Strap.....	\$10
STP.....	Spring Loaded Strap.....	\$25
RPP	Remote Probe, Plenum Cable* ..	\$0
RPPFEP-18" ..	Remote Probe, FEP Cable*	\$3
RPPFEP2-18" ..	Remote Pr., Subm. FEP Cable* ..	\$10

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

BBX	BAPI-Box Crossover (IP10, NEMA 1) ..	\$0
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#4: Test & Balance or Terminal Strip (Optional)
(requires a BBX enclosure above)

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

*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

List Price: \$18 + \$10 = \$28 List Price

Option Selection Guide

Strap & 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: Configuration (Required)

S	Clamp-On Strap.....	\$10
STP.....	Spring Loaded Strap.....	\$25
RPP	Remote Probe, Plenum Cable** ..	\$0
RPPFEP-18" ..	Remote Probe, FEP Cable**	\$3
RPPFEP2-18" ..	Remote Pr., Subm. FEP Cable** ..	\$10

#4: Enclosure (Required)

BBX	BAPI-Box Crossover (IP10, NEMA 1) ..	\$0
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#5: Terminal Strip (Optional)

TS	Terminal Strip Connection.....	\$0
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*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

List Price: \$125 + \$10 = \$135 List Price

Your Number: BA/





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

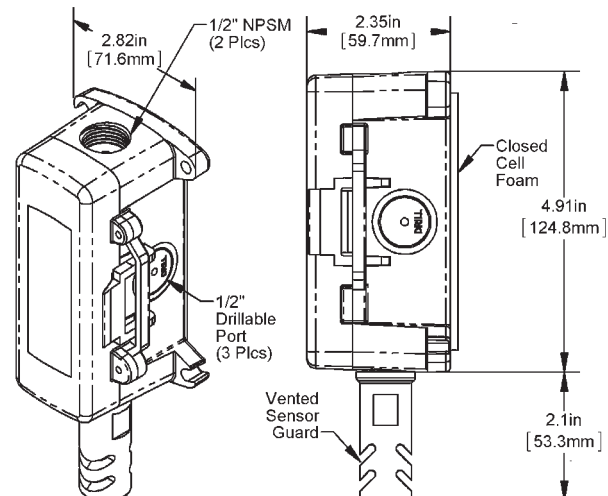
Sensing Element:

Thermistor or RTD
 (See Sensors Section for Specs.)

Enclosure Rating: IP66, NEMA 4

Enclosure Material:

UV-resistant polycarbonate, UL94 V-0





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
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/





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.

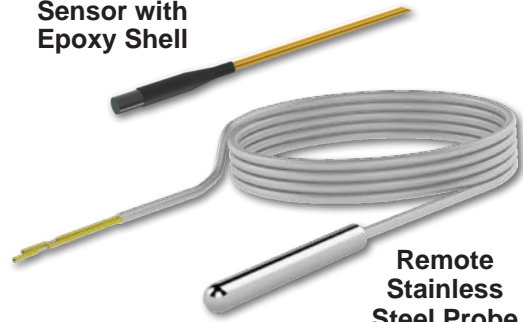
Remote Sensors and Probes are available with a BAPI-Box Crossover or the BAPI-Box 2 enclosure.

The BAPI-Box Crossover

The new 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 °C
 Units w/ Plenum-Rated Cable: -20 to 75 °C
 Units w/ Halogen-Free Cable: -40 to 90 °C
 Temperature Transmitter: -20 to 70 °C
 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.)





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

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/





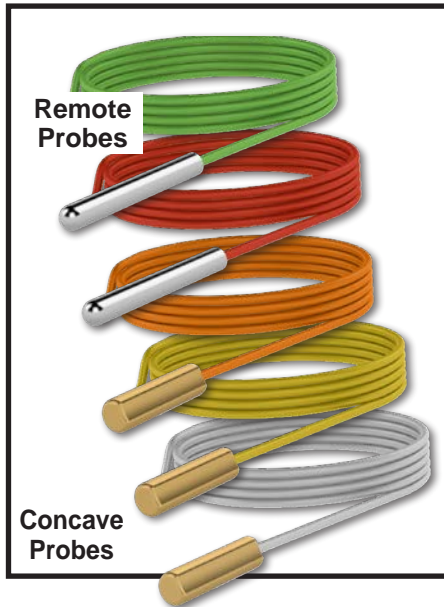
Features & Options

- 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 indentation 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 indentation. 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 105°C • 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

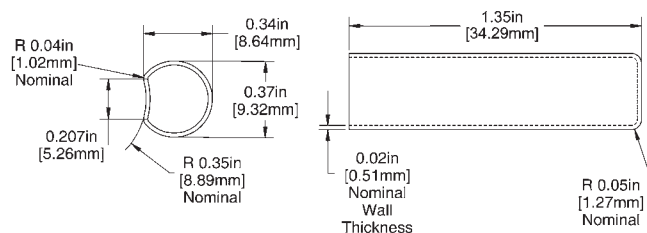
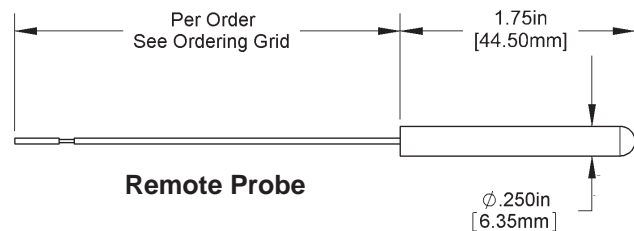
(IP44 w/ knockout plug in open port)

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.)





Submittal sheets without List Prices are available on our website at www.bapivac.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/





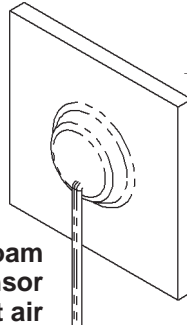
Features & Options

- 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 105°C)

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:

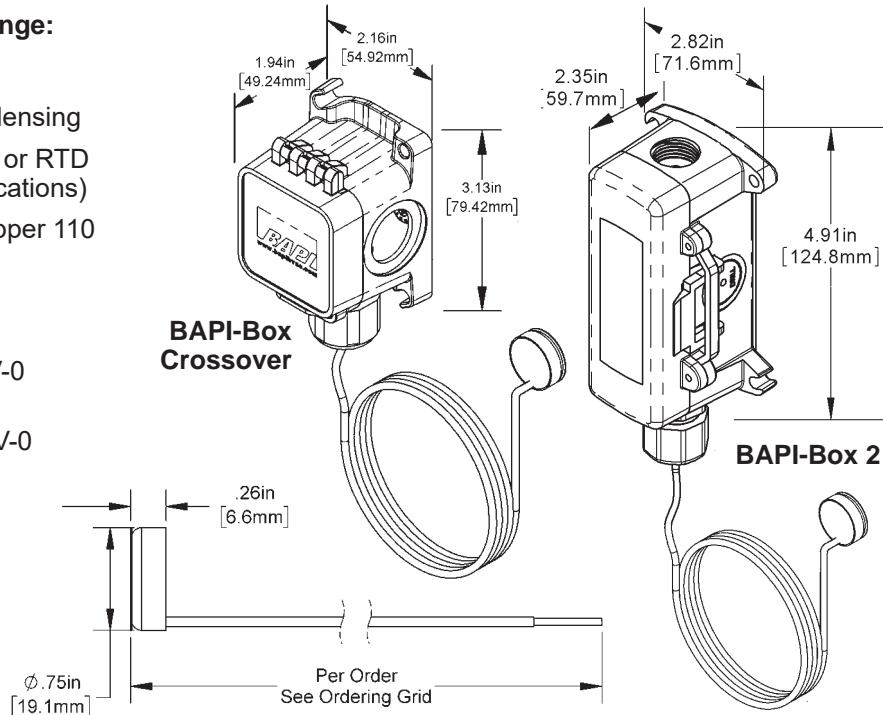
BAPI-Box 2:
UV-resistant polycarb., UL94 V-0

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)





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

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
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*Voltage outputs are field selectable

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

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/





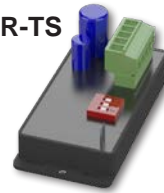
Features & Options

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.

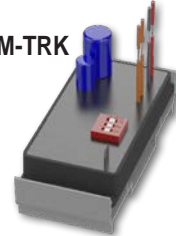
These transmitters are available with a wired connection via flying leads or a pluggable terminal block (-TS).

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.

XOR-TS



XOR-STM-TRK



XOR-BBX



XOR-BB2-TS

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. 30°F (16.6°C), Max 1000°F (555°C)

Calibration Zero:

Min. -148°F (-100°C), Max 900°F (482°C)

System Accuracy: ±0.065% of Span

Linearity: ±(0.125 × T-20°C)/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 158°F, (-20 to 70°C)
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

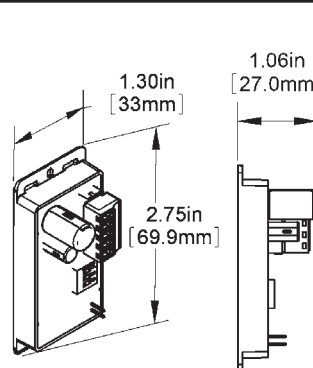
BAPI-Box Crossover Enclosure Material:

Polycarbonate (UL94 V-0) & Nylon (UL94 HB)

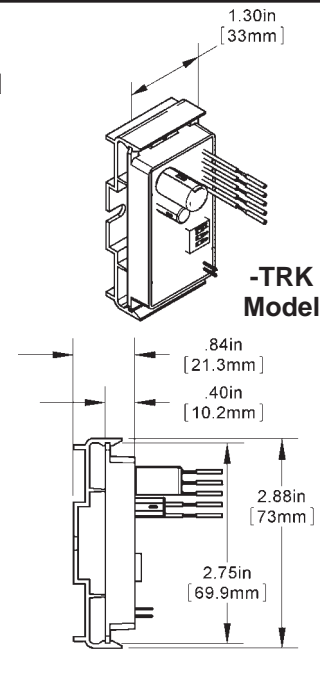
BAPI-Box Crossover Enclosure Rating:

IP10, NEMA 1
(IP44 w/ knockout plug in open port)

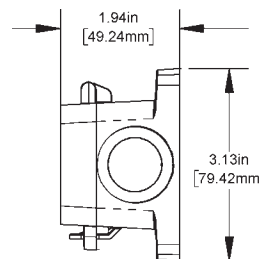
Agency: RoHS / JIS C1604-1989 / PT=DIN43760, IEC Pub 751-1983



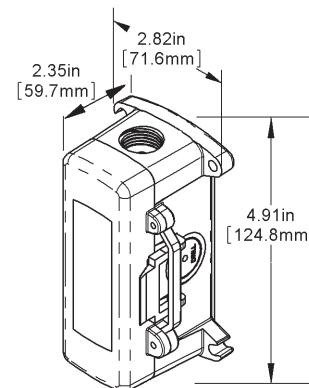
-STM Model
(shown with optional Terminal Strip)



-TRK Model



XOR-BBX Model



XOR-BB2 Model





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.



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/





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 Thermbuffer 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 Thermbuffer 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 new 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.)*

BAPI-Box Crossover with 2" Buffer Chamber



BAPI-Box 2 with 1" Buffer Chamber

1" Hanging Bracket

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 185°F (-40 to 85°C)
Extreme Temp Sensor: -328 to 32°F (-200 to 0°C)
Temp. Transmitter: -4 to 158°F (-20 to 70°C)
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)

[\(For enclosure and buffer chamber dimension drawings, see the end of the section.\)](#)



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/



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.



**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")**

For detailed specifications on the individual Sensors & Transmitters, turn to "Sensors" Section.

Specifications

Thermistor:

Temp. Output..... Resistance
Accuracy $\pm 0.36^{\circ}\text{F}$, ($\pm 0.2^{\circ}\text{C}$)
Probe Range -40° to 221°F (-40° to 105°C)

RTD:

Platinum (PT) $\text{K}\Omega$ @ 0°C , 385 curve,
Platinum (PT) $1\text{K}\Omega$ @ 0°C , 375 curve
PT Accuracy (std) 0.12% @Ref, or $\pm 0.55^{\circ}\text{F}$, ($\pm 0.3^{\circ}\text{C}$)
PT Probe Range -40° to 221°F , (-40 to 105°C)
Nickel (Ni) $1\text{K}\Omega$ @ 70°F , JCI curve
Ni Probe Range -40° to 221°F (-40 to 105°C)

Probe Material: Rigid Stainless Steel, 0.25" OD

Probe Length: 1.75 to 48" or custom per order

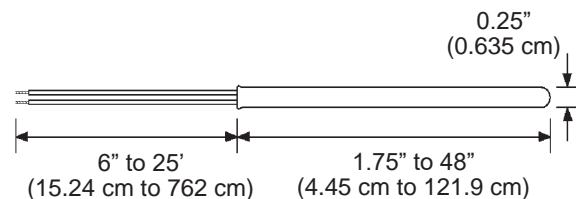
Lead Wire: Twin lead 22awg stranded

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





Replacement Temperature Probes

B61

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 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).	\$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: 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	.....\$0
TFE-18"	18 inch Etched Teflon leads	.....\$0
TFE-5'	5 feet Etched Teflon leads	.....\$2
TFE-10'	10 feet Etched Teflon leads	.....\$4
TFE-15'	15 feet Etched Teflon leads	.....\$6
TFE-20'	20 feet Etched Teflon leads	.....\$8
TFE-25'	25 feet Etched Teflon leads	...\$10

Plenum-Rated Cable

PL-18"	18 inch Plenum-Rated Cable	..\$0
PL-5'	5 feet Plenum-Rated Cable	....\$2
PL-10'	10 feet Plenum-Rated Cable	...\$4
PL-15'	15 feet Plenum-Rated Cable	...\$6
PL-20'	20 feet Plenum-Rated Cable	...\$8
PL-25'	25 feet Plenum-Rated Cable	..\$10

FEP-Jacketed Cable

FEP-18"	18 inch FEP-Jacketed Cable	...\$3
FEP-5'	5 feet FEP-Jacketed Cable	....\$5
FEP-10'	10 feet FEP-Jacketed Cable	..\$10
FEP-15'	15 feet FEP-Jacketed Cable	..\$15
FEP-20'	20 feet FEP-Jacketed Cable	..\$20
FEP-25'	25 feet FEP-Jacketed Cable	..\$25

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.

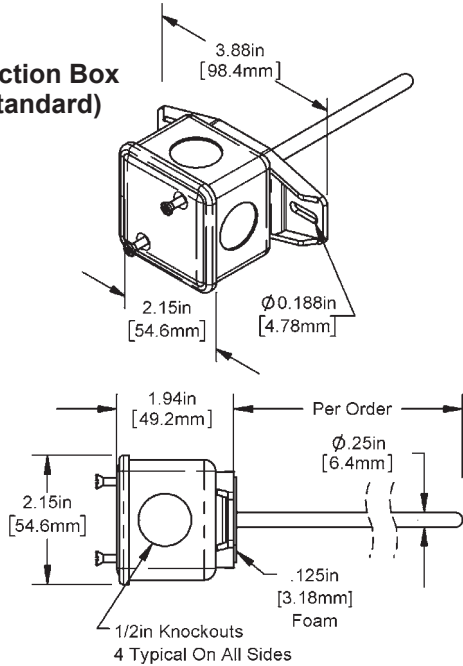
List Price: \$18 (10K-2 Thermistor) = \$18 List Price

Your Number: BA/

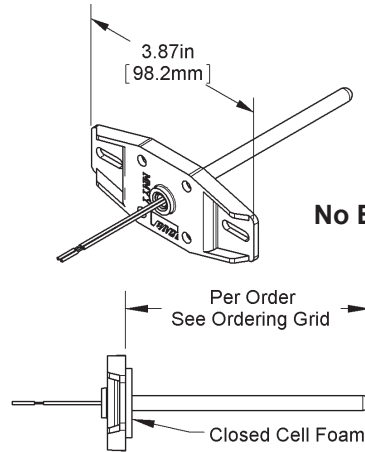




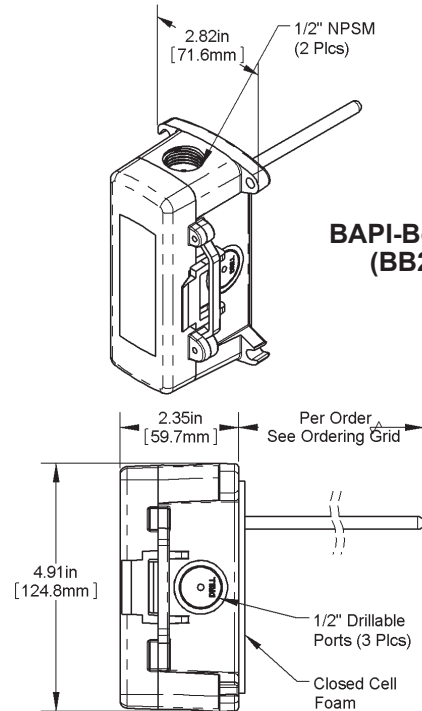
Junction Box (Standard)



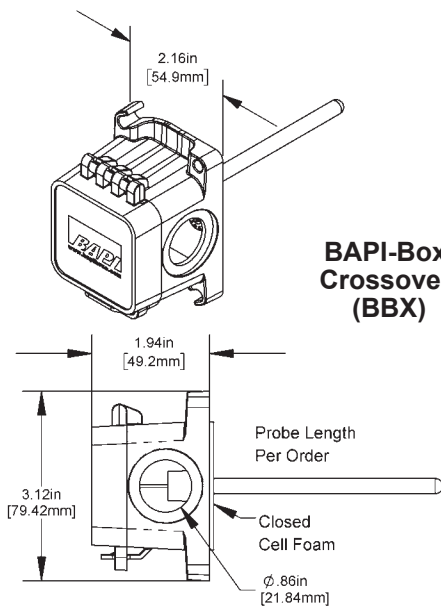
No Box (NB)



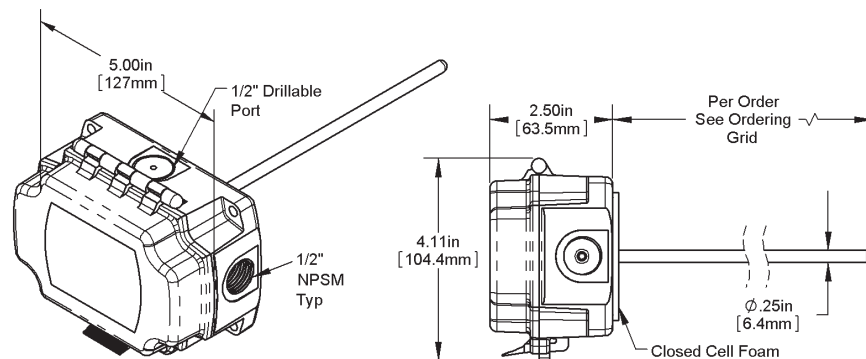
BAPI-Box 2 (BB2)



BAPI-Box Crossover (BBX)



BAPI-Box (BB)

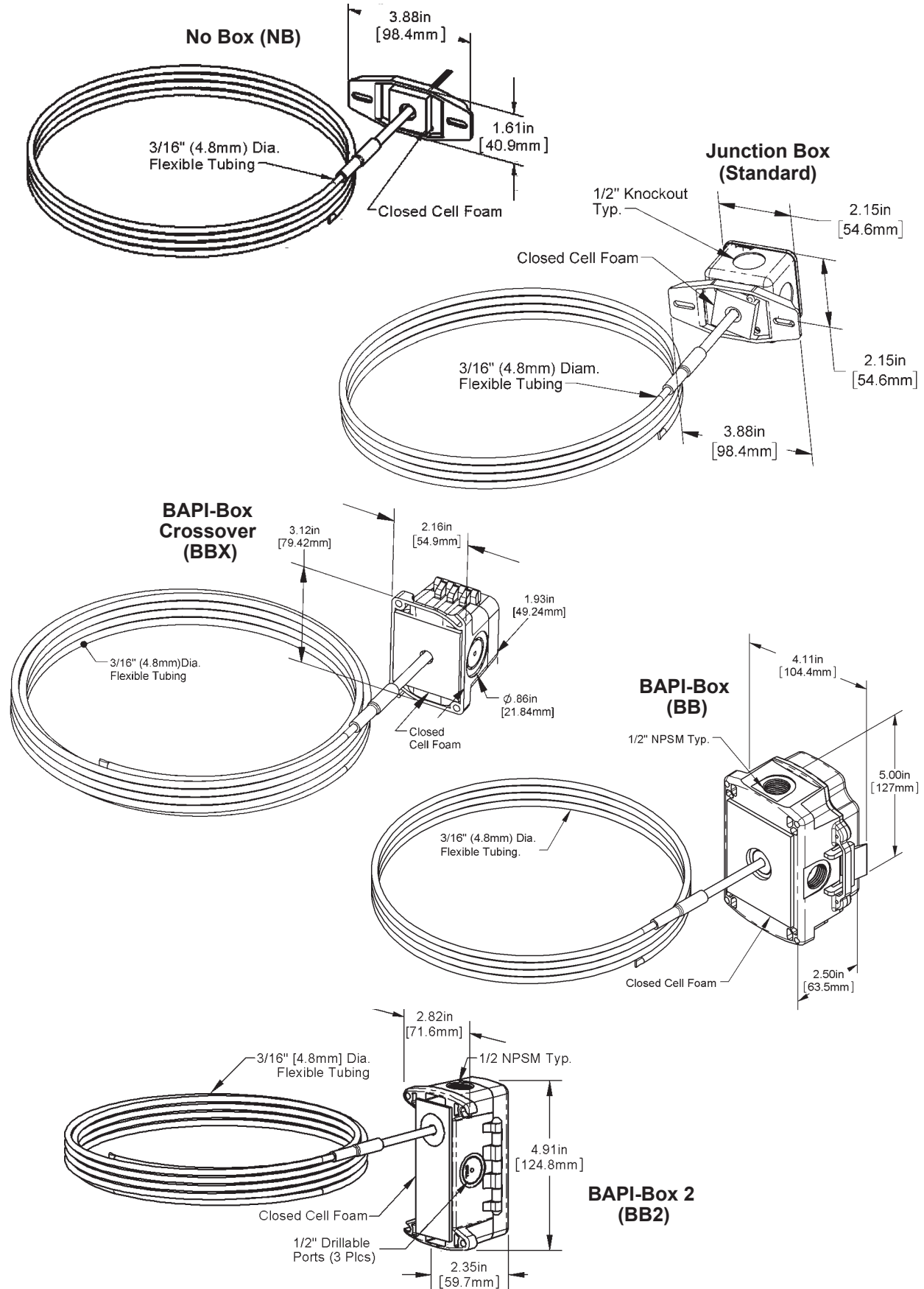




Duct Averaging Sensor Enclosures

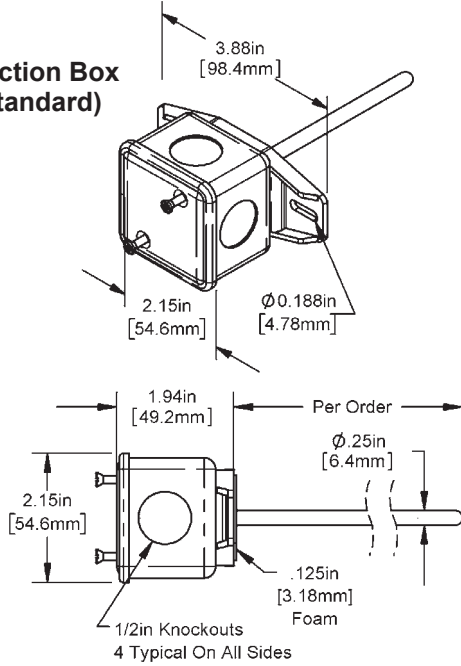
Rev. 05/17/23

Temperature Sensors

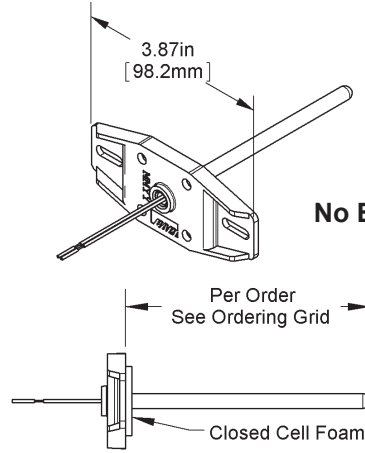




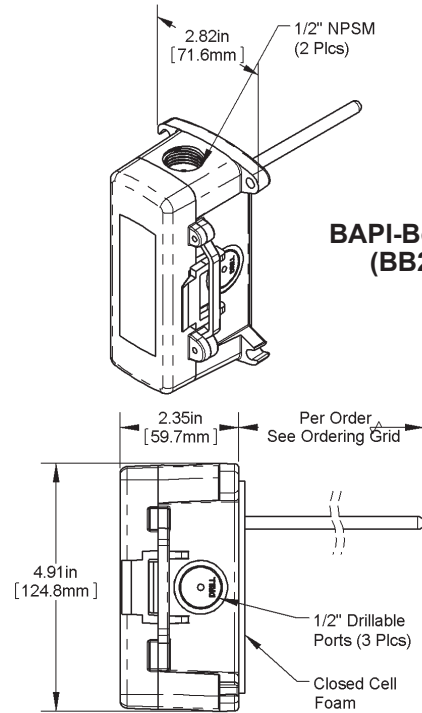
Junction Box (Standard)



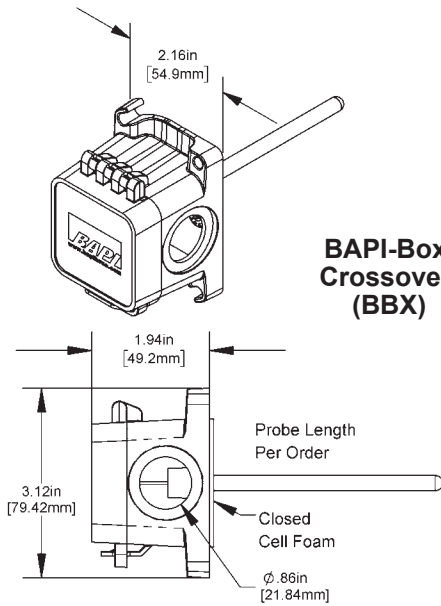
No Box (NB)



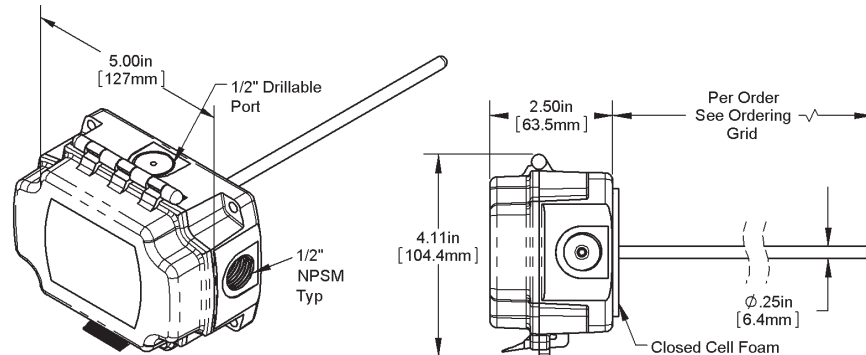
BAPI-Box 2 (BB2)



BAPI-Box Crossover (BBX)



BAPI-Box (BB)



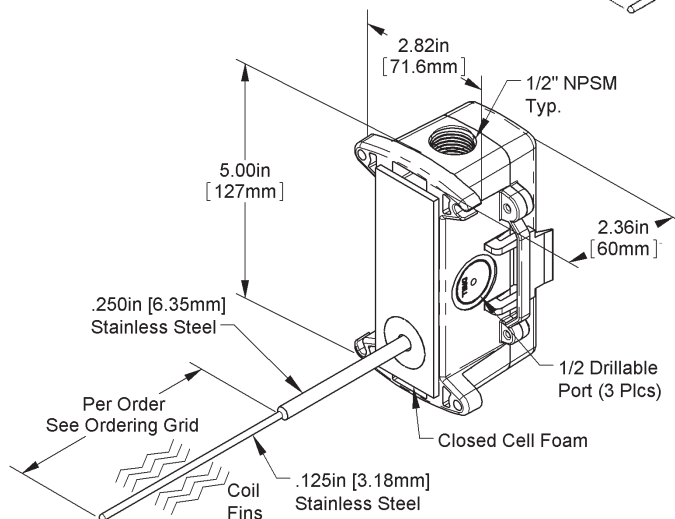
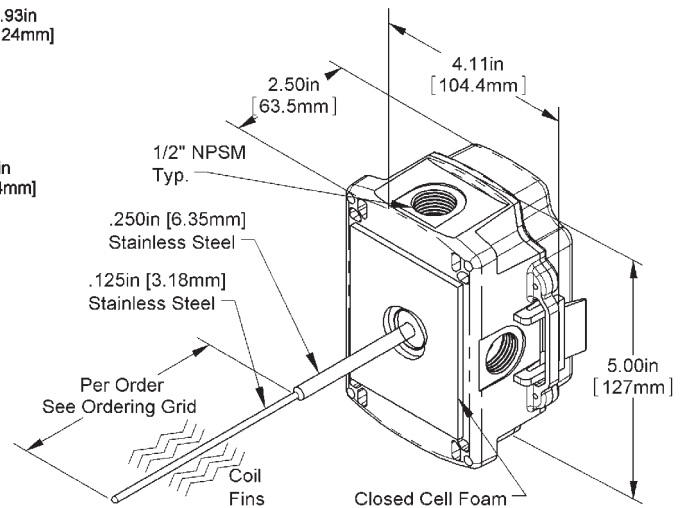
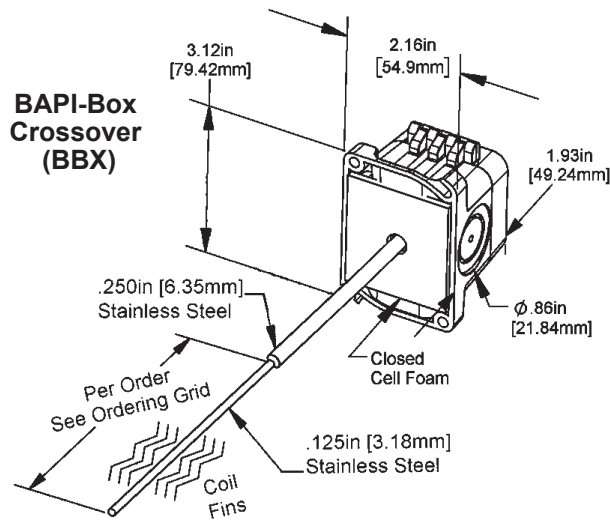
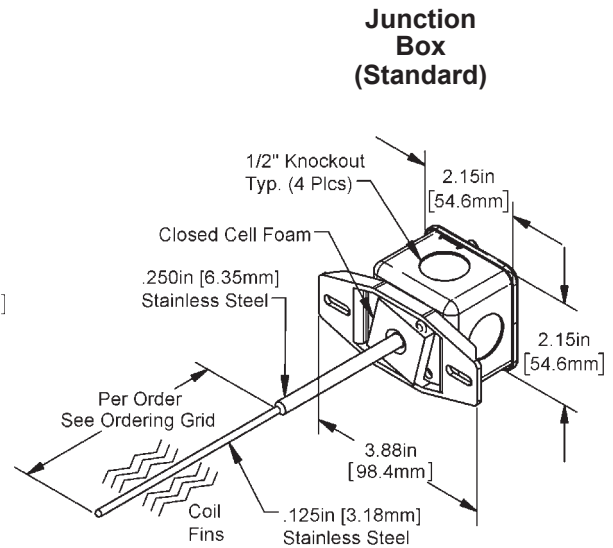
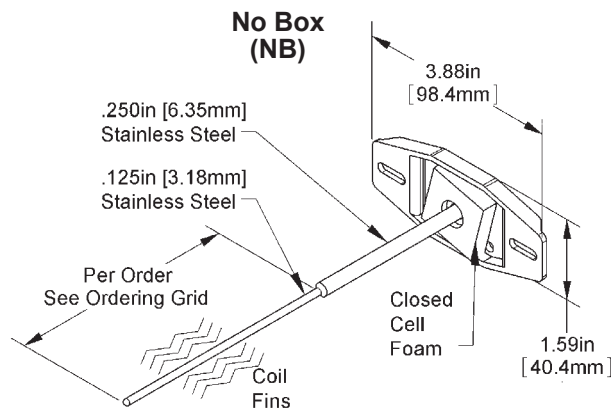


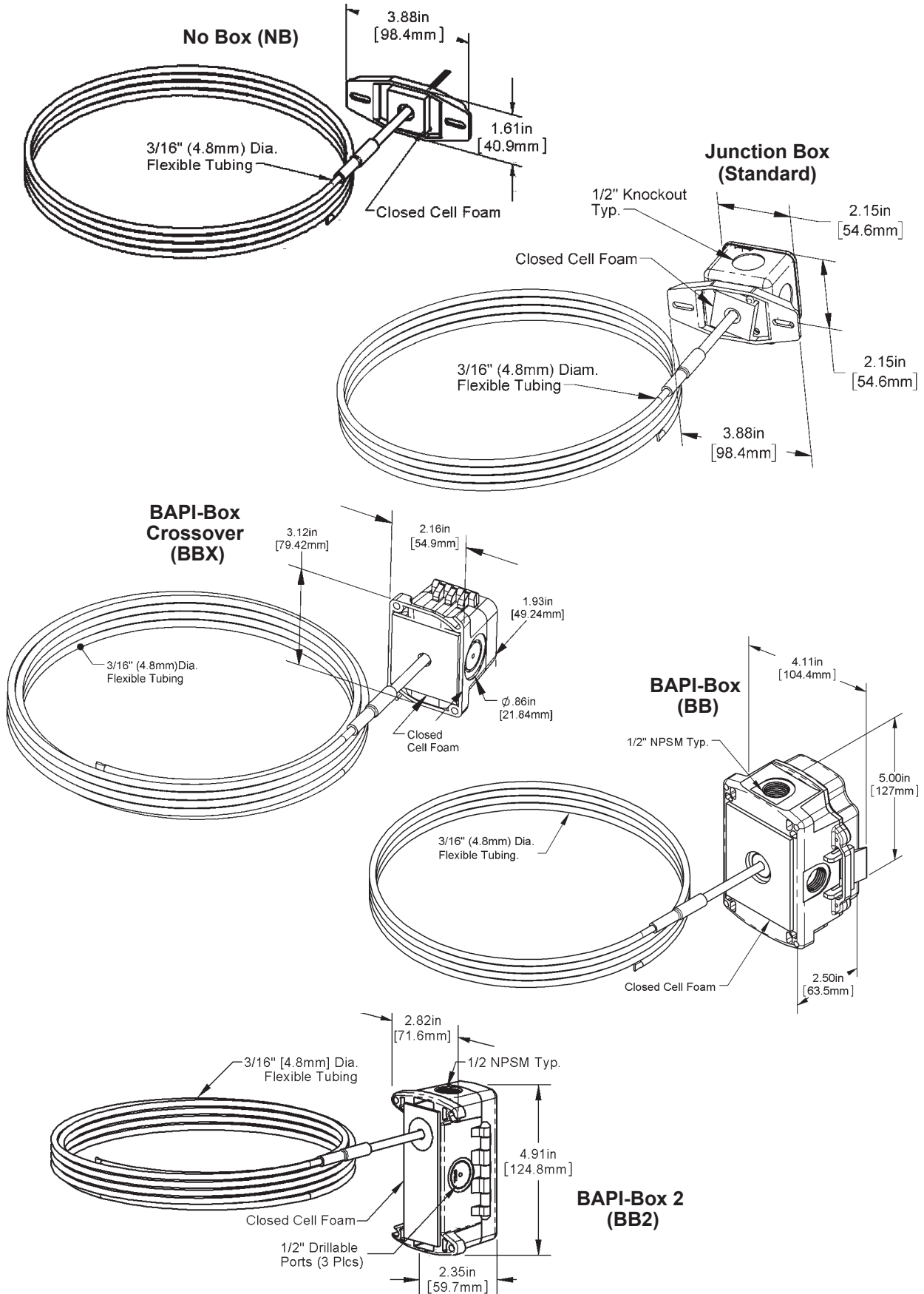
Submersible Duct Sensor Enclosures

B65

Rev. 05/17/23

Temperature Sensors



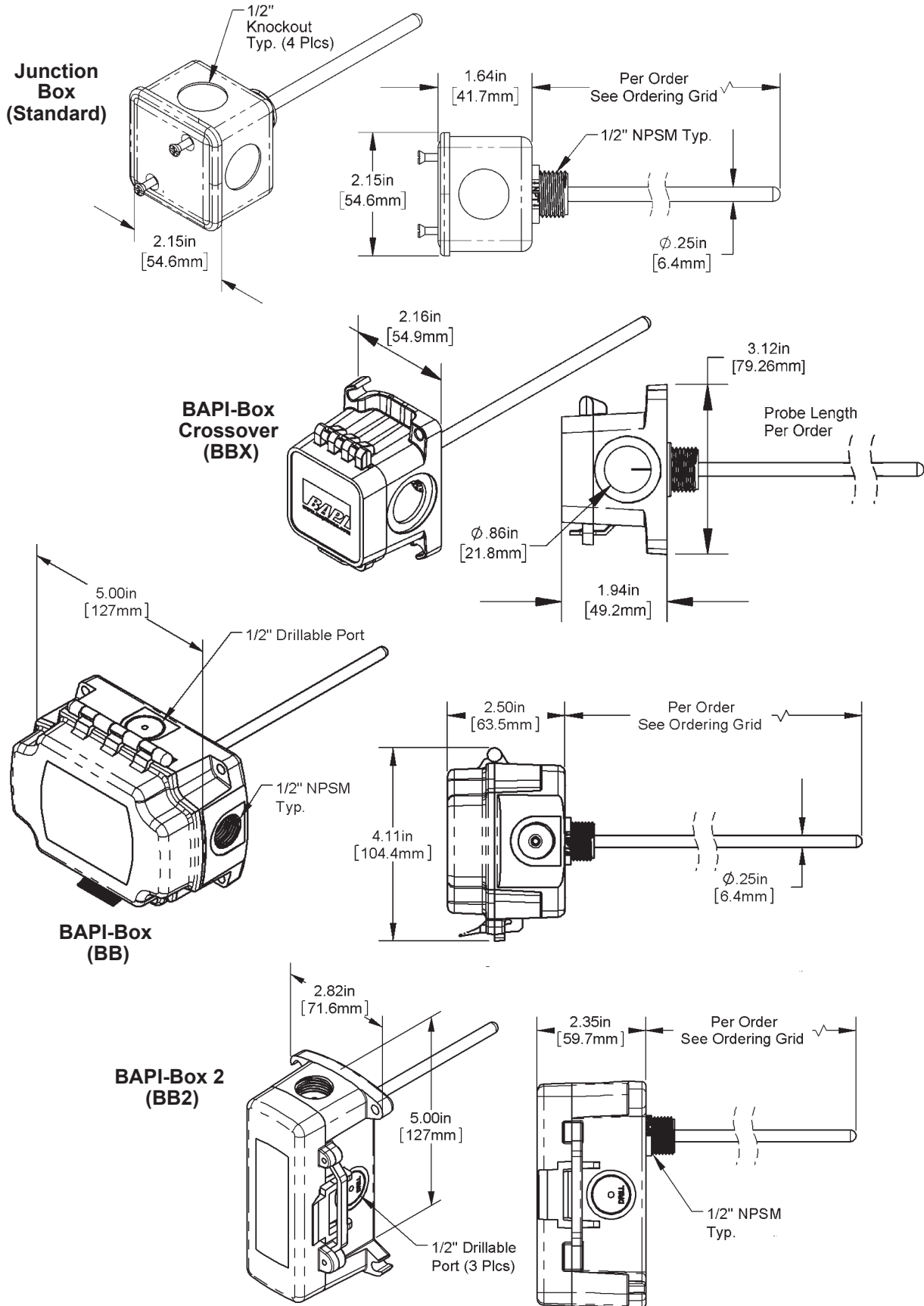


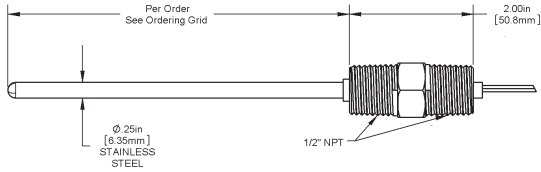


Immersion Probes w/ nylon fitting Enclosures

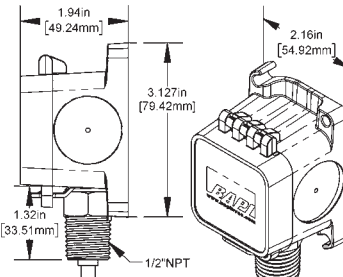
Rev. 05/17/23

Temperature Sensors

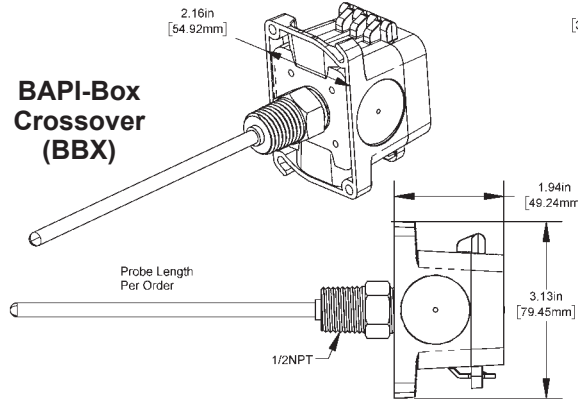




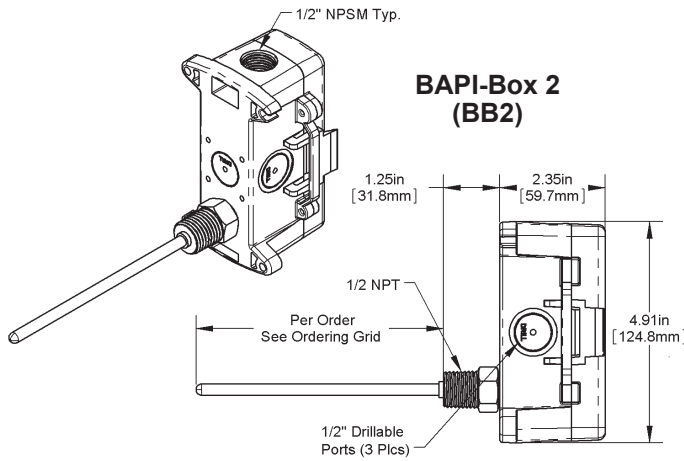
Probe without Enclosure



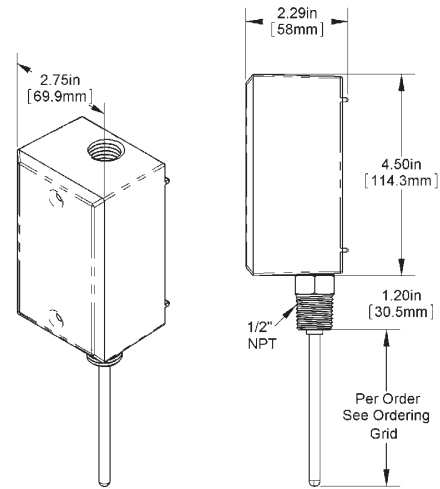
BAPI-Box Crossover (BBX)



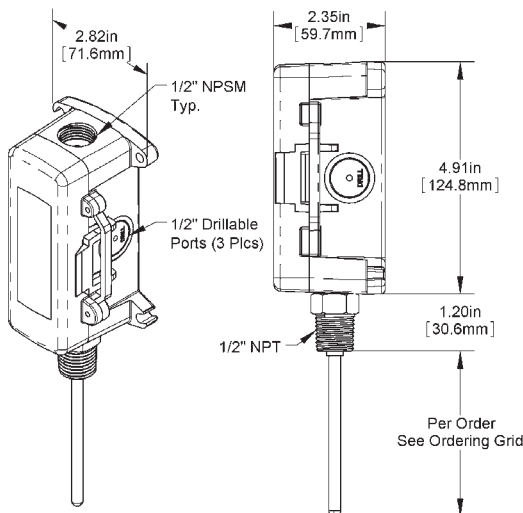
BAPI-Box Crossover "Outside Mount" (BBXO)



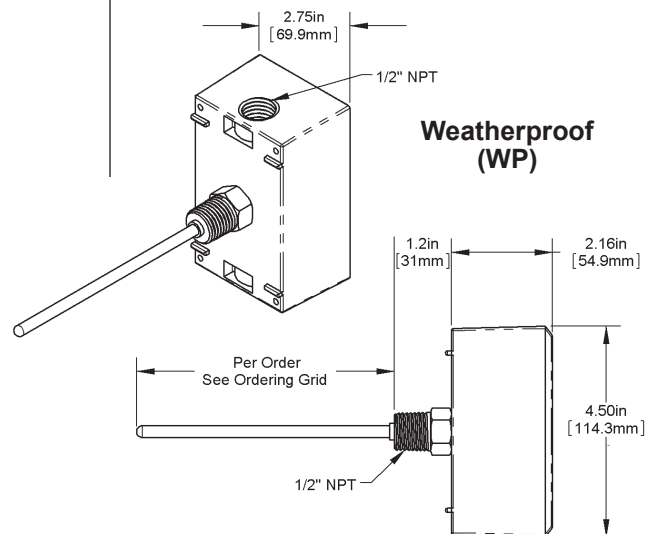
BAPI-Box 2 (BB2)



Weatherproof "Outside Mount" (WPO)

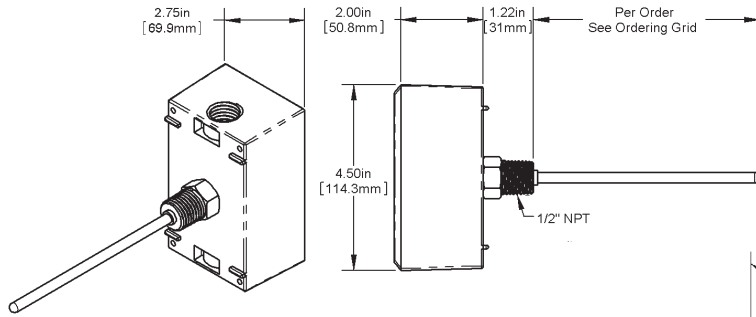


BAPI-Box 2 "Outside Mount" (BB2O)



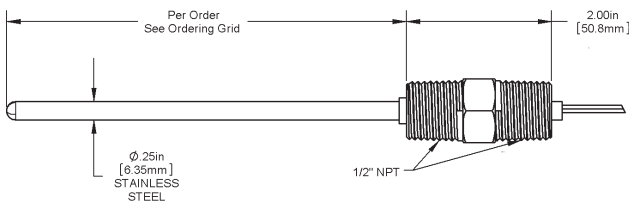
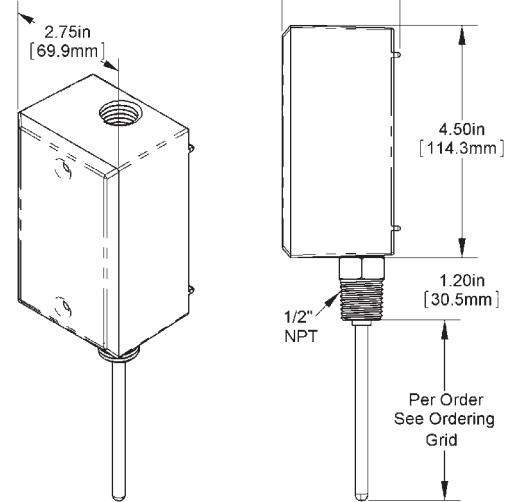
Weatherproof (WP)



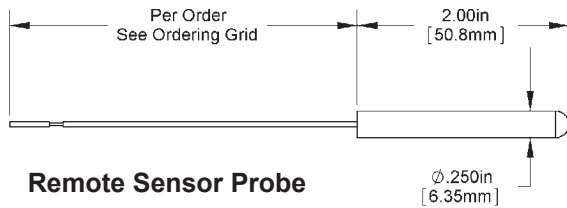


Immersion Weatherproof Standard Mount (WP)

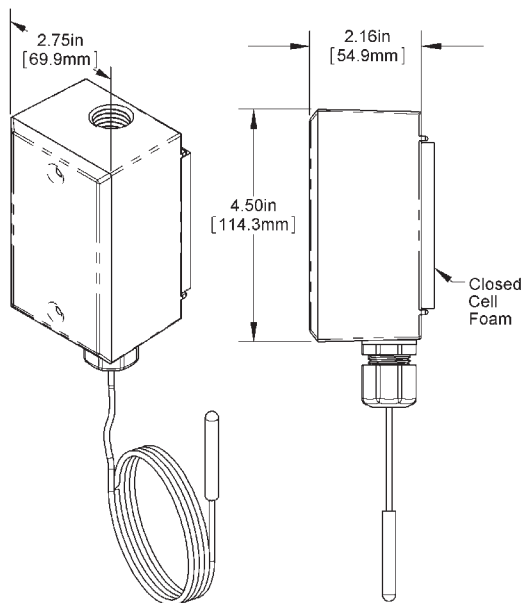
Immersion Weatherproof Outside Mount (WPO)



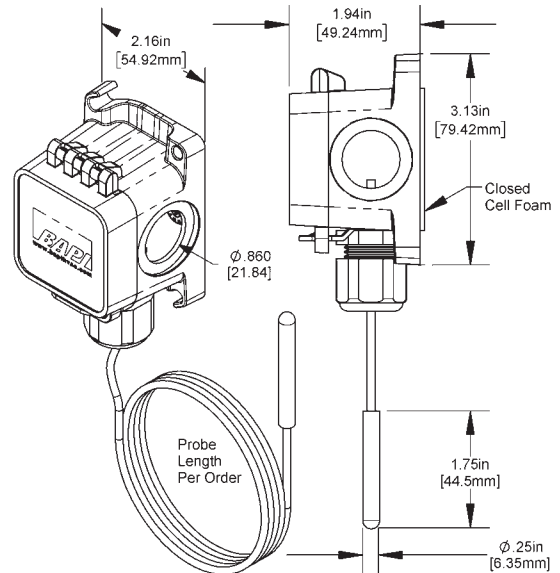
Immersion Probe without Enclosure



Remote Sensor Probe



Remote Weatherproof (WP)

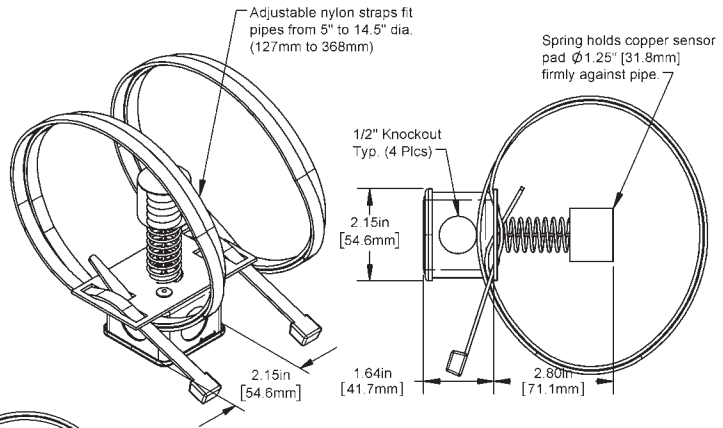


BAPI-Box Crossover (BBX)

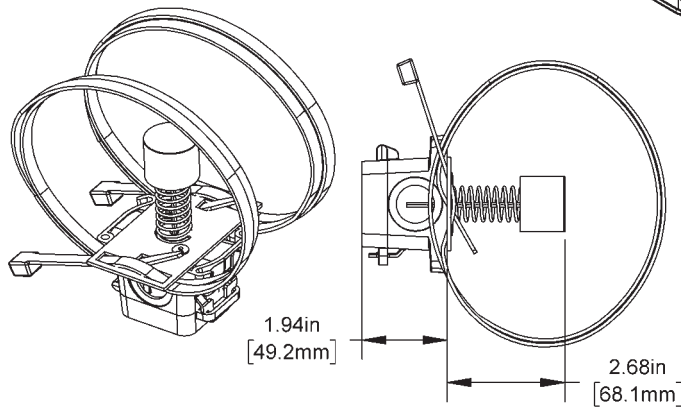




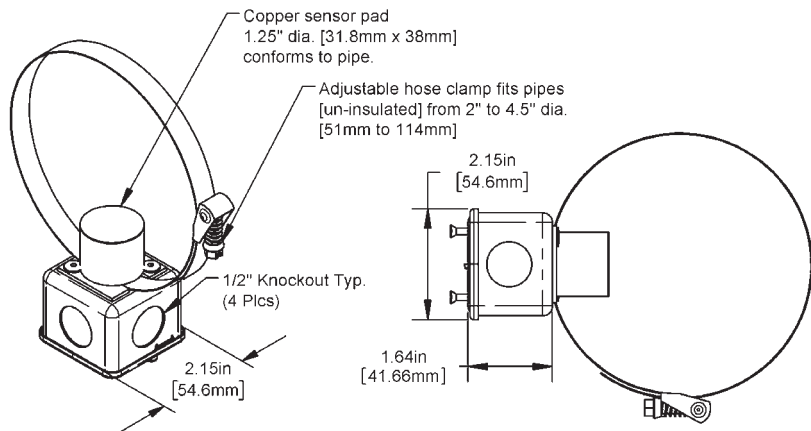
Spring-Loaded Strap Junction Box (JB)



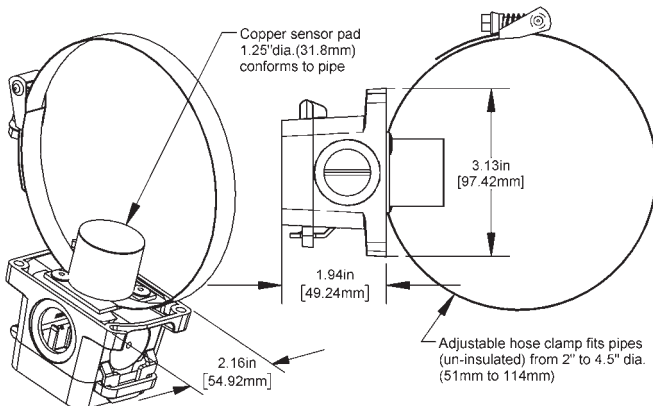
Spring-Loaded Strap BAPI-Box Crossover (BBX)



Clamp-On Strap Junction Box (JB)



Clamp-On Strap BAPI-Box Crossover (BBX)



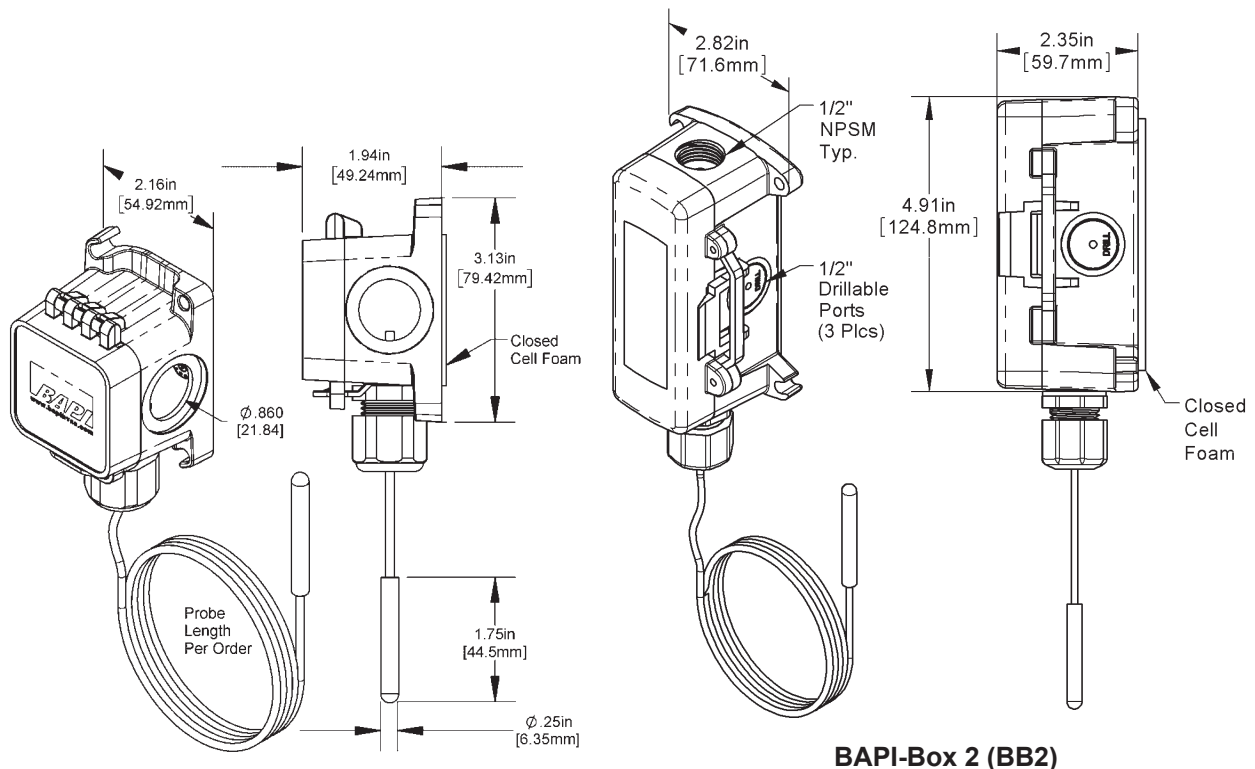
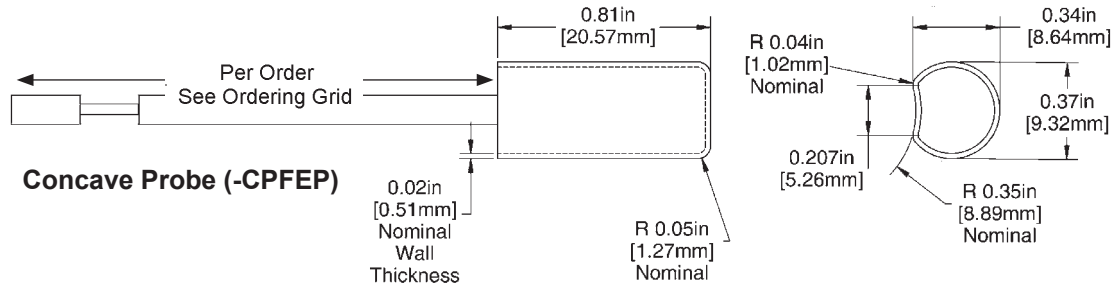
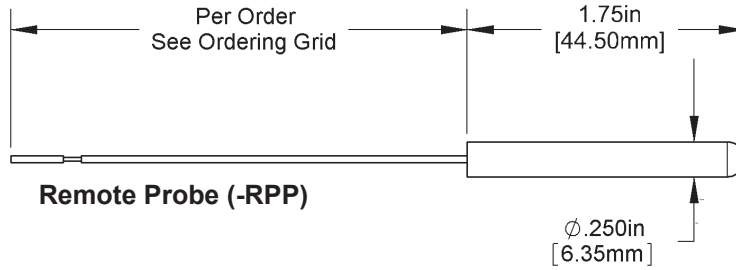
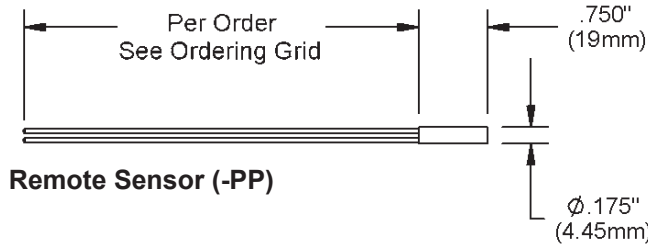


Remote & Concave Sensors & Probes

B71

Rev. 01/21/19

Temperature Sensors



BAPI-Box Crossover (BBX)

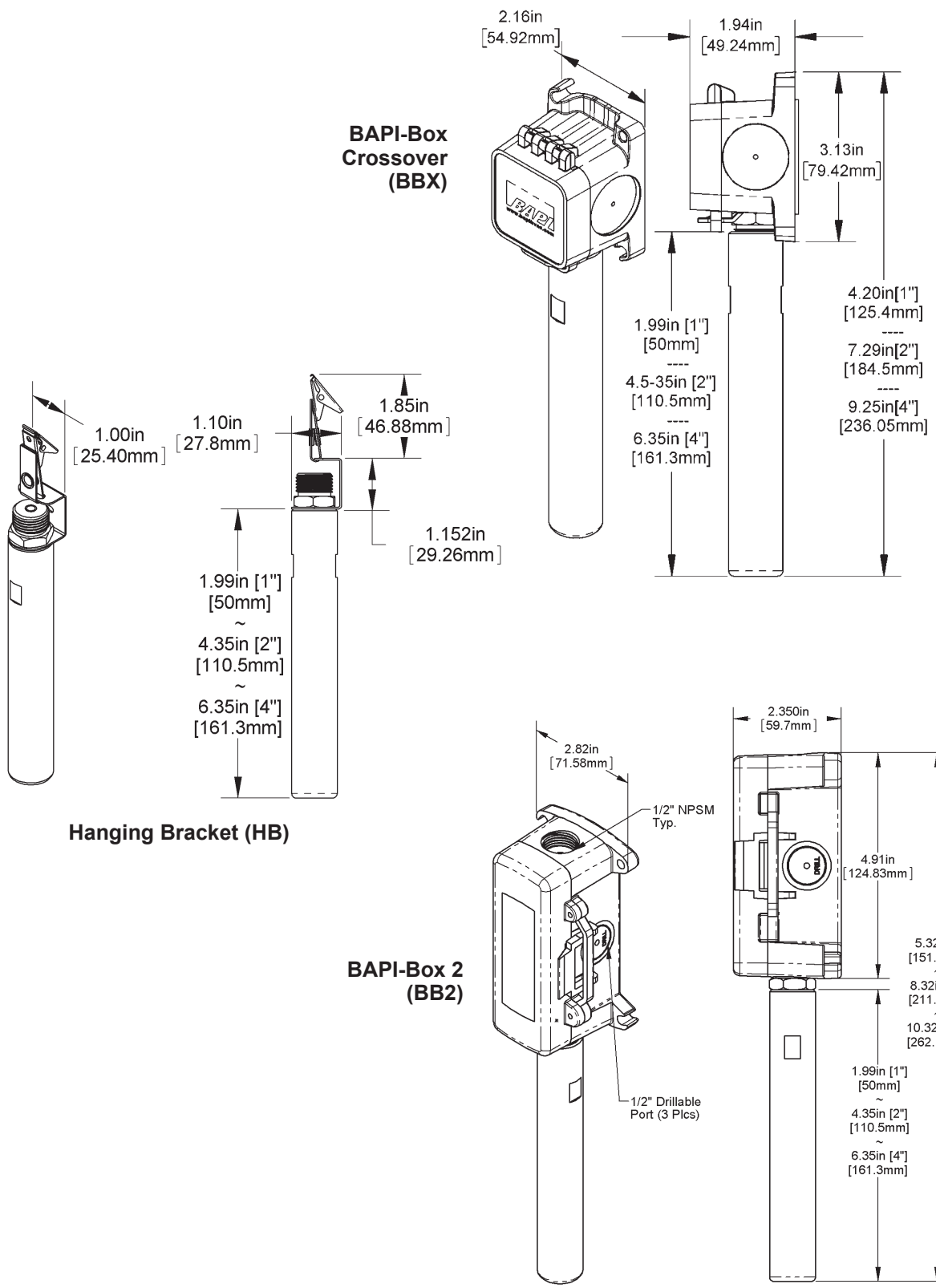
BAPI-Box 2 (BB2)



B72 Thermobuffer Units

Temperature Sensors

Rev. 01/21/19





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



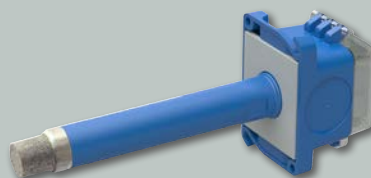
pg C12

Outside Air
in the BAPI-Box 2
Enclosure



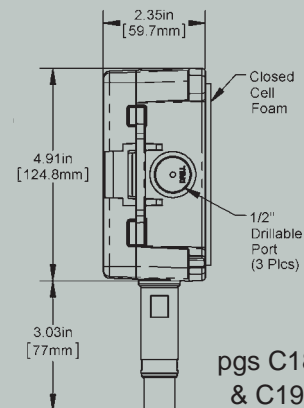
pg C14

Duct Sensor
in the BAPI-Box
Crossover



pg C16

Dimension Drawings
for Outside Air and Duct
Units





Features & Options

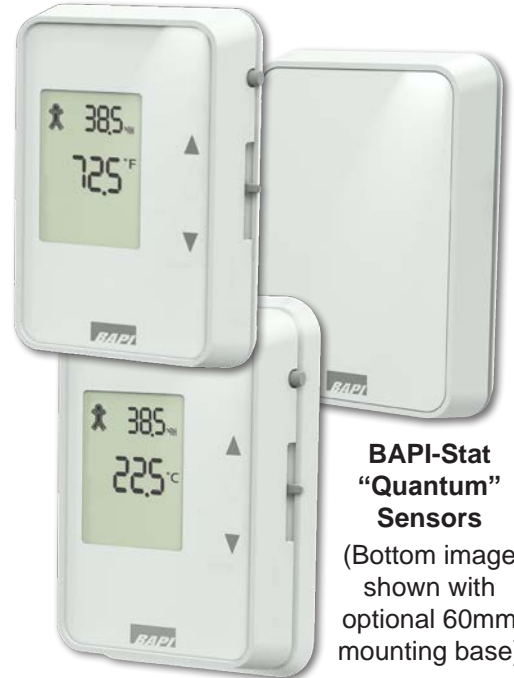
- Optional Temperature Setpoint Adjustment and Occupant Override
- Temp, Humidity and Room Occupancy Status Display
- Higher Contrast Display for Improved Clarity at Greater Distances

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.



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)

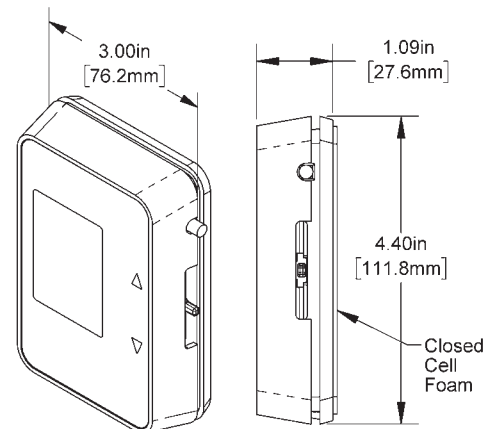
Environmental Operation Range:

32 to 122 °F (0 to 50 °C) • 0 to 95%, non-condensing

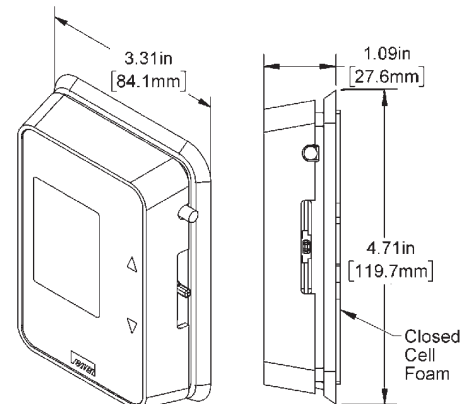
Material & Rating: ABS Plastic, UL 94, V-0

Agency: 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)





BAPI-Stat "Quantum" Humidity Sensors

Humidity or Combination Temp/Humidity Sensors

Submittal sheets without List Prices are available on our website at www.bapivac.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. 14.

**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.bapivac.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/



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,
 $\pm 2\%RH @ 25^{\circ}C (77^{\circ}F)$, 20 to 80%RH

Temp: Semi-conductor Band Gap,
 $\pm 0.3^{\circ}C (\pm 0.54^{\circ}F) @ 20$ to $40^{\circ}C (68$ to $104^{\circ}F)$

Field Calibration Adjustment:

$\pm 5\%$ in 0.1% increments (Factory Calibrated)

Optional Passive Temperature Sensor Accuracy:

$\pm 0.36^{\circ}F$ Thermistor, $\pm 0.5^{\circ}F$ RTD
 (Higher accuracy available)

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

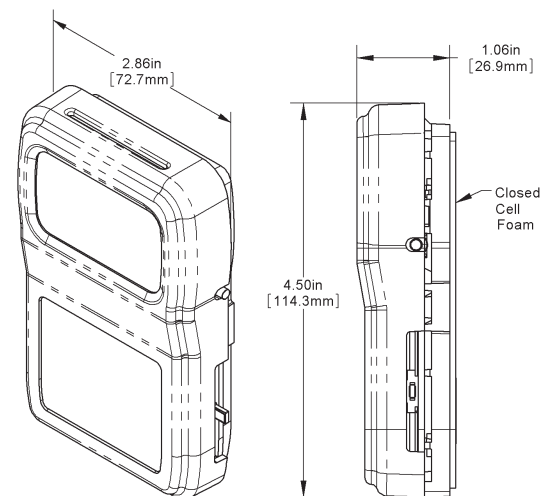
Mounting: Standard 2"x4" J-box or drywall mount
 - screws provided

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.



BAPI-Stat 4™ Style Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

C5

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 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)	\$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)

H220	4 to 20mA Output	\$260
H205	0 to 5V Output	\$260
H210	0 to 10V Output	\$260
H212	2 to 10V Output	\$260

#3: Display and Indication (required)

B4DF	Temperature Displayed in °F	\$35
B4DC	Temperature Displayed in °C	\$35
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	\$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

#6: Setpoint Legend (required)

L6	Cool/Warm
L0	No Legend

#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
Z	No Override	

#8: Communication Jack (optional)

C35L	3.5mm Phono Style Jack	\$10
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#9: Common Ground (required)

CG	Common Ground
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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

List Price:

\$18 (Thermistor) + \$260 (Humidity) + \$35 (Display) + \$6 (Setpoint) + \$5 (Override) = \$324 List Price

Your Number: BA/





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.

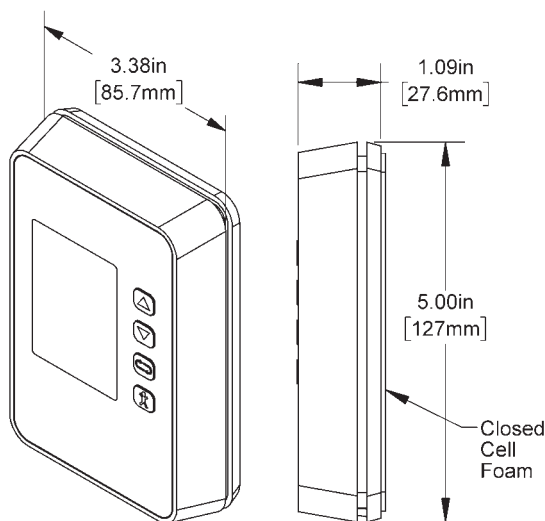
This unit can be configured with up to four transmitted variables. Contact your BAPI representative for details.

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

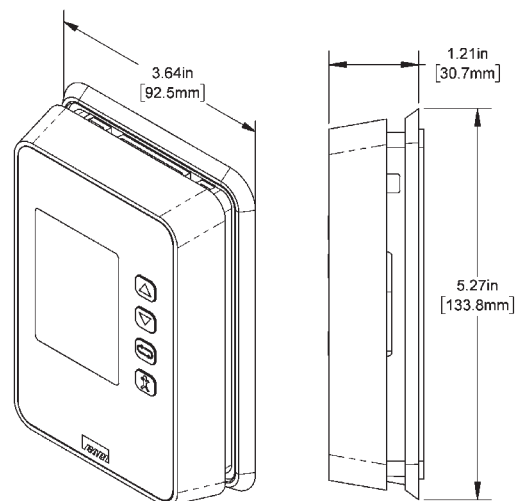


BAPI-Stat "Quantum Prime" Temp & Humidity Sensor
(image at right shown with optional 60mm mounting base)

Dimensions



Unit with Standard Mounting Base



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



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:

60 mA max DC 4 to 20 mA Output (<30mA typical)

36 mA max DC 0 to 5 or 0 to 10 VDC Outputs (6mA typical)

0.9 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 122°F (0 to 50°C)

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: 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.





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.

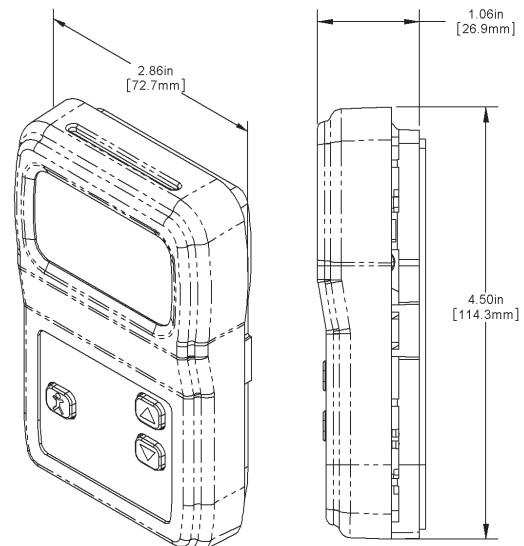
**BAPI recommends that you do not run wiring for the room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.

Ambient (Enclosure):

Temperature: . 32 to 122°F (0 to 50°C)

Humidity: 0 to 95%RH, Non-Cond.

Agency: RoHS





BAPI-Stat 4 “X-Combo” Temp/Humidity Unit

Humidity or Combination Temp/Humidity Sensors

C9

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





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.

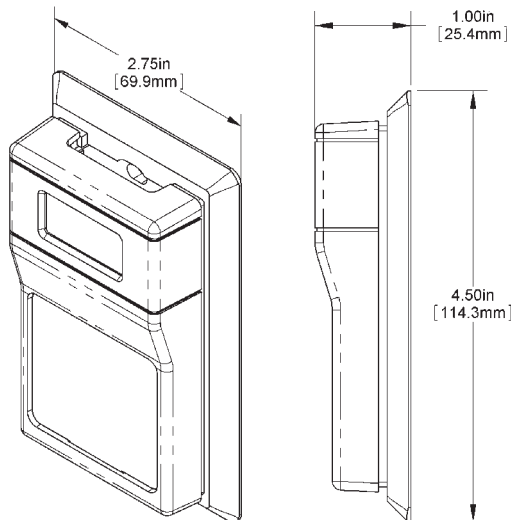
Mounting: 2"x4" J-box or drywall mount - screws provided

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





Delta Style Room Humidity Units

C11

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)

	<u>List Price</u>
#1: Temperature Sensor (optional)	
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/





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.

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.



5
YEAR
WARRANTY

BAPI-Stat
4MB
Units

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: $\pm 0.3^{\circ}\text{C}$ @ 20 to 40 $^{\circ}\text{C}$ (68 to 104 $^{\circ}\text{F}$)

%RH: $\pm 2\%$ RH @ 25 $^{\circ}\text{C}$ (77 $^{\circ}\text{F}$), 20 to 80%RH

Wiring: 2 pair of 14 to 22 AWG*

Mounting:

Standard 2" by 4" J-box

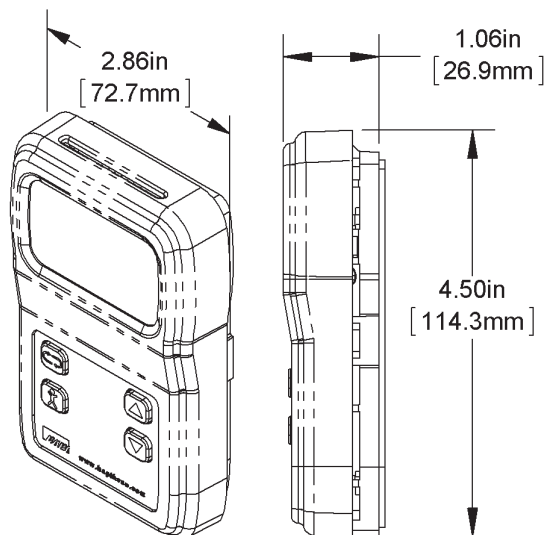
or drywall mount (screws provided)

Environmental Operation Range:

Temperature: 32 to 122 $^{\circ}\text{F}$ (0 to 50 $^{\circ}\text{C}$)

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.





BAPI-Stat 4 Modbus Room Sensor

C13

Humidity or Combination Temp/Humidity Sensors

Submittal sheets without List Prices are available on our website at www.bapivac.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 Modbus Sensor Option Selection Guide:

BA/BS4MB(#1) - (#2) - (#3) - (#4) - (#5)

#1: Display (required)

List Price

F	Display with Temperature in °F	\$130
C	Display with Temperature in °C	\$130
X	No Display	\$130

#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	\$150

#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.bapivac.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.

List Price: \$130 (Base Price) + \$150 (Humidity) = \$280 List Price

Your Number: BA/





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 maxFor units with 0 to 5 or 1 to 5 VDC or 4 to 20 mA Humidity Outputs
- 15 to 35 VDC, 6 mA maxFor units with 0 to 10 or 2 to 10 VDC Humidity Output
- 12 to 27 VAC, 0.53 VA maxFor units with 0 to 5 or 1 to 5 VDC Humidity Outputs
- 15 to 27 VAC, 0.14 VA maxFor units with 0 to 10 or 2 to 10 VDC Humidity Output

Enclosure Dimensions:

H x W x D

- BAPI-Box5 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 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

Enclosure Rating: IP66, NEMA 4





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
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
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)

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
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*Voltage outputs are 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/



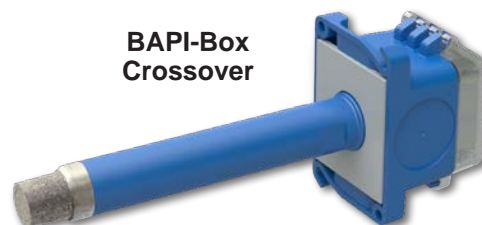


Features & Options

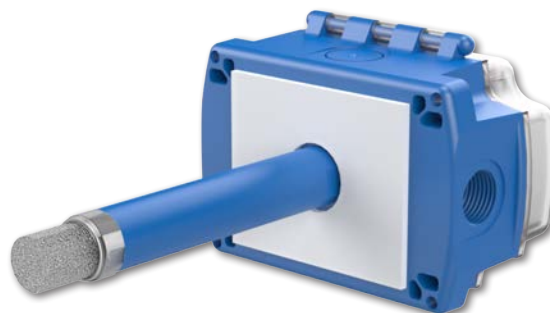
- 10 Points of Calibration from 10 to 90% RH
- Humidity Only or Temp./Humidity Combination
- Replaceable Stainless Steel Filter
- Green Power Indication LED on BAPI-Box Crossover Units
- $\pm 2\%$ and $\pm 3\%$ RH Accuracies

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 two of the most watertight enclosures available today. The BAPI-Box 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.



BAPI-Box Crossover



BAPI-Box



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 maxFor units with 0 to 5 or 1 to 5 VDC or 4 to 20 mA Humidity Output
 15 to 35 VDC, 6 mA maxFor units with 0 to 10 or 2 to 10 VDC Humidity Output
 12 to 27 VAC, 0.53 VA maxFor units with 0 to 5 or 1 to 5 VDC Humidity Output
 15 to 27 VAC, 0.14 VA maxFor 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-Box5 x 4.1 x 2.5" (127 x 104 x 63.5mm)

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

Sensor:

2% Humidity: Capacitive $\pm 2\%$ (10 to 80% RH @ 25°C)
 $\pm 3\%$ (80 to 90% RH @ 25°C)

3% Humidity: Capacitive $\pm 3\%$ (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: IP66, NEMA 4X

BAPI-Box Crossover Material:

Cover: Polycarbonate, UL94 V-0
 Base: Nylon, UL94 HB

BAPI-Box Material:

UV-resistant Polycarbonate, UL94 V-0

Environmental Operation Range:

Temperature: -40 to 158°F (-40 to 70°C)
 Humidity: 0 to 100% RH
 Fully Temperature Compensated





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 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-BB	BAPI-Box (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
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)

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
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**Voltage outputs are field selectable*

Example Number:

BA/(T1K)[32 TO 212F] - (H200) - (D-BB)

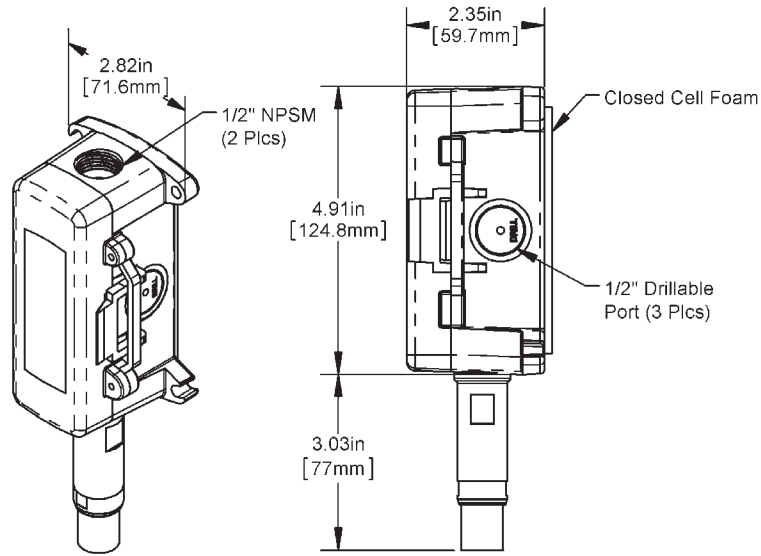
BA/T1K[32 TO 212F]-H200-D-BB (no parenthesis)

Description: Temperature Transmitter with 4 to 20mA Output and 32 to 212°F Range, ±2%RH with 4 to 20mA Output, BAPI-Box Enclosure

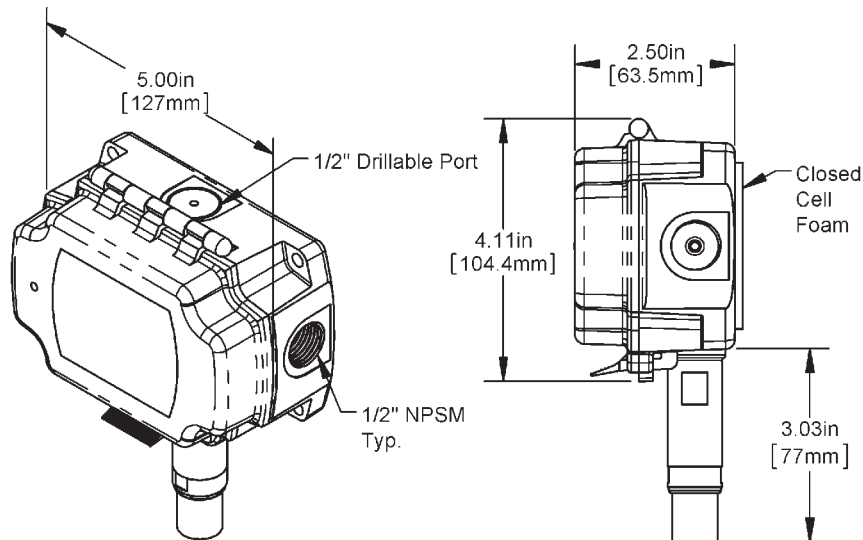
List Price: \$125 + \$240 + \$12 = \$377

Your Number: BA/

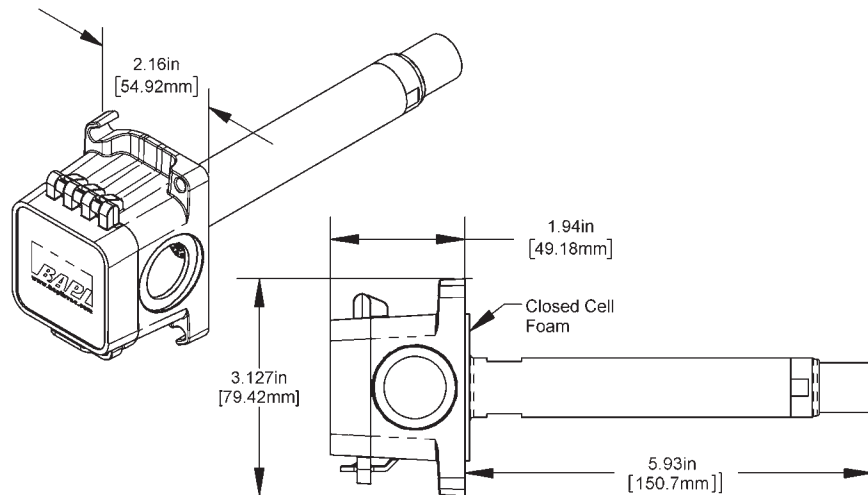
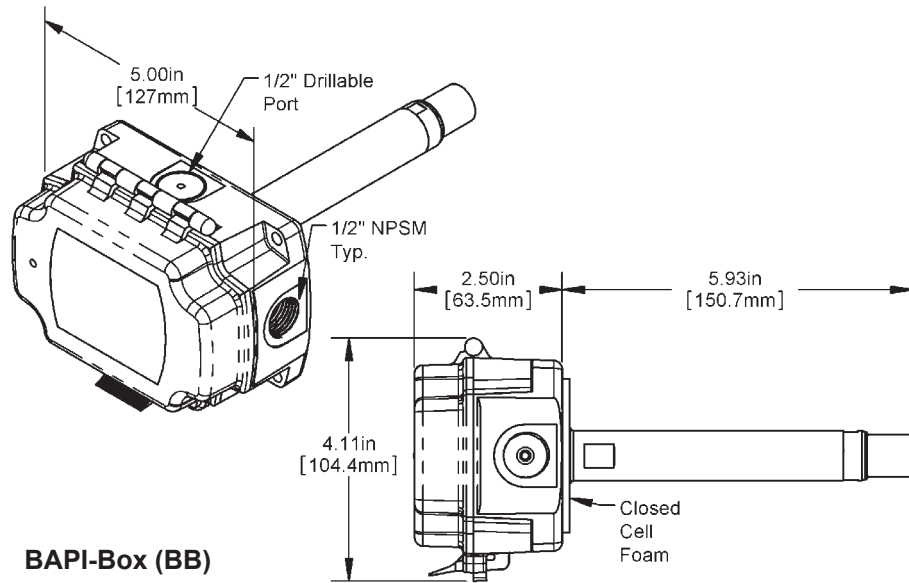




BAPI-Box 2 (BB2)








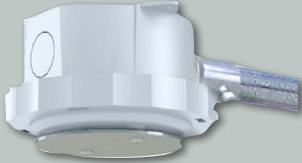
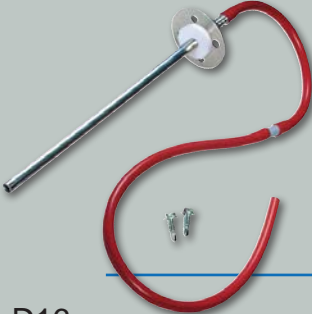



BAPI-Box (BB)



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<p>EZ Pressure Panel Mount with Low & Standard Ranges</p>  <p>pg D2</p>	<p>ZPM Pressure IP44-Rated Unit</p>  <p>pg D4</p>	
<p>ZPM BAPI-Box - Standard Accuracy $\pm 1\%$ IP66-Rated Unit</p>  <p>pg D6</p>	<p>ZPM BAPI-Box - Precision Accuracy $\pm 0.25\%$ IP66-Rated Unit</p>  <p>pg D8</p>	<p>Fixed Range Pressure Low & Standard Ranges</p>  <p>pg D10</p>
<p>Room Pressure Pickup Ports</p>  <p>pg D12</p>	<p>Ceiling and Wall Plate Pickup Ports</p>  <p>pg D14</p>	<p>Outside Air Pickup Port</p>  <p>pg D14</p>
<p>Pressure Probes and Accessories</p>  <p>pg D16</p>	<p>BAPI-Box Pressure Switch</p>  <p>pg D18</p>	<p>Beck Adjustable Pressure Switch</p>  <p>pg D20</p>





Features & Options

- 10 Pressure Ranges & Three Outputs – All Field Selectable
- Standard Range and Low Range Models (-5 to +5 WC or -1,250 to +1,250 Pascals) (-1.0 to +1.0 WC or -250 to +250 Pascals)
- About 1/3rd the Size of Field Mount Pressure Sensors to Save Panel Space



- NIST 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



Specifications

Power:

7 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 850 Ω Maximum @ 24 VDC
 0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC Output 6Ω min.

System Accuracy: ±0.25% FS at 72°F (22°C) for all units

Low Range Unit: ±0.005" WC (±1.24 Pa)
 Standard Range Unit: ±0.025" WC (±6.22 Pa)

Stability: ±0.25% F.S. per year

Overpressure:

Low Range: Proof: 100" WC (3.6 PSI)
 Burst: 300" WC (10.82 PSI)
 Standard Range: Proof: 200" WC (7.21 PSI)
 Burst: 300" WC (10.82 PSI)

Media: Clean, dry, non-corrosive gases

Compensated Temperature Range:

32 to 122°F (0 to 50°C)

Environmental Operating Range:

14°F to 140°F (-10°C to 60°C)

Storage Temp.: -40 to 203°F (-40 to 95°C)

Humidity: 0 to 95% RH, non-condensing

Wiring:

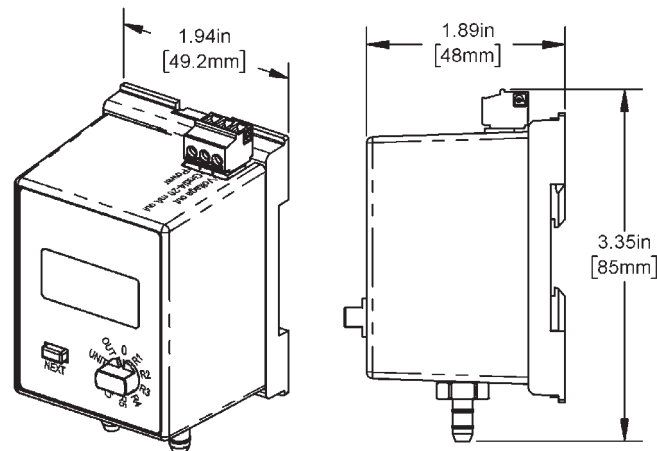
Removable terminal block (14 to 24 AWG)*
 2 wires (4 to 20mA Current loop)*
 3 wires (AC or DC powered, Voltage out)*

Port Size: 1/4" barb (1/8" to 3/16" I.D.)

Enclosure Material: ABS Plastic, UL94 V-0

Mounting: DIN Rail, Snaptrack or Surface

Agency: RoHS, UL



*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.





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

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)		#2: Pressure Range continued...
#1: Pressure Output (required)		STANDARD RANGES
20..... 4 to 20 mA		<u>WC Ranges</u>
05..... 0 to 5 V		<u>Pascal Ranges</u>
15..... 1 to 5 V		SR71.. 0 to 1.00
10..... 0 to 10 V		SR72.. 0 to 2.00
12..... 2 to 10 V		SR73.. 0 to 2.50
		SR74.. 0 to 3.00
		SR75.. 0 to 5.00
		SR76.. -1.00 to 1.00
		SR77.. -2.00 to 2.00
		SR78.. -2.50 to 2.50
		SR79.. -3.00 to 3.00
		SR80.. -5.00 to 5.00
		SR81..... 0 to 250
		SR82..... 0 to 300
		SR83..... 0 to 500
		SR84..... 0 to 1,000
		SR85..... 0 to 1,250
		SR86..... -250 to 250
		SR87..... -300 to 300
		SR88..... -500 to 500
		SR89.. -1,000 to 1,000
		SR90.. -1,250 to 1,250
#2: Pressure Range (required)		#3: Static Pressure Tube (required)
LOW RANGES		EZ-NT .. No Tube included
<u>WC Ranges</u>	<u>Pascal Ranges</u>	EZ-ST .. Static Pressure Tube included
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	
		<i>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</i>

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-





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
- Outputs, Ranges and Units all Easily Set in the Field Without Power
- NIST Certificate Available at No Extra Charge
- Thumb Latch Closure - No Cover 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.



Ranges and Outputs Can Be Set Easily Without Powering the Unit. Just Open the Hinged Cover.



ZPM Pressure Sensor



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 6K Ω Minimum

System Accuracy: $\pm 0.25\%$ FS at 72°F (22°C) for all units

Low Range Unit: ± 0.005 " WC (± 1.24 Pa)
Standard Range Unit: ± 0.025 " WC (± 6.22 Pa)
High Range Unit: ± 0.075 " WC (± 18.66 Pa)

Stability: $\pm 0.25\%$ FS per year

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

Compensated Temperature Range:

32 to 122°F (0 to 50°C)

Environmental Operating Range:

-4 to 140°F (-20 to 60°C)

Storage Temperature:

-40 to 185°F (-40 to 85°C)

Humidity: 0 to 95% RH, non-condensing

Wiring:

2 wires (4 to 20mA Current loop)
3 wires (AC or DC powered, VDC output)

Port Size: 1/4" barb

Enclosure Material:

UV-resistant Polycarbonate, UL94 V-0

Enclosure Rating: 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 dimension drawing.)

Agency:

CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL, RoHS





ZPM Pressure Sensor

Zone Pressure Multi-Sensors (ZPM)

D5

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





Features & Options

- 10 Pressure Ranges and 3 Output Options
- Standard, Low and High Range Models
- Non-Flow-Through Sensor



ZPM BAPI-Box



- IP66-rated Enclosure with Hinged Cover
- NIST 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



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

System Accuracy: ±1.0% FS, 32 to 104°F (0 to 40°C)

Accuracy Low Range: ±0.02” WC (±4.98 Pa)
 Accuracy Standard Range: ±0.1” WC (±24.9 Pa)
 Accuracy High Range: ±0.3” WC (±74.65 Pa)

Temp Hysteresis & Stability: ±1% FS per year

Field Selectable Outputs:

4 to 20 mA, 0 to 5 V, 0 to 10 V

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)

Compensated Temp. Range:

32 to 122°F (0 to 50°C)

Environmental Operating Range:

Temp: -4 to 140°F
 (-20 to 60°C)

Humidity: 0 to 95% RH, non-condensing

Storage Temp: -40 to 185°F (-40 to 85°C)

Media: Clean, dry, non-corrosive gases

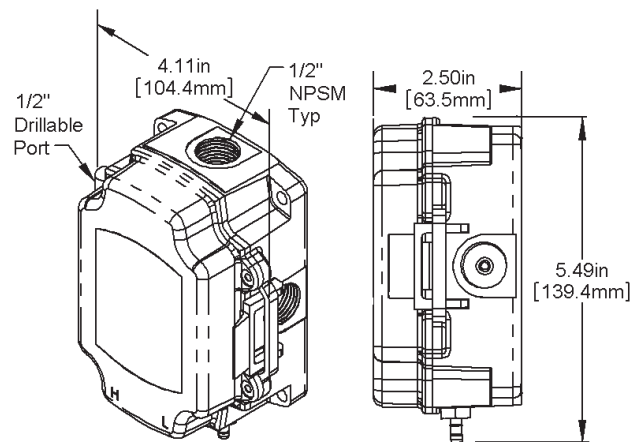
Wiring: 3 wires (2 wires for 4 to 20mA output)

Encl. Material: UV-resist. Polycarb., UL94 V-0

Enclosure Rating: IP66, NEMA 4

Port Size: 1/4” barb

Agency: CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL, RoHS



HIGH RANGES	
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

LOW RANGES	
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

STANDARD RANGES	
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





ZPM BAPI-Box - Standard Accuracy ±1%

D7

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

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>LIST PRICE</u>
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.





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 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

System Accuracy: ±0.25% FS at 72°F (22°C)
 Accuracy Low Range: ±0.005" WC (±1.24 Pa)
 Accuracy Standard Range: ±0.025" WC (±6.22 Pa)
 Accuracy High Range: ±0.075" WC (±18.66 Pa)

Temp Hysteresis & Stability: ±0.25% FS per year

Field Selectable Outputs:

4 to 20 mA, 0 to 5 V, 1 to 5 V, 0 to 10 V, 2 to 10 V

Load Resistance:

4 to 20 mA Output: 850Ω Maximum @ 24 VDC
 Voltage Output: 6KΩ Minimum

Overpressure:

Low Range: Proof 270" WC (67 kPa)
 Standard Range: Proof 300" WC (74 kPa)
 High Range: Proof 350" WC (87 kPa)

Compensated Temp. Range:

32 to 122°F (0 to 50°C)

Environmental Operating Range:

Temp: -4 to 140°F (-20 to 60°C)
 Humidity: 0 to 95% RH, non-condensing

Storage Temp: -40 to 185°F (-40 to 85°C)

Media: Clean, dry, non-corrosive gases

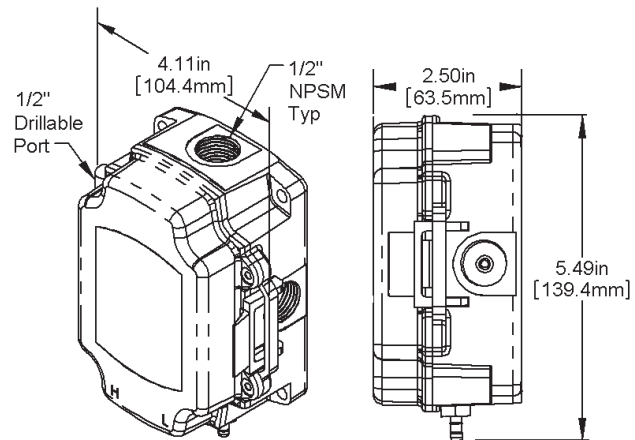
Wiring: 3 wires (2 wires for 4 to 20mA output)

Encl. Material: UV-resist. Polycarb., UL94 V-0

Enclosure Rating: IP66, NEMA 4

Port Size: 1/4" barb

Agency: CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL, RoHS



HIGH RANGES	
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

LOW RANGES	
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

STANDARD RANGES	
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





ZPM BAPI-Box - Precision Accuracy $\pm 0.25\%$

D9

Zone Pressure Multi-Sensor (ZPM) in an IP66 enclosure

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

Precision Accuracy ($\pm 0.25\%$) Unit Ordering Information

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>LIST PRICE</u>
STANDARD RANGE UNITS		
BA/ZPM-SR-NT-D-BB	Standard Range, No Probe included, with Display, $\pm 0.25\%$ Accuracy.....	\$425
BA/ZPM-SR-ST-D-BB	Standard Range, Static Probe and Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-SR-AT-D-BB	Standard Range, Attached Static Probe and Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-SR-NT-ND-BB ...	Standard Range, No Probe included, No Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-SR-ST-ND-BB ...	Standard Range, Static Probe, No Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-SR-AT-ND-BB ...	Standard Range, Attached Static Probe, No Display, $\pm 0.25\%$ Accuracy	\$425
LOW RANGE UNITS		
BA/ZPM-LR-NT-D-BB	Low Range, No Probe included, with Display, $\pm 0.25\%$ Accuracy.....	\$425
BA/ZPM-LR-ST-D-BB	Low Range, Static Probe and Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-LR-AT-D-BB	Low Range, Attached Static Probe and Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-LR-NT-ND-BB ...	Low Range, No Probe included, No Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-LR-ST-ND-BB ...	Low Range, Static Probe, No Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-LR-AT-ND-BB ...	Low Range, Attached Static Probe, No Display, $\pm 0.25\%$ Accuracy	\$425
HIGH RANGE UNITS		
BA/ZPM-HR-NT-D-BB	High Range, No Probe included, with Display, $\pm 0.25\%$ Accuracy.....	\$425
BA/ZPM-HR-ST-D-BB	High Range, Static Probe and Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-HR-AT-D-BB	High Range, Attached Static Probe and Display, $\pm 0.25\%$ Accuracy	\$425
BA/ZPM-HR-NT-ND-BB ...	High Range, No Probe included, No Display, $\pm 0.25\%$ Accuracy.....	\$425
BA/ZPM-HR-ST-ND-BB ...	High Range, Static Probe, No Display, $\pm 0.25\%$ Accuracy.....	\$425
BA/ZPM-HR-AT-ND-BB ...	High Range, Attached Static Probe, No Display, $\pm 0.25\%$ 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.





Patent Pending

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 Certificate Available at No Extra Charge
- Rugged IP66, NEMA 4 Enclosure with Hinged Cover
- Three Visible LEDs for Pressure Status at a Glance



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:

±1.0% FS, 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)

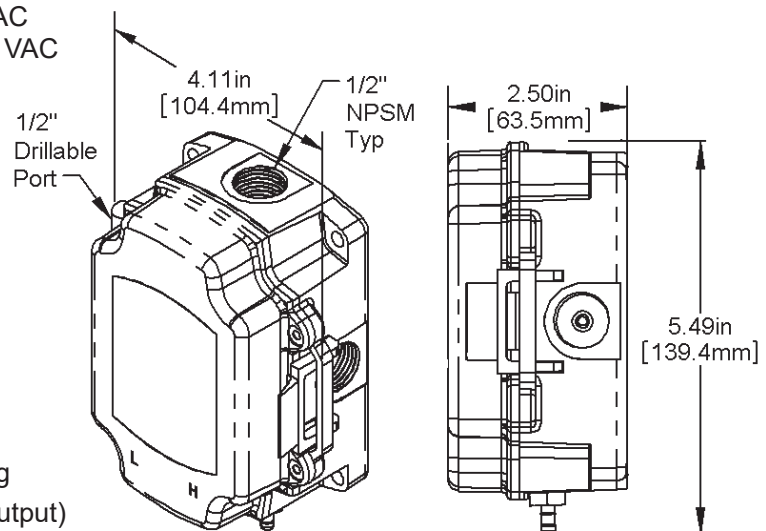
Port Size: 1/4" barb

Enclosure Material: UV-resistant Polycarb., UL94 V-0

Enclosure Rating: IP66, NEMA 4

Media: Clean, dry, non-corrosive gases

Agency: 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.





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

<u>WC Ranges</u>	<u>Pascal Ranges</u>
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

<u>WC Ranges</u>	<u>Pascal Ranges</u>
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.

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/ZPS-ACC07 ...	Static Pressure Probe Assembly	\$28





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



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

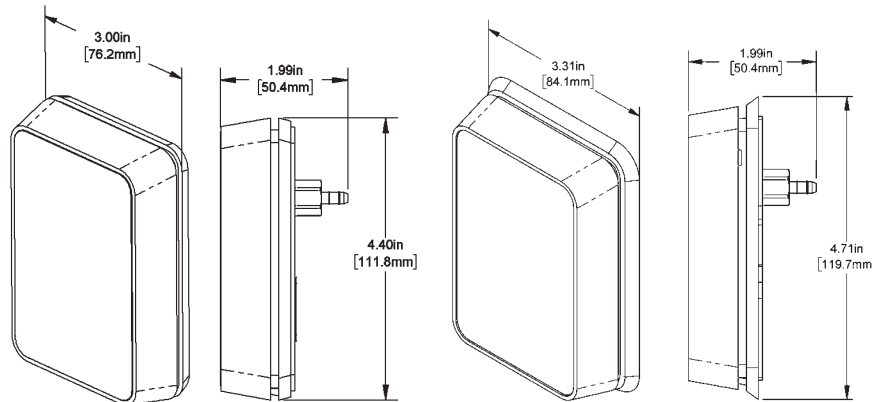
Low Profile Port: -40 to 185°F (-40 to 85°C) • 0% to 100% RH, non-condensing

Material:

Quantum, Delta Style & Low Profile:
ABS Plastic, UL 94, V-0

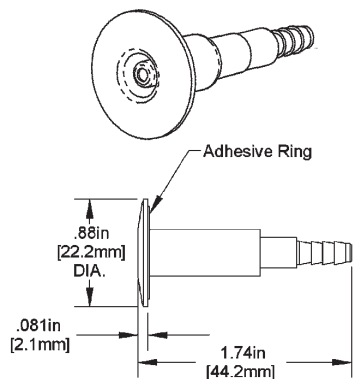
Wall Plate:
Stainless Steel

Ceiling Plate:
Galvanized Steel

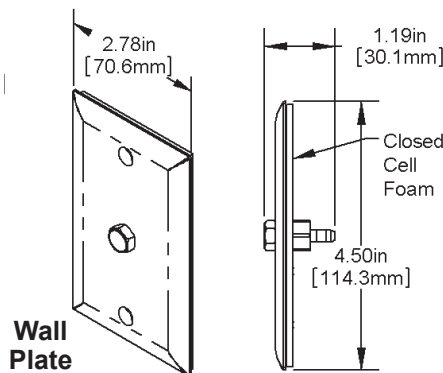


BAPI-Stat "Quantum" Enclosure
(with standard mounting base)

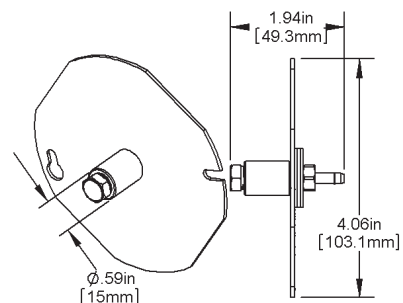
BAPI-Stat "Quantum" Enclosure
(with optional 60mm mounting base for European wall boxes)



Low Profile Port



Wall Plate



Ceiling Mount Cover





Zone Pressure Pickup Ports

D13

Zone Pressure Sensors (ZPS)

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.

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





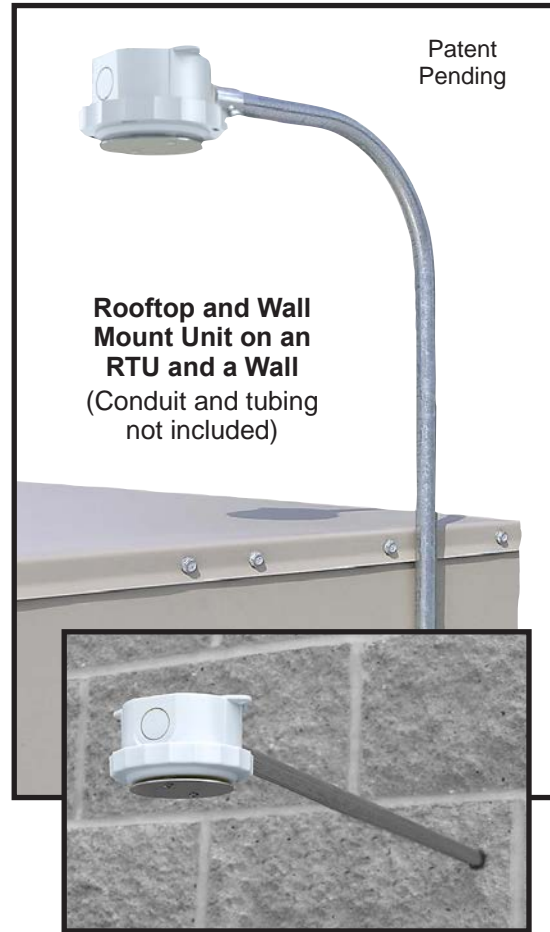
Features & Options

- 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.



Specifications

Environmental Operation Range:

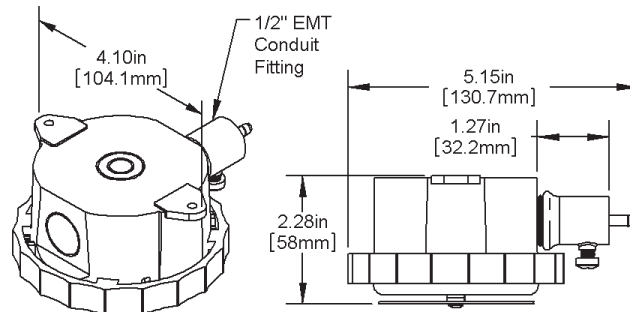
Temperature:
-40 to 212 °F
(-40 to 100 °C)

Humidity:
0% to 100% RH,
condensing

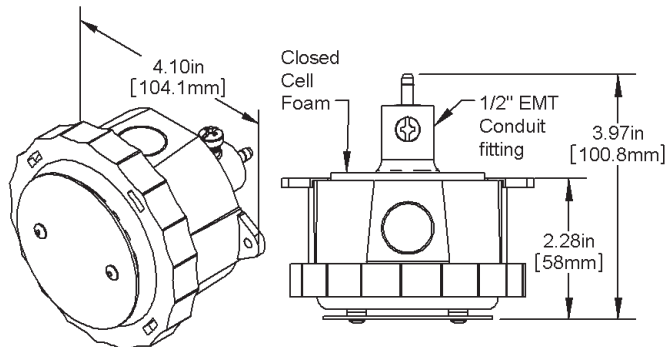
Material:

UV-resistant plastic

Rooftop and Wall Mount



Vertical Mount





Outside Air Pressure Pickup Port

D15

Zone Pressure Sensors (ZPS)

Datasheets without List Prices are available on our website at www.bapivac.com

Ordering Information

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>LIST PRICE</u>
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**

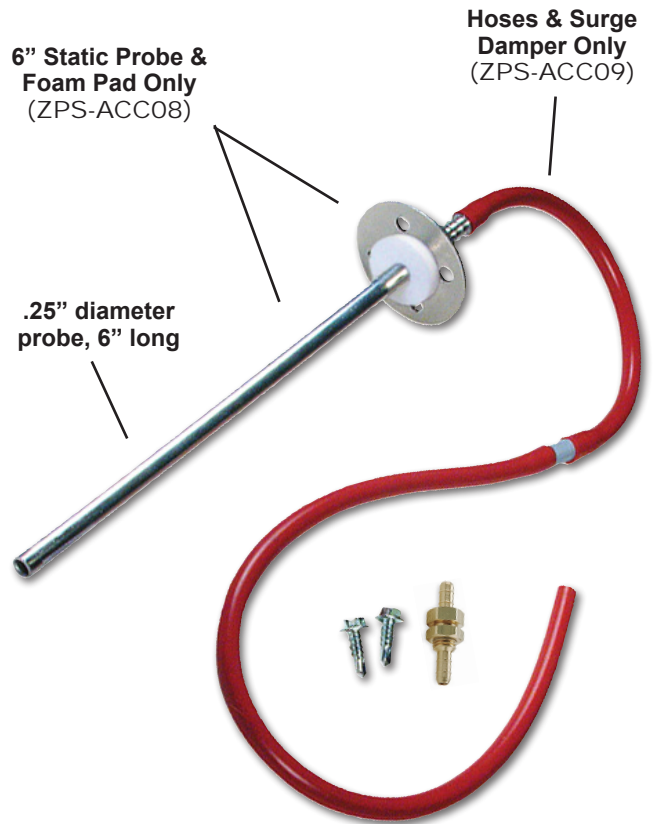
For more info, see pages D12-13





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)



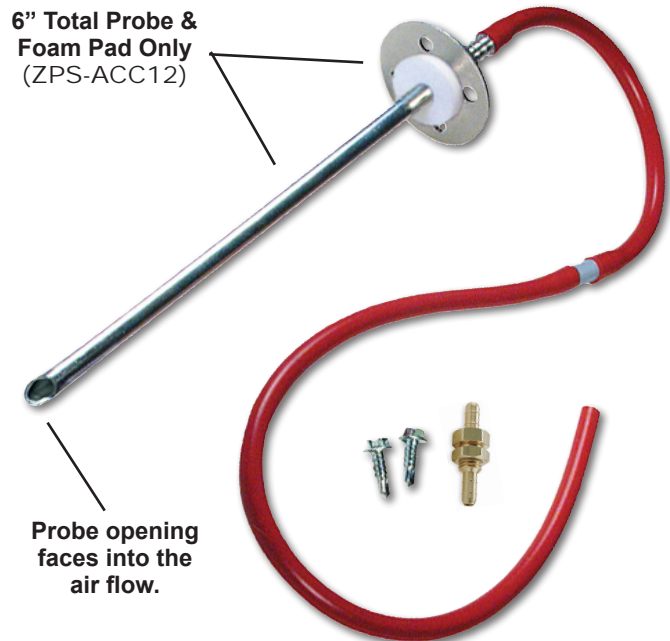
Surge Damper, 5 micron (ZPS-ACC15)



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)



Zone Pressure Probes & Accessories

D17

Zone Pressure Sensors (ZPS)

Datasheets without List Prices are available on our website at www.bapivac.com

Ordering Information

<u>PART #</u>	<u>DESCRIPTION</u>	<u>LIST PRICE</u>
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.





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.

The unit also features an extremely high proof pressure so that it will continue to function properly even if it is accidentally connected to an unusually high or low pressure.



Differential Pressure Switch



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)

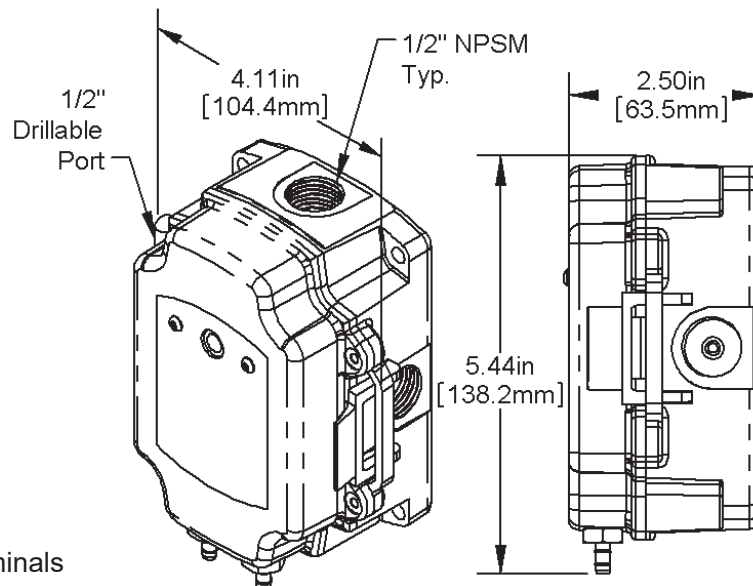
Repeatability:

<10% of Setting

Wiring:

1/4" (6.4mm) Quick-Disconnect Terminals

Agency: RoHS





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

Ordering Information

<u>PART #S</u>	<u>DESCRIPTION</u>	<u>LIST PRICE</u>
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





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

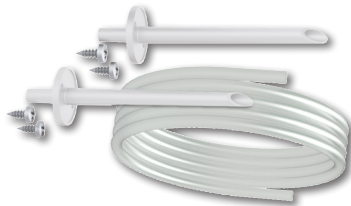


Beck Adjustable Pressure Switch



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: $\pm 15\%$, min. ± 0.04 " WC (± 10 Pa) • Drift: $\pm 15\%$

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

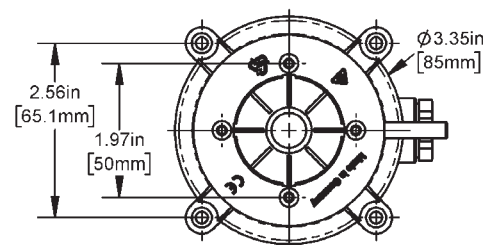
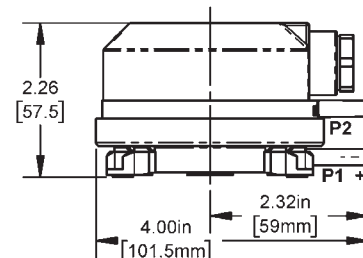
Electrical connections:

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





Beck Adjustable Pressure Switch

D21

Zone Pressure Sensors

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

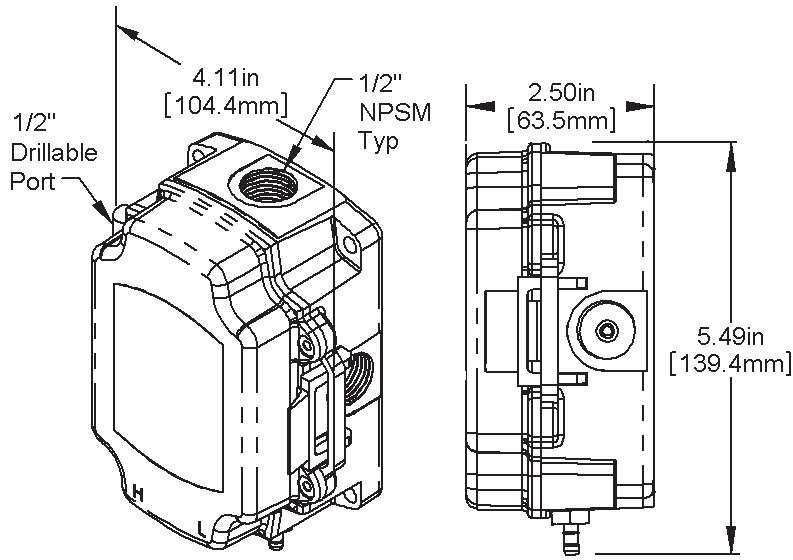
Ordering Information

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

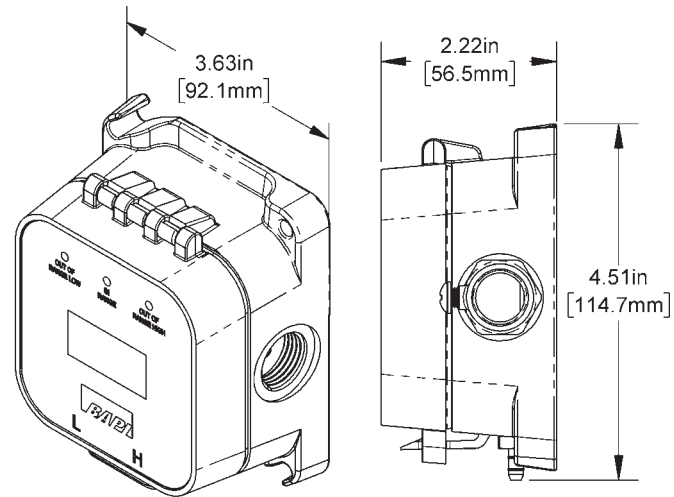


Gray shaded items follow the Buy and Resale Multiplier.

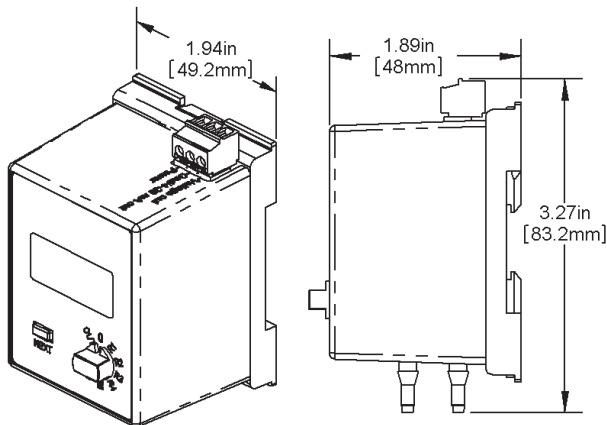




BAPI-Box Enclosure Units



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

CO₂ Sensors

with continuous automatic Barometric pressure compensation

Quantum Prime



pg E8

Quantum



pg E10

Duct & Rough Service



pg E12



Calibration Kit, pg E25

CO Sensors

for Room, Duct or Rough Service

BABI-Stat "Quantum"



pg E14

Duct and Rough Service



pg E16



Rough Service

pg E18

NO₂ Duct & Rough Service Sensor

pg E20



Particulate Sensors



pg E22 & 23

Refrigerant Leak Detector



pg E24

VOC and CO₂ Sensor White Papers and App. Notes - pages 27-37

- BAPI VOC Sensor Offers an Alternative to CO₂ for Demand Controlled Ventilation, pg 27
- Using the BAPI VOC Sensor for Demand Controlled Ventilation, pgs 28-32
- Calibration Methods for Single and Dual Beam CO₂ Sensors, pg 33
- Common VOCs Detected by BAPI's VOC Sensor, pgs 34-35
- The Effects of Temperature and Altitude on CO₂ Measurement, pgs 36-37





Features & Options

- VOC Alone or Temperature and Humidity Combination
- Achieves True Indoor Air Quality, Not Just CO₂ Dilution
- Output is Correlated to a CO₂ Value Allowing You to Ventilate Using ASHRAE's CO₂-Based VRP Algorithm

Humans respire Volatile Organic Compounds (VOCs) as well as CO₂. The BAPI sensor is able to measure these VOCs and indicate when a space is occupied just as well as a CO₂ 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 CO₂ 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 CO₂ equivalent level. This lets you use ASHRAE's CO₂-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: (No AC Power)

0 to 5 VDC Output Units:

9 to 35 VDC @ 50 mA Max (9 to 15 VDC recommended)

0 to 10 VDC Output Units:

15 to 35 VDC @ 50mA Max (15 VDC recommended)

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 CO₂ 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/CO₂ Equivalent Level:

Good, Green < 1,000 ppm

Fair, Yellow = 1,000 to 1,500 ppm

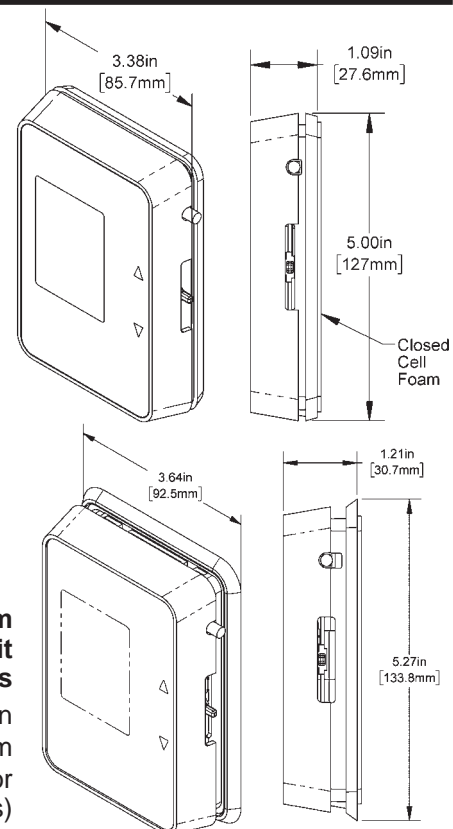
Poor, Red > 1,500 ppm

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)





VOC Room Sensor, BAPI-Stat "Quantum Prime"

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)

- FUnit with Display and °F indication ... \$35
- CUnit with Display and °C indication... \$35
- XUnit without Display

#2: VOC Output (required)

- AVOC 0 to 5V Output\$475
- BVOC 0 to 10V Output\$475

#3: Temperature Sensor (required)

- A1K Platinum RTD (385 curve)..... \$25
- B10K-2 Thermistor..... \$18
- C10K-3 Thermistor..... \$18
- D10K-3[11K] Thermistor..... \$18
- E20K Thermistor..... \$18
- F1.8K Thermistor..... \$18
- G1K Ω Nickel RTD \$65
- H3K Thermistor..... \$18
- XNo Temperature Sensor

#4: Humidity Output (required)

- A±2% Accuracy, Output of 0 to 5V..... \$80
- B±2% Accuracy, Output of 0 to 10V.... \$80
- XNo Humidity Output

#5: Setpoint Adjustment (required)

- 1.....Slider Setpoint Adjustment \$6
- XNo 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
- C50 to 90 °F or 10 to 32 °C
- D55 to 85 °F or 13 to 30 °C
- E60 to 80 °F or 15 to 27 °C
- F65 to 80 °F or 18 to 27 °C
- XNo 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
- XNo Setpoint Adjustment

#8: Occupant Override (required)

- JOverride as a Separate Output \$5
- NOverride in Parallel (//) with Sensor.... \$5
- POverride in Parallel (//) with Setpoint.. \$5
- XNo Override

#9: Optional Selections* (optional)

- ADifferential Ground
- BComm Jack C35 \$10
- FTest and Balance Switch \$7.50

*When more than one is selected, put in alphabetical order. Additional options and descriptions can be found on pg. 14

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/





Features & Options

- Available with a CO₂ 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 CO₂ 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 CO₂ level of 0 to 2,000 ppm. This allows the sensor's output to be used for ASHRAE's CO₂-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 CO₂ 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 VAm_{ax}

CO₂e Unit Detection Range: 0 to 2,000 ppm CO₂ 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:

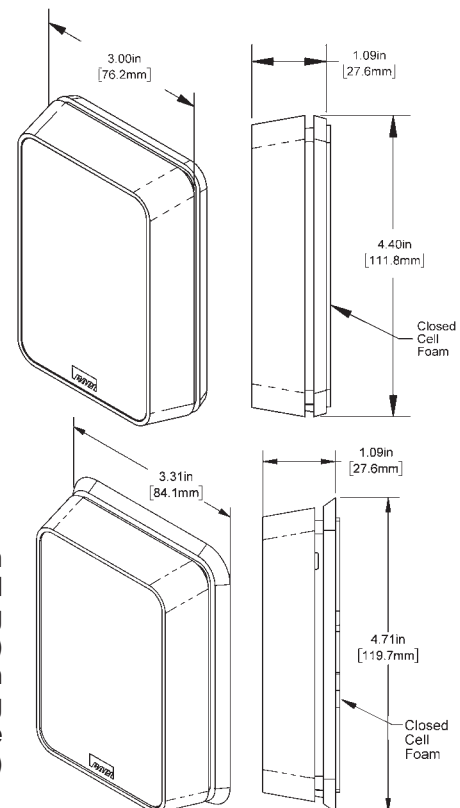
32 to 122°F (0 to 50°C)

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)





VOC Room Sensor, BAPI-Stat “Quantum”

E5

Air Quality Sensors

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

Ordering Information:

Units with CO2 Equivalent (CO2e) Output

<u>Part #</u>	<u>Description</u>	<u>List Price</u>
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

<u>Part #</u>	<u>Description</u>	<u>List Price</u>
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





Features & Options

- Available with a CO₂ 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 CO₂ 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 CO₂ level of 0 to 2,000 ppm. This allows the sensor's output to be used for ASHRAE's CO₂-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 CO₂ 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".)



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 VAmx

CO₂e Unit Detection Range:

0 to 2,000 ppm CO₂ 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





VOC Duct and Rough Service Sensor

Ordering Grids without List Prices are available on our website at www.bapihvac.com

Ordering Information:

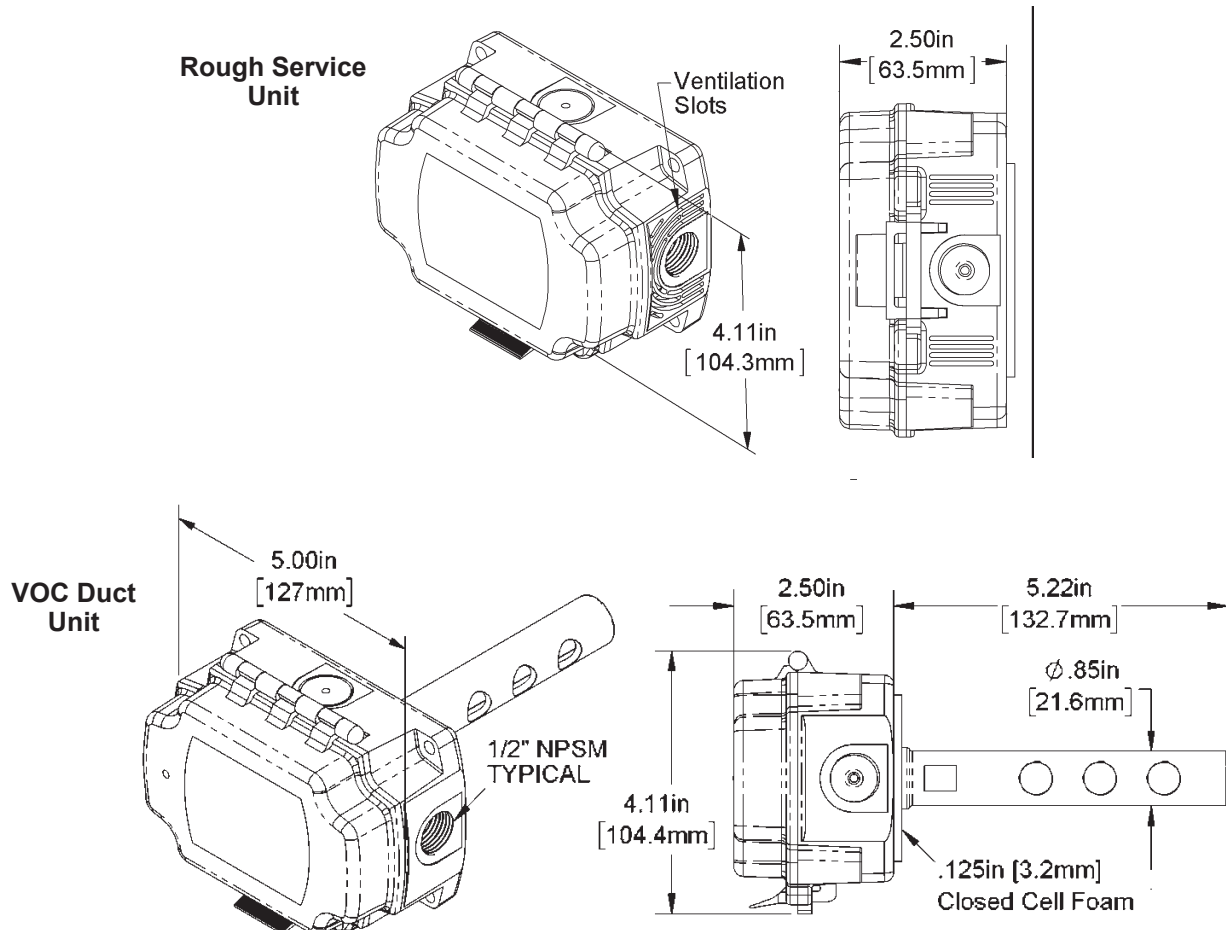
Units with CO2 Equivalent (CO2e) Output

<u>Part #</u>	<u>Description</u>	<u>List Price</u>
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

<u>Part #</u>	<u>Description</u>	<u>List Price</u>
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





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 AB 841 When Connected to a Building Automation System (choose option N when ordering)

The BAPI CO₂ Sensor is an accurate and reliable way of incorporating demand controlled ventilation into a building’s HVAC strategy. It measures the CO₂ in a range of 0 to 2,000 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 3-point calibration process for enhanced accuracy and stability.

Barometric pressure changes can affect CO₂ 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 CO₂ 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”
CO₂ Sensors**

(bottom unit shown with optional
60mm mounting base)

Specifications

Power for 0 to 5 VDC Outputs:

0 to 5V Outputs: 9 to 35 VDC @ 240 mA (9 to 24 VDC recomm.)

0 to 10V Outputs: 15 to 35 VDC @ 240 mA (15 to 24 VDC recomm.)

CO₂ 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

CO₂ Detection Range: 0 to 2,000 ppm

Start-Up Time: <2 Minutes

Response Time: <2 Minutes for 90% step change typical (after start-up)

CO₂ Accuracy:

400 to 1,000 ppm: ±75 ppm • >1,000 ppm: ±10% of reading

CO₂ Drift Stability:

<5% of full scale over life of product.

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

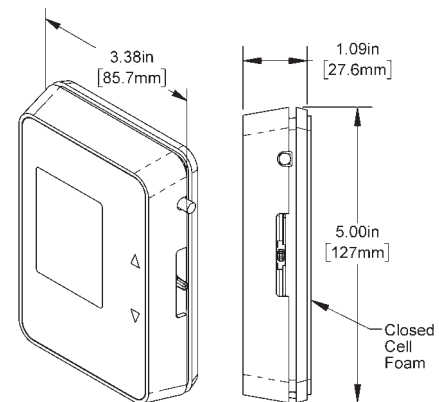
LED CO₂ Level Indicator:

Good, Green < 1,000 ppm (1,100 ppm when option “N” chosen)

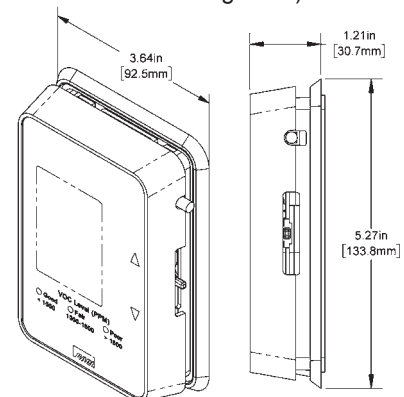
Fair, Yellow = 1,000 to 1,500 ppm (1,100 to 1,500 ppm when “N” chosen)

Poor, Red > 1,500 ppm

Agency: RoHS, California Title 24 and AB 841



Unit Dimensions
(bottom unit shown with 60mm
mounting base)





Submittal sheets without List Prices are available on our website at www.bapivac.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 Prime” CO₂ Sensor Option Selection Guide:

Unit w/ Standard Mounting Base

BA/AQP(#1) - (#2) - (#3) - (#4) - (#5) - (#6)(#7) - (#8) - (#9)

Unit w/ 60mm Mounting Base

BA/AQP60(#1) - (#2) - (#3) - (#4) - (#5) - (#6)(#7) - (#8) - (#9)

#1: Display Style (required)

- FUnit with Display and °F indication \$35
- CUnit with Display and °C indication..... \$35
- XUnit without Display

#2: CO₂ Output (required)

- CDual Channel, 0 to 5V Output \$475
- DDual Channel, 0 to 10V Output \$475

#3: Temperature Sensor (required)

- A1K Platinum RTD (385 curve)..... \$25
- B10K-2 Thermistor..... \$18
- C10K-3 Thermistor..... \$18
- D10K-3[11K] Thermistor..... \$18
- E20K Thermistor \$18
- F1.8K Thermistor \$18
- G1K Ω Nickel RTD \$65
- H3K Thermistor \$18
- XNo Temperature Sensor

#4: Humidity Output (required)

- A±2% Accuracy, Output of 0 to 5V \$80
- B±2% Accuracy, Output of 0 to 10V \$80
- XNo Humidity Output

#5: Setpoint Adjustment (required)

- 1Slider Setpoint Adjustment \$6
- XNo 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
- C50 to 90 °F or 10 to 32 °C
- D55 to 85 °F or 13 to 30 °C
- E60 to 80 °F or 15 to 27 °C
- F65 to 80 °F or 18 to 27 °C
- XNo Setpoint Adjustment

#7: Setpoint Output Range (required)

- 000 to 5 V
- 100 to 10 V
- 400 to 1 K
- 600 to 10 KΩ
- 800 to 20 KΩ
- 814.75 K to 24.75 KΩ
- 826.19 K to 26.19 KΩ
- 8410 K to 30 KΩ
- XNo Setpoint Adjustment

#8: Occupant Override (required)

- JOverride as a Separate Output \$5
- NOverride in Parallel (//) with Sensor \$5
- POverride in Parallel (//) with Setpoint..... \$5
- XNo Override

#9: Optional Selections* (optional)

- ADifferential Ground
- BComm Jack C35 \$10
- FTest and Balance Switch \$7.50
- NLED Alert Level for California AB 841 \$6

*When more than one is selected, put in alphabetical order. Additional options can be found on pg. 14

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” CO₂ Sensor, °F Display, 0 to 5V Dual Channel CO₂ 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 (CO₂ Unit) + \$18 (Thermistor) + \$80 (Humidity) + \$6 (Setpoint) + \$5 (Override) = \$619 List

Your Number: BA/





Features & Options

- Automatic Barometric Pressure and Temperature Compensation
- Optimized for Continuously Occupied Areas

The BAPI-Stat “Quantum” CO₂ Sensor is an accurate and reliable way of incorporating demand controlled ventilation into your HVAC strategy. It measures the CO₂ in ranges of 0 to 2,000, 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 CO₂ 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 of the installation.

For 0 to 2000 ppm units, the CO₂ level is indicated as “Good, Fair or Poor” by three LEDs on the front of the unit. If it reaches the top of the ppm range, the red LED will begin to flash. A 60mm mounting base is also available to fit European style junction boxes.



5
YEAR
WARRANTY

BAPI-Stat “Quantum” CO₂ Sensors

(Bottom unit shown w/ optional
60mm mounting base)

Specifications

Power: 12 to 24 VDC, 240 mA • 18 to 24 VAC, 12 VA Peak

CO₂ Sensing Element:

Dual Channel Non-Dispersive Infrared (NDIR)

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

Enclosure Material: ABS Plastic, Material Rated UL94 V-O

CO₂ Detection Range:

0 to 2,000, 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:

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

CO₂ Accuracy:

400 to 1,000 ppm: ±75 ppm

>1,000 ppm: ±10% of reading

CO₂ Drift Stability:

<5% of full scale over life of product.

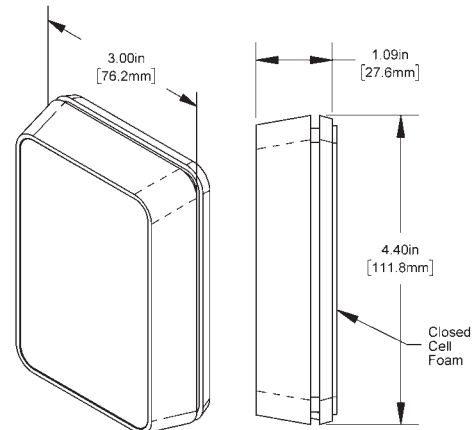
LED CO₂ Level Indicator (for 0 to 2,000 ppm units only):

Good, Green < 1,000 ppm

Fair, Yellow = 1,000 to 1,500 ppm

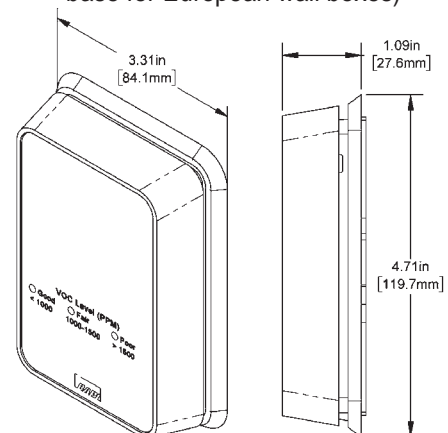
Poor, Red > 1,500 ppm

Agency: RoHS, CE, Title 24 Requirements



Unit Dimensions

(bottom unit shown w/ 60mm mounting
base for European wall boxes)





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

Ordering Information: BAPI-Stat “Quantum” CO₂ Sensor

UNITS WITH STANDARD MOUNTING BASE

<u>Part #</u>	<u>Description</u>	<u>List Price</u>
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-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

<u>Part #</u>	<u>Description</u>	<u>List Price</u>
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-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 CO₂ 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





Features & Options

- Automatic Air Pressure and Temperature Compensation
- Optimized for Continuously Occupied Areas

The BAPI CO₂ Duct Sensor is an accurate and reliable way of incorporating demand controlled ventilation. It measures CO₂ in ranges of 0 to 2,000, 0 to 5,000 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 CO₂ 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 duct 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. For 0 to 2,000 ppm units, the CO₂ level is indicated as "Good, Fair or Poor" by three LED's on the front of the unit. If it reaches the top of the ppm range, the red LED will begin to flash.



Duct Sensor



Rough Service Sensor

Specifications

Power:

12 to 24 VDC, 240 mA • 18 to 24 VAC, 12 VA Peak

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

CO₂ Sensing Element:

Dual Channel Non-Dispersive Infrared (NDIR)

Unventilated BAPI-Box Enclosure Rating:

NEMA 4, IP66

Enclosure Material: Polycarbonate, UL94 V-0

CO₂ Detection Range:

0 to 2,000, 0 to 5,000 and 0 to 50,000 ppm

Start-Up Time: <2 Minutes

Response Time:

<2 Minutes for 90% step change typical (after start-up)

LED CO₂ Level Indicator

(0 to 2,000 ppm units only):

Good, Green < 1,000 ppm

Fair, Yellow = 1,000 to 1,500 ppm

Poor, Red > 1,500 ppm

CO₂ Accuracy:

400 to 1,000 ppm: ±75 ppm

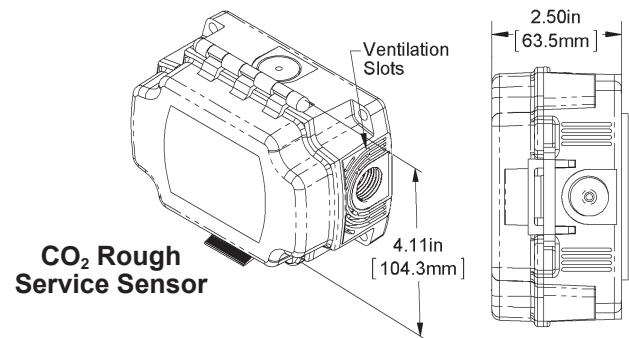
>1,000 ppm: ±10% of reading

CO₂ Drift Stability:

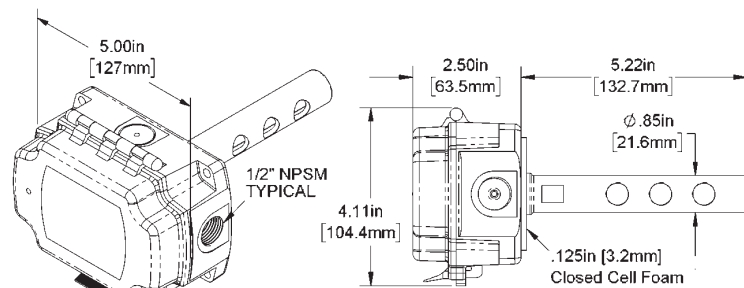
<5% of full scale over life of product.

Agency: RoHS, CE, Title 24 Requirements

Warranty Period: 5 Years



CO₂ Rough Service Sensor



CO₂ Duct Sensor





CO₂ Duct and Rough Service Sensor

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

Ordering Information

<u>DUAL CHANNEL "24/7" UNITS FOR CONTINUOUSLY OCCUPIED AREAS</u>	<u>LIST PRICE</u>
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/DCD05-5K-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/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/

Associated Products

BAPI VC350A or VC350A-EZ VOLTAGE CONVERTERS

The CO₂ 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





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)

Specifications

Power Supply: 24 VAC/VDC $\pm 10\%$, 1.0 VA Max

CO Sensor Technology: Electrochemical

CO Detection Range: 0 to 40 ppm

CO Accuracy: $\pm 3\%$ 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.

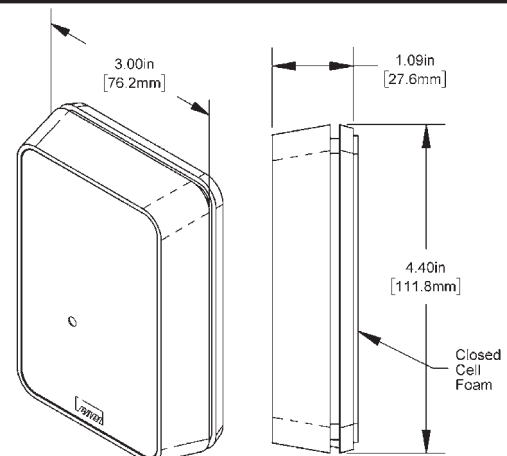
Encl. Material & Rating: ABS Plastic, UL94 V-0

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

Sensing Element Life: 7 years typical

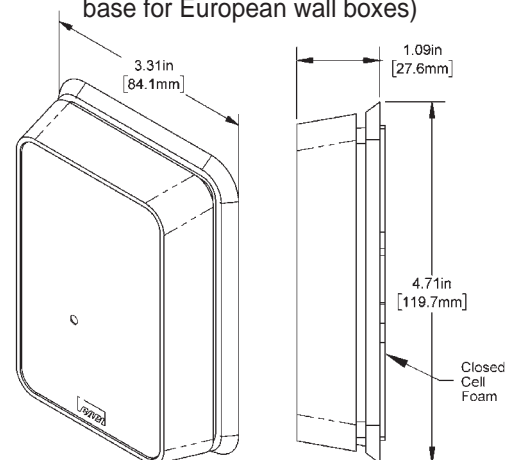
Certifications: RoHS

Warranty Period: 5 years



Unit Dimensions

(bottom unit shown w/ 60mm mounting base for European wall boxes)





Carbon Monoxide, BAPI-Stat “Quantum”

E15

Air Quality Sensors

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

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.





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

5
YEAR
WARRANTY

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

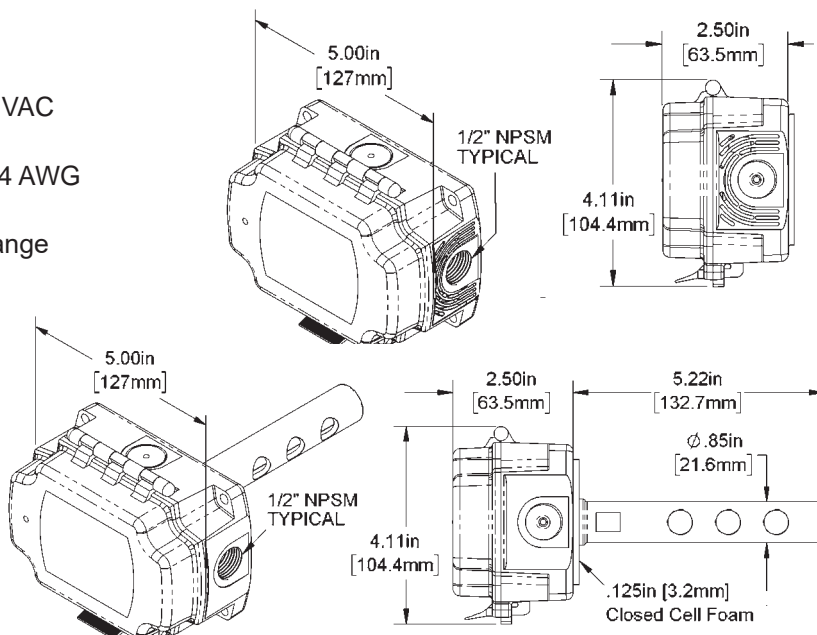
Agency: RoHS, CE

Accuracy:

<200 ppm = $\pm 3\%$ FS, 32 to 122°F (0 to 50°C)
201 to 500 ppm = $\pm 5\%$ 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





CO Duct & Rough Service Sensor

E17

Air Quality Sensors

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

Ordering Information

<u>Part #</u>	<u>Description</u>	<u>List Price</u>
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)





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

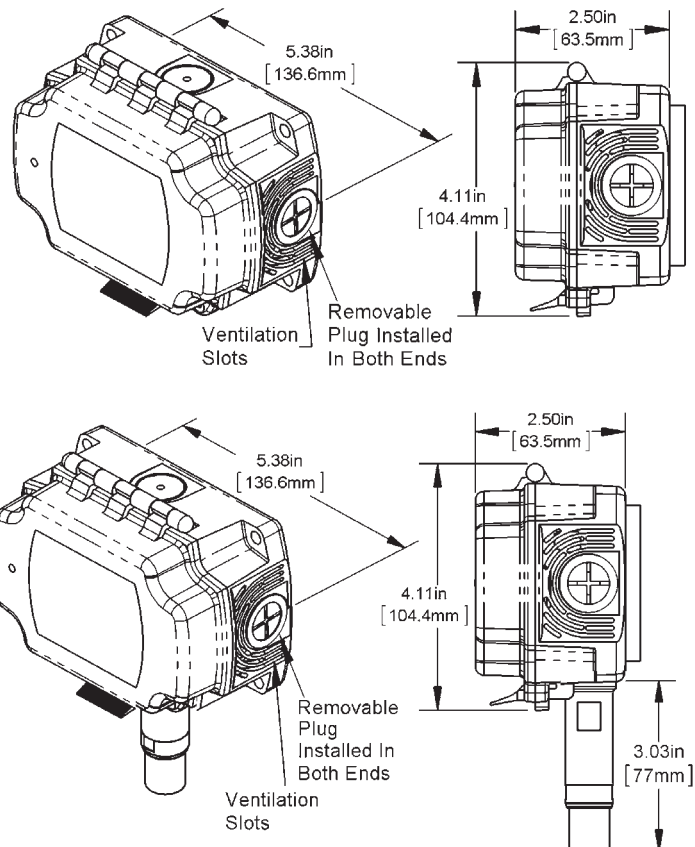
Continuous: 32 to 122°F (0 to 50°C)
5 to 95%RH Noncondensing

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





Carbon Monoxide (CO) Rough Service Sensor

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

Ordering Information

<u>Part #</u>	<u>Description</u>	<u>List Price</u>
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





Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Two Independent Alarm Contacts
- Field Selectable NO₂ 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 NO₂ 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 NO₂ concentrations from 1 to 10 ppm. An alarm timer holds the output relays on for a fixed time after the NO₂ level has fallen below 80% of setpoint to allow additional fan time to ensure the NO₂ has been purged. The field replaceable sensor element lasts approximately 7 years and is self-tested daily.



Rough Service (top) and Duct NO₂ 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:

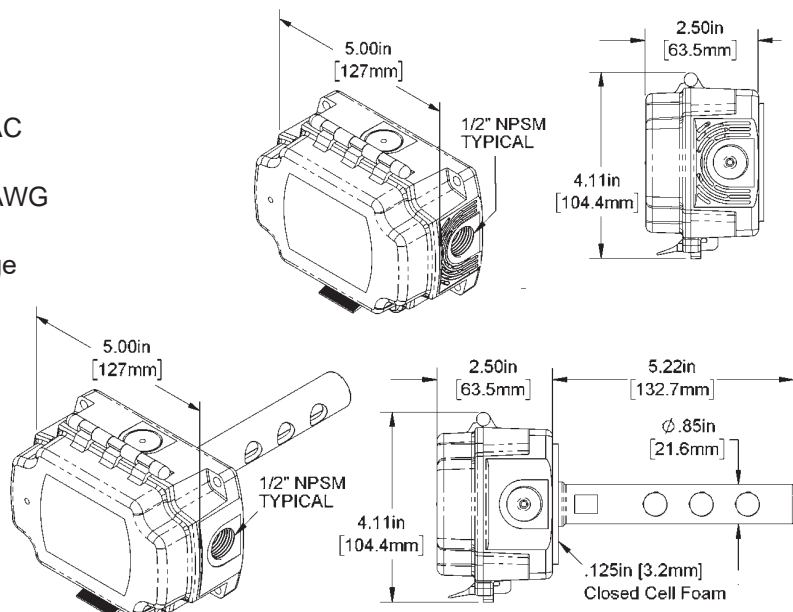
7 Years Typical

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





Nitrogen Dioxide Duct & Rough Service Sensor

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

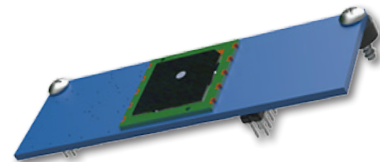
Ordering Information

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 NO₂ Modules must be installed and powered within 4 months of purchase to prevent loss of accuracy.

Replacement NO₂ Module

The Replacement NO₂ 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 NO₂ Module
(For use with BA/NO2-V-BB and BA/NO2-D-BB sensors only)





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/m³. A 60mm mounting base is available to fit European style junction boxes.



BAPI-Stat “Quantum” Particulate Sensors
(Right unit shown with 60mm mounting base)



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.bapivac.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/m³

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:

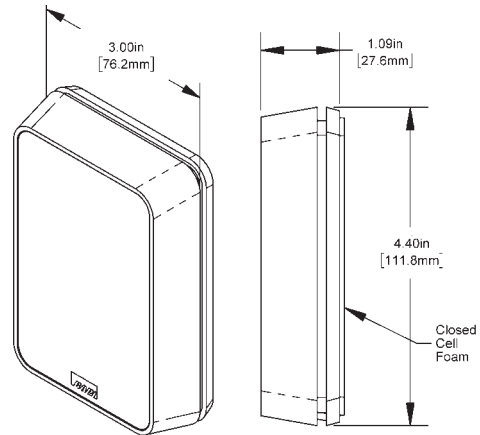
-4 to 158°F (-20 to 70°C)
0 to 95%RH Non-condensing

Enclosure Material: ABS Plastic, UL94 V-0

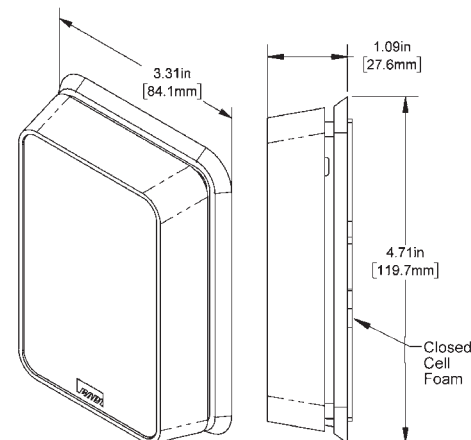
Mounting:

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





Rev. 09/21/21

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-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 $\mu\text{g}/\text{m}^3$.

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



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 $\mu\text{g}/\text{m}^3$

Accuracy at 77°F ±9°F (25°C ±5°C):

	0 to 100 $\mu\text{g}/\text{m}^3$	100 to 1,000 $\mu\text{g}/\text{m}^3$
PM1.0	±25 $\mu\text{g}/\text{m}^3$	±25% of reading
PM2.5	±15 $\mu\text{g}/\text{m}^3$	±15% of reading
PM10	±25 $\mu\text{g}/\text{m}^3$	±25% of reading

Response Time: <6 Seconds

Wiring: 3 Wires, 16 to 22 AWG

Environmental Operating Range:

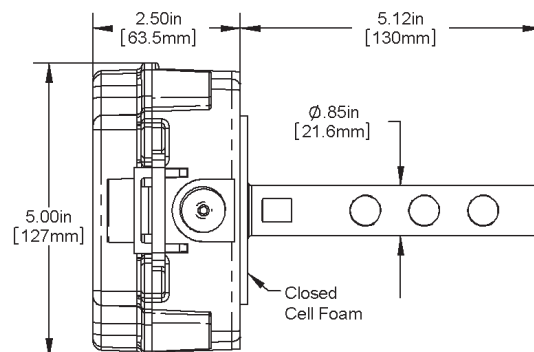
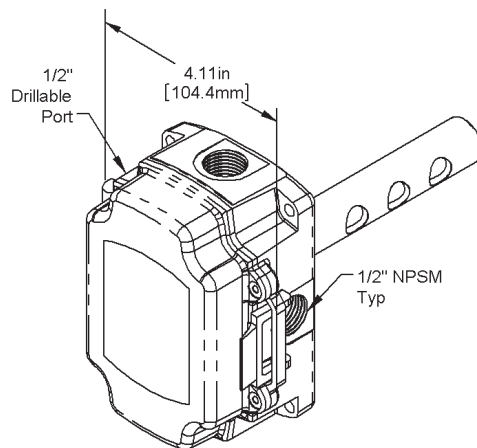
-4 to 158°F (-20 to 70°C)

0 to 95%RH Non-condensing

Enclosure Material:

UV-resistant Polycarbonate, UL94 V-0

Agency: CE EN 61326-1:2013 EMC, UL94 V-0, RoHS





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

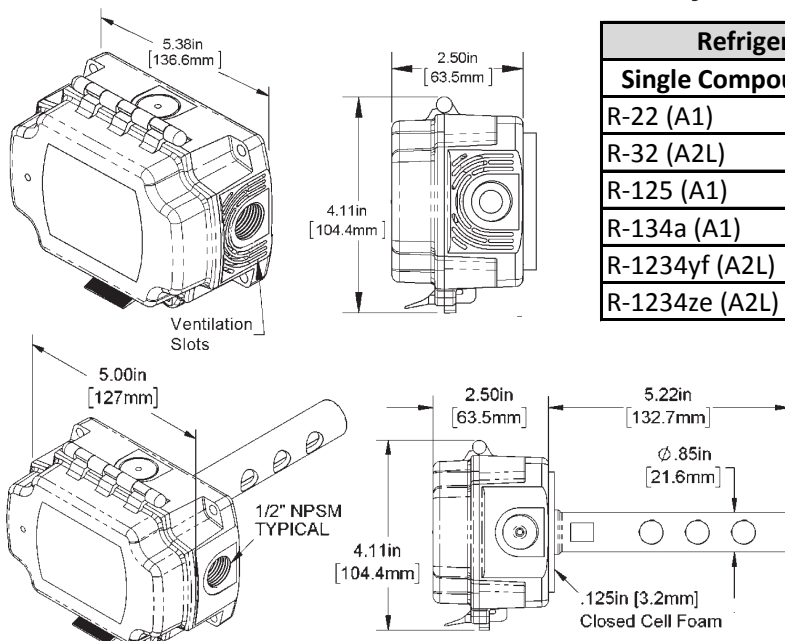
Output Impedance: 680 Ohms

Output Voltage: 0 to 4.8 VDC

Ambient Temp: 32 to 140°F (0 to 60°C)

Sensor Element Life: 2 Years Typical

Warranty: 2 Years



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".





Rev. 12/09/22

Features & Options

- Calibrates and verifies proper operation of specified BAPI CO₂ Room and Duct Sensors¹

BAPI's CO₂ Sensor Calibration Kit verifies the proper operation and calibrates all of BAPI's room and duct CO₂ sensors. Two calibration gas concentrations are required to perform a complete calibration². Purchase the single point gas at a CO₂ 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 CO₂ Sensor Calibration Kit consists of the following:

- A communications cable that connects a computer to the BAPI CO₂ sensor³
- 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 CO₂ sensor
- Shunt jumpers to place the BAPI CO₂ sensor into test mode

Notes

¹Specified BAPI CO₂ 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/

²A single point gas may not be required. If the ambient CO₂ 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.

³The test software must be downloaded from the BAPI CO₂ Sensor Calibration Kit webpage at:

<https://www.bapihvac.com/product/co2-sensor-calibration-kit/>

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



CO₂ Sensor Calibration Kit



CO₂ Sensor Calibration Kit with Optional Case (shown with customer supplied gas cylinders)



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



VOC Sensor Verification Kit



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BAPI VOC Sensor Offers an Alternative to CO₂ for Demand Controlled Ventilation



Most system designers use CO₂ sensors to indicate room occupancy as part of their Demand Controlled Ventilation (DCV) setup. One drawback with this method is that it ignores the harmful contaminants that may be present in the air even when the CO₂ levels are low.

BAPI's VOC Sensor offers the best of both worlds. It allows for ventilation based on occupancy as well as air contaminants -- and doesn't require any more work than using a CO₂ sensor.

The BAPI unit does this by measuring Volatile Organic Compounds (VOCs) then outputting a signal that corresponds to a CO₂ level of 0-2,000 ppm. This means system designers can use their existing CO₂-based DCV occupancy algorithms while monitoring both occupancy and VOCs.

One of the keys to the BAPI sensor is the fact that VOCs are as good an indicator of space occupancy as CO₂. That's because a large share of VOCs in an indoor space are generated by humans from our breath, sweat and skin or from colognes and perfumes, etc. (See Table 1.)

Extensive research was conducted on human occupancy, VOC levels and CO₂ 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 CO₂, and this algorithm was used to create the output of the VOC sensor. The accuracy of this output as compared to CO₂ levels is shown in the chart at right.

The chart shows that the VOC sensor tracks occupancy and that the output has a high correlation to the CO₂ level. The chart also shows that the sensor indicates when additional VOCs or air contaminants are present from cooking or other activities.

More information on the BAPI VOC Sensor including a White Paper and Video are available on our website at www.bapihvac.com

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, Alcohols, Aldehydes, Ketones
Furniture	Poly Vinyl Chloride (PVC)	Toluene, Xylene, Decane

Indicating Occupancy with VOCs

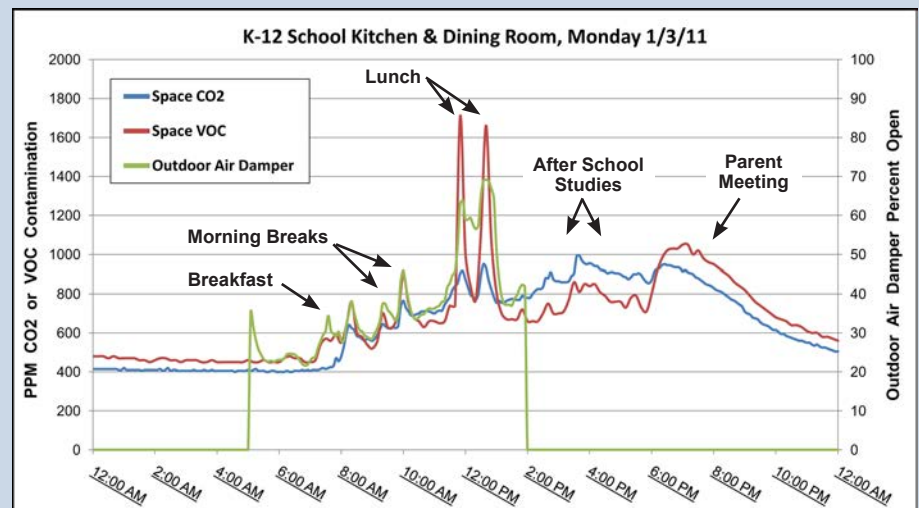
This chart was taken in a kitchen and dining area of a public school in Wisconsin. This is a true multi-purpose area with breakfast, snacks, lunch, and after school studies in the day, and athletic practices, exercise classes and meetings at night.

The open percentage of the outdoor air damper is controlled by the VOC sensor output through a PID control loop from 5 am to 2 pm when the space is considered "occupied". The outside air damper is closed during the unoccupied period, and ventilation is accomplished by diffusion from the adjacent hallways.

At 7 am, the VOC sensor picks up the breakfast cooking aromas and activities. The CO₂ sensor climbs a short time later as the students arrive to eat. The VOC sensor has slightly higher readings than the CO₂ 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. The BAPI sensor will allow these additional VOCs to be ventilated away while the CO₂ sensor will not.

At 2:30 pm, students arrive for "After School Studies" so the VOCs and CO₂ rise a little during this period. There is a community meeting at 6 pm. Notice how the VOCs track slightly below the CO₂ during the "After School Study" period when it is mostly kids in the room. Then the VOCs track slightly above the CO₂ during the community meeting period when it is mostly adults in the room. This is because adults use more perfumes and colognes than kids, and therefore generate more VOCs than kids.

Whether it's kids or adults in the room, and whether they're studying or eating, the chart proves that the VOC sensor output directly correlates to occupancy in the room and can easily be set up for Demand Controlled Ventilation.



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Overview

This paper will prove that the BAPI's Volatile Organic Compound (VOC) sensor is an accurate and reliable way of incorporating Demand-Controlled Ventilation (DCV) into a building's HVAC strategy. It will also show that the VOC sensor is as good an indicator of space occupancy as a CO₂ sensor while also measuring other air contaminants which affect human comfort and health. The paper will also describe how the VOC sensor output corresponds to the CO₂ level in the space so that system designers can use their existing CO₂-based DCV occupancy algorithms. Finally, it will detail how proper ventilation from the VOC sensor improves occupant comfort, health and productivity, and saves money for building owners.

CO₂ and Demand-Controlled Ventilation

Until now, Indoor Air Quality (IAQ) has been defined as proper temperature, humidity and CO₂ levels. According to tenants however, offensive odors, smoke, carpet off-gassing and other VOCs have just as much or more impact on human comfort, productivity and health.

Then why is IAQ so closely linked to CO₂? This is due to one interpretation of The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 62.1. This standard establishes minimum ventilation rates for proper IAQ, allowing for DCV which saves on heating and cooling costs by bringing in outside air only as it is needed. Standard 62.1 has two procedures for establishing the ventilation rates — one based on IAQ and contaminants and the other based on occupancy. The occupancy procedure, formally called the Ventilation Rate Procedure or VRP, is used most often due to its straightforward math, and the vast majority of system designers who choose VRP also choose CO₂ sensors to determine the occupancy of the space.

The main drawback with this method of DCV is that it ignores the offensive odors, air contaminants and VOCs that may be present even when the CO₂ levels are low¹.

As stated earlier, Standard 62.1 has two procedures, one based on occupancy and the other based on IAQ and air contaminants. The difficulty with the IAQ procedure is that HVAC system designers must use subjective criteria, such as whether the air quality is acceptable to 80% or more of the building's occupants. System designers are not comfortable dealing with these subjective perception-based criteria, so most choose the CO₂ occupancy method, even though it ignores other air contaminants.

BAPI's VOC sensor offers the best of both worlds. It allows for ventilation based on occupancy as well as air contaminants. The BAPI unit does this because it has been optimized for DCV. Using a calibration algorithm, the sensor value is converted to an output with a high correlation to a CO₂ level. This lets you use Ashrae's more popular and straight forward occupancy-based VRP schedule.

More information on this correlated CO₂ output is included in the next section, but let's start with the VOCs themselves.

What are VOCs and Where Do They Come From?

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, Carbon Monoxide (CO)
Building Materials	Paints, Adhesives, Solvents, Carpets	Formaldehyde, Alkanes, Alcohols, Aldehydes, Ketones, Siloxanes
Furniture	Poly Vinyl Chloride (PVC)	Toluene, Xylene, Decane



What are VOC's and Where Do They Come From? continued...

VOCs are chemicals that contain carbon and can be emitted as gases at room temperature. Table 1 shows some typical indoor contaminants and their sources. VOCs evaporate from substances, such as cleaning products, adhesives, paints, dry-cleaning fluids and wood preservatives. VOCs are also emitted from humans and animals in their breath, sweat and directly from their skin. In fact, the majority of VOCs in an indoor space are generated by humans. The BAPI sensor is able to measure these VOCs, and that is why the sensor is as good an indicator of occupancy as a CO₂ sensor.

Space Occupancy — VOC Sensing versus CO₂ Sensing

Extensive research was conducted on VOCs and CO₂ in 1,500 offices, schools and homes to determine the correlation between CO₂ levels and VOC levels. This research was used to create correlated CO₂ output for the BAPI VOC sensor. The accuracy of this output as compared to CO₂ levels is shown in the following seven charts.

These charts were taken Jan. 3-9, 2011, in a Kitchen and Dining area of a public school in Wisconsin. This location 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 VOC and CO₂ sensors are located next to each other in the dining room near the kitchen entrance. The open percentage of the outdoor air damper for this area is controlled by the VOC sensor output through a PID control loop from 5 am to 2 pm on weekdays when the space is considered "occupied". The outside air damper is closed during the unoccupied period, and ventilation is accomplished by diffusion from the adjacent hallways.

The following charts show the output of the VOC Sensor and CO₂ Sensor and the Outside Air Damper position during a typical week from Monday through Sunday. These charts show that the output of the VOC sensor has a high correlation to CO₂ levels and is reliable, predictable and repeatable.

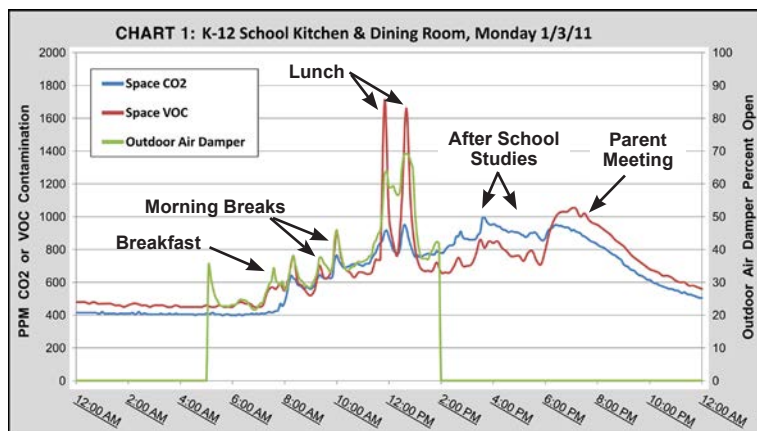
Chart 1. Monday:

The area goes into occupied mode at 5 am and the outdoor air damper -- the green line -- begins to track the output of the VOC sensor -- the red line. At 7 am, the VOC sensor picks up the breakfast cooking aromas and activities. The CO₂ sensor climbs a short time later as the students arrive to eat. The VOC sensor has slightly higher readings than the CO₂ 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. Additional fresh air is brought in to dilute the VOCs during the lunch period.

The outdoor air damper is closed at 2 pm but the room is still in use for "After School Studies" so the VOCs and CO₂ rise a little during this period from 2:30 to 5 pm.

Interestingly there is a community meeting in the dining room at 6 pm, and the audience is mostly adults. Notice how the VOCs track slightly below the CO₂ during the "After School Study" period when it is mostly kids in the room. Then the two switch and the VOCs track slightly above the CO₂ during the community meeting period when it is mostly adults in the room. That's because adults use more perfumes and colognes than kids, and therefore generate more VOCs than kids.

Whether it's kids or adults in the room, and whether they're studying or eating, the chart shows that the VOC sensor output directly correlates to occupancy in the area. The chart also shows that using the VOC sensor to control the outdoor air damper results in appropriate ventilation for the space.



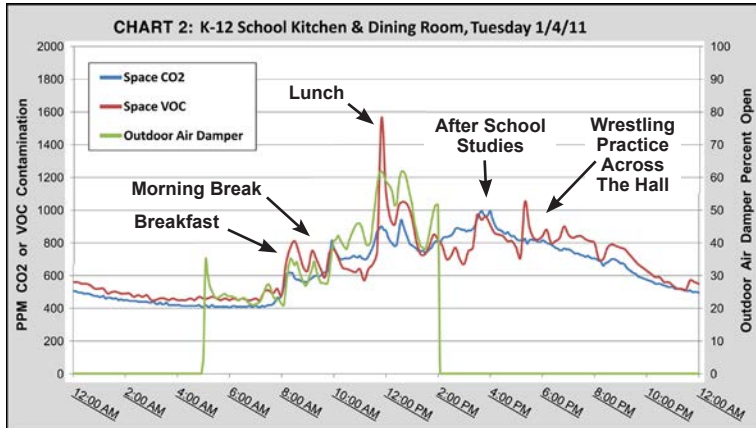


Chart 2, Tuesday:

The area again goes into occupied mode at 5 am and there are increases in VOCs and CO₂ during breakfast, morning break, 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.

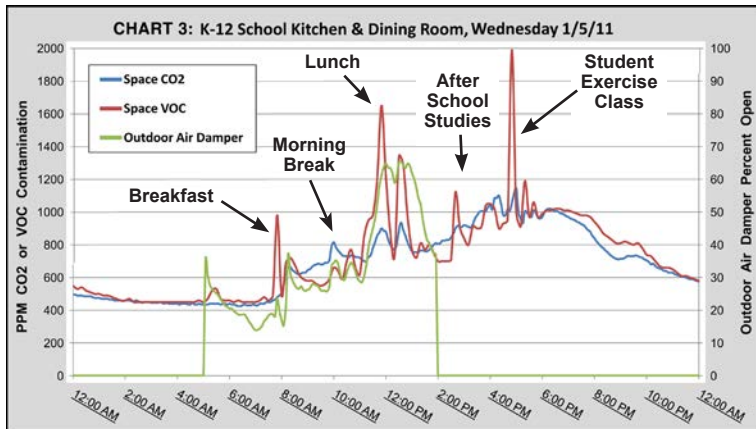


Chart 3, Wednesday:

The daytime portion of Wednesday is similar to Monday and Tuesday with increases in VOCs and CO₂ during breakfast, midmorning break 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 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.

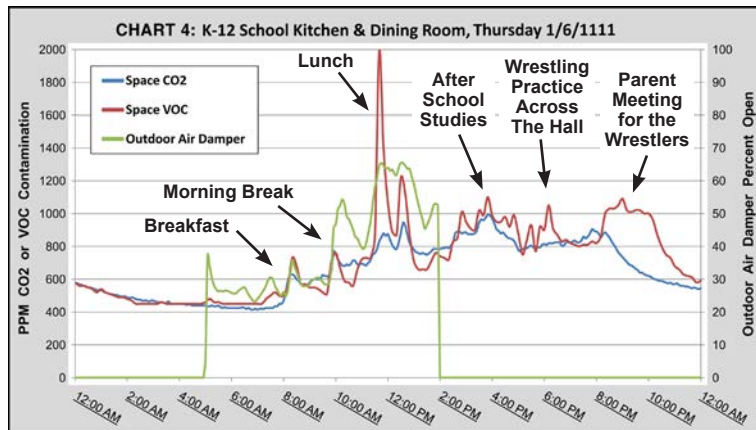


Chart 4, Thursday:

The daytime portion of Thursday is similar to the rest of the week with increases in VOCs and CO₂ during breakfast, midmorning break 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.

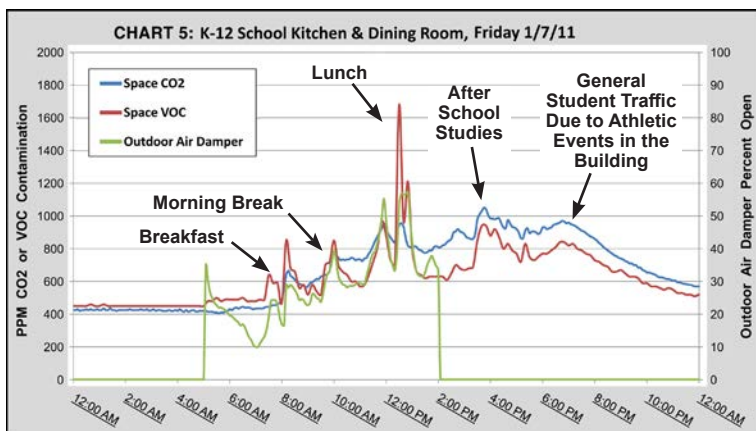


Chart 5, Friday:

The daytime portion of Friday is similar to the rest of the week with increases in VOCs and CO₂ during breakfast, midmorning break and after school studies, and spikes in VOCs due to cooking at lunch.

There is an increase in VOCs from 6:15 to 7:30 pm in the dining room area due to student traffic in the area from an athletic event in another part of the school building.

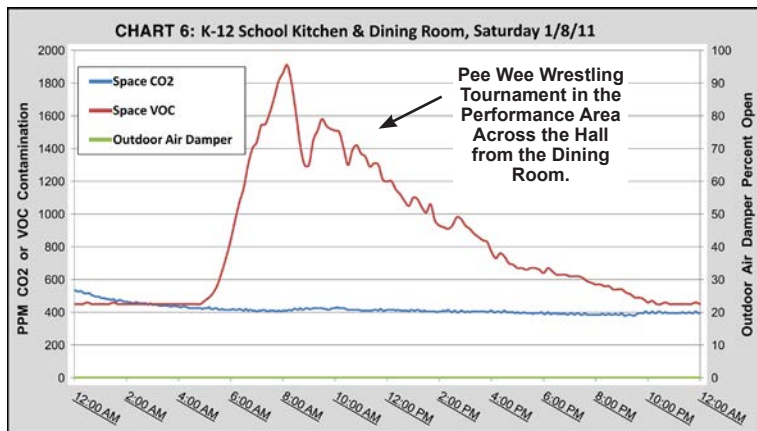


Chart 6, Saturday:

The space is considered unoccupied on Saturday so the Outdoor Air Damper is off.

However, VOCs are being generated in the dining room from about 6 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. A CO₂ sensor would not ventilate away these VOCs and odors.

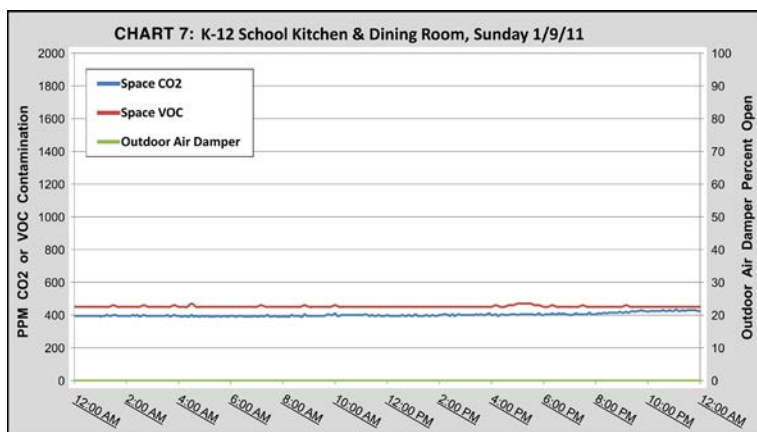


Chart 7, Sunday:

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 CO₂.



The True Meaning of Air Quality

VOCs are known to cause eye, nose and throat irritations, headache, drowsiness, dizziness, nausea, difficulty concentrating and fatigue; all summarized under the term SBS (Sick Building Syndrome). The importance of detecting the presence of VOCs in indoor air goes beyond these immediate health concerns. People judge the quality of the air not just by how it feels (temperature and humidity), but also by how it smells. Unfortunately, offensive odors in offices, kitchens, gymnasiums and restrooms have no impact on CO₂ levels. A tuna fish sandwich left in a desk drawer over a weekend may not be life threatening, but may smell like it by Monday.

These obnoxious odors reduce everyone's productivity until the odor is eliminated. In retail settings, customers may leave and never come back. Even small amounts can have a very immediate effect. A single person entering or passing through a space may deteriorate the air quality due to heavy amounts of aftershave lotion, cologne, perfume, hand soap, laundry detergent residue, fabric softeners or residual cigarette smoke.

In these cases a CO₂ sensor will not correct the problem. For instance, a Circuit Court Judge in Tennessee was plagued by migraine headaches causing him to suspend proceedings until his headaches went away. A VOC sensor installed in the courtroom discovered that the Judge's headaches were caused by support staff's cosmetics. Proper ventilation reduced the VOCs to acceptable levels and the judge's migraines stopped.

In another example, a plastic injection molding company's staff was plagued by persistent minor upper respiratory ailments. A VOC sensor was installed and the customer thought it was faulty because the output stayed at maximum no matter how much outdoor air was admitted to the building. Subsequent troubleshooting revealed that a recently installed molding machine had its exhaust vented into the building's fresh air intake duct by mistake. Within two weeks of rerouting the exhaust, all occupant respiratory symptoms disappeared. A CO₂ sensor would not have sensed the contaminant from the molding machine.



The Financial Benefits of Appropriate Ventilation

One of the arguments used against VOC sensors is that because they sense odors and contaminants along with occupancy, that the building will be over-ventilated and therefore wastes energy. According to ASHRAE Standard 62.1 however, VOC sensors allow the building to be appropriately ventilated, not over-ventilated, and this appropriate ventilation will save building owners and tenants money in the long run².

The Building Owners and Management Association (BOMA) stated in a 1999 report that typical building operating costs are 83.3% personnel salaries, 13.5% rent, 2.1% repair and maintenance and 1.2% total energy costs (Heat, Air Conditioning, Lighting, Business Equipment Power, Water Heating, etc). Clearly, the cost of employees is by far the greatest expense to the tenant or owner/employer.

"It has now been shown beyond reasonable doubt that poor indoor air quality in buildings can decrease productivity as much as six to nine percent," stated Professor David Wyon of the Technical University of Denmark's International Centre for Indoor Environment and Energy.

Numerous domestic and international studies support Wyon, showing that appropriate ventilation leads to increased worker productivity, increased worker accuracy, higher morale, less absenteeism and lower health insurance costs from fewer and less costly claims. For a tiny increase in total operating costs to ensure appropriate ventilation, owners/occupants can experience significant increases in employee productivity and significant decreases in employee expenses.

Because complaints about comfort are the number one reason tenants choose to leave a space, assuring indoor air quality with appropriate ventilation means that building owners will lose less tenants. They may even be able to increase rents by showing increased tenant productivity and comfort.

Please call a BAPI representative at +1-608-735-4800 for more information on how a VOC sensor can enhance your next DDC installation.

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Other References of Interest

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Carbon Dioxide (CO₂) in air is normally measured in Parts Per Million (ppm). At 1,000 ppm CO₂, one million air molecules would contain a mixture of 999,000 air molecules and 1,000 CO₂ molecules. The most common CO₂ sensors are Non-Dispersive InfaRed, or NDIR. An NDIR CO₂ 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. CO₂ 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 CO₂ molecules. Measuring the resultant light intensity measures the number of CO₂ molecules.

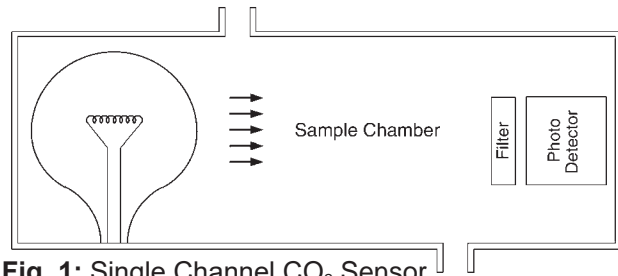


Fig. 1: Single Channel CO₂ Sensor

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 CO₂ 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 CO₂ concentration.

Automatic Background Calibration

One way to compensate for sensor drift is through automatic background calibration. Outdoor levels of CO₂ are generally around 400 ppm. Since people are the main source of CO₂ inside a building, when a building is unoccupied for 4 to 8 hours the CO₂ levels tend to drop to the outside level. Automatic background calibration uses the sensor's on-board microprocessor to remember the lowest CO₂ concentration that occurs every 24 hours. The sensor assumes this low point is the outside CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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.

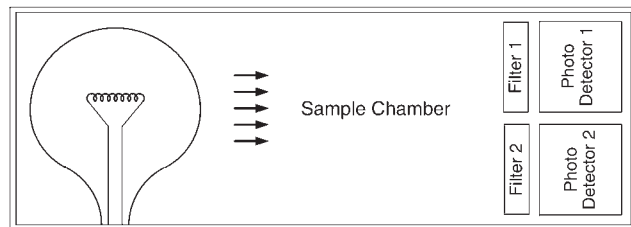


Fig. 2: Dual Channel CO₂ Sensor

BAPI Calibratable vs Non-Calibratable Sensors

Some BAPI CO₂ sensors can be field calibrated and others cannot. The figures at right show the two CO₂ 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)





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.

<u>VOC</u>	<u>Source</u>
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-trimethylpentane.....	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



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...

<u>VOC</u>	<u>Source</u>
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





Carbon Dioxide (CO₂) in air is normally measured in Parts Per Million (ppm). At 1,000 ppm CO₂, a volume of air containing one million air molecules would contain a mixture of 999,000 air molecules and 1,000 CO₂ 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 CO₂ is not affected. If you started with 1,000 ppm of CO₂, then you finish with 1,000 ppm of CO₂ despite the changes in the air volume.

The most common CO₂ sensors are known by the engineering term Non-Dispersive InfraRed, or NDIR. An NDIR CO₂ 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. CO₂ 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 CO₂ molecules that are present. Measuring the resultant light intensity measures the number of CO₂ 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 CO₂. At low pressures or high temperatures, there will be fewer air molecules in the sample chamber, so there will also be fewer CO₂ molecules, even though the ppm of CO₂ hasn't changed. Fewer CO₂ molecules "fools" the sensor into thinking that the CO₂ concentration is lower than it really is. At high pressures or low temperatures, there are more air molecules in the sample chamber and more CO₂ molecules, even though the CO₂ concentration hasn't changed. More CO₂ molecules "fools" the sensor into thinking that the CO₂ concentration is higher than it really is. Therefore a CO₂ sensor calibration will only be accurate at one temperature and one air pressure.

Calculating Temperature and Barometric Pressure Effects on CO₂ Measurement

The following formula derived from the Ideal Gas Law relates changes in air volume to temperature, pressure and the number of molecules present:

$$\text{ppm CO}_2 \text{ corrected} = \text{ppm CO}_2 \text{ measured} * ((T_{\text{measured}} * p_{\text{ref}}) / (p_{\text{measured}} * T_{\text{ref}}))$$

- 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 uses the Ideal Gas Law formula above to show how the uncompensated CO₂ measurement would change with temperatures from 32 °F to 110 °F. Initial conditions are 1,000 ppm CO₂, 77°F and sea level Barometric Pressure. As seen in Table 1, the CO₂ 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 CO₂ measurement would change with altitudes of -1,000 to 10,000 feet. Initial conditions are 77°F and 1,000 ppm CO₂ at sea level. As seen in Table 2, the CO₂ concentration varies by 349 ppm.

Table 1: CO₂ 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 2: CO₂ 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



Weather Effects on Barometric Pressure and CO₂ 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 CO₂ level was 1,000 ppm at sea level, then Table 3 shows what the measured CO₂ concentration would be in DeSoto on those days. From January 15, 2005 until October 26, 2010, weather patterns alone changed the CO₂ measurement by 75 ppm, which is the entire accuracy specification for a typical NDIR CO₂ sensor.

On the single day of January 18, 2005, weather patterns changed the CO₂ measurement by 35 ppm, which is almost 50% of the specified accuracy specification of a typical NDIR CO₂ sensor.

Table 3: CO₂ 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 CO₂ Measurement

Temperature and Barometric Pressure affect CO₂ measurement individually as well as in combination. **Table 4** shows the measured CO₂ 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 CO₂ concentration was 1,000 ppm at 77°F and sea level, the measured CO₂ 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 CO₂ sensor.

Table 4: CO₂ 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 CO₂ Measurement Compensation

Due to the constantly changing nature of Barometric Pressure and temperature and their effect on CO₂ measurement, the only way to get an accurate CO₂ measurement with an NDIR sensor is through temperature and Barometric Pressure compensation. That's why all BAPI CO₂ sensors have a built in Barometric Pressure sensor and temperature sensor.





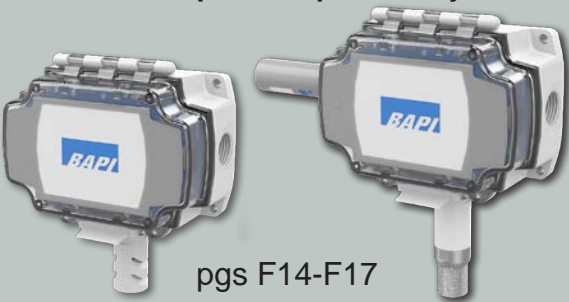




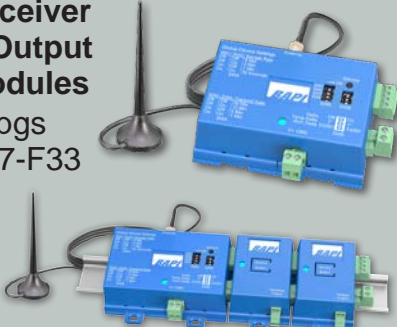

Every eight seconds the BAPI sensor takes a CO₂ reading then compensates that value based on the current temperature and Barometric Pressure. That's one reason why BAPI's CO₂ sensors are the most accurate in the HVAC/R industry. There is also no need for an HVAC technician to spend valuable time manually entering the altitude value for the location into each and every sensor when it is installed. This makes the BAPI CO₂ sensor one of the easiest to install, saving time and money.



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Rev. 06/21/23

<p>BAPI-Stat “Quantum” Sensors</p>  <p>pgs F2-F5</p>	<p>Duct Temp or Temp/Humidity Sensor</p>  <p>pgs F6-F9</p>	
<p>Immersion Temp Sensor</p>  <p>pg F10</p>	<p>Remote Probe Temperature Sensor</p>  <p>pg F12</p>	
<p>Outside Air Temp or Temp/Humidity Sensor</p>  <p>pgs F14-F17</p>	<p>Thermobuffer Temperature Sensor</p>  <p>pg F18</p>	
<p>BAPI-Stat “Quantum Slim” Sensors</p>  <p>pgs F20-F23</p>	<p>Food Probe Sensor</p>  <p>pg F24</p>	
<p>Gateway</p>  <p>pg F26</p>	<p>Receiver & Output Modules</p> <p>pgs F27-F33</p> 	<p>Replacement Batteries</p>  <p>pg F34</p>





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.



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: 10 sec to 5 min

Temp Offset: ±0.1°F/C to ±5.0°F/C

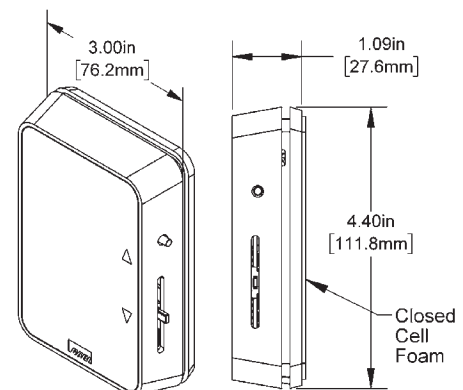
Onboard Memory:

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.

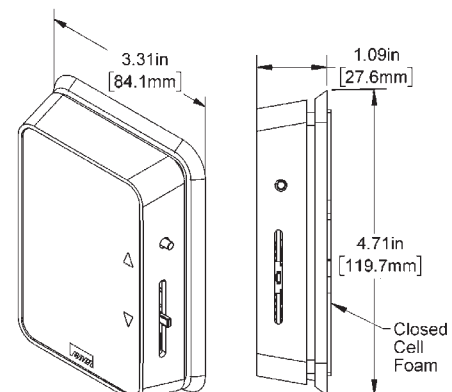
Agency: RoHS / FCC: T4FSM220913 / IC: 9067A-SM220913

*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.



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



BAPI-Stat “Quantum” Temperature Sensor

Wireless System

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

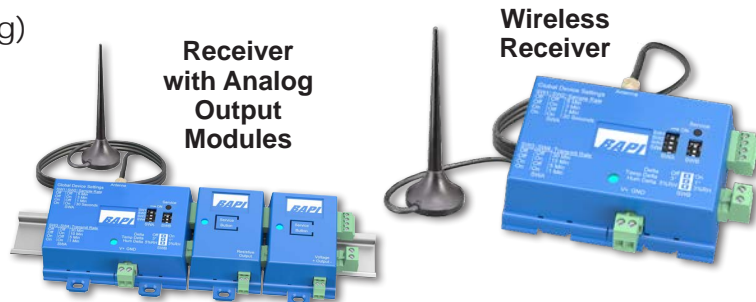
Ordering Information

	<u>List Price</u>
BATTERY POWER UNITS WITH STANDARD MOUNTING BASE	
BA/WT-BLE-Q-BAT	
Wireless BAPI-Stat “Quantum” Temp Sensor, Battery Power	\$215
BA/WT-BLE-Q-S-BAT	
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Battery Power	\$221
BA/WT-BLE-Q-SO-BAT	
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Override, Battery Power	\$226
BATTERY POWER UNITS WITH 60MM MOUNTING BASE	
BA/WT-BLE-Q60-BAT	
Wireless BAPI-Stat “Quantum” Temp Sensor, Battery Power, 60mm Base	\$215
BA/WT-BLE-Q60-S-BAT	
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Battery Power, 60mm Base	\$221
BA/WT-BLE-Q60-SO-BAT	
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Override, Battery Power, 60mm Base ...	\$226
BA/LI14505: 3.6V Lithium Battery	\$3 (net price)
WIRE POWER UNITS WITH STANDARD MOUNTING BASE	
BA/WT-BLE-Q-PWR	
Wireless BAPI-Stat “Quantum” Temp Sensor, Wire Power	\$215
BA/WT-BLE-Q-S-PWR	
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Wire Power	\$221
BA/WT-BLE-Q-SO-PWR	
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Override, Wire Power	\$226
WIRE POWER UNITS WITH 60MM MOUNTING BASE	
BA/WT-BLE-Q60-PWR	
Wireless BAPI-Stat “Quantum” Temp Sensor, Wire Power, 60mm Base	\$215
BA/WT-BLE-Q60-S-PWR	
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Wire Power, 60mm Base	\$221
BA/WT-BLE-Q60-SO-PWR	
Wireless BAPI-Stat “Quantum” Temp Sensor, Setpoint, Override, Wire Power, 60mm Base	\$226



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.





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.



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: $\pm 1.7^{\circ}\text{F}$ (0.95°C) from 32 to 158 $^{\circ}\text{F}$ (0 to 70 $^{\circ}\text{C}$)

Humidity: $\pm 2\% \text{RH}$ @ 77 $^{\circ}\text{F}$ (25 $^{\circ}\text{C}$), 20 to 80%RH

Temperature Range: -4 to 221 $^{\circ}\text{F}$ (-20 to 105 $^{\circ}\text{C}$)

Transmission Distance: Varies by application*

Environmental Operation Range:

Temp: -4 to 149 $^{\circ}\text{F}$ (-20 to 65 $^{\circ}\text{C}$)

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 $^{\circ}\text{F}/\text{C}$ to 5.0 $^{\circ}\text{F}/\text{C}$

Delta T (Humidity): 0.1%RH to 5.0%RH

Transmit Interval: 30 sec to 12 hour

Sample Interval: 10 sec to 5 min

Temp Offset: $\pm 0.1^{\circ}\text{F}/\text{C}$ to $\pm 5.0^{\circ}\text{F}/\text{C}$

Humidity Offset: $\pm 0.1\% \text{RH}$ to $\pm 3.0\% \text{RH}$

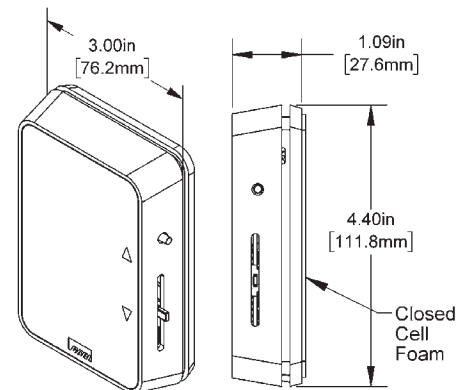
Onboard Memory:

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.

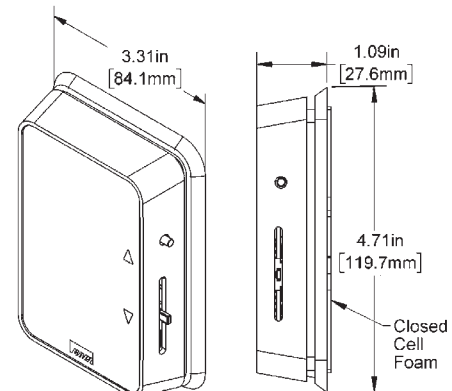
Agency: RoHS / FCC: T4FSM220913 / IC: 9067A-SM220913

*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.



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



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

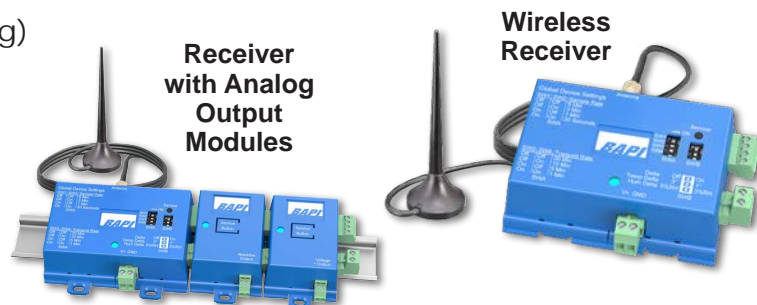
Ordering Information

	<u>List Price</u>
BATTERY POWER UNITS WITH STANDARD MOUNTING BASE	
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.





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 1/4" (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

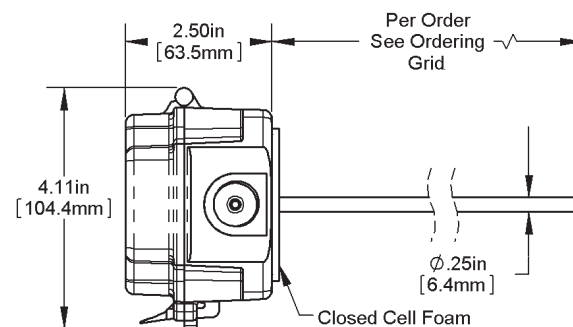
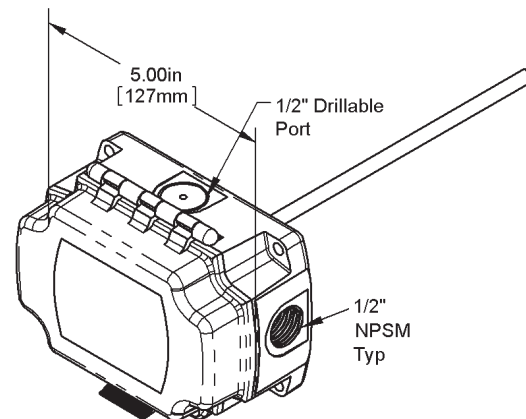
User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour
Sample Interval: 10 sec to 5 min
Temp Offset: ±0.1°F/C to ±5.0°F/C

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 / FCC: T4FSM220809 / IC: 9067A-SM220809

*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.



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



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

Ordering Information

	<u>List Price</u>
BATTERY POWER UNITS	
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

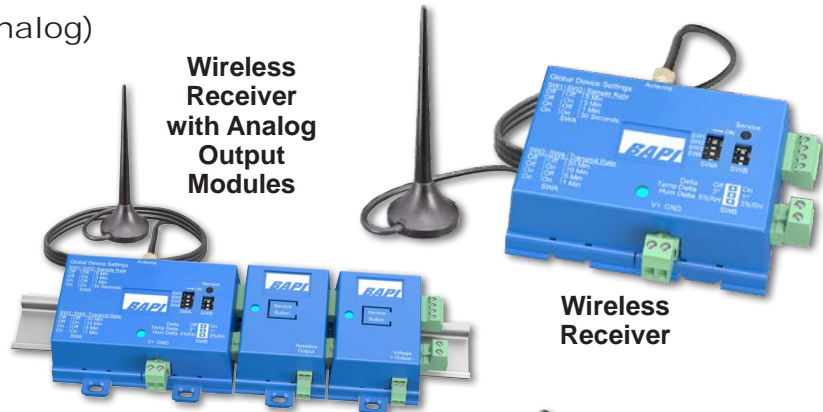
Custom probe lengths available.



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.





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

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: $\pm 1.0^{\circ}\text{F}$ (0.55°C) from 32 to 158 $^{\circ}\text{F}$ (0 to 70 $^{\circ}\text{C}$)

Humidity: $\pm 2\%\text{RH}$ @ 77 $^{\circ}\text{F}$ (25 $^{\circ}\text{C}$), 20 to 80%RH

Temperature Range: -4 to 221 $^{\circ}\text{F}$ (-20 to 105 $^{\circ}\text{C}$)

Transmission Distance: Varies by application*

Environmental Operation Range:

Temp: -4 to 149 $^{\circ}\text{F}$ (-20 to 65 $^{\circ}\text{C}$)

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 $^{\circ}\text{F}/\text{C}$ to 5.0 $^{\circ}\text{F}/\text{C}$

Delta T (Humidity): 0.1%RH to 5.0%RH

Transmit Interval: 30 sec to 12 hour

Sample Interval: 10 sec to 5 min

Temp Offset: $\pm 0.1^{\circ}\text{F}/\text{C}$ to $\pm 5.0^{\circ}\text{F}/\text{C}$

Humidity Offset: $\pm 0.1\%\text{RH}$ to $\pm 3.0\%\text{RH}$

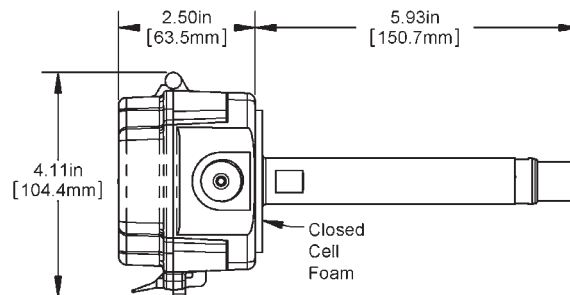
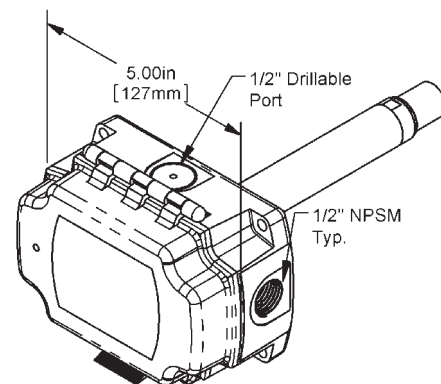
Onboard Memory:

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 / FCC: T4FSM220809 / IC: 9067A-SM220809

*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.



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



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

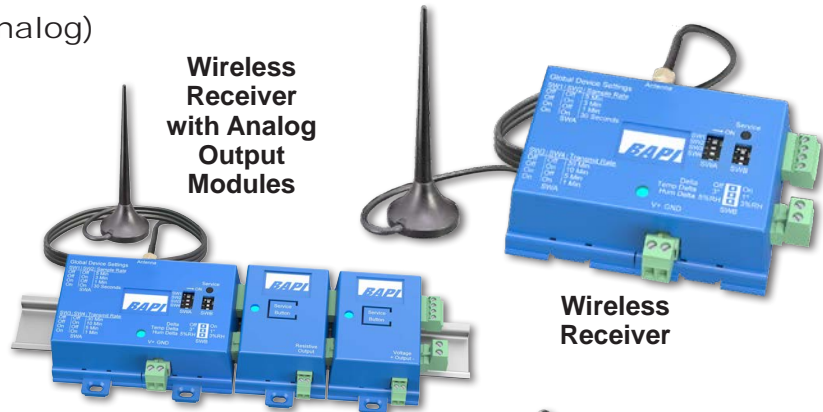
Wireless Duct Temperature & Humidity Sensor, Wire Power\$406



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.



Wireless 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





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 1/4" (6.4mm) probe with standard probe lengths from 2" to 8" (51 to 203mm).



Wireless Immersion 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

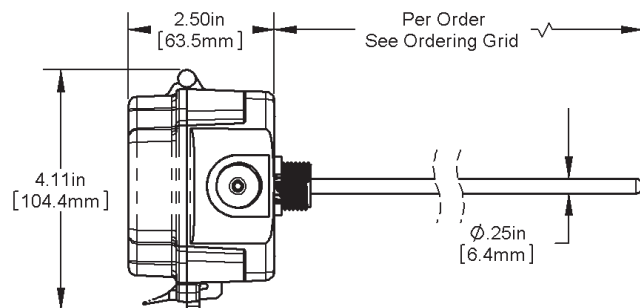
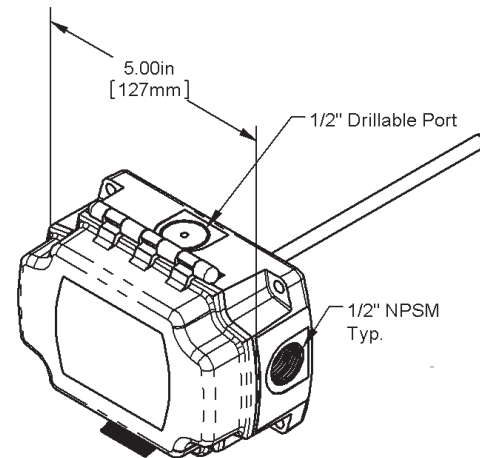
Sample Interval: 10 sec to 5 min

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 / FCC: T4FSM220809 / IC: 9067A-SM220809



*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.

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





Immersion Temperature Sensor

F11

Wireless System

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

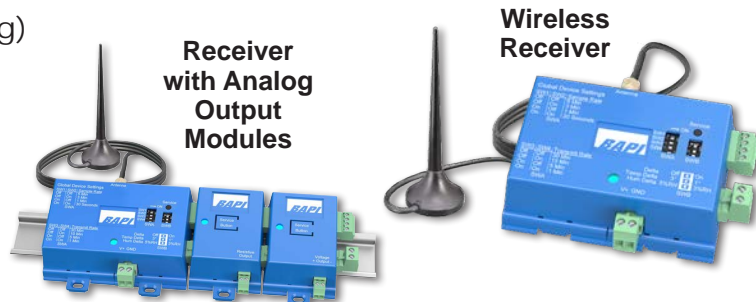
Immersion Unit Probes are designed to be inserted into a Thermowell and BAPI offers stainless steel thermowells in matching lengths to the immersion sensors. For more info on Thermowells, see the BAPI website or contact your BAPI representative.



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.



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Tel: +1-608-735-4800 • Fax: +1-608-735-4804 • Email: sales@bapivac.com • Web: www.bapivac.com



Features & Options

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

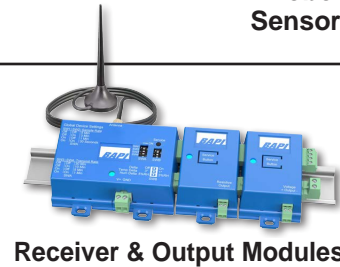
BAPI's Remote Probe Wireless Sensor measures the temperature and transmits the data via Bluetooth Low Energy to a receiver or gateway. It features a 1.75" (44mm) long SS probe with either Plenum-Rated or FEP-Jacketed Cable and an IP66-rated BAPI-Box enclosure. Five lead lengths from 5 to 25 feet (1.5 to 7.6 meters).



Wireless Remote Probe Sensor

ASSOCIATED RECEIVER OR GATEWAY

- **Receiver (Wireless-to-Analog)** - Receives the data from 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

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: 10 sec to 5 min

Temp Offset: ±0.1°F/C to ±5.0°F/C

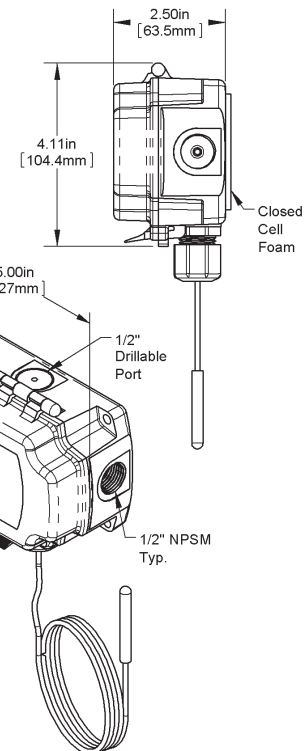
Onboard Memory:

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 / FCC: T4FSM220809 / IC: 9067A-SM220809

*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.



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





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

Ordering Information

	<u>List Price</u>
BATTERY POWER UNITS	
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





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.



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: $\pm 1.0^{\circ}\text{F}$ (0.55°C) from 32 to 158°F (0 to 70°C)

Barometric Pressure: ± 2 mbar @ 25°C ($0.40''\text{H}_2\text{O}$)

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): $0.1^{\circ}\text{F}/\text{C}$ to $5.0^{\circ}\text{F}/\text{C}$ • Transmit Interval: 30 sec to 12 hour

Sample Interval: 10 sec to 5 min • Temp Offset: $\pm 0.1^{\circ}\text{F}/\text{C}$ to $\pm 3.0^{\circ}\text{F}/\text{C}$

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 / FCC: T4FSM220809 / IC: 9067A-SM220809

*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.

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





Outside Air Temperature Sensor

F15

Wireless System

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

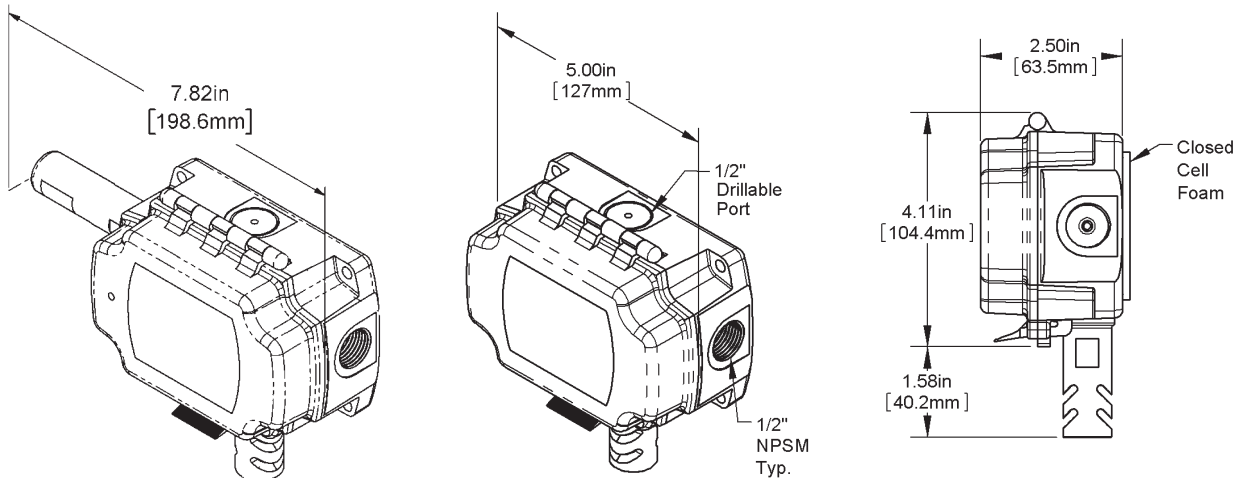
BA/WT-BLE-O-BB-PWR

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

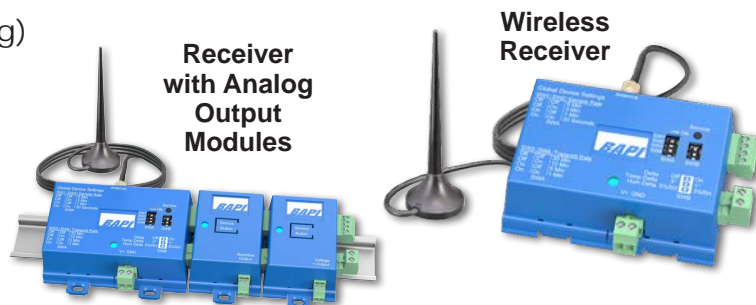
Dimensions



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.





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.



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: $\pm 1.0^{\circ}\text{F}$ (0.55°C) from 32 to 158 $^{\circ}\text{F}$ (0 to 70 $^{\circ}\text{C}$)

Humidity: $\pm 2\% \text{RH}$ @ 77 $^{\circ}\text{F}$ (25 $^{\circ}\text{C}$), 20 to 80%RH

Barometric Pressure: $\pm 2 \text{ mbar}$ @ 25 $^{\circ}\text{C}$ (0.40 $^{\circ}\text{H}_2\text{O}$)

Light Level: 10 Lux + 10% of reading.

Temperature Range: -4 to 221 $^{\circ}\text{F}$ (-20 to 105 $^{\circ}\text{C}$)

Light Level Sensing Range: 0 to 64,000 lux

Transmission Distance: Varies by application*

Environmental Operation Range:

Temp: -4 to 149 $^{\circ}\text{F}$ (-20 to 65 $^{\circ}\text{C}$) • 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 $^{\circ}\text{F}/\text{C}$ to 5.0 $^{\circ}\text{F}/\text{C}$ • Delta T (Humidity): 0.1%RH to 5.0%RH

Transmit Interval: 30 sec to 12 hour • Sample Interval: 10 sec to 5 min

Temp Offset: $\pm 0.1^{\circ}\text{F}/\text{C}$ to $\pm 5.0^{\circ}\text{F}/\text{C}$ • Humidity Offset: $\pm 0.1\% \text{RH}$ to $\pm 3.0\% \text{RH}$

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 / FCC: T4FSM220809 / IC: 9067A-SM220809

*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.

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





Outside Air Temp/Humidity Sensor

F17

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

BALI14505: 3.6V Lithium Battery \$3 (net price)

WIRE POWER UNITS

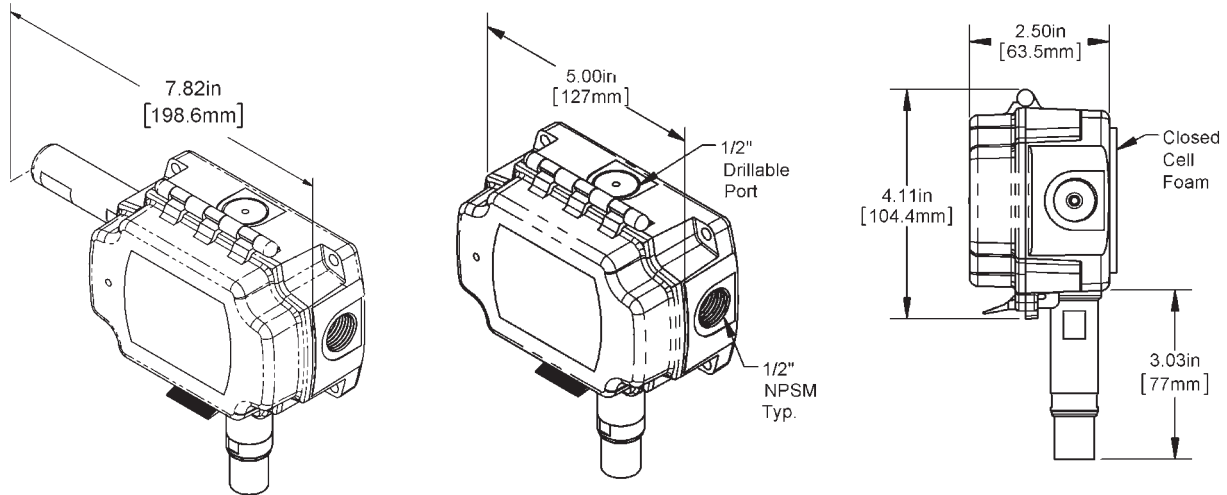
BA/WTH-BLE-O-BB-PWR

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

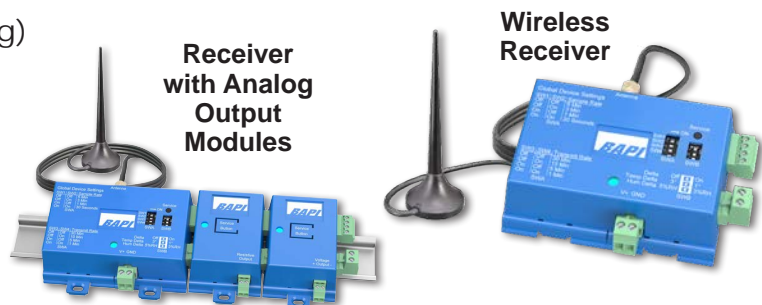
Dimensions



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.





Features & Options

- User adjustable settings
- 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

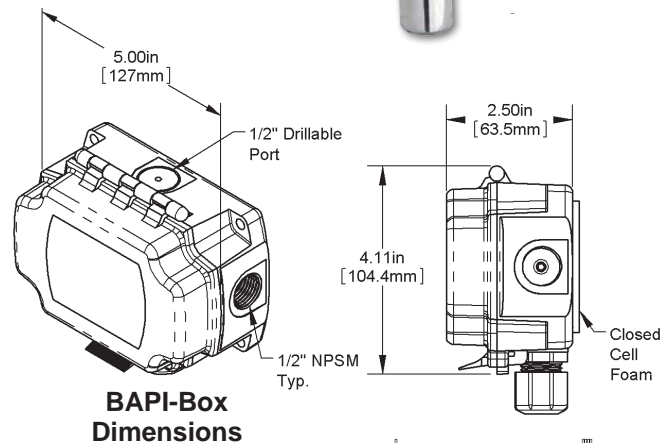
Frequency: 2.4 GHz (Bluetooth Low Energy)

Receiver Sensitivity: -97 dBm

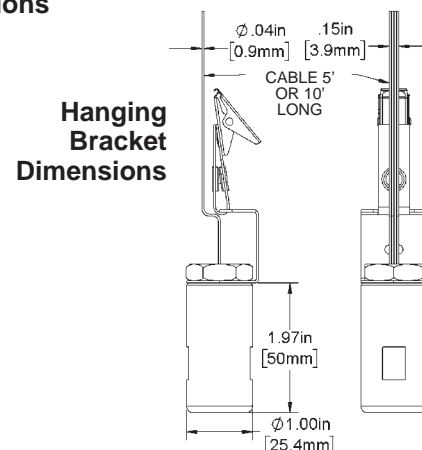
User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour
Sample Interval: 10 sec to 5 min
Temp Offset: ±0.1°F/C to ±5.0°F/C

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 / FCC: T4FSM220809 / IC: 9067A-SM220809



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.

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





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

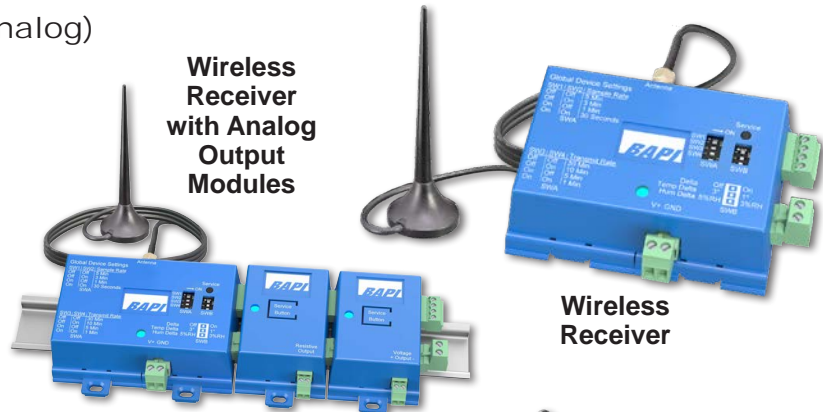
Wireless Thermobuffer Sensor, 1" (25mm) 304 SS Hanging Bracket w/ 10' (3m)
FEP-Jacketed Cable, Wire Power..... \$442



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.



Wireless 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





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

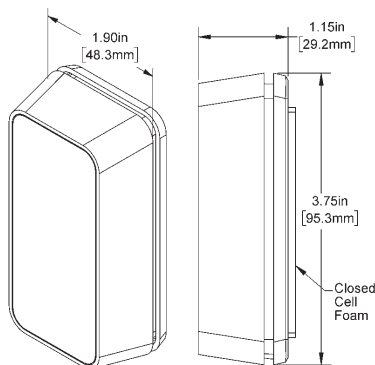
Ext. Probe Material: 304 Stainless Steel
1.75" (44mm) Bullet Probe with FEP Cable
1" (25mm) Thermobuffer with FEP Cable

User Adjustable Settings:
Delta T (Temp): 0.1°F/C to 5.0°F/C
Transmit Interval: 30 sec to 12 hour
Sample Interval: 10 sec to 5 min
Temp Offset: ±0.1°F/C to ±5.0°F/C

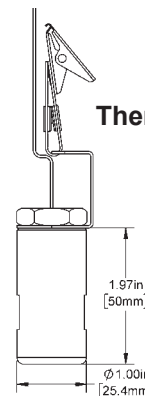
Onboard Memory:
Sensor retains up to 16,000 readings should the communication become interrupted. If using a Gateway, the data is re-transmitted once communication is re-established.

Agency: RoHS / FCC: T4FSM220923
IC: 9067A-SM220923

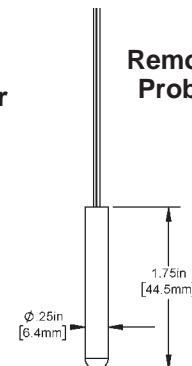
BAPI-Stat "Quantum Slim"



Thermobuffer



Remote Probe



*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.

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



BAPI-Stat “Quantum Slim” Temp Sensor

Wireless System

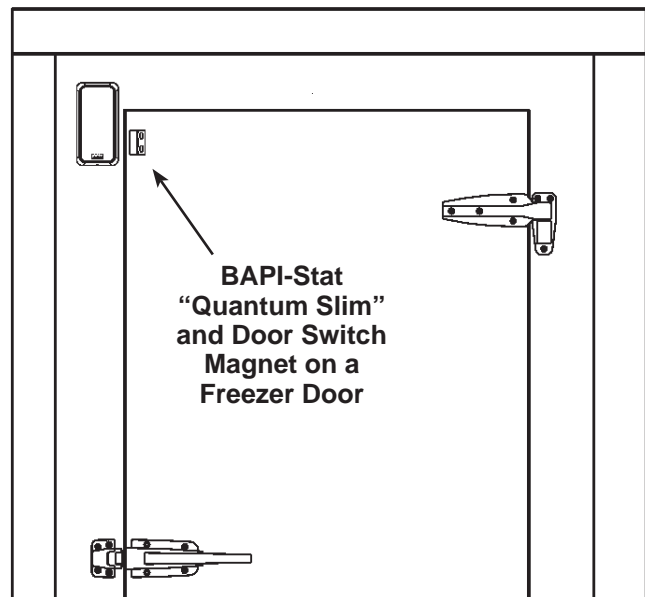
Submittal sheets without List Prices are available on our website at www.bapivac.com

Ordering Information

	<u>List Price</u>
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.



<u>Part #</u>	<u>Description</u>	<u>List Price</u>
BA/DSM	Door Switch Magnet	\$8

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





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.



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: $\pm 1.25^{\circ}\text{F}$ (0.7°C) from 32 to 158°F (0 to 70°C)
Humidity: $\pm 2\% \text{RH}$ @ 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

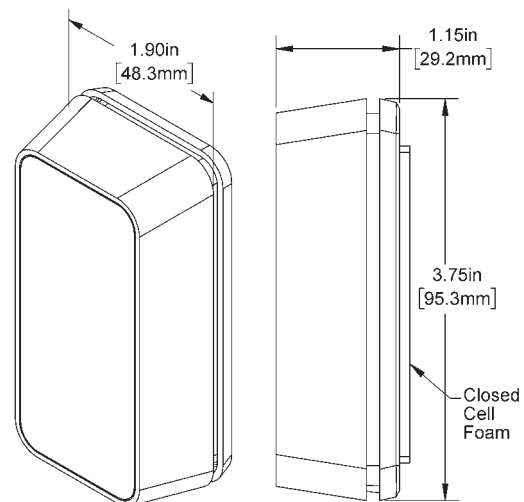
User Adjustable Settings:

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: 10 sec to 5 min
Temp Offset: $\pm 0.1^{\circ}\text{F/C}$ to $\pm 5.0^{\circ}\text{F/C}$
Humidity Offset: $\pm 0.1\% \text{RH}$ to $\pm 3.0\% \text{RH}$

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 / FCC: T4FSM220923
IC: 9067A-SM220923



*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.

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





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

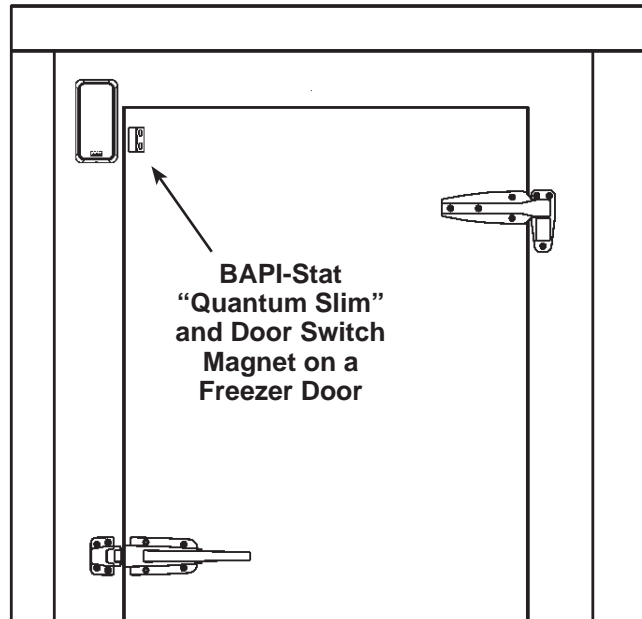
BA/LI14505

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.

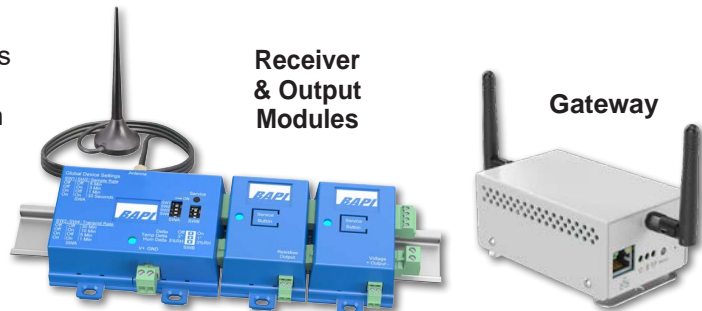


Part #	Description	List Price
BA/DSM	Door Switch Magnet	\$8

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.





Features & Options

- NSF certified with food and dishwasher safe materials
- User adjustable settings
- 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 conveyor systems.



Specifications

Power: One included Lithium 1/2AA 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*

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
 Sample Interval: 10 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.

Enclosure Material: Food Safe Plastic

*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.

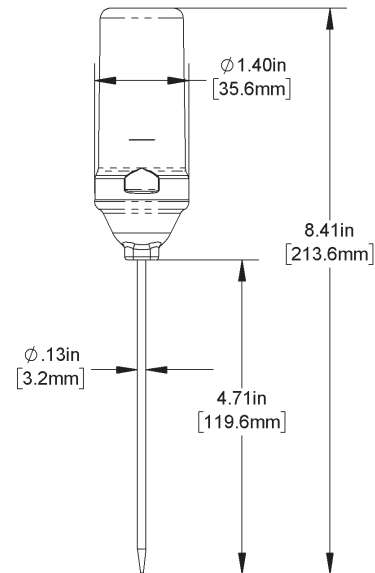
**Actual battery life is dependent on the sensor's adjustable settings and environmental conditions.

Frequency: 2.4 GHz (Bluetooth Low Energy)

Receiver Sensitivity: -97 dBm

Probe Material: 304 SS, 1/8" (3.2mm) diameter

Agency:
 RoHS / NSF Certified
 FCC: T4FSM211222 / IC: 9067A-SM211222



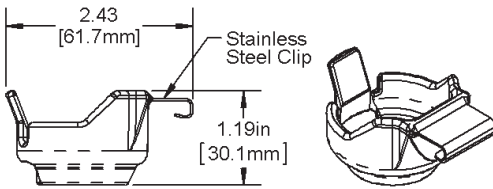
Food Probe Calculated Battery Life**		
Transmit Interval	Sample Rate	Estimated Life (years)
30 sec	30 sec	0.25
1 min	1 min	0.42
3 min	1 min	0.55
5 min	5 min	1.45
10 min	5 min	1.96



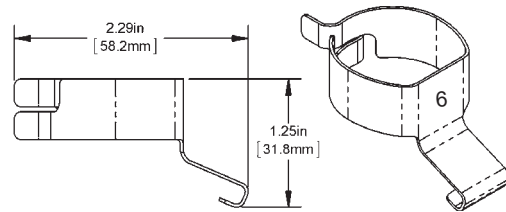
Submittal sheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

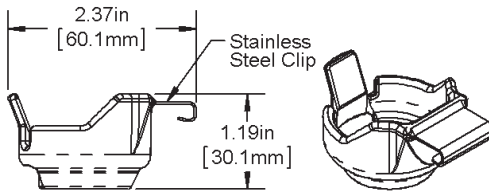
<u>PART NUMBER</u>	<u>List Price</u>	
BA/WFP-BLE-PT .. Wireless Food Temperature Probe	\$300	
BA/BAT-5AA-HIT .. Lithium ½AA Battery, 3.6V, for the Wireless Food Probe	\$6 (net price)	
BA/FP-CLP4	Fixed Depth Clip for Stainless Steel Square Food Bins (Black Plastic)	\$15
BA/FP-CLP5	Fixed Depth Clip for 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	



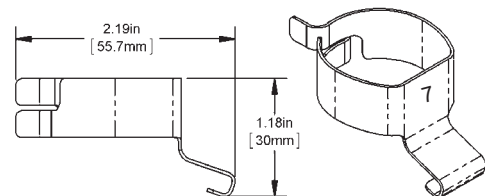
Fixed Depth Clip for Most Plastic Square Bins (Amber Plastic)



Adjustable Depth Bin Clip for Most Plastic Square Bins (“6” stamp on flat)



Fixed Depth Clip for Most Stainless Steel Square Bins (Black Plastic)



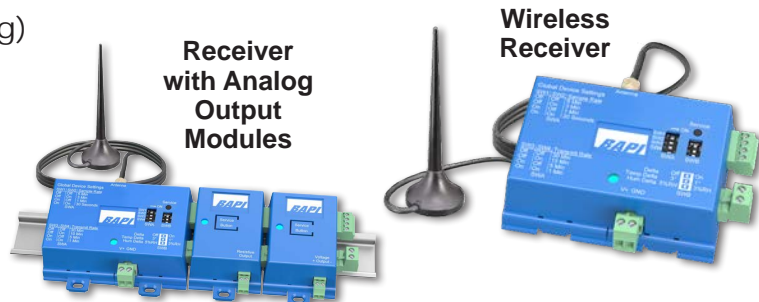
Adjustable Depth Bin Clip for Most SS Square Bins (“7” stamp on flat)



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.



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.





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.



ORDERING INFO:

List Price

BA/GTW-BLE: Wireless Gateway..... \$735

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

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

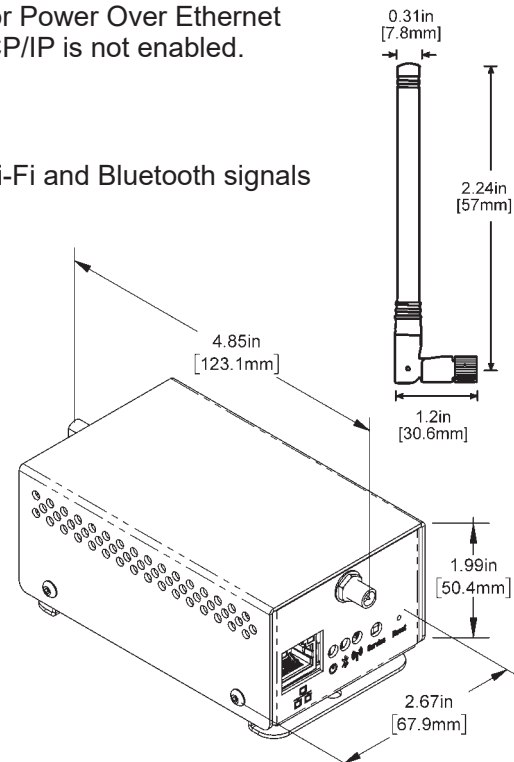
Receiver Sensitivity: -97 dBm

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.





Rev. 12/11/23

Wireless Receiver

F27

Wireless System

Features & Options

- Receiver output is converted to an analog voltage or resistance by the associated Analog Output Modules
- Supports up to 32 sensors and 127 Analog Output Modules
- User adjustable settings
- Surface, snaptrack or DIN rail mountable

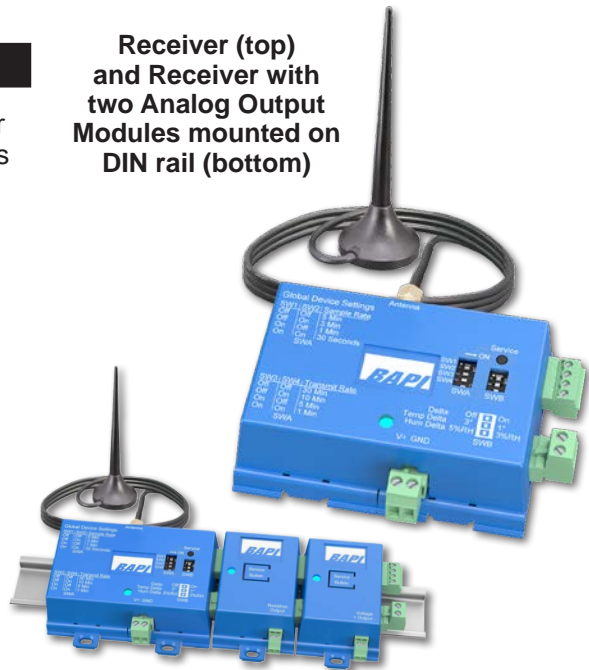
The Wireless Receiver from BAPI receives the data from one or more wireless sensors. The data is then transferred to the Analog Output Modules and converted to an analog voltage or resistance. The receiver supports up to 32 sensors and up to 127 different Analog Output Modules.

ORDERING INFO:

BA/RCV-BLE-EZ.... Wireless Receiver\$300

List Price

Receiver (top) and Receiver with two Analog Output Modules mounted on DIN rail (bottom)



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

Associated Products

• Temp or Temp/Humidity Sensors

A wide range of sensors that measure and send the temp or temp/humidity data to the receiver.



• **Analog Output Modules:**
Converts the signal from the Receiver into an analog voltage or resistance.



Sensors



Specifications

Supply Power: 15 to 40 VDC or 12 to 24 VAC, halfwave rectified

Power Consumption: 30mA @ 24 VDC, 2.75 VA @ 24 VAC

Capacity/Unit: Up to 32 sensors and 127 different Analog Output Modules

Reception Distance: Varies by application*

Frequency: 2.4 GHz (Bluetooth Low Energy)

Bus Cable Distance:

4,000 ft with shielded, twisted pair cable

Environmental Operation Range:

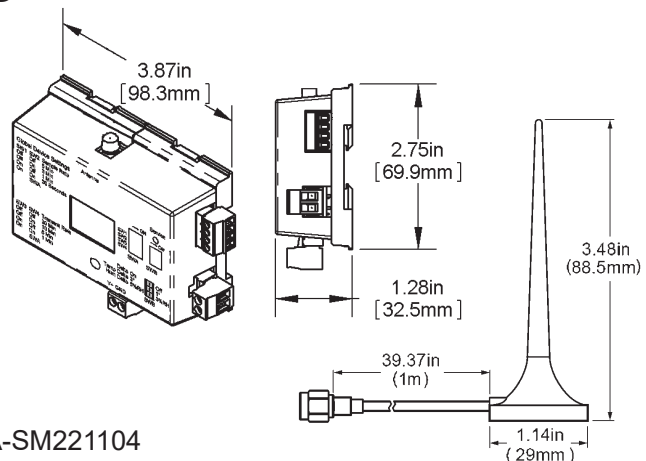
Temp: 32 to 140°F (0 to 60°C)

Humidity: 5 to 95% RH non-condensing

Enclosure Material & Rating:

ABS Plastic, UL94 V-0

Agency: RoHS / FCC: T4FSM221104 / IC: 9067A-SM221104



*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.





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.

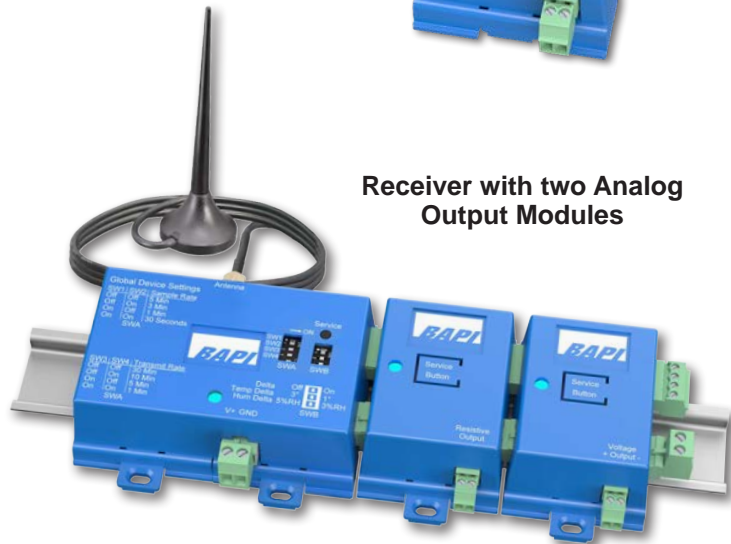
The ROM is easily trained to a single sensor variable with a pushbutton and LED. The ROM is surface, 2.75" snaptrack or 35mm DIN rail mountable.

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



Receiver with two Analog Output Modules



Specifications

Supply Power:

15 to 40 VDC or 12 to 24 VAC, half wave

Power Consumption:

20 mA @ 24 VDC, 1.55 VA @ 24 VAC

Analog Input Bias Voltage: 10 VDC max

Temperature Output Ranges:

10K-2 Unit:..... 35 to 120°F (1 to 50°C)

10K-3 Unit:..... 32 to 120°F (0 to 50°C)

10K-3(11K) Unit:.... 32 to 120°F (0 to 50°C)

20K Unit:..... 53 to 120°F (12 to 50°C)

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:

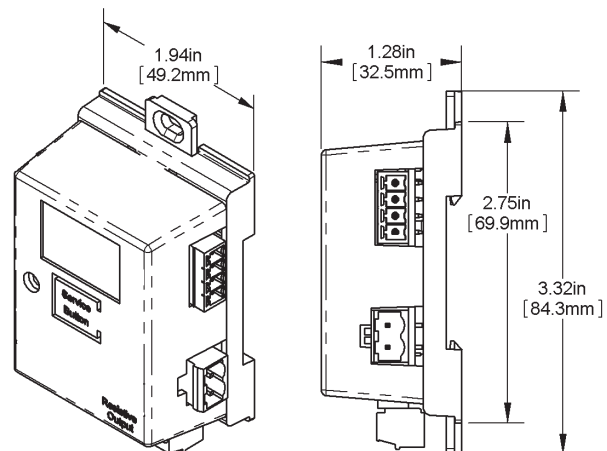
Temp: 32 to 140°F (0 to 60°C)

Humidity: 5 to 95% RH non-condensing

Enclosure Material & Rating:

ABS Plastic, UL94 V-0

Agency: RoHS





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

Ordering Information

<u>PART NUMBERS</u>	<u>List Price</u>
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)





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.

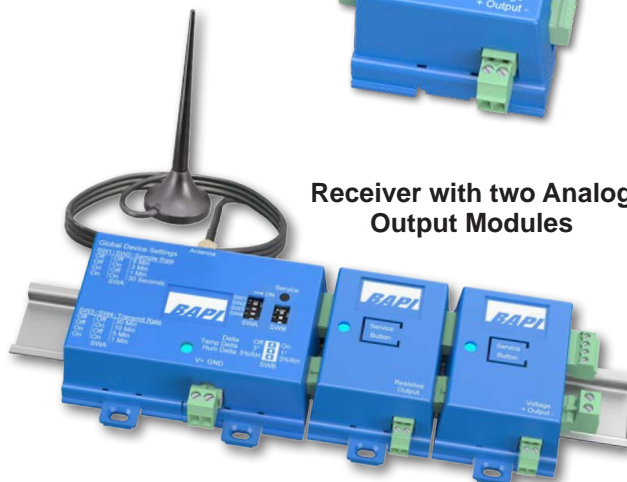
The VOM is easily trained to a single sensor variable with a pushbutton and LED. The VOM is surface, 2.75" snaptrack or 35mm DIN rail mountable.

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.

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: (half wave)
15 to 40 VDC, 12 to 24 VAC

Power Consumption:
25 mA @ 24 VDC, 1.75 VA @ 24 VAC

Output Current: 2.5 mA @ 4K Ω 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 (5V or 10V)

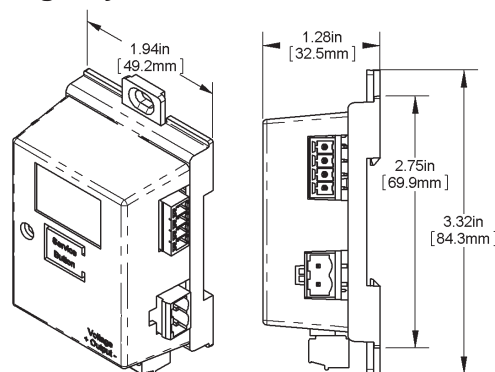
Bus Cable Distance:
4,000 ft with shielded, twisted pair cable

Output Resolution: 150 μ V

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





Voltage Output Module (VOM)

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 90°F Range	\$150
BA/VOM-BLE-05-D-F-EZ: Voltage Output Module, 0 to 5V Output, 55 to 85°F Range	\$150
BA/VOM-BLE-05-E-F-EZ: Voltage Output Module, 0 to 5V Output, 60 to 80°F Range.....	\$150
BA/VOM-BLE-05-F-F-EZ: Voltage Output Module, 0 to 5V Output, 65 to 80°F Range.....	\$150
BA/VOM-BLE-05-G-F-EZ: Voltage Output Module, 0 to 5V Output, 45 to 96°F Range	\$150
BA/VOM-BLE-05-H-F-EZ: Voltage Output Module, 0 to 5V Output, -20 to 120°F Range	\$150
BA/VOM-BLE-05-KK-F-EZ: Voltage Output Module, 0 to 5V Output, 32 to 185°F Range.....	\$150
BA/VOM-BLE-05-MM-F-EZ: Voltage Output Module, 0 to 5V Output, -40 to 140°F Range.....	\$150
BA/VOM-BLE-10-C-F-EZ: Voltage Output Module, 0 to 10V Output, 50 to 90°F Range	\$150
BA/VOM-BLE-10-D-F-EZ: Voltage Output Module, 0 to 10V Output, 55 to 85°F Range	\$150
BA/VOM-BLE-10-E-F-EZ: Voltage Output Module, 0 to 10V Output, 60 to 80°F Range.....	\$150
BA/VOM-BLE-10-F-F-EZ: Voltage Output Module, 0 to 10V Output, 65 to 80°F Range.....	\$150
BA/VOM-BLE-10-G-F-EZ: Voltage Output Module, 0 to 10V Output, 45 to 96°F Range	\$150
BA/VOM-BLE-10-H-F-EZ: Voltage Output Module, 0 to 10V Output, -20 to 120°F Range	\$150
BA/VOM-BLE-10-KK-F-EZ: Voltage Output Module, 0 to 10V Output, 32 to 185°F Range.....	\$150
BA/VOM-BLE-10-MM-F-EZ: Voltage Output Module, 0 to 10V Output, -40 to 140°F Range.....	\$150
°C TEMPERATURE PART NUMBERS	
BA/VOM-BLE-05-C-C-EZ: Voltage Output Module, 0 to 5V Output, 10 to 32°C Range.....	\$150
BA/VOM-BLE-05-D-C-EZ: Voltage Output Module, 0 to 5V Output, 13 to 30°C Range.....	\$150
BA/VOM-BLE-05-E-C-EZ: Voltage Output Module, 0 to 5V Output, 15 to 27°C Range.....	\$150
BA/VOM-BLE-05-F-C-EZ: Voltage Output Module, 0 to 5V Output, 18 to 27°C Range	\$150
BA/VOM-BLE-05-G-C-EZ: Voltage Output Module, 0 to 5V Output, 7 to 35°C Range	\$150
BA/VOM-BLE-05-H-C-EZ: Voltage Output Module, 0 to 5V Output, -29 to 49°C Range	\$150
BA/VOM-BLE-05-KK-C-EZ: Voltage Output Module, 0 to 5V Output, 0 to 85°C Range	\$150
BA/VOM-BLE-05-MM-C-EZ: Voltage Output Module, 0 to 5V Output, -40 to 60°C Range	\$150
BA/VOM-BLE-10-C-C-EZ: Voltage Output Module, 0 to 10V Output, 10 to 32°C Range.....	\$150
BA/VOM-BLE-10-D-C-EZ: Voltage Output Module, 0 to 10V Output, 13 to 30°C Range.....	\$150
BA/VOM-BLE-10-E-C-EZ: Voltage Output Module, 0 to 10V Output, 15 to 27°C Range.....	\$150
BA/VOM-BLE-10-F-C-EZ: Voltage Output Module, 0 to 10V Output, 18 to 27°C Range	\$150
BA/VOM-BLE-10-G-C-EZ: Voltage Output Module, 0 to 10V Output, 7 to 35°C Range	\$150
BA/VOM-BLE-10-H-C-EZ: Voltage Output Module, 0 to 10V Output, -29 to 49°C Range	\$150
BA/VOM-BLE-10-KK-C-EZ: Voltage Output Module, 0 to 10V Output, 0 to 85°C Range	\$150
BA/VOM-BLE-10-MM-C-EZ: Voltage Output Module, 0 to 10V Output, -40 to 60°C 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.





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.

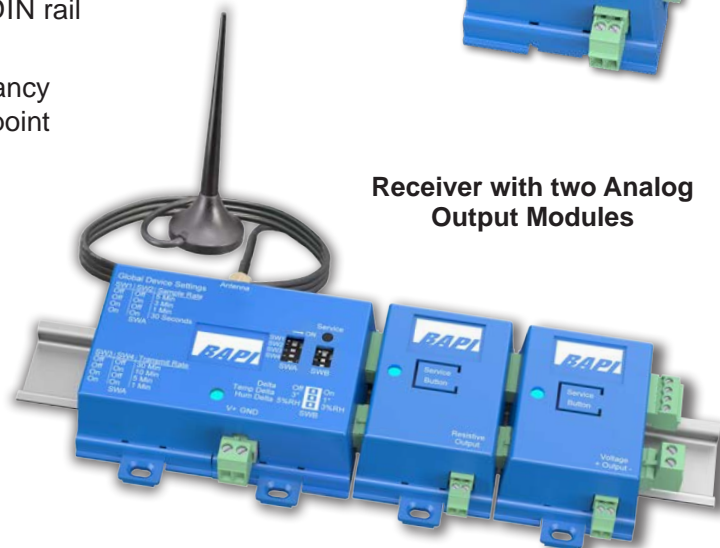
The units are available with an occupancy override signal in parallel with the setpoint output. For resistance output units, the resistance goes to 0Ω briefly when the override button is pressed. For voltage output units, the voltage goes to $0V$ briefly when the override button is pressed.

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



Receiver with two Analog Output Modules



Specifications

Supply Power: (half wave)
15 to 40 VDC, 12 to 24 VAC

Power Consumption:
Resistance Models: 20 mA @ 24 VDC, 1.55 VA @ 24 VAC
Voltage Models: 25 mA @ 24 VDC, 1.75 VA @ 24 VAC

Output Current: 2.5 mA @ 4K Ω load

Analog Input Bias Voltage:
10 VDC max (Resistance Output Models only)

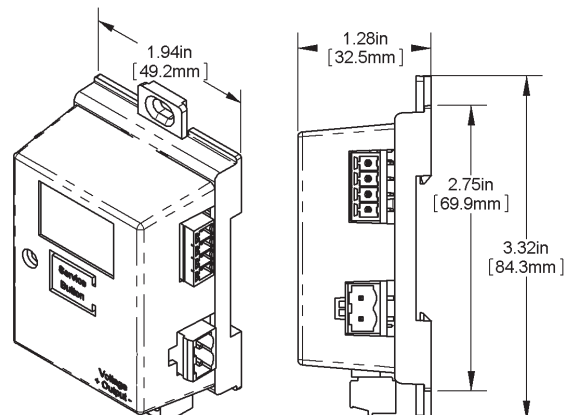
Lost Comm. Timeout: 35 min. (Fast Flash)
Reverts to its last command

Bus Cable Distance:
4,000 ft with shielded, twisted pair cable

Output Resolution:
Resistance Output: 100 Ω
Voltage Output: 150 μ V

Environmental Operation Range:
Temp: 32 to 140 $^{\circ}$ F (0 to 60 $^{\circ}$ C)
Humidity: 5 to 95% RH non-condensing

Material & Rating:
ABS Plastic, UL94 V-0
Agency: RoHS





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

Ordering Information

<u>VOLTAGE OUTPUT UNIT</u>	<u>List Price</u>
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)

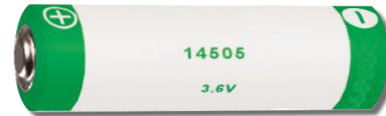




Features & Options

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/LI14505
(for all BAPI Wireless Sensors except the Wireless Food Probe)

BA/BAT-5AA-HIT

The BA/BAT-5AA-HIT High Temperature Lithium 1/2AA battery is the ideal replacement for the BAPI Bluetooth Low Energy Wireless Food Probe sensor. Each food probe takes one battery.



BA/BAT-5AA-HIT
(for Wireless Food Probe)

<u>PART NUMBER</u>	<u>DESCRIPTION</u>
--------------------	--------------------

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 1/2AA 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), 1/2AA
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



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.


























Optional Pluggable Terminal Block Kit for AOMs (4 Connectors)

<u>PART NUMBER:</u>	<u>List Price</u>
BA/AOM-CONN ..Pluggable Terminal Block Kit.....	\$15





<h3>Power Supplies and Voltage Converters</h3> <p>VC350A-EZ 350mA Voltage Converter  pg F2</p> <p>VC350A 350mA Voltage Converter </p> <p>PDM - Power Distribution Module  pg F4</p> <hr/> <p>VC2000 Voltage Conv.  pg F5</p> <p>PS17 Power Supplies  pg F6</p>			<h3>Water Leak Detector</h3>  <p>pgs F8-F11</p>
<h3>Door Monitor Alarm (DMA)</h3>  <p>pg F12</p>	<h3>BAPI-Guard</h3>  <p>pg F14</p>	<h3>PMPB5 - Pulse Meter Pulse Buffer</h3>  <p>pg F16</p>	<h3>FPB - Flexible Probe Bracket</h3>  <p>pg F18</p>
<h3>BAPI Screwdriver and Allen Wrench</h3>  <p>pg F19</p>	<h3>Clean Cut Tool for BAPI-Boxes</h3>  <p>pg F20</p>	<h3>Trim Rings for the BAPI-Stat 4</h3>  <p>pg F21</p>	<h3>Adaptor Plates for Retrofit Installations</h3>  <p>pg F22</p>
<h3>Custom Logo Plates</h3>  <p>pg F24</p>	<h3>Light Level Sensor</h3>  <p>pg F25</p>	<h3>RJ22 Comm. Jack Adaptor</h3>  <p>Security Screws & Spanner Bit</p>  <p>pg F26</p>	<h3>Replacement Keys, Foambacks & Humidity filters</h3>  <p>pg F27</p>
<h3>Sealant Filled Connectors</h3>  <p>pg F28</p>	<h3>Pierceable Knockout Plugs for Enclosures</h3>  <p>pg F29</p>	<h3>Replacement Batteries</h3>  <p>pg F30</p>	<h3>Weather Shade for Outdoor Air Sensors</h3>  <p>pg F31</p>





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

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 $\pm 10\%$. The adjustable model has an output of 5 to 24 VDC.



VC350A EZ mounted on DIN Rail

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:

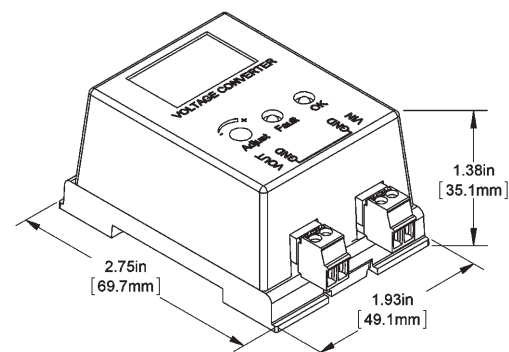
0 to 95% RH non-condensing
-40 to 149°F (-40 to 65°C) 350 mA @ any output voltage
-40 to 158°F (-40 to 70°C) 350 mA @ 5 VDC
330 mA @ 10 VDC
280 mA @ 12 VDC
224 mA @ 15 VDC
140 mA @ 24 VDC

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.





Rev. 05/31/22

VC350A Voltage Converter

G3

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

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



VC350A mounted in optional snaptrack

EZ Voltage Converter

BAPI's 350mA EZ Voltage Converter allows for DIN Rail, Snaptrack or surface mounting. (See pg F2.)



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 $\pm 10\%$. The adjustable model has an output of 5 to 24 VDC.

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

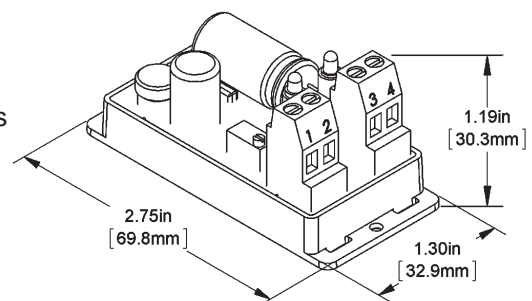
Environmental Storage Range:

-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.



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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)



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

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/PDM-5-B	Five circuit Power Distribution Module, with breaker.....	\$364
BA/PDM-3-B	Three circuit Power Distribution Module, with breaker	\$277
BA/PDM-5-F	Five circuit Power Distribution Module, with fuse	\$218
BA/PDM-3-F	Three circuit Power Distribution Module, with fuse	\$182
BA/PDM-5-B-DIN	Five circuit Power Distribution Module, with breaker, DIN mount.....	\$364
BA/PDM-3-B-DIN	Three circuit Power Distribution Module, with breaker, DIN mount.....	\$277
BA/PDM-5-F-DIN	Five circuit Power Distribution Module, with fuse, DIN mount.....	\$218
BA/PDM-3-F-DIN	Three circuit Power Distribution Module, with fuse, DIN mount	\$182

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

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:

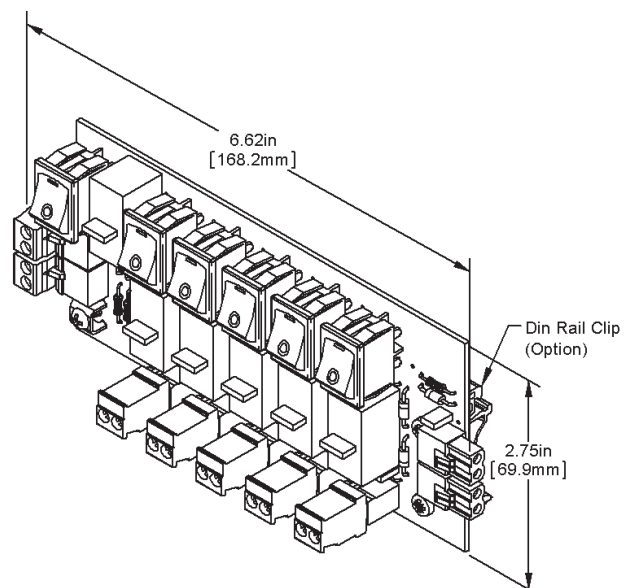
- Master..... Common rocker switch
- Circuit Individual rocker switch

Connection: Plug in terminal strip,
Cage clamp, 28 to 12 AWG

Mounting: 2.75" snaptrack

Ambient: -40 to 158°F (-40 to 70°C)

Warranty: 5 years





Rev. 05/26/21

VC2000 Voltage Converters

Accessories for HVAC/R

G5

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



Ordering Information

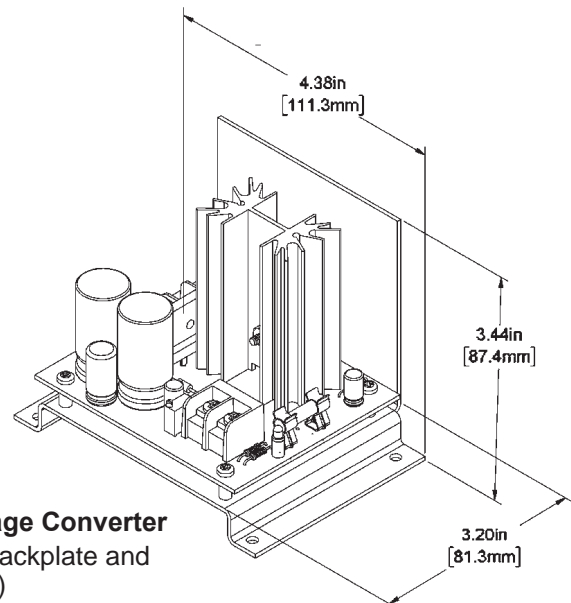
<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/VC2A-F	Converter without backplate, cartridge fuse.....	\$120
BA/VC2A-P	Converter without backplate, self-resetting fuse	\$120
BA/VC2B-F	Converter with backplate, cartridge fuse.....	\$120
BA/VC2B-P	Converter with backplate, self-resetting fuse	\$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 158°F (-40 to 70°C)
- 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)



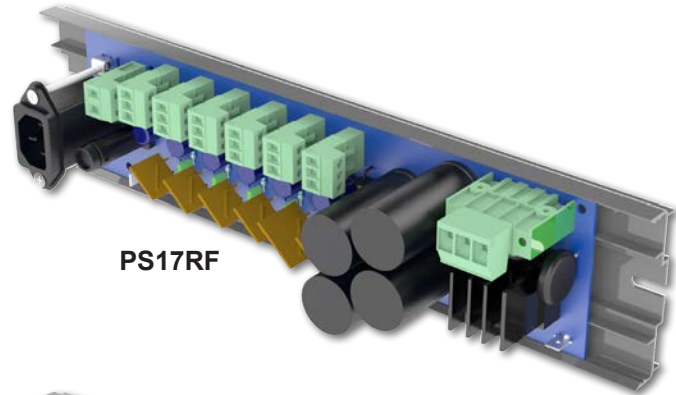


Overview

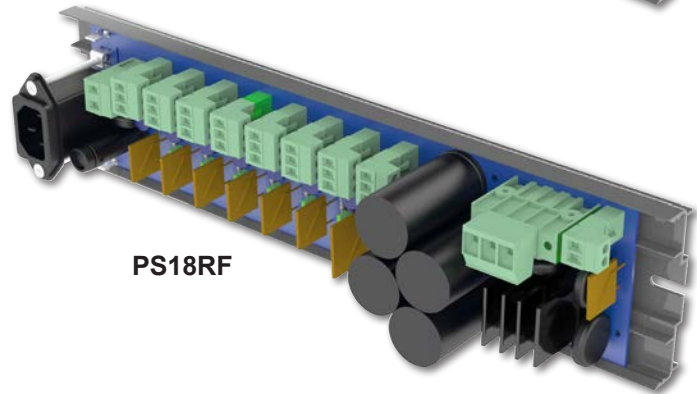
The PS17RF, PS18RF and PS19RF Power Supplies provide multiple 33 VDC* outputs with over-current protection to operate any of BAPI's ETA modules except the RS-485 communication modules. All power supplies are furnished with standard 2.75" snaptrack and include a green LED to indicate when power is supplied 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.

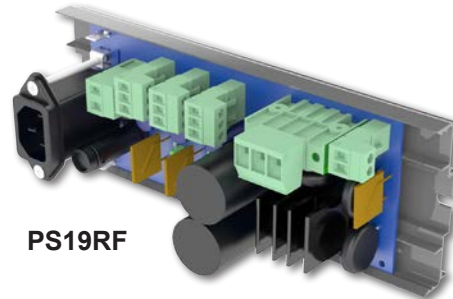
All three units provide a transient line filter for the line voltage input to the transformer. Plug a standard computer power cord into a duplex outlet and then into the line filter to power the units.



PS17RF



PS18RF



PS19RF



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





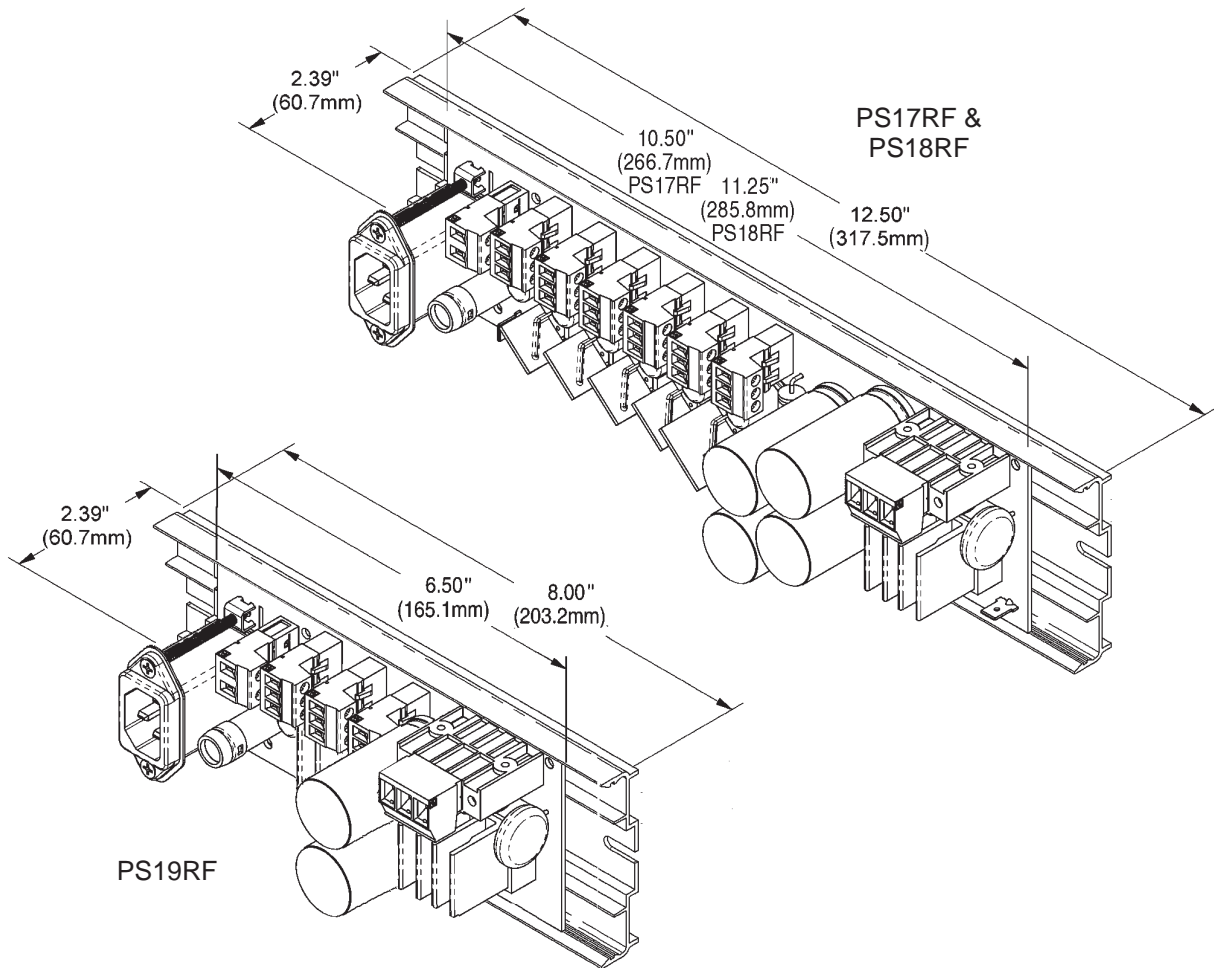
Ordering Information

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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





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.

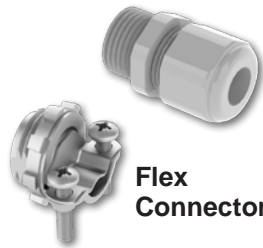
The sensors detect dirty and purified water, deionized water, distilled water and reverse osmosis (RO) water.



Attached
Sensor



Remote
Sensor



Liquid
Tight
Fitting

Flex
Connector

Specifications

Power: 24VAC/VDC $\pm 10\%$, 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 screw from 0.063 to 0.84" (1.60 to 21.34mm)

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 185°F (-28 to 158°C)

Detector (BB): -4 to 158°F (-20 to 70°C), 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





Water Leak Detector – 5 Amp Relays

G9

Accessories for HVAC/R

Submission 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)

PS..... Probe Sensor built into the enclosure..... \$32

RS5..... Remote Spot Sensor with 5 foot FEP cable \$36

RS10..... Remote Spot Sensor with 10 foot FEP cable \$41

RS25..... Remote Spot 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

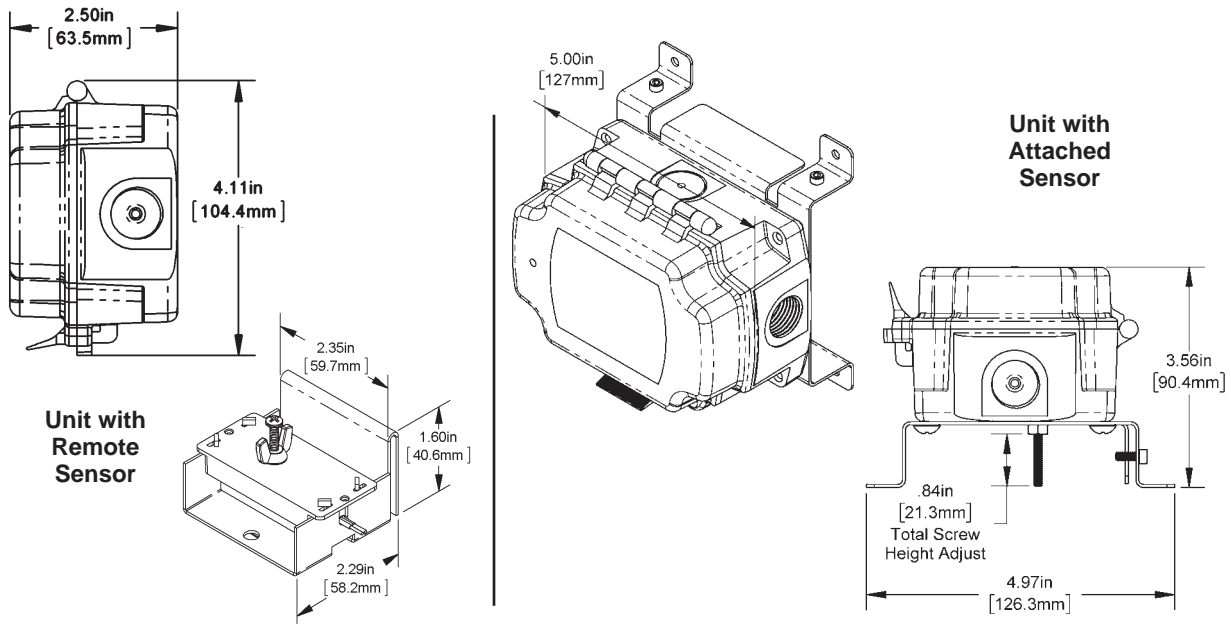
List Price: \$200 (Two 5A Relays) + \$41 (10' Remote Sensor) + \$12 (BAPI-Box) = \$253 List Price

Your Number: BA/

Replacement Remote Sensors (For updates to existing systems)

Part Number	Sensor Type	List Price
BA/RS5	Remote Spot Water Sensor with 5 foot FEP cable	\$36
BA/RS10	Remote Spot Water Sensor with 10 foot FEP cable	\$41
BA/RS25	Remote Spot Water Sensor with 25 foot FEP cable	\$56

Dimensions





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. The sensor detects dirty and purified water, deionized water, distilled water and reverse osmosis (RO) water.

Water Leak Detector with Rope Sensor



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)

ANOTHER ORIGINAL BAPI



Specifications

Power:

24VAC/VDC $\pm 10\%$, 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 sensor cable, detects 1/8" of water. Max length: 100' (30.5m)

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 167°F (0 to 75°C)

Detector (BB): -4 to 158°F (-20 to 70°C), 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





Water Leak Detector w/Rope Sensor – 5 Amp Relays

G11

Accessories for HVAC/R

Submission datasheets without List Prices are available on our website at www.bapivac.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

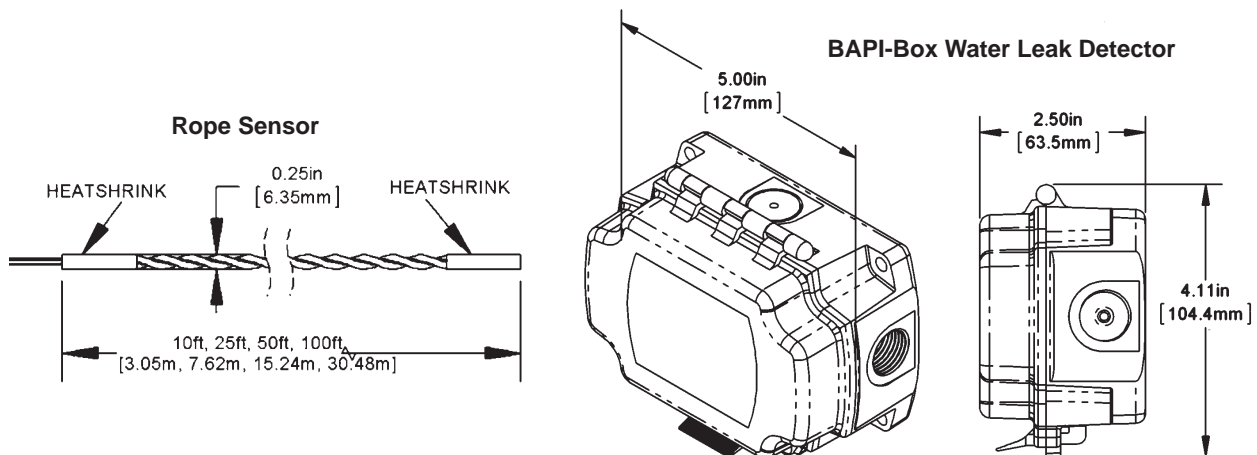
Your Number: BA/

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





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:

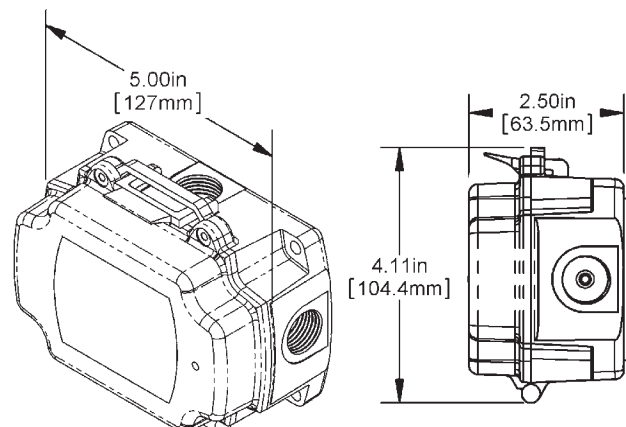
UV-resistant Polycarbonate, UL94 V-0

Enclosure Rating: IP66, NEMA 4

Agency:

CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment), UL94 V-0, RoHS

Warranty: 5 years





Door Monitor Alarm (DMA)

G13

Accessories for HVAC/R

Submittal datasheets without List Prices are available on the BAPI website.

Ordering Information

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/DMA	Door Monitor Alarm (DMA).....	\$805

REED SWITCH FOR THE DMA

BA/DMA-RSW1.....	Press Fit Magnetic Contact, 3/4" (19mm) diameter	\$10
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





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

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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

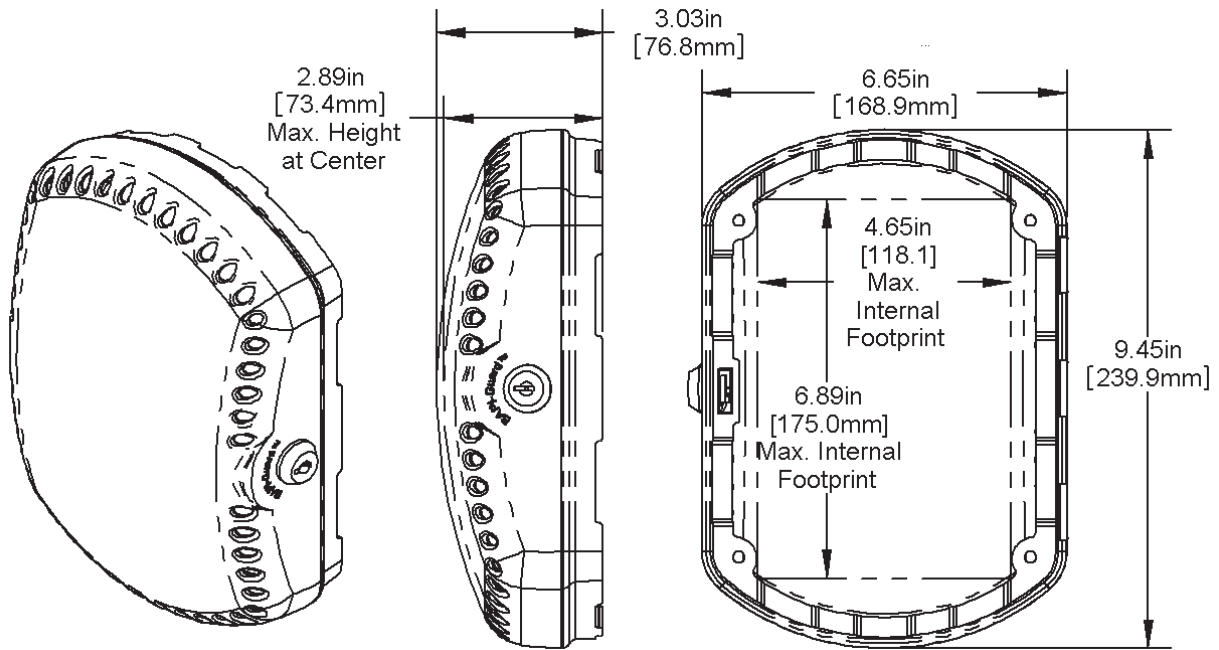
Delta Style Enclosure
 BAPI-Stat “Quantum”
 Automated Logic RS Series
 York Zone Sensor
 Invensys MN series

If you have a question about whether a model will fit a specific thermostat, please call BAPI.

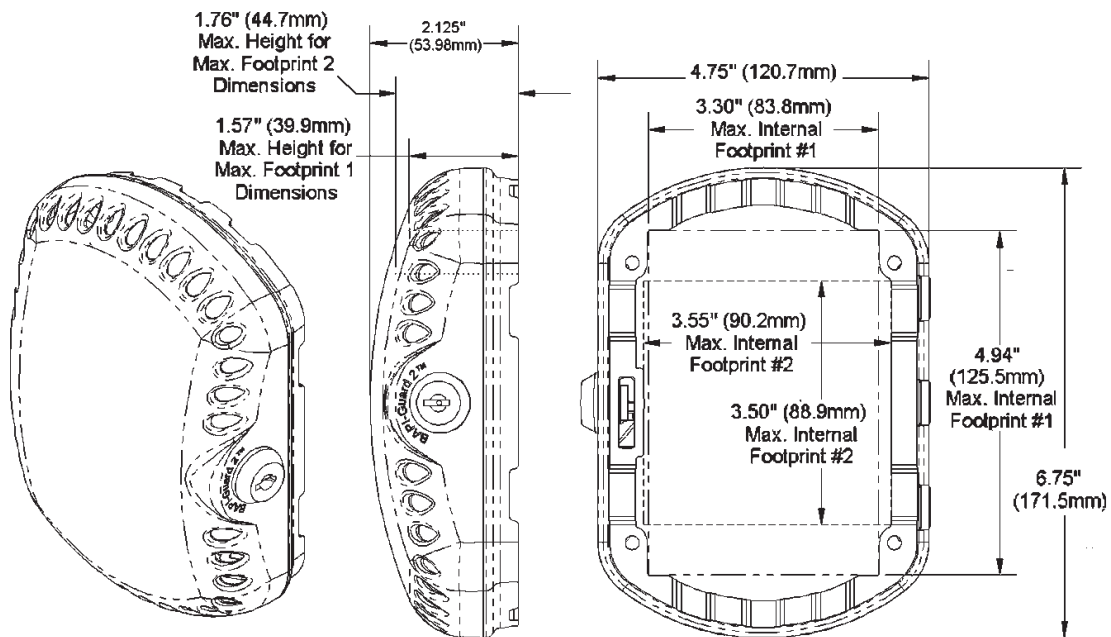




Dimensions



BAPI-Guard



BAPI-Guard 2

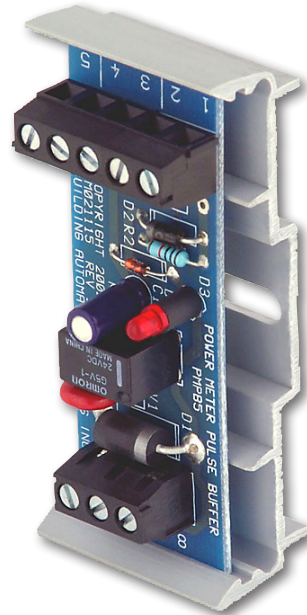




Overview

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:

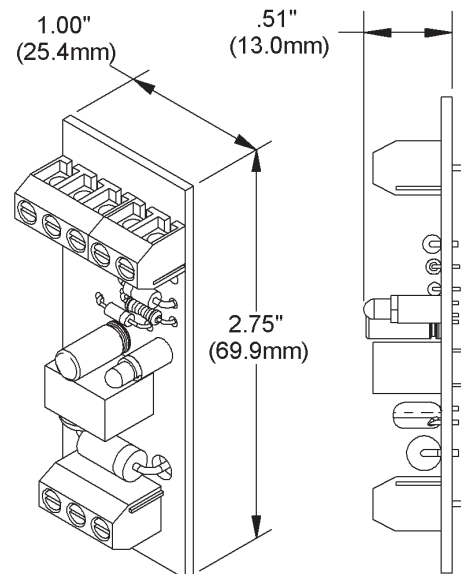
24VAC 50/60HZ @ 25mA (0.6VA)

Contact Rating:

1A @ 24VAC maximum, 1mA @ 5VDC minimum)

Contact Repetition Rate:

2 seconds per pulse maximum





Rev. 07/12/21

TS1 & TS2 - Transient Suppressor

G17

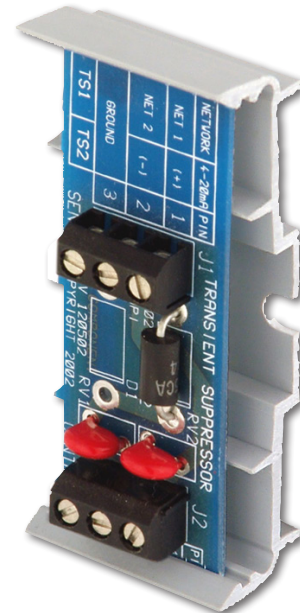
Accessories for HVAC/R

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

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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

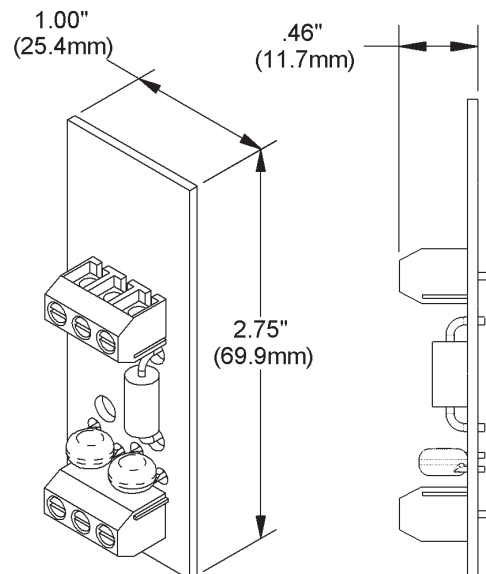
Specifications

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





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

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

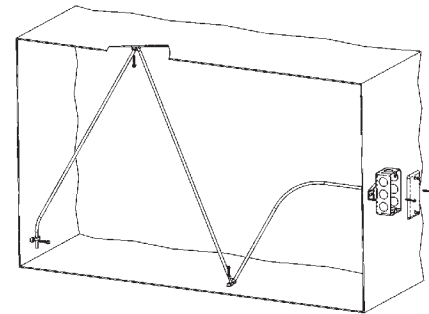
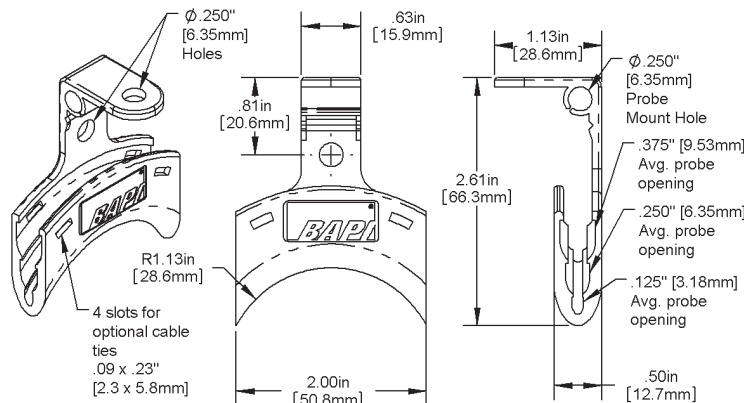
Rating: UL94 V-2 (plenum rated), RoHS Compliant

Mounting: Two 1/4" holes, on the top and side.

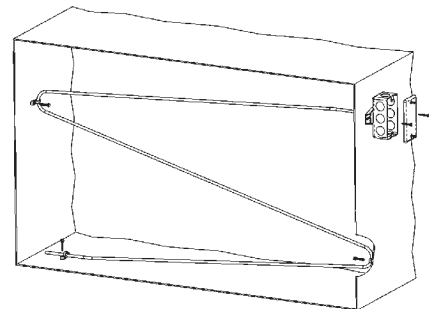
Probe Size: 1/8", 1/4", and 3/8" flexible probes
1/4" rigid probe holder, w/break off score

Bracket Arc: 1.125" radius

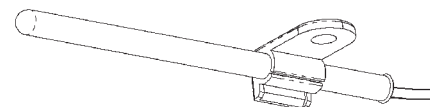
Operational Temp: -22 to 167°F, (-30 to 75°C)



Vertical Mounting of the Averaging Sensor



Horizontal Mounting of the Averaging Sensor



1/4" Rigid Probe Mounting (using scored break off)



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

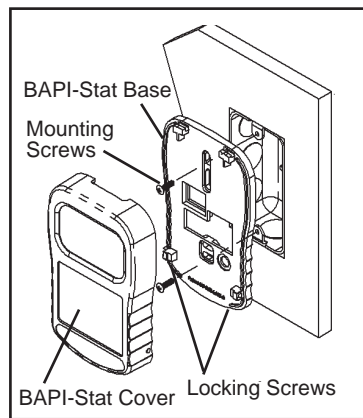
<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/116W.....	BAPI 6.75" Screwdriver & Allen Wrench Combination	\$20
BA/116.....	BAPI 6" Screwdriver & Allen Wrench Combination	\$12

Gray shaded items follow the Buy and Resale Multiplier.

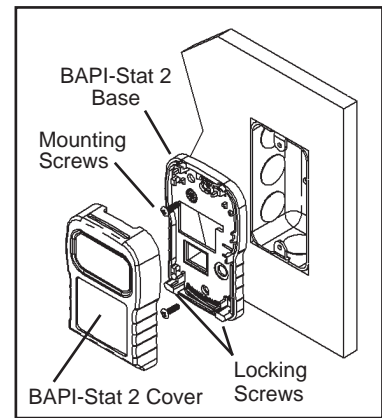
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Allen Wrench Locking Screw Locations for BAPI Room Units

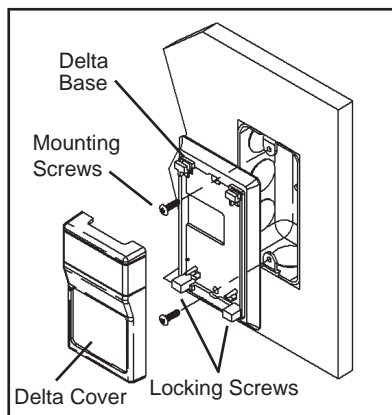
The figures below show the location of the locking screws on 5 of BAPI's room unit enclosures. The BAPI Screwdriver can be used with all of them. Simply snap the cover in place and turn the locking screws counterclockwise with the Allen wrench, backing them out to lock the cover in place.



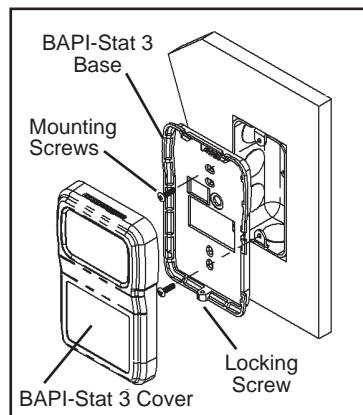
BAPI-Stat Style Enclosure



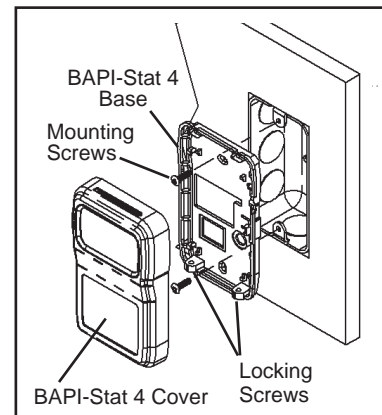
BAPI-Stat 2 Style Enclosure



Delta Style Enclosure



BAPI-Stat 3 Style Enclosure



BAPI-Stat 4 Style Enclosure





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 1/2" NPSM threaded ports of the BAPI-Box and BAPI-Box 2 polycarbonate enclosures. This tool makes removing the plastic plug fast and easy and produces 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 - 1/2" 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

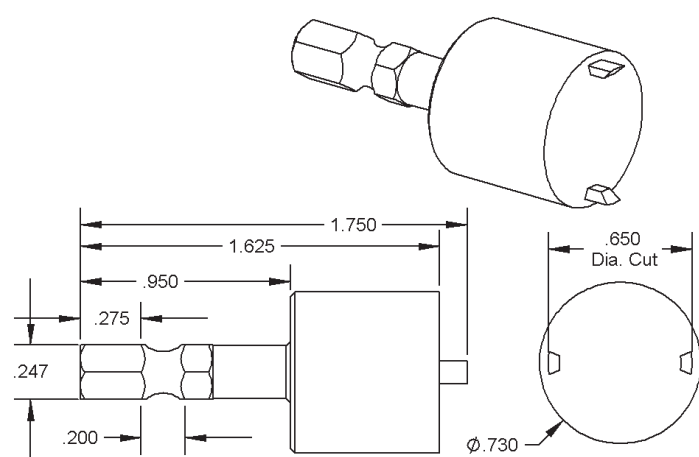
Sharpening: Hand grinder or file
(As needed)

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)





Rev. 11/23/20

BAPI-Stat 4 Trim Ring

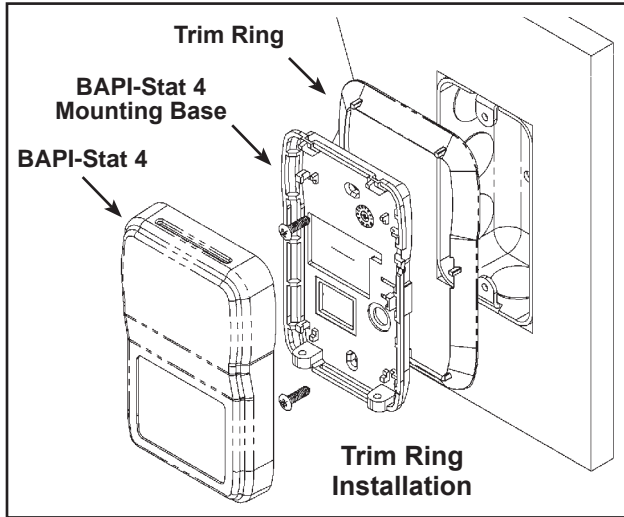
G21

Accessories for HVAC/R

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 Trim Ring



BAPI-Stat 4 with and without Trim Ring

Ordering Information

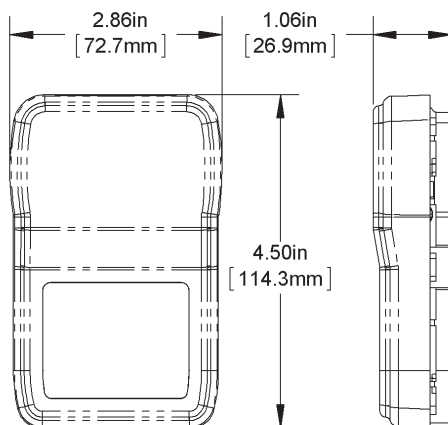
Part Number	Description	List Price
BA/BS4-TR-BW	BAPI-Stat 4 Trim Ring, Bright White Color	\$4
BA/BS4-TR	BAPI-Stat 4 Trim Ring, Beige Color.....	\$4

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

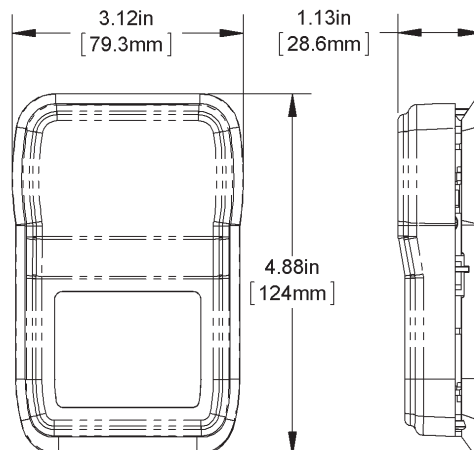
Specifications

Material: ABS plastic, Flame-retardant, UL 94, V-0
Temperature: 32 to 122°F (0 to 50°C)

Humidity: 0 to 95%, non-condensing



BAPI-Stat 4 without Trim Ring



BAPI-Stat 4 with Trim Ring





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.



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

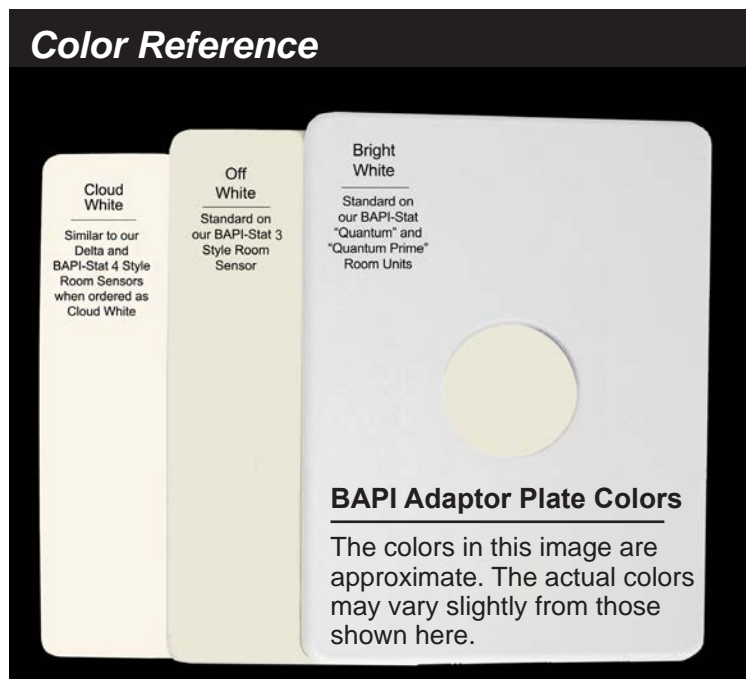
Mounting:

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

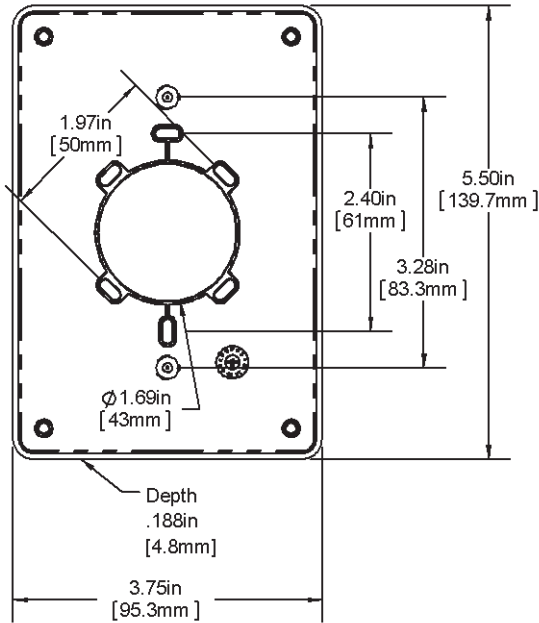




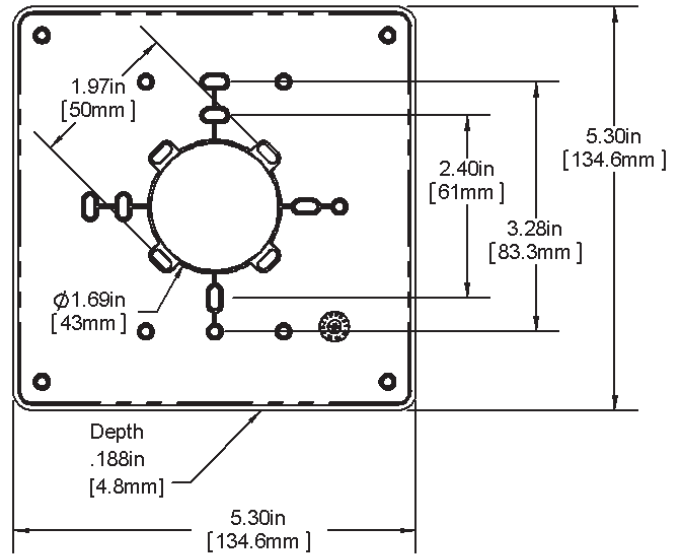
Adaptor Plates for Retrofits

Accessories for HVAC/R

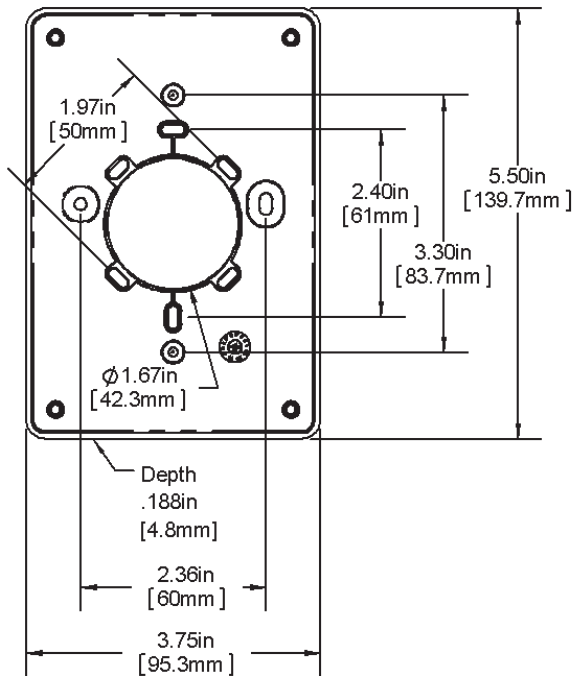
G23



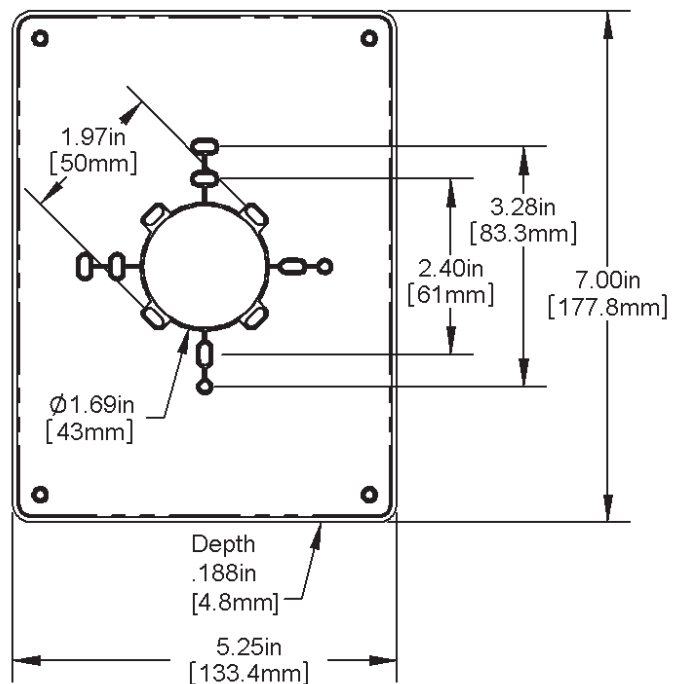
BA/ADP-37-55-BW



BA/ADP-53-53-BW



BA/ADP-37-55-BW-UK



BA/ADP-525-7-BW





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.

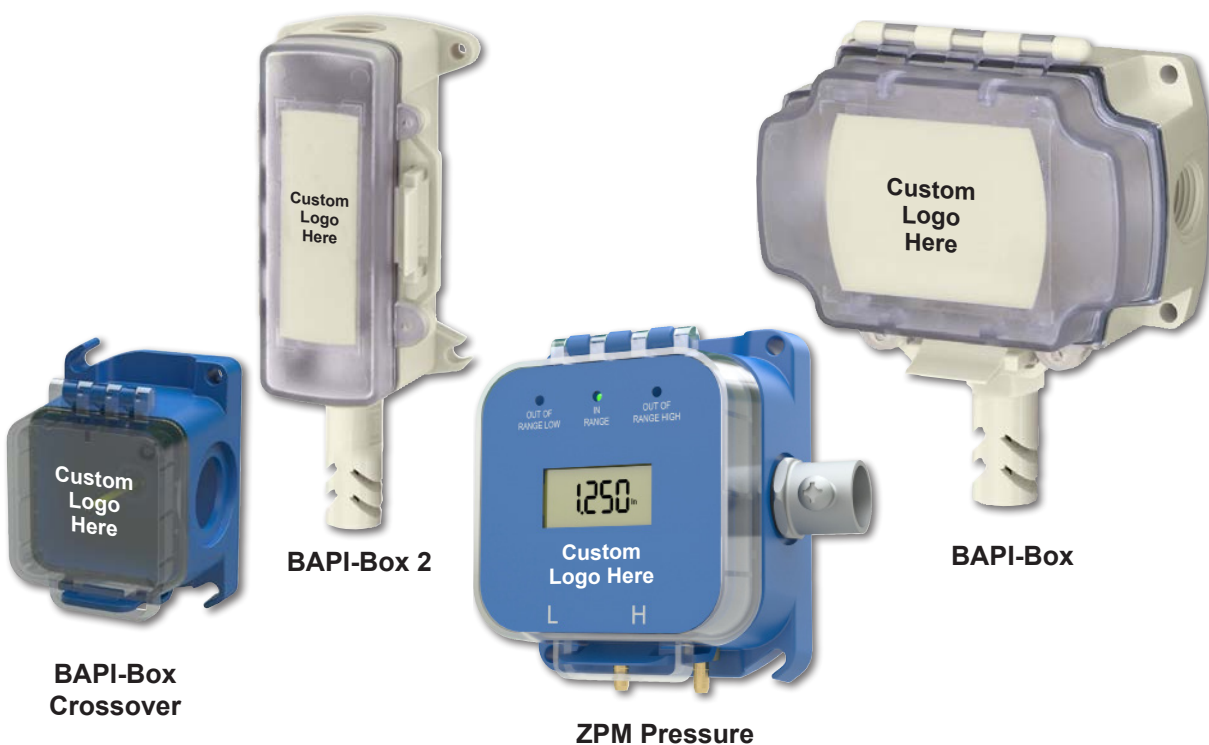
Call BAPI for pricing information and lead times on Custom Logo Plates.



BAPI-Stat "Quantum Prime"



BAPI-Stat "Quantum"



**BAPI-Box
Crossover**

BAPI-Box 2

ZPM Pressure

BAPI-Box



Rev. 02/08/22

Outdoor Light Level Sensor

G25

Accessories for HVAC/R

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)

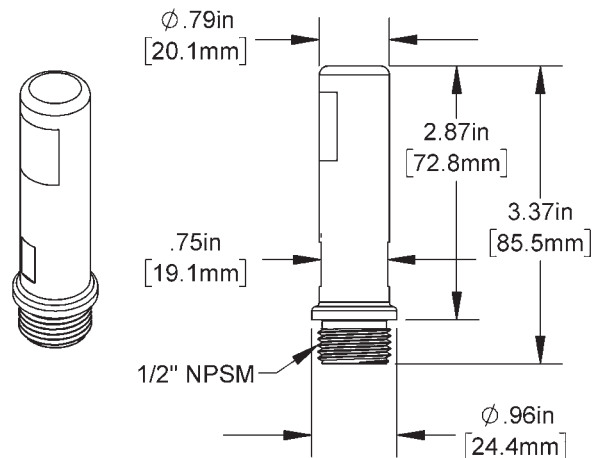
Humidity: 0 to 100%, non-condensing

Enclosure Material:

UV-Inhibited Polycarbonate

Enclosure Rating and Material Rating:

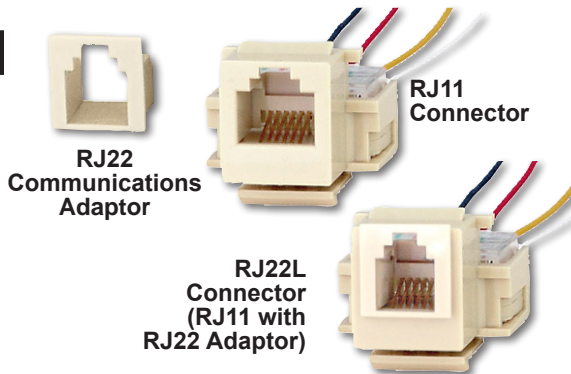
IP66, NEMA 4 / UL94 V-0





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 Adaptor converts the standard RJ11 jack used in BAPI sensors to the smaller RJ22 dimensions.



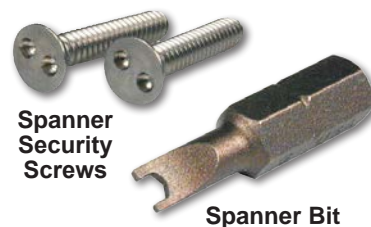
ORDERING INFORMATION

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

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





Rev. 01/13/23

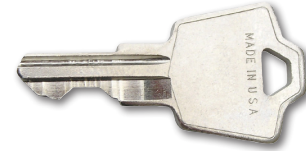
Replacement Keys

Accessories for HVAC/R

G27

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

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



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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 two types of SFCs: a Twist-On and a Crimp-On. The Crimp-On (SFC3000) is used for factory terminations, while the Twist-On SFC2000 is used for field terminations.

The 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 (105°C), and it is not UL listed.

The 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.



Twist-On SFC2000



Crimp-On SFC3000

Ordering Information

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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

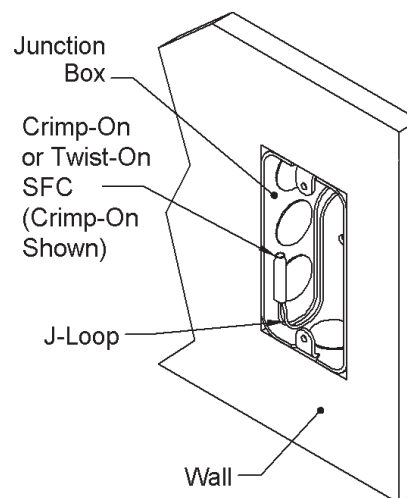
Gray shaded items follow the Buy and Resale Multiplier.

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J-Loop Termination Technique

Incorporating a "J-Loop" (also known as a drip loop) into all terminations adds an additional layer of protection against moisture and oxidation by directing moisture away from the connection.

The idea is to place the wire junction as high as possible and form a "J" with the leadwires. The bottom of this "J" should be below the junction point. Any moisture that collects on the leadwires is pulled downward by gravity to the bottom of this loop and away from the junction.





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

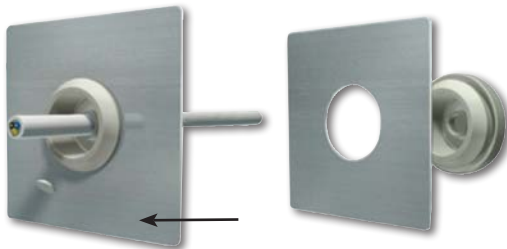
Pierceable Knockout Plugs are available for the open port in the BAPI-Box Crossover and BAPI-Box 4 Enclosure, as well as the non-threaded ports in the BAPI-Box, BAPI-Box 2 and Junction Box and enclosures. The plugs will also work in panels with a metal thickness of 0.118" or smaller.

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 Enclosure, the Pierceable Knockout Plug increases the enclosure rating from IP10 to IP44. When installed in the open port of the BAPI-Box Crossover enclosure, the Pierceable Knockout Plug increases the enclosure rating from IP10 to IP44.



Pierceable Knockout Plug installed in a J-Box (top) and in the open port of a BAPI-Box Crossover Enclosure (left).



Pierceable Knockout Plug installation and wire insertion.



Ordering Information

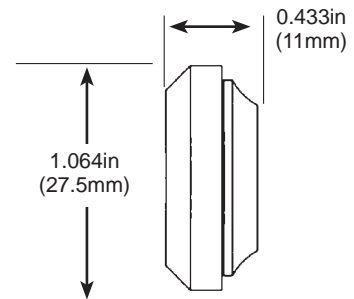
Part Number	Description	List Price
BA/PKP-100.....	Pierceable Knockout Plugs for Enclosure Ports, pack of 100.....	\$55

Gray shaded items follow the Buy and Resale Multiplier.

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

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)

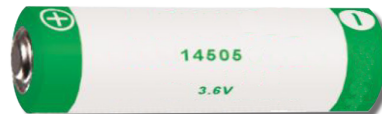




Features & Options

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/LI14505
(for all BAPI Wireless Sensors except the Wireless Food Probe)

BA/BAT-5AA-HIT

The BA/BAT-5AA-HIT High Temperature Lithium 1/2AA battery is the ideal replacement for the BAPI Bluetooth Low Energy Wireless Food Probe sensor. Each food probe takes one battery.



BA/BAT-5AA-HIT
(for Wireless Food Probe)

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	
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 1/2AA 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), 1/2AA
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



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.



Optional Pluggable Terminal Block Kit for AOMs (4 Connectors)

<u>PART NUMBER:</u>	<u>List Price</u>
BA/AOM-CONN ..Pluggable Terminal Block Kit.....	\$15



Rev. 07/12/21

Weather Shade Kit

G31

Accessories for HVAC/R

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



Weather Shade mounted on a BAPI-Box

Ordering Information

Part Number	Description	List Price
BAWSK	Weather Shade Kit..... (Includes a pre-assembled shade and DIN rail bracket, two capped mount tubes, one adjustable clamp and one adjustable clamp with retention plate.)	\$150

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

Specifications

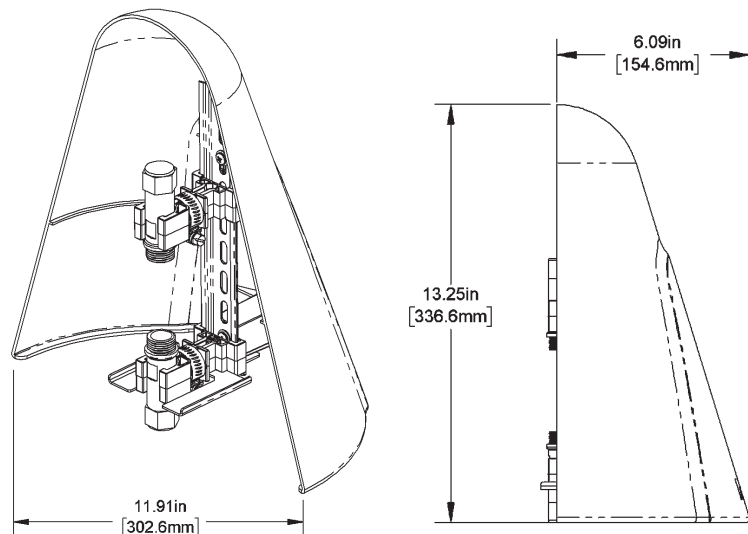
Shade Material:

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”.



———— BAPI-Guard ————

Thermostat Protector



BAPI-Guard
installed over
a BAPI-Stat
“Quantum”
room sensor

- Prevents Tampering, Damage and Unauthorized Adjustment
- Exceptional Airflow for Proper Thermostat Operation
- Made from Thick, Durable Polycarbonate with Key Lock Protection
- 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. It is made of thick, durable polycarbonate and features exceptional airflow, key lock protection, horizontal or vertical mounting and easy installation with hardware included.



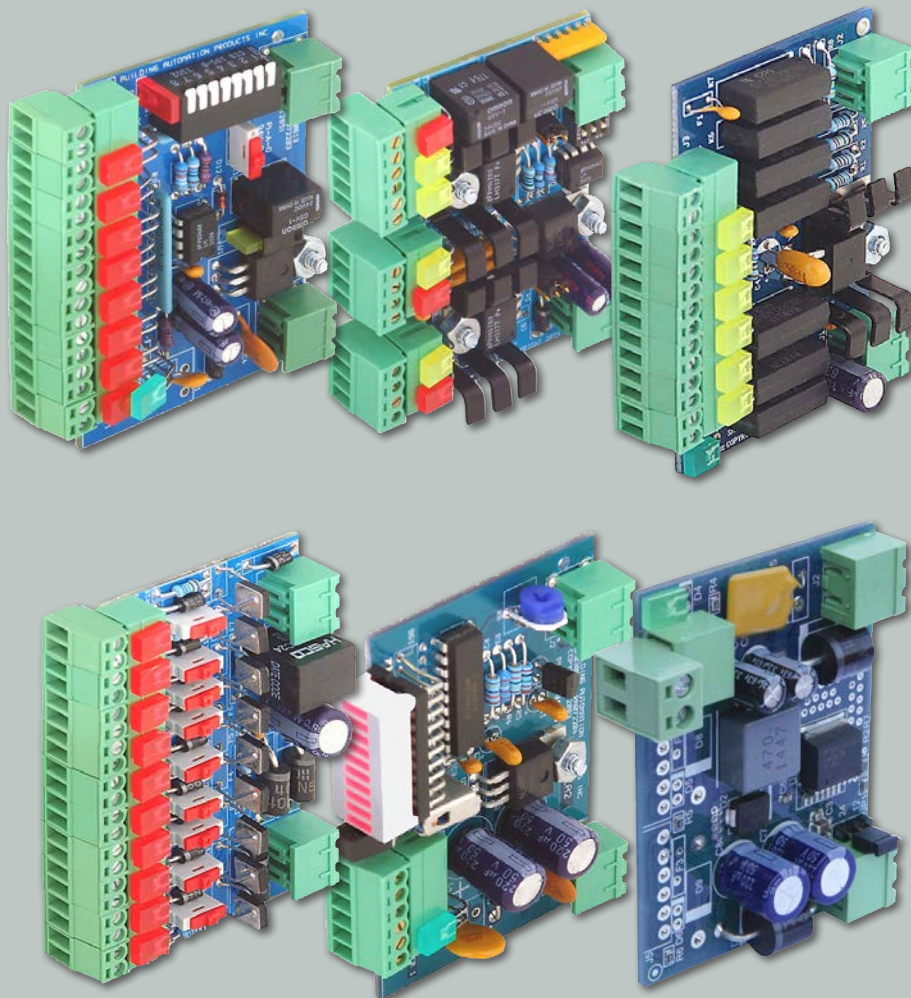
ETA Product Line Overview

BAPI's Electronic Technician Assistant (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.





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 Supply 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.





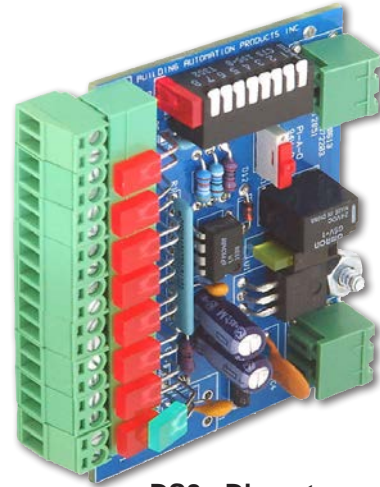
Overview

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.



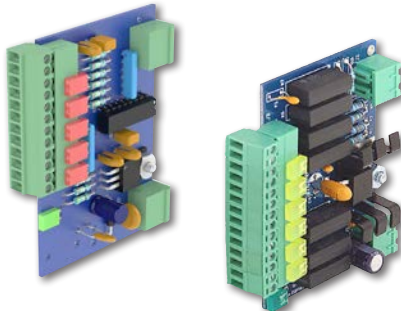
DS8 - Discrete Summary Module

Part Number	Description	List Price
BA/DS8	Discrete Summary Module, 8 Input	\$95

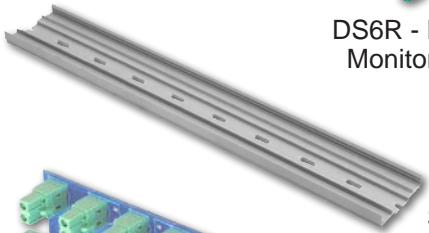
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Associated Products

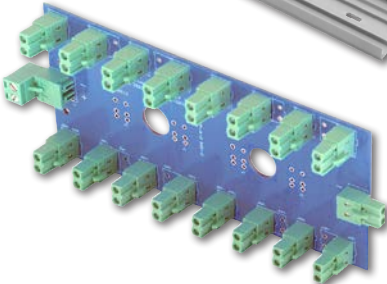
MXV - Dry Switch Monitor, 5 Input (p. H11)



DS6R - Dry Switch Monitor (p. H13)

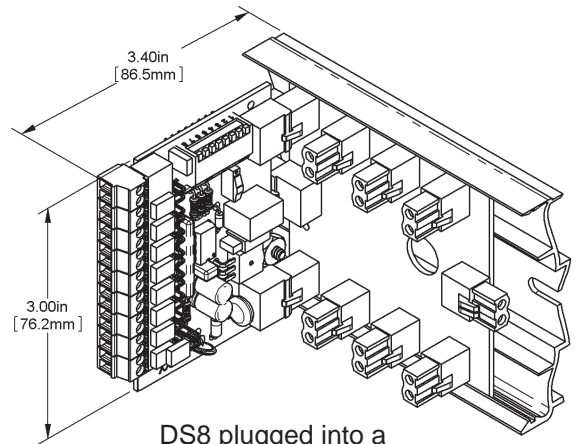


TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 Interface Backplane (p. H16)

Specifications



- 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



Rev. 11/09/20

EA1 - Two Position Actuator Interface

H5

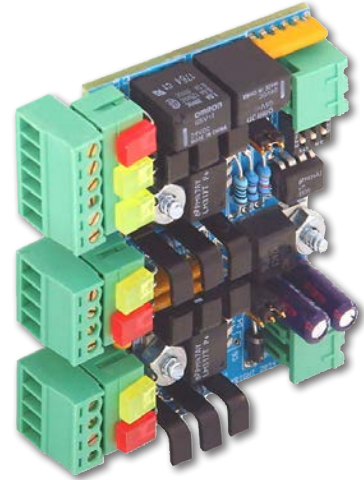
ETA Line

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

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

EA1 plugged into a BP4 Backplane

3.40in [86.4mm]

3.00in [76.2mm]

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)



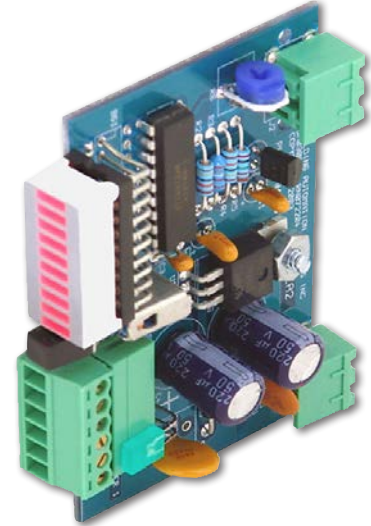


Overview

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

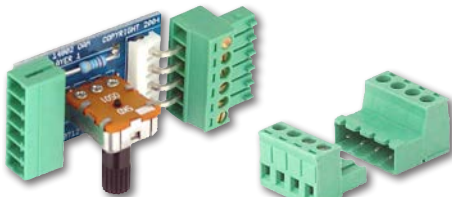
Belimo® is a trademark of Belimo Aircontrols (USA) Inc. registered in the United States and other countries.

Part Number	Description	List Price
BA/EA2	Modulating Actuator Interface	\$87

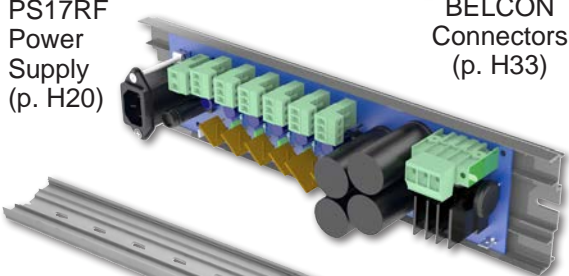
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Associated Products

OAM - Output Adjust Module (p. H7)

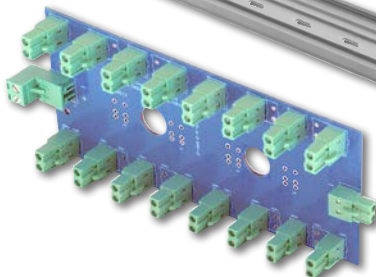


PS17RF Power Supply (p. H20)



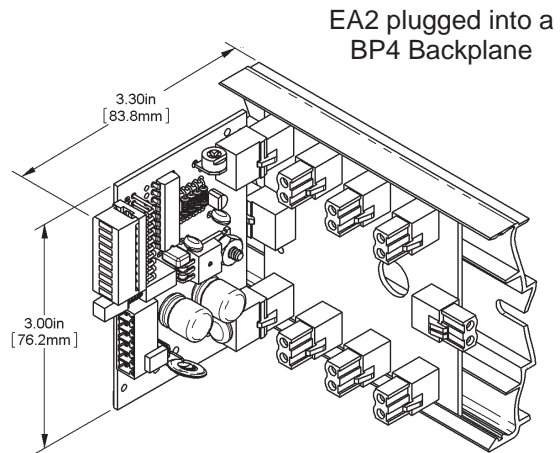
BELCON Connectors (p. H33)

TRK18 Snaptrack (p. H18)



BP2, BP4 or BP8 or Interface Backplane (p. H16)

Specifications



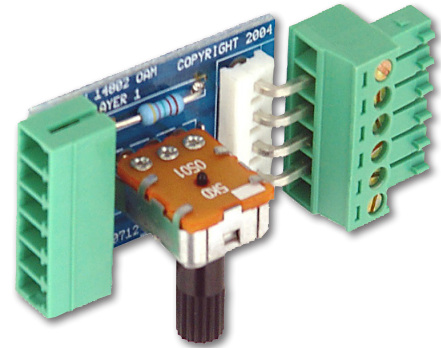
- Power Voltage:** 28 to 35 VDC
20 to 26 VAC
- Power Current:** 50 mA max. plus actuators
(1.7 VA max plus actuator)
- Actuator Control Voltage:** 2 to 10 VDC
- Actuator Power Voltage:** 24 VDC
- Actuator Power Current:** 500 mA max (12 Watts total)



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.

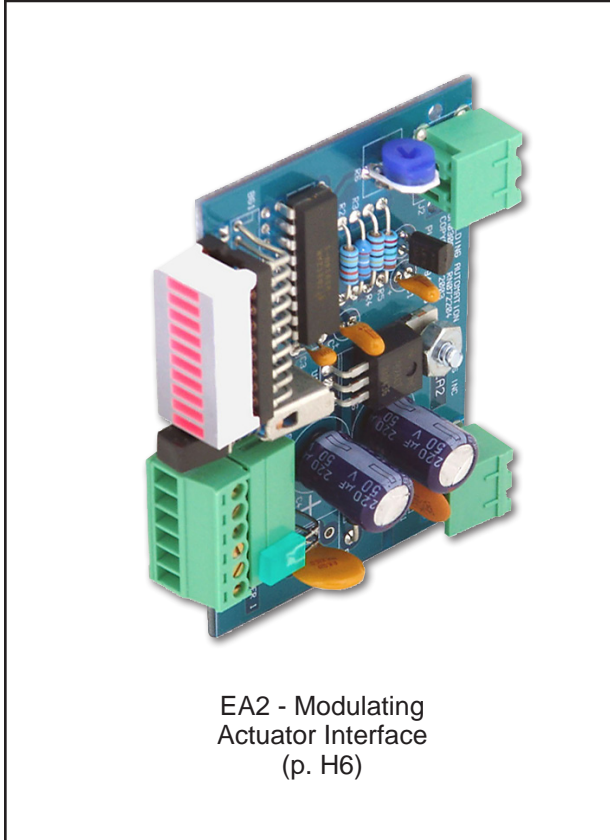


OAM - Output Adjust Module

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/OAM	Output Adjust Module	\$23

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

Associated Products



Specifications

OAM plugged into an EA2 Module

3.00in [76.2mm]

4.04in [102.6mm]

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)



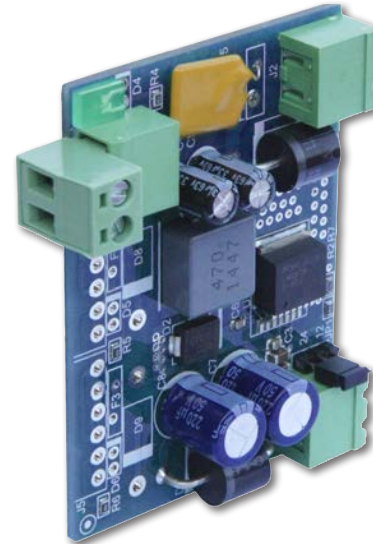


Overview

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

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/3324VC	Voltage Converter.....	\$120

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

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 Voltage: 12 or 24 VDC \pm 0.25 VDC

Output Current: 1.5 Amp Max (30VA max)



CDSP2 - Carbon Dioxide Sensor Power Supply

H9

Rev. 11/06/20

ETA Line

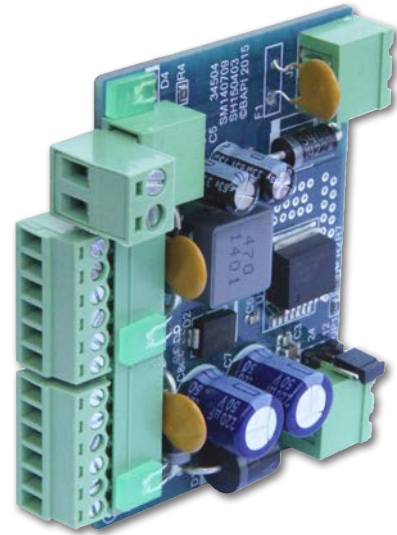
Overview

Many facilities use Carbon Dioxide (CO₂) sensors for demand-controlled ventilation. Although BAPI makes CO₂ 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 CO₂ 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.

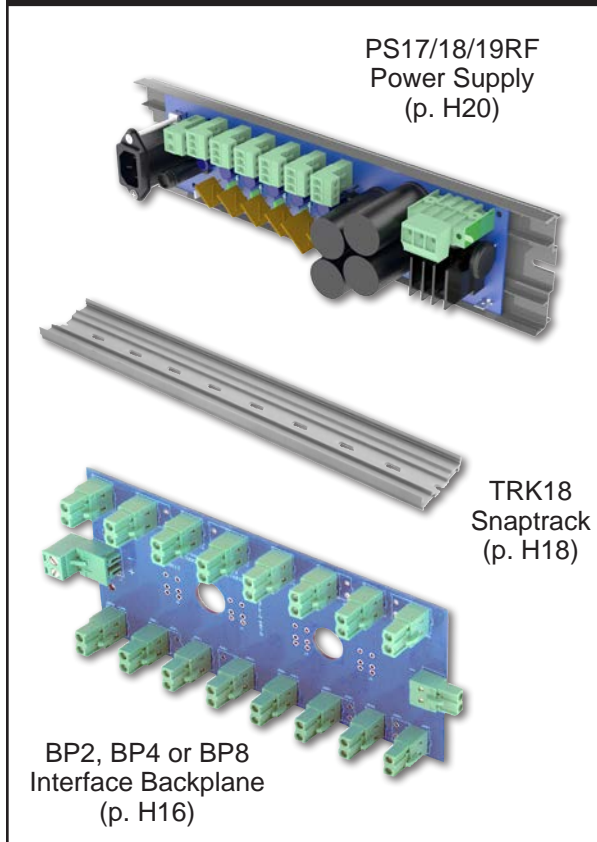


CDSP2 - Carbon Dioxide Sensor Power Supply

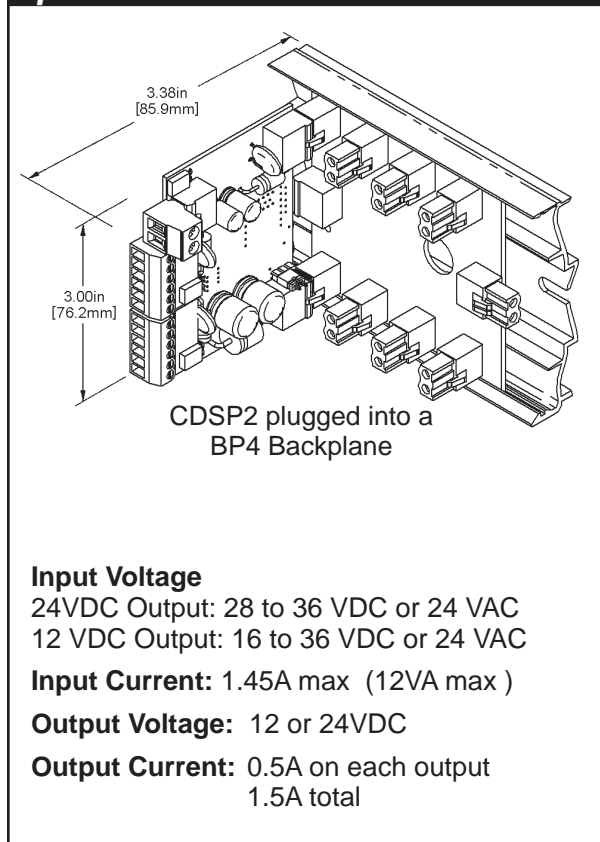
<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/CDSP2	Carbon Dioxide Sensor Power Supply.....	\$130

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

Associated Products



Specifications



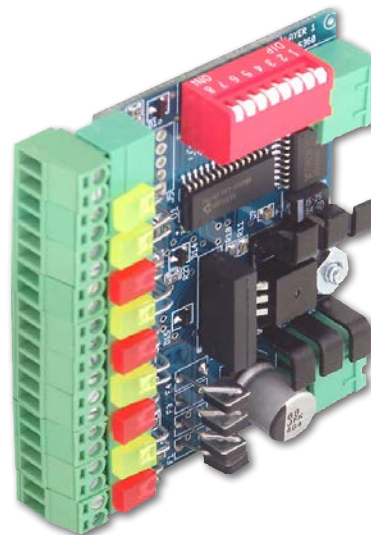


Overview

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)



MXV - Dry Switch Monitor, 5 Input

H11

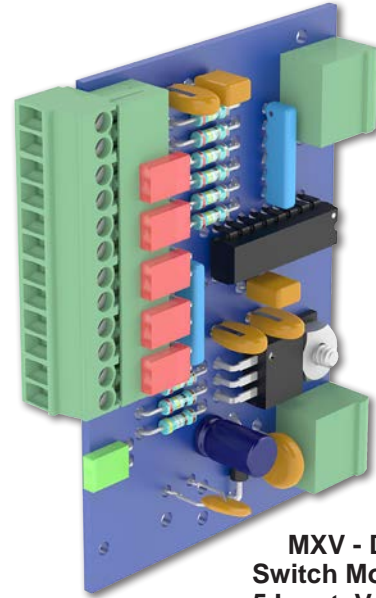
Rev. 11/09/20 **ETA Line**

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.

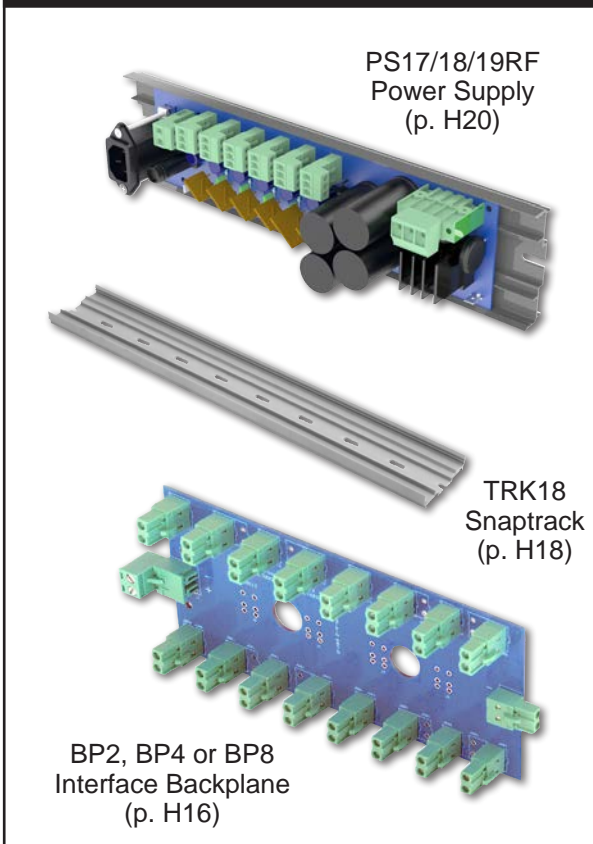


MXV - Dry Switch Monitor, 5 Input, Voltage Output

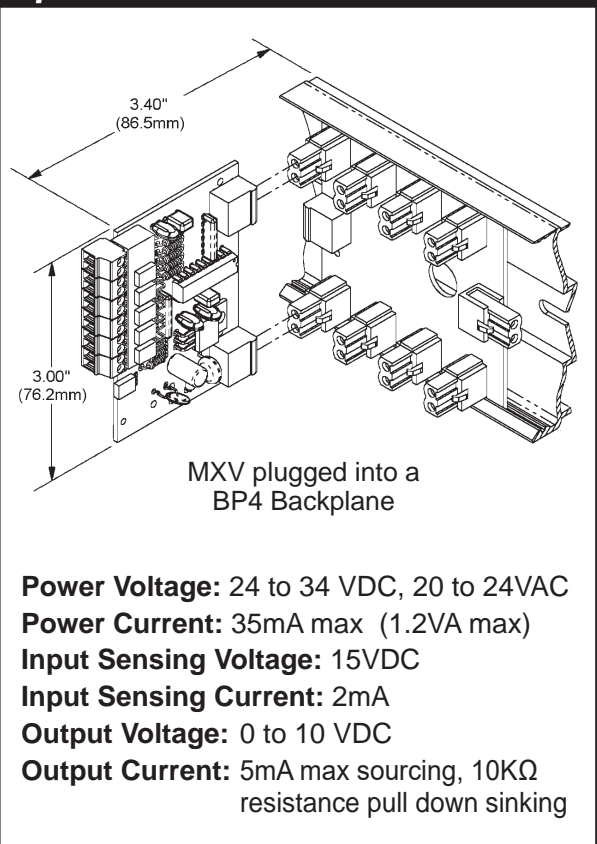
<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/MXV	Dry Switch Monitor, 5 Input, Voltage Output.....	\$303

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

Associated Products



Specifications





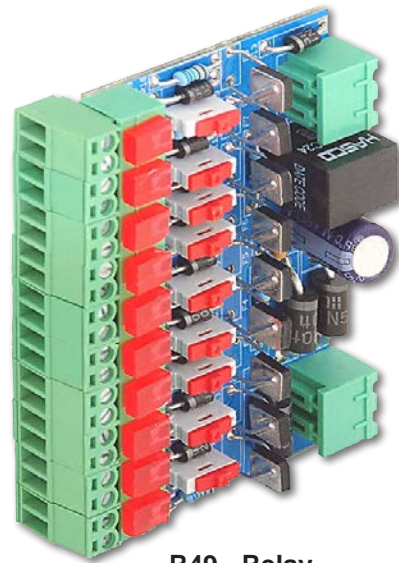
Overview

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.

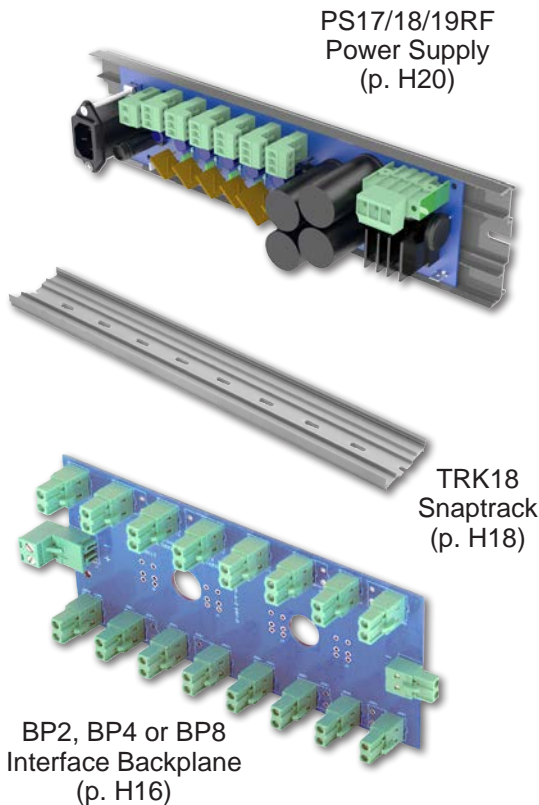


R49 - Relay Interface

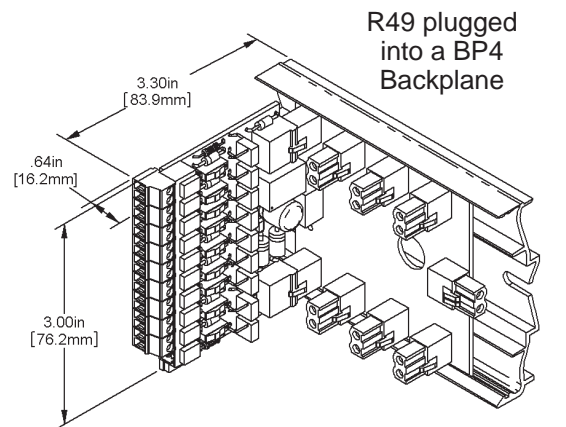
<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/R49	Relay Interface Module, 9 Output.....	\$125

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

Associated Products



Specifications



- 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)



Rev. 11/05/20

DS6R - Dry Switch Monitor

H13

ETA Line

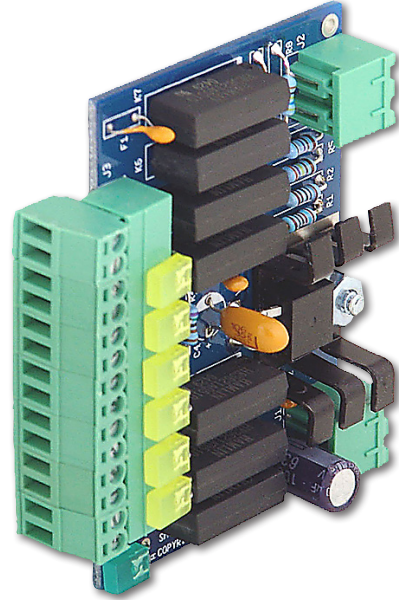
Overview

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.



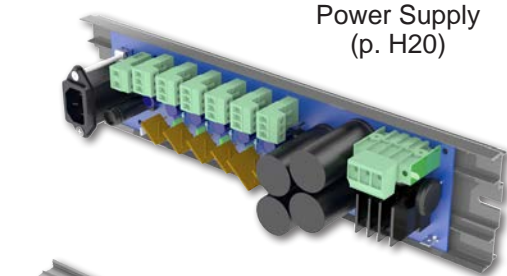
DS6R - Dry Switch Monitor

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/DS6R.....	Dry Switch Monitor, 30K Output.....	\$95
BA/DS6R-10K....	Dry Switch Monitor, 10K Output.....	\$95

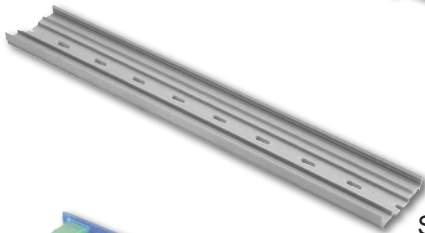
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

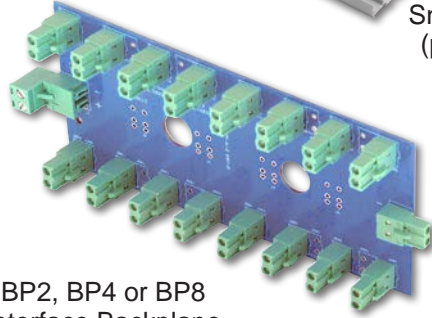
PS17/18/19RF
Power Supply
(p. H20)



TRK18
Snaptrack
(p. H18)

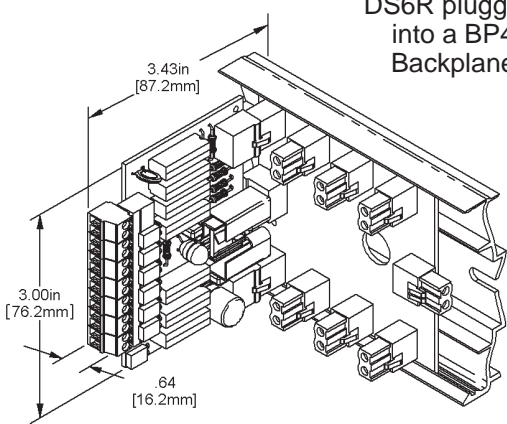


BP2, BP4 or BP8
Interface Backplane
(p. H16)



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)





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.

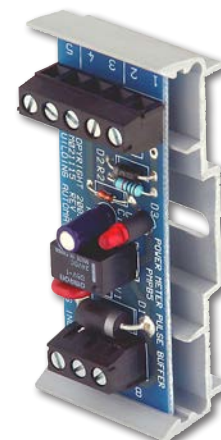
Part Number	Description	List Price
BA/PMPB5	Pulse Meter Pulse Buffer	\$27.50

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

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.



PMPB5 mounted in the optional 2.75" snaptrack

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

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



TS1 & TS2 - Transient Suppressors mounted in optional 2.75" snaptrack





Rev. 10/16/12

TURB - Terminal Unit Relay Board

H15

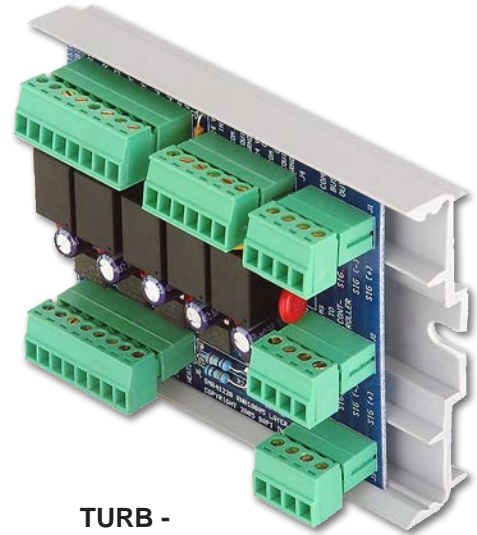
ETA Line

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.

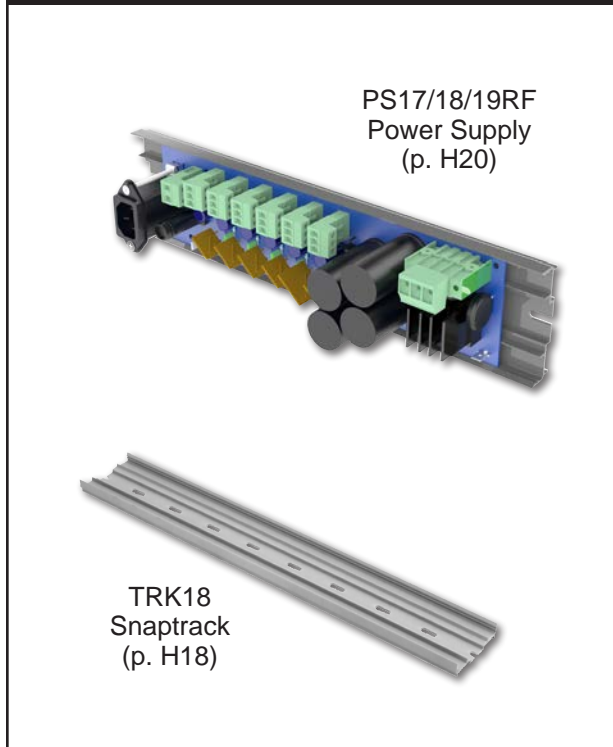


TURB - Terminal Unit Relay Board mounted in the optional 2.75" snaptrack

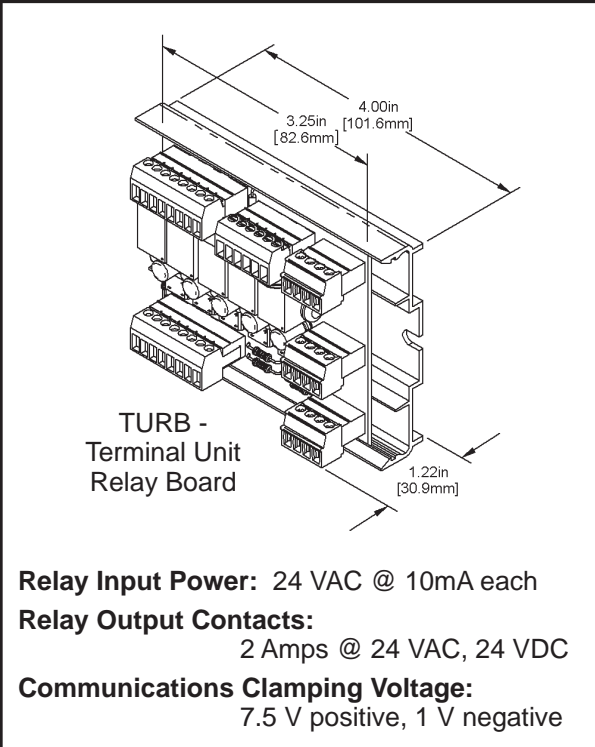
<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/TURB	Terminal Unit Relay Board.....	\$57
BA/TURB-TRK	TURB with 4" piece of 2.75" snaptrack.....	\$65

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

Associated Products



Specifications





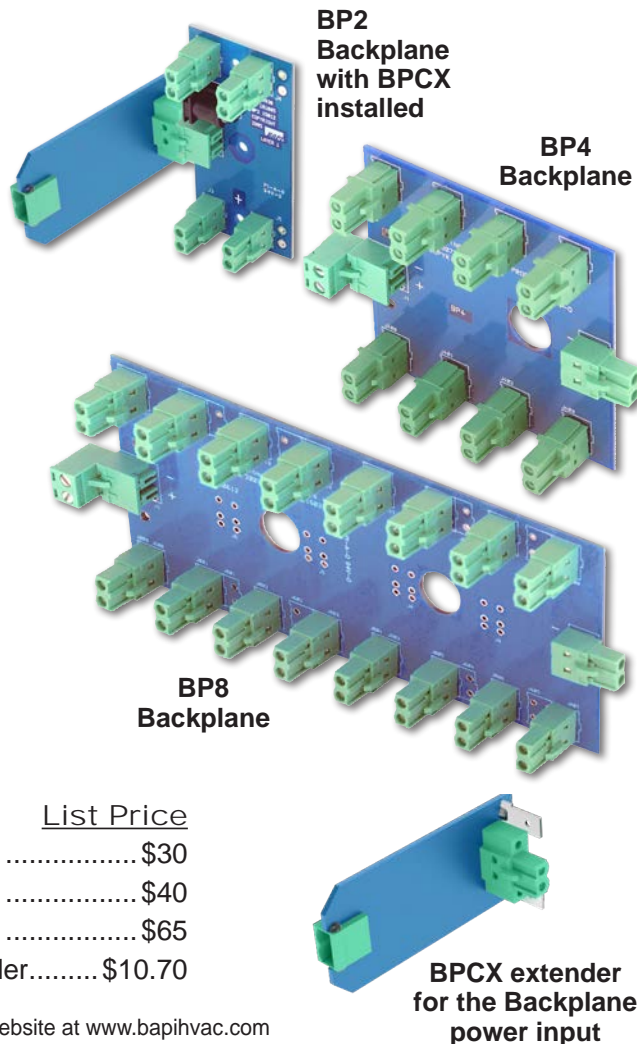
Overview

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.

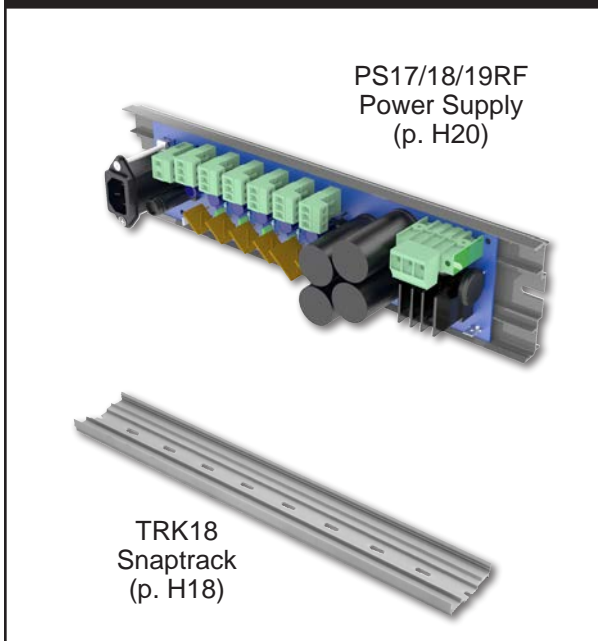
The BPCX extends the backplane power input plug to make it more accessible for service.



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

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

Associated Products



Specifications

PCB Lengths	
BP2	1.5in [38.1mm]
BP4	3in [76.2mm]
BP8	6in [152.4mm]

1.25in [31.8mm]

.75in [19.1mm] Typ.

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.



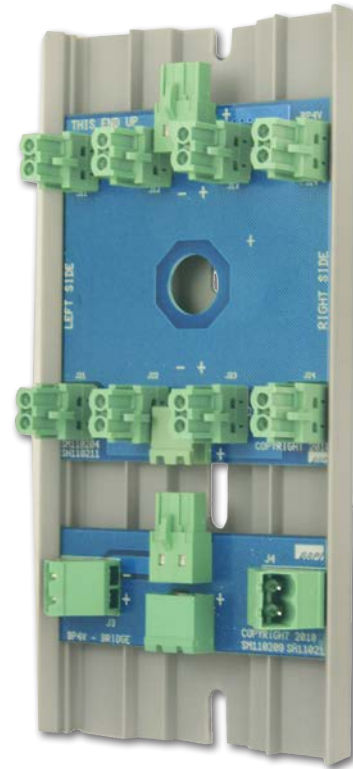
Overview

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.

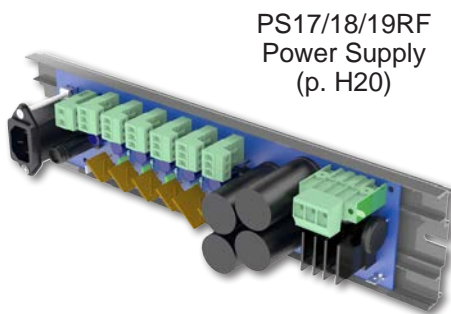


BP4-V - Vertical Backplane and a BP-BR - Power Bridge in a 2.75" wide piece of snaptrack (sold separately)

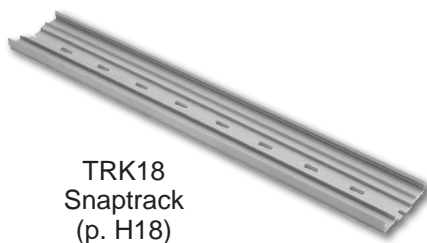
Part Number	Description	List Price
BA/BP4-V	Vertical Backplane	\$40
BA/BP-BR	Bridge (to connect Vertical Backplanes)	\$22

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

Associated Products



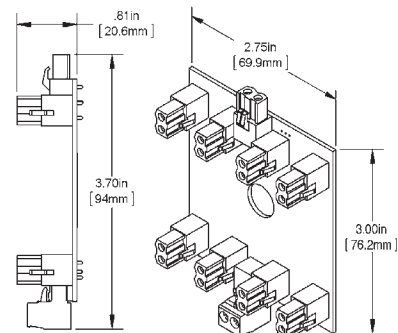
PS17/18/19RF Power Supply (p. H20)



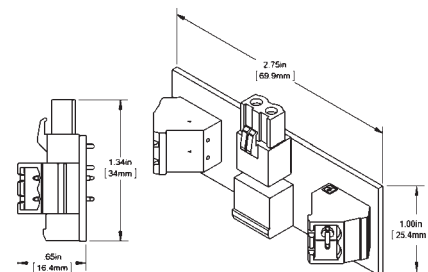
TRK18 Snaptrack (p. H18)

Specifications

BP4-V - Vertical Backplane



BA/BP-BR - Power Bridge



Power Voltage: 34 VDC max, 24 VAC max
Power Current: 4 Amp max.



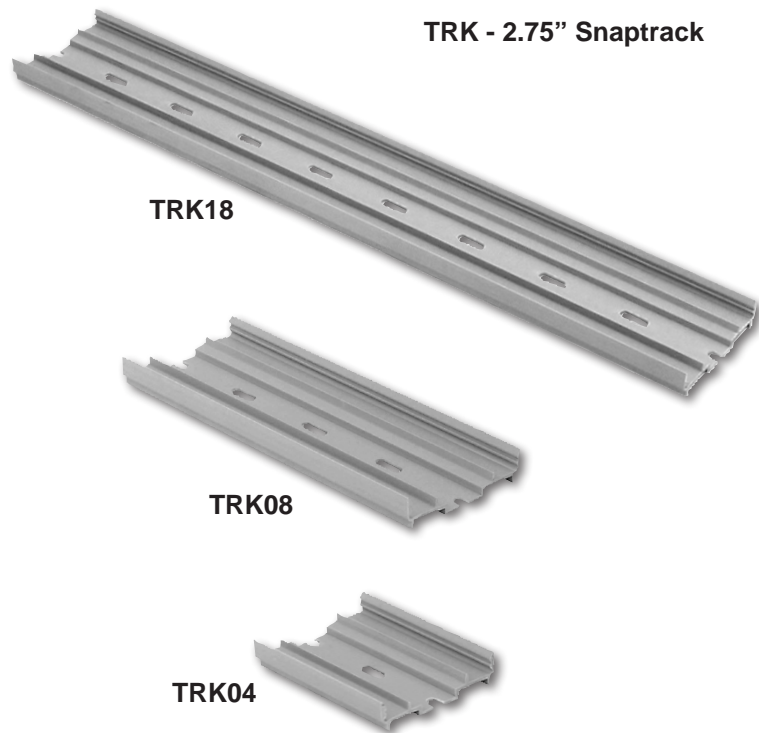


Overview

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.

TRK - 2.75" Snaptrack



<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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



Rev. 11/09/20

PAN16 - Panduit 1x3x16" Wire Duct

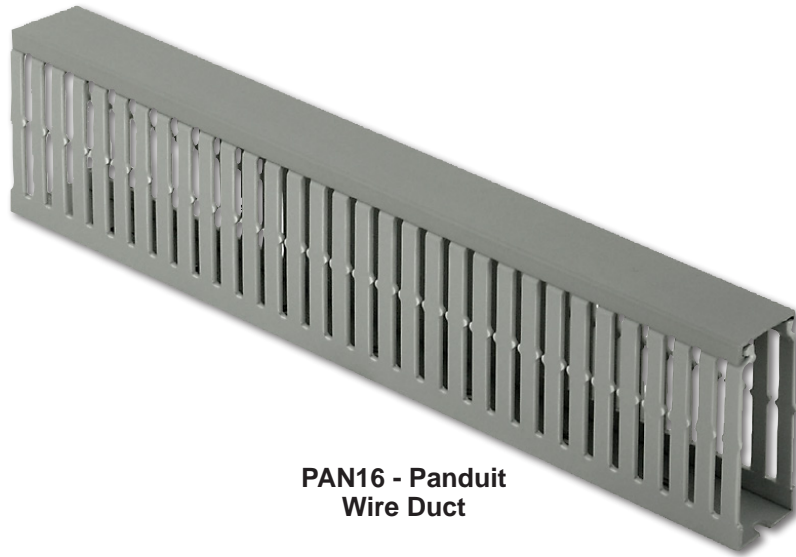
H19

ETA Line

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

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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



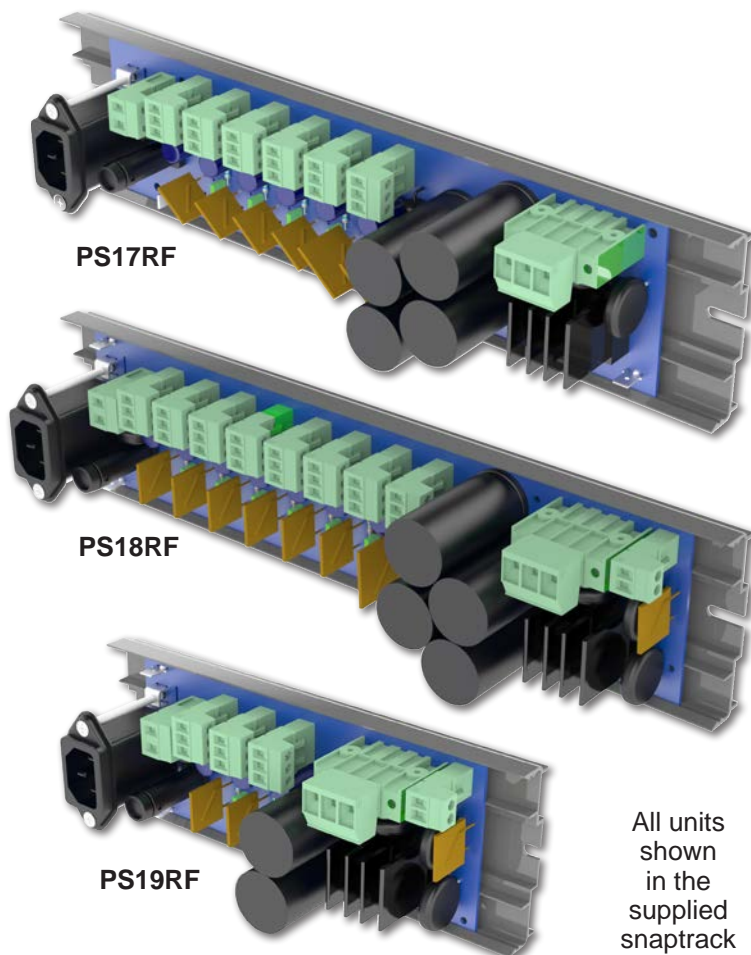


Overview

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

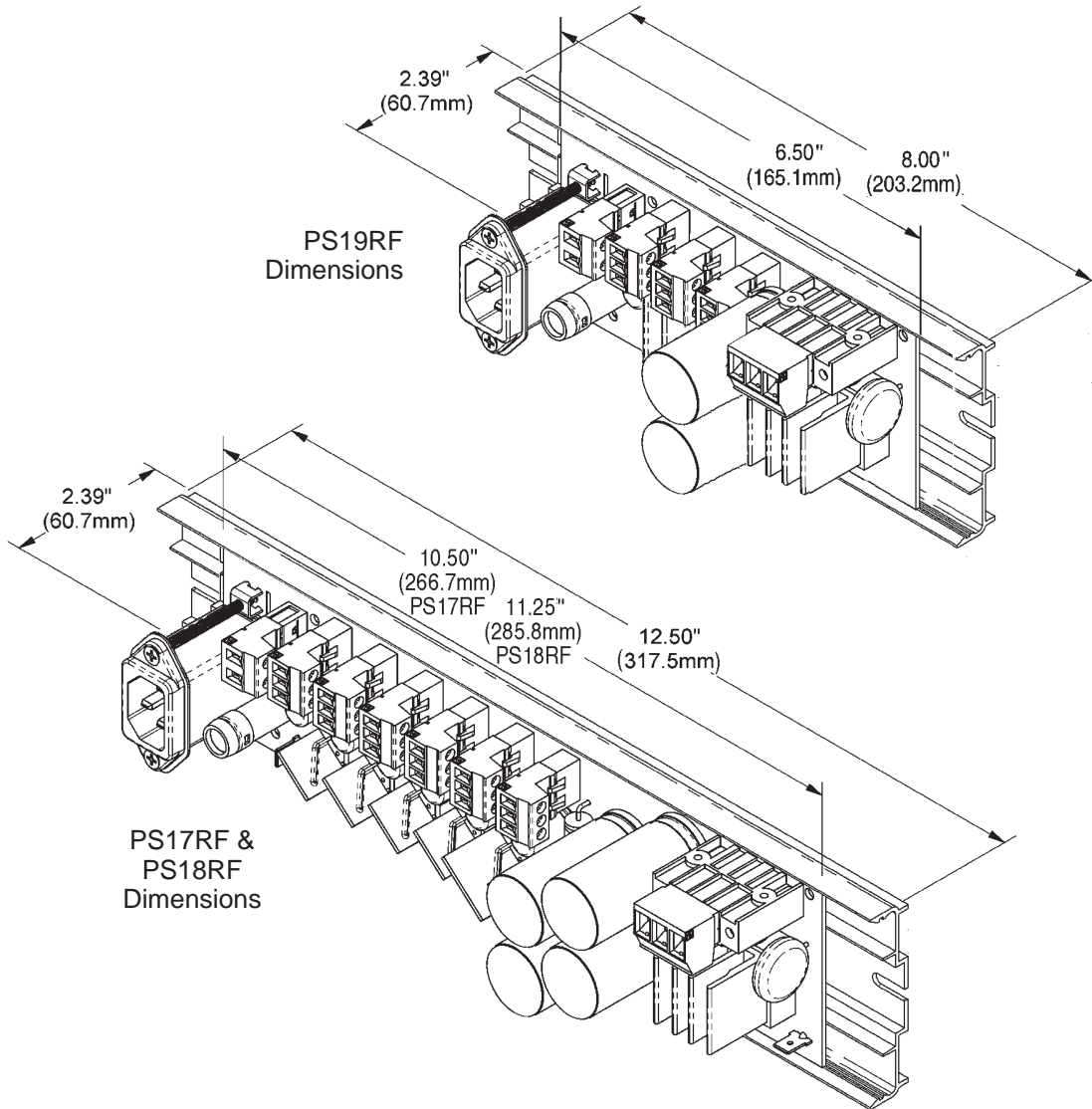
18 VAC input = 24 VDC output

20 VAC input = 28 VDC output

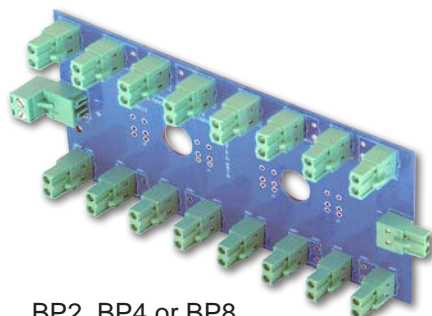
24 VAC input = 33 VDC output



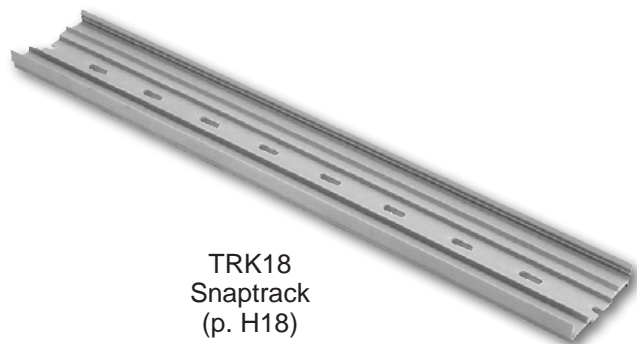
Dimensions



Associated Products



BP2, BP4 or BP8
Backplane (p. H16)



TRK18
Snaptrack
(p. H18)

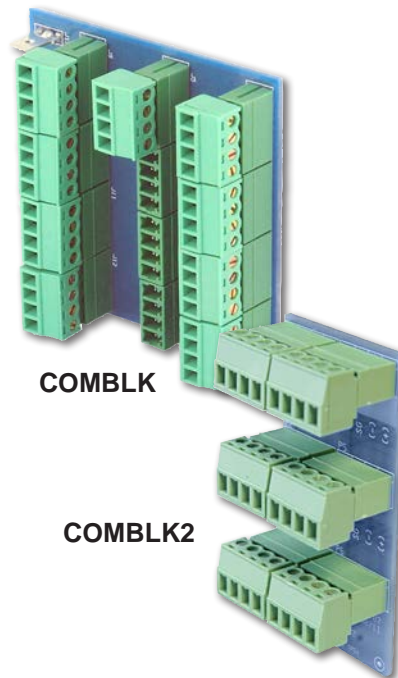


Overview

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.



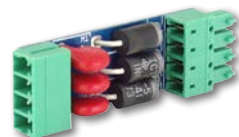
Part Number	Description	List Price
BA/COMBLK.....	Comm. Cable Terminal Block (NEC Class 2 Circuits, 4 Amp max.).....	\$65
BA/COMBLK2.....	Comm. Cable Terminal Block (NEC Class 2 Circuits, 4 Amp max.).....	\$53

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

Associated Products

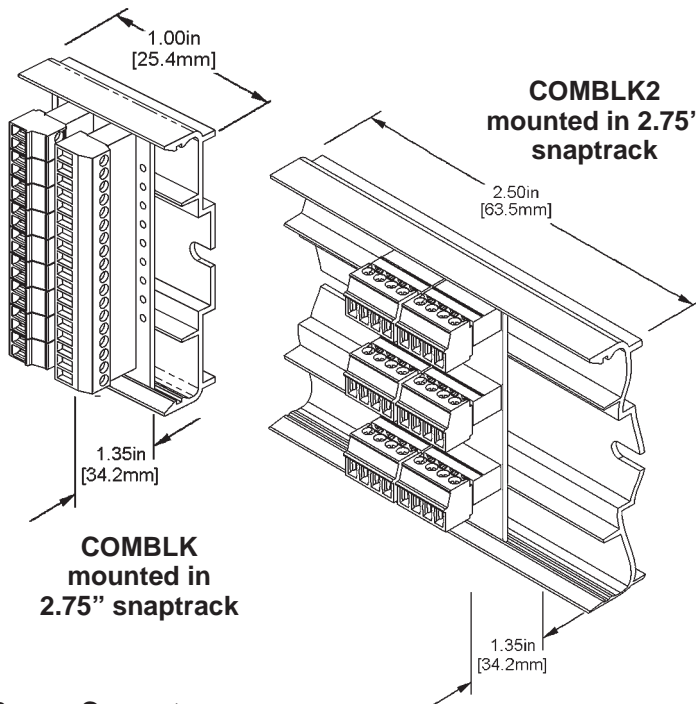


TRK18
Snaptrack
(p. H18)



COMSRG
- Communication Surge
Protector
(p. H21)

Specifications



Power Current:
NEC Class 2 Circuits, 4 Amp max.



Rev. 11/06/20

COMSRG - Comm. Surge Protector

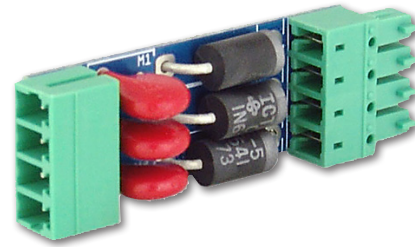
H23

ETA Line

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.

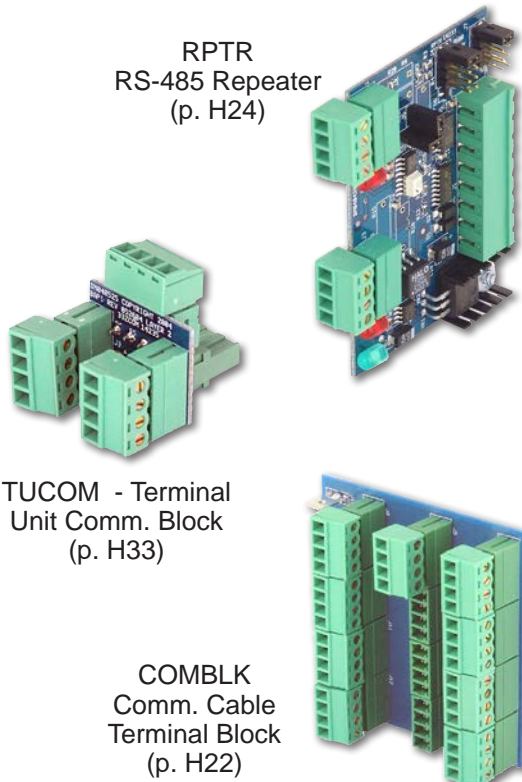


COMSRG
- Communication Surge Protector

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/COMSRG	Communications Surge Protector	\$55

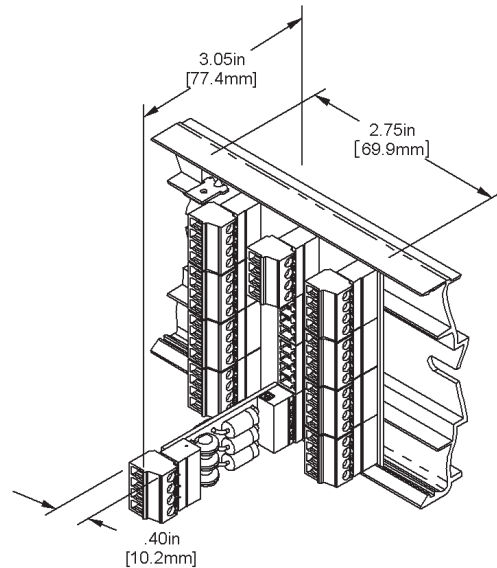
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products



Specifications

COMSRG module plugged into a COMBLK Communications Cable Terminal Block



Clamp Voltage: 6 VDC
Clamp Energy: 2.3 Joules





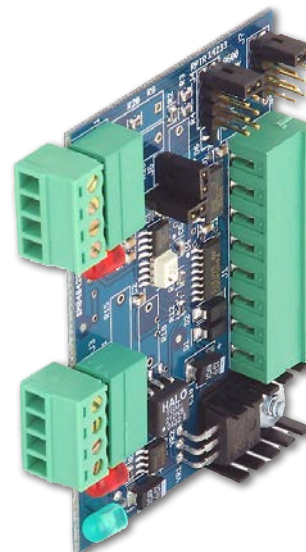
Overview

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

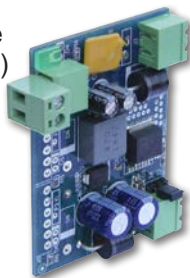
Part Number	Description	List Price
BA/RPTR	RS-485 Repeater	\$215
BA/RPTR-KIT	RS-485 Repeater Communication Kit (see page G25)	\$335

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

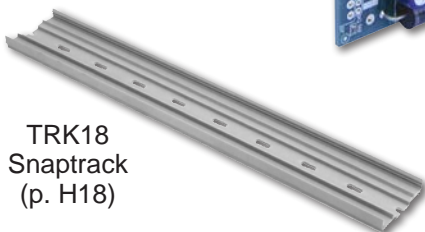
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

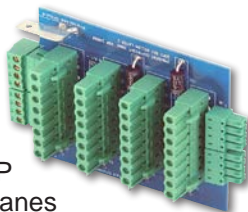
3324VC Voltage Converter (p. H8)



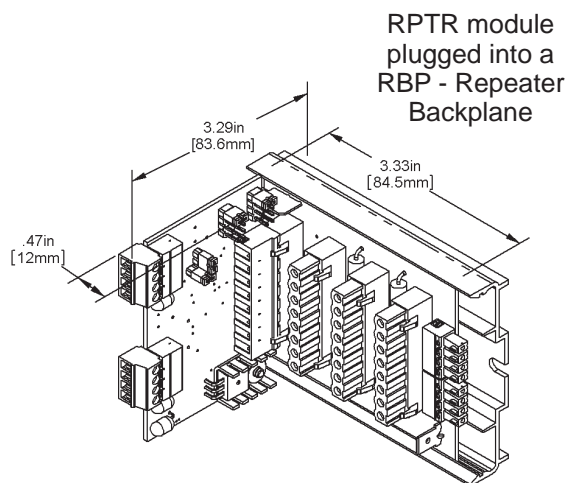
TRK18 Snaptrack (p. H18)



RBP or SRBP Repeater Backplanes (p. H30-32)



Specifications



- 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)



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)

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/RPTR-KIT	RS-485 Repeater Communication Kit (see page G25)	\$335
	<i>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</i>	

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

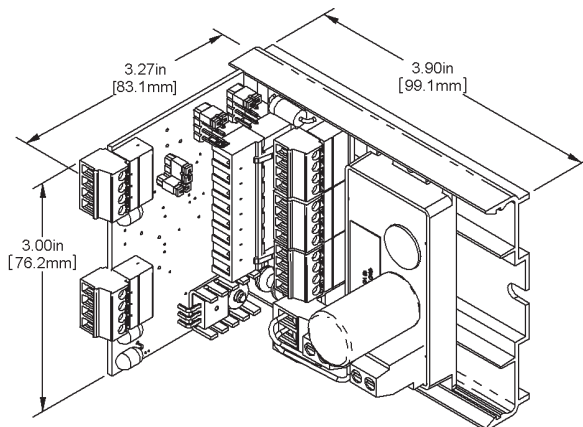
Rectification: Half-Wave Rectified

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





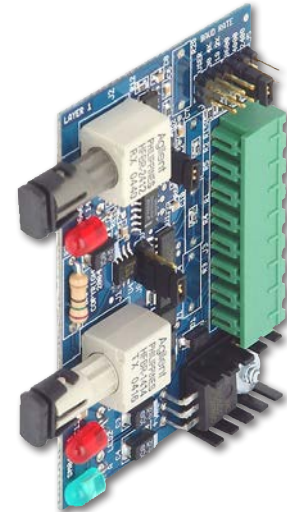
Overview

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.



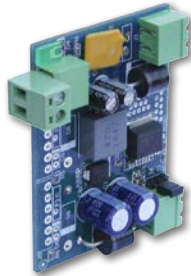
FOX - RS-485 Fiber Optic Transceiver

Part Number	Description	List Price
BA/FOX	RS-485 Fiber Optic Transceiver.....	\$340
BA/FOX-KIT	FOX Communication Kit (see page G25)	\$460
	<i>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</i>	

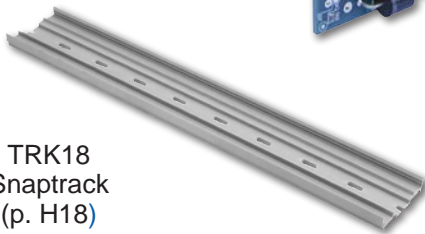
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

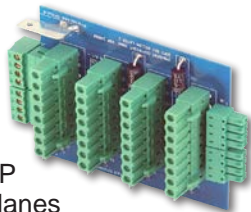
3324VC Voltage Converter
(p. H8)



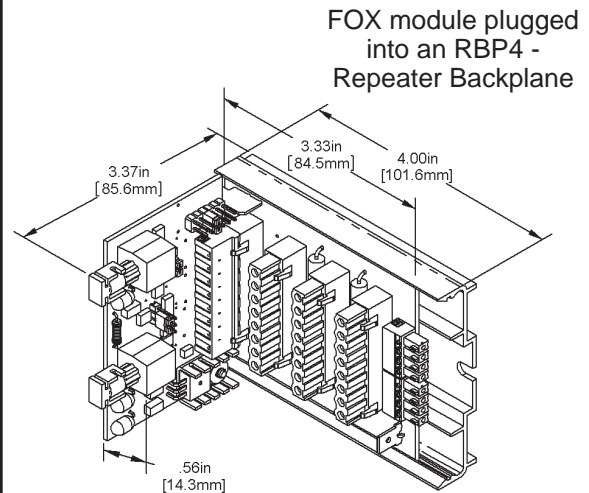
TRK18 Snaptrack
(p. H18)



RBP or SRBP Repeater Backplanes
(p. GH0-32)



Specifications



- 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)



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)	\$460
	<i>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</i>	

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

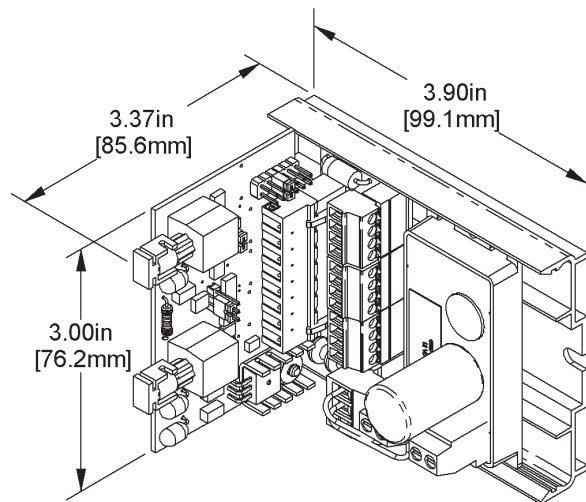
Grounding: AC and DC Ground are common

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





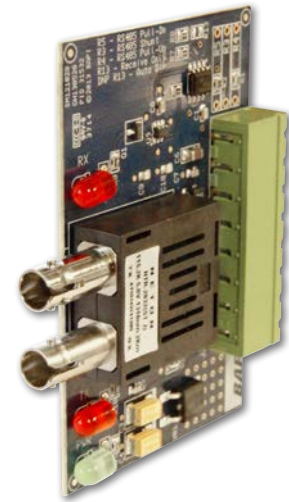
Overview

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.



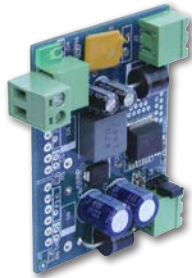
SOX - RS-485 Fiber Optic Transceiver

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/SOX RS-485	Fiber Optic Transceiver (for single-mode fiber cable).....	\$315

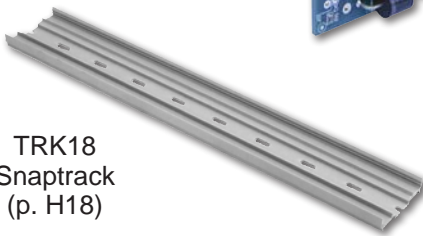
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

3324VC Voltage Converter
(p. H8)



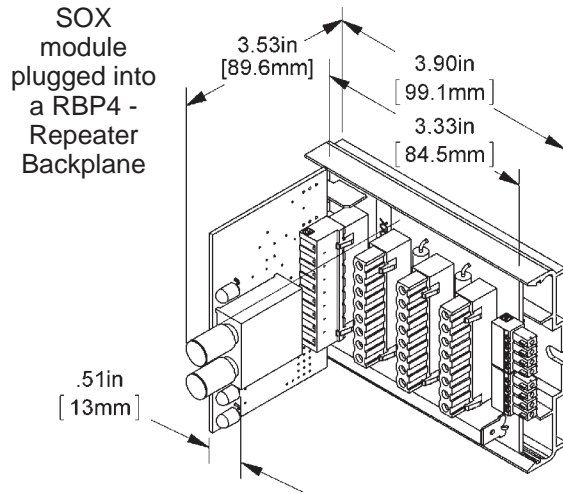
TRK18 Snaptrack
(p. H18)



RBP4, RBP8 or SRBP
Repeater Backplanes
(p. H30-32)



Specifications



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)



Rev. 03/17/21

TB18 - Pluggable Terminal Block

H29

ETA Line

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.

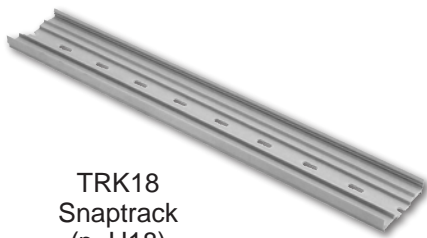
**TB18
Pluggable
Terminal
Block**



<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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

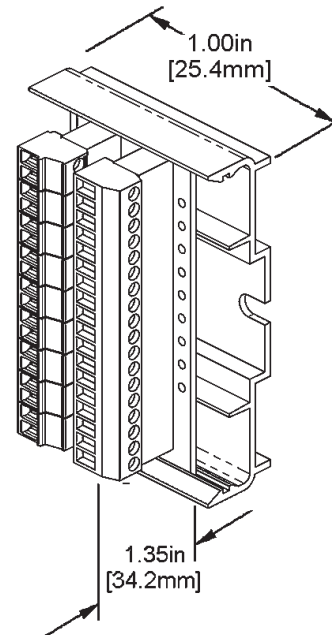
Associated Products



TRK18
Snaptrack
(p. H18)

Specifications

**TB18
mounted
in 2.75"
snaptrack**



Power Current:
NEC Class 2 Circuits, 4 Amp max.



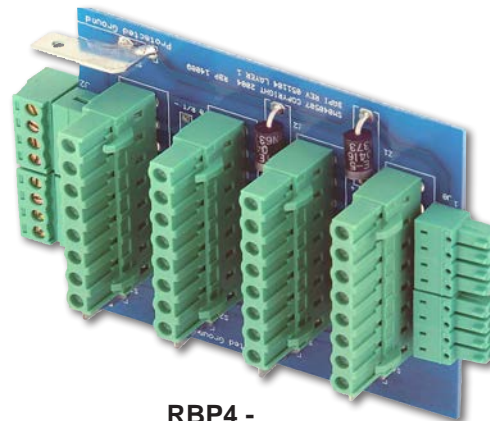


Overview

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.

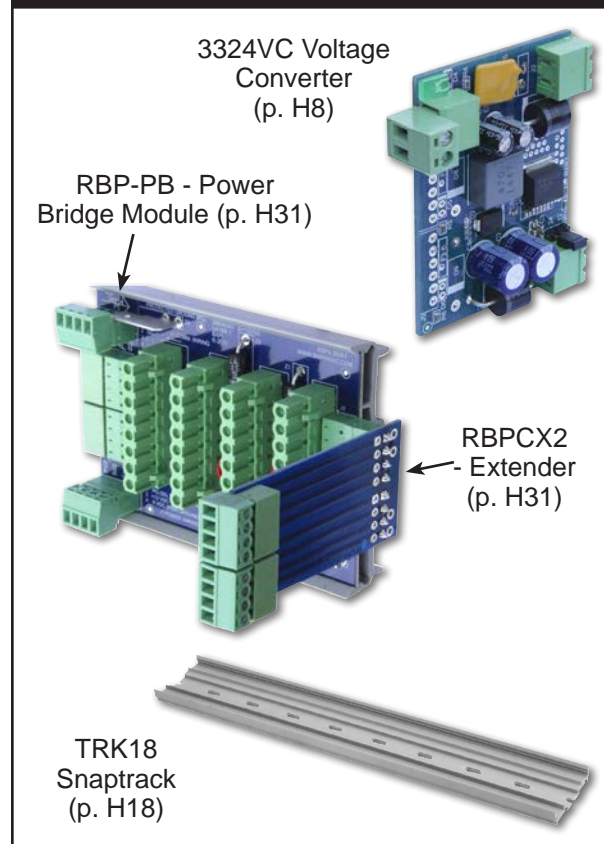


**RBP4 -
Communications
Repeater Backplane**

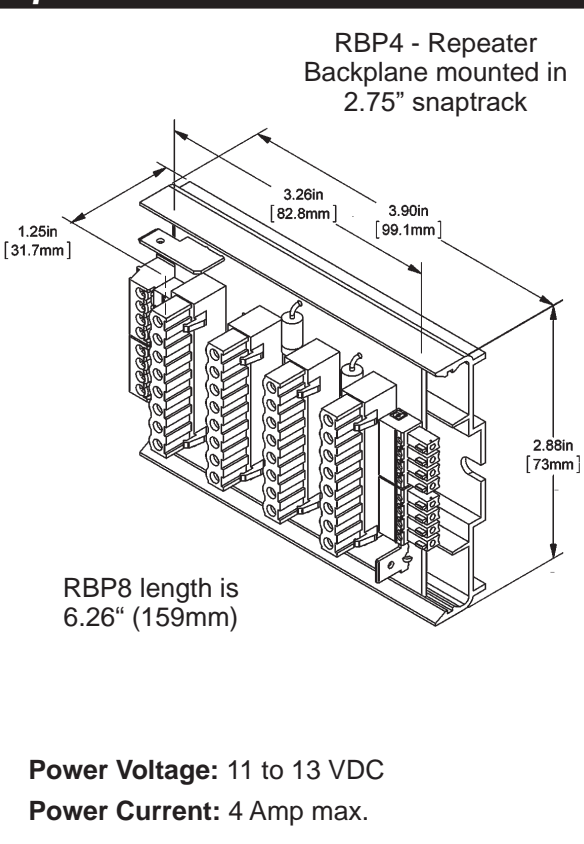
Part Number	Description	List Price
BA/RBP4	Comm. Repeater Backplane, supports 4 communication modules.....	\$90
BA/RBP4-TRK	Comm. Repeater Backplane with 4" piece of 2.75" snaptrack	\$98
BA/RBP8	Comm. Repeater Backplane, supports 8 communication modules.....	\$145
BA/RBP8-TRK	Comm. Repeater Backplane with 6" piece of 2.75" snaptrack	\$155

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

Associated Products



Specifications





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 communications plug connects to the bus on the right; the lower plug connects to the bus on the left.

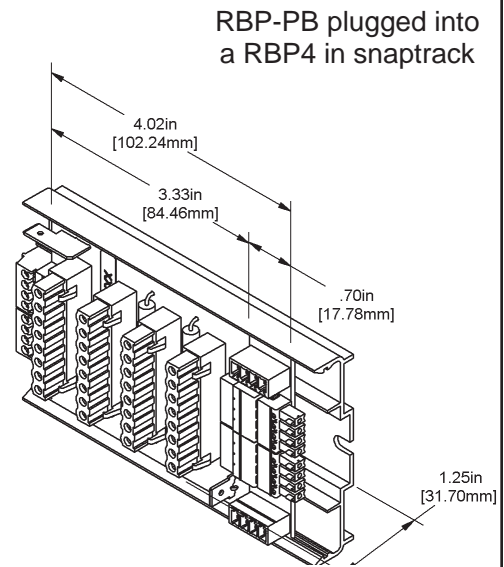


**RBP-PB
Power Bridge**

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



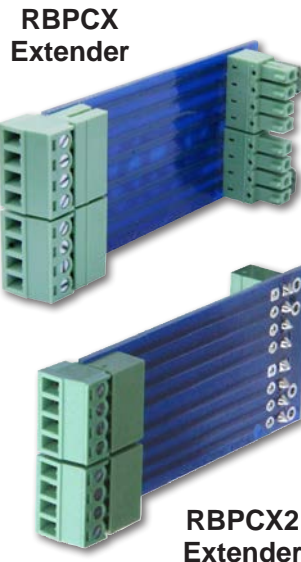
Power Voltage: 12 VDC
Power Current: 4 Amp Maximum

RBPCX, RBPCX2 - Connector Extenders

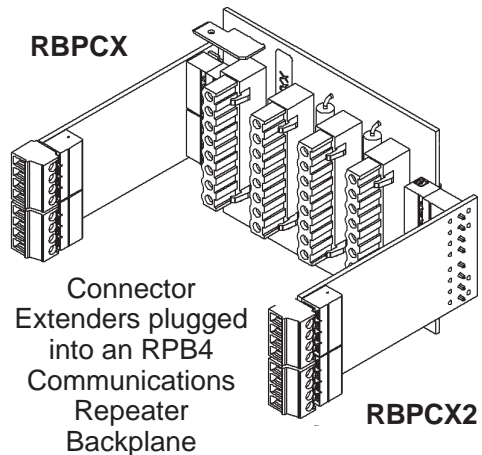
Overview

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.



Specifications



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





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 its 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).

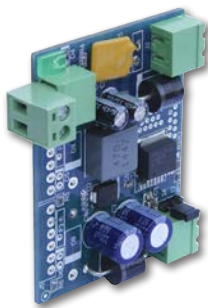


SRBP - Single Repeater Backplane

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



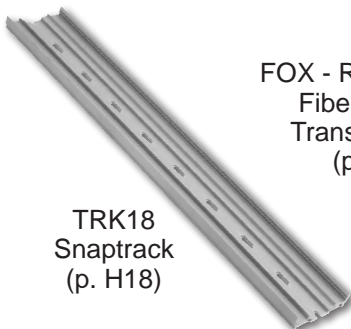
3324VC Voltage Converter
(p. H8)



SOX - RS-485 Fiber Optic Transceiver
(p. H26)



RPTR - RS-485 Repeater
(p. H22)



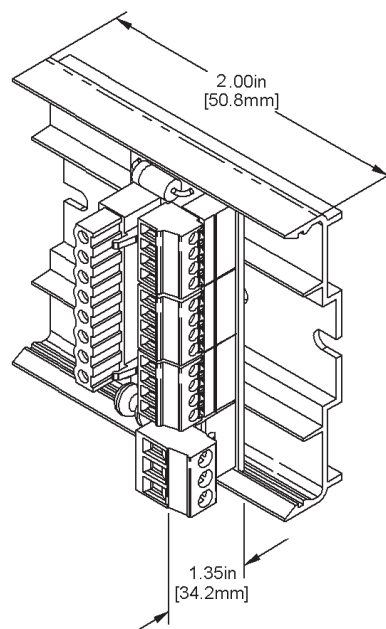
TRK18 Snaptrack
(p. H18)

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.



Rev. 11/09/20

BELCON - Mating Pair Belimo® Connectors

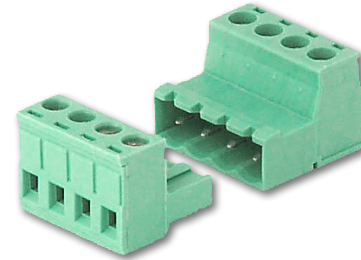
H33

ETA Line

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.

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/BELCON	Mating Pair of Belimo® Connectors (NEC Class 2 Circuits, 4 Amp max.)	\$12

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

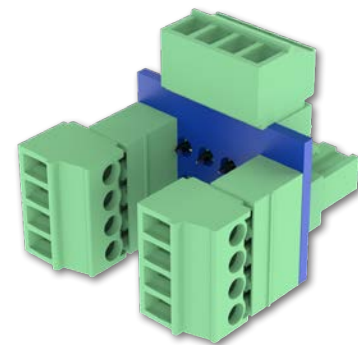
TUCOM - Terminal Unit Comm. Block

Overview

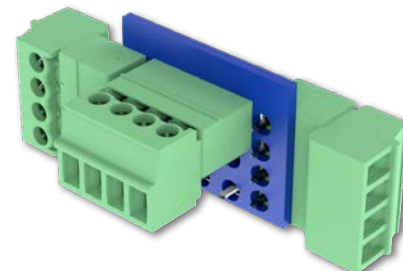
The TUCOM and TUCOM2 are specific purpose connectors that add pluggable screw terminals for any zone or unitary controller having a 3P, 5mm or 5.08mm communication connection. Two options are available to fit in the tightest spaces.

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**

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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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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.

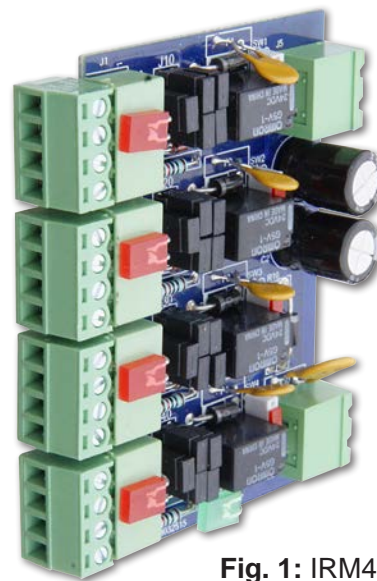
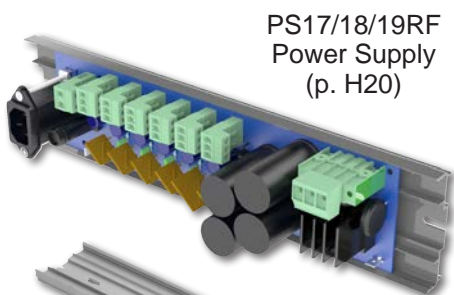


Fig. 1: IRM4 Interposing Relay Module

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/IRM4	Interposing Relay Module.....	\$153

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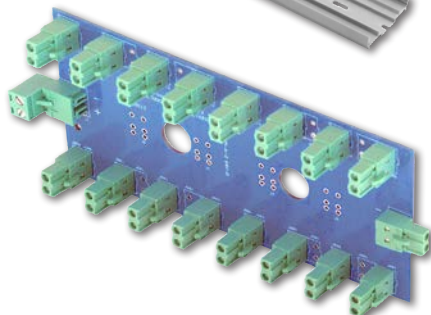
Associated Products



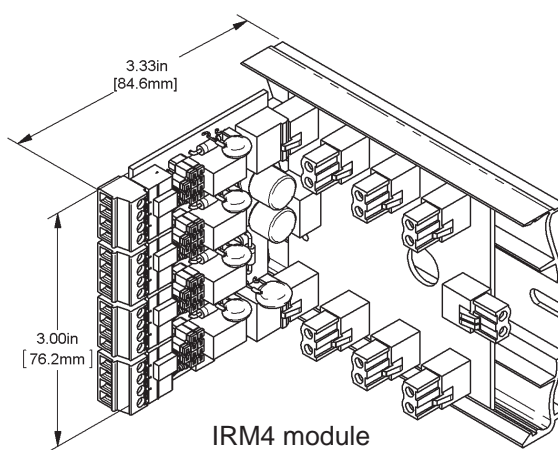
PS17/18/19RF Power Supply (p. H20)

TRK18 Snaptrack (p. H18)

BP2, BP4 or BP8 Interface Backplane (p. H16)



Specifications



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 as the power input voltage.



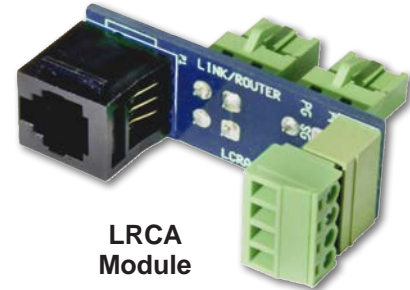
Overview

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.

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.



LRCA Module



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

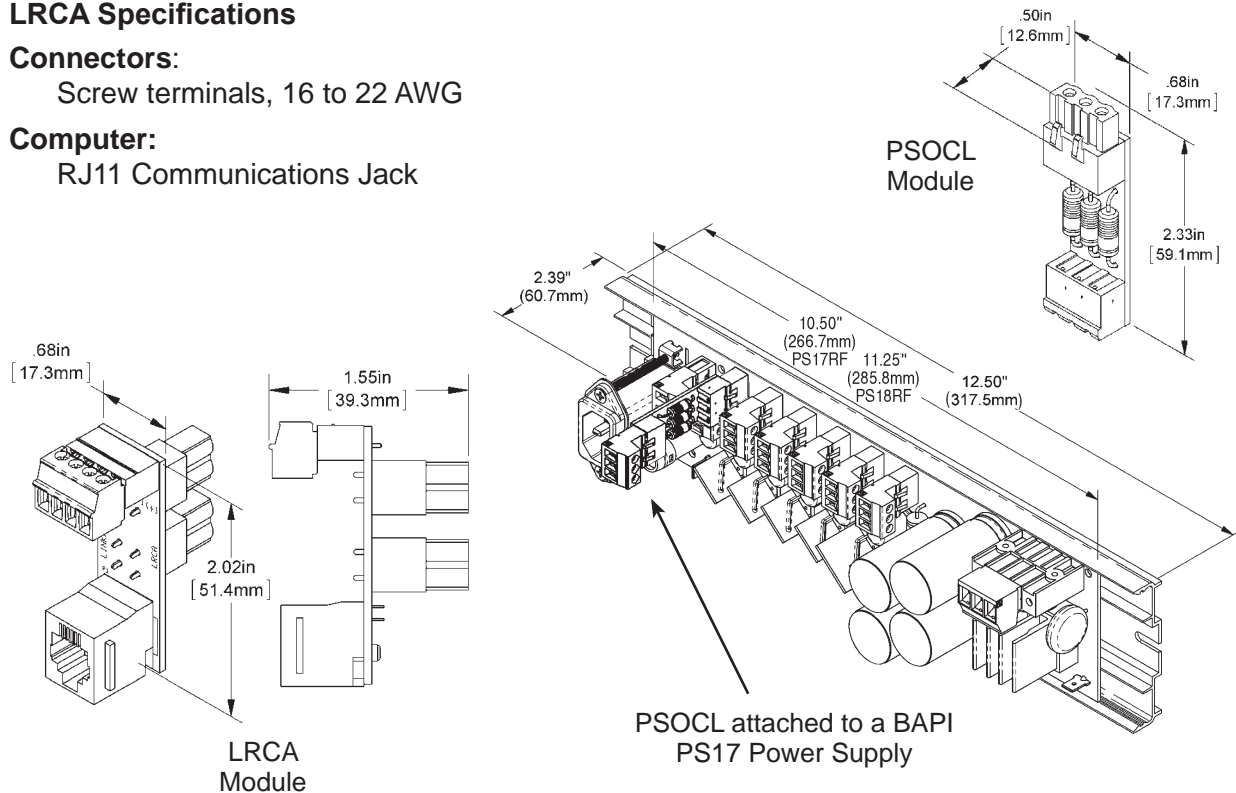
LRCA Specifications

Connectors:

Screw terminals, 16 to 22 AWG

Computer:

RJ11 Communications Jack

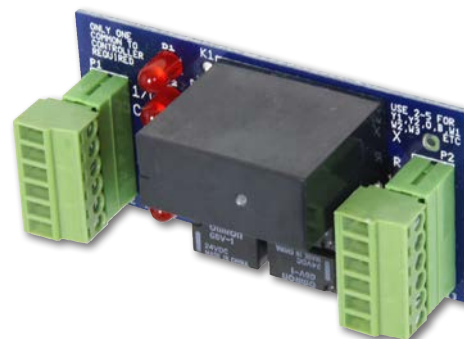




Overview

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

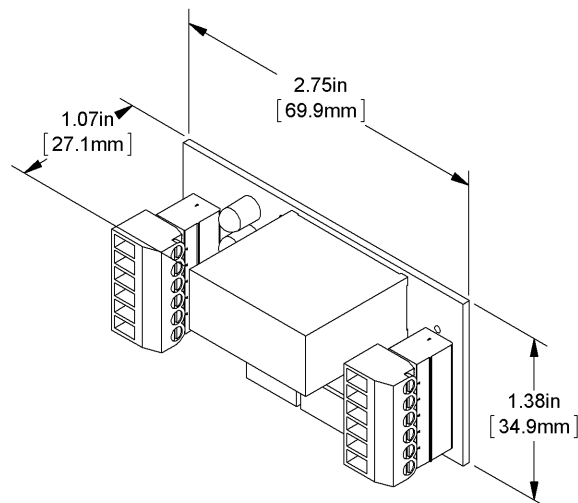
0 to 95% RH noncondensing

Screw Terminals

16 to 28 AWG (1.29mm to 0.32mm)

PCB

FR4 94V0





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.

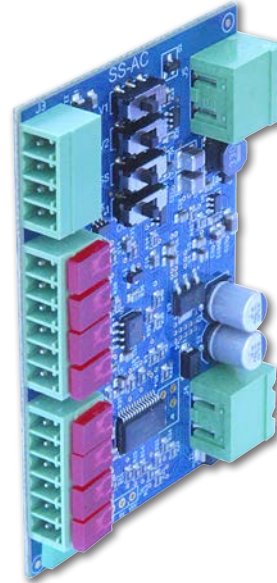
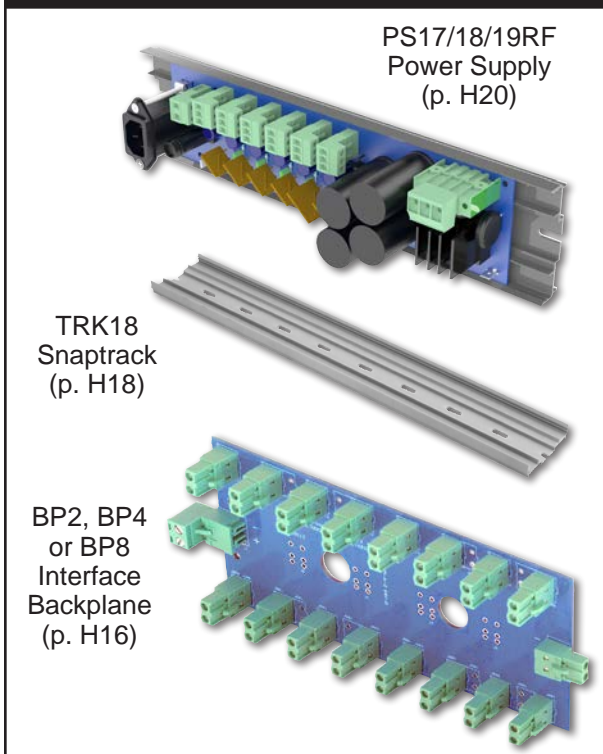


Fig. 1:
SS-AC Selector Switch/Alarm Counter Module

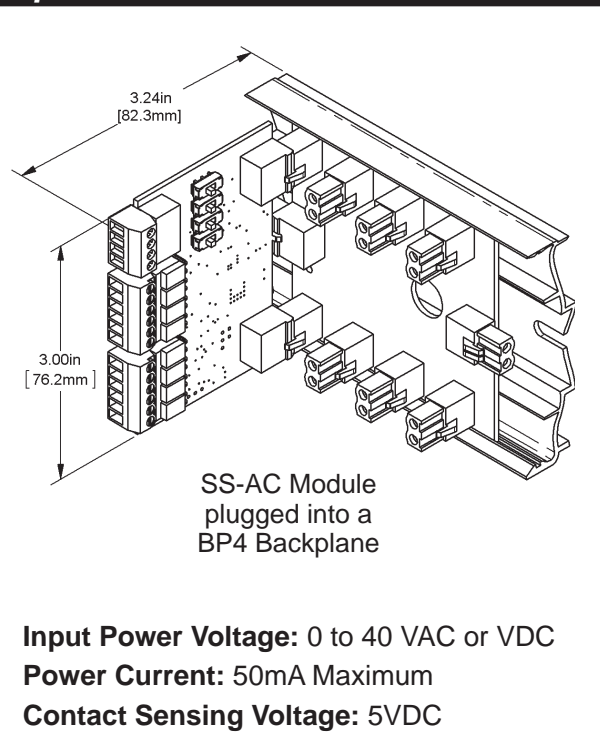
<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/SS-AC	Selector Switch/Alarm Counter.....	\$225

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

Associated Products



Specifications





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.

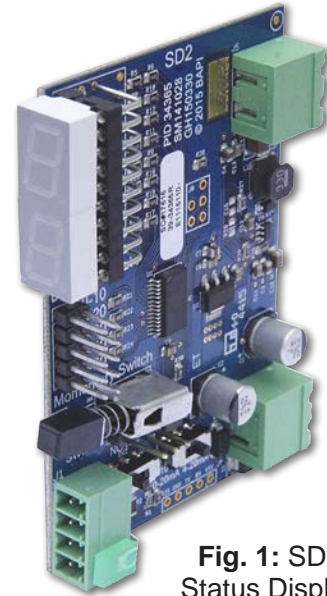


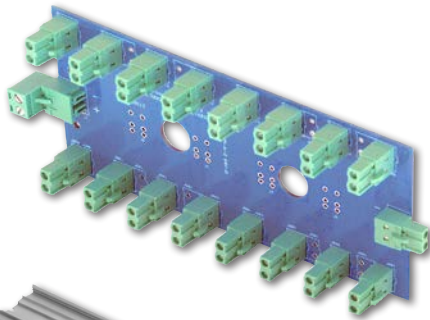
Fig. 1: SD2 Status Display Module

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/SD2	Status Display, Dual 7 Segment Display	\$295

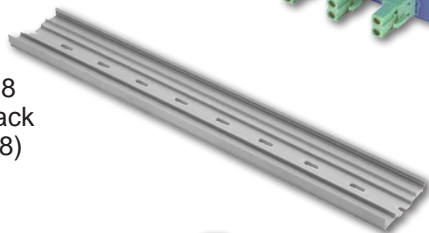
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

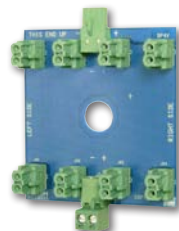
BP2, BP4 or BP8 Interface Backplane (p. H16)



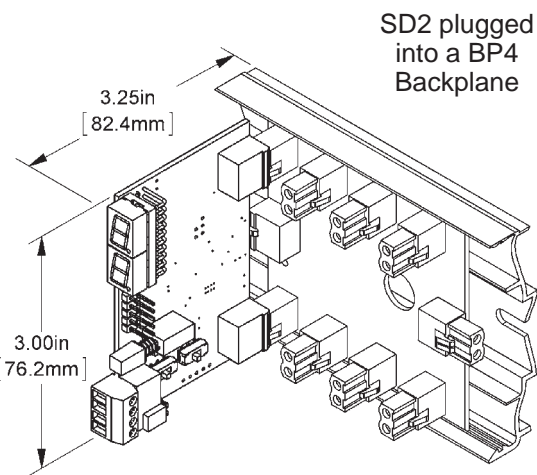
TRK18 Snaptrack (p. H18)



BP4-V Vertical Backplane (p. H17)



Specifications



- 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



Rev. 11/21/19

PE4 - Pulse Extender, 4 Output

H39

ETA Line

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.

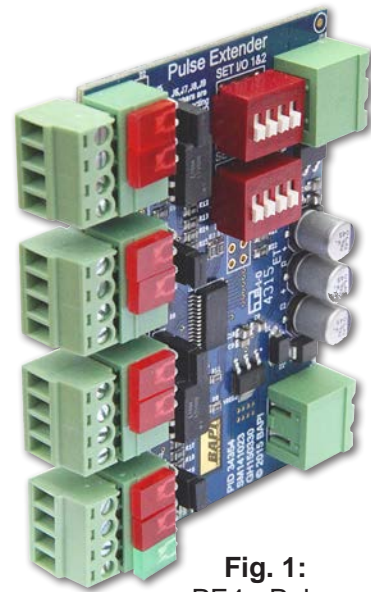


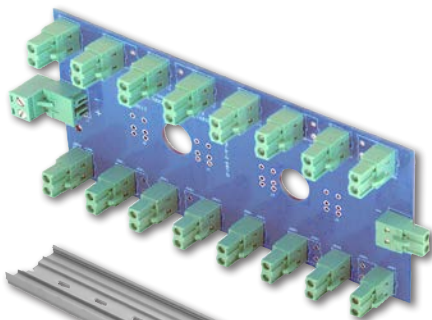
Fig. 1:
PE4 - Pulse Extender

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

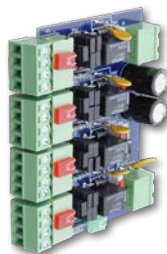
Associated Products

BP2, BP4
or BP8
Interface
Backplane
(p. H16)



TRK18
Snaptrack
(p. H18)

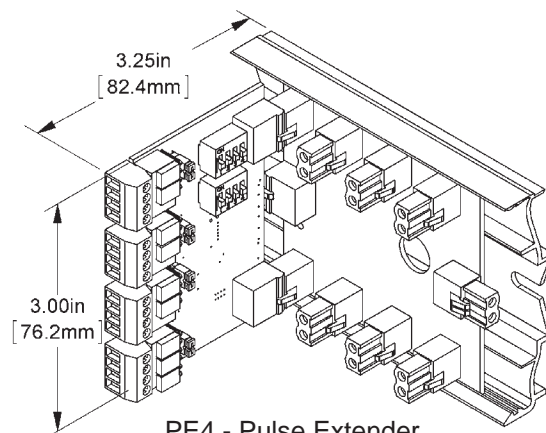
IRM4 -
Interposing
Relay
Module
(p. H34)



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)





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.bapivac.com

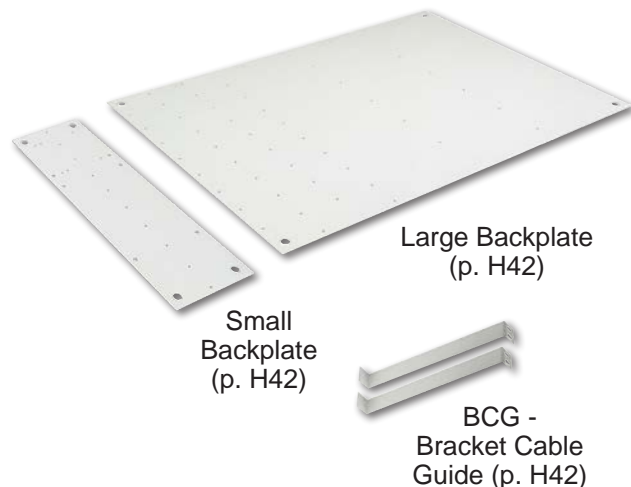
Associated Products

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)



Rev. 06/08/17

20x20x8 Steel Enclosure

H41

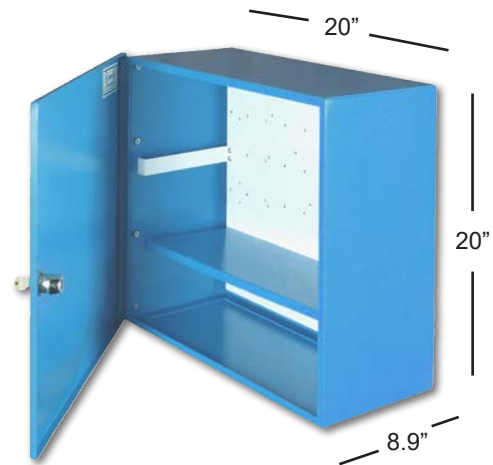
ETA Line

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

<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/20208N1S.....	Steel Enclosure, 20x20x8.....	Call for Pricing

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

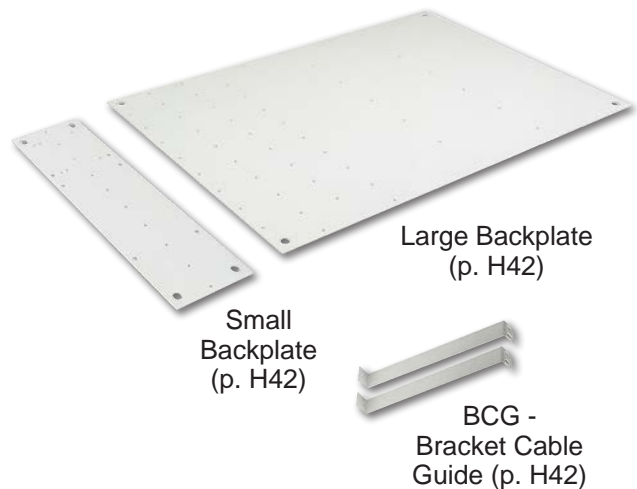
Associated Products

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.

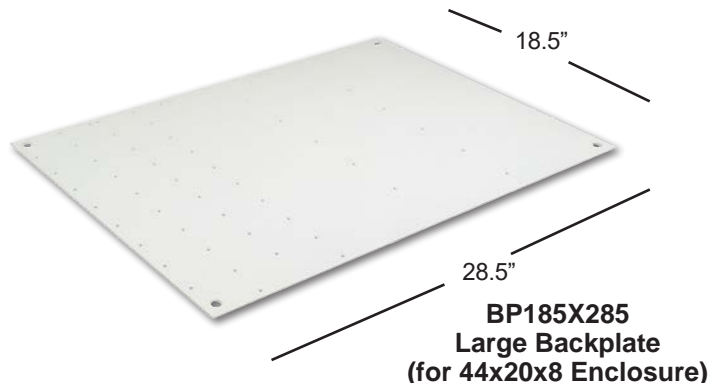




Overview

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.



<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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.



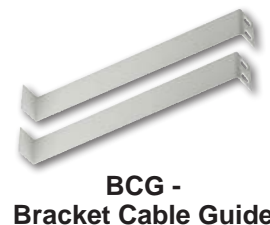
<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
BA/BP6X185.....	Small Backplate.....	\$35

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 enclosure 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.



<u>Part Number</u>	<u>Description</u>	<u>List Price</u>
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 10K Ω thermistor or a 1K Ω 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.



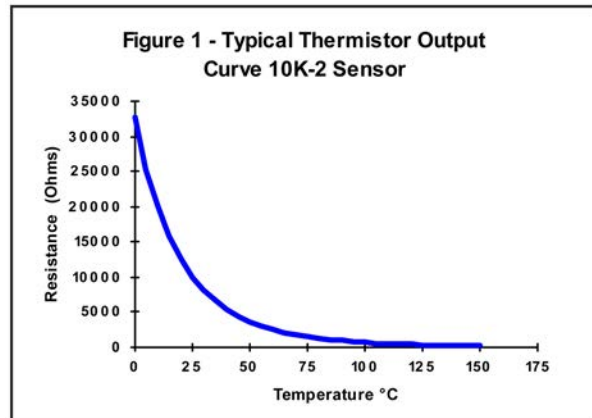


Thermistor Description

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 K Ω @ 25 °C	-55 to 150 °C
2.2K	2.2 K Ω @ 25 °C	-55 to 150 °C
3K**	3 K Ω @ 25 °C	-55 to 150 °C
3.3K	3.3 K Ω @ 25 °C	-55 to 150 °C
10K-2**	10 K Ω @ 25 °C	-55 to 150 °C
10K-3**	10 K Ω @ 25 °C	-55 to 150 °C
10K-3(11K)**	5.2 K Ω @ 25 °C	-55 to 150 °C
10K-4	10 K Ω @ 25 °C	-55 to 150 °C
20K**	20 K Ω @ 25 °C	-55 to 150 °C
47K	47 K Ω @ 25 °C	-55 to 150 °C
50K	50 K Ω @ 25 °C	-80 to 150 °C
100K**	100 K Ω @ 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

BAPI Sensor Specifications

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1.8K Thermistor Output Table

°F	°C	Ohms
-39	-39.44	37793
-37	-38.33	35455
-35	-37.22	33277
-33	-36.11	31248
-31	-35.00	29356
-29	-33.89	27591
-27	-32.78	25945
-25	-31.67	24408
-23	-30.56	22972
-21	-29.44	21619
-19	-28.33	20365
-17	-27.22	19193
-15	-26.11	18096
-13	-25.00	17069
-11	-23.89	16107
-9	-22.78	15205
-7	-21.67	14360
-5	-20.56	13568
-3	-19.44	12818
-1	-18.33	12120
1	-17.22	11466
3	-16.11	10850
5	-15.00	10272
7	-13.89	9728
9	-12.78	9217
11	-11.67	8736
13	-10.56	8283
15	-9.44	7853
17	-8.33	7451
19	-7.22	7073
21	-6.11	6716
23	-5.00	6379
25	-3.89	6062
27	-2.78	5762
29	-1.67	5479
31	-0.56	5212
33	0.56	4957
35	1.67	4718

°F	°C	Ohms
37	2.78	4493
39	3.89	4279
41	5.00	4077
43	6.11	3886
45	7.22	3705
47	8.33	3534
49	9.44	3371
51	10.56	3216
53	11.67	3070
55	12.78	2932
57	13.89	2801
59	15.00	2676
61	16.11	2558
63	17.22	2445
65	18.33	2339
67	19.44	2237
69	20.56	2140
71	21.67	2048
73	22.78	1961
75	23.89	1878
77	25.00	1799
79	26.11	1724
81	27.22	1653
83	28.33	1585
85	29.44	1520
87	30.56	1457
89	31.67	1398
91	32.78	1342
93	33.89	1289
95	35.00	1237
97	36.11	1189
99	37.22	1142
101	38.33	1097
103	39.44	1055
105	40.56	1014
107	41.67	975
109	42.78	938
111	43.89	903

°F	°C	Ohms
113	45.00	869
115	46.11	836
117	47.22	805
119	48.33	775
121	49.44	747
123	50.56	720
125	51.67	693
127	52.78	668
129	53.89	644
131	55.00	622
133	56.11	600
135	57.22	578
137	58.33	558
139	59.44	539
141	60.56	520
143	61.67	502
145	62.78	485
147	63.89	469
149	65.00	453
151	66.11	437
153	67.22	423
155	68.33	409
157	69.44	395
159	70.56	382
161	71.67	370
163	72.78	358
165	73.89	346
167	75.00	335
169	76.11	324
171	77.22	314
173	78.33	304
175	79.44	295
177	80.56	285
179	81.67	277
181	82.78	268
183	83.89	260
185	85.00	252
187	86.11	244

* All Passive Thermistors 10K Ω and smaller are CE compliant.

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3K Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	96941	37	2.78	8510	113	45.00	1310
-37	-38.33	90108	39	3.89	8050	115	46.11	1255
-35	-37.22	83804	41	5.00	7619	117	47.22	1202
-33	-36.11	77983	43	6.11	7213	119	48.33	1151
-31	-35.00	72607	45	7.22	6831	121	49.44	1104
-29	-33.89	67637	47	8.33	6472	123	50.56	1058
-27	-32.78	63041	49	9.44	6134	125	51.67	1014
-25	-31.67	58789	51	10.56	5813	127	52.78	973
-23	-30.56	54851	53	11.67	5513	129	53.89	933
-21	-29.44	51173	55	12.78	5231	131	55.00	895
-19	-28.33	47795	57	13.89	4965	133	56.11	860
-17	-27.22	44663	59	15.00	4714	135	57.22	825
-15	-26.11	41756	61	16.11	4478	137	58.33	793
-13	-25.00	39059	63	17.22	4254	139	59.44	761
-11	-23.89	36553	65	18.33	4043	141	60.56	731
-9	-22.78	34225	67	19.44	3844	143	61.67	703
-7	-21.67	32061	69	20.56	3655	145	62.78	676
-5	-20.56	30047	71	21.67	3477	147	63.89	650
-3	-19.44	28157	73	22.78	3309	149	65.00	625
-1	-18.33	26414	75	23.89	3150	151	66.11	601
1	-17.22	24790	77	25.00	3000	153	67.22	578
3	-16.11	23277	79	26.11	2858	155	68.33	556
5	-15.00	21865	81	27.22	2723	157	69.44	536
7	-13.89	20549	83	28.33	2596	159	70.56	516
9	-12.78	19320	85	29.44	2475	161	71.67	496
11	-11.67	18173	87	30.56	2360	163	72.78	478
13	-10.56	17101	89	31.67	2252	165	73.89	461
15	-9.44	16091	91	32.78	2149	167	75.00	444
17	-8.33	15155	93	33.89	2051	169	76.11	428
19	-7.22	14280	95	35.00	1959	171	77.22	413
21	-6.11	13461	97	36.11	1871	173	78.33	398
23	-5.00	12694	99	37.22	1788	175	79.44	384
25	-3.89	11975	101	38.33	1709	177	80.56	370
27	-2.78	11302	103	39.44	1634	179	81.67	357
29	-1.67	10671	105	40.56	1562	181	82.78	345
31	-0.56	10079	107	41.67	1494	183	83.89	333
33	0.56	9519	109	42.78	1430	185	85.00	321
35	1.67	8999	111	43.89	1368	187	86.11	310

* All Passive Thermistors 10K Ω and smaller are CE compliant.



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10K-2 Thermistor Output Table

BAPI Sensor Specifications

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10K-2 Thermistor Output Table

°F	°C	Ohms
-39	-39.44	323839
-37	-38.33	300974
-35	-37.22	279880
-33	-36.11	260410
-31	-35.00	242427
-29	-33.89	225809
-27	-32.78	210443
-25	-31.67	196227
-23	-30.56	183068
-21	-29.44	170775
-19	-28.33	159488
-17	-27.22	149024
-15	-26.11	139316
-13	-25.00	130306
-11	-23.89	121939
-9	-22.78	114165
-7	-21.67	106939
-5	-20.56	100218
-3	-19.44	93909
-1	-18.33	88090
1	-17.22	82670
3	-16.11	77620
5	-15.00	72911
7	-13.89	68518
9	-12.78	64419
11	-11.67	60592
13	-10.56	57017
15	-9.44	53647
17	-8.33	50526
19	-7.22	47606
21	-6.11	44874
23	-5.00	42317
25	-3.89	39921
27	-2.78	37676
29	-1.67	35573
31	-0.56	33599
33	0.56	31732
35	1.67	29996

°F	°C	Ohms
37	2.78	28365
39	3.89	26834
41	5.00	25395
43	6.11	24042
45	7.22	22770
47	8.33	21573
49	9.44	20446
51	10.56	19376
53	11.67	18378
55	12.78	17437
57	13.89	16550
59	15.00	15714
61	16.11	14925
63	17.22	14180
65	18.33	13478
67	19.44	12814
69	20.56	12182
71	21.67	11590
73	22.78	11030
75	23.89	10501
77	25.00	10000
79	26.11	9526
81	27.22	9078
83	28.33	8653
85	29.44	8251
87	30.56	7866
89	31.67	7505
91	32.78	7163
93	33.89	6838
95	35.00	6530
97	36.11	6238
99	37.22	5960
101	38.33	5697
103	39.44	5447
105	40.56	5207
107	41.67	4981
109	42.78	4766
111	43.89	4561

°F	°C	Ohms
113	45.00	4367
115	46.11	4182
117	47.22	4006
119	48.33	3838
121	49.44	3679
123	50.56	3525
125	51.67	3380
127	52.78	3242
129	53.89	3111
131	55.00	2985
133	56.11	2865
135	57.22	2751
137	58.33	2642
139	59.44	2538
141	60.56	2438
143	61.67	2343
145	62.78	2252
147	63.89	2165
149	65.00	2082
151	66.11	2003
153	67.22	1927
155	68.33	1855
157	69.44	1785
159	70.56	1718
161	71.67	1655
163	72.78	1594
165	73.89	1536
167	75.00	1480
169	76.11	1427
171	77.22	1375
173	78.33	1326
175	79.44	1279
177	80.56	1234
179	81.67	1190
181	82.78	1149
183	83.89	1109
185	85.00	1070
187	86.11	1034

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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

BAPI Sensor Specifications

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

°F	°C	Ohms
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

°F	°C	Ohms
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

°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

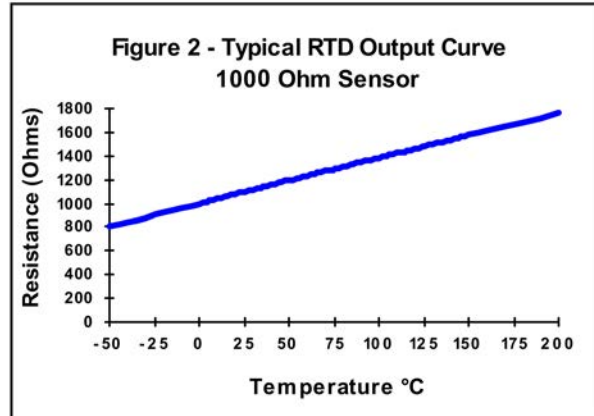


RTD Description

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 1 KΩ Platinum RTDs with the ranges shown in the table at right.



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: $\pm(0.3 + 0.005T)$; T= Temp in °C
- Single Point Class A: $\pm(0.15 + 0.002T)$; T= Temp in °C
- Averaging Standard: $\pm(0.5 + 0.005(T-25))$; 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°C

Standardization:

- DIN 43760-1980, IEC Pub 751-1983, JIS C1604-1989

Sensor Type	Reference Resistance	Temp. Coefficient	Operating Range
BA/1K[375]*	1 kΩ @ 0 °C	3.75Ω/°C	-60 to 150 °C
BA/1K[Ni]	1 kΩ @ 21 °C	5.68Ω/°C	-60 to 200 °C
BA/1K*	1 kΩ @ 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

°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

°F	°C	Ohms
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

°F	°C	Ohms
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



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

°F	°C	Ohms
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

°F	°C	Ohms
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





1K Ω 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

°F	°C	Ohms
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

°F	°C	Ohms
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



Temperature Transmitter Description

BAPI temperature transmitters incorporate a 1K Ω RTD sensor and a transducer. 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.

The thermistor transmitter is microprocessor based and does not allow or require field calibration. The thermistor transmitter is first programmed for the specified range, and after connecting to the transducer, the output is verified at one temperature.

The RTD transmitters are 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. RTD transmitters have non-interacting zero and span potentiometers that are used for factory adjustments.

BAPI offers a variety of standard and custom transmitter ranges. Additionally, BAPI can provide matched 1K RTD-based units. Matched 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.

Matched errors are

$\pm((\text{Span} * \text{Linearity Error}) + (\text{Reference Thermometer uncertainty}))$

Where Linearity Error = Square Root($(\text{Transmitter Linearity})^2 + (\text{RTD Linearity})^2$) =

Square Root($(0.125\%)^2 + (0.2\%)^2$) = 0.234%

Examples:

BA/T1K(-30 to 130F)

Span = 130 - (-30) = 160

Matched error = $\pm((160 * 0.234\%) + (0.05^\circ\text{F})) = \pm 0.42^\circ\text{F}$

BA/T1K(45 to 95F)

Span = 95 - 45 = 50

Matched error = $\pm((50 * 0.234\%) + (0.05^\circ\text{F})) = \pm 0.17^\circ\text{F}$

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 non-room configurations where moisture or condensation may be a problem. Due to the extremely low moisture absorption properties of the potting material, a ruggedized transmitter will remain operational even if temporarily immersed in water.

T1K Transmitter Specifications

Sensor: 1K Ω Platinum RTD

Supply Voltage: 7 to 40 VDC

Output: 4 to 20 mA

Max. Loop Resistance: 850 Ω at 24VDC

Span: Min 16.6 $^\circ\text{C}$ (30 $^\circ\text{F}$), Max 555 $^\circ\text{C}$ (1000 $^\circ\text{F}$)

Zero: Min -100 $^\circ\text{C}$ (-148 $^\circ\text{F}$), Max 482 $^\circ\text{C}$ (900 $^\circ\text{F}$)

Field Adjustments: (Unit is factory calibrated, field adjustment will void calibration warranty)

Zero: +/- 10% • Span: +/- 10%

Accuracy: $\pm 0.065\%$ of Span (8 & 16mA outputs)

Linearity: $\pm 0.125\%$ of Span

Operational Humidity:

0 to 95%, non-condensing

0 to 100%, condensing for short intervals

Output Current limits:

Less than 1mA and 22.35 ± 0.15 mA

Power Output Shift:

$\pm 0.009\%$ of Span 7 to 40VDC

Connections:

Four 22-gauge etched Teflon leads or terminal blocks

Operating Temperature:

Transmitter: -20 to 70 $^\circ\text{C}$

Sensor: -65 to 105 $^\circ\text{C}$ (standard)

-200 to 600 $^\circ\text{C}$ (available)





0-100 °F 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
0	0.00	0.00	4.000
1	0.05	0.10	4.160
2	0.10	0.20	4.320
3	0.15	0.30	4.480
4	0.20	0.40	4.640
5	0.25	0.50	4.800
6	0.30	0.60	4.960
7	0.35	0.70	5.120
8	0.40	0.80	5.280
9	0.45	0.90	5.440
10	0.50	1.00	5.600
11	0.55	1.10	5.760
12	0.60	1.20	5.920
13	0.65	1.30	6.080
14	0.70	1.40	6.240
15	0.75	1.50	6.400
16	0.80	1.60	6.560
17	0.85	1.70	6.720
18	0.90	1.80	6.880
19	0.95	1.90	7.040
20	1.00	2.00	7.200
21	1.05	2.10	7.360
22	1.10	2.20	7.520
23	1.15	2.30	7.680
24	1.20	2.40	7.840
25	1.25	2.50	8.000
26	1.30	2.60	8.160
27	1.35	2.70	8.320
28	1.40	2.80	8.480
29	1.45	2.90	8.640
30	1.50	3.00	8.800
31	1.55	3.10	8.960
32	1.60	3.20	9.120
33	1.65	3.30	9.280
34	1.70	3.40	9.440
35	1.75	3.50	9.600
36	1.80	3.60	9.760
37	1.85	3.70	9.920
38	1.90	3.80	10.080
39	1.95	3.90	10.240
40	2.00	4.00	10.400
41	2.05	4.10	10.560
42	2.10	4.20	10.720
43	2.15	4.30	10.880
44	2.20	4.40	11.040
45	2.25	4.50	11.200
46	2.30	4.60	11.360
47	2.35	4.70	11.520
48	2.40	4.80	11.680
49	2.45	4.90	11.840

%RH	5V	10V	mA
50	2.50	5.00	12.000
51	2.55	5.10	12.160
52	2.60	5.20	12.320
53	2.65	5.30	12.480
54	2.70	5.40	12.640
55	2.75	5.50	12.800
56	2.80	5.60	12.960
57	2.85	5.70	13.120
58	2.90	5.80	13.280
59	2.95	5.90	13.440
60	3.00	6.00	13.600
61	3.05	6.10	13.760
62	3.10	6.20	13.920
63	3.15	6.30	14.080
64	3.20	6.40	14.240
65	3.25	6.50	14.400
66	3.30	6.60	14.560
67	3.35	6.70	14.720
68	3.40	6.80	14.880
69	3.45	6.90	15.040
70	3.50	7.00	15.200
71	3.55	7.10	15.360
72	3.60	7.20	15.520
73	3.65	7.30	15.680
74	3.70	7.40	15.840
75	3.75	7.50	16.000
76	3.80	7.60	16.160
77	3.85	7.70	16.320
78	3.90	7.80	16.480
79	3.95	7.90	16.640
80	4.00	8.00	16.800
81	4.05	8.10	16.960
82	4.10	8.20	17.120
83	4.15	8.30	17.280
84	4.20	8.40	17.440
85	4.25	8.50	17.600
86	4.30	8.60	17.760
87	4.35	8.70	17.920
88	4.40	8.80	18.080
89	4.45	8.90	18.240
90	4.50	9.00	18.400
91	4.55	9.10	18.560
92	4.60	9.20	18.720
93	4.65	9.30	18.880
94	4.70	9.40	19.040
95	4.75	9.50	19.200
96	4.80	9.60	19.360
97	4.85	9.70	19.520
98	4.90	9.80	19.680
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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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

Designator	Output Range	Span	Delta Style	Units Without Display				BAPI Room Sensors				Units With or Without Display				
				"Quantum" without Display	BAPI-Stat 4 without Display	RJP	RJPS	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
00	0 to 5 V	5 Volts	X	X	X	X	X	X	X	Ch 1,2,3	X	X	X	X	X	X
01	1 to 5 V	4 Volts	X	X	X	X	X	X	X		X	X	X	X	X	X
02	3.7 to 0.85 V	2.85 Volts	X	X	X	X	X	X	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	X	X	X
04	4.2 to 1.2 V	3 Volts	X	X	X	X	X	X	X		X	X	X	X	X	X
07	2.773 to 0.43 V	2.343 Volts	X	X	X	X	X	X	X		X	X	X	X	X	X
10	0 to 10 V	10 Volts	X	X	X	X	X	X	X		X	X	X	X	X	X
11	2 to 10 V	8 Volts	X	X	X	X	X	X	X		X	X	X	X	X	X
16	4 to 20 mA	16 mA								Ch 1,2	X	X	X	X	X	X ²
20	889 to 111 Ω	778 Ω						X	X		X	X	X	X	X	X ²
21	792 to 208 Ω	584 Ω						X	X		X	X	X	X	X	X ²
22	695 to 305 Ω	390 Ω						X	X		X	X	X	X	X	X ²
23	674 to 274 Ω	400 Ω	X	X	X	X	X	X	X		X	X	X	X	X	X ²
24	597 to 305 Ω	292 Ω						X	X		X	X	X	X	X	X ²
25	800 to 1200	400 Ω	X	X	X	X	X	X	X		X	X	X	X	X	X ²
26	909 to 1309	400 Ω	X	X	X	X	X	X	X		X	X	X	X	X	X ²
27	1800 to 2200	400 Ω	X	X	X	X	X	X	X		X	X	X	X	X	X ²
28	865 to 1266	400 Ω	X	X	X	X	X	X	X		X	X	X	X	X	X ²
29	700 to 300	400 Ω	X	X	X	X	X	X	X		X	X	X	X	X	X ²
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
48	0 to 2 KΩ	2 KΩ									X	X	X	X	X	X
55	0 to 1.5 KΩ	2 KΩ									X	X	X	X	X	X
50	0 to 5 KΩ	5 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X
51	7.87K to 2.87K Ω	5 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X
52	10.0K to 15.0K Ω	5 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X
53	2.5K to 7.5K Ω	5 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X
54	1K to 6K Ω	5 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X
60	0 to 10 KΩ	10 KΩ	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
62	9577 to 1422 Ω	8.16K	X	X	X	X	X	X	X		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
64	200 to 10.2 KΩ	10 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X
65	10.4K to 4000	10 KΩ	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
67	5K to 15 KΩ	10 KΩ	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	X	X	X	X
[XL]**	10.8K to 6000	9.62 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X
80	0 to 20 KΩ	20 KΩ	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
82	6.19 to 26.19 KΩ	20 KΩ	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
84	10 to 30 KΩ	20 KΩ	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
90	0 to 100 KΩ	100 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X
91	25K to 75 KΩ	50 KΩ	X	X	X	X	X	X	X		X	X	X	X	X	X

*Setpoint range must be within displayed temperature range

**XL 10 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.

¹Only available with pushbutton style setpoint sensors.

²The resolution is 40μ per step with 250 steps.

Note: RJP options 60, 61 and 62 are not available for large display spans. Contact your BAPI representative for additional information.



Setpoint Display Ranges for BAPI Room Sensors

Designator	Setpoint Display Range**		Humidity		R _u P	R _u P _S	"Quantum", Decora & BAPI-Stat 4		X-Combo*	T1K Room Trans	"Quantum Prime" or BAPI-Stat 3* VOC & CO2		BAPI-Com**
	°F	°C	Generic				"Quantum Prime" or BAPI-Stat 3* Temp & Humidity	"Quantum Prime" or BAPI-Stat 3* VOC & CO2					
A			-3 to +3		X	X	X	X	X	X	X	X	X
B	50 to 90°F	10 to 32°C	-5 to +5		X	X	X	X	X	X	X	X	X
C	55 to 85°F	13 to 30°C			X	X	X	X	X	X	X	X	X
D	60 to 80°F	15 to 27°C			X	X	X	X	X	X	X	X	X
E	65 to 80°F	18 to 27°C			X	X	X	X	X	X	X	X	X
F	45 to 96°F	7 to 35°C			X	X	X	X	X	X	X	X	X
G	-20 to 120°F	-29 to 49°C			X	X	X	X	X	X	X	X	X
H	68 to 76°F	20 to 26°C			X	X	X	X	X	X	X	X	X
J	65 to 95°F	18 to 35°C			X	X	X	X	X	X	X	X	X
K	70 to 74°F	21 to 23°C			X	X	X	X	X	X	X	X	X
L		0 to 100%RH											
M		35 to 70%RH											
N													
P	40 to 80°F	4 to 27°C		-2 to +2	X	X	X	X	X	X	X	X	X
X	60 to 85°F	15 to 30°C			X	X	X	X	X	X	X	X	X
AA	54 to 90°F	12 to 32°C			X	X	X	X	X	X	X	X	X
BB	41 to 86°F	5 to 30°C			X	X	X	X	X	X	X	X	X
CC	32 to 100°F	0 to 38°C			X	X	X	X	X	X	X	X	X
DD	67 to 77°F	19 to 25°C			X	X	X	X	X	X	X	X	X
EE		-10 to +10			X	X	X	X	X	X	X	X	X
FF	0 to 100°F	-18 to 38°C			X	X	X	X	X	X	X	X	X
GG	40 to 90°F	4 to 32°C			X	X	X	X	X	X	X	X	X
JJ	32 to 185°F	0 to 85°C			X	X	X	X	X	X	X	X	X
KK	-40 to 140°F	-40 to 60°C			X	X	X	X	X	X	X	X	X
MM	69 to 75°F	21 to 24°C			X	X	X	X	X	X	X	X	X
NN	55 to 95°F	13 to 35°C		-4 to +4	X	X	X	X	X	X	X	X	X
PP	32 to 212°F	0 to 100°C			X	X	X	X	X	X	X	X	X
QQ	25 to 50°F	-4 to 10°C			X	X	X	X	X	X	X	X	X
RR	50 to 86°F	10 to 30°C			X	X	X	X	X	X	X	X	X
SS		Maximum Temperature Display Range ->											
TT													

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	Heat	Cool	Auto	
XLD	5K	10K	15K	20K	25K					RuPM, BAPISat 2 & 4
X01	4.89K	2.33K	10.63K	13.24K	16.33K					RuPM, BAPISat 2 & 4
X02	2K	4K	6K	8K	10K					RuPM, BAPISat 2 & 4
X03	5K	10K				15K				RuPM, BAPISat 2 & 4
X05	4.89K	2.33K				15.8K				RuPM, BAPISat 2 & 4
X06	6.5K		8.5K	10.5K	12K					BAPISat 2 & 4 Only
X07	5K					15K				BAPISat 2 & 4 Only
X08	12.686K	11.86K				13.86K				RuPM, BAPISat 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	Heat	Cool	
H02	5K	10K	15K	20K			BAPISat 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	Heat	Cool	
HCF	5K	10K	15K	20K	25K	30K			RuPM, BAPISat 2 & 4
H01	0K	2K	4K	6K	8K	10K			RuPM, BAPISat 2 & 4





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





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.



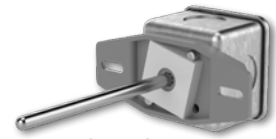
BAPI-Box Crossover

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.



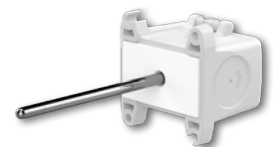
Junction Box (JB)

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)

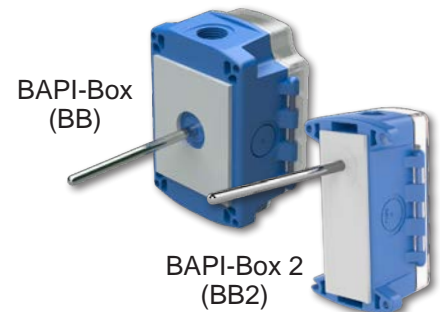
INDOOR/OUTDOOR ENCLOSURES

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)

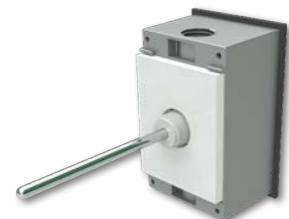
Weatherproof Enclosure (“Bell Box”)

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](#).





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 **National Electrical Manufacturers Association (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)”

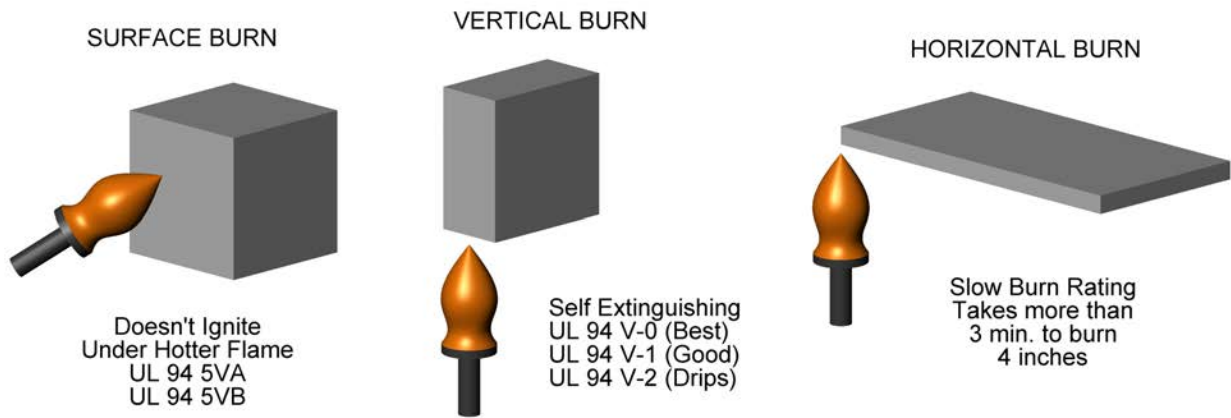




All of BAPI's indoor sensor bodies and transmitter enclosures are made from UL94 V-0 rated plastics.

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.





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.





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 Temperature °F Pressure 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. Phone (608) 735-4800


750 North Royal Avenue Fax (608) 735-4804

Gays Mills, WI 54631





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 #	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 Temperature °F Pressure 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:

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's standard product accuracy for Duct and Outside Air Humidity units is either $\pm 2.0\%$ or $\pm 3.0\%$ 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 $\pm 0.5\%RH$. 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.

Customer		P.O.		Order #	
Your Company Name		Your P.O. #		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
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Humidity Transmitter Certification (Room Units)

Rev. 06/11/19

BAPI Application Notes

BAPI's standard product accuracy for Humidity Room Sensors is $\pm 2.0\%$. 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 $\pm 0.5\%RH$. 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.

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:

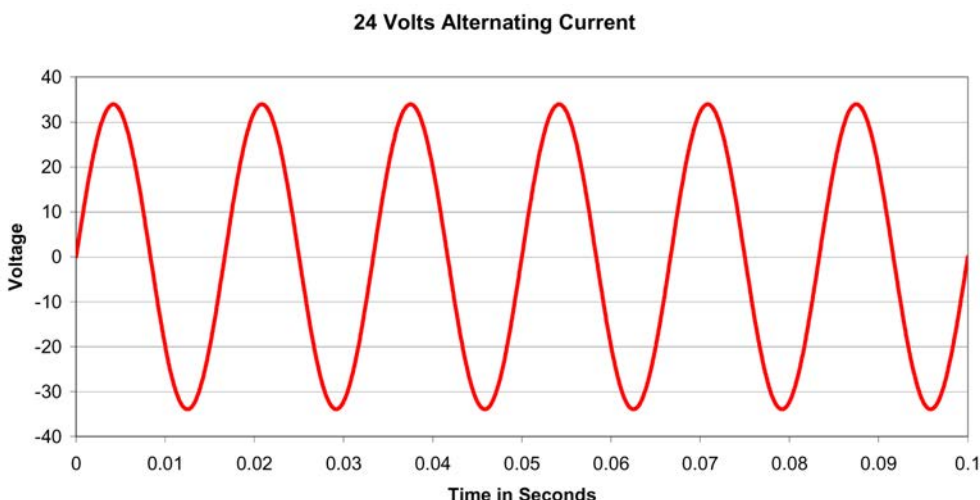
	Building Automation Products, Inc. 750 North Royal Avenue Gays Mills, WI 54631	Phone (608) 735-4800 Fax (608) 735-4804
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24 VAC

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.



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.





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.





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 °F. If the wire is run in a portion of the building where temperatures can increase to 140 °F, 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 °F and below (10% maximum drop in voltage)

Wire gauge	Ω/1000 ft (305 M) @ 70°F	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 °F (10% maximum drop in voltage)

Wire gauge	Ω/1000 ft (305 M) @ 70°F	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.





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.

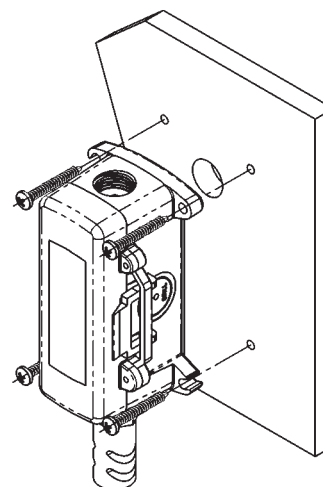


Fig. 1: The BAPI-Box 2 enclosure outside mounting. The probe and shield should be pointing downward.

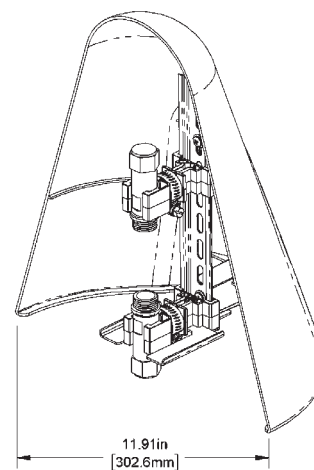


Fig. 2: Weather Shade Kit.

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.



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.

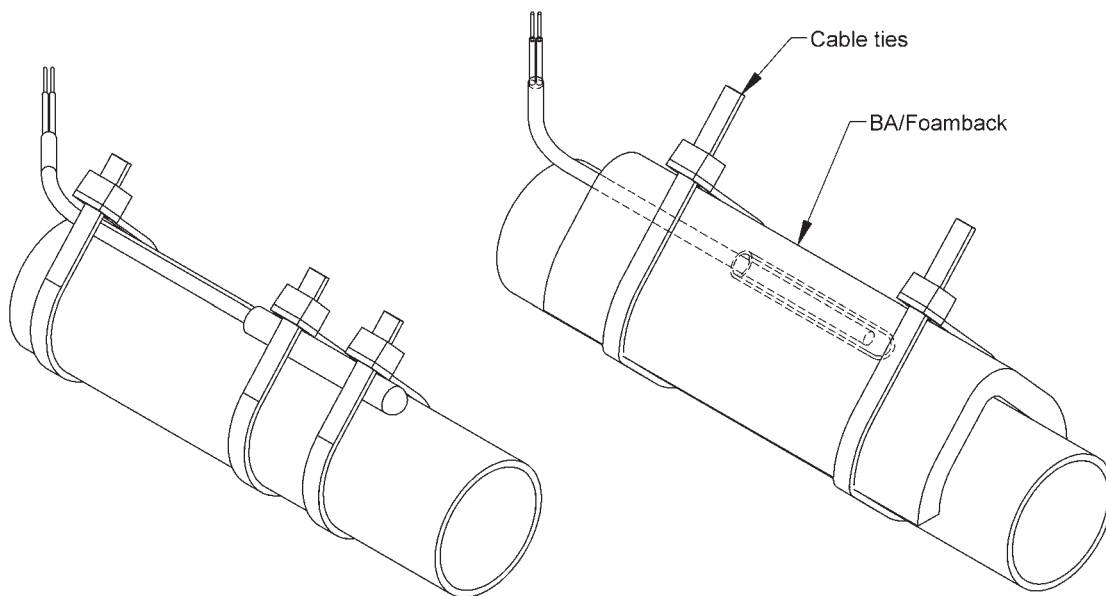


Figure 1: Remote probe with FEP jacketed cable strapped directly to pipe.

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

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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 SpeedDee. 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.

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 or 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 only¹. 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 officer². 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.

¹Product credits may vary depending on product type and quantity.

²BAPI 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.

<u>Part Number</u>	<u>Net Price</u>
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.	
BA/BTP-RECERTIFY	\$100.00
Blü-Test Probe Recertification with NIST Traceable Certificate of Calibration and Battery	

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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