BUILDING AUTOMATION PRODUCTS INC.

2021 FULL CATALOG

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



Changing the way you think about sensors...

BAPI®
Sensors for HVAC/R

BAPI-BACKED Confidence



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

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

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

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

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



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

Rev. 01/28/15

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We make it easy for you.



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

5 YEAR WARRANTY

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

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

2. BAPI BACKED

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

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

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

4. Advanced Warranty Replacement

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

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

5. Flat Rate Shipping

BAPI offers flat rate ground shipping on order shipments being shipped within the contiguous United States. Orders requiring expediting or vendor freight charges – as well as orders to Hawaii, Alaska, Guam and Puerto Rico – will qualify for a discounted published shipping rate that will be added to the invoice. BAPI will not bill third party or bill 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 the flat rate shipping program.

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

The BAPI Difference

Changing the way you think about sensors™

ANOTHER ORIGINAL BAPI

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

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



99.94% Manufacturing Efficiency Rate



Live Support



Manufactured in the USA



On-Site, Multi-Step Testing



Computer Aided Workstations

Marketing Support

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

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

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

Sales Support

Our sales & customer service team offer the following:

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

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

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



Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills, WI 54631

email: sales@bapihvac.com
phone: +1-608-735-4800
website: www.bapihvac.com

Company Overview

Rev. 01/29/21

Company Background

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

Website Resources - www.bapihvac.com

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

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



The BAPI-Guard Video

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

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

The BAPI Difference

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

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

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

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

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

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

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NIST Traceable Test Instruments - pgs A2-A3

BUILDING AUTOMATION PRODUCTS INC.

BAPI Blü-Test TEST INSTRUMENT SUITE

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



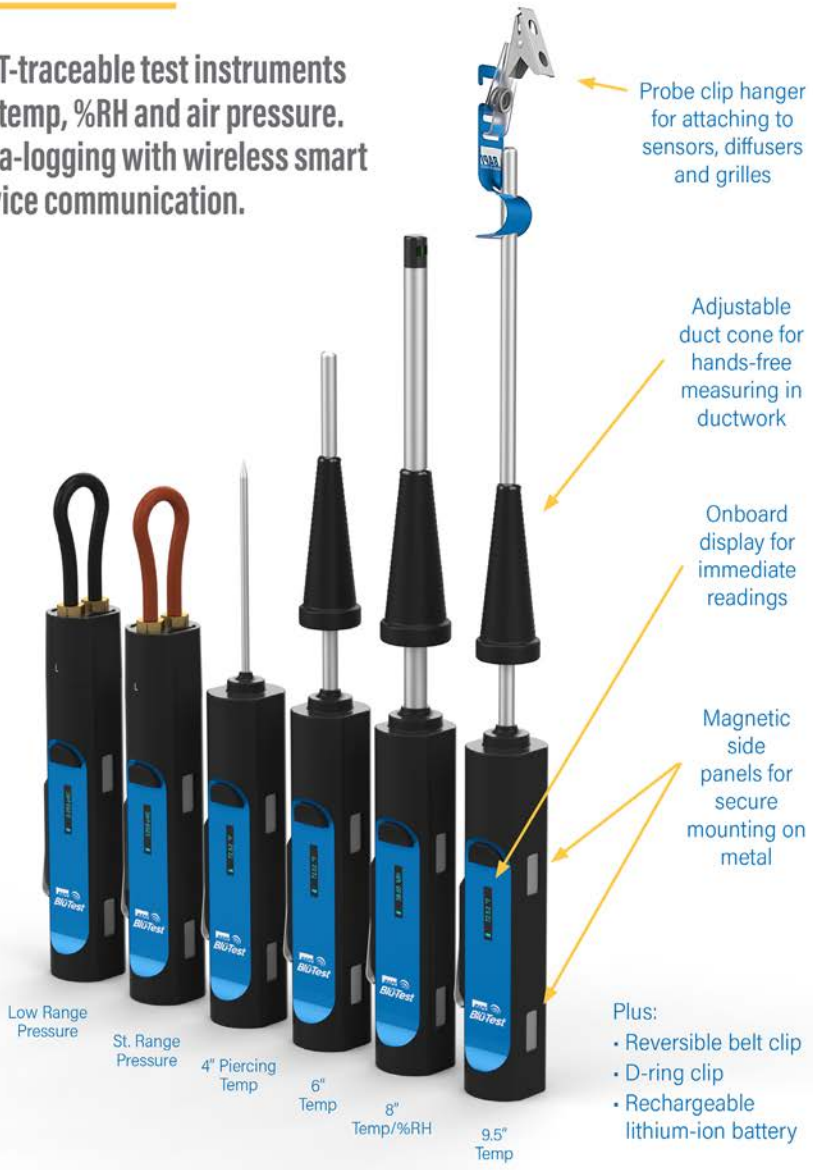
Handy App with trending and other features

GET IT ON Google Play | Download on the App Store

Each probe stores up to a million readings!



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



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

BAPI Sensors for HVAC/R

Building Automation Products, Inc.
phone +1-608-735-4800
email sales@bapihvac.com
website www.bapihvac.com

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

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

Blü-Test - Wireless Test Instruments

Test Instruments

Rev. 08/16/21

Features & Options

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



Blü-Test App Screens

GET IT ON Google Play

Download on the App Store

5 YEAR WARRANTY

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



Specifications

Power: 3.7V, 2,600 mAh Rechargeable Battery

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

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

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

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

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

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

Communication: Bluetooth LE, Class 2 v4.2

Data Logging: 10 second intervals

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

FCC ID: Contains FCC ID 2AA9B04

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

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

Ordering Information

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

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

Gray shaded items follow the Buy and Resale Multiplier.

Blü-Test App Features

Free App

Android OS 5.1 or Apple iOS 10 or higher required

View live data from multiple probes

Review and email log files

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

Download on the App Store

GET IT ON Google Play

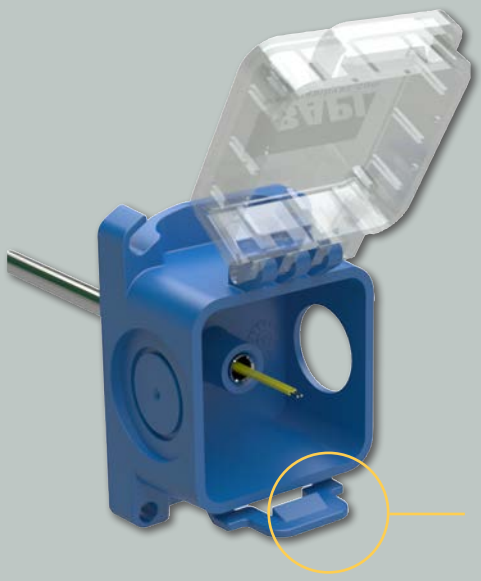
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*NIST is the National Institute of Standards and Technology

**NSF is the National Sanitation Foundation

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.



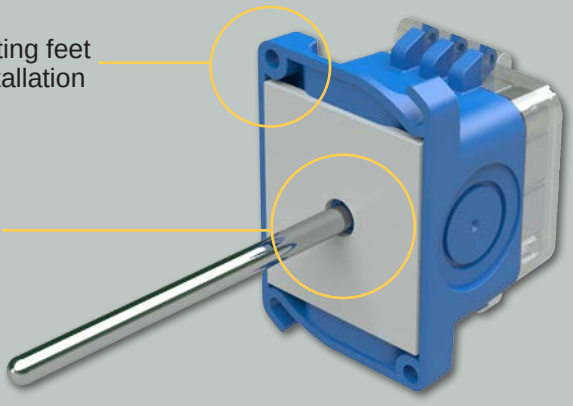


Open mounting feet for fast installation

Transmitter units come with an LED power indicator

Optional knockout plug

Thumb latch for easy operation and a secure lock every time



Durable mounting feet for secure installation

Closed cell foam backing for a tight seal

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

RµP 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



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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



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"L-Temp"
Echelon Sensor



pg B26

Wall Plates
w/ optional Override



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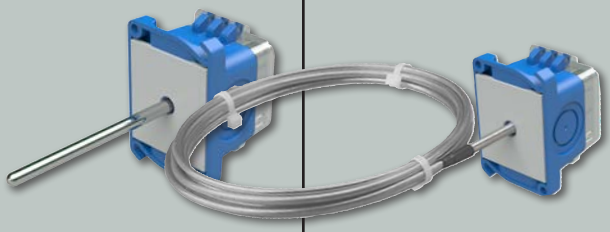
BAPI
Sensors for HVAC/R

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Temperature Sensors

BAPI Non-Room Temperature Sensors

Duct Sensors



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Duct Averaging

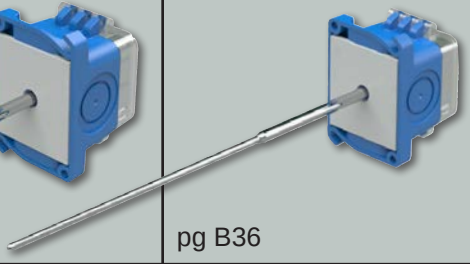
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Rigid Averaging



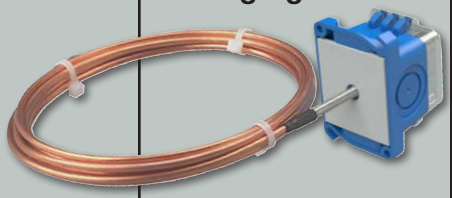
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Submersible Duct



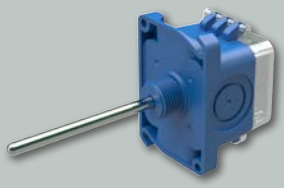
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Submersible Averaging



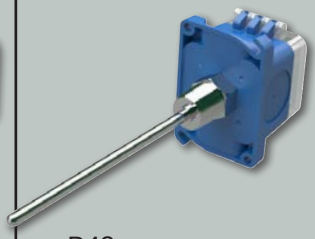
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Immersion



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Immersion with SS Fitting



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Thermowells for Immersion Sensors



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Extreme Temp RTD - Immersion



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Extreme Temp RTD - Remote



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Clamp-On Strap



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Strap-On Sensors



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Outside Air



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Remote Sensors and Probes



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Concave and Remote Probes with Colored Cable



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Surface Sensor



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4 to 20mA Transmitters



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Thermobuffer for Freezers and Coolers



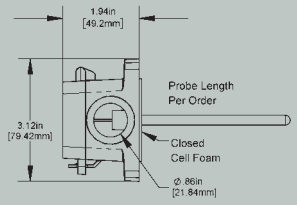
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Replacement Sensors



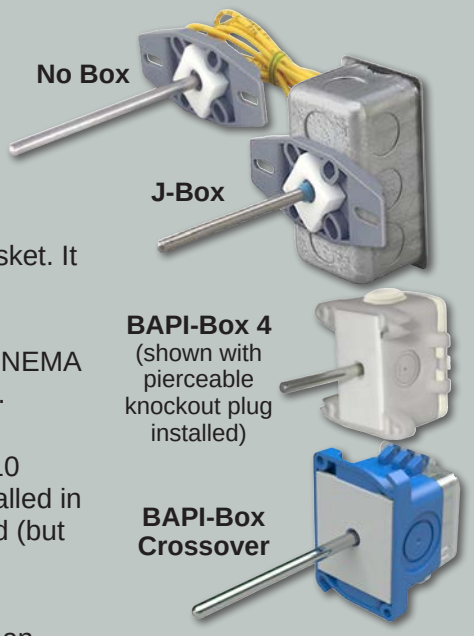
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Non-Room Sensor Dimension Drawings



pgs B64-B74

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.

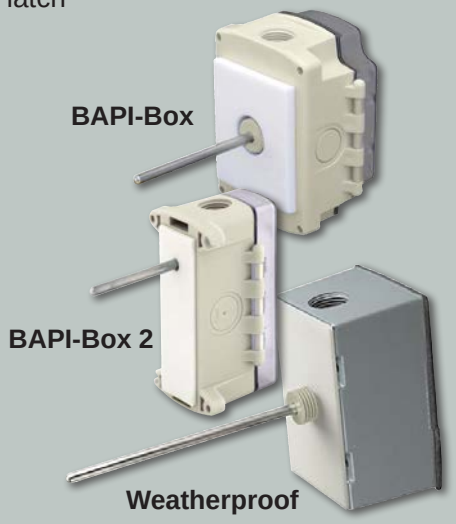
BAPI-Box 4 Enclosure
The BAPI-Box 4 is made of nylon and plastic and carries an IP10 rating (or an IP44 rating with the Pierceable Knockout Plug installed in the open port). It is half the size of the BAPI-Box 2 with a hinged (but not gasketed) cover.

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)	4.2 x 3.9 x 1.94" (106 x 98.4 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	0.43 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.

BAPI-Stat “Quantum” with Display

Temperature Sensors

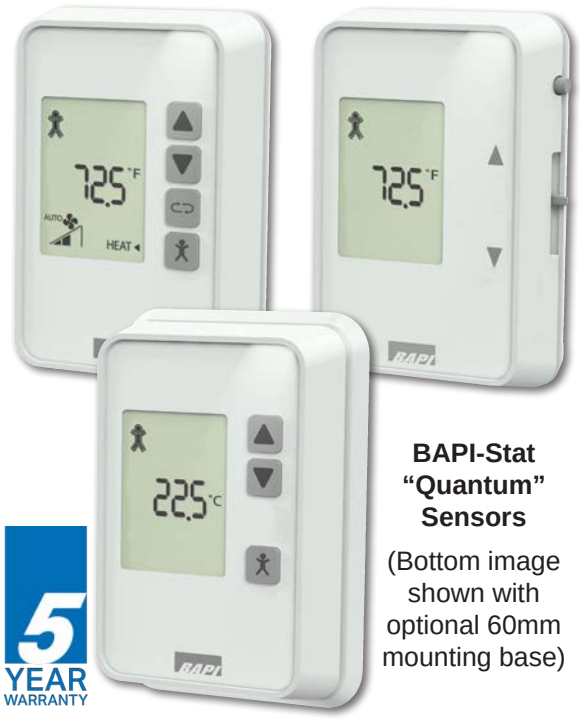
Rev. 12/01/21

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)

5 YEAR WARRANTY

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*

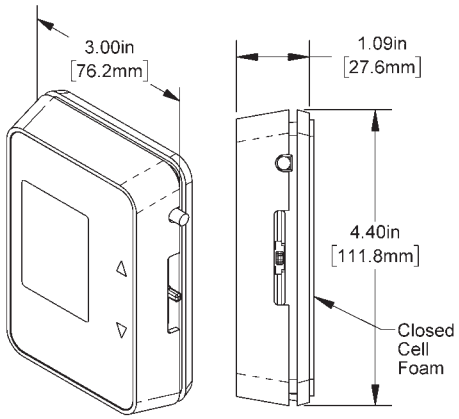
Mounting:
Standard 2”x4” junction box, European junction box or drywall mount (screws provided)

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

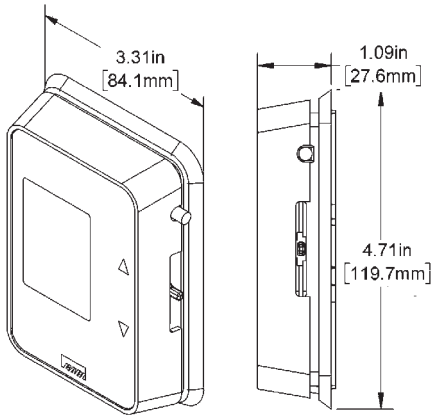
Enclosure Material: ABS Plastic, UL94 V-0

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)

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BAPI-Stat “Quantum” with Display

Temperature Sensors

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

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

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

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

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

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

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

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

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

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

#5: Setpoint Output Range (required)
00.....0 to 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/

BAPI-Stat “Quantum Prime” Temp & Humidity Sensor

Temp or Temp/Humidity Sensors

Rev. 12/15/20

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.

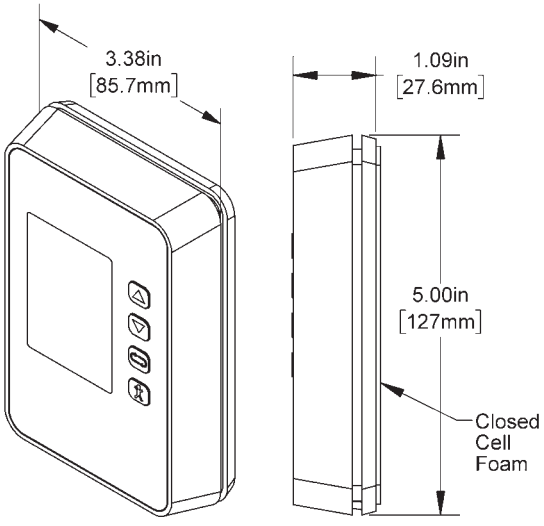


BAPI-Stat “Quantum Prime” Temp & Humidity Sensor

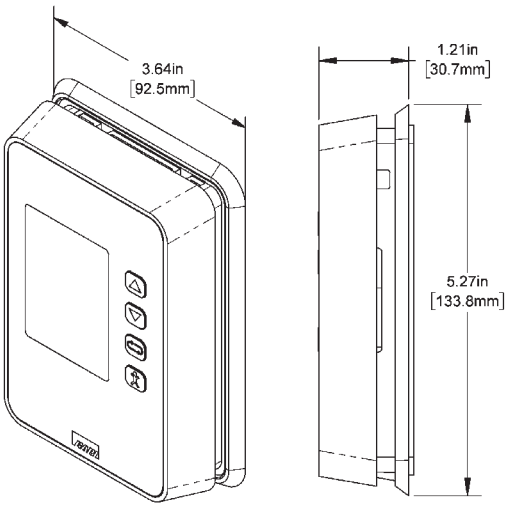
(Image at right shown with optional 60mm mounting base)

5 YEAR WARRANTY

Dimensions



Unit with Standard Mounting Base



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

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Ordering Information

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

Specifications

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

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

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

Enclosure Material: ABS Plastic, UL 94, V-0

Agency: RoHS

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

BAPI-Stat “Quantum Slim” Sensor

Temperature Sensors

Rev. 12/01/21

Features & Options

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

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

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



BAPI-Stat “Quantum Slim” Sensors

Specifications

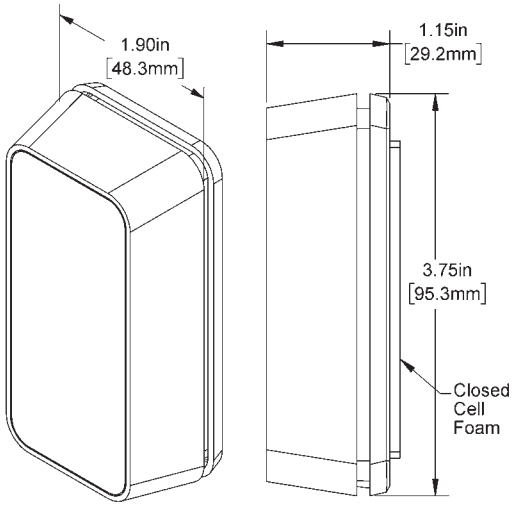
Wiring:
One pair of 16 to 22 AWG wires

Mounting:
Surface or drywall mount (screws provided)

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

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

Agency: RoHS, CE



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Ordering Information

Part Number	Description	List Price
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

BAPI-Stat 4™ Room Unit with Display

Temperature Sensors

Rev. 12/01/21

Features & Options

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

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

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

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



BAPI-Stat 4 Units

Specifications

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

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

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

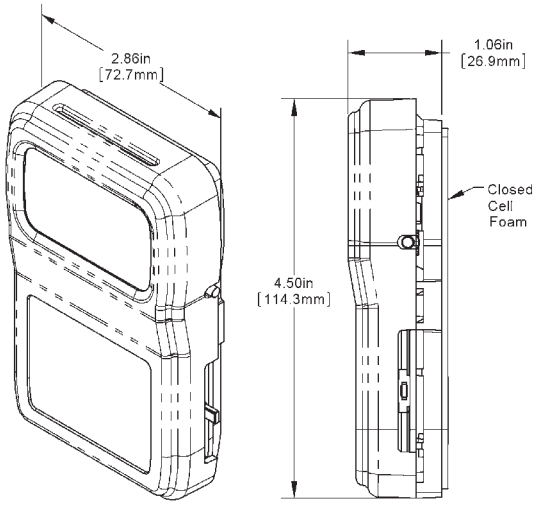
Wiring: 2 to 4 pair of 16 to 22AWG*

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

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

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

Agency: RoHS & CE



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

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BAPI-Stat 4™ Room Unit with Display

Temperature Sensors

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/

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RµP & RµPS Room Units

Temperature Sensors

Rev. 12/01/21

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 RµP and RµPS 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.



RµP (above) and RµPS (right)

Specifications

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

Power RµPS:
9 to 40 VDC (15 to 24 VDC recommended)
15 to 28 VAC (Requires a separate pair of shielded wires)

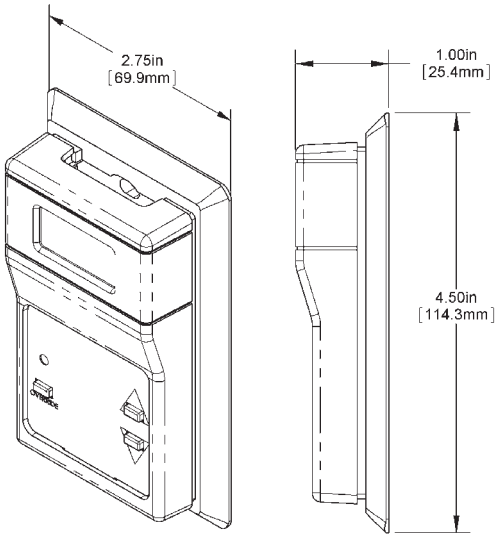
Power Consumption:
10 mA max. DC, .2 VA maximum AC

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 ºF (0 to 50 ºC)
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.



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

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

RµP & RµPS 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/

BAPI-Stat 3™ Room Unit

Temperature Sensors

Rev. 12/12/16

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

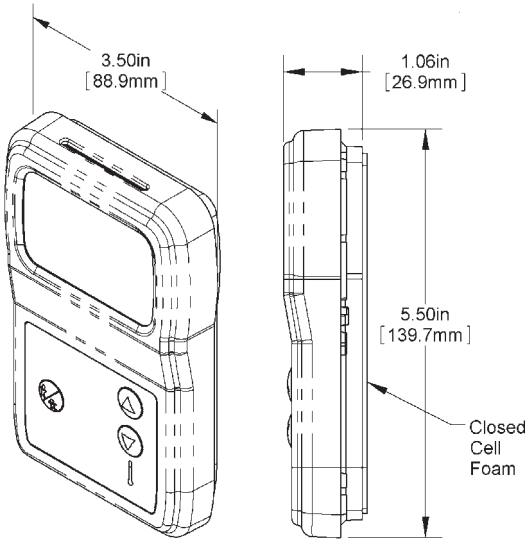
Optional Direct Temp. Sensor:
Thermistor or RTD (See Sensors Sect. for Specs.)

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.

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BAPI-Stat 4 “X-Combo” Room Unit

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”

5 YEAR WARRANTY

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

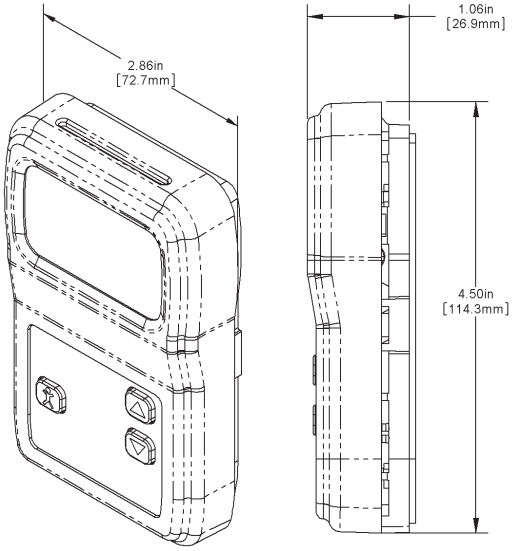
Termination: 8 Terminals, 16 to 22 AWG**

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

Enclosure Material: ABS Plastic, UL94V-0

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

Agency: RoHS



*AC power requires a separate pair of shielded wires.

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

BAPI-Stat “Quantum” Without Display

Temperature Sensors

Rev. 12/01/21

Features & Options

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

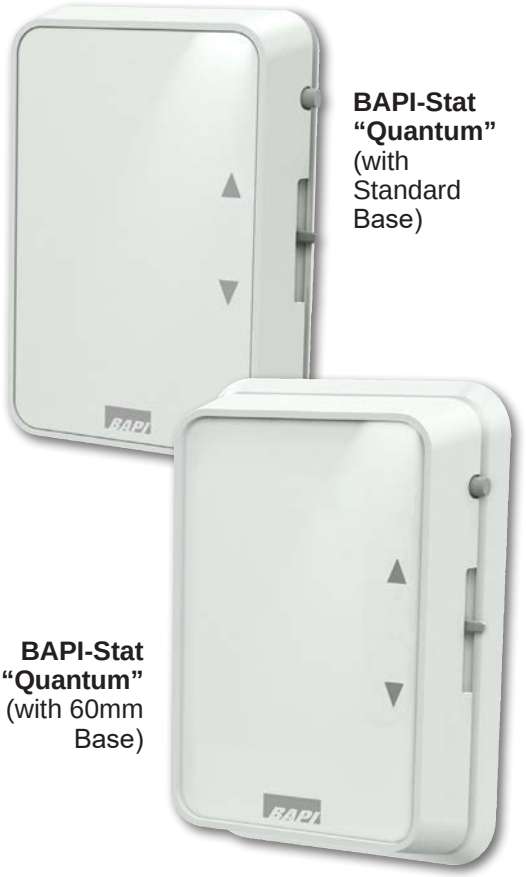
Enclosure Style
The BAPI-Stat “Quantum” sensors without display feature a modern enclosure style with optional slider setpoint adjustment and override. A 60mm mounting base is also available to fit European style junction boxes.

Setpoint
Setpoint is available as a slidepot in various ranges.

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

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

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



BAPI-Stat “Quantum” (with Standard Base)

BAPI-Stat “Quantum” (with 60mm Base)

Specifications

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

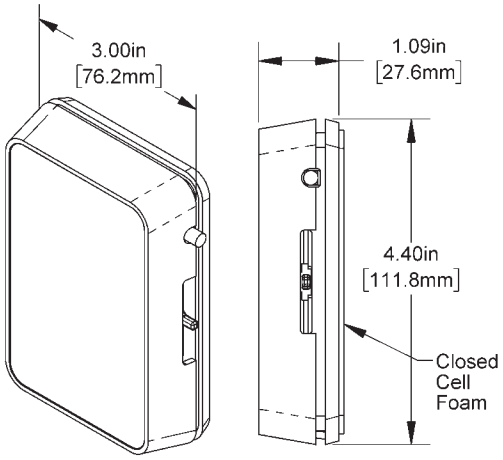
Wiring: 16 to 22 AWG

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

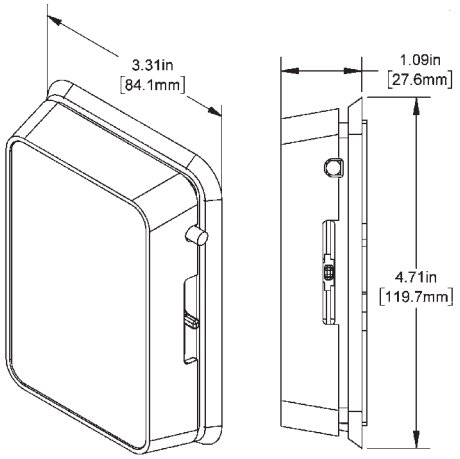
Enclosure Material:
ABS Plastic, UL94 V-0

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

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



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



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

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BAPI-Stat “Quantum” Without Display

Temperature Sensors

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

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

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

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

#1: Temperature Sensor (required)

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

#2: Room Sensor Style (required)

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

#3: Setpoint Output Range (optional)

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

#4: Setpoint Legend

(Required for units with Setpoint)

L8	Up/Down Arrows

#5: Override (required)

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

#6: Communication Jack (optional)

C35	3.5mm Phono Style Jack	$7

#7: Common or Differential Gnd (required)

CG	Common Ground
DF	Differential Inputs

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

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

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

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

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

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

Your Number: BA/

BAPI-Stat 4 & Delta Style Units Without Display

Temperature Sensors

Rev. 12/01/21

Features & Options

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

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

Setpoint
Setpoint is available as a slidepot in various ranges.

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

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

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



BAPI-Stat 4



Delta Style

Specifications

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

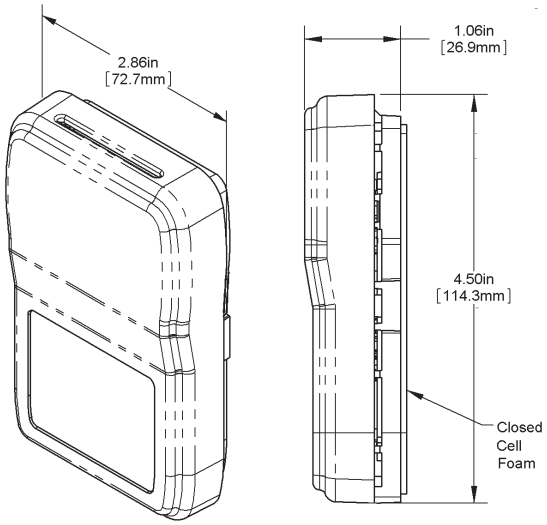
Wiring: 16 to 22 AWG

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

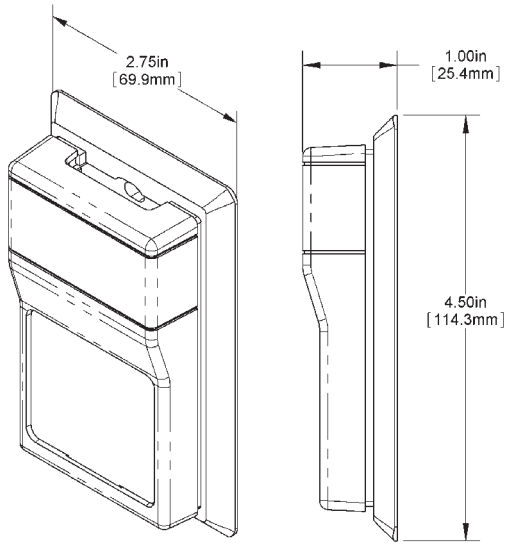
Enclosure Material:
ABS Plastic, UL94 V-0

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

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



BAPI-Stat 4



Delta Style

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BAPI-Stat 4 & Delta Style Units Without Display

Temperature Sensors

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

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

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

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

#1: Temperature Sensor (required)

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

#2: Room Sensor Style (required)

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

#3: Setpoint Output Range (optional)

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

#4: Setpoint Legend

(Required for units with Setpoint)

L6	Cool/Warm
L0	No Legend

#5: Override (required)

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

#6: Communication Jack (optional)

C35	3.5mm Phono Style Jack	$7

#7: Common or Differential Gnd (required)

CG	Common Ground
DF	Differential Inputs

#8: Delta Style Enclosure Color

(required for Delta Style Enclosures)

BW	Bright White Delta Style Enclosure

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

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

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

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

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

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

Your Number: BA/

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B20 Decora Style Room Unit

Temperature Sensors

Rev. 12/01/21

Features & Options

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

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

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



Decora Style Units with and without Setpoint Adjustment

Specifications

Power: 5 VDC to 12 VDC ±5%

Power Consumption: 0.5 mA

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

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

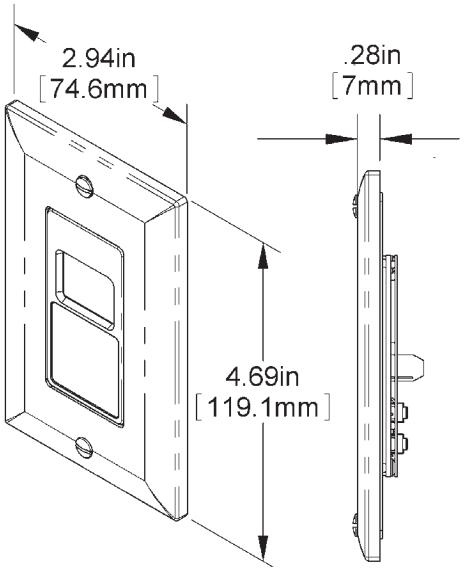
Mounting:
Standard 2”x4” J-box with Decora Style Trim Plate

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

Material: ABS Plastic

Material Rating: UL94 V-0

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



Associated Products

VC350A “EZ” - Voltage Converter

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



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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/

B22 Low Profile "Button" Sensor

Temperature Sensors

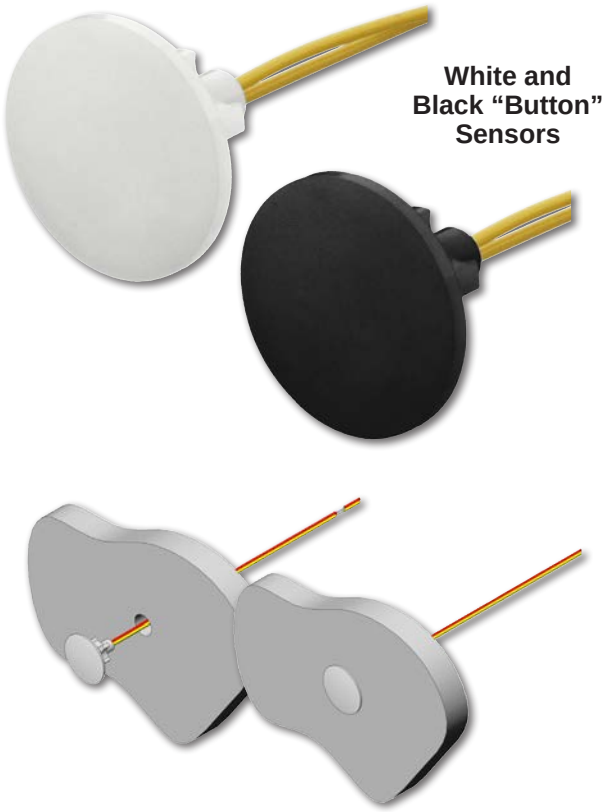
Rev. 12/01/21

Features & Options

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

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

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



White and Black "Button" Sensors

Specifications

Thermistor

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

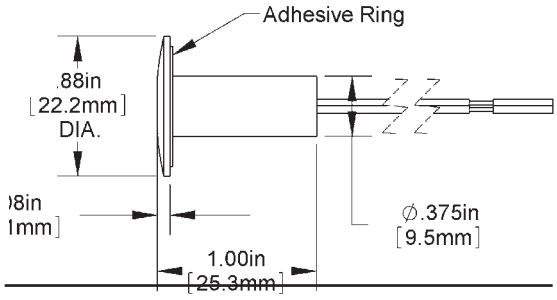
RTD

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

Sensitivity

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

Wiring: One pair of 22 AWG wires



Wire Insulation:
Etched Teflon or Plenum-Rated

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

Enclosure Material and Ratings:
Plastic, NEMA 1, UL94

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

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

0 to 100% RH, Non-condensing

Agency: RoHS, CE

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

Button Sensor Option Selection Guide:

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

#1: Temperature Sensor (required)

1K[375]	1K Platinum RTD (375 curve)	$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/

T1K Transmitter Room Unit

Temperature Sensors

Rev. 02/24/21

Features & Options

- Delta Style or BAPI-Stat 4 Enclosure
- 4 to 20 mA Temperature Output
- Optional Display on the BAPI-Stat 4
- Optional Setpoint Adjustment, Override and Communication Jack on the BAPI-Stat 4

The T1K Transmitter Room Unit comes in the Delta Style and 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, ºF or ºC and a new stylish look.

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



5 YEAR WARRANTY

Delta Style Unit (Not available with Display, Setpoint, Override or Comm. Jack.)

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, Delta: 32 to 122ºF (0 to 50ºC)
Temperature, BS4: 15ºF to 130ºF, (-9º to 54ºC)
Humidity: 0 to 95%, non-condensing

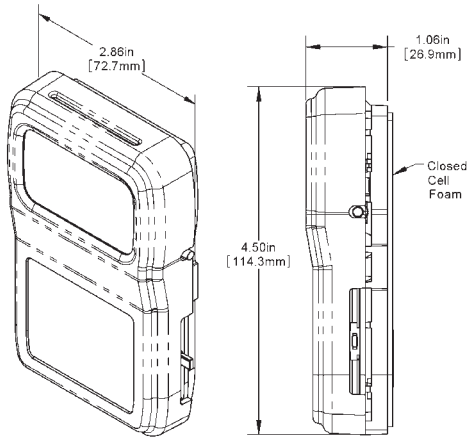
Mounting:
2x4" J-box or drywall mount, screws provided

Wiring:
1 to 3 pair of 16 to 22AWG

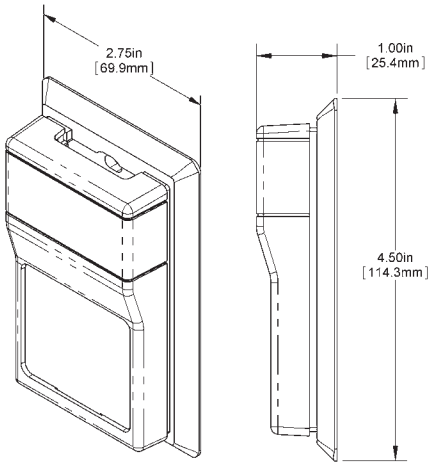
Material & Rating:
BAPI-Stat 4: ABS Plastic, UL94 V-0
Delta Style: ABS Plastic, UL94 HB

Agency: RoHS

BAPI-Stat 4 Enclosure



Delta Style Enclosure



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T1K Transmitter Room Unit

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**) - (**#9**)

#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

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

#2: Display (required)

B4SD ..... BAPI-Stat 4 with Display $185
B4SX ..... BAPI-Stat 4, No Display $150
RX..... Delta Style Encl., No Display $100

#3: Setpoint Display Range (required)

(Setpoint is not available for Delta Style Units)

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

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

#4: Setpoint Output Range

(Required if a Display Range is selected in #3, not available for Delta Style Units)

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, not available for Delta Style Units)

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

#6: Occupant Override (required)

(Override is not available for Delta Style Units)

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)

(Comm. Jack is not available for Delta Style Units)

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

#8: Common or Differential Gnd (required)

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

#9: Delta Style Enclosure Color

(required for Delta Style Enclosures)

BW..... Bright White Delta Style Enclosure

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/

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Echelon® Compatible “L-Temp”

Temperature Sensors

Rev. 01/05/22

Features & Options

- Optional Display, Setpoint and Override
- °C or °F Operation (user selectable)
- Standard 4-Wire Termination

BAPI’s Echelon® compatible “L-Temp” Unit features measurement and display of local temperature (°C or °F), as well as display of outdoor temperature and outdoor humidity – all in one package.

An onboard Neuron® chip allows connection directly to a LonWorks® network using star, bus, or loop topology. Additional options include Temperature Setpoint and Occupant Override.

5 YEAR WARRANTY



L-Temp Unit with Setpoint & Override

Specifications

Power: 8 to 24VDC (recommended) or 12 to 28VAC

Power Consumption: 35 mA maximum DC

Sensing Elements:
Temp. - Semiconductor Band Gap, Proportional to Absolute Temperature, ±0.3°C

Wiring: 4 wire, twisted pair 22 AWG minimum

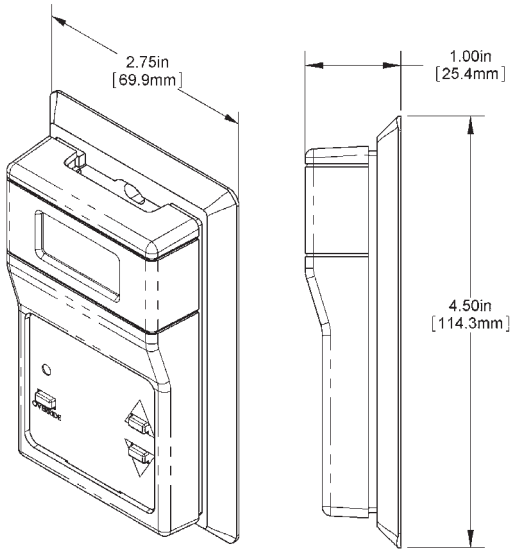
Communication:
Neuron® 3120®, 78 kbps using FTT-10A transceiver

Mounting: 2x4” J-box or drywall - screws provided

Material & Rating: ABS Plastic, UL94 HB

Temperature Range: -40 to 85ºC

Environmental Specifications:
Temperature: 32 to 122 ºF (0 to 50 ºC)
Humidity: 0 to 95%, non-condensing



*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. For additional wiring info and requirements, refer to Echelon’s Bulletin titled “Junction Box and Wiring Guidelines for Twisted Pair LonWorks® Networks” which can be found at the following URL: “www.echelon.com/support/documentation/Bulletin/005-0023-01K.pdf”

The “L-Temp” is designed following the LonMark® Interoperability Guidelines, and incorporates standard configuration property types (SCPT). A complete SNVT/SCPT list with definitions is available upon request. Echelon®, LonWorks®, Neuron®, and 3120® are trademarks of Echelon Corporation registered in the United States and other countries. LonMark® is a trademark of the LonMark Interoperability Association registered in the United States and other countries.

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Ordering Information

Part Number	Description	List Price
BA/LC-R-BW	L-Temp Unit, Bright White Color	$240
BA/LC-RD-BW	L-Temp Unit with Display, Bright White Color	$275
BA/LC-RSOD-BW	L-Temp Unit with Setpoint, Override and Display, Bright White Color	$286

Wall Plate Units

Temperature Sensors

Rev. 12/01/21

Features & Options

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

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

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



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



Plain



Standard Override



Low Profile Override



Low Profile Override with LED Indicator

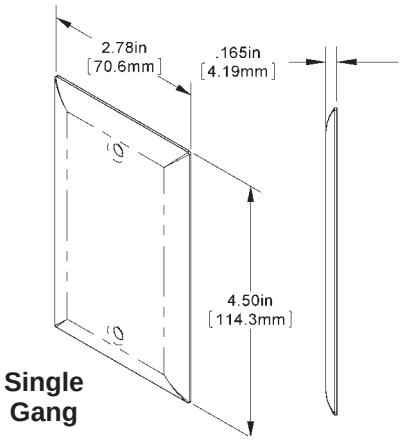
Specifications

Material:
Aluminum or Stainless Steel

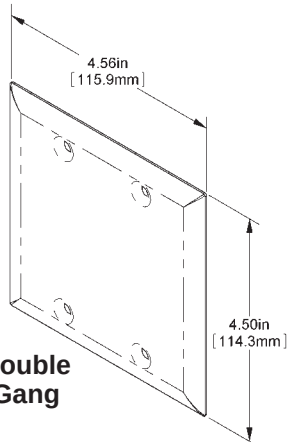
Sensing Element:
Thermistor or RTD
(See Sensors Sect. for Specs.)

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

Humidity:
0 to 95%, non-condensing



Single Gang



Double Gang

Associated Products

Spanner Security Screws & Spanner Bit

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



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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.

Wall Plate Option Selection Guide

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

#1: Temperature Sensor (required)		**List Price**
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
Transmitters for 4 to 20 mA Temperature Output		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$100
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$100
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$100
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$100
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$100
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$100

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Room Sensor Style (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

Additional options, such as rotary setpoint adjustment and communication jacks, 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**) - (**SP**) - (**O2G24**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-SP-O2G24

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

List Price: $18 (Thermistor) + $100 (Override) = $118 List Price

Your Number: BA/

Duct Units

Temperature Sensors

Rev. 12/01/21

Features & Options

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

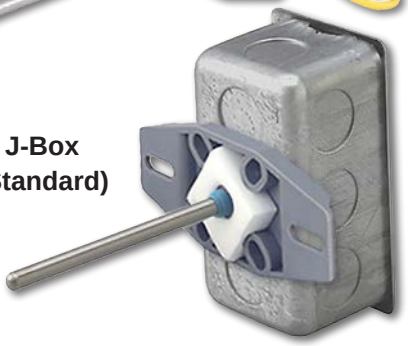
Single Point Duct Units feature closed cell foam to seal the probe insertion hole and to absorb vibration. Mounting tabs allow for easy installation directly to the wall of the duct.

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.

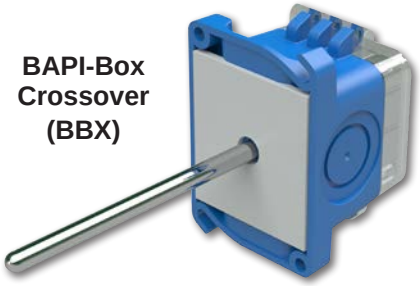
Duct Units come standard with a 2”x4” steel J-Box but are also available with no box or the new BAPI-Box Crossover enclosure.



No Box (NB)



J-Box (Standard)



BAPI-Box Crossover (BBX)



The New BAPI-Box Crossover Enclosure

The new 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:
BAPI-Box Crossover: -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:
Junction Box: Galvanized Steel
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0 • Base: Nylon, UL94 HB

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

Enclosure Dimensions: H x W x D
BAPI-Box Crossover:
3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
Junction Box
4.2 x 3.9 x 1.94” (106 x 98.4 x 49mm)

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

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

Duct Temperature Option Selection Guide

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

#1: Temperature 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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
Transmitters below require a BAPI-Box Crossover Enclosure		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type and Length (required)		
D-2”	Duct, 2” (51mm) length	$7
D-4”	Duct, 4” (102mm) length	$7
D-8”	Duct, 8” (203mm) length	$7
D-12”	Duct, 12” (305mm) length	$7
D-18”	Duct, 18” (457mm) length	$7

#3: Enclosure and Lead Length (optional, J-Box comes standard)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
NB-18”	No Box, 18” Etched Teflon Leads	$0
NB-5’	No Box, 5’ Plenum-Rated Cable Leads	$2
NB-10’	No Box, 10’ Plenum-Rated Cable Leads	$4
NB-15’	No Box, 15’ Plenum-Rated Cable Leads	$6

#4: Test & Balance or Terminal Strip (optional, requires a BAPI-Box Crossover Enclosure)		
TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

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

Example Number: BA/(**10K-2**) - (**D-8”**) - (**NB-5’**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-D-8”-NB-5’

Description: 10K-2 Thermistor, Duct Temperature Sensor, No Box Enclosure with 5’ Leads.

List Price: $18 (10K-2 Thermistor) + $7 (Duct, 8” Length) + $2 (No Box, 5’ Leads) = $27 List Price

Your Number: BA/

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Duct Averaging Units

Temperature Sensors

Rev. 01/03/22

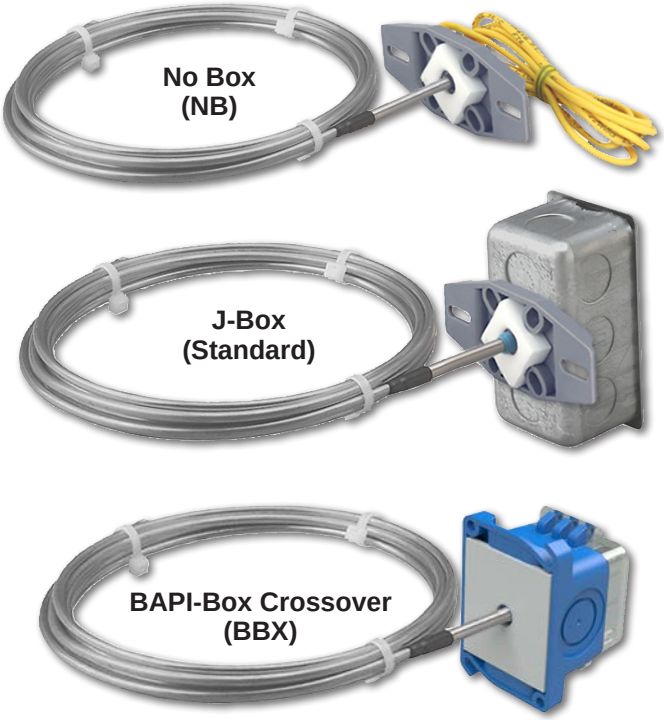
Features & Options

- Averaging Lengths: 8’, 12’ and 24’
- Three 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”x4” steel J-Box but are also available with no box or the new BAPI-Box Crossover enclosure.





Flexible Probe Bracket for Mounting Averaging Sensors

The Flexible Probe Bracket (FPB) is used to mount averaging sensors, low limit thermostats, or liquid fill thermostats.

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.

(See the Accessories Section for more information.)

Specifications

Environmental Operation Range:
Temperature:
BAPI-Box Crossover: -40 to 85 °C
Other Enclosures: -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:
Junction Box: Galvanized Steel
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0 • Base: Nylon, UL94 HB

Enclosure Rating:
Junction Box: IP20, NEMA 1
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)
Junction Box
4.2 x 3.9 x 1.94” (106 x 98.4 x 49mm)

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

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

Duct Averaging Sensor Option Selection Guide

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

#1: Temperature 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 Platinum RTD (375 curve)	$25
1K	1K Platinum RTD (385 curve)	$25
Transmitters below require a BAPI-Box Crossover Enclosure		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type and Length (required)		
A-8'	Flexible Averaging, 8' (2.4m) length	$87
A-12'	Flexible Averaging 12' (3.7m) length	$92
A-24'	Flexible Averaging 24' (7.3m) length	$116

#3: Enclosure and Lead Length (optional, J-Box comes standard)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
NB	No Box (comes with 6" Etched Teflon Leads)	$0

#4: Test & Balance or Terminal Strip (optional, requires a BAPI-Box Crossover Enclosure)		
TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

Certain sensor types or lengths may not be available at this time or the pricing may vary from what is shown above. Please contact your BAPI representative for full availability and pricing.

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

Example Number: BA/ (**10K-2**) - (**A-8'**) - (**BBX**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-A-8'-BBX

Description: 10K-2 Thermistor, Duct Averaging Sensor, BAPI-Box Crossover Enclosure

List Price: $18 (10K-2 Thermistor) + $87 (Probe 8' Length) = $105 List Price

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.

Rigid Averaging Units

Temperature Sensors

Rev. 12/01/21

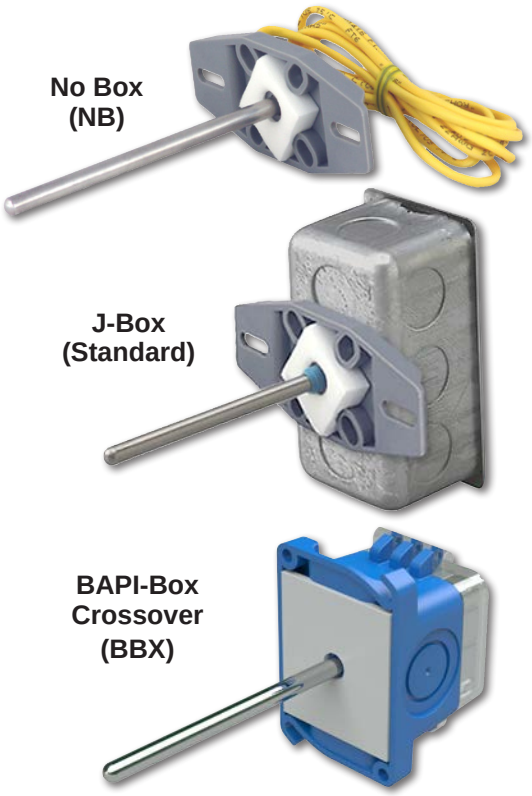
Features & Options

- Averaging Lengths: 12”, 2’, 3’ and 4’
- Three Enclosure Styles including the new 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”x4” steel J-Box but are also available with no box or the new BAPI-Box Crossover enclosure.





The New BAPI-Box Crossover Enclosure

The new 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 knockplug plug sold separately.)



Specifications

Environmental Operation Range:
Temperature:
BAPI-Box Crossover: -40 to 85 °C
Other Enclosures: -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:
Junction Box: Galvanized Steel
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0 • Base: Nylon, UL94 HB

Enclosure Rating:
Junction Box: IP20, NEMA 1
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)
Junction Box
4.2 x 3.9 x 1.94” (106 x 98.4 x 49mm)

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

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

Rigid Averaging Sensor Option Selection Guide

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

#1: Temperature 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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
Transmitters below require a BAPI-Box Crossover Enclosure		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type and Length (required)		
RA-12”	Rigid Averaging, 12” (0.3m) Length	$68
RA-2’	Rigid Averaging, 2’ (0.6m) Length	$68
RA-3’	Rigid Averaging, 3’ (0.9m) Length	$102
RA-4’	Rigid Averaging, 4’ (1.2m) Length	$136

#3: Enclosure and Lead Length (optional, J-Box comes standard)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
NB	No Box (comes with 6” Etched Teflon Leads)	$0

#4: Test & Balance or Terminal Strip (optional, requires a BAPI-Box Crossover Enclosure)		
TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

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

Example Number: BA/ (**10K-2**) - (**RA-2’**) - (**BBX**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-RA-2’-BBX

Description: 10K-2 Thermistor, Rigid Averaging Sensor, BAPI-Box Crossover Enclosure.

List Price: $18 (10K-2 Thermistor) + $68 (Probe 2’ Length) = $86 List Price

Your Number: BA/

Submersible Duct Units

Temperature Sensors

Rev. 12/01/21

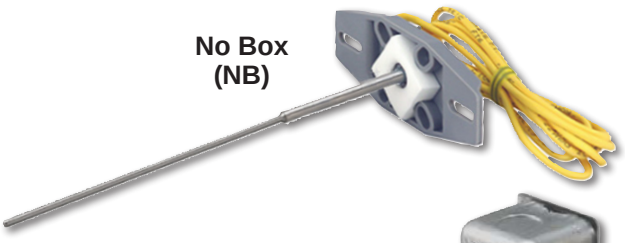
Features & Options

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

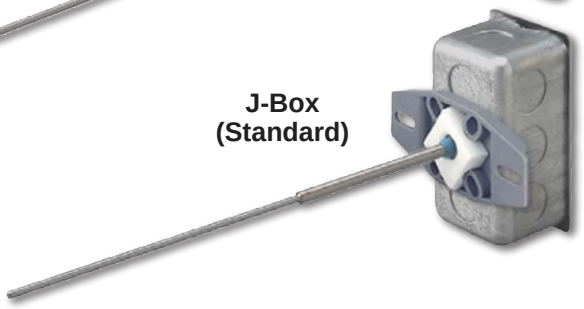
Submersible Duct Units feature closed cell foam to seal the probe insertion hole and absorb vibration and mounting tabs for easy installation. All units have etched Teflon leadwires and encapsulated sensors to create a watertight package that can perform under real world conditions.

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

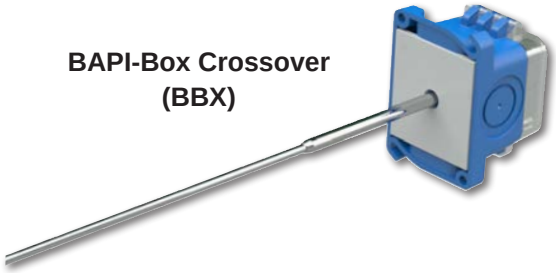
Submersible Duct Units come standard with a 2”x4” steel J-Box but are also available with no box or the new BAPI-Box Crossover enclosure.



No Box (NB)



J-Box (Standard)



BAPI-Box Crossover (BBX)



The New BAPI-Box Crossover Enclosure

The new 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 knockplug plug sold separately.)



Specifications

Environmental Operation Range:
Temperature:
BAPI-Box Crossover: -40 to 85 °C
Other Enclosures: -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:
Junction Box: Galvanized Steel
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0 • Base: Nylon, UL94 HB

Enclosure Rating:
Junction Box: IP20, NEMA 1
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)
Junction Box
4.2 x 3.9 x 1.94” (106 x 98.4 x 49mm)

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

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

Submersible Duct Sensor Option Selection Guide

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

#1: Temperature 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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
Transmitters below require a BAPI-Box Crossover Enclosure		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type and Length (required)		
SD-12”	Submersible Duct, 12” (0.3m) length	$117
SD-18”	Submersible Duct, 18” (0.46m) length	$120
SD-24”	Submersible Duct, 24” (0.6m) length	$138
SD-36”	Submersible Duct, 36” (0.9m) length	$142
SD-48”	Submersible Duct, 48” (1.2m) length	$150

#3: Enclosure and Lead Length (optional, J-Box comes standard)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
NB	No Box (comes with 6” Etched Teflon Leads)	$0

#4: Test & Balance or Terminal Strip (optional, requires a BAPI-Box Crossover enclosure)		
TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

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

Example Number: BA/ (**10K-2**) - (**SD-24”**) - (**BBX**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-SD-24”-BBX

Description: 10K-2 Thermistor, Submersible Duct Sensor, BAPI-Box Crossover Enclosure

List Price: $18 (10K-2 Thermistor) + $138 (Probe 24” Length) = $156 List Price

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.

Submersible Averaging

Temperature Sensors

Rev. 01/03/22

Features & Options

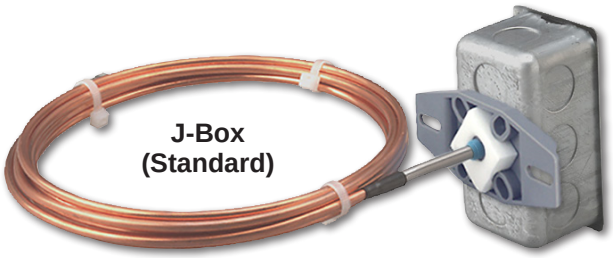
- Waterproof, Copper-Cased Element
- Continuous Averaging (RTD models only)
- Averaging Lengths: 2', 4' and 8'

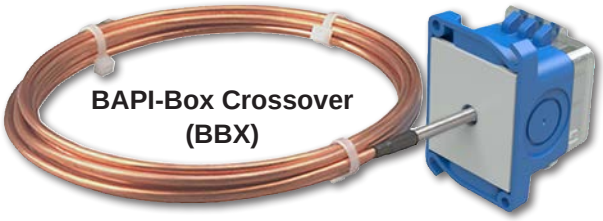
Submersible Averaging Units feature closed cell foam to seal the probe insertion hole and absorb vibration and mounting tabs allow for easy installation. All Units have etched Teflon leadwires and encapsulated sensors to create a watertight package that can withstand high humidity and perform in the 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"x4" steel J-Box but are also available with no box or the new BAPI-Box Crossover enclosure.









The New BAPI-Box Crossover Enclosure

The new 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 knockplug plug sold separately.)



Specifications

Environmental Operation Range:
Temperature:
BAPI-Box Crossover: -40 to 85 °C
Other Enclosures: -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:
Junction Box: Galvanized Steel
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0 • Base: Nylon, UL94 HB0

Enclosure Rating:
Junction Box: IP20, NEMA 1
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)
Junction Box
4.2 x 3.9 x 1.94" (106 x 98.4 x 49mm)

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

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

Submersible Averaging Sensor Option Selection Guide

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

#1: Temperature Sensor (required)

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

Call for price on all units.

1K[375] .....1K Platinum RTD (375 curve)
1K .....1K Platinum RTD (385 curve)

Transmitters below require a BAPI-Box Crossover Enclosure
T1K[32 TO 212F] .....1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range
T1K[20 TO 120F] .....1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range
T1K[0 TO 100F] .....1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range
T1K[0 TO 100C] .....1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range
T1K[-7 TO 49C] .....1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range
T1K[-18 TO 38C] .....1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type and Length (required)

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

#3: Enclosure and Lead Length (optional, J-Box comes standard)

BBX .....BAPI-Box Crossover (IP10, NEMA 1)
NB.....No Box (comes with 6" Etched Teflon Leads)

#4: Test & Balance or Terminal Strip (optional, requires a BAPI-Box Crossover enclosure)

TB .....Test & Balance Switch
TS .....Terminal Strip Connection (The $7 does not apply to T1K transmitter units)

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

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

Example Number: BA/ (**10K-2**) - (**SA-2'**) - (**BBX**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-SD-2'-BBX

Description: 10K-2 Thermistor, Submersible Averaging Sensor, BAPI-Box Crossover Enclosure

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.

Immersion Probes w/ nylon fitting

Temperature Sensors

Rev. 12/01/21

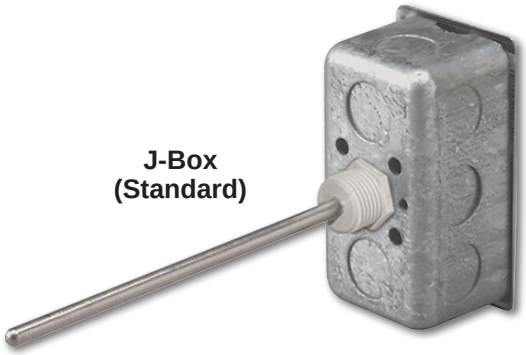
Features & Options

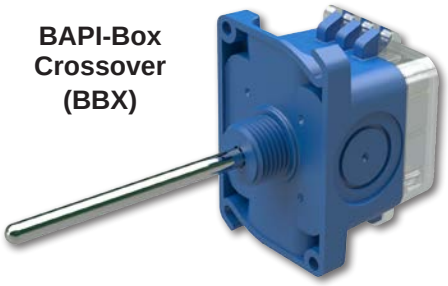
- Probe Lengths: 2”, 4” & 8” (fit standard BAPI Thermowell lengths)
- Series 304 Stainless Steel Probes and three Enclosure Styles
- Double Encapsulated Sensors & Etched Teflon Leadwires

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”x4” steel J-Box but are also available with the polycarbonate and nylon BAPI-Box Crossover enclosure.





The BAPI-Box Crossover

The BAPI-Box Crossover enclosure features a hinged cover with thumb latch for easy termination. A pierceable knockout plug is available for the open port for an IP44 rating. See the Accessories section for more info.



(Shown with knockout plug sold separately.)

BAPI Thermowells

Immersion Unit Probes are designed to be inserted into a Thermowell. For more info on Thermowells, see page A42.



Specifications

Environmental Operation Range:
Temperature:
BAPI-Box Crossover: -40 to 85 °C
Other Enclosures: -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:
Junction Box: Galvanized Steel
BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0 • Base: Nylon, UL94 HB

Enclosure Rating:
Junction Box: IP20, NEMA 1
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)
Junction Box
4.2 x 3.9 x 1.94” (106 x 98.4 x 49mm)

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

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

Immersion Sensor Option Selection Guide

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

#1: Temperature 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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25

Transmitters below require a BAPI-Box Crossover Enclosure

T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type and Length (required)

I-2”	Immersion, 2” (51mm) length	$7
I-4”	Immersion, 4” (102mm) length	$7
I-8”	Immersion, 8” (203mm) length	$7

#3: Enclosure and Lead Length (optional, comes standard with Junction Box)

BBX	BAPI-Box Crossover (IP10, NEMA 1 or IP44 with knockout plug installed)	$0

#4: Test & Balance or Terminal Strip (optional, requires a BAPI-Box Crossover Enclosure)

TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

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**) - (**I-2”**) - (**BBX**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-I-2”-BBX

Description: 10K-2 Thermistor, Immersion Sensor, BAPI-Box Crossover, No Test and Balance or Terminal Strip.

List Price: $18 (10K-2 Thermistor) + $7 (Probe 2” Length) = $25 List Price

Your Number: BA/

Immersion Probes w/ stainless steel fitting

Temperature Sensors

Rev. 12/01/21

Features & Options

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

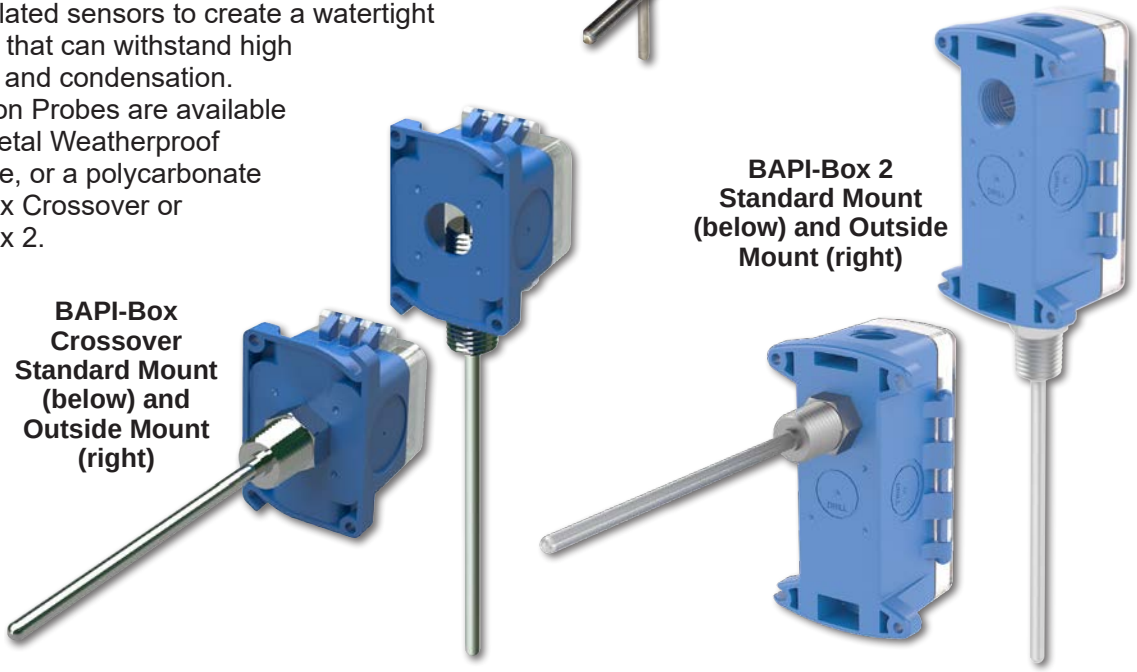
Immersion Units are available in 2”, 4” and 8” probe lengths. This unit is provided with a 1/4” stainless steel probe and a 1/2” NPT double-ended stainless steel fitting.

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



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

No Box



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

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

Specifications

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

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

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

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

Enclosure Rating:
Weatherproof: IP24, NEMA 3R

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

BAPI-Box 2: IP66, NEMA 4X

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

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

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Immersion Probes w/ stainless steel fitting

Temperature Sensors

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

Use the Option Selection 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.

Immersion Sensor with SS Fitting Option Selection Guide

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

#1: Temperature 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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
Transmitters below require a BAPI-Box 2 Enclosure		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type and Length (required)		
I-2”-SS	Immersion, SS Fitting, 2” (51mm) length - Use 2” BAPI Thermowell	$42
I-4”-SS	Immersion, SS Fitting, 4” (102mm) length - Use 4” BAPI Thermowell	$42
I-8”-SS	Immersion, SS Fitting, 8” (203mm) length - Use 8” BAPI Thermowell	$42

#3: Enclosure Style and Probe Mount (required)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BBXO	BAPI-Box Crossover (IP10, NEMA 1), Outside Mount (probe out bottom)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4X)	$12
BB2O	BAPI-Box 2 (IP66, NEMA 4X), Outside Mount, (probe out the bottom)	$12
WP	Weatherproof (IP24, NEMA 3R)	$12
WPO	Weatherproof (IP24, NEMA 3R), Outside Mount, (probe out the bottom)	$12

#4: Test & Balance or Terminal Strip (optional, requires a BAPI-Box Crossover Enclosure)		
TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

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**) - (**I-2”-SS**) - (**BBX**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-I-2”-SS-BBX

Description: 10K-2 Thermistor, Immersion Sensor with SS Fitting, BAPI-Box Crossover.

List Price: $18 (10K-2 Thermistor) + $42 (Probe 2” Length) = $60 List Price

Your Number: BA/

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Thermowells

Temperature Sensors

Rev. 01/04/22

Features & Options

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



Machined Thermowell

Standard Thermowells available from BAPI include 304 stainless steel (machined), 316 stainless steel (machined), brass (machined), and two part* (welded) 304 stainless steel. 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.



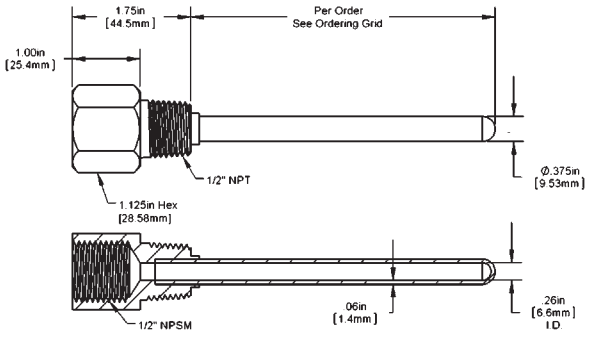
Two Part (welded) Thermowell

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.

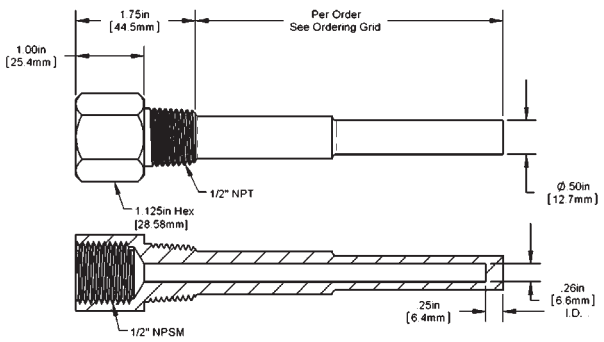
Occasionally, the material consideration is one of strength rather than corrosion. For example, a machined stainless steel well may be required for high pressure water service where otherwise a brass or two part stainless steel well would be satisfactory from a corrosion standpoint.

Note: The two part welded stainless steel thermowells are not intended for service in moving water. They may be used in catch basins, sumps or large storage tanks with small inlet and outlet pipes. Do not mount the two part welded stainless steel thermowells close to the inlet or outlet pipe of the tank.

Specifications



Two Part (Welded) Thermowell
304 Stainless Steel



Machined Thermowell
304 or 316 Stainless Steel or Brass

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

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

Ordering Information

Part #	Description	List Price
BA/2”	Two Part (Welded) 304 Stainless Steel - 2”	$22
BA/4”	Two Part (Welded) 304 Stainless Steel - 4”	$24
BA/8”	Two Part (Welded) 304 Stainless Steel - 8”	$28
BA/2”M304	Machined 304 Stainless Steel - 2”	$24
BA/4”M304	Machined 304 Stainless Steel - 4”	$30
BA/8”M304	Machined 304 Stainless Steel - 8”	$46
BA/2”M316	Machined 316 Stainless Steel - 2”	$44
BA/4”M316	Machined 316 Stainless Steel - 4”	$50
BA/8”M316	Machined 316 Stainless Steel - 8”	$80
BA/2”MB	Machined Brass - 2”	$23
BA/4”MB	Machined Brass - 4”	$26
BA/8”MB	Machined Brass - 8”	$45

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

Gray shaded items follow the Buy and Resale Multiplier.

Comparing the Wake Frequency and the Resonant Frequency

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

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

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

Table 1: Pressure Rating versus Temperature

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

Table 2: Maximum Fluid Velocity versus Insertion Length

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

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

Boiler, Stack or Cryogenic

Features & Options

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

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

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

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

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



Immersion Without Enclosure



Immersion Outside Mount (WPO)

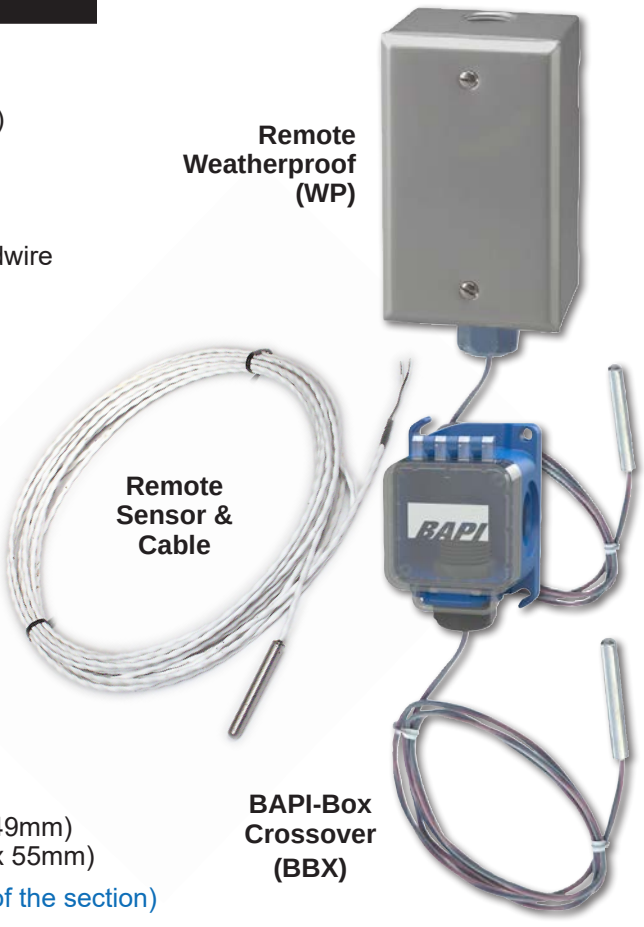


Immersion Standard Mount (WP)

Specifications

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

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



Extreme Temp. Platinum RTDs - Immersion & Remote

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.

Extreme Temp Immersion Option Selection Guide

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

#1: Platinum RTD Temperature Sensor (required)		**List Price**
1K[1]	1K Plat. RTD, -328 to 32 °F (-200 to 0 °C), PTFE Insulation Leads	$145
1K[2]	1K Plat. RTD, 77 to 500 °F (25 to 260 °C), PTFE Insulation Leads	$145
1K[3]	1K Plat. RTD, 77 to 1,112 °F (25 to 600 °C), Fiberglass Insulation Leads	$145
#2: Probe Type and Length (required)		
I-2”	3.5” length of ¼” Diameter, 316 SS Probe, double-ended 1/2” NPT	$0
I-4”	5.5” length of ¼” Diameter, 316 SS Probe, double-ended 1/2” NPT	$17.50
I-8”	8.5” length of ¼” Diameter, 316 SS Probe, double-ended 1/2” NPT	$17.50
#3: Enclosure Style and Probe Mount (optional)		
WP	Weatherproof (IP24, NEMA 3R)	$12
WPO	Weatherproof (IP24, NEMA 3R), Outside Mount, (probe out the bottom)	$12

Certain sensor types or lengths may not be available at this time or the pricing may vary from what is shown above. Please contact your BAPI representative for full availability and pricing.

Extreme Temp Remote Option Selection Guide

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

#1: Platinum RTD Temperature Sensor (required)		**List Price**
1K[1]	1K Plat. RTD, -328 to 32 °F (-200 to 0 °C), PTFE Insulation Leads	$145
1K[2]	1K Plat. RTD, 77 to 500 °F (25 to 260 °C), PTFE Insulation Leads	$145
1K[3]	1K Plat. RTD, 77 to 1,112 °F (25 to 600 °C), Fiberglass Insulation Leads	$145
#2: Probe Type and Length (required)		
RP-5’	2” SS Sensor with 5’ PTFE Jacketed Cable or Fiberglass Insulated Leadwires	$5
RP-10’	2” SS Sensor with 10’ PTFE Jacketed Cable or Fiberglass Insulated Leadwires	$10
RP-15’	2” SS Sensor with 15’ PTFE Jacketed Cable or Fiberglass Insulated Leadwires	$15
#3: Enclosure Style and Probe Mount (optional)		
WP	Weatherproof (IP24, NEMA 3R)	$12
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0

Certain sensor types or lengths may not be available at this time or the pricing may vary from what is shown above. 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.

List Price: $145 (Plat. RTD) + $12 (Weatherproof Encl.) = $157 List Price

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.

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Strap Units and Remote Probe Units

Temperature Sensors

Rev. 12/01/21

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 A48 for more Remote Probe Options.)









The BAPI-Box Crossover

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

Specifications

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

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

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

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

Encl. Dimensions: H x W x D
BAPI-Box Crossover:..3.1 x 2.2 x 1.9” (79 x 56 x 49mm)
Junction Box:.....4.2 x 3.9 x 1.94” (106 x 98.4 x 49mm)

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

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

Strap Sensor Option Selection Guide

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

#1: Temperature 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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
Transmitters below require a BAPI-Box Crossover Enclosure		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Strap Config and Lead Length (required)		
S	Clamp-On Strap - fits 2 to 4.5” (5 to 11.4 cm) diameter pipes	$10
STP	Spring Loaded Strap - fits 5 to 14.5” (13 to 37 cm) diameter pipes	$25
RPP	Remote Probe with 18” of Plenum-Rated Cable	$0
RPPFEP-18”	Remote Probe with 18” of FEP-Jacketed Cable	$3
RPPFEP2-18”	Remote Probe w/ 18” of FEP-Jacketed Cable (suitable for submersion)	$10

#3: Enclosure (optional, comes standard with Junction Box)		
BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0

#4: Test & Balance or Terminal Strip (optional, requires a BAPI-Box Crossover Enclosure)		
TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

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

Example Number: BA/ (**10K-2**) - (**S**) - (**BBX**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-S-BBX

Description: 10K-2 Thermistor, Clamp-On Strap, BAPI-Box Crossover Enclosure, No Terminal Strip.

List Price: $18 (10K-2 Thermistor) + $10 (Clamp-On Strap) = $28 List Price

Your Number: BA/

Outside Air Units

Temperature Sensors

Rev. 12/01/21

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.)

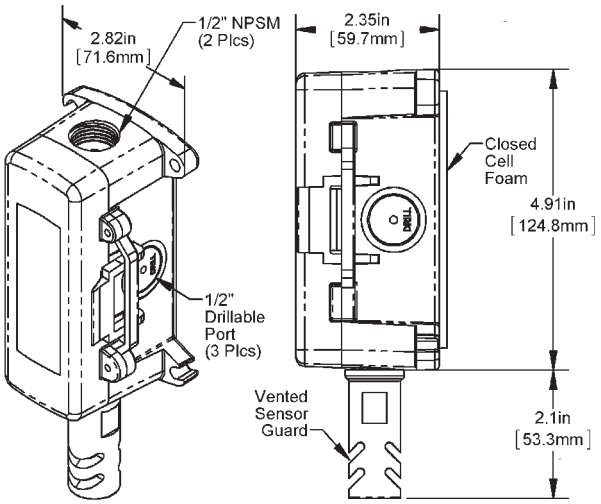
Specifications

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

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

Enclosure Rating: IP66, NEMA 4

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



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Use the Option Selection 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.

Outside Air Temperature Option Selection Guide

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

#1: Temperature 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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25

Transmitters below require a BAPI-Box 2 Enclosure

T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Outside Air Unit (required)		
O	Outside Air Unit	$0

#3: Enclosure and Lead Length (required)		
BB2	BAPI-Box 2 Polycarbonate Enclosure (IP66, NEMA 4)	$12

#4: Test & Balance or Terminal Strip (optional)		
TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

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**) - (**O**) - (**BB2**) - ( )

Actual Number (with parenthesis removed): BA/10K-2-O-BB2

Description: 10K-2 Thermistor, Outside Air Temperature Sensor, BAPI-Box 2 Enclosure, No Test and Balance or Terminal Strip.

List Price: $18 (10K-2 Thermistor) + $12 (BAPI-Box 2 Enclosure) = $30 List Price

Your Number: BA/

Remote Sensors & Probes

Temperature Sensors

Rev. 12/01/21

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 new BAPI-Box Crossover enclosure 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 section for more info.



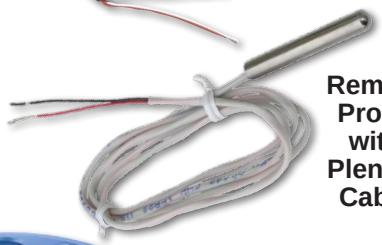
(Shown with knockout plug sold separately.)



Remote Sensor with Epoxy Shell



Remote Probe with FEP Cable



Remote Probe with Plenum Cable



BAPI-Box Crossover (BBX)

BAPI-Box 2 (BB2)

Specifications

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

Round Probe Material: Stainless Steel

Enclosure Material:
BAPI-Box 2: UV-resistant 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.)

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

BAPI-Box 2 Enclosure Rating: 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)

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.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.

Remote Sensors and 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

1K Plat. RTD Transmitters below with 4 to 20 mA Output - BAPI-Box 2 Enclosure required.

T1K[32 TO 212F]....32 to 212°F Range $125
T1K[20 TO 120F]....20 to 120°F Range $125
T1K[0 TO 100F].....0 to 100°F Range $125

T1K[0 TO 100C] .....0 to 100°C Range.....$125
T1K[-7 TO 49C] .....-7 to 49°C Range $125
T1K[-18 TO 38C] ....-18 to 38°C Range $125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe and Cable Options (required)

REMOTE SENSOR, ETCHED TEFLON LEADS

PP-6" .....Remote Sensor, 6" Leads..... $-4

REMOTE SENSOR, PLENUM-RATED CABLE

PP-18" .....Remote Sensor, 18" Leads..... $-4
PP-5'.....Remote Sensor, 5' Leads ..... $-2
PP-10'.....Remote Sensor, 10' Leads $0
PP-15'.....Remote Sensor, 15' Leads $2
PP-20'.....Remote Sensor, 20' Leads $4
PP-25'.....Remote Sensor, 25' Leads $6

Additional options are available 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

REMOTE PROBE, PLENUM-RATED CABLE

RPP-6".....Remote Probe, 6" Leads $0
RPP-18".....Remote Probe, 18" Leads $0
RPP-5' .....Remote Probe, 5' Leads.....$2
RPP-10' .....Remote Probe, 10' Leads.....$4
RPP-15' .....Remote Probe, 15' Leads.....$6
RPP-20' .....Remote Probe, 20' Leads.....$8
RPP-25' .....Remote Probe, 25' Leads.....$10

REMOTE PROBE, FEP-JACKETED CABLE

RPFEP-6" .....Remote Probe, 6" Leads $3
RPFEP-18" ....Remote Probe, 18" Leads $3
RPFEP-5'.....Remote Probe, 5' Leads.....$5
RPFEP-10'.....Remote Probe, 10' Leads.....$10
RPFEP-15'.....Remote Probe, 15' Leads.....$15
RPFEP-20'.....Remote Probe, 20' Leads.....$20
RPFEP-25'.....Remote Probe, 25' Leads.....$25

REMOTE PROBE, FEP-JACKETED CABLE SUITABLE FOR SUBMERSION

RPFEP2-6" ....Remote Probe, 6" Leads $10
RPFEP2-18" ..Remote Probe, 18" Leads $10
RPFEP2-5'.....Remote Probe, 5' Leads.....$15
RPFEP2-10'...Remote Probe, 10' Leads.....$20
RPFEP2-15'...Remote Probe, 15' Leads.....$25
RPFEP2-20'...Remote Probe, 20' Leads.....$30
RPFEP2-25'...Remote Probe, 25' Leads.....$35

REMOTE PROBE, HALOGEN-FREE CABLE

RPHALO-6" ...Remote Probe, 6" Leads $10
RPHALO-18" .Remote Probe, 18" Leads $10
RPHALO-5'....Remote Probe, 5' Leads.....$15
RPHALO-10'..Remote Probe, 10' Leads.....$30
RPHALO-15'..Remote Probe, 15' Leads.....$45
RPHALO-20'..Remote Probe, 20' Leads.....$60
RPHALO-25'..Remote Probe, 25' Leads.....$75

#3: Enclosure

(optional, BB2 required for units with transmitter)

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

Example Number: BA/(**10K-2**) - (**RPP-18"**) - (**BBX**)

Actual Number (with parenthesis removed): BA/10K-2-RPP-18"-BBX

Description: 10K-2 Thermistor, Outside Air Temperature Sensor, Remote Probe with Plenum Rated Cable, 18" Cable Leads, BAPI-Box Crossover Enclosure.

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

Your Number: BA/

Concave & Remote Probes with Colored Cable

Temperature Sensors

Rev. 12/01/21

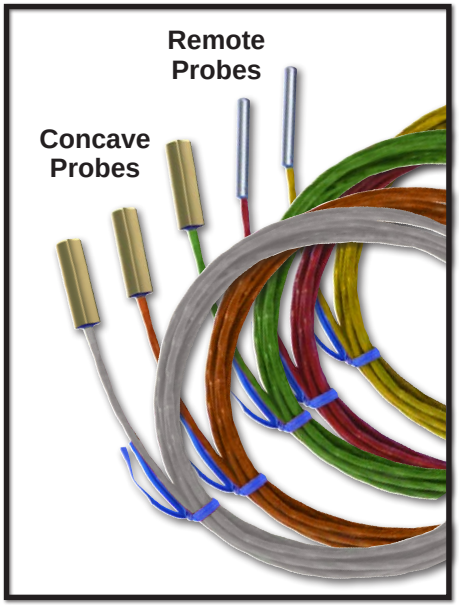
Features & Options

- Waterproof, Double Encapsulated Sensors
- Concave Probe or Remote Probes
- Optional BAPI-Box Crossover or BAPI-Box 2 Enclosure
- FEP-Jacketed Cable in 5 Color Choices

The Concave Probes feature a 1.35” long brass encapsulation shell with a concave indention so that they fit on the outside of pipes such as condensor lines. Remote Probes feature a 1.75” long stainless steel probe without an indention. Both probes come with FEP-jacketed cable in a choice of 5 colors and lead lengths.

Remote probes are commonly used in refrigerators, freezers, dry storage, car wash bays and other hard-to-access areas where immersion or duct sensors do not fit well.

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





Specifications

Environmental Operation Range:
Temperature Sensor: -40 to 105 ºC • 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

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

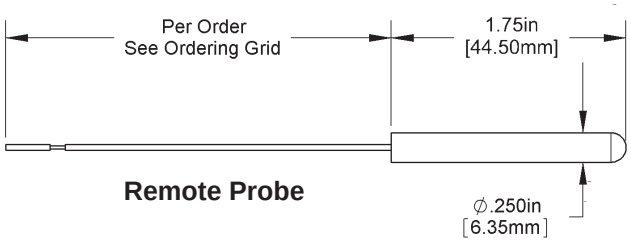
BAPI-Box Crossover Enclosure Rating:
IP10, NEMA 1 (IP44 w/ knockout plug in open port)

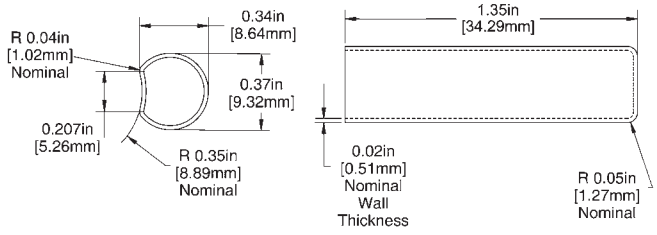
BAPI-Box 2 Enclosure Rating: IP66, NEMA 4X

Enclosure Dimensions: H x W x D
BAPI-Box 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.)





Concave Probe

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Concave & Remote Probes with Colored Cable

Temperature Sensors

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

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.

Concave and Remote Probes with Colored Cables Selection Guide:

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

#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

1K Plat. RTD Transmitters below with 4 to 20 mA Output - BAPI-Box 2 Enclosure required.

T1K[32 TO 212F]	32 to 212°F Range	$125
T1K[20 TO 120F]	20 to 120°F Range	$125
T1K[0 TO 100F]	0 to 100°F Range	$125
T1K[0 TO 100C]	0 to 100°C Range	$125
T1K[-7 TO 49C]	-7 to 49°C Range	$125
T1K[-18 TO 38C]	-18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type (required)

RPFEP	Remote Probe	
CPFEP	Concave Probe	$4

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: FEP Cable Color and Length (required)

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
GRN-18”	Green Cable, 18” Length	$3
GRN-5’	Green Cable, 5’ Length	$10
GRN-10’	Green Cable, 10’ Length	$20
GRN-15’	Green Cable, 15’ Length	$30
GRN-20’	Green Cable, 20’ Length	$40
YEL-18”	Yellow Cable, 18” Length	$3
YEL-5’	Yellow Cable, 5’ Length	$10
YEL-10’	Yellow Cable, 10’ Length	$20
YEL-15’	Yellow Cable, 15’ Length	$30
YEL-20’	Yellow Cable, 20’ Length	$40
RED-18”	Red Cable, 18” Length	$3
RED-5’	Red Cable, 5’ Length	$10
RED-10’	Red Cable, 10’ Length	$20
RED-15’	Red Cable, 15’ Length	$30
RED-20’	Red Cable, 20’ Length	$40
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

#4: Enclosure (optional)

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

Example Number: BA/(**10K-2**) - (**CPFEP**) - (**ORG-5’**) - (**BBX**)

Actual Number (with parenthesis removed): BA/10K-2-CPFEP-ORG-5’-BBX

Description: 10K-2 Thermistor, Concave Probe, 5’ of FEP-Jacketed Orange Cable, BAPI-Box Crossover Enclosure.

List Price:
$18 (10K-2 Therm.) + $4 (Concave Probe) + $10 (5’ Orange Cable) = $32 List Price

Your Number: BA/

B56 Surface Sensor

Temperature Sensors

Rev. 12/01/21

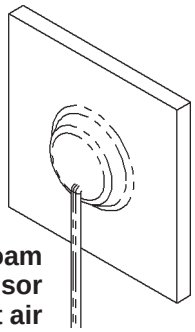
Features & Options

- Copper Encapsulation Shell and Thermal Adhesive for Increased Temperature Transfer
- Easy to Install on Flat Surfaces
- Optional BAPI-Box 2 or Crossover
- FEP-Jacketed Cable

The Surface Sensor features a 0.75” diameter copper encapsulation shell with a thermally adhesive tape to mount on flat surfaces.

Surface Sensors are commonly used on glass windows and doors, solar panel modules, and other hard-to-access areas where a Remote Probe may be difficult to mount.

Surface Sensors are available with a BAPI-Box Crossover or BAPI-Box 2 enclosure. Unit includes a square closed-cell foam cover to isolate the sensor from the ambient air.

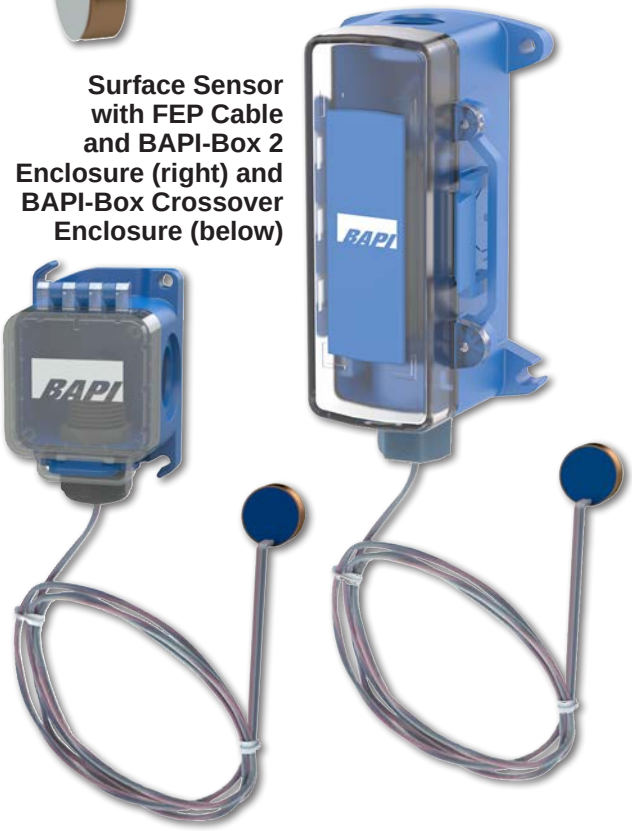


Includes square foam cover to insulate sensor from ambient air

Surface Sensor with FEP Cable
(with white adhesive strip on sensing surface)



Surface Sensor with FEP Cable and BAPI-Box 2 Enclosure (right) and BAPI-Box Crossover Enclosure (below)



Specifications

Environmental Operation Range:
Temperature Sensor:
-40 to 221°F (-40 to 105ºC)
Humidity: 0 to 100%, non-condensing

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

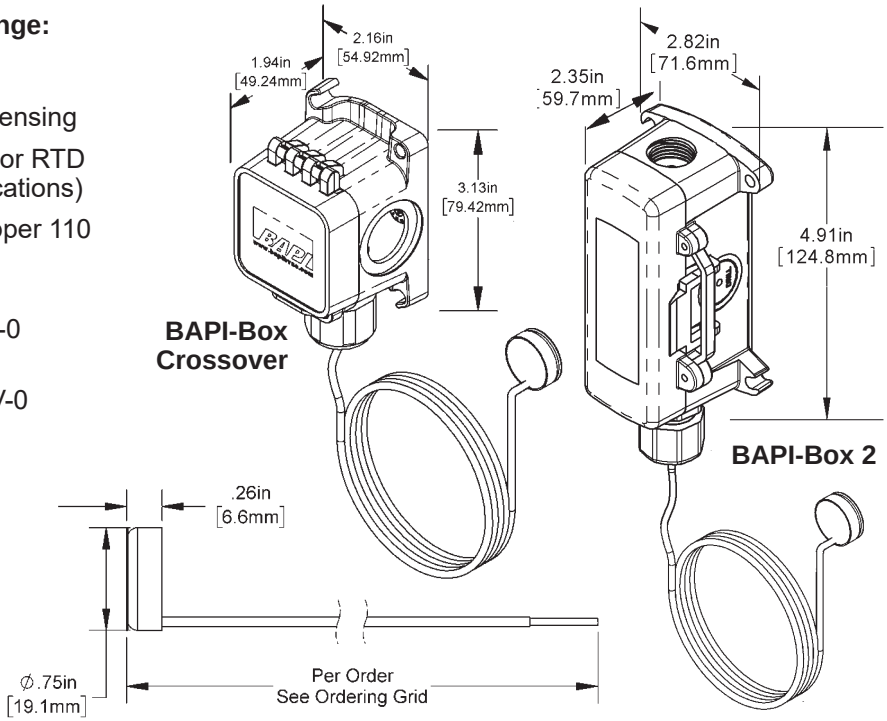
Surface Sensor Material: Copper 110

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

BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 HB

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

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



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Use the Option Selection 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.

Surface Sensor Selection Guide:

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

#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

1K Plat. RTD Transmitters below with 4 to 20 mA Output - require a BAPI-Box Crossover Enclosure

T1K[32 TO 212F]	32 to 212°F Range	$125
T1K[20 TO 120F]	20 to 120°F Range	$125
T1K[0 TO 100F]	0 to 100°F Range	$125
T1K[0 TO 100C]	0 to 100°C Range	$125
T1K[-7 TO 49C]	-7 to 49°C Range	$125
T1K[-18 TO 38C]	-18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Probe Type (required)

SMFEP	Surface Sensor	$15

#3: FEP 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

#4: Enclosure (optional)

BBX	BAPI-Box Crossover (IP10)	$0
BB2	BAPI-Box 2 (IP66)	$12

#5: Test & Balance or Terminal Strip (optional)

TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K transmitter units)	$7

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**) - (**SMFEP**) - (**5’**) - (**BBX**) - ( )

Actual Number (with parenthesis removed):
BA/10K-2-SMFEP-5’-BBX

Description:
10K-2 Thermistor, Surface Sensor, 5’ of FEP-Jacketed Cable, BAPI-Box Crossover Enclosure, No Test and Balance Switch or Terminal Strip

List Price:
$18 (10K-2 Therm.) + $15 (Surface Sensor) + $5 (5’ FEP Cable) = $38 List Price

Your Number: BA/

4 to 20 mA Temperature Transmitters

Temperature Sensors

Rev. 03/15/18

Features & Options

- Fully Encapsulated Circuitry
- Green Power Indication LED on BBX Models

BAPI's loop powered 4 to 20mA temperature transmitters feature a 1,000Ω Platinum RTD (385 curve) and are available in a wide selection of temperature ranges or custom ranges.

They mount in a variety of enclosures to accommodate any application and terminate with flying leads or terminal screws. The unit is fully encapsulated (ruggedized) with a high thermal conductivity material to prevent circuit overheating and is water resistant.



XOR-BBX Model



Specifications

Power Required:
7 to 40VDC (All units except XOR-BBX6)
10 to 40VDC (XOR-BBX6 units)

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

Output Wiring: 2 Wire Loop
Flying Leads (4 to 22 AWG)
or 4 Terminal Block (24 to 12 AWG)

Calibration Span:
Min. 30ºF (16.6ºC), Max 1000ºF (555ºC)

Calibration Zero:
Min. -148ºF (-100ºC), Max 900ºF (482ºC)

Accuracy: ±0.065% of Span

Linearity: ±0.125% of Span

RTD Sensor (2 Wire):
1KΩ, 2 Wire Plat. (PT), 385 Curve
Matched (M): 13 to 302°F (-25 to 150°C)
with 3-point certificate (25%, 50% & 75%)

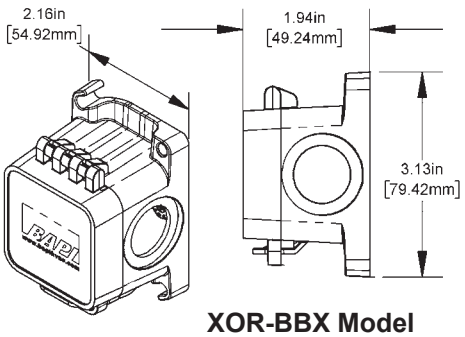
Mounting Shell:
ABS shell w/ Waterproof Urethane Fill

Transmitter Ambient:
-4 to 158ºF, (-20º to 70ºC)
0 to 95% RH, Non-condensing

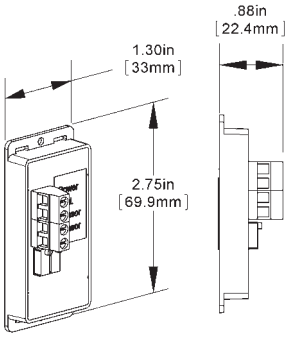
BAPI-Box Crossover Encl. Material:
Polycarbonate, UL94V-0, UV-Rated

BAPI-Box Crossover Encl. Rating: IP10, NEMA 1

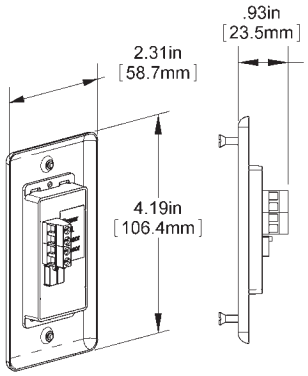
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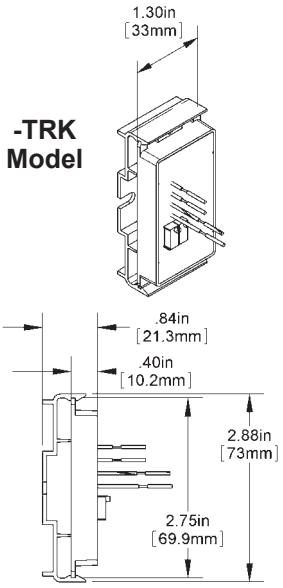
XOR-BBX Model

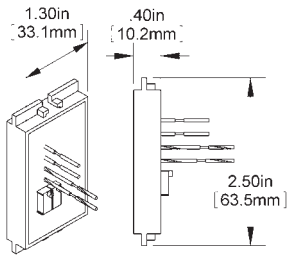


-STM Model
(shown with optional Terminal Strip)



-XOR Model
(shown with optional Terminal Strip)





-EUM Model

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

4 to 20 mA Transmitter Option Selection Guide

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

#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

#2: 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

#3: Configuration and Optional Enclosure (required)		
XOR	Transmitter in snaptrack mountable shell, w/ metal plate	
XOR-EUM	Transmitter in EU size shell	
XOR-STM	Transmitter in snaptrack mountable shell, no metal plate	
XOR-TRK	Transmitter with 1.25” inch wide piece of 2-3/4” snap track	$5
XOR-BBX	Transmitter in a BAPI-Box Crossover enclosure (IP10)	$0

#4: 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/(**T1K**)(**[0 to 100F]**) - (**XOR-BBX**) - ( )

Actual Number (with parenthesis removed): BA/T1K[0 to 100F]-XOR-BBX

Description: T1K Transmitter, 0 to 100°F Range in a BAPI-Box Crossover Enclosure.

List Price: $100 (T1K Transmitter) = $100 List Price

Your Number: BA/

B60 Thermobuffer Freezer/Cooler Sensor

Temperature Sensors

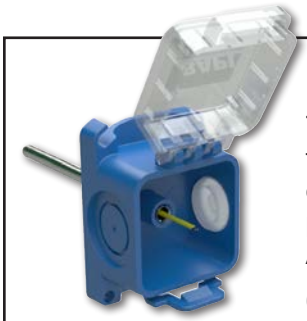
Rev. 01/03/22

Features & Options

- Fluid-Filled Chamber Tracks Temperature of Freezer or Cooler Contents, Not Air Temperature, Decreasing False Alarms
- Easy Wall Mount or Wire Shelf Hanger
- Available with Extreme Temp Sensor for -328 to 32°F (-200 to 0°C)

The BAPI Thermobuffer Temperature Sensor is used to simulate the refrigerator contents rather than the refrigerator air temperature. The fluid-filled chamber allows for slower reaction to abrupt temperature changes, yet still maintains long-term accuracy if the change remains permanent. It eliminates the temperature spikes due to frequent refrigerator or freezer door opening and decreases false alarms.

The Thermobuffer comes in three buffer sizes 1", 2" and 4" and is designed to save valuable shelf space by mounting to the wall or by hanger in a refrigerator or freezer. The buffer chamber is machined in 304 Stainless Steel or aluminum and accommodates a variety of temperature sensors or transmitters to interface with all BAS systems.



The BAPI-Box Crossover

The 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.)



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: ~7 ml of fluid
2" Chamber: ~24 ml of fluid
4" Chamber: ~32 ml of fluid

Note: Unit requires customer-supplied food grade glycol antifreeze for proper operation.

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

BAPI-Box 2: IP66, NEMA 4X

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

BAPI-Box Crossover:
Cover: Polycarbonate, UL94 V-0
Base: Nylon, UL94 H

Environmental Operating Range:
Standard Temp Sensor: -40 to 185ºF (-40 to 85ºC)
Extreme Temp Sensor: -328 to 32°F (-200 to 0°C)
Temp. Transmitter: -4 to 158ºF (-20 to 70ºC)
Humidity: 0 to 100%RH, Condensing

Agency: CE, RoHS

Encl. Dimensions: H x W x D
BAPI-Box Crossover: 3.1 x 2.2 x 1.9" (79 x 56 x 49mm)
BAPI-Box 2: 4.9 x 2.8 x 2.35" (125 x 71.6 x 60mm)

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

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Thermobuffer Freezer/Cooler Sensor

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.

Thermobuffer Freezer/Cooler Sensor Option Selection Guide

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[NI]	1K Ω Nickel RTD	$65
1K	1K Plat. RTD (385 curve)	$25
1K[1]	1K Plat. RTD, Extreme Temp, -328 to 32°F (-200 to 0°C), PTFE Insulation Leads (Call for availability and pricing)	

1K Plat. RTD Transmitters below with 4 to 20 mA Output - require a BAPI-Box 2 Enclosure

T1K[32 TO 212F]	32 to 212°F Range	$125
T1K[20 TO 120F]	20 to 120°F Range	$125
T1K[0 TO 100F]	0 to 100°F Range	$125
T1K[0 TO 100C]	0 to 100°C Range	$125
T1K[-7 TO 49C]	-7 to 49°C Range	$125
T1K[-18 TO 38C]	-18 to 38°C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

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

#2: Buffer Material and Length (required)

TB-M304-1	1” 304 SS Buffer (Overall length 1.9”)	$80
TB-M304-2	2” 304 SS Buffer (Overall length 4.3”)	$192
TB-M304-4	4” 304 SS Buffer (Overall length 6.3”)	$192
TB-MAL-2	2” Aluminum Buffer (Overall length 4.3”)	$132
TB-MAL-4	4” Aluminum Buffer (Overall length 6.3”)	$132

#3: Hanging Bracket Mounting (optional)

HB	Hanging Bracket (30” FEP-Jacketed Cable)	$7

#4: Enclosure Style (required)

BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
BB2	BAPI-Box 2 (IP66, NEMA 4X)	$12
NB	No Box	$0

#5: Custom Lead Length
(for HB and No Box units)

5	5’ of FEP-Jacketed Cable	$5
10	10’ of FEP-Jacketed Cable	$10
25	25’ of FEP-Jacketed Cable	$25

#6: Test & Bal. or Terminal Strip (optional)

TB	Test & Balance Switch	$7.50
TS	Terminal Strip Connection (The $7 does not apply to T1K units)	$7

Example Number:
BA/ **(10K-2) - (TB-M304-1) - ( ) - (BBX) - ( ) - ( )** = BA/10K-2-TB-M304-1-BBX
Description: 10K-2 Thermistor, Thermobuffer, 1” 304SS Buffer, BAPI-Box Crossover Enclosure.
List Price: $18 (10K-2 Thermistor) + $80 (1” SS Buffer) = $98 List Price

Your Number: BA/

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Replacement Temperature Probes

Temperature Sensors

Rev. 12/01/21

Features & Options

- Plenum-rated Etched Teflon Leads or Cable
- Probe Lengths from 1.75” to 48”
- 1/4” Stainless Steel Probes
- Fits BAPI Duct, Immersion or Remote Sensor Applications
- Double Encapsulated

BAPI’s Duct, Immersion and Remote temperature replacement probes are easy to field swap to save time and money when the old probe becomes damaged or the sensor requirements have changed.

Replacement Probes feature a standard 1/4” stainless steel probe, double encapsulated temperature sensor with minimum 6” 22 AWG Etched Teflon lead wires. The probes are available in various lengths from 1.75” to 48”. The leads are available in a variety of lengths including 18”, 5’, 10’, 15’, 20’, and 25’.

Additional cable options, lead lengths, and probe styles are available upon request. See the order grid to select the probe replacement for your application.

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

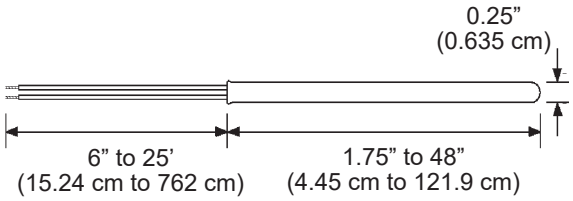


Replacement Probes 1.75”, 4.5”, 6.5” & 8.25” Probes with Etched Teflon Leads (The 1.75” Probe is “No Flare” while the other three are “Flared”)

Specifications

Thermistor:
Temp. Output ..... Resistance
Accuracy ..... ±0.36ºF, (±0.2ºC)
Probe Range ..... -40º to 221ºF (-40º to 105ºC)

RTD:
Platinum (PT) ..... KΩ @0ºC, 385 curve,
Platinum (PT) ..... 1KΩ @0ºC, 375 curve
PT Accuracy (std) .... 0.12% @Ref, or ±0.55ºF, (±0.3ºC)
PT Probe Range ..... -40º to 221ºF, (-40 to 105ºC)
Nickel (Ni) ..... 1KΩ @70ºF, JCI curve
Ni Probe Range ..... -40º to 221ºF (-40 to 105ºC)



Probe Material: Rigid Stainless Steel, 0.25” OD

Probe Length: 1.75 to 48” or custom per order

Lead Wire: Twin lead 22awg stranded

Wire Insulation: Etched Teflon, Plenum-Rated or FEP-Jacketed

Environmental Operating Range:
Probe with Etched Teflon or FEP-Jacketed Wire: -40 to 105°C
Probe with Plenum-Rated Wire: -20 to 75°C

Agency: RoHS

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Replacement Temperature Probes

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”

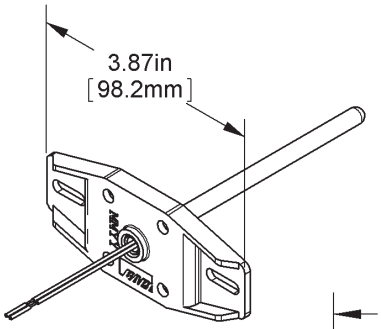
Description: 10K-2 Thermistor, Flared 4.5” Probe, 18” of Etched Teflon Leads.

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

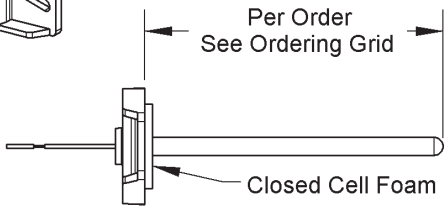
Your Number: BA/

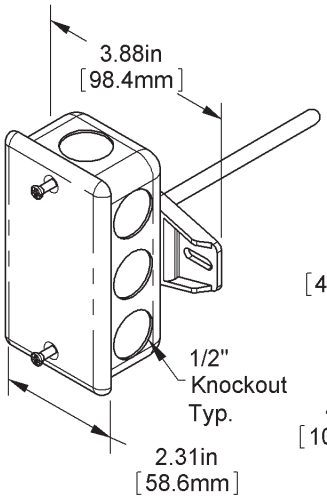
Duct Temperature Sensor Enclosures

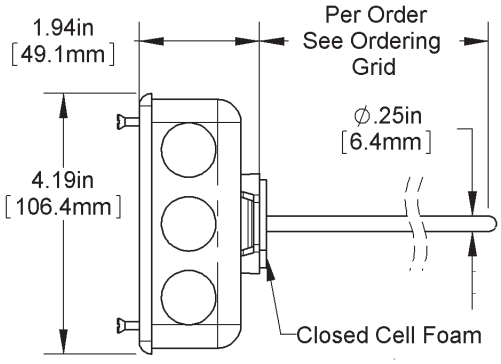
Temperature Sensors



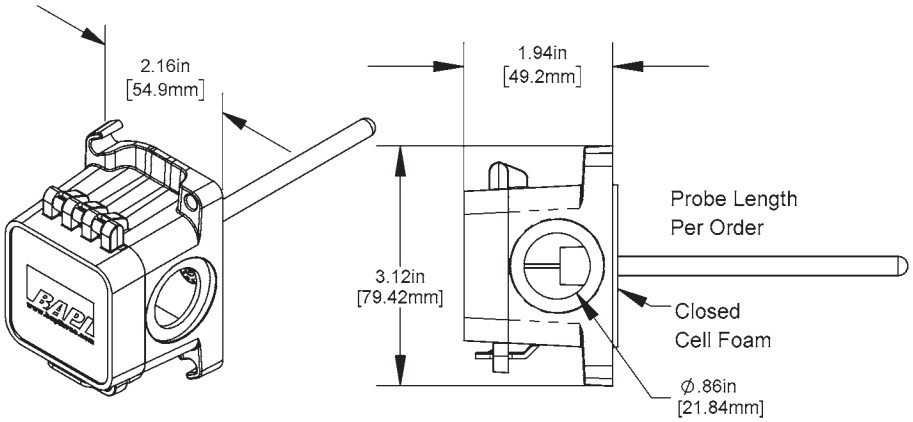
No Box (NB)





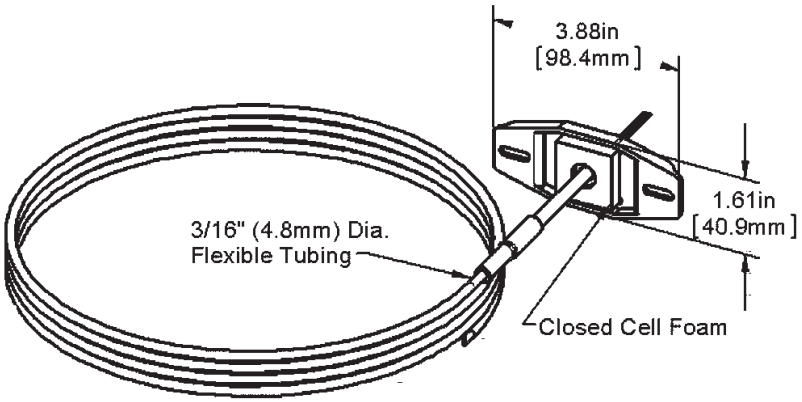


Junction Box (Standard)

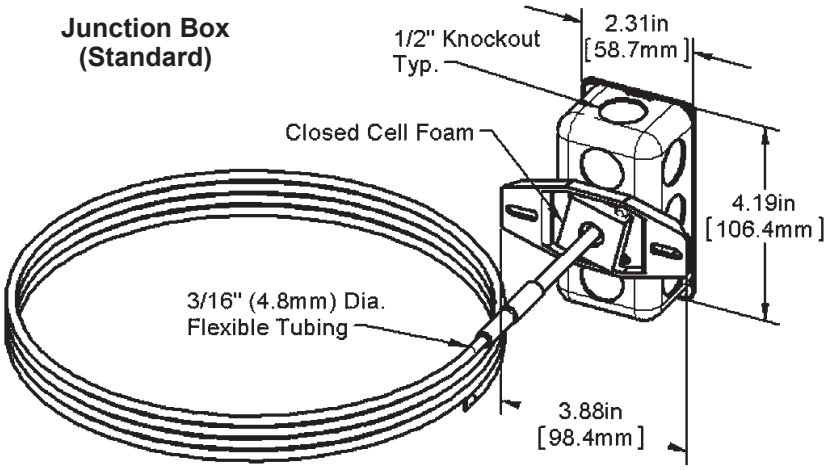


BAPI-Box Crossover (BBX)

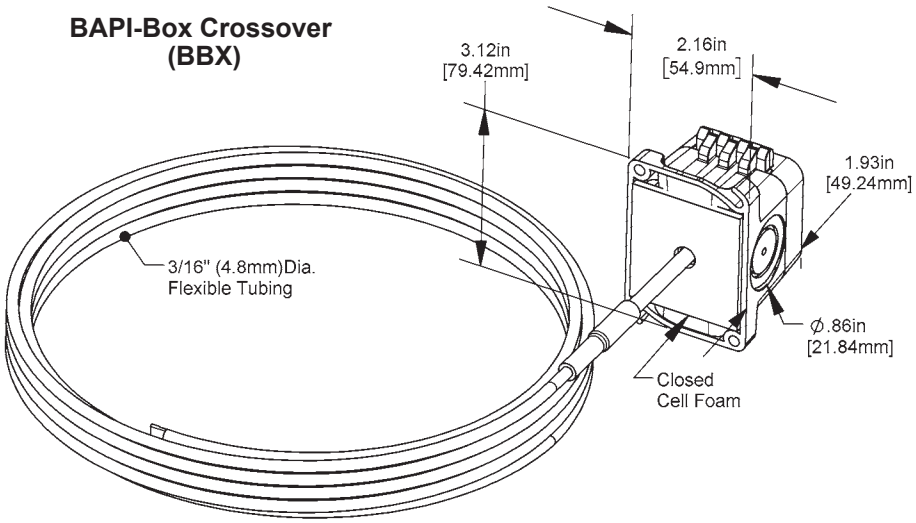
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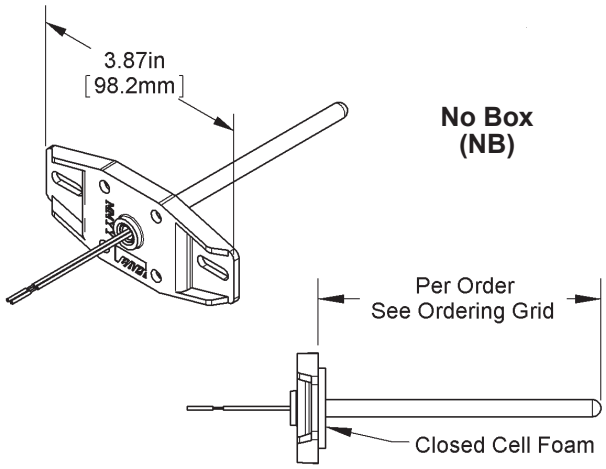
Junction Box (Standard)



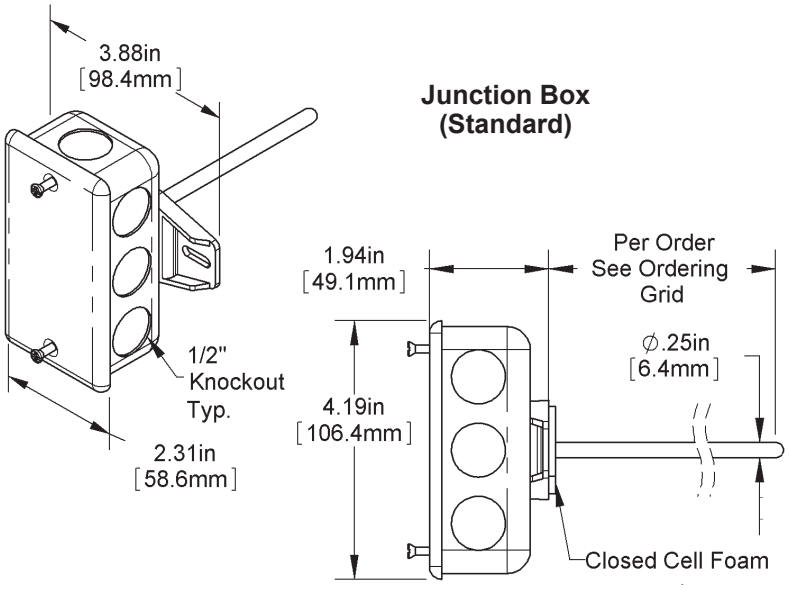
BAPI-Box Crossover (BBX)



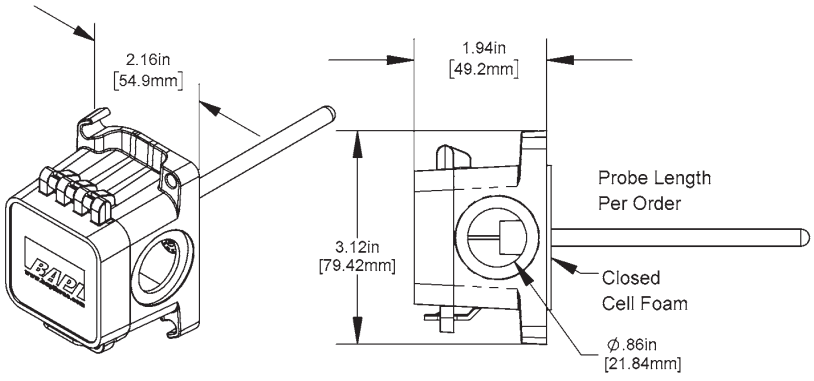
No Box (NB)

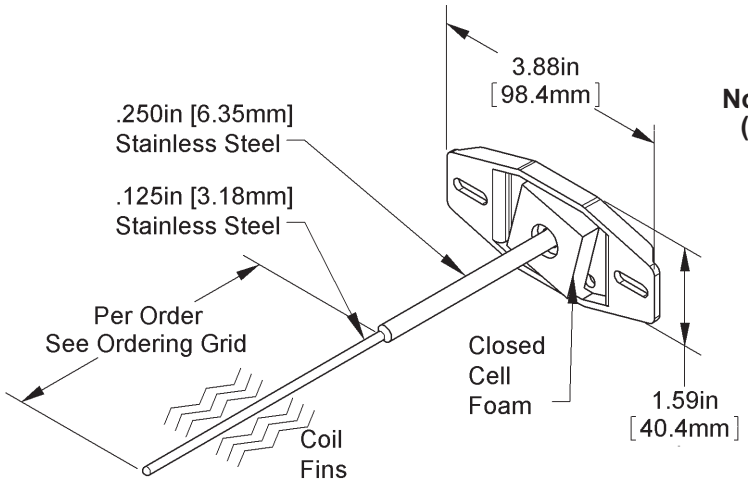


Junction Box (Standard)

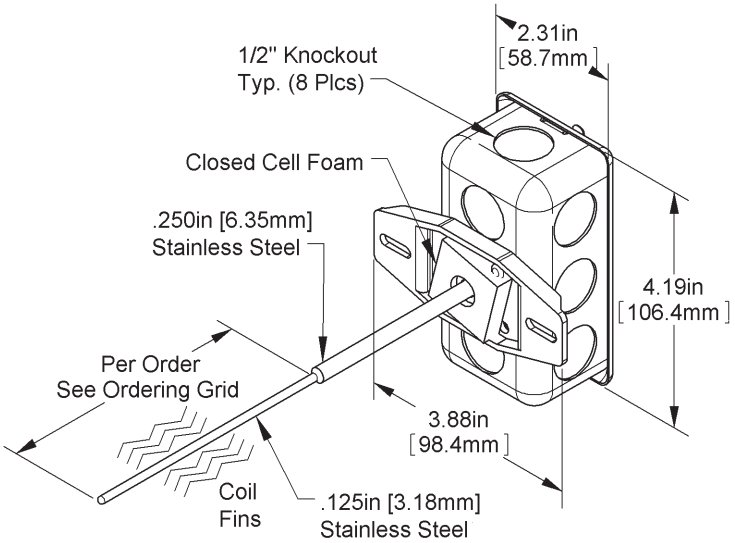


BAPI-Box Crossover (BBX)

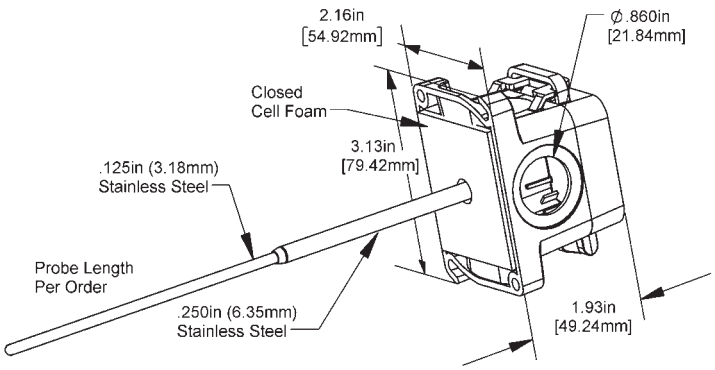




No Box (NB)

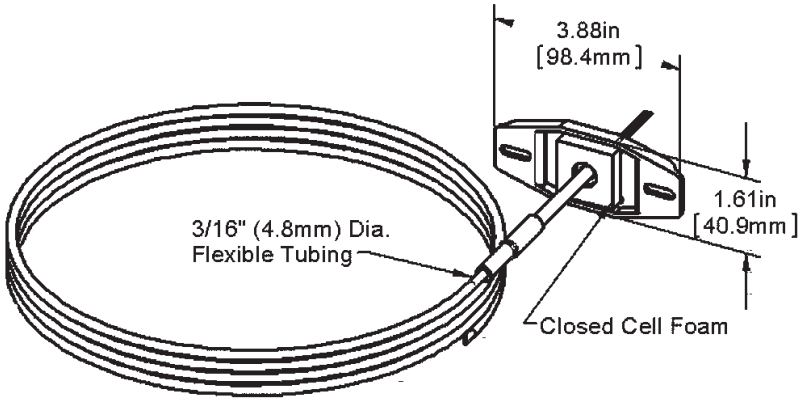


Junction Box (Standard)

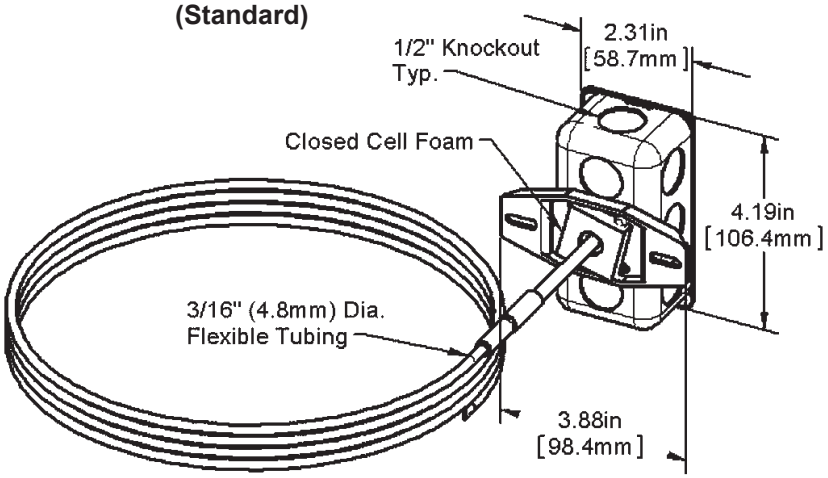


BAPI-Box Crossover (BBX)

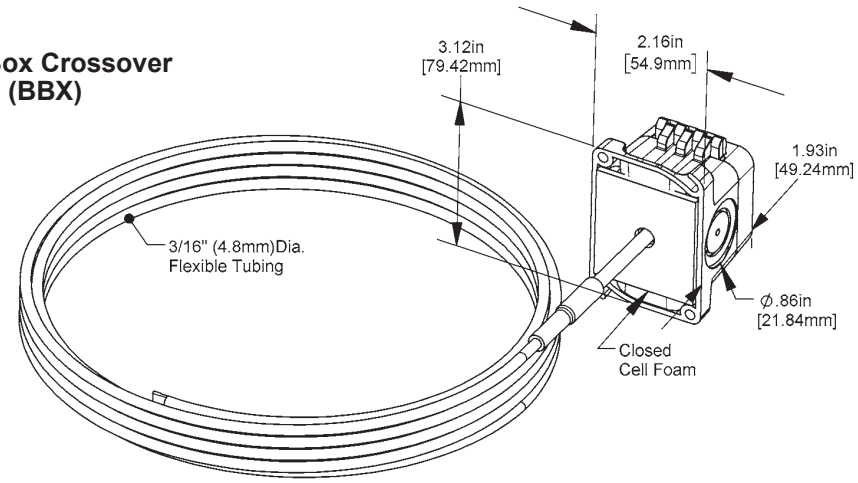
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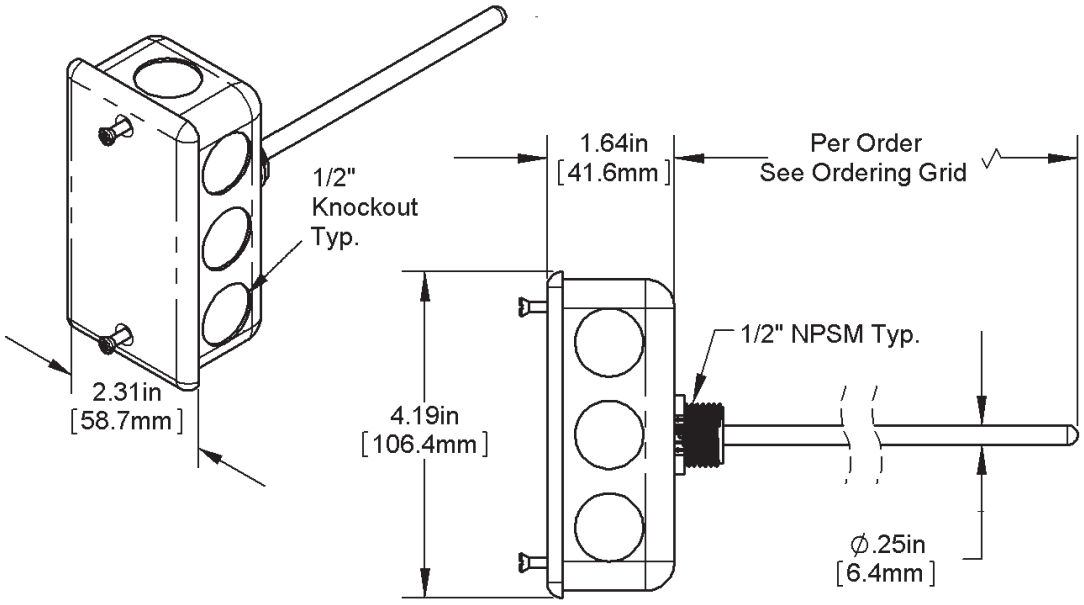


Junction Box (Standard)

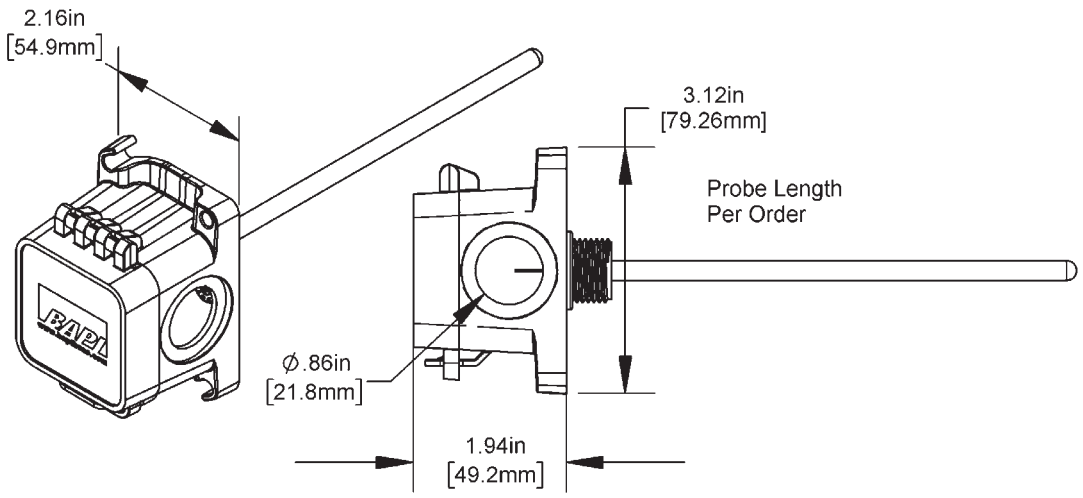


BAPI-Box Crossover (BBX)





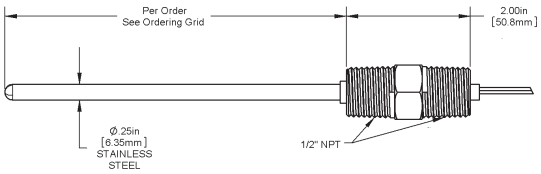
Junction Box (Standard)



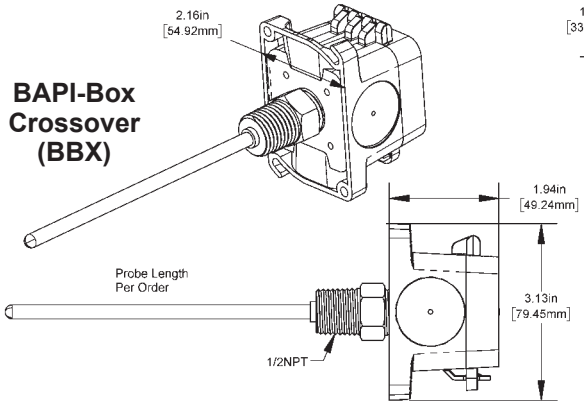
BAPI-Box Crossover (BBX)

Immersion Probes with Stainless Steel Fittings

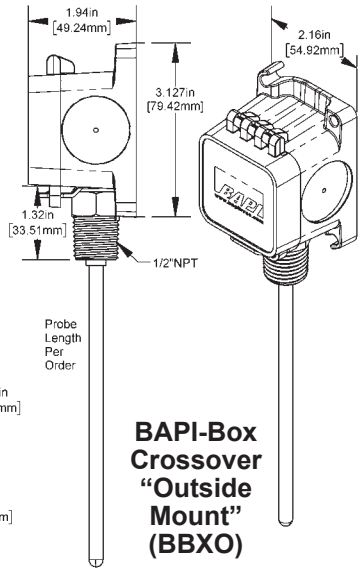
Temperature Sensors



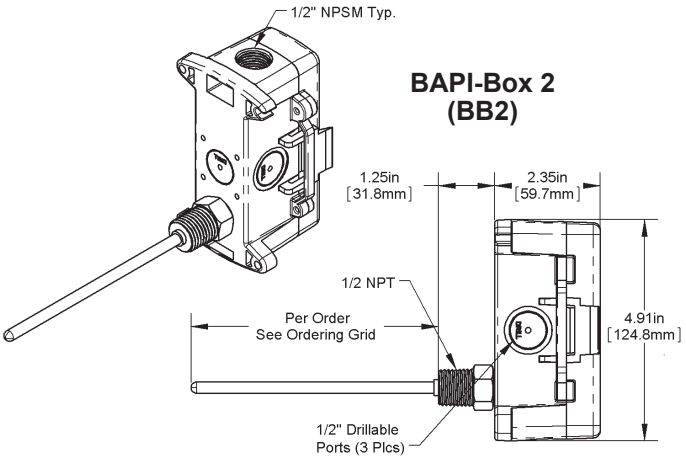
Probe without Enclosure



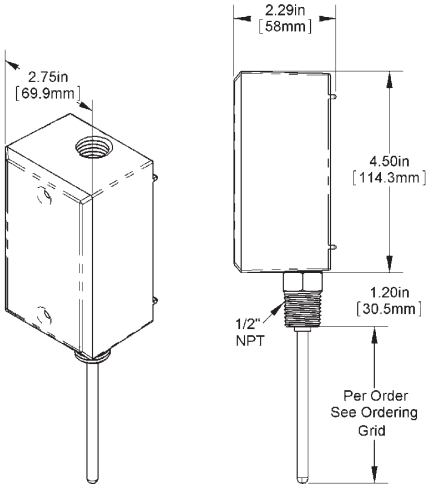
BAPI-Box Crossover (BBX)



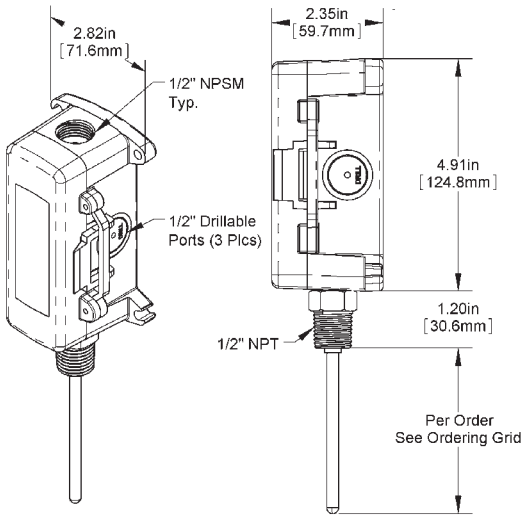
BAPI-Box Crossover "Outside Mount" (BBXO)



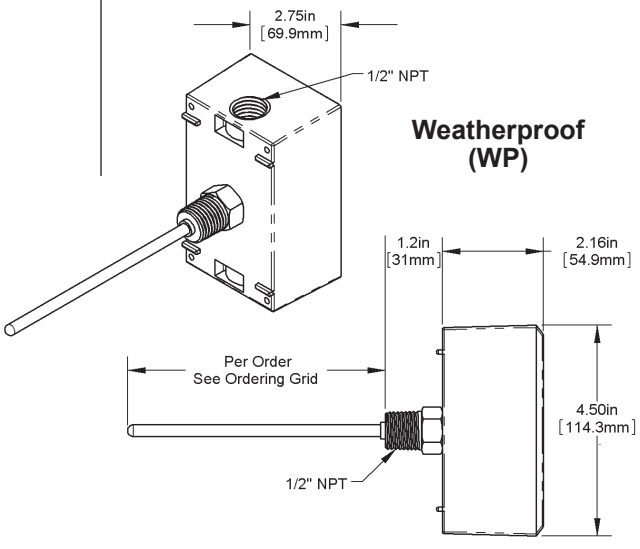
BAPI-Box 2 (BB2)



Weatherproof "Outside Mount" (WPO)

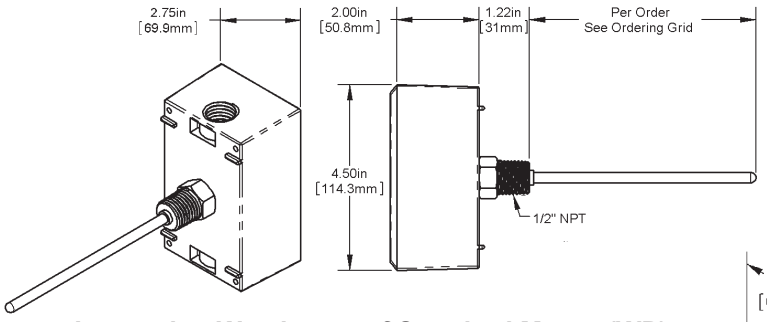


BAPI-Box 2 "Outside Mount" (BB2O)



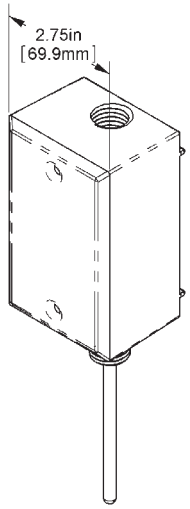
Weatherproof (WP)

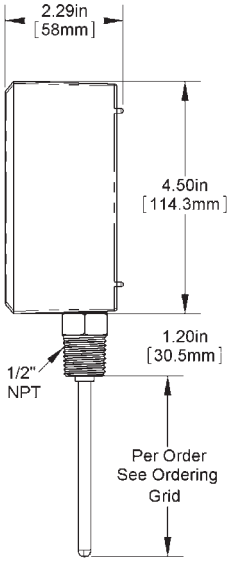
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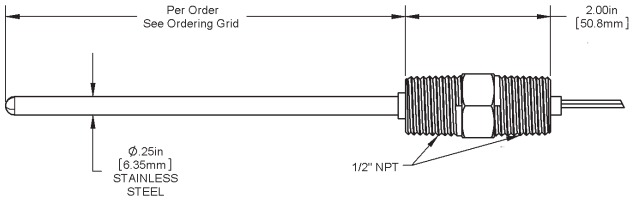


Immersion Weatherproof Standard Mount (WP)

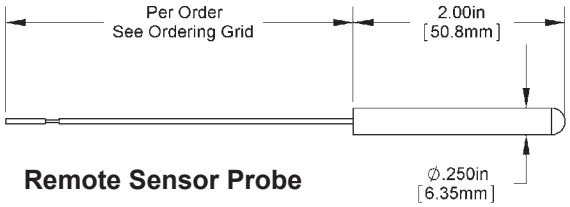
Immersion Weatherproof Outside Mount (WPO)



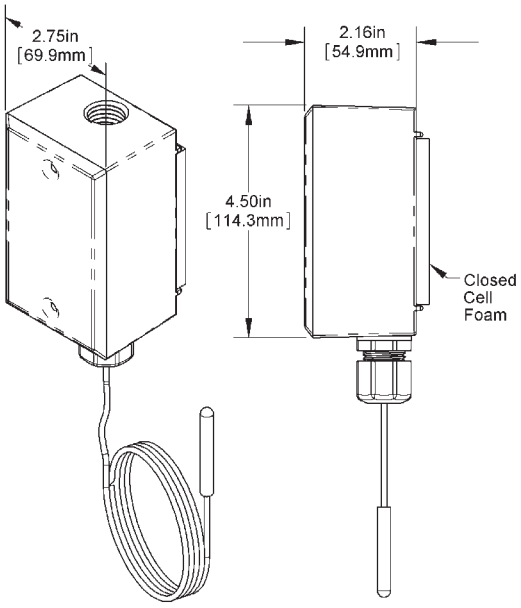




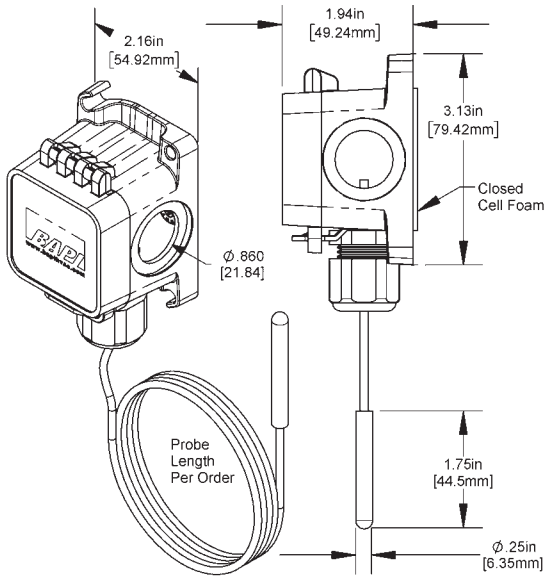
Immersion Probe without Enclosure



Remote Sensor Probe

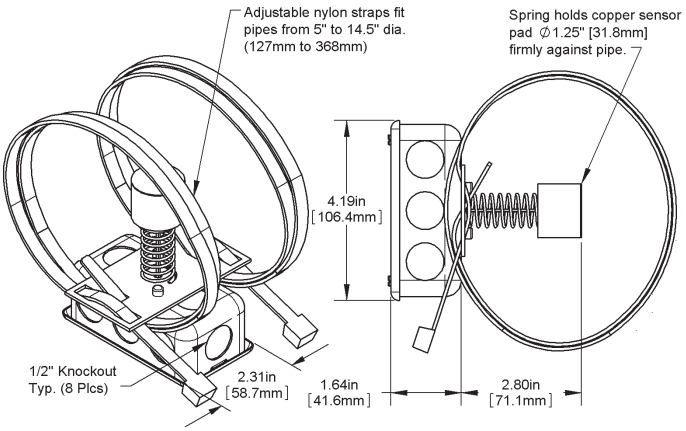


Remote Weatherproof (WP)

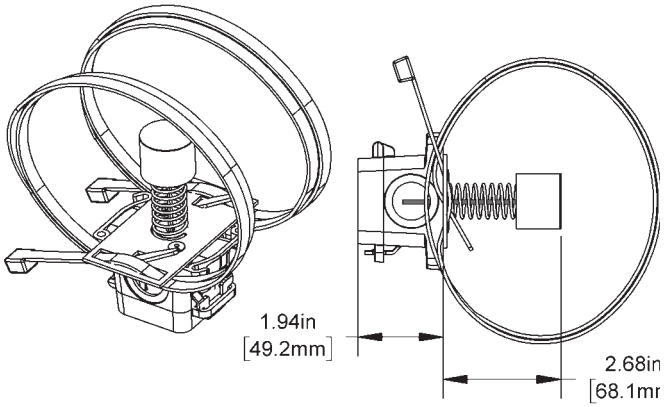


BAPI-Box Crossover (BBX)

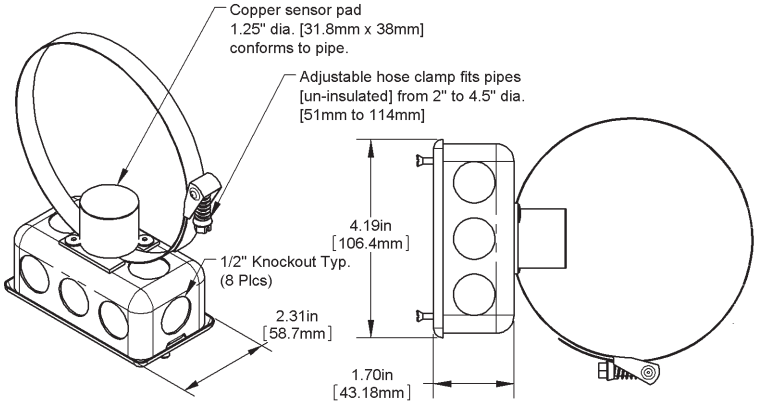
Spring-Loaded Strap Junction Box (JB)



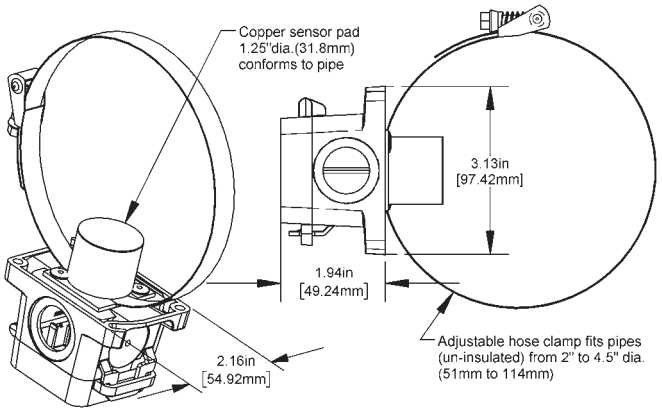
Spring-Loaded Strap BAPI-Box Crossover (BBX)

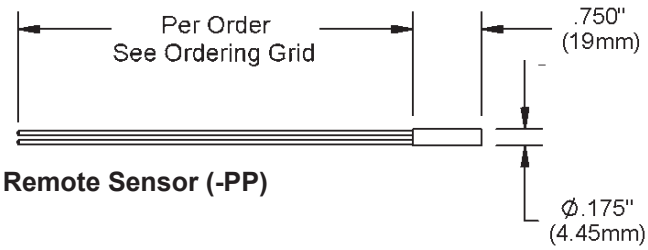


Clamp-On Strap Junction Box (JB)

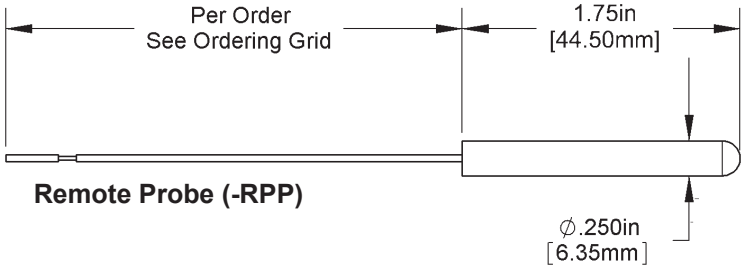


Clamp-On Strap BAPI-Box Crossover (BBX)

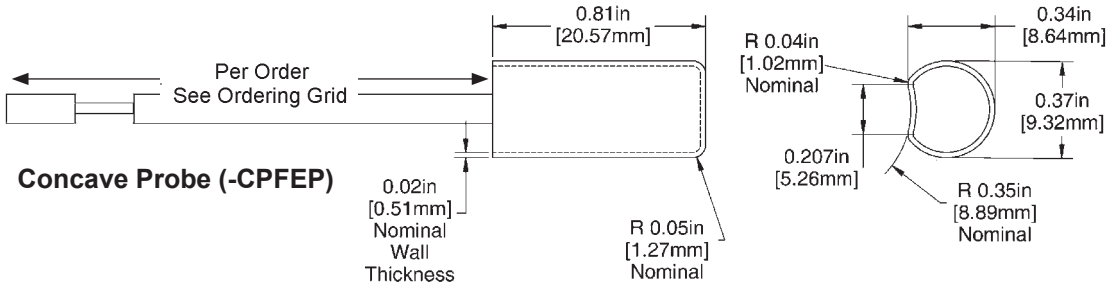




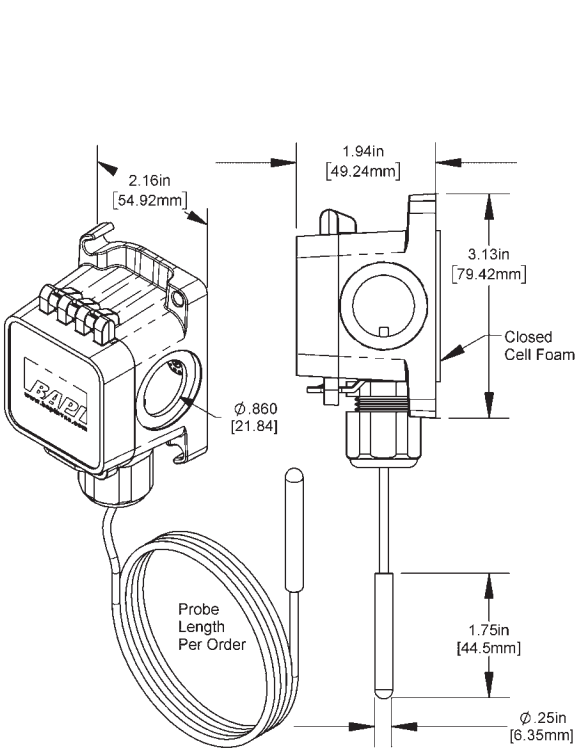
Remote Sensor (-PP)



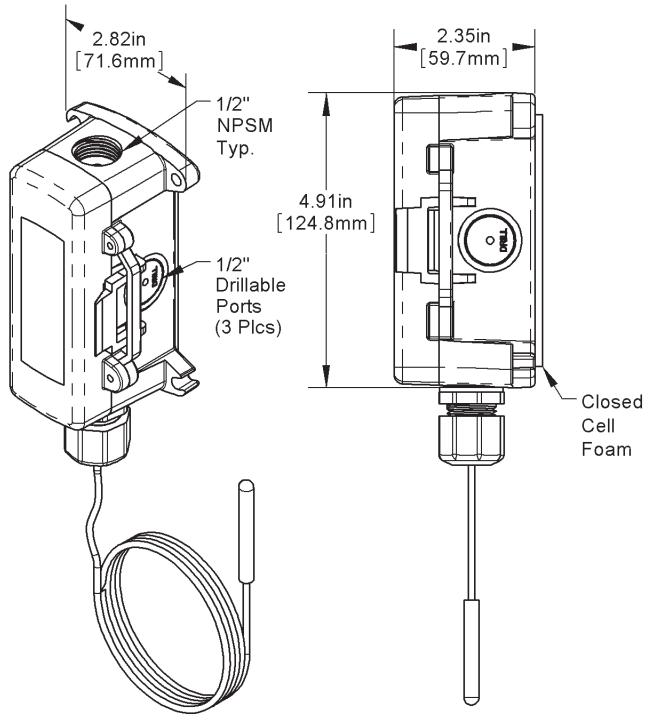
Remote Probe (-RPP)



Concave Probe (-CPFEP)

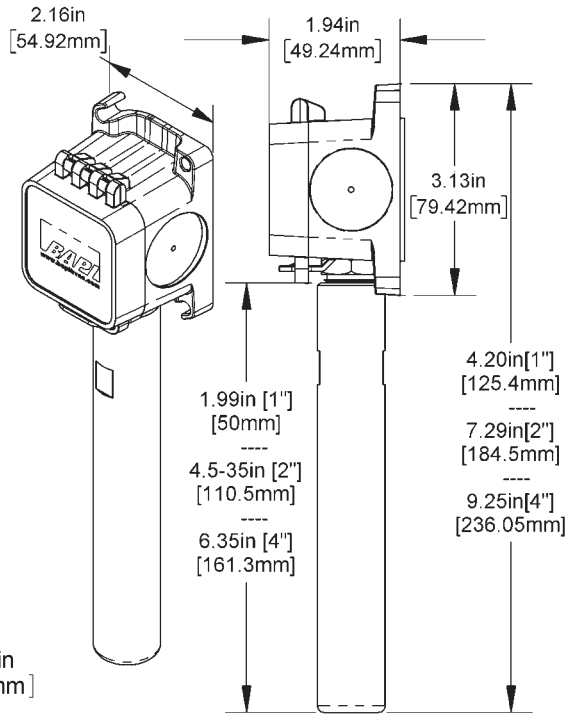


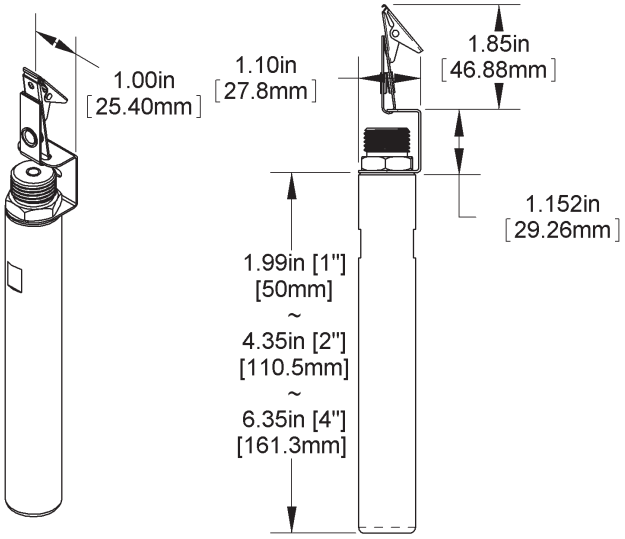
BAPI-Box Crossover (BBX)



BAPI-Box 2 (BB2)

BAPI-Box Crossover (BBX)





Hanging Bracket (HB)

BAPI-Box 2 (BB2)

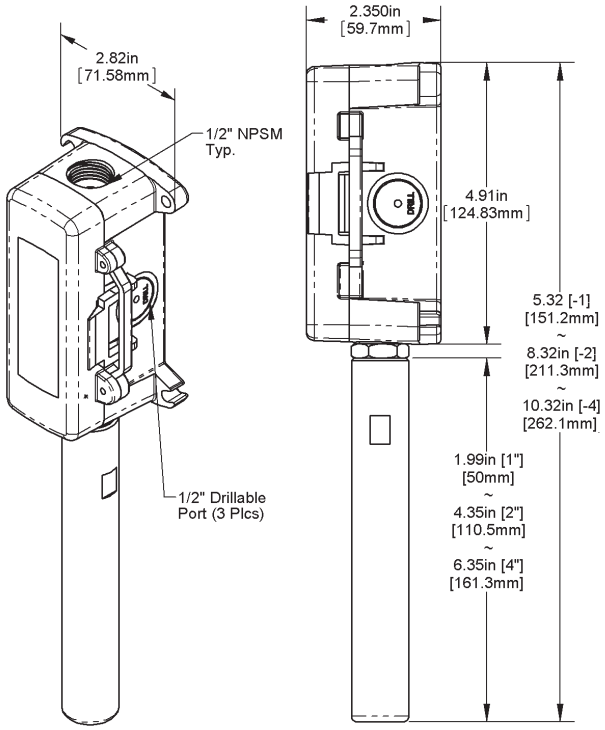


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BAPI Humidity Only or Temperature/Humidity Sensors

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The Latest Innovation from BAPI



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BAPI-Stat "Quantum Prime"
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pg C8

"X-Combo"
Temp & Humidity Setpoint



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Delta Style Sensors
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Modbus Sensor
in the BAPI-Stat 4



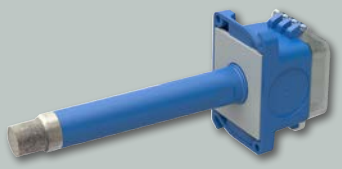
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Outside Air
in the BAPI-Box 2 Enclosure

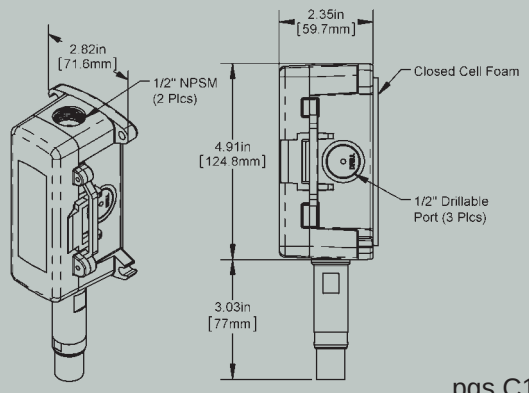


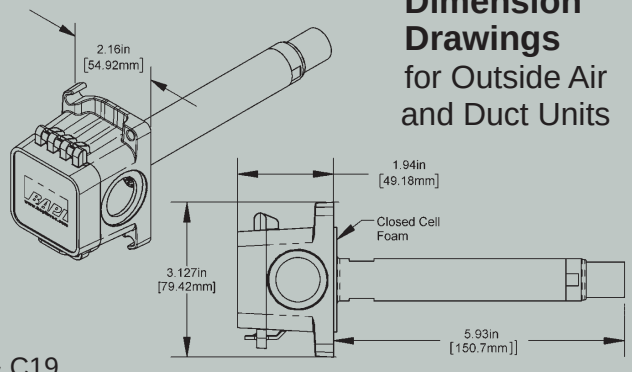
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Duct Sensor
in the BAPI-Box Crossover



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Dimension Drawings
for Outside Air and Duct Units

pgs C18 & C19

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BAPI-Stat “Quantum” Humidity Sensors

Humidity or Combination Temp/Humidity Sensors

Rev. 12/03/21

Features & Options

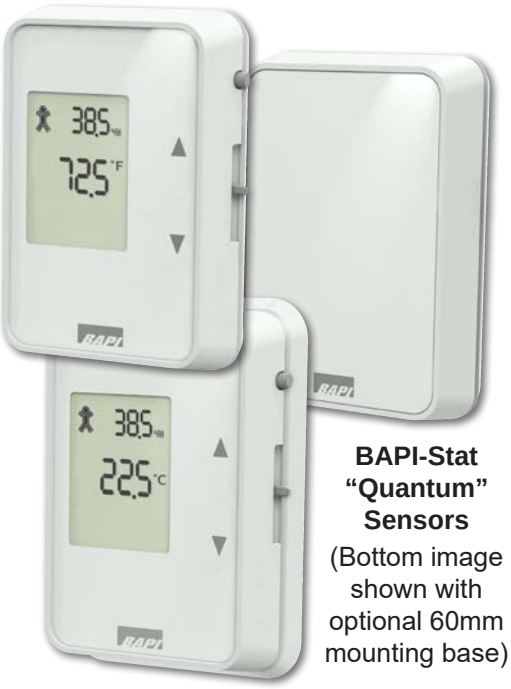
- Optional Temperature Setpoint Adjustment and Occupant Override
- Temp, Humidity and Room Occupancy Status Display
- Higher Contrast Display for Improved Clarity at Greater Distances

BAPI’s BAPI-Stat Quantum room sensors feature a modern enclosure style with slider setpoint adjustment and occupancy override.

The optional LCD can display both temperature and humidity as well as room occupancy status. The display has been upgraded for higher contrast, providing improved clarity at greater distances.

5 YEAR WARRANTY

It is available with an optional occupancy override, 3.5mm (1/8”), RJ11 or RJ22 Communication Jack and a 60mm mounting base is also available to fit European style junction boxes.



BAPI-Stat “Quantum” Sensors
(Bottom image shown with optional 60mm mounting base)

Specifications

Power:
12 to 35 VDC for 4 to 20 mA or 0 to 5 VDC Output
15 to 35 VDC for 0 to 10 VDC Output
15 to 28 VAC for 0 to 5 VDC or 0 to 10 VDC Output
(AC power requires a separate pair of shielded wires.)

Power Consumption:
20 mA max. for 4 to 20 mA Output
4 mA max. for 0 to 5 VDC and 0 to 10 VDC Output
0.1 VA max. for 0 to 5 VDC and 0 to 10 VDC Output

Temp/%RH Sensor Construction:
Communicating Integrated Circuit

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

Temp: Semi-conductor Band Gap,
±0.3°C (±0.54°F) @ 20 to 40°C (68 to 104°F)

Field Calibration Adjustment:
±5% in 0.1% increments (Factory Calibrated)

Optional Passive Temperature Sensor Accuracy:
±0.36°F Thermistor, ±0.5°F RTD (Higher accuracy available)

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

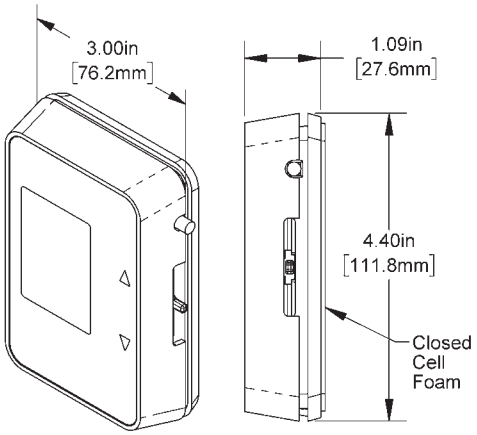
Mounting: Standard 2”x4” junction box, European junction box or drywall mount (screws provided)

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

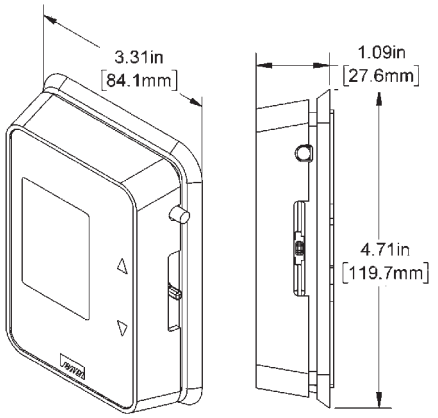
Material & Rating: ABS Plastic, UL 94, V-0

Agency: RoHS

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



Unit with Standard Mounting Base



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

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BAPI-Stat "Quantum" Humidity Sensors

Humidity or Combination Temp/Humidity Sensors

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

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

BAPI-Stat "Quantum" Humidity Sensor Option Selection Guide:

Unit w/ Standard Mounting Base
BA/HQ (**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**)(**#6**) - (**#7**) - (**#8**)

Unit w/ 60mm Mounting Base
BA/HQ60 (**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**)(**#6**) - (**#7**) - (**#8**)

#1: Display (required)
F .....Temperature Displayed in °F $35
C .....Temperature Displayed in °C..... $35
X .....No Display

#2: Temperature Sensor (required)
A .....1K Platinum RTD (385 curve)..... $25
B .....10K-2 Thermistor..... $18
C .....10K-3 Thermistor..... $18
D .....10K-3[11K] Thermistor..... $18
E .....20K Thermistor..... $18
F .....1.8K Thermistor..... $18
G.....1K Ω Nickel RTD $65
H.....3K Thermistor..... $18
X .....No Temperature Sensor

#3: Humidity (%RH) Sensor (required)
A .....4 to 20mA Output $260
B .....0 to 5V Output $260
C .....0 to 10V Output $260

#4: Setpoint Adjustment (required)
1.....Slider Setpoint Adjustment $6
X .....No Setpoint Adjustment

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

#6: Setpoint Output Range (required)
00.....0 to 5V (not available w/ 4 to 20mA %RH output)
10.....0 to 10V (not available w/ 4 to 20mA %RH output)
40.....0 to 1KΩ
60.....0 to 10KΩ
80.....0 to 20KΩ
81.....4.75K to 24.75KΩ
82.....6.19K to 26.19KΩ
84.....10K to 30KΩ
X .....No Setpoint Adjustment

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

#8: Optional Selections* (optional)
A .....Differential Ground
B .....Comm Jack C35..... $10
C .....Comm Jack C11** $20
D .....Comm Jack C22** $25
F .....Test & Balance Switch..... $7.50

*When more than one is selected, put in alphabetical order. Additional options and descriptions can be found on pg. I4.

**Comm Jacks C11 and C22 are available for display units only

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

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

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

Description:
BAPI-Stat Quantum Series Room Temp/Humidity Sensor, °F Display, 10K-2 Thermistor Temperature Sensor, 0 to 10 V Humidity Output, Slider Setpoint Adjustment, 50 to 90°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Override in Parallel with Sensor, No additional optional selections.

List Price:
$35 (Display) + $18 (Thermistor) + $260 (%RH) + $6 (Setpoint) + $5 (override) = $324 List Price

Your Number: BA/

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C4

BAPI-Stat 4™ Style Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

Rev. 11/18/20

Features & Options

- Patented BAPI Enclosure Styles
- Humidity Only or Temp./Humidity Combo
- 2% RH Accuracy
- Optional Display, Temperature Setpoint, Override and Comm. Jack
- Full-range Temperature Compensation of RH Signal
- Five Year Warranty

The BAPI-Stat 4 Style room units are available as humidity only sensors or as combination temperature and humidity sensor.

They are available with optional display, temperature setpoint adjustment, occupant override and three styles of communications jack.



BAPI-Stat 4 Units with optional Setpoint and Override

Specifications

Power:
10 to 35 VDC for 4 to 20 mA or 0 to 5 VDC Output
15 to 35 VDC for 0 to 10 VDC Output
12 to 24 VAC for 0 to 5 VDC Output
15 to 28 VAC for 0 to 10 VDC Output
(AC power requires a separate pair of shielded wires.)

Power Consumption:
20 mA max. for 4 to 20 mA Output
4 mA max. for 0 to 5 VDC and 0 to 10 VDC Output
0.1 VA max. for 0 to 5 VDC and 0 to 10 VDC Output

RH/Temp Sensor Construction:
Communicating Integrated Circuit

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

Temp: Semi-conductor Band Gap,
±0.3°C (±0.54°F) @ 20 to 40°C (68 to 104°F)

Field Calibration Adjustment:
±5% in 0.1% increments (Factory Calibrated)

Optional Passive Temperature Sensor Accuracy:
±0.36°F Thermistor, ±0.5°F RTD
(Higher accuracy available)

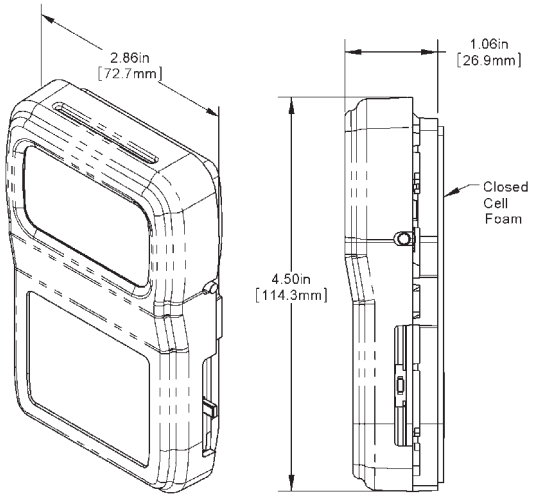
Wiring: 2 to 6 pair of 16 to 22 AWG*

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

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

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

Agency: RoHS and CE



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

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BAPI-Stat 4™ Style Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

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	3.5 mm Phono Style Jack	$10

#9: Common Ground (required)

CG	Common Ground

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

Example Number: BA/ (**10K-2**) - (**H205**) - (**B4DF**) - (**E**)(**80**) - (**L6**) - (**N**) - ( ) - (**CG**)

Actual Number (with parenthesis removed): BA/10K-2-H205-B4DF-E80-L6-N-CG

Description: 10K-2 Thermistor Temperature Sensor, 0 to 5V Humidity Output, BAPI-Stat 4 with °F Display, 60 to 80°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Cool/Warm Setpoint Legend, Override in Parallel with the Sensor, No Comm. Jack, Common Ground Configuration

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

Your Number: BA/

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BAPI-Stat “Quantum Prime” Temp & Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

Rev. 12/15/20

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.

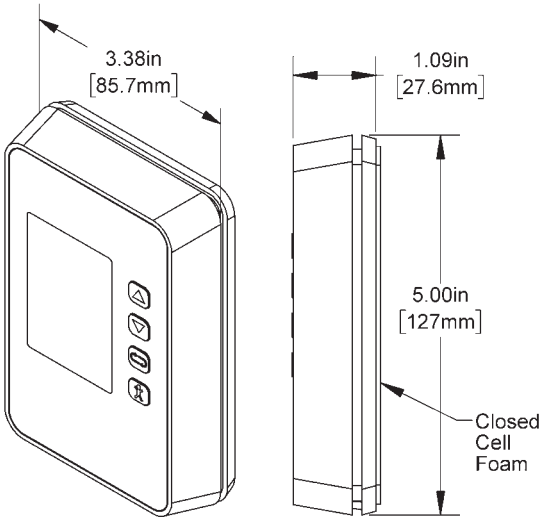


BAPI-Stat “Quantum Prime” Temp & Humidity Sensor

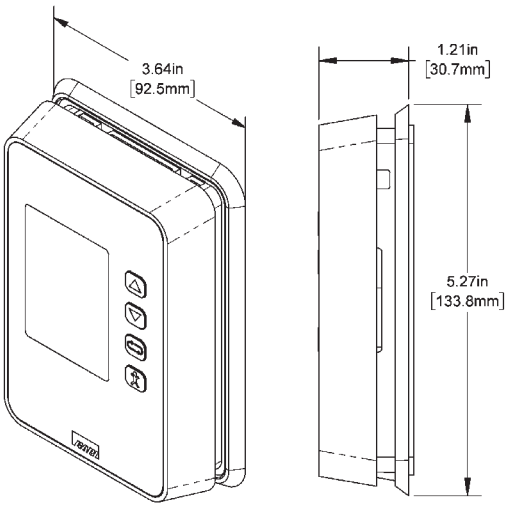
(image at right shown with optional 60mm mounting base)

5 YEAR WARRANTY

Dimensions



Unit with Standard Mounting Base



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

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Ordering Information

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

Specifications

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

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

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

Enclosure Material: ABS Plastic, UL 94, V-0

Agency: RoHS

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

BAPI-Stat 3™ Temp/Humidity Unit

Humidity or Combination Temp/Humidity Sensors

Rev. 12/12/16

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

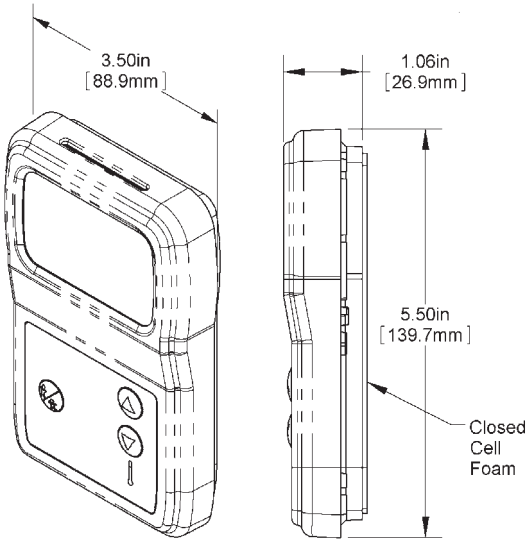
Optional Direct Temp. Sensor:
Thermistor or RTD (See Sensors Sect. for Specs.)

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.

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

Rev. 11/18/20

Humidity or Combination Temp/Humidity 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”

5 YEAR WARRANTY

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,
±0.3°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

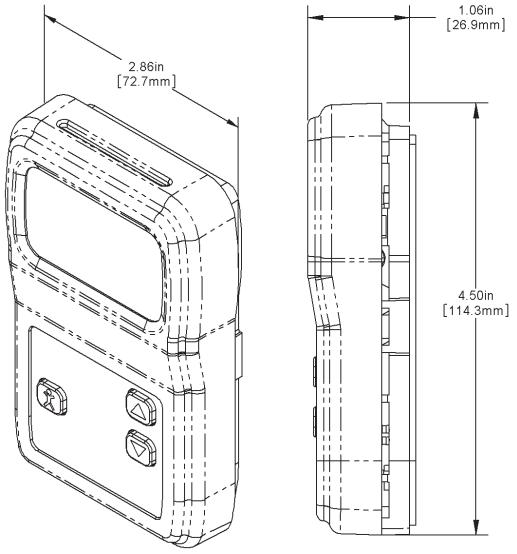
Termination: 8 Terminals, 16 to 22 AWG**

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

Enclosure Material: ABS Plastic, UL94V-0

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

Agency: RoHS



*AC power requires a separate pair of shielded wires.

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

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Delta Style Room Humidity Units

Humidity or Combination Temp/Humidity Sensors

Rev. 11/01/21

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 pages B10-11 of this section.



Delta Style Enclosures with and without Display

Specifications

Power:
10 to 35 VDC (0 to 5 VDC or 4 to 20 mA Outputs)
15 to 40 VDC (0 to 10 VDC Output)
12 to 24 VAC (0 to 5 VDC Output)
15 to 28 VAC (0 to 10 VDC Output)

Note: If AC power is used, it must be shielded from the signal wiring

Power Consumption:
22 mA max. DC (0 to 5 VDC or 4 to 20 mA Outputs)
6 mA max DC (0 to 10 VDC Output)
0.53 VA max. AC (0 to 5 VDC Output)
0.14 VA max. AC (0 to 10 VDC Output)

Sensing Elements:
Temperature - Thermistor or RTD
(See "Sensors" section for specs.)

Humidity - Capacitive Type,
±2% or ±3%RH @ 25°C (77°F), 0 to 90%RH

%RH Calibration Adjustment: ±5% POT

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

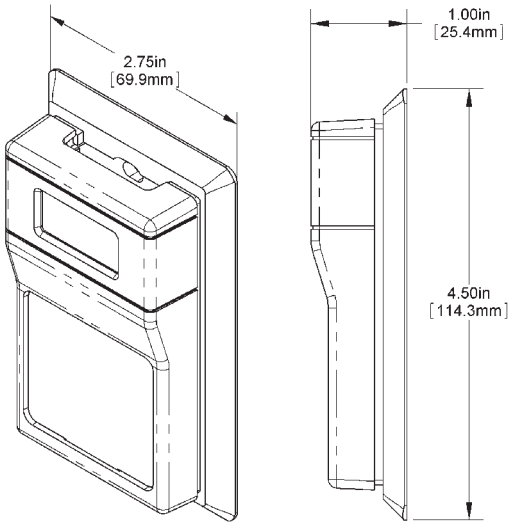
*BAPI recommends that you do not run wiring for the room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.

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

Environmental Operation Range:
Temp: 32 to 122 °F (0 to 50 °C)
Humidity: 5 to 95%, non-condensing

Material & Rating: ABS Plastic, UL94 HB

Agency: RoHS and CE



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Delta Style Room Humidity Units

Humidity or Combination Temp/Humidity Sensors

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

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

Delta Style Room Humidity Sensor Option Selection Guide:

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

#1: Temperature Sensor (optional)		**List Price**
1K[375]	1K Platinum RTD (375 curve)	$25
1K	1K Platinum RTD (385 curve)	$25
1.8K	1.8K Thermistor	$18
3K	3K Thermistor	$18
10K-2	10K-2 Thermistor	$18
10K-3	10K-3 Thermistor	$18
10K-3[11K]	10K-3[11K] Thermistor	$18
20K	20K Thermistor	$18
#2: Humidity Output (required)		
H200	Interchangeable 4 to 20mA or 0 to 5V Output	$260
H210	0 to 10V Output	$260
H212	2 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/

C12

BAPI-Stat 4 Modbus Room Sensor

Humidity or Combination Temp/Humidity Sensors

Rev. 11/18/20

Features & Options

- Modbus Serial Communications Protocol
- BAPI-Stat 4 Style Enclosure with Optional Large Display
- Robust Tactile Pushbuttons on Display Units
- Setpoint Adjustment on Display Unit with Optional Humidity Measurement, Fan Speed Control and Occupant Override
- Five Year Warranty

The BAPI-Stat 4MB unit features an optional large LCD with all the visual indicators on the display itself. Display units provide local indication of temperature with temperature setpoint adjustment and optional occupant override.

The unit is also available with humidity measurement and fan speed/mode adjustment for applications with fan coils, heat pumps or unit ventilators.

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.





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

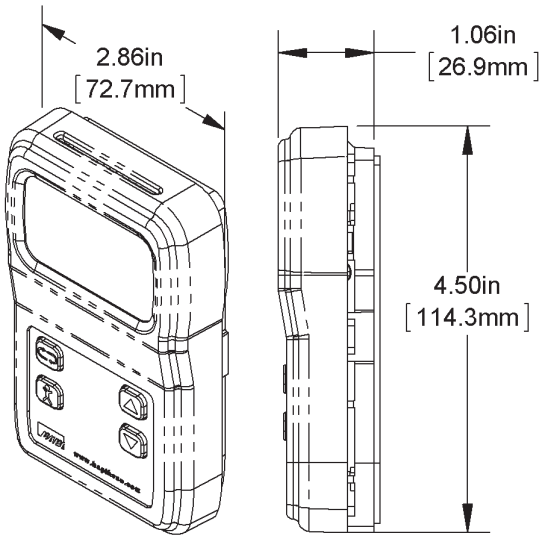
Sensor Accuracy:
Temp: ±0.3°C @ 20 to 40°C (68 to 104°F)
%RH: ±2%RH @ 25°C (77°F), 20 to 80%RH

Wiring: 2 pair of 14 to 22 AWG*

Mounting:
Standard 2" by 4" J-box
or drywall mount (screws provided)

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

Agency: RoHS and CE



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

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BAPI-Stat 4 Modbus Room Sensor

Humidity or Combination Temp/Humidity Sensors

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

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

BAPI-Stat 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.bapihvac.com

Example Number: BA/**BS4MB**(**F**) - (**E**) - (**H2**) - (**FN**) - (**J**)

Actual Number (with parenthesis removed): BA/BS4MBF-E-H2-FN-J

Description: BAPI-Stat 4MB Unit with Pushbutton Setpoint, °F Display, 60 to 80°F Setpoint Display Range, Humidity Measurement, No Fan Speed Adjustment, Override Enabled.

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

Your Number: BA/

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Outside Air Units

Humidity or Combination Temp/Humidity Sensors

Rev. 12/03/21

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
(only available for units with a humidity and temperature transmitter)

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 and Consumption:
10 to 35 VDC, 22 mA max. (for units with 0 to 5 VDC or 4 to 20 mA Humidity Outputs)
15 to 35 VDC, 6 mA max. (for units with 0 to 10 VDC Humidity Output)
12 to 27 VAC, 0.53 VA max. (for units with 0 to 5 VDC Humidity Outputs)
15 to 27 VAC, 0.14 VA max. (for units with 0 to 10 VDC Humidity Output)

Enclosure Dimensions: **H x W x D**
BAPI-Box.....5 x 4.1 x 2.5" (127 x 104 x 63.5mm)
BAPI-Box 2:.....4.9 x 2.8 x 2.35" (125 x 71.6 x 60mm)

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

Sensor:
Humidity:
Capacitive 2% or 3%RH
(10 to 90% RH @ 23°C)

Temperature:
Thermistor or RTD
(See Sensors section for specs)

Enclosure Rating:
IP66, NEMA 4

Enclosure Material:
UV-res. 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

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.

Outside Air Humidity Sensor Option Selection Guide

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

#1: Temperature Sensor or Transmitter (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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
Temperature Transmitters below require a BAPI-Box Enclosure		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212 °F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120 °F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100 °F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100 °C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49 °C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38 °C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Humidity Output (required)		
H200	±2% Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA	$240
H210	±2% Humidity Transmitter with 0 to 10 V Output	$240
H212	±2% Humidity Transmitter with 2 to 10 V Output	$240
H300	±3% Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA	$240
H310	±3% Humidity Transmitter with 0 to 10 V Output	$240
H312	±3% Humidity Transmitter with 2 to 10 V Output	$240

#3: Enclosure Style (required)		
O-BB2	BAPI-Box 2 (IP66, NEMA 4X)	$12
O-BB	BAPI-Box (for units with a humidity and temp transmitter only) (IP66, NEMA 4X)	$12

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**) - (**O-BB2**)

Actual Number (with parenthesis removed): BA/10K-2-H200-O-BB2

Description: 10K-2 Thermistor, 0 to 5V or 4 to 20mA Humidity Output, BAPI-Box 2 Enclosure.

List Price: $18 (Thermistor) + $240 (Humidity) + $12 (BAPI-Box 2) = $270 List Price

Your Number: BA/

Duct Units

Humidity or Combination Temp/Humidity Sensors

Rev. 12/03/21

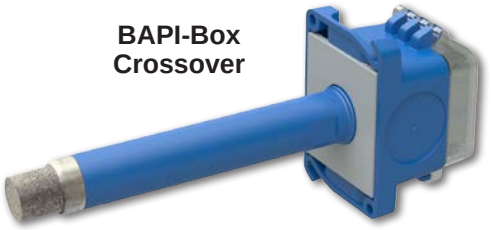
Features & Options

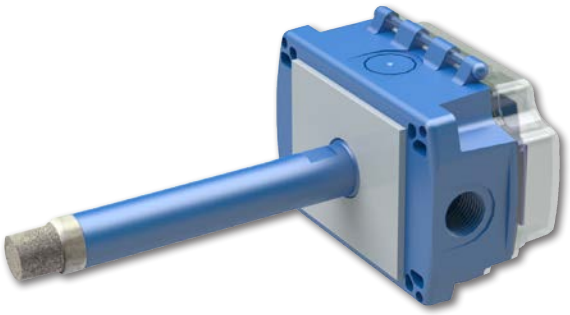
- 10 Points of Calibration from 10 to 90% RH
- Humidity Only or Temp./Humidity Combination
- Replaceable Stainless Steel Filter
- Green Power Indication LED on BAPI-Box Crossover Units
- 2% and 3% RH Accuracies

Humidity control is an important aspect of any climate control system. Therefore, humidity sensors must be both accurate and dependable. BAPI's humidity transmitters are calibrated at 10 points from 10 to 90% RH for accuracy, eliminating field calibration.

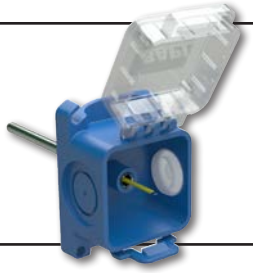
The Duct Units are also extremely dependable, featuring two of the most watertight enclosures available today. The BAPI-Box and BAPI-Box Crossover Enclosures are made of UV-resistant polycarbonate and carry an IP66 rating. The BAPI-Box is only available for units with a temperature transmitter and a humidity transmitter.

BAPI-Box Crossover





BAPI-Box
(only available for units with a temperature transmitter and a humidity transmitter)



The BAPI-Box Crossover Enclosure

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

(Unit shown with knockplug plug sold separately.)

Specifications

Power and Consumption:
10 to 35 VDC, 22 mA max. (for units with 0 to 5 VDC or 4 to 20 mA Humidity Outputs)
15 to 35 VDC, 6 mA max. (for units with 0 to 10 VDC Humidity Output)
12 to 27 VAC, 0.53 VA max. (for units with 0 to 5 VDC Humidity Outputs)
15 to 27 VAC, 0.14 VA max. (for units with 0 to 10 VDC Humidity Output)

Enclosure Dimensions: **H x W x D**
BAPI-Box Crossover:.....3.1 x 2.2 x 1.9" (79 x 56 x 49mm)
BAPI-Box.....5 x 4.1 x 2.5" (127 x 104 x 63.5mm)

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

Sensor:
Humidity:
Capacitive 2% or 3%RH (10 to 90% RH @ 23°C)

Temperature:
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

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

UV-resistant Polycarbonate, UL94 V-0

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

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

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

Duct Humidity Sensor Option Selection Guide

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

#1: Temperature Sensor or Transmitter (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 Platinum RTD (375 curve)	$25
1K[NI]	1K Ω Nickel RTD	$65
1K	1K Platinum RTD (385 curve)	$25
Temperature Transmitters below require a BAPI-Box Enclosure		
T1K[32 TO 212F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212 °F Range	$125
T1K[20 TO 120F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120 °F Range	$125
T1K[0 TO 100F]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100 °F Range	$125
T1K[0 TO 100C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100 °C Range	$125
T1K[-7 TO 49C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49 °C Range	$125
T1K[-18 TO 38C]	1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38 °C Range	$125

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Humidity Output (required)		
H200	±2% Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA	$240
H210	±2% Humidity Transmitter with 0 to 10 V Output	$240
H212	±2% Humidity Transmitter with 2 to 10 V Output	$240
H300	±3% Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA	$240
H310	±3% Humidity Transmitter with 0 to 10 V Output	$240
H312	±3% Humidity Transmitter with 2 to 10 V Output	$240

#3: Enclosure Style (required)		
D-BBX	BAPI-Box Crossover (IP10, NEMA 1)	$0
D-BB	BAPI-Box (for units with a humidity and temperature transmitter only)	$12

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

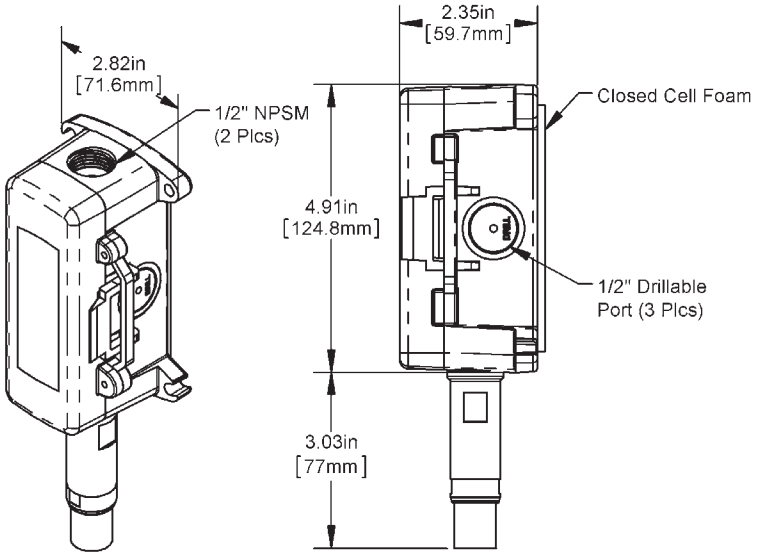
Example Number: BA/(**10K-2**) - (**H200**) - (**D-BBX**)

Actual Number (with parenthesis removed): BA/10K-2-H200-D-BBX

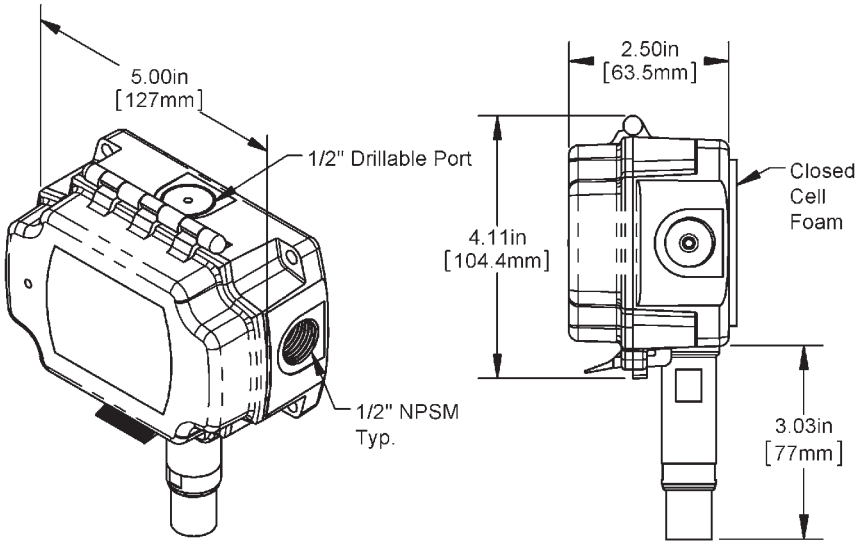
Description: 10K-2 Thermistor, 0 to 5V or 4 to 20mA Humidity Output, BAPI-Box Crossover IP10-rated Enclosure.

List Price: $18 (Thermistor) + $240 (Humidity) = $258 List Price

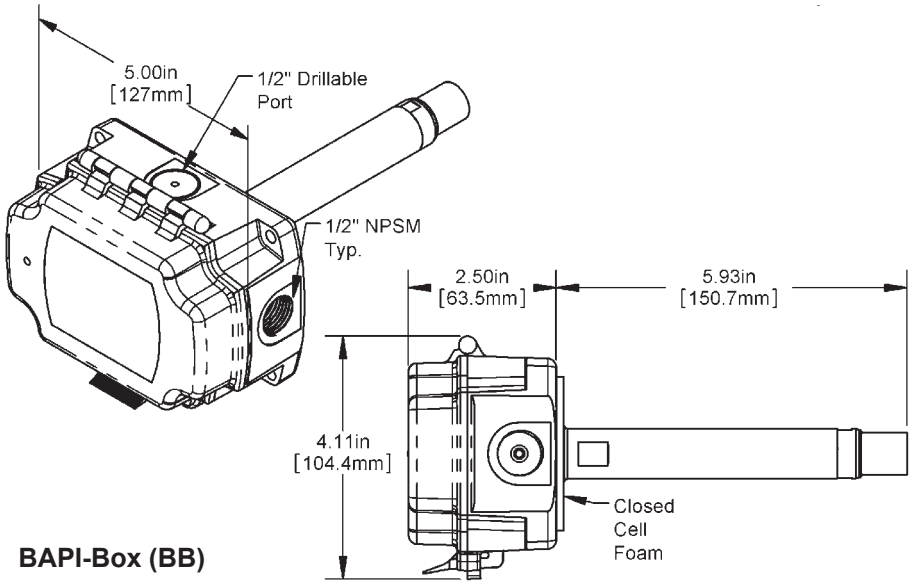
Your Number: BA/



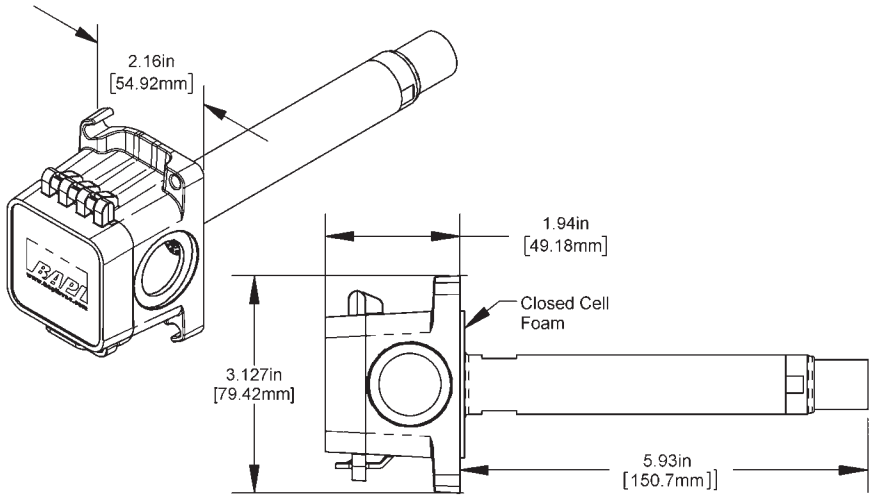
BAPI-Box 2 (BB2)



BAPI-Box (BB)



BAPI-Box (BB)



BAPI-Box Crossover (BBX)

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EZ Pressure
Panel Mount with Low & Standard Ranges



pg D2

ZPM Pressure
IP44-Rated Unit



pg D4

ZPM in a BAPI-Box
IP66-Rated Unit



pg D6

ZPT Touch Pressure
Low & Standard Ranges



pg D8

Fixed Range Pressure
Low & Standard Ranges



pg D10

Room Pressure
Pickup Ports



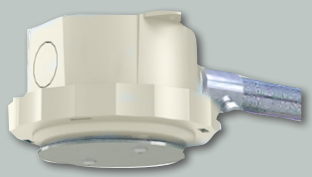
pg D12

Ceiling and Wall Plate
Pickup Ports



pg D12

Outside Air
Pickup Port



pg D14

Pressure Probes
and Accessories



pg D16

BAPI-Box
Pressure Switch



pg D18

Beck Adjustable
Pressure Switch



pg D20

D2

EZ Pressure Sensor

Zone Pressure Sensors (ZPS)

CE Rev. 07/06/21

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
- Free NIST Certificate Included with Each Unit at No Extra Charge
- Mounts in DIN Rail, Snaptrack or Directly to the Panel Backplane
- Display That Aids in Troubleshooting by Showing Pressure Over Entire Operational Range



EZ Pressure Sensor

5 YEAR WARRANTY

Specifications

Power:
7 to 40 VDC (4 to 20 mA Output)
7 to 40 VDC or 18 to 28 VAC (0 to 5 VDC Output)
13 to 40 VDC or 18 to 28 VAC (0 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 VDC or 0 to 10 VDC output 1KΩ minimum

Accuracy for Standard Pressure Ranges at 72°F:
±0.25% of range

Accuracy for Low Pressure Ranges at 72°F:
±0.5% of range for the three lowest unidirectional and bidirectional ranges

±0.25% of range all other ranges

Stability: ±0.25% F.S. per year

Environmental Operation Range:
14°F to 140°F (-10°C to 60°C)

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

Temperature Error for Standard Ranges:
0.01% FS/°F (0.02% FS/°C)
(±5.0" W.C. @ 14 to 140°F [-10 to 60°C])

Temperature Error for Low Ranges:
0.04% FS/°F (0.07% FS/°C)
(±1.0" W.C. @ 14 to 140°F [-10 to 60°C])

Overpressure: Proof: 27.68" W.C. (1 PSI),
Burst: 41.52" W.C. (1.5 PSI)

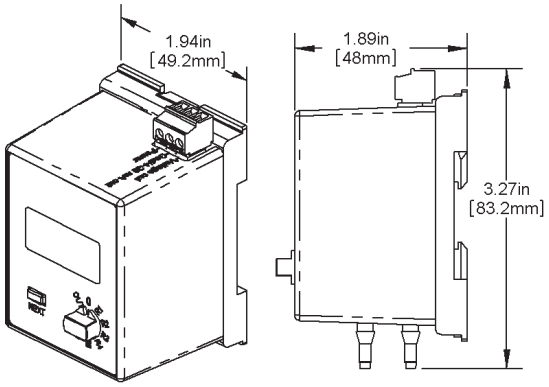
Wiring: Removable terminal block (14 to 24 AWG)*
2 wires (4 to 20mA Current loop)*
3 wires (AC or DC powered, Voltage out)*

Humidity: 0 to 95% RH, non-condensing

Port Connection: 1/4" tubing (1/8" to 3/16" I.D.)

Enclosure Material: ABS Plastic, UL94 V-0

Mounting: DIN Rail, Snaptrack or Surface



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

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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	$320
ZPS-SR-EZ-NT-PA	Standard Range Unit, Pascals, Display, No Tube or Probe included	$320
ZPS-SR-EZ-ST-IN	Standard Range Unit, Inches WC, Display with Static Pressure Probe	$320
ZPS-SR-EZ-ST-PA	Standard Range Unit Pascals, Display with Static Pressure Probe	$320
ZPS-LR-EZ-NT-IN	Low Range Unit, Inches WC, Display, No Tube or Probe included	$320
ZPS-LR-EZ-NT-PA	Low Range Unit, Pascals, Display, No Tube or Probe included	$320
ZPS-LR-EZ-ST-IN	Low Range Unit, Inches WC, Display with Static Pressure Probe	$320
ZPS-LR-EZ-ST-PA	Low Range Unit Pascals, Display with Static Pressure Probe	$320

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)** - **(#4)**

#1: Pressure Output (required)
20..... 4 to 20 mA
05..... 0 to 5 V
10..... 0 to 10 V

#2: Pressure Range (required)

LOW RANGES

WC Ranges	Pascal Ranges
LR51.. 0 to 0.10	LR61 .....0 to 30
LR52.. 0 to 0.25	LR62 .....0 to 50
LR53.. 0 to 0.50	LR63 .....0 to 100
LR54.. 0 to 0.75	LR64 .....0 to 175
LR55.. 0 to 1.00	LR65 .....0 to 250
LR56.. -0.10 to 0.10	LR66 ..... -30 to 30
LR57.. -0.25 to 0.25	LR67 ..... -50 to 50
LR58.. -0.50 to 0.50	LR68 ..... -100 to 100
LR59.. -0.75 to 0.75	LR69 ..... -175 to 175
LR60.. -1.00 to 1.00	LR70 ..... -250 to 250

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

#2: Pressure Range continued...

STANDARD RANGES

WC Ranges	Pascal Ranges
SR71.. 0 to 1.00	SR81.....0 to 250
SR72.. 0 to 2.00	SR82.....0 to 300
SR73.. 0 to 2.50	SR83.....0 to 500
SR74.. 0 to 3.00	SR84.....0 to 1,000
SR75.. 0 to 5.00	SR85.....0 to 1,250
SR76.. -1.00 to 1.00	SR86..... -250 to 250
SR77.. -2.00 to 2.00	SR87..... -300 to 300
SR78.. -2.50 to 2.50	SR88..... -500 to 500
SR79.. -3.00 to 3.00	SR89.. -1,000 to 1,000
SR80.. -5.00 to 5.00	SR90.. -1,250 to 1,250

#3: Static Pressure Tube (required)
EZ-NT .. No Tube included
EZ-ST .. Static Pressure Tube included

#4: Display (optional)
D..... LCD (See Note below)

Note: The display is always present. If you do not select the display option, the display will show the word “On” rather than the current pressure.

Example Number: ZPS - (**05**) - (**SR72**) - (**EZ-ST**) - (**D**)

Actual Number (with parenthesis removed): ZPS-05-SR72-EZ-ST-D

Description: 0 to 5 V Output, 0 to 2” WC Pressure Range, EZ Unit with Static Tube and Display.

List Price: $320 for all units

Your Number: ZPS-

ZPM Pressure Sensor

Zone Pressure Multi-Sensors (ZPM)

CE Rev. 12/06/21

Features & Options

- 10 Pressure Ranges and 5 Output Options
- Standard, Low and High Range Models
- Non-Flow-Through Sensor so There's No Cross Contamination of Air



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

- Outputs, Ranges and Units all Easily Set in the Field Without Power
- NIST Certificate Included with With Each Unit 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.



5 YEAR WARRANTY

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 6KΩ Minimum

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)
High Range Unit: ±0.075" WC (±18.66 Pa)

Stability: ±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

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Ordering Information

STANDARD RANGE UNITS

PART NUMBER	DESCRIPTION	LIST PRICE
BA/ZPM-SR-NT-D	ZPM Standard Range, No Probe included, with Display	$320
BA/ZPM-SR-ST-D	ZPM Standard Range, with Static Pressure Probe and Display	$320
BA/ZPM-SR-AT-D	ZPM Standard Range, with Attached Static Probe and Display	$320
BA/ZPM-SR-NT-ND	ZPM Standard Range, No Probe included, No Display	$320
BA/ZPM-SR-ST-ND	ZPM Standard Range, with Static Pressure Probe, No Display	$320
BA/ZPM-SR-AT-ND	ZPM Standard Range, with Attached Static Probe, No Display	$320

LOW RANGE UNITS

BA/ZPM-LR-NT-D	ZPM Low Range, No Probe included, with Display	$320
BA/ZPM-LR-ST-D	ZPM Low Range, with Static Pressure Probe and Display	$320
BA/ZPM-LR-AT-D	ZPM Low Range, with Attached Static Probe and Display	$320
BA/ZPM-LR-NT-ND	ZPM Low Range, No Probe included, No Display	$320
BA/ZPM-LR-ST-ND	ZPM Low Range, with Static Pressure Probe, No Display	$320
BA/ZPM-LR-AT-ND	ZPM Low Range, with Attached Static Probe, No Display	$320

HIGH RANGE UNITS

BA/ZPM-HR-NT-D	ZPM High Range, No Probe included, with Display	$320
BA/ZPM-HR-ST-D	ZPM High Range, with Static Pressure Probe and Display	$320
BA/ZPM-HR-AT-D	ZPM High Range, with Attached Static Probe and Display	$320
BA/ZPM-HR-NT-ND	ZPM High Range, No Probe included, No Display	$320
BA/ZPM-HR-ST-ND	ZPM High Range, with Static Pressure Probe, No Display	$320
BA/ZPM-HR-AT-ND	ZPM High Range, with Attached Static Probe, No Display	$320

Pressure Range, Output Range and Inches of Water Column or Pascal Operation will be selected in the field for these units. Ranges and Outputs shown below:

Custom Ranges are also available. Contact your BAPI representative for ordering information.

Your Number: BA/ZPM-

Field Selectable Ranges and Outputs

STANDARD RANGE UNITS

Inches WC	Pascals
0 to 1.00	0 to 250
0 to 2.00	0 to 300
0 to 2.50	0 to 500
0 to 3.00	0 to 1,000
0 to 5.00	0 to 1,250
-1.00 to 1.00	-250 to 250
-2.00 to 2.00	-300 to 300
-2.50 to 2.50	-500 to 500
-3.00 to 3.00	-1,000 to 1,000
-5.00 to 5.00	-1,250 to 1,250

LOW RANGE UNITS

Inches WC	Pascals
0 to 0.10	0 to 30
0 to 0.25	0 to 50
0 to 0.50	0 to 100
0 to 0.75	0 to 175
0 to 1.00	0 to 250
-0.10 to 0.10	-30 to 30
-0.25 to 0.25	-50 to 50
-0.50 to 0.50	-100 to 100
-0.75 to 0.75	-175 to 175
-1.00 to 1.00	-250 to 250

HIGH RANGE UNITS

Inches WC	Pascals
0 to 5	0 to 1,250
0 to 10	0 to 2,500
0 to 15	0 to 4,000
0 to 25	0 to 6,000
0 to 30	0 to 7,400

OUTPUTS AVAILABLE

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

ZPM BAPI-Box Pressure Sensor

Zone Pressure Multi-Sensor (ZPM) in an IP66 enclosure CE Rev. 12/06/21

Features & Options

- 10 Pressure Ranges and 5 Output Options
- Standard, Low and High Range Models
- Non-Flow-Through Sensor so There's No Cross Contamination of Air



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

- IP66-rated Enclosure with Thumb Latch Closure
- NIST Certificate Included with With Each Unit at No Extra Charge
- Outputs, Ranges and Units all Easily Set in the Field Without Power
- 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



5 YEAR WARRANTY

ZPM BAPI-Box Pressure Sensor



IP44-Rated ZPM Unit

An IP44-rated version of the ZPM pressure sensor is also available. See pgs D4-5.

Specifications

Power:
7 to 40 VDC (4 to 20 mA Output)
7 to 40 VDC or 18 to 32 VAC (0 to 5 or 1 to 5 VDC Output)
13 to 40 VDC or 18 to 32 VAC (0 to 10 or 2 to 10 VDC Output)

Power Consumption:
20 mA max, DC only at 4 to 20 mA Output
5.2 mA max DC at 0 to 5 or 0 to 10 VDC Output
0.12 VA max AC at 0 to 5 or 0 to 10 VDC Output

Load Resistance:
4 to 20 mA Output 850 Ω Maximum @ 24 VDC
0 to 5 or 0 to 10 VDC Output 6KΩ Minimum

Accuracy: ±0.25% FS at 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: ±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: IP66, NEMA 4

Enclosure Dimensions: H x W x D
5.49 x 4.11 x 2.5" (139 x 104 x 64mm)
(See end of section for full dimension drawing)

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

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ZPM BAPI-Box Pressure Sensor

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

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-BB	ZPM BAPI-Box Standard Range, No Probe included, with Display	$385
BA/ZPM-SR-ST-D-BB	ZPM BAPI-Box Standard Range, with Static Pressure Probe and Display	$385
BA/ZPM-SR-AT-D-BB	ZPM BAPI-Box Standard Range, with Attached Static Probe and Display	$385
BA/ZPM-SR-NT-ND-BB	ZPM BAPI-Box Standard Range, No Probe included, No Display	$385
BA/ZPM-SR-ST-ND-BB	ZPM BAPI-Box Standard Range, with Static Pressure Probe, No Display	$385
BA/ZPM-SR-AT-ND-BB	ZPM BAPI-Box Standard Range, with Attached Static Probe, No Display	$385

LOW RANGE UNITS

BA/ZPM-LR-NT-D-BB	ZPM BAPI-Box Low Range, No Probe included, with Display	$385
BA/ZPM-LR-ST-D-BB	ZPM BAPI-Box Low Range, with Static Pressure Probe and Display	$385
BA/ZPM-LR-AT-D-BB	ZPM BAPI-Box Low Range, with Attached Static Probe and Display	$385
BA/ZPM-LR-NT-ND-BB	ZPM BAPI-Box Low Range, No Probe included, No Display	$385
BA/ZPM-LR-ST-ND-BB	ZPM BAPI-Box Low Range, with Static Pressure Probe, No Display	$385
BA/ZPM-LR-AT-ND-BB	ZPM BAPI-Box Low Range, with Attached Static Probe, No Display	$385

HIGH RANGE UNITS

BA/ZPM-HR-NT-D-BB	ZPM BAPI-Box High Range, No Probe included, with Display	$385
BA/ZPM-HR-ST-D-BB	ZPM BAPI-Box High Range, with Static Pressure Probe and Display	$385
BA/ZPM-HR-AT-D-BB	ZPM BAPI-Box High Range, with Attached Static Probe and Display	$385
BA/ZPM-HR-NT-ND-BB	ZPM BAPI-Box High Range, No Probe included, No Display	$385
BA/ZPM-HR-ST-ND-BB	ZPM BAPI-Box High Range, with Static Pressure Probe, No Display	$385
BA/ZPM-HR-AT-ND-BB	ZPM BAPI-Box High Range, with Attached Static Probe, No Display	$385

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

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D8

"Touch" Pressure Sensor

Zone Pressure Touch Sensors (ZPT)

CE Rev. 07/06/21

Features & Options

- Field Selectable Output, Ranges and WC or Pascal Units
- Optional Attached Static Pressure Probe So the Unit Doesn't Require Two Trades to Install
- Standard Range (-5 to +5 WC or -1,250 to +1,250 Pascals) or Low Range (-1.0 to +1.0 WC or -250 to +250 Pascals)
- Free NIST Certificate Included with Each Unit at No Extra Charge
- Rugged IP66, NEMA 4 Enclosure with Hinged Cover
- Custom Pressure Ranges Can be Created in the Field
- Touch Interface Through the Cover, No More Dip Switches
- Display That Aids in Troubleshooting by Showing Pressure Over Entire Operational Range

Patent Pending



Touch 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 V Output)
13 to 40 VDC or 18 to 32 VAC (0 to 10 or 2 to 10 V Output)

Power Consumption:
20 mA max, DC only at 4 to 20 mA Output
4.9 mA max DC at 0 to 5 VDC or 0 to 10 VDC Output
0.12 VA max AC at 0 to 5 VDC or 0 to 10 VDC Output

Load Resistance:
4 to 20 mA Output 850 Ω Maximum @ 24 VDC
0 to 5 V or 0 to 10 V output 1KΩ minimum

Accuracy for Standard Pressure Ranges at 72°F:
±0.25% of range

Accuracy for Low Pressure Ranges at 72°F:
±0.5% of range for the three lowest unidirectional and bidirectional ranges

±0.25% of range all other ranges

Stability: ±0.25% F.S. per year

Environmental Operation Range:
14°F to 140°F (-10°C to 60°C)

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

Temperature Error for Standard Ranges:
0.01% FS/°F (0.02% FS/°C)
(±5.0" W.C. @ 14 to 140°F [-10 to 60°C])

Temperature Error for Low Ranges:
0.04% FS/°F (0.07% FS/°C)
(±1.0" W.C. @ 14 to 140°F [-10 to 60°C])

Overpressure: Proof: 27.68 in W.C (1 PSI),
Burst: 41.52 in W.C. (1.5 PSI)

Wiring:
2 wires (4 to 20mA Current loop)*
3 wires (AC or DC powered, Voltage out)*

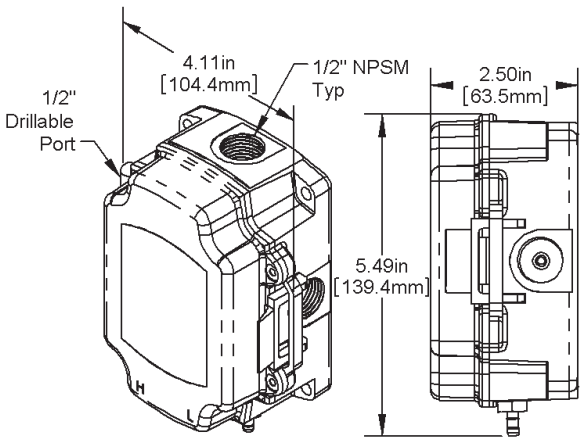
Humidity: 0 to 95% RH, non-condensing

Port Connection:
1/4" tubing (1/8" to 3/16" I.D.)

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

Enclosure Rating: IP66, NEMA 4

Mounting:
Four external tabs with holes for #10 screws



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

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Ordering Information (for units without a factory specified range or output)

PART NUMBER	DESCRIPTION	LIST PRICE
ZPT-SR-BB-NT-D	Standard Range Unit, Display, No Tube or Probe included	$350
ZPT-SR-BB-ST-D	Standard Range Unit, Display with Static Pressure Probe	$350
ZPT-SR-BB-AT-D	Standard Range Unit, Display with Attached Static Probe	$350
ZPT-LR-BB-NT-D	Low Range Unit, Inches WC, Display, No Tube or Probe included	$350
ZPT-LR-BB-ST-D	Low Range Unit, Inches WC, Display with Static Pressure Probe	$350
ZPT-LR-BB-AT-D	Low Range Unit, Inches WC, Display with Attached Static Probe	$350

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 Touch Pressure Option Selection Guide

ZPT - **(#1) - (#2) - (#3) - (#4)**

#1: Pressure Output (required)

20..... 4 to 20 mA
05..... 0 to 5 V
10..... 0 to 10 V
12..... 2 to 10 V
15..... 1 to 5 V

#2: Pressure Range (required)

LOW RANGES

WC Ranges		Pascal Ranges	
LR51	0 to 0.10	LR61	0 to 30
LR52	0 to 0.25	LR62	0 to 50
LR53	0 to 0.50	LR63	0 to 100
LR54	0 to 0.75	LR64	0 to 175
LR55	0 to 1.00	LR65	0 to 250
LR56	-0.10 to 0.10	LR66	-30 to 30
LR57	-0.25 to 0.25	LR67	-50 to 50
LR58	-0.50 to 0.50	LR68	-100 to 100
LR59	-0.75 to 0.75	LR69	-175 to 175
LR60	-1.00 to 1.00	LR70	-250 to 250

Factory set Custom Ranges are available for these units. Contact your BAPI representative for ordering.

#2: Pressure Range continued...

STANDARD RANGES

WC Ranges		Pascal Ranges	
SR71	0 to 1.00	SR81	0 to 250
SR72	0 to 2.00	SR82	0 to 300
SR73	0 to 2.50	SR83	0 to 500
SR74	0 to 3.00	SR84	0 to 1,000
SR75	0 to 5.00	SR85	0 to 1,250
SR76	-1.00 to 1.00	SR86	-250 to 250
SR77	-2.00 to 2.00	SR87	-300 to 300
SR78	-2.50 to 2.50	SR88	-500 to 500
SR79	-3.00 to 3.00	SR89	-1,000 to 1,000
SR80	-5.00 to 5.00	SR90	-1,250 to 1,250

#3: Static Pressure Tube (required)

BB-NT .. No Tube included
BB-ST .. Static Pressure Tube included
BB-AT .. Attached Static Pressure Probe

#4: Display (optional)

D..... LCD (See Note below)

Note: The display is always present. If you do not select the display option, the display will show the word "On" rather than the current pressure.

Example Number: ZPT - (**05**) - (**SR72**) - (**BB-ST**) - (**D**)

Actual Number (with parenthesis removed): ZPT-05-SR72-BB-ST-D

Description: 0-5 V Output, 0 to 2" WC Pressure Range, Touch Unit with Static Tube and Display.

List Price: $350 for all units

Your Number: ZPT-

D10 Fixed Range Pressure

Zone Pressure Sensors (ZPS)

Rev. 01/07/21

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
- Free NIST Certificate Included with Each Unit at No Extra Charge
- Rugged IP66, NEMA 4 Enclosure with Hinged Cover
- Visible 5-Color LED to Indicate Current Pressure Status Without Having to Access the BAS



Fixed Range Pressure

Specifications

Power:
18 to 28 VAC, 0.4 VA max
9 to 32 VDC with 0 to 5V output, 10 mA max
13 to 32 VDC with a 0 to 10V out, 10mA max

Accuracy at 72°F
±1% for pressures ≤ 0.25" WC (62.5 Pa)
±0.5% for pressures > 0.25" WC (62.5 Pa)

Temperature Error
0.01% FS/°F (0.02% FS/°C)
(±5.0 in WC [1,250 Pa] @ 14 to 140°F [-10 to 60°C])

0.04% FS/°F (0.07% FS/°C)
(±1.0 in WC [250 Pa] @ 14 to 140°F [-10 to 60°C])

Environmental Operation Range:
14°F to 140°F (-10°C to 60°C)

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

Stability: 0.15% FS per year

Overpressure
Proof: 27.68 in W.C. (1 PSI)
Burst: 41.52 in W.C. (1.5 PSI)

Wiring*: 3-wires, AC or DC powered, Voltage out

Humidity: 0 to 95% RH, non-condensing

Port Connection: 1/4" tubing (1/8" to 3/16" I.D.)

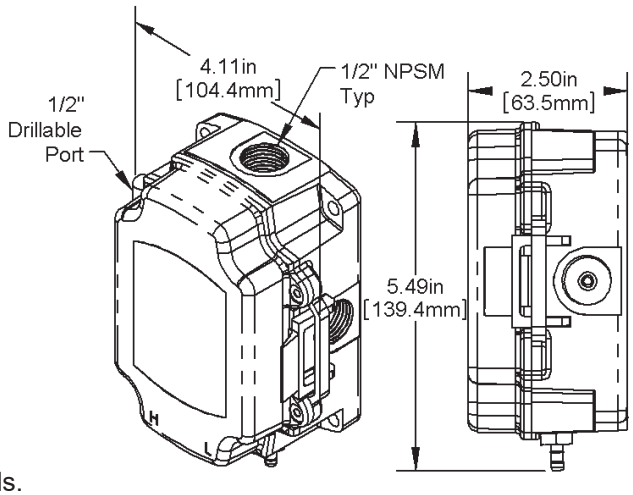
*__BAPI__ recommends that you do not run wiring for the pressure transmitter in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators, and coils.

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

Enclosure Rating: IP66, NEMA 4

5-Color LED:
Red – over pressure
Green – top half of span
Amber – center of span
Blue – bottom half of span
Purple – under pressure

Mounting:
Four external tabs with holes for #10 screws



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Fixed Range Pressure Option Selection Guide

ZPS - **(#1) - (#2) - (#3)**

#1: Pressure Output (required)
05..... 0 to 5 V
10..... 0 to 10 V
12..... 2 to 10 V
15..... 1 to 5 V

#2: Pressure Range (required)

UNIDIRECTIONAL RANGES

WC Ranges	Pascal Ranges
FR51.. 0 to 0.10	FR61.....0 to 30
FR52.. 0 to 0.25	FR62.....0 to 50
FR53.. 0 to 0.50	FR63.....0 to 100
FR55.. 0 to 1.00	FR65.....0 to 250
FR91.. 0 to 1.25	FR82.....0 to 300
FR73.. 0 to 2.50	FR83.....0 to 500
FR74.. 0 to 3.00	FR84.....0 to 1,000
FR75.. 0 to 5.00	FR85.....0 to 1,250

#2: Pressure Ranges continued...

BIDIRECTIONAL RANGES

WC Ranges	Pascal Ranges
FR56.. -0.10 to 0.10	FR66..... -30 to 30
FR57.. -0.25 to 0.25	FR67..... -50 to 50
FR58.. -0.50 to 0.50	FR68..... -100 to 100
FR60.. -1.00 to 1.00	FR70..... -250 to 250
FR96.. -1.25 to 1.25	FR87..... -300 to 3000
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)
BB-NT.. No Tube included
BB-ST .. Static Pressure Tube included
BB-AT .. Attached Static Pressure Probe

Factory set Custom Ranges are available for these units. Contact your BAPI representative for ordering.

Example Number: ZPS - (**05**) - (**FR73**) - (**BB-ST**)
Actual Number (with parenthesis removed): ZPS-05-FR72-BB-ST
Description: 0 to 5 V Output, 0 to 2.50” WC Pressure Range, FRP Unit with Static Tube.
List Price: $235 for any unit.

Your Number: ZPS-

D12 Zone Pressure Pickup Ports

Zone Pressure Sensors (ZPS)

Rev. 02/24/21

Features & Options

- Wall and Ceiling Ports That Are Economical & Easy to Install
- Includes 80 Micron Sintered SS Filter To Prevent Insects or Debris from Entering or Plugging the Tubing
- Accommodates 1/8" I.D. to 5/32" I.D. Tubing
- Modern BAPI-Stat "Quantum" Enclosure Style on Room Ports
- Low Profile "Button" Pickup Port That Is Smaller Than a Quarter in Size and Blends In With Its Surroundings



Wall Plate



Low Profile Port



Ceiling Mount Square Cover



BAPI-Stat "Quantum"
(Right unit shown with 60mm mounting base for European wall boxes. Unit is also available with a temp sensor.)

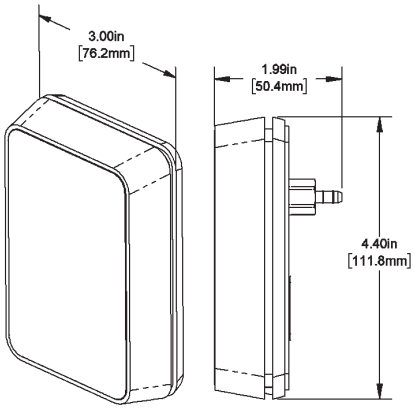
Specifications

Environmental Operating Range:
Wall & Ceiling Plates: 32 to 122°F (0 to 50°C) • 0% to 95% RH, non-condensing
Low Profile Port: -40 to 185ºF (-40 to 85ºC) • 0% to 100% RH, non-condensing

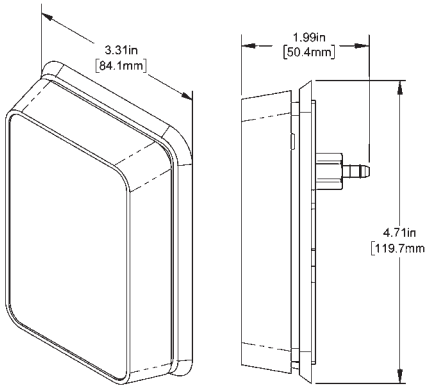
Material:
Quantum, Delta Style & Low Profile:
ABS Plastic, UL 94, V-0

Wall Plate:
Stainless Steel

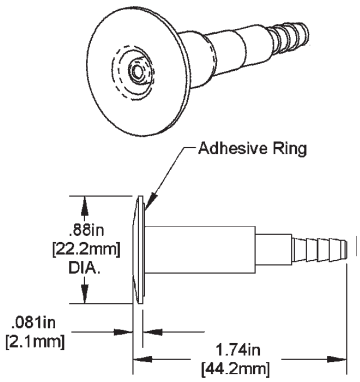
Ceiling Plate:
Galvanized Steel



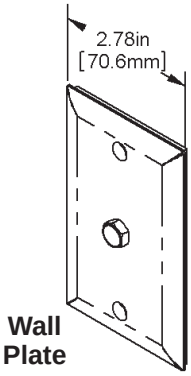
BAPI-Stat "Quantum" Enclosure
(with standard mounting base)



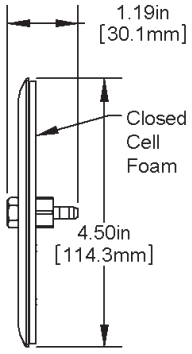
BAPI-Stat "Quantum" Enclosure
(with optional 60mm mounting base for European wall boxes)

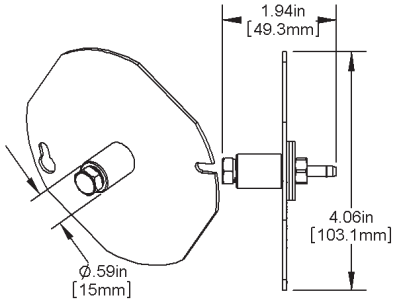


Low Profile Port



Wall Plate





Ceiling Mount Cover

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

Pressure Pickup Ports Option Selection Guide

ZPS-ACC (**#1**) - (**#2**)

#1: Pickup Port (required)

01	2” X 4” Stainless Steel Wall Plate with Static Pickup	$18
04	BAPI-Stat “Quantum” with Static Pickup, standard mounting base	$15
04-60	BAPI-Stat “Quantum” with Static Pickup, 60mm mounting base	$15
05	Ceiling Mount Square Cover with Static Pickup	$15
20	Low Profile Pressure Pickup Port	$30

#2: Temperature Sensor (optional, not available for 05 and 20 above)

18	1.8K Thermistor	$18
3	3K Thermistor	$18
102	10K-2 Thermistor	$18
103	10K-3 Thermistor	$18
10311	10K-3[11K] Thermistor	$18
20	20K Thermistor	$18
1375	1K Platinum RTD (375 curve)	$25
1	1K Platinum RTD (385 curve)	$25

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

Example Number: ZPS-ACC(**04**) - (**102**)

Actual Number (with parenthesis removed): ZPS-ACC04-102

Description: BAPI-Stat “Quantum” Style Enclosure with Static Pickup, 10K-2 Thermistor Temperature Sensor.

List Price: $15 (BAPI-Stat “Quantum” Style Enclosure) + $18 (Thermistor) = $33 List Price

Your Number: ZPS/ACC

Outside Air Pressure Pickup Port

Zone Pressure Sensors (ZPS)

Rev. 01/11/21

Features & Options

- Rooftop and Wall Mount or Vertical Mount for Building Soffits or Ceilings.
- Rugged, UV-Resistant and Flame-Retardant Plastic to Perform and Last Under Harsh Conditions
- Parallel Plate Design Reduces Fluctuations from Wind Gusts for More Stable Readings



Rooftop and Wall Mount Unit on an RTU and a Wall
(Conduit and tubing not included)

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:

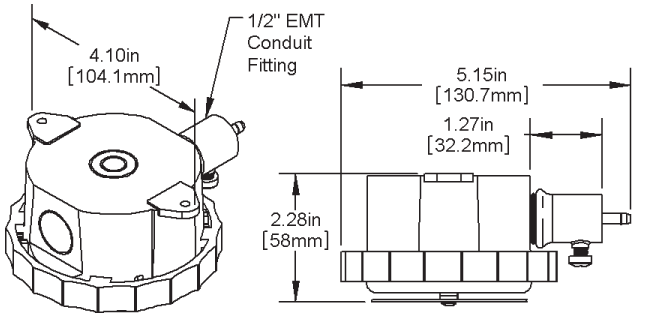
Temperature:
-40 to 212 °F
(-40 to 100 °C)

Humidity:
0% to 100% RH, condensing

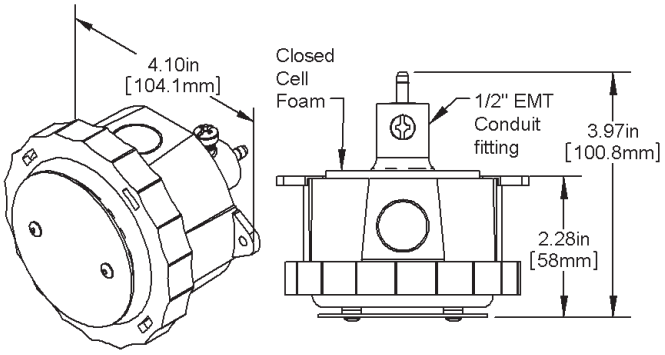
Material:

UV-resistant plastic

Rooftop and Wall Mount



Vertical Mount



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Ordering Information

PART NUMBER	DESCRIPTION	LIST PRICE
ZPS-ACC10	Rooftop and Wall Mount Outside Air Pressure Pickup Port	$45
ZPS-ACC10-V	Vertical Mount Outside Air Pressure Pickup Port	$45

Wall & Ceiling Pressure Pickup Ports

Wallplates and BAPI-Stat "Quantum" Style units available as pressure pickups alone or as combination pressure pickup and temperature sensor

Room pressure pickup ports are available as a Wall Plate or a BAPI-Stat "Quantum" enclosure, both sized to fit a common 2" x 4" electrical box. A foam gasket seals the plate or enclosure to the wall. These units are available as a pickup alone or with a temperature sensor.

BAPI also offers a Ceiling Mount Square Cover that fits a standard 3/4" thick suspended ceiling tile, and a Low Profile Port that is ideal for locations where aesthetics are as important as the pressure measurement. The only visible portion is a flush 7/8" dot on the wall.



BAPI-Stat "Quantum" Enclosure



Wall Plate



Low Profile Port



Ceiling Mount Square Cover

For more info, see pages D10-11

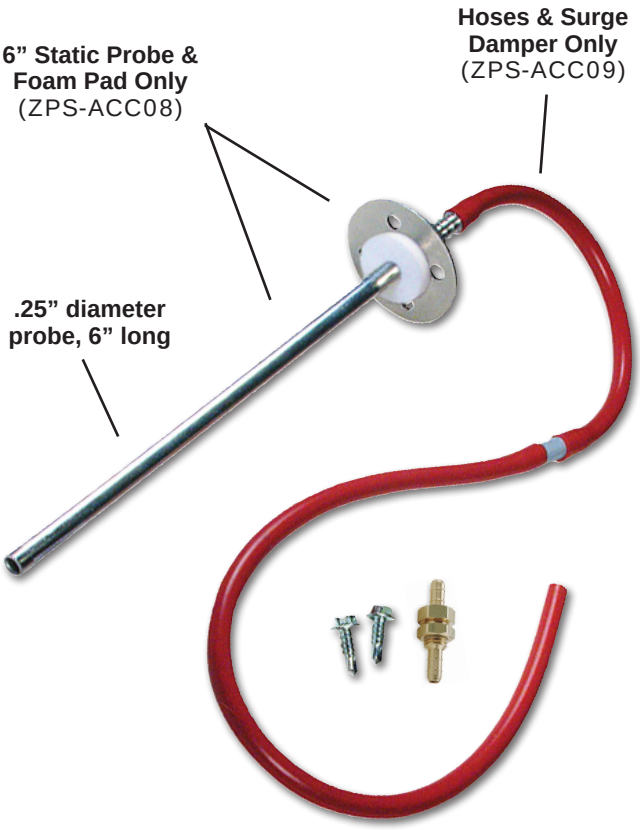
Zone Pressure Probes & Accessories

Zone Pressure Sensors (ZPS)

Rev. 08/18/21

Overview

- Individual Static or Total Pressure Probes, or Probe Assemblies that Include Probe and Rubber Hose with Built-In Surge Damper
- Pitot Pressure Probe Assembly That Includes the Total Probe Assembly and the Static Probe Assembly
- Besides the probe assemblies (which includes all the components), many of the assembly components are available in smaller groupings.
- Barb Accommodates 1/8" ID to 5/32" ID Tubing
- Silicon Tubing on Probe Assemblies is 1/8" ID, 1/4" OD
- All Probe Assemblies Include a Built-In 5 Micron Surge Damper That Absorbs Rapid Pressure Fluctuations, Such As Those Caused By Opening and Closing of Doors



Static Pressure Probe Assembly, 6" (ZPS-ACC07)



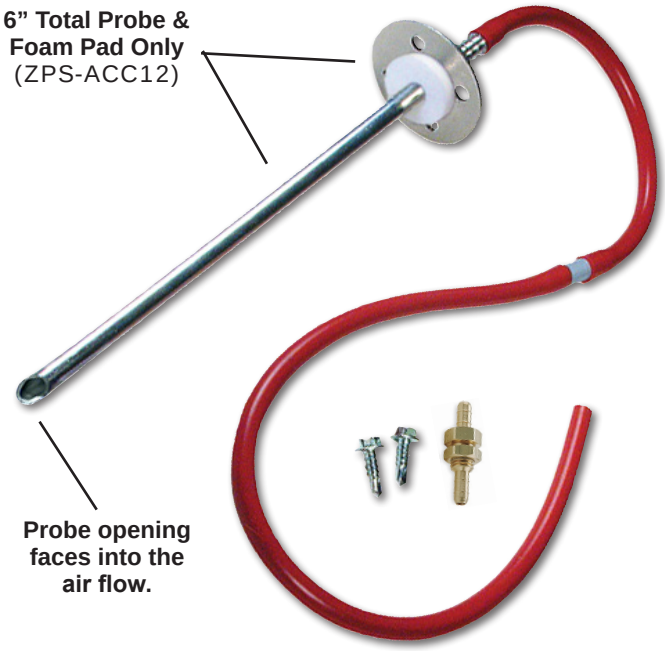
Surge Damper, 5 micron (ZPS-ACC15)



Static Probe Only, Zero Depth (ZPS-ACC22)



Silicone Rubber Tubing (ZPS-SIL-250-125-50)



Total Pressure Probe Assembly, 6"
(ZPS-ACC12 includes 6" Total Probe Assembly and 6" Static Probe Assembly)

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Ordering Information

PART #	DESCRIPTION	LIST PRICE
ZPS-ACC07	Static Probe Assembly, Aluminum 6” long	$28
ZPS-ACC08	Static Probe & Foam Pad Only, Aluminum 6” long (doesn’t include tubing & damper)	$13
ZPS-ACC09	Rubber Tubing with Built-In Surge Damper (includes a bulkhead fitting)	$15
ZPS-ACC11	Pitot Probe Assembly, Aluminum 3.5” long (includes static & total probe assemblies)	$72
ZPS-ACC12	Pitot Probe Assembly, Aluminum 6” long (includes ZPS-ACC07)	$72
ZPS-ACC13	Total Probe Only, Aluminum 3.5”, w/ Circular Foam (doesn’t include hoses & damper)	$14
ZPS-ACC14	Total Probe Only, Aluminum 3.5”, 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)	$30
ZPS-ACC22	Static Probe Only, Zero Length, with Circular Foam and Mounting Screws	$7.50
ZPS-SIL-250-125-50	Silicone Rubber Tubing, 50’ Roll (1/8” ID, 1/4” OD)	$73.50

Gray shaded items follow the Buy and Resale Multiplier.

D18 Differential Pressure Switch

Zone Pressure Sensors

Rev. 06/03/21

Features & Options

- Easy to Access Field Adjustable Setpoint from 0.1” to 40” WC (20 to 10,000 Pa)
- 5 Amp Silver Contacts, NO and NC
- Built-In Pressure Snubber for More Stable Readings

The BAPI Differential Pressure Switch is ideal for air filter monitoring, static pressure proving, airflow proving or auxiliary fan actuation.

The setpoint is field adjustable from 0.1” to 40” WC (20 to 10,000 Pa), and the unit can measure positive pressure, vacuum or true differential pressure. The six pressure ranges are field selectable by changing a color-coded spring. The spring for the range that you order is preinstalled, and the other five springs are shipped with the unit so that you can change ranges in the field if you choose.

The unit features a rugged plastic enclosure that protects the electrical terminations and pressure adjustment screw which is easily accessed through a port in the front cover using a square screwdriver bit (BA/SQ1BIT). The quick connect wiring terminations are accessed by opening the hinged cover. The unit is very compact and can be mounted directly on a flat surface with the rugged mounting feet.



Differential Pressure Switch

5 YEAR WARRANTY

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

Specifications

Measurement Media:
Air, Combustion Gases

Operating Environment:
-40 to 185°F (-40 to 85°C)
5 to 95% RH non-condensing

Contact Ratings:
5 Amp Resistive, 125 VAC

Proof Pressure:
100” WC (3.6 PSI, 24,900 Pa)

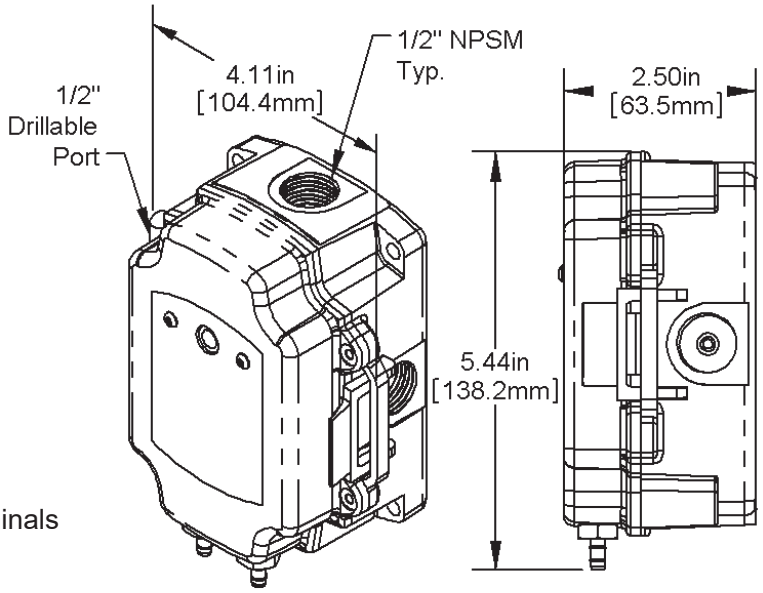
Pressure Ports:
1/4” Barbed Fittings

Switch Type:
SPDT (Silver Contacts)

Repeatability:
<10% of Setting

Wiring:
1/4” (6.4mm) Quick-Disconnect Terminals

Agency:
RoHS



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Ordering Information

PART #S	DESCRIPTION	LIST PRICE
BA/SW1A	Differential Pressure Switch, 0.1” to 0.8” WC (20 to 200 Pa)	$84
BA/SW2A	Differential Pressure Switch, 0.5” to 1.2” WC (120 to 300 Pa)	$84
BA/SW3A	Differential Pressure Switch, 0.7” to 2.2” WC (180 to 550 Pa)	$84
BA/SW5A	Differential Pressure Switch, 3.2” to 10.4” WC (800 to 2600 Pa)	$98
BA/SW6A	Differential Pressure Switch, 8.8” to 24” WC (2200 to 6000 Pa)	$98
BA/SW7A	Differential Pressure Switch, 12” to 40” WC (3000 to 10000 Pa)	$98
BA/SQ1BIT:	Square Screwdriver Bit to turn the Pressure Adjustment Screw	*$1

*Net Price - Multipliers do not apply on the Square Screwdriver Bit.


Square Screwdriver Bit

Note: If you are using metal tubing, add “-PIB” to the end of the part number so that the High and Low Pressure ports will be located in the base of the unit rather than in the hinged cover.

Wall & Ceiling Pressure Pickup Ports

Wallplates and BAPI-Stat “Quantum” Style units available as pressure pickups alone or as combination pressure pickup and temperature sensor

Room pressure pickup ports are available as a Wall Plate or a BAPI-Stat “Quantum” enclosure, both sized to fit a common 2” x 4” electrical box. A foam gasket seals the plate or enclosure to the wall. These units are available as a pickup alone or with a temperature sensor.

BAPI also offers a Ceiling Mount Square Cover that fits a standard 3/4” (19mm) thick suspended ceiling tile, and a Low Profile Port that is ideal for locations where aesthetics are as important as the pressure measurement. The only visible portion is a flush 7/8” (22mm) dot on the wall.


BAPI-Stat “Quantum” Enclosure


Wall Plate


Low Profile Port


Ceiling Mount Square Cover

For more info, see pages D12-13

D20 Beck Adjustable Pressure Switch

Zone Pressure Sensors

Rev. 04/20/21

Features & Options

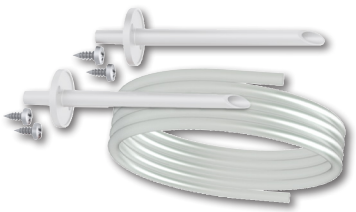
- Designed for Monitoring Overpressure, Vacuum and Differential Pressure of Air or Other Non-Combustible, Non-Aggressive Gases
- Ideal for Air Filter and Fan Status Monitoring, Industrial Cooling-Air Circuit Monitoring, Duct Air Flow Monitoring, Air Flow Proving for Heater Control and Frost Prevention 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: ≤±15%, min. ±0.04” WC (±10 Pa) • Drift: ≤±15%

Diaphragm Material:
Silicone, tempered at 392°F (200°C), free of gas emissions

Pressure Connections:
2 plastic pipe connection pieces, external dia. 0.24” (6mm)
Marked “+” to higher pressure, marked “-” to lower pressure

Body and Cover Material: UV-resistant plastic

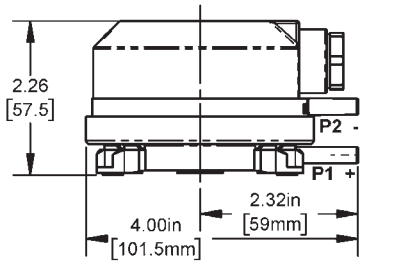
Mechanical Working Life: Over 1,000,000 switching operations

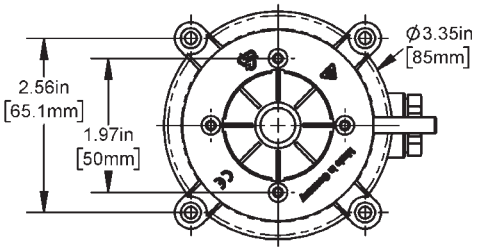
Electrical Rating:
0.4A Inductive, 250 VAC • 1.5A Resistive, 250 VAC
0.8A Inductive, 125 VAC • 3.0A Resistive, 125 VAC
0.4A, 30VDC • 0.1A, 24 VDC

Electrical connections:
1/4” Spade Plug (AMP flat plug), 0.25” x 0.03” (6.3 x 0.8mm) in accordance with DIN 46244 or push-on screw terminals included

Protection Category: IP54 or IP65

CE Conformity:
Low Voltage Directive 2014/35/EU; RoHS Directive 2011/65/EU





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

Ordering Information

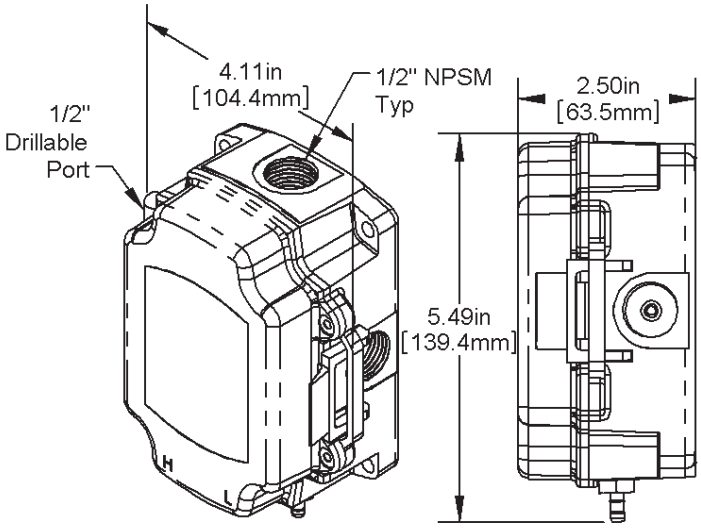
Part Number	Pressure Range	Accuracy/ Repeatability	Encl. Rating	List Price
BA/APSW1	0.08 to 1.2” WC / 20 to 300 Pa	±5% / min. ±0.02” WC (±5 Pa)	IP54	$25
BA/APSW2	0.2 to 2” WC / 50 to 500 Pa	±2.5% / min. ±0.02” WC (±5 Pa)	IP54	$25
BA/APSW3	0.8 to 4” WC / 200 to 1,000 Pa	±1% / min. ±0.02” WC (±5 Pa)	IP54	$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 2500 Pa	±1%	IP54	$25
BA/APSW6	0.8 to 4” WC / 200 to 1,000 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 2500 Pa	±1%	IP65	$37
BA/APSW6-65	0.8 to 4” WC / 200 to 1,000 Pa	±1%	IP65	$37
BA/APSW-ACC	2 Total Pressure Tubes and 2 Meters of Pressure Tubing			$3.50

Gray shaded items follow the Buy and Resale Multiplier.

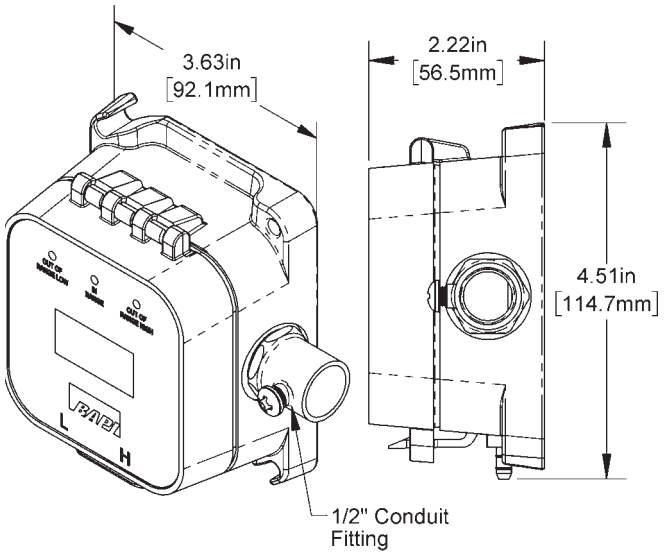
BAPI Pressure Sensor Dimensions

Zone Pressure Sensors

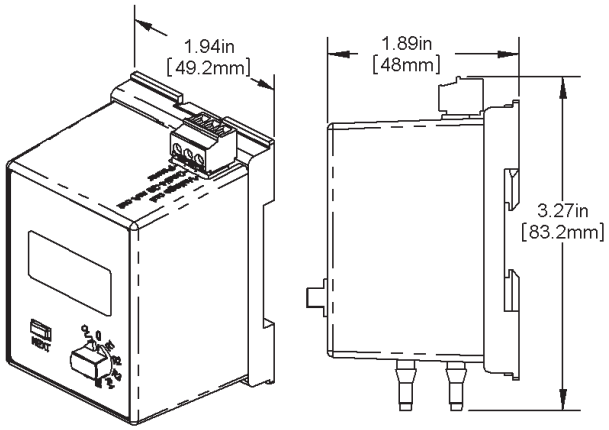
Rev. 04/28/21



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

BAPI-Stat 3



pg E6

Duct & Rough Service



pg E8

Verification Kit, pg E29

CO_2 Sensors

with continuous automatic Barometric pressure compensation

Quantum Prime



pg E10

Quantum



pg E12

BAPI-Stat 3



pg E14

Duct & Rough Service



pg E16

Calibration Kit, pg E29

CO Sensors

for Room, Duct or Rough Service

BAPI-Stat 4

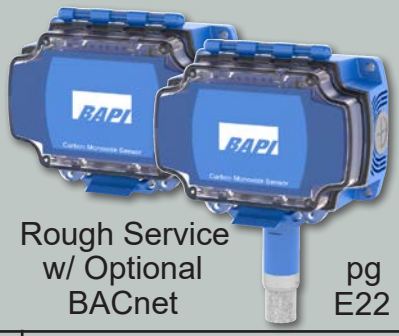


pg E18

Duct and Rough Service



pg E20



Rough Service w/ Optional BACnet

pg E22

NO_2 Duct & Rough Service Sensor



pg E24

Particulate Sensors



pg E26 & 27

Refrigerant Leak Detector



pg E28

VOC and CO_2 Sensor White Papers and App. Notes - *pages 31-41*

- BAPI VOC Sensor Offers an Alternative to CO_2 for Demand Controlled Ventilation, pg 31
- Using the BAPI VOC Sensor for Demand Controlled Ventilation, pgs 32-36
- Calibration Methods for Single and Dual Beam CO_2 Sensors, pg 37
- Common VOCs Detected by BAPI's VOC Sensor, pgs 38-39
- The Effects of Temperature and Altitude on CO_2 Measurement, pgs 40-41

VOC Room Sensor, BAPI-Stat "Quantum Prime"

Air Quality Sensors

Rev. 12/03/21

Features & Options

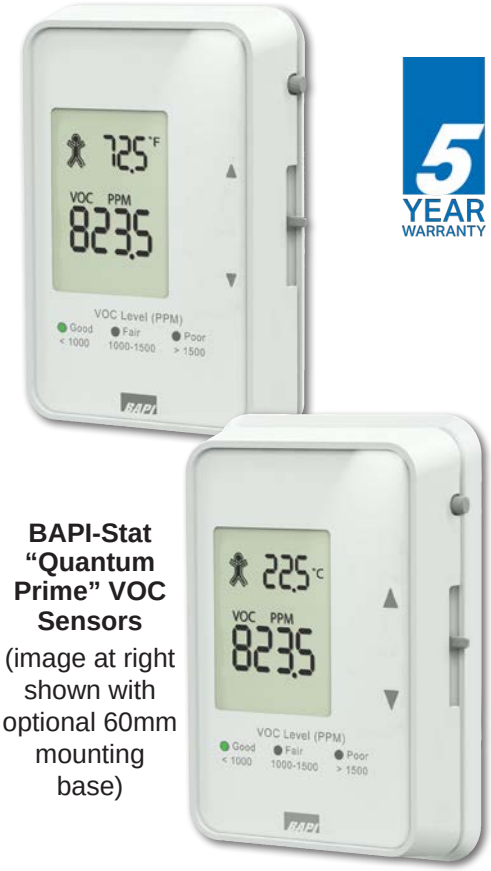
- VOC Alone or Temperature and Humidity Combination
- Achieves True Indoor Air Quality, Not Just CO_2 Dilution
- Output is Correlated to a CO_2 Value Allowing You to Ventilate Using ASHRAE's CO_2-Based VRP Algorithm

Humans respirate Volatile Organic Compounds (VOCs) as well as CO_2. The BAPI sensor is able to measure these VOCs and indicate when a space is occupied just as well as a CO_2 sensor.

The advantage of the VOC sensor is that it measures air contaminants from other sources besides respiration, such as building materials, cleaners, perfumes and furniture and carpet off-gassing. So using this sensor for Demand Controlled Ventilation is a way of achieving true indoor air quality, rather than CO_2 dilution.

A further benefit is that it requires no additional work on your part. That's because the sensor converts the VOC reading to a CO_2 equivalent level. This lets you use ASHRAE's CO_2-based VRP schedule to ventilate.

The unit is available as VOC alone or with temp and humidity sensing, temp setpoint and override. The optional display alternates between the measured values. The VOC level is indicated as "Good, Fair or Poor" by LEDs on the front of the unit. A 60mm mounting base is also available to fit European style junction boxes.



BAPI-Stat "Quantum Prime" VOC Sensors

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

5 YEAR WARRANTY

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 CO_2 ppm equivalent

Response Time: Less Than 60 Sec. (after Start-Up Time)

Operating Environment:
32 to 122°F (0 to 50°C) • 0 to 95% RH non-condensing

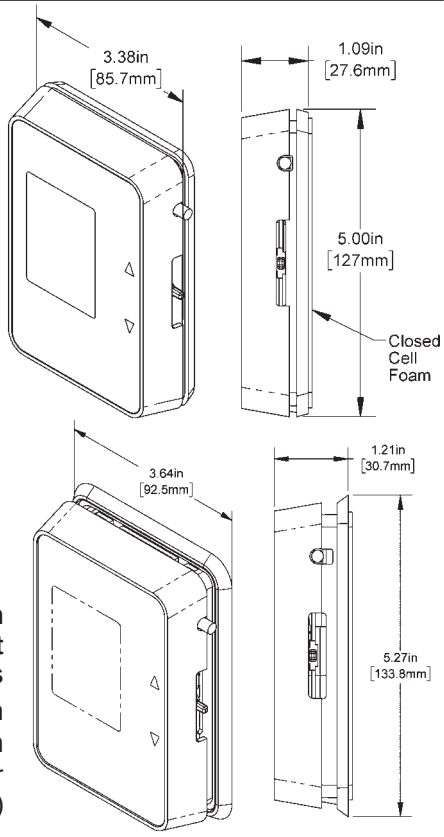
Material: ABS Plastic, Material Rated UL94 V-0

Start-Up Time: 15 minutes

Cover LED VOC/CO_2 Equivalent Level:
Good, Green < 1,000 ppm
Fair, Yellow = 1,000 to 1,500 ppm
Poor, Red > 1,500 ppm

Agency: RoHS

Warranty Period: 5 years



BAPI-Stat "Quantum Prime" VOC Unit Dimensions

(bottom unit shown with optional 60mm mounting base for European wall boxes)

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VOC Room Sensor, BAPI-Stat "Quantum Prime"

Air Quality Sensors

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

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

BAPI-Stat "Quantum Prime" VOC Sensor Option Selection Guide:

Unit w/ Standard Mounting Base
BA/BQP(**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**) - (**#6**)(**#7**) - (**#8**) - (**#9**)

Unit w/ 60mm Mounting Base
BA/BQP60(**#1**) - (**#2**) - (**#3**) - (**#4**) - (**#5**) - (**#6**)(**#7**) - (**#8**) - (**#9**)

#1: Display Style (required)
F .....Unit with Display and °F indication ... $35
C .....Unit with Display and °C indication ... $35
X .....Unit without Display

#2: VOC Output (required)
A .....VOC 0 to 5V Output $475
B .....VOC 0 to 10V Output $475

#3: Temperature Sensor (required)
A .....1K Platinum RTD (385 curve)..... $25
B .....10K-2 Thermistor..... $18
C .....10K-3 Thermistor..... $18
D .....10K-3[11K] Thermistor..... $18
E .....20K Thermistor..... $18
F .....1.8K Thermistor..... $18
G.....1K Ω Nickel RTD $65
H.....3K Thermistor..... $18
X .....No Temperature Sensor

#4: Humidity Output (required)
A .....±2% Accuracy, Output of 0 to 5V..... $80
B .....±2% Accuracy, Output of 0 to 10V.... $80
X .....No Humidity Output

#5: Setpoint Adjustment (required)
1.....Slider Setpoint Adjustment $6
X .....No Setpoint Adjustment

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

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

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

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

#9: Optional Selections* (optional)
A .....Differential Ground
B .....Comm Jack C35..... $10
F .....Test and Balance Switch $7.50

*When more than one is selected, put in alphabetical order. Additional options and descriptions can be found on pg. I4

Example Number: BA/BQP **(F) - (A) - (B) - (A)- (1) - (F)(80) - (N)**

Actual Number (with brackets removed): BA/BQPF-A-B-A-1-F80-N

Description: BAPI-Stat "Quantum Prime" VOC Sensor, °F Display, 0 to 5V VOC Output, 10K-2 Thermistor Temperature Sensor, 0 to 5V Humidity Output, Slider Setpoint Adjustment, 65 to 80 Temp Setpoint Display Range, 0 to 20K Temp Setpoint Output Range, Override in Parallel with the temp sensor, No Additional Options

List Price: $35 (°F Display) + $475 (VOC Unit) + $18 (Thermistor) + $80 (Humidity) + $6 (Setpoint) + $5 (Override) = $619 List

Your Number: BA/

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VOC Room Sensor, BAPI-Stat “Quantum”

Air Quality Sensors

CE Rev. 05/20/21

Features & Options

- Available with a CO_2 Equivalent Output (CO2e) or a Total VOC Output (TVOC)
- Field-Selectable 0 to 5 or 0 to 10 VDC Output

The quality of the air that we breathe is essential to our health and knowing the air quality level is the first step to improving it. BAPI’s VOC sensors provide that critical air quality information.

The CO_2 equivalent (CO2e) units combine the benefits of VOC sensors and the common application of CO2 sensors into one unit. It provides a VOC reading that correlates to a typical indoor CO_2 level of 0 to 2,000 ppm. This allows the sensor’s output to be used for ASHRAE’s CO_2-based VRP ventilation schedule.

The total VOC (TVOC) units provide a VOC reading that is the total concentration of all VOCs present in the space within a range of 0 to 2,500 ppb. This is often needed to meet 3rd party building certifications that require separate CO_2 and VOC readings.

Additional information on VOCs and using the CO2e units in your ventilation strategy is available on our website and in the Air Quality section of our catalog.

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



CO2e Unit with Standard Mounting Base
(includes cover LEDs for air quality levels of “Good”, “Fair” and “Poor”.)



TVOC Unit with 60mm Mounting Base
(cover LEDs not available for TVOC units.)

Specifications

Power: (Half-wave rectified)
12 to 24 VDC, 35 mA max • 18 to 24 VAC, 4 VAmax

CO2e Unit Detection Range: 0 to 2,000 ppm CO_2 equivalent

TVOC Unit Detection Range: 0 to 2,500 ppb

Sensing Element: Micro-machined metal oxide

Start-Up Time: 15 minutes

Response Time: <60 sec (after start-up time)

Cover LEDs for CO2e Models (not available on TVOC Models)**:**
Good, Green < 1,000 PPM
Fair, Yellow = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

Selectable Output: 0 to 5 or 0 to 10 VDC > 4KΩ impedance

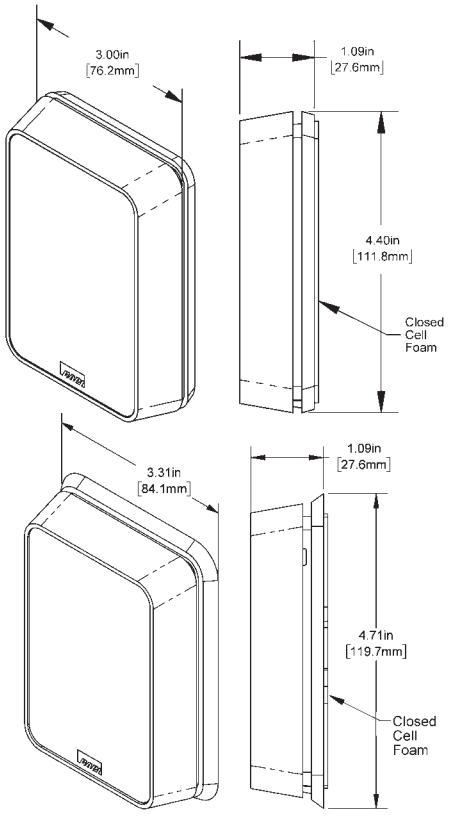
Wiring: 3 wires, 16 to 22 AWG

Operating Environment:
32 to 122°F (0 to 50°C)
5 to 95%RH non-condensing

Enclosure Material: ABS plastic, UL94, V-0

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

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



Unit with standard Mounting Base (top) and 60mm Mounting Base (bottom)

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Ordering Information:

Units with CO2 Equivalent (CO2e) Output

Part #	Description	List Price
BA/BQX-A	BAPI-Stat “Quantum” VOC (CO2e), 0 to 5V Output, Standard Mounting Base	$425
BA/BQX-B	BAPI-Stat “Quantum” VOC (CO2e), 0 to 10V Output, Standard Mounting Base	$425
BA/BQX60-A	BAPI-Stat “Quantum” VOC (CO2e), 0 to 5V Output, 60mm Mounting Base	$425
BA/BQX60-B	BAPI-Stat “Quantum” VOC (CO2e), 0 to 10V Output, 60mm Mounting Base	$425

Units with Total VOC (TVOC) Output

Part #	Description	List Price
BA/BQX-T-A-BNK	BAPI-Stat “Quantum” TVOC, 0 to 5V Output, Standard Mounting Base	$425
BA/BQX-T-B-BNK	BAPI-Stat “Quantum” TVOC, 0 to 10V Output, Standard Mounting Base	$425
BA/BQX60-T-A-BNK	BAPI-Stat “Quantum” TVOC, 0 to 5V Output, 60mm Mounting Base	$425
BA/BQX60-T-B-BNK	BAPI-Stat “Quantum” TVOC, 0 to 10V Output, 60mm Mounting Base	$425

VOC Room Sensor, BAPI-Stat 3 Enclosure

Air Quality Sensors

Rev. 01/19/21

Features & Options

- VOC Alone or Temperature and Humidity Combination
- Achieves True Indoor Air Quality, Not Just CO_2 Dilution
- Output is Correlated to a CO_2 Value Allowing You to Ventilate Using ASHRAE's CO_2-Based VRP Algorithm

Humans respirate Volatile Organic Compounds (VOCs) as well as CO_2. The BAPI sensor is able to measure these VOCs and indicate when a space is occupied just as well as a CO_2 sensor.

The advantage of the VOC sensor is that it measures air contaminants from other sources besides respiration, such as building materials, cleaners, perfumes and furniture and carpet off-gassing. Using this sensor for Demand Controlled Ventilation then is a way of achieving true indoor air quality, rather than just CO_2 dilution.

A further benefit is that it requires no additional work on your part. That's because the sensor converts the VOC reading to a CO_2 equivalent level. This lets you use ASHRAE's CO_2-based VRP schedule to ventilate. (More information on the CO_2 equivalent output is available on our website or in the Application Notes at the end of this section of the catalog.)

The unit is available as a VOC sensor alone or as a combination temperature and humidity sensor. The optional display alternates between the measured values and is field adjustable between °F or °C. Optional indication of the VOC level as "Good, Fair or Poor" is available as a three-color LED or arrow on the display.



VOC Sensors with Temp. Setpoint and Override.

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: 2"x4" J-Box or drywall mount – screws provided

VOC Detection Range: 0 to 2,000 CO_2 PPM equivalent

Response Time: Less Than 60 Sec. (after Start-Up Time)

Start-Up Time: 15 minutes

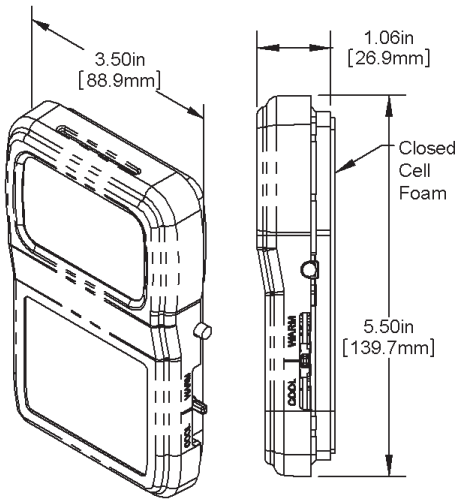
Operating Environment:
32 to 122°F (0 to 50°C) • 0 to 95% RH non-condensing

LED VOC/CO_2 Equivalent Level Indicator:
Good, Green < 1,000 PPM
Fair, Yellow = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

Material:
ABS Plastic, Material Rated UL94V-0

Agency: RoHS

Warranty Period: 5 years



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

VOC BAPI-Stat 3 Room Sensor Option Selection Guide:

BA/BS3 (**#1**) - (**#2**) - (**#3**) - (**#4**)(**#5**) - (**#6**) - (**#7**) - (**#8**) - (**#9**) - (**#10**)

#1: Display Style (required)
F .....Unit with Display and °F indication ... $35
C .....Unit with Display and °C indication ... $35
X .....Unit without Display

#2: VOC Output (required)
VOC05..VOC 0 to 5V Output $475
VOC10..VOC 0 to 10V Output $475

#3: Humidity Output (Optional)
H205.....±2% Accuracy, Output of 0 to 5V..... $80
H210.....±2% Accuracy, Output of 0 to 10V.... $80
H212.....±2% Accuracy, Output of 2 to 10V.... $80

#4: Temp Setpoint Display Range (optional)
A .....-3 to +3 ..... $6
B .....-5 to +5 ..... $6
C .....50 to 90 °F or 10 to 32 °C $6
D .....55 to 85 °F or 13 to 30 °C..... $6
E .....60 to 80 °F or 15 to 27 °C..... $6
F .....65 to 80 °F or 18 to 27 °C..... $6

#5: Temp 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

#6: Temp Setpoint Legend (optional)
L6.....Cool/Warm
L0.....No Legend

#7: Temperature Sensor (optional)
1375.....1K Platinum RTD (375 curve)..... $25
1.....1K Platinum RTD (385 curve)..... $25
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

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

#9: Communication Jack (optional)
C35.....3.5 mm Phono Style Jack..... $10

#10: Configuration
(optional - Common Ground is default)
DF.....Differential Ground

#11: VOC Level Indication (required)
LED.....3 Color LED on Logo Plate
ARW .....Black Arrow on Display
BNK .....No LED or Arrow

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/BS3 **(F) - (VOC05) - ( ) - (F)(80)(L6) - (102) - (N) - ( ) - (DF) - (ARW)**

Actual Number (with parenthesis removed): BA/BS3F-VOC05-F80L6-102-N-DF-ARW

Description: BAPI-Stat 3, °F Display, 0 to 5V VOC Output, 65 to 80 Temp Setpoint Display Range, 0 to 20K Temp Setpoint Output Range, Cool/Warm Legend, 10K-2 Thermistor Temperature Sensor, No Override, No Comm. Jack, Differential Ground Configuration, Black Arrow on Display VOC Level Indication

List Price: $35 (°F Display) + $475 (VOC Unit) + $6 (Temp Setpoint) +$18 (Thermistor) = $534 List

Your Number: BA/

VOC Duct and Rough Service Sensor

Air Quality Sensors

CE Rev. 05/26/21

Features & Options

- Available with a CO_2 Equivalent Output (CO2e) or a Total VOC Output (TVOC)
- Ventilated BAPI-Box for Rough Service Areas and BAPI-Box with Aspiration Tube for Ducts
- Field-Selectable 0 to 5 or 0 to 10 VDC Output

The quality of the air that we breathe is essential to our health and knowing the air quality level is the first step to improving it. BAPI's VOC sensors provide that critical air quality information.

The CO_2 equivalent (CO2e) units combine the benefits of VOC sensors and the common application of CO2 sensors into one unit. It provides a VOC reading that correlates to a typical indoor CO_2 level of 0 to 2,000 ppm. This allows the sensor's output to be used for ASHRAE's CO_2-based VRP ventilation schedule.

The total VOC (TVOC) units provide a VOC reading that is the total concentration of all VOCs present in the space within a range of 0 to 2,500 ppb. This is often needed to meet 3rd party building certifications that require separate CO_2 and VOC readings.

Additional information on VOCs and using the CO2e units in your ventilation strategy is available on our website and in the Air Quality section of our catalog.

The Duct unit uses an aspiration tube, while the Rough Service unit uses a ventilated BAPI-Box and is ideal for areas such as outdoor air plenums, equipment rooms, green houses and warehouses.



Duct CO2e Unit
(includes cover LEDs for air quality levels of "Good", "Fair" and "Poor".)

5 YEAR WARRANTY



Rough Service TVOC Unit
(cover LEDs not available for TVOC units.)

Specifications

Power: (Half-wave rectified)
12 to 24 VDC, 35 mA max
18 to 24 VAC, 4 VAmax

CO2e Unit Detection Range:
0 to 2,000 ppm CO_2 equivalent

TVOC Unit Detection Range:
0 to 2,500 ppb

Sensing Element:
Micro-machined metal oxide

Start-Up Time:
15 minutes

Response Time:
<60 sec (after start-up time)

Selectable Output:
0 to 5 or 0 to 10 VDC > 10KΩ impedance

Wiring:
3 wires, 16 to 22 AWG

Cover LEDs for CO2e Models
(not available on TVOC Models)**:**
Good, Green < 1,000 PPM
Fair, Yellow = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

Operating Environment:
32 to 122°F (0 to 50°C)
5 to 95%RH non-condensing

Enclosure Material:
UV-Resistant Polycarbonate, UL94, V-0

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

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Ordering Information:

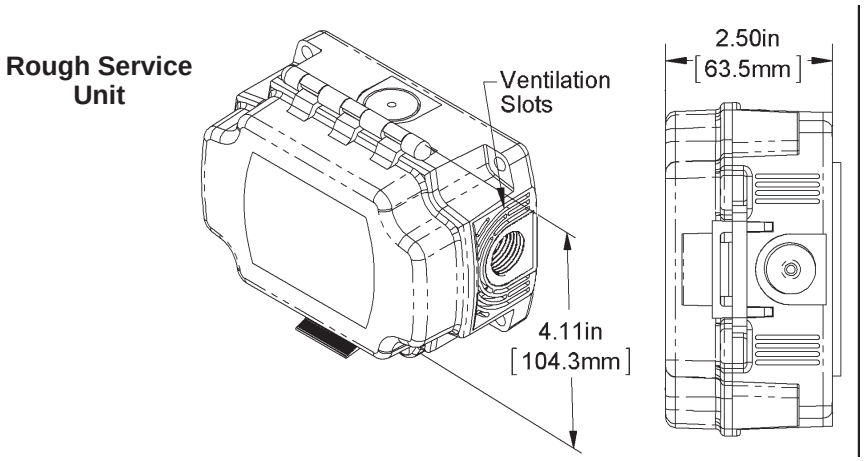
Units with CO2 Equivalent (CO2e) Output

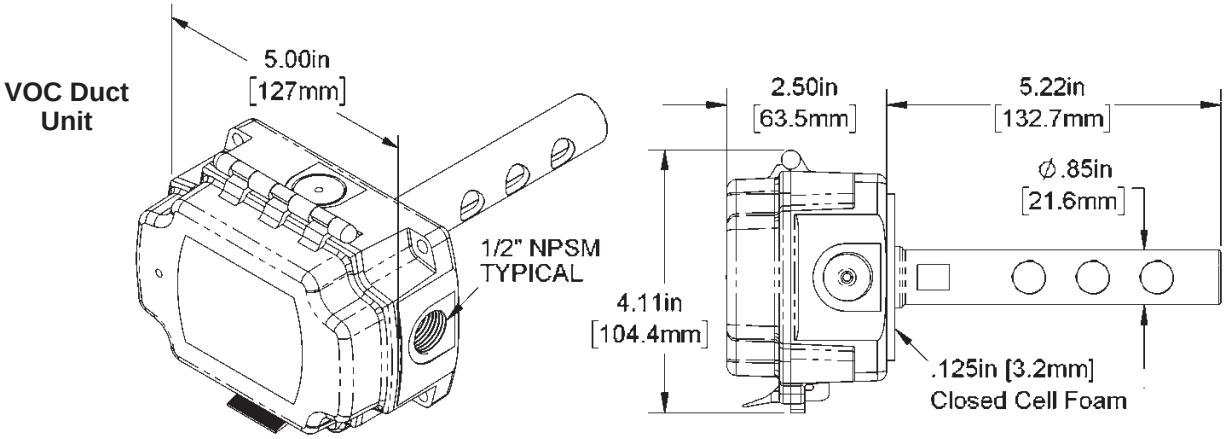
Part #	Description	List Price
BA/VOC05-D-BB	Duct VOC (CO2e), 0 to 5V Output	$487
BA/VOC10-D-BB	Duct VOC (CO2e), 0 to 10V Output	$487
BA/VOC05-V-BB	Rough Service VOC (CO2e), 0 to 5V Output	$555
BA/VOC10-V-BB	Rough Service VOC (CO2e), 0 to 10V Output	$555

Units with Total VOC (TVOC) Output

Part #	Description	List Price
BA/TVOC05-D-BB-BNK	Duct VOC (TVOC), 0 to 5V Output	$487
BA/TVOC10-D-BB-BNK	Duct VOC (TVOC), 0 to 10V Output	$487
BA/TVOC05-V-BB-BNK	Rough Service VOC (TVOC), 0 to 5V Output	$555
BA/TVOC10-V-BB-BNK	Rough Service VOC (TVOC), 0 to 10V Output	$555

Dimensions





CO_2 Room Sensor, BAPI-Stat "Quantum Prime"

Air Quality Sensors

Rev. 12/03/21

Features & Options

- Automatic Barometric Pressure Compensation for Accurate Readings Regardless of Weather or Altitude
- Optional Temperature, Setpoint, Override and Humidity
- Models for Periodically or Continuously Occupied Areas
- Models that Meet California AB 841 When Connected to a Building Automation System (choose option N when ordering)

The BAPI CO_2 Sensor is an accurate and reliable way of incorporating demand controlled ventilation into a building's HVAC strategy. It measures the CO_2 in a range of 0 to 2,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

The Single Channel unit has been optimized for periodically unoccupied areas and features automatic background calibration over a long time period to reduce drift. The Dual Channel "24/7" unit has been optimized for continuously occupied areas and features a 3-point calibration process for enhanced accuracy and stability.

Barometric pressure changes can affect CO_2 sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric pressure sensor that continuously compensates the output for accurate readings despite the weather or altitude.

The CO_2 level is indicated by three LEDs on the front of the unit. A 60mm mounting base is available to fit European style junction boxes.



BAPI-Stat "Quantum Prime" CO_2 Sensors
(bottom unit shown with optional 60mm mounting base)

Specifications

Power 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.)

CO_2 Sensor: Single or 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-O

CO_2 Detection Range: 0 to 2,000 ppm

Start-Up Time: <2 Minutes

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

CO_2 Accuracy (Single Channel Units):
400 to 1,250 ppm: ±30ppm or 3% of reading, whichever is greater
1,250 to 2,000 ppm: ±5% of reading + 30ppm

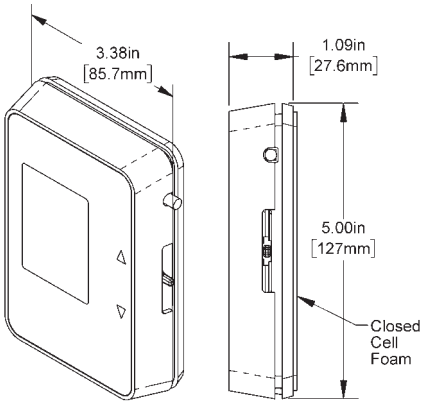
CO_2 Accuracy (Dual Channel "24/7" Units):
400 to 1,000 ppm: ±75 ppm • >1,000 ppm: ±10% of reading

CO_2 Drift Stability (Dual Channel "24/7" Units):
<5% of full scale over life of product.

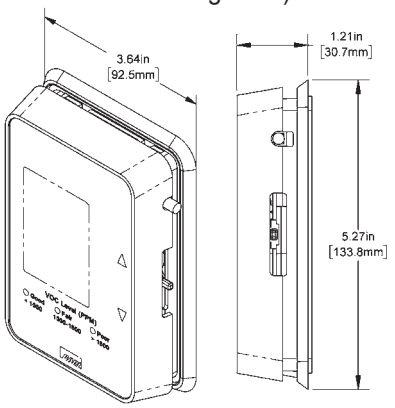
Mounting: Standard 2"x4" junction box, European junction box or drywall mount (screws provided)

LED CO_2 Level Indicator:
Good, Green < 1,000 ppm (1,100 ppm when option "N" chosen)
Fair, Yellow = 1,000 to 1,500 ppm (1,100 to 1,500 ppm when "N" chosen)
Poor, Red > 1,500 ppm

Agency: RoHS, California Title 24 and AB 841



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



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CO_2 Room Sensor, BAPI-Stat "Quantum Prime"

Air Quality Sensors

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Use the 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)
F .....Unit with Display and °F indication $35
C .....Unit with Display and °C indication..... $35
X .....Unit without Display

#2: CO2 Output (required)
A .....Single Channel, 0 to 5V Output..... $475
B .....Single Channel, 0 to 10V Output..... $475
C .....Dual Channel, 0 to 5V Output $505
D .....Dual Channel, 0 to 10V Output $505

#3: Temperature Sensor (required)
A .....1K Platinum RTD (385 curve)..... $25
B .....10K-2 Thermistor..... $18
C .....10K-3 Thermistor..... $18
D .....10K-3[11K] Thermistor..... $18
E .....20K Thermistor..... $18
F .....1.8K Thermistor..... $18
G.....1K Ω Nickel RTD $65
H.....3K Thermistor..... $18
X .....No Temperature Sensor

#4: Humidity Output (required)
A .....±2% Accuracy, Output of 0 to 5V..... $80
B .....±2% Accuracy, Output of 0 to 10V..... $80
X .....No Humidity Output

#5: Setpoint Adjustment (required)
1.....Slider Setpoint Adjustment $6
X .....No Setpoint Adjustment

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

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

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

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

#9: Optional Selections* (optional)
A .....Differential Ground
B .....Comm Jack C35..... $10
F .....Test and Balance Switch $7.50
N.....LED Alert Level for California AB 841 ..... $6

*When more than one is selected, put in alphabetical order. Additional options can be found on pg. I4

Example Number: BA/AQP **(F) - (A) - (B) - (A)- (1) - (F)(80) - (N)**

Actual Number (with brackets removed): BA/AQPF-A-B-A-1-F80-N

Description: BAPI-Stat "Quantum Prime" CO2 Sensor, °F Display, 0 to 5V Single Channel CO2 Output, 10K-2 Thermistor Temperature Sensor, 0 to 5V Humidity Output, Sider Setpoint Adjustment, 65 to 80 Temp Setpoint Display Range, 0 to 20K Temp Setpoint Output Range, Override in Parallel with the temp sensor, No Additional Options

List Price: $35 (°F Display) + $475 (CO2 Unit) + $18 (Thermistor) + $80 (Humidity) + $6 (Setpoint) + $5 (Override) = $619 List

Your Number: BA/

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CO_2 Room Sensor, BAPI-Stat "Quantum"

Air Quality Sensors

Rev. 01/19/21

Features & Options

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

The BAPI-Stat "Quantum" CO_2 Sensor is an accurate and reliable way of incorporating demand controlled ventilation into your HVAC strategy. It measures the CO_2 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.

The Single Channel unit has been optimized for periodically unoccupied areas and features automatic background calibration over a long time period to reduce drift. The Dual Channel "24/7" unit has been optimized for continuously occupied areas and features a three-point calibration process for enhanced stability, accuracy and reliability.

Barometric pressure changes can affect the output of CO_2 sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric sensor that continuously compensates the output for accurate readings despite the weather or altitude of the installation.

For 0 to 2000 PPM units, the CO_2 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.



BAPI-Stat "Quantum" CO_2 Sensors

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

Specifications

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

CO_2 Sensing Elements:
Single or 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 UL94V-O

CO_2 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)

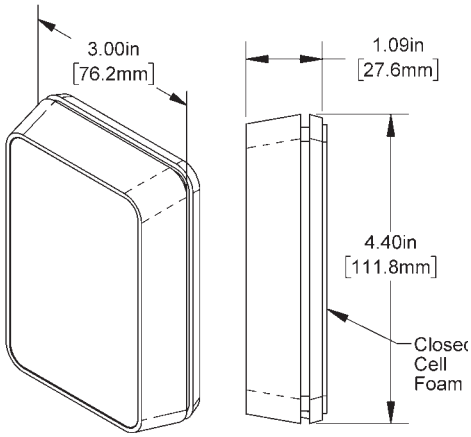
CO_2 Accuracy (Single Channel Units):
400 to 1,250 ppm: ±30ppm or 3% of reading, whichever is greater
1,250 to 2,000 ppm: ±5% of reading + 30ppm

CO_2 Accuracy (Dual Channel "24/7" Units):
400 to 1,000 ppm: ±75 ppm
>1,000 ppm: ±10% of reading

CO_2 Drift Stability (Dual Channel "24/7" Units):
<5% of full scale over life of product.

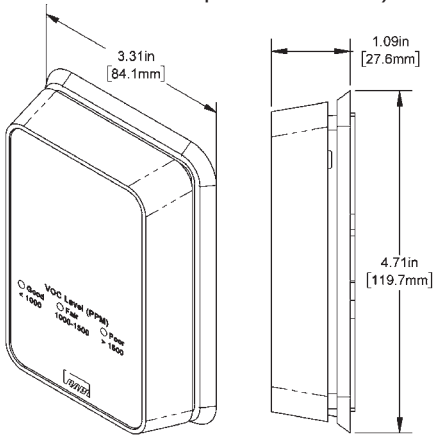
LED CO_2 Level Indicator (for 0 to 2.000 PPM units only):
Good, Green < 1,000 PPM
Fair, Yellow = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

Agency: RoHS, CE, Title 24 Requirements



Unit Dimensions

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



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CO_2 Room Sensor, BAPI-Stat "Quantum"

Air Quality Sensors

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Ordering Information: BAPI-Stat "Quantum" CO_2 Sensor

UNITS WITH STANDARD MOUNTING BASE

Part #	Description	List Price
BA/AQX-A	Single Channel for Periodically Unoccupied Areas, 0 to 5V Output, 0 to 2,000 PPM Range	$425
BA/AQX-B	Single Channel for Periodically Unoccupied Areas, 0 to 10V Output, 0 to 2,000 PPM Range	$425
BA/AQX-C	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 2,000 PPM Range	$455
BA/AQX-D	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 2,000 PPM Range	$455
BA/AQX-E	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 5,000 PPM Range	Call
BA/AQX-F	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 5,000 PPM Range	Call
BA/AQX-G	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 10,000 PPM Range	Call
BA/AQX-H	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 10,000 PPM Range	Call
BA/AQX-I	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 50,000 PPM Range	Call
BA/AQX-J	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 50,000 PPM Range	Call

UNITS WITH 60MM MOUNTING BASE

Part #	Description	List Price
BA/AQX60-A	Single Channel for Periodically Unoccupied Areas, 0 to 5V Output, 0 to 2,000 PPM Range	$425
BA/AQX60-B	Single Channel for Periodically Unoccupied Areas, 0 to 10V Output, 0 to 2,000 PPM Range	$425
BA/AQX60-C	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 2,000 PPM Range	$455
BA/AQX60-D	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 2,000 PPM Range	$455
BA/AQX60-E	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 5,000 PPM Range	Call
BA/AQX60-F	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 5,000 PPM Range	Call
BA/AQX60-G	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 10,000 PPM Range	Call
BA/AQX60-H	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 10,000 PPM Range	Call
BA/AQX60-I	Dual Channel for Continuously Occupied Areas, 0 to 5V Output, 0 to 50,000 PPM Range	Call
BA/AQX60-J	Dual Channel for Continuously Occupied Areas, 0 to 10V Output, 0 to 50,000 PPM Range	Call

Your Number: BA/

Associated Products

BAPI VC350A or VC350A-EZ VOLTAGE CONVERTERS

The CO_2 unit requires 240mA of current to operate correctly. If this is more current than can be provided by the controller power output, then the unit can be powered by a BAPI VC350A or VC350A-EZ Voltage Converter. See the Accessories section for more info.



VC350A-EZ Voltage Converter

CO_2 Room Sensor, BAPI-Stat 3 Enclosure

Air Quality Sensors

Rev. 01/19/21

Features & Options

- Automatic Barometric Pressure Compensation for Accurate Readings Regardless of Weather or Altitude
- Optional Temperature, Setpoint, Override and Humidity
- Models for Periodically Unoccupied or Continuously Occupied Areas

The BAPI CO_2 Sensor is an accurate and reliable way of incorporating demand controlled ventilation into a building's HVAC strategy. It measures the CO_2 in a range of 0 to 2,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

The Single Channel (ACD) unit has been optimized for periodically unoccupied areas and features automatic background calibration over a long time period to reduce drift. The Dual Channel (DCD) "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 from altitude or weather patterns can affect CO_2 sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric pressure sensor that continuously compensates the output for accurate readings despite the weather or altitude of the installation.

The unit can be ordered as CO_2 alone, or with optional temp, temp setpoint, override and humidity. Optional indication of CO_2 level as "Good, Fair or Poor" is available as a three-color LED or as an arrow on the display.



CO_2 Sensors with Temp Setpoint and Override.

Specifications

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

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

Sensing Elements:
ACD Unit CO_2: Single Channel Non-Dispersive Infrared (NDIR)
DCD Unit CO_2: Dual Channel Non-Dispersive Infrared (NDIR)
Humidity: 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 UL94V-O

CO_2 Detection Range: 0 to 2,000 ppm

Start-Up Time: <2 Minutes

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

CO_2 Accuracy (Single Channel ACD Units):
400 to 1,250 ppm: ±30ppm or 3% of reading, whichever is greater
1,250 to 2,000 ppm: ±5% of reading + 30ppm

CO_2 Accuracy (Dual Channel DCD "24/7" Units):
400 to 1,000 ppm: ±75 ppm
>1,000 ppm: ±10% of reading

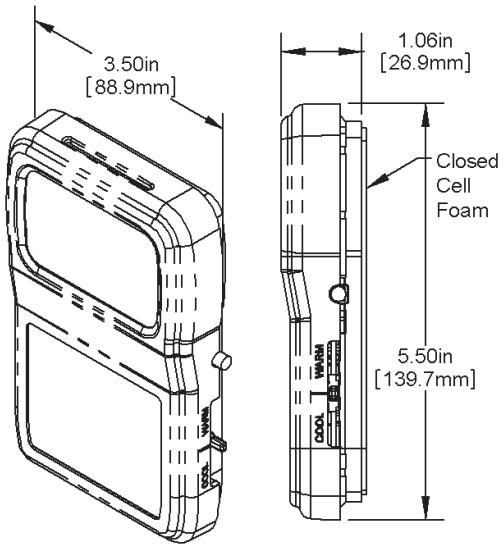
CO_2 Drift Stability (Dual Channel DCD "24/7" Units):
<5% of full scale over life of product.

Mounting: 2x4" J-Box or drywall – screws provided

LED CO_2 Level Indicator:
Good, Green < 1,000 PPM
Fair, Orange = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

Agency: RoHS, Title 24 Requirements

Warranty Period: 5 Years



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CO_2 Room Sensor, BAPI-Stat 3 Enclosure

Air Quality Sensors

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

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

CO2 BAPI-Stat 3 Room Sensor Option Selection Guide:

BA/BS3 (**#1**) - (**#2**) - (**#3**) - (**#4**)(**#5**) - (**#6**) - (**#7**) - (**#8**) - (**#9**) - (**#10**)

#1: Display Style (required)
F .....Unit with Display and °F indication ... $35
C .....Unit with Display and °C indication ... $35
X .....Unit without Display

#2: CO2 Output (required)
ACD05 ..Single Channel, 0 to 5V Output $475
ACD10 ..Single Channel, 0 to 10V Output $475
DCD05 ..Dual Channel, 0 to 5V Output $505
DCD10 ..Dual Channel, 0 to 10V Output $505

#3: Humidity Output (Optional)
H205 .....±2% Accuracy, Output of 0 to 5V $80
H210 .....±2% Accuracy, Output of 0 to 10V $80
H212 .....±2% Accuracy, Output of 2 to 10V $80

#4: Temp Setpoint Display Range (optional)
A .....-3 to +3 ..... $6
B .....-5 to +5 ..... $6
C .....50 to 90 °F or 10 to 32 °C $6
D .....55 to 85 °F or 13 to 30 °C..... $6
E .....60 to 80 °F or 15 to 27 °C..... $6
F .....65 to 80 °F or 18 to 27 °C..... $6

#5: Temp 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

#6: Temp Setpoint Legend (optional)
L6.....Cool/Warm
L0.....No Legend

#7: Temperature Sensor (optional)
1375.....1K Platinum RTD (375 curve)..... $25
1.....1K Platinum RTD (385 curve)..... $25
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

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

#9: Communication Jack (optional)
C35.....3.5 mm Phono Style Jack..... $10

#10: Configuration
(optional - Common Ground is default)
DF.....Differential Ground

#11: CO2 Level Indication (required)
LED.....3 Color LED on Logo Plate
ARW .....Black Arrow on Display
BNK .....No LED or Arrow

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

Example Number:
BA/BS3 **(F) - (ACD05) - ( ) - (F)(80)(L6) - (102) - (N) - ( ) - (DF) - (ARW)**

Actual Number (with parenthesis removed): BA/BS3F-ACD05-F80L6-102-N-DF-ARW

Description: BAPI-Stat 3, °F Display, 0 to 5V Single Channel CO2 Output, 65 to 80 Temp Setpoint Display Range, 0 to 20K Temp Setpoint Output Range, Cool/Warm Legend, 10K-2 Thermistor Temperature Sensor, No Override, No Comm. Jack, Differential Ground Configuration, Black Arrow on Display CO2 Level Indication

List Price:
$35 (°F Display) + $475 (Single Channel Unit) + $6 (Temp Setpoint) + $18 (Thermistor) = $534 List

Your Number: BA/

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CO_2 Duct and Rough Service Sensor

Air Quality Sensors

CE Rev. 01/19/21

Features & Options

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

The BAPI CO_2 Duct Sensor is an accurate and reliable way of incorporating demand controlled ventilation. It measures CO_2 in ranges of 0 to 2,000, 0 to 5,000 and 0 to 50,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

The Single Channel unit has been optimized for periodically unoccupied areas and features Automatic Background Calibration (ABC) over a long time period to reduce drift. The Dual Channel "24/7" unit has been optimized for continuously occupied areas and features a 3-point calibration process for enhanced accuracy and reliability.

Altitude and weather patterns can affect CO_2 sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric pressure sensor that continuously compensates the output for accurate readings despite the weather or altitude.

The Duct unit samples 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 CO_2 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

CO_2 Sensing Elements:
ACD Unit CO_2: Single Channel Non-Dispersive Infrared (NDIR)
DCD Unit CO_2: Dual Channel Non-Dispersive Infrared (NDIR)

Encl. Rating: Unventilated BAPI-Box: NEMA 4, IP66

Encl. Material: Polycarbonate, UL94 V-O

CO_2 Detection PPM Range:
0 to 2,000, 0 to 5,000 and 0 to 50,000

Start-Up Time: <2 Minutes

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

LED CO_2 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

CO_2 Accuracy, "24/7" Units:
400 to 1,000 ppm: ±75 ppm
>1,000 ppm: ±10% of reading

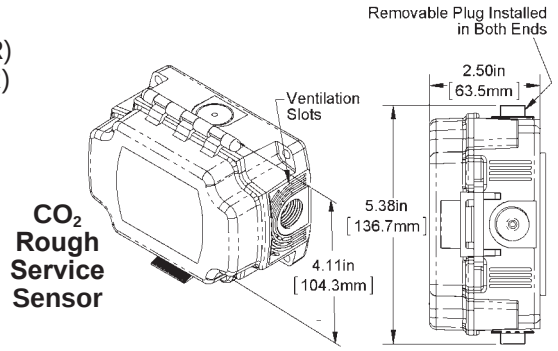
CO_2 Drift Stability, "24/7" Units:
<5% of full scale over life of product.

CO_2 Accuracy, Single Channel (ABC) Units:
400 to 1,250 ppm: ±30ppm or 3% of reading, whichever is greater

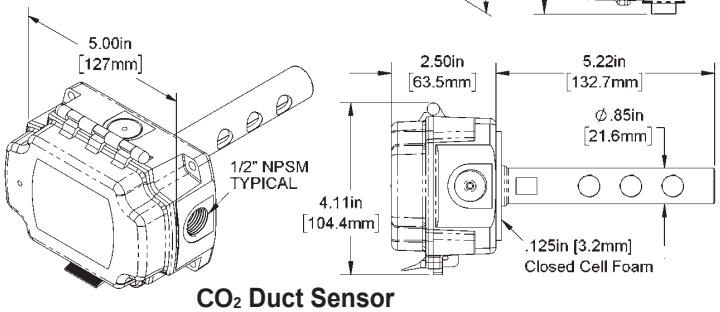
1,250 to 2,000 ppm: ±5% of reading + 30ppm

Agency: RoHS, CE, Title 24 Requirements

Warranty Period: 5 Years



CO_2 Rough Service Sensor



CO_2 Duct Sensor

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CO_2 Duct and Rough Service Sensor

Air Quality Sensors

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

Ordering Information

SINGLE CHANNEL (ABC) UNITS FOR PERIODICALLY UNOCCUPIED AREAS	LIST PRICE
BA/ACD05-D-BB Single Channel CO_2 Duct Sensor, 0 to 5V Output, 0 to 2,000 PPM Range	$470
BA/ACD05-V-BB Single Channel CO_2 Rough Service Sensor, 0 to 5V Output, 0 to 2,000 PPM Range	$550
BA/ACD10-D-BB Single Channel CO_2 Duct Sensor, 0 to 10V Output, 0 to 2,000 PPM Range	$470
BA/ACD10-V-BB Single Channel CO_2 Rough Service Sensor, 0 to 10V Output, 0 to 2,000 PPM Range	$550

DUAL CHANNEL "24/7" UNITS FOR CONTINUOUSLY OCCUPIED AREAS	LIST PRICE
BA/DCD05-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 5V Output, 0 to 2,000 PPM Range	$500
BA/DCD05-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 5V Output, 0 to 2,000 PPM Range	$580
BA/DCD10-D-BB Dual Channel "24/7" CO_2 Duct Sensor, 0 to 10V Output, 0 to 2,000 PPM Range	$500
BA/DCD10-V-BB Dual Channel "24/7" CO_2 Rough Service Sensor, 0 to 10V Output, 0 to 2,000 PPM Range	$580
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

Associated Products

BAPI VC350A or VC350A-EZ VOLTAGE CONVERTERS

The CO_2 unit requires 240mA of current to operate correctly. If this is more current than can be provided by the controller power output, then the unit can be powered by a BAPI VC350A or VC350A-EZ Voltage Converter. See the Accessories section for more info.



VC350A-EZ
Voltage Converter

E18 Carbon Monoxide Room Sensor

Air Quality Sensors

Rev. 07/21/21

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 20 mA Output
- BAPI-Stat 4 Enclosure with LED Status Indication

The BAPI Carbon Monoxide Room Sensor features a BAPI-Stat 4 Style Enclosure 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 4 Style Enclosure

5 YEAR WARRANTY

Specifications

Power Supply: 24 VAC/VDC, 1.0 VA Max

Audible Alarm: 75 dB at 10 feet

Relay Output: Form “C”, 0.1A , 30VDC, Jumper selectable for Normally Closed or Normally Open

CO Measurement Range: 0 to 40 ppm

Relay/Alarm Trip Level: 30 ppm CO

Jumper Selectable Analog Output: 0 to 5VDC, 0 to 10VDC or 4 to 20mA

CO Sensor Technology: Electrochemical

LED Behavior:

Normal Status
Green LED illuminated, Red LED flashes every 30 seconds indicating that the alarm is powered

Alarm Status
Green LED extinguished, flashing Red LED and audible alarm

Trouble/Service Status
Green LED illuminated, Red LED flashes twice and horn “beeps” once every 30 seconds

Test Status
Green LED illuminated, one chirp, then Red LED flashes 4 to 5 times followed by 2 alarm signals

Operating/Storage Temp:
40 to 100°F (4.4 to 37.8°C); 15 to 95% RH

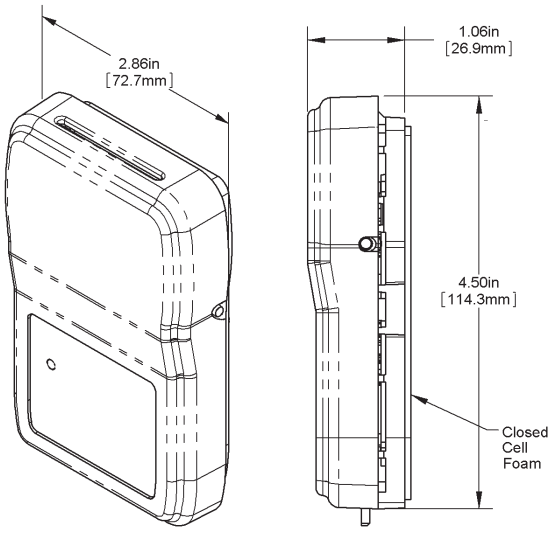
Sensor Life: 7 years typical

Response Time: 15 seconds typical

Sensor Overload Level: 5,000 ppm CO

Agency: RoHS

Warranty: 5 years



BAPI-Stat 4 Style Enclosure

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Ordering Information

Part #	Description	List Price
BA/CO-B4	Carbon Monoxide (CO) Sensor in a BAPI-Stat 4 Enclosure	$450

Note: Sensors must be installed and powered within 4 months of purchase to prevent loss of accuracy.

E20 CO Duct & Rough Service Sensor

Air Quality Sensors

Rev. 07/21/21

Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Field Selectable Ranges and Outputs
- Large Display and Two Independent Alarm Contacts
- Certificate of Calibration Included with Sensors and Replacement Modules

BAPI's Carbon Monoxide Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. The Duct unit samples duct air using an aspiration tube. The Rough Service unit features a ventilated BAPI-Box and is ideal for parking ramps, equipment rooms and warehouses.

The sensor has field selectable CO ranges of 0 to 100, 0 to 200, 0 to 300 and 0 to 500 ppm. It also has field selectable outputs of 0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC and 3-wire 4 to 20 mA output. The large LCD is backlit for 10 seconds after any button push.

Two independent SPDT alarm contacts switch at field selectable CO concentrations of 25, 35, 50, 100 and 200 ppm. An alarm timer can hold the output relays on for one to ten minutes after the CO level has fallen below 80% of setpoint. This allows additional fan run time to be sure that the CO has been purged.

The field replaceable sensor element lasts approximately 7 years and is self tested daily.



Rough Service (top) and Duct CO Sensors

Specifications

Power:
18 to 28 VAC, 7.2 VA Max
18 to 40 VDC, 180 mA Max

Field Selectable Ranges:
0 to 100, 0 to 200, 0 to 300 & 0 to 500 ppm

Alarm Relays:
2 Independent, Dry SPDT (Form C)
2 Amps at 24 VAC/DC, Resistive
140 VA Inrush, 48 VA Holding at 24 VAC

Field Wiring Terminals:
Pluggable Screw Terminals, 14 to 24 AWG

Response Time:
<80 seconds from 10% to 90% of range

Alarm Relay Setpoints:
25, 35, 50, 100 or 200 ppm

Alarm Timer:
0, 1, 5 & 10 minutes

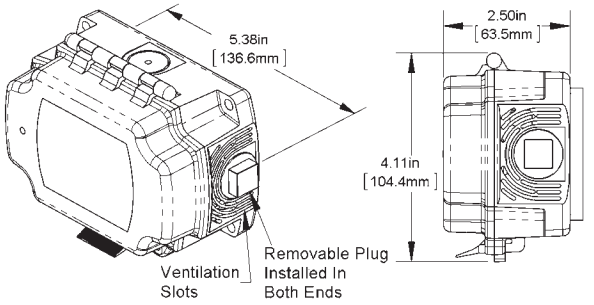
Sensor Element Life:
7 Years Typical

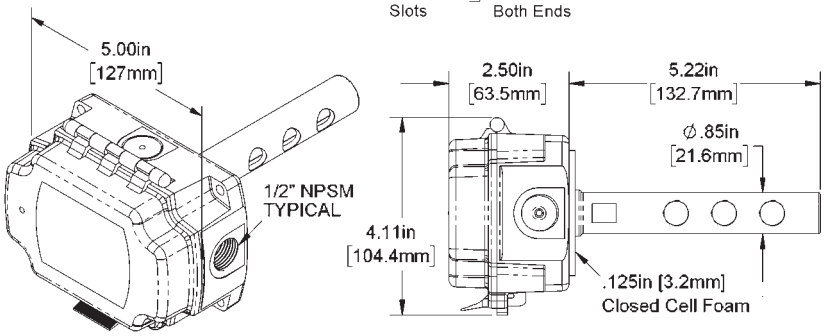
Field Selectable Outputs:
3-wire 4 to 20 mA
0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC

Agency: RoHS, CE

Accuracy:
<200 ppm = ±3% FS, 32 to 122°F (0 to 50°C)
201 to 500 ppm = ±5% FS, 50 to 122°F (10 to 50°C)

Environmental Operation Range
14 to 122°F (-10 to 50°C) • 5 to 95%RH Noncondensing





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Ordering Information

Part #	Description	List Price
BA/CO-V-BB	Rough Service Carbon Monoxide Sensor	$900
BA/CO-D-BB	Duct Mount Carbon Monoxide Sensor	$832
BA/COS	Factory Calibrated Replacement CO Module (For use with BA/CO-V-BB and BA/CO-D-BB sensors only)	$250

Replacement CO Module

The Replacement CO Module is factory calibrated so no calibration is needed at installation. It has a sensor life of approximately 7 years which doesn't begin until the module is installed in the sensor.



BA/COS: Factory Calibrated Replacement CO Module
(For use with BA/CO-V-BB and BA/CO-D-BB sensors only)

CO Rough Service with Optional BACnet

Air Quality Sensors

CE Rev. 07/21/21

Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Optional BACnet MS/TP Output of CO, Temp and Humidity
- Field Selectable Voltage Outputs
- Certificate of Calibration Included with Sensors and Replacement Modules

BAPI's Carbon Monoxide Rough Service Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. It features a ventilated BAPI-Box and is ideal for parking ramps, equipment rooms and warehouses.

The sensor has a CO range of 0 to 500 ppm with field selectable outputs of 0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC. It includes optional humidity measurement with one of the above voltage outputs, and temperature via a 10K-2, 10K-3 or 20K Thermistor. The CO, temperature and humidity outputs are also available via BACnet MS/TP.

The field replaceable sensor element lasts approximately 7 years and is self-tested daily.



CO Rough Service Sensors (Bottom unit shown with temp and %RH sensing)

Specifications

Power:
0 to 5 or 1 to 5 VDC Output
9 to 40 VDC, 10 mA Max
12 to 28 VAC, 1.4 VA Max

0 to 10 or 2 to 10 VDC Output
12 to 40 VDC, 10 mA Max
12 to 28 VAC, 1.4 VA Max

BACnet Output
9 to 40 VDC, 35 mA Max
12 to 28 VAC, 1.7 VA Max

CO Measurement Range: 0 to 500 ppm

Field Wiring Terminals:
Flying Leads, 22 AWG

Response Time:
<80 seconds from 10% to 90% of range

Sensor Element Life: 7 Years Typical

Field Selectable Voltage Outputs
0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC

Carbon Monoxide Sensor Accuracy:
<200ppm = ±3% FS, 32 to 122°F (0 to 50°C)
201 to 500 ppm = ±5% FS, 50 to 122°F (10 to 50°C)

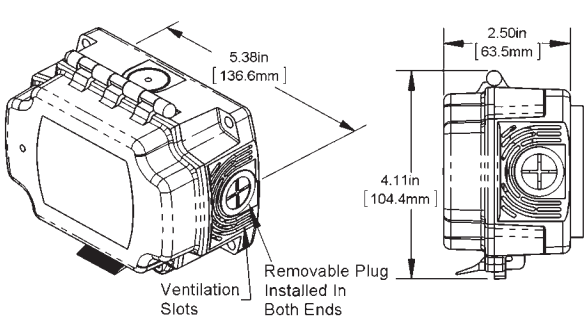
Temperature Sensor Accuracy:
BACnet Units: ±0.3°C from -40 to 257°F (-40 to 125°C)
Thermistor Units: See "Sensors" section for specs

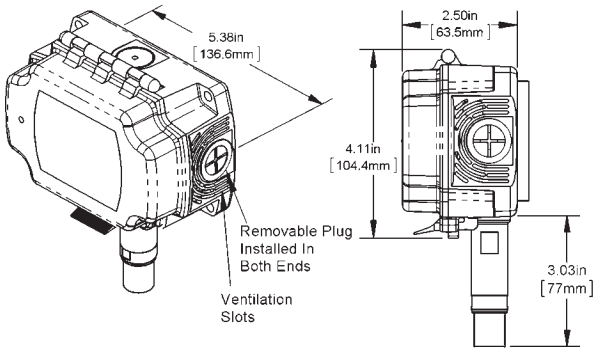
Humidity Sensor Accuracy:
±2% RH (20% to 80%) @ 25°C, Fully Compensated

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

Intermittent: -40 to 131°F (-40 to 55°C)
5 to 95%RH Noncondensing

Agency: RoHS, CE





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Ordering Information

Part #	Description	List Price
BA/BBV-CO	Rough Service CO Sensor	$345
BA/BBV-COV-102-H	Rough Service CO Sensor with 10K-2 Thermistor Temp and %RH	$446
BA/BBV-COV-103-H	Rough Service CO Sensor with 10K-3 Thermistor Temp and %RH	$446
BA/BBV-COV-20-H	Rough Service CO Sensor with 20K Thermistor Temp and %RH	$446
BA/BBV-COBN	Rough Service CO Sensor with BACnet Output	$489
BA/BBV-COBN-H	Rough Service CO Sensor with Temp, %RH and BACnet Output	$583
BA/BBV-COS	Factory Calibrated Replacement CO Module (For use with BA/BBV version CO sensors only)	$250

Replacement CO Module

The Replacement CO Module is factory calibrated so no calibration is needed at installation. It has a sensor life of approximately 7 years which doesn't begin until the module is installed in the sensor.

BA/BBV-COS: Factory Calibrated Replacement CO Module
(For use with BA/BBV version CO sensors only)



E24 Nitrogen Dioxide Duct & Rough Service Sensor

Air Quality Sensors

Rev. 07/21/21

Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Two Independent Alarm Contacts
- Field Selectable NO_2 Ranges and Outputs
- Certificate of Calibration Included with Sensors and Replacement Modules

BAPI's Nitrogen Dioxide Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. The Duct unit samples duct air using an aspiration tube. The Rough Service unit features a ventilated BAPI-Box and is ideal for parking ramps, equipment rooms and warehouses.

The sensor has field selectable NO_2 ranges of 0 to 2.5, 0 to 5, 0 to 7.5 and 0 to 10 ppm. It also has field selectable outputs of 0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC as well as a 3-wire 4 to 20 mA output. The LCD is backlight for 10 seconds after a button push.

Two independent SPDT alarm contacts switch at 5 field-selectable NO_2 concentrations from 1 to 10 ppm. An alarm timer holds the output relays on for a fixed time after the NO_2 level has fallen below 80% of setpoint to allow additional fan time to ensure the NO_2 has been purged. The field replaceable sensor element lasts approximately 7 years and is self-tested daily.



Rough Service (top) and Duct NO_2 Sensors

Specifications

Power:
18 to 28 VAC, 7.2 VA Max
18 to 40 VDC, 180 mA Max

Field Selectable Ranges:
0 to 2.5 ppm • 0 to 5.0 ppm
0 to 7.5 ppm • 0 to 10.0 ppm

Accuracy: ±5.0% FS

Alarm Relays:
2 Independent, Dry SPDT (Form C)
2 Amps at 24 VAC/DC, Resistive
140 VA Inrush, 48 VA Holding at 24 VAC

Field Wiring Terminals:
Pluggable Screw Terminals, 14 to 22 AWG

Response Time:
<80 seconds from 10% to 90% of range

Alarm Relay Setpoints:
1.0, 2.5, 5.0, 7.5 or 10 ppm

Alarm Timer:
0, 1, 5 & 10 minutes

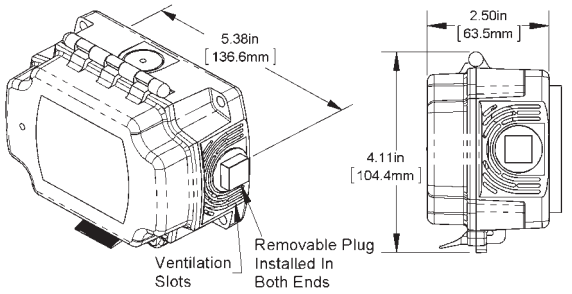
Field Selectable Analog Outputs:
3-wire 4 to 20 mA
0 to 5 VDC, 1 to 5 VDC
0 to 10 VDC, 2 to 10 VDC

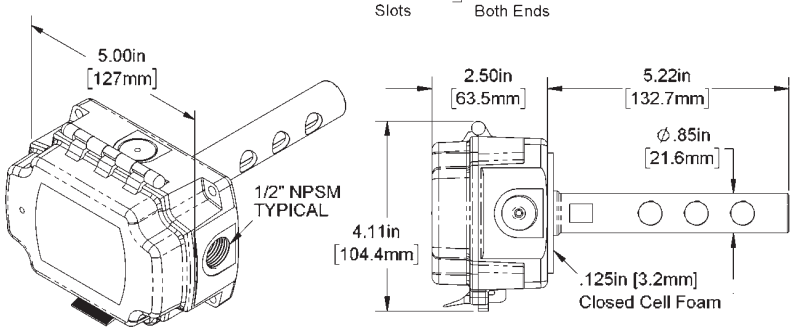
Sensor Element Life:
7 Years Typical

Environmental Operation Range:
Continuous: -4 to 104°F (-20 to 40°C), 15 to 95%RH Non-condensing

Intermittent: -22 to 122°F (-30 to 50°C), 0 to 95%RH Non-condensing

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





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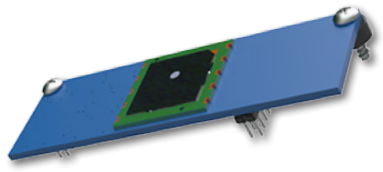
Ordering Information

Part #	Description	List Price
BA/NO2-V-BB	... Rough Service NO_2 Sensor, Ventilated BAPI-Box	$1,170
BA/NO2-D-BB	... Duct Mount NO_2 Sensor	$1,100
BA/NO2S	..... Factory Calibrated Replacement NO_2 Module (For use with BA/NO2-V-BB and BA/NO2-D-BB sensors only)	$570

Note: Sensors and Replacement NO_2 Modules must be installed and powered within 4 months of purchase to prevent loss of accuracy.

Replacement NO_2 Module

The Replacement NO_2 Module is factory calibrated so no calibration is needed at installation. It has a sensor life of approximately 7 years which doesn't begin until the module is installed in the sensor.



BA/NO2S: Factory Calibrated Replacement NO_2 Module
(For use with BA/NO2-V-BB and BA/NO2-D-BB sensors only)

Particulate Sensor, BAPI-Stat "Quantum"

Air Quality Sensors

Rev. 06/11/21

Features & Options

- Field Selectable Particulate Size of PM1.0, PM2.5 and PM10
- Field Selectable Outputs of 0 to 5V, 0 to 10V and 4 to 20mA
- Laser-based, light scattering particle sensing with 10 year expected lifetime.

The BAPI-Stat "Quantum" Particulate Sensor is an accurate and reliable way of continuously monitoring the concentration of particles in a room. Laser-based sensors provide the highest accuracy for commercial applications and will measure particle concentrations from 0 to 1,000 µg/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)

5 YEAR WARRANTY

ORDERING INFORMATION **List Price**

BA/CQX.....Particulate Sensor, Standard Mounting Base..... $475
BA/CQX60.....Particulate Sensor, 60mm Mounting Base $475

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

Specifications

Power: (Half-wave rectified)
7 to 40 VDC (4 to 20mA Output)
7 to 40 VDC or 12 to 28 VAC (0 to 5 VDC Output)
15 to 40 VDC or 15 to 28 VAC (0 to 10 VDC Output)

Power Consumption:
75 mA Max @ 24 VDC • 3 VA Max @ 24 VAC

Load Resistance: VDC Output 4K Ohms Min

Sensing Element: Laser-based, Light Scattering

Sensor Element Life: 10 Years Typical

Concentration Range: 0 to 1,000 µg/m³

Accuracy at 77°F (25°C):

	0 to 100 µg/m³	100 to 1,000 µg/m³
PM1.0	±25 µg/m³	±25% of reading
PM2.5	±15 µg/m³	±15% of reading
PM10	±25 µg/m³	±25% of reading

Response Time: <6 Seconds

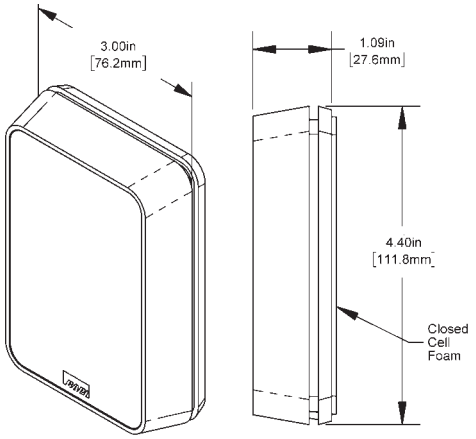
Wiring: 3 Wires, 16 to 22 AWG

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

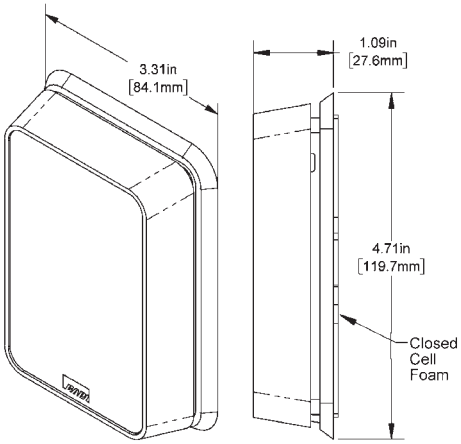
Enclosure Material: ABS Plastic, UL94 V-0

Mounting:
Standard 2"x4" Junction Box, European Junction Box or Drywall Mount (screws provided)

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



Unit with Standard Mounting Base



Unit with 60mm Mounting Base

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Features & Options

- Field Selectable Particulate Size of PM1.0, PM2.5 and PM10
- Field Selectable Outputs of 0 to 5V, 0 to 10V and 4 to 20mA
- Laser-based, light scattering particle sensing with 10 year expected lifetime.

The BAPI-Box Duct Particulate Sensor is an accurate and reliable way of continuously monitoring the concentration of particles in a duct. The duct unit samples duct air using an aspiration tube.

Laser-based sensors provide the highest accuracy for commercial applications and will measure particle concentrations from 0 to 1,000 µg/m³.

ORDERING INFORMATION **List Price**

BA/PM-D-BB... Particulate Sensor, Duct.....$750

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



Duct Particulate Sensor

5 YEAR WARRANTY

Specifications

Power: (Half-wave rectified)
7 to 40 VDC (4 to 20mA Output)
7 to 40 VDC or 12 to 28 VAC (0 to 5 VDC Output)
15 to 40 VDC or 15 to 28 VAC (0 to 10 VDC Output)

Power Consumption:
75 mA Max @ 24 VDC • 3 VA Max @ 24 VAC

Load Resistance: VDC Output 4K Ohms Min

Sensing Element: Laser-based, Light Scattering

Sensor Element Life: 10 Years Typical

Concentration Range: 0 to 1,000 µg/m³

Accuracy at 77°F ±9°F (25°C ±5°C):

	0 to 100 µg/m³	100 to 1,000 µg/m³
PM1.0	±25 µg/m³	±25% of reading
PM2.5	±15 µg/m³	±15% of reading
PM10	±25 µg/m³	±25% of reading

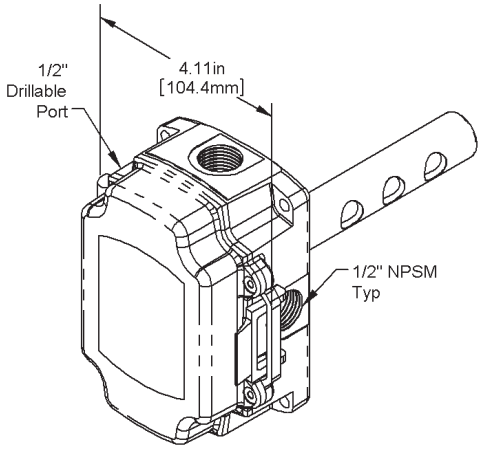
Response Time: <6 Seconds

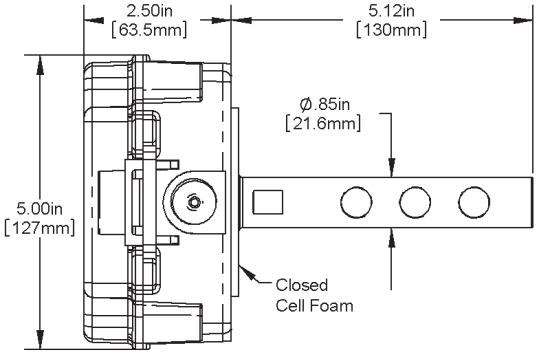
Wiring: 3 Wires, 16 to 22 AWG

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

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

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





Refrigerant Leak Detector

Air Quality Sensors

Rev. 02/15/21

Features & Options

- Detects Most Modern Refrigerants
- Area Monitoring for Leaks and Spills
- Provides a Voltage Output
- Cost Effective

The BAPI Refrigerant Leak Detector is an area monitor that detects a wide range of refrigerants. It is not intended for critical ppm measurements nor life safety applications. 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.



Refrigerant Leak Detector in a BAPI-Box Enclosure

ORDERING INFORMATION **List Price**

BA/RLD ..... Refrigerant Leak Detector in a Blue BAPI-Box Enclosure $465

BA/RLD-W ..... Refrigerant Leak Detector in a White BAPI-Box Enclosure $465

BA/RLD-EL ..... Replacement Element $60

Gray shaded items follow the Buy and Resale Multiplier.

Specifications

Power:
9 to 40 VDC at 120 mA max
19 to 32 VAC at 5 VA

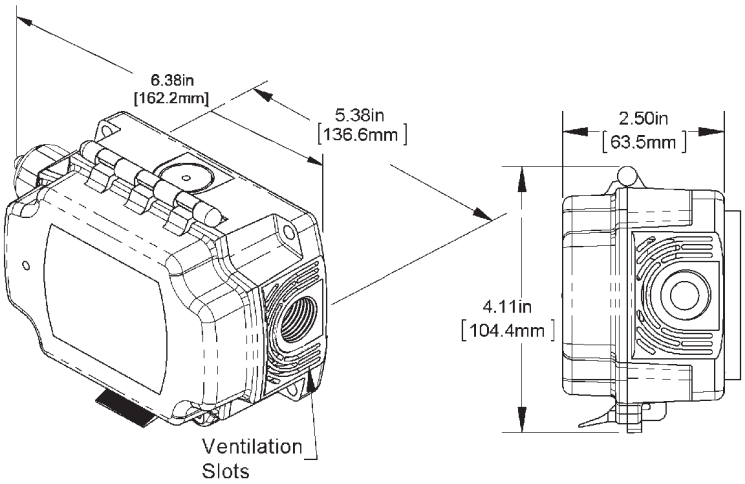
Output Impedance: 680 Ohms

Output Voltage: 0 to 4.8 VDC

Ambient Temp: 32 to 140ºF (0 to 60ºC)

Sensor Element Life: 2 Years Typical

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".

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Features & Options

- Calibrates and Verifies Proper Operation of All BAPI CO_2 Room and Duct Sensors

BAPI's CO_2 Sensor Calibration Kit verifies the proper operation and calibrates all of BAPI's room and duct CO_2 sensors. Two calibration gas concentrations are required to perform a complete calibration*. Purchase the single point gas at a CO_2 concentration of 400 to 800 ppm, and the span gas at 1,000 to 1,200 ppm. Only one regulator is required because it can be swapped between gas cylinders.

BAPI's CO_2 Sensor Calibration Kit consists of the following:

- A communications cable that connects a computer to the BAPI CO_2 sensor**
- A funnel used as a gas shroud
- A length of tubing to connect the funnel to the test gases
- Rubber bands to secure the funnel to the BAPI CO_2 sensor
- Shunt jumpers to place the BAPI CO_2 sensor into test mode

*A single point gas may not be required. If the ambient CO_2 concentration is known, stays stable at ±10 ppm for at least 10 minutes and is in the range of 350 to 800 ppm, you may perform the single point accuracy check & calibration without any test gas.

**The test software must be downloaded from the BAPI CO_2 Sensor Calibration Kit webpage at: https://www.bapihvac.com/product/co2-sensor-calibration-kit/



CO_2 Sensor Calibration Kit



CO_2 Sensor Calibration Kit with Optional Case (shown with customer supplied gas cylinders)

ORDERING INFORMATION		List Price
BA/CO2-KIT	CO_2 Sensor Calibration Kit	$155
BA/CO2-KIT-C	CO_2 Sensor Cal. Kit with Case	$600
BA/CO2-C	Empty Case with Foam Cutouts	$455

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

VOC Sensor Verification Kit

Overview

The VOC Sensor Verification Kit allows a known VOC sample to be generated and applied to a BAPI room or duct VOC sensor. The sample tests the dynamic range of the sensor to see if the sensor element is working correctly.

The kit consists of a plastic bottle and a 60mL syringe and a comprehensive set of instructions. The customer has to supply 70% minimum Isopropyl Alcohol.



VOC Sensor Verification Kit

ORDERING INFORMATION		List Price
BA/VOC-KIT	VOC Sensor Verification Kit	$18

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

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BAPI VOC Sensor Offers an Alternative to CO_2 for Demand Controlled Ventilation



Most system designers use CO_2 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 CO_2 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 CO_2 sensor.

The BAPI unit does this by measuring Volatile Organic Compounds (VOCs) then outputting a signal that corresponds to a CO_2 level of 0-2,000 ppm. This means system designers can use their existing CO_2-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 CO_2. 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 CO_2 levels in 1,500 offices, schools and homes to determine the relationship between these three factors. The research identified a complex correlation algorithm between VOCs and CO_2, and this algorithm was used to create the output of the VOC sensor. The accuracy of this output as compared to CO_2 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 CO_2 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

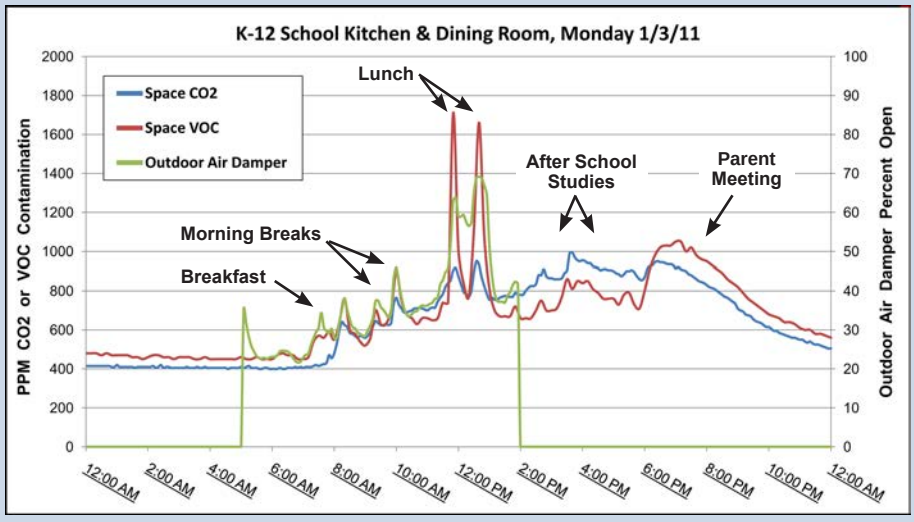
This chart was taken in a kitchen and dining area of a public school in Wisconsin. This is a true multi-purpose area with breakfast, snacks, lunch, and after school studies in the day, and athletic practices, exercise classes and meetings at night.

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 CO_2 sensor climbs a short time later as the students arrive to eat. The VOC sensor has slightly higher readings than the CO_2 sensor during breakfast and the morning breaks because the VOCs from the food are added to the VOCs generated by the people. This is also seen at lunch as cooking of the sausage pizza generated lots of VOCs which are added to the VOCs from the students and staff. The BAPI sensor will allow these additional VOCs to be ventilated away while the CO_2 sensor will not.

At 2:30 pm, students arrive for "After School Studies" so the VOCs and CO_2 rise a little during this period. There is a community meeting at 6 pm. Notice how the VOCs track slightly below the CO_2 during the "After School Study" period when it is mostly kids in the room. Then the VOCs track slightly above the CO_2 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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E32 Using the BAPI VOC Sensor for Demand Controlled Ventilation

Rev. 11/16/12

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 CO_2 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 CO_2 level in the space so that system designers can use their existing CO_2-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.

CO_2 and Demand-Controlled Ventilation

Until now, Indoor Air Quality (IAQ) has been defined as proper temperature, humidity and CO_2 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 CO_2? 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 CO_2 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 CO_2 levels are low[1].

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 CO_2 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 CO_2 level. This lets you use Ashrae's more popular and straight forward occupancy-based VRP schedule.

More information on this correlated CO_2 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, CO, CO_2
Building Materials	Paints, Adhesives, Solvents, Carpets	Formaldehyde, Alkanes, Alcohols, Aldehydes, Ketones, Siloxanes
Furniture	**P**oly **V**inyl **C**hloride (PVC)	Toluene, Xylene, Decane

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Using the BAPI VOC Sensor for Demand Controlled Ventilation

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 CO_2 sensor.

Space Occupancy — VOC Sensing versus CO_2 Sensing

Extensive research was conducted on VOCs and CO_2 in 1,500 offices, schools and homes to determine the correlation between CO_2 levels and VOC levels. This research was used to create correlated CO_2 output for the BAPI VOC sensor. The accuracy of this output as compared to CO_2 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 CO_2 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.

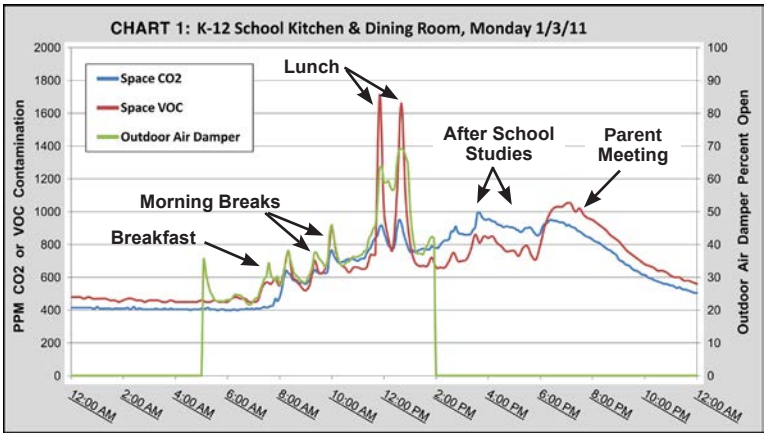
The following charts show the output of the VOC Sensor and CO_2 Sensor and the Outside Air Damper position during a typical week from Monday through Sunday. These charts show that the output of the VOC sensor has a high correlation to CO_2 levels and is reliable, predictable and repeatable.

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 CO_2 sensor climbs a short time later as the students arrive to eat. The VOC sensor has slightly higher readings than the CO_2 sensor during breakfast and the morning breaks because the VOCs from the food are added to the VOCs generated by the people. This is also seen at lunch as cooking of the sausage pizza generated lots of VOCs which are added to the VOCs from the students and staff. 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 CO_2 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 CO_2 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 CO_2 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.

Using the BAPI VOC Sensor for Demand Controlled Ventilation

Rev. 11/16/12

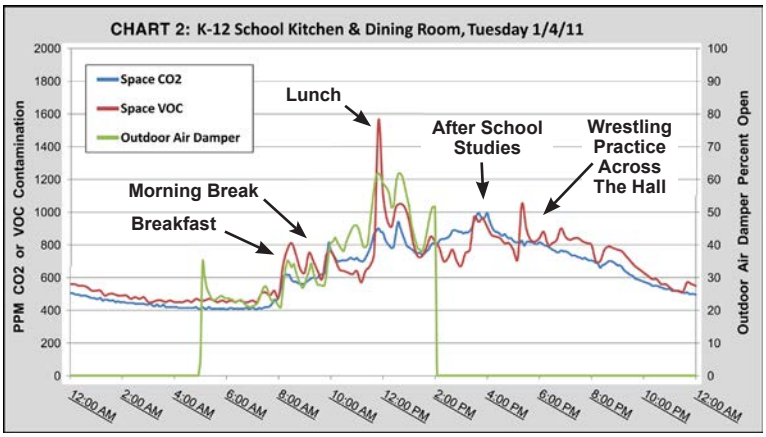


Chart 2, Tuesday:
The area again goes into occupied mode at 5 am and there are increases in VOCs and CO_2 during breakfast, morning break, lunch and after school studies.

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.

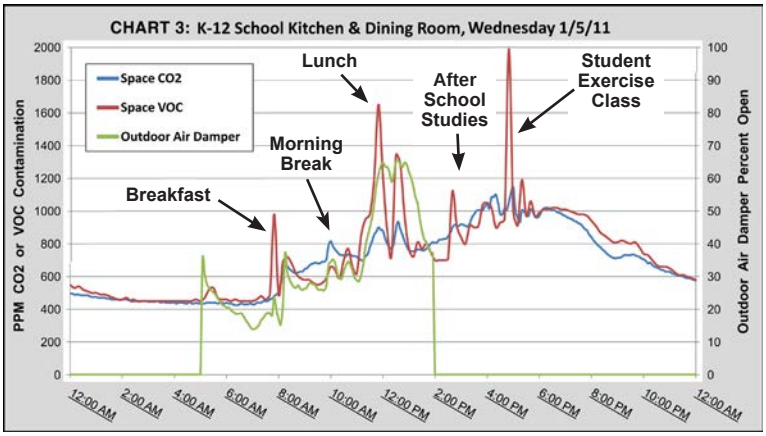


Chart 3, Wednesday:
The daytime portion of Wednesday is similar to Monday and Tuesday with increases in VOCs and CO_2 during breakfast, midmorning break and after school studies, and spikes in VOCs due to cooking at lunch.

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.

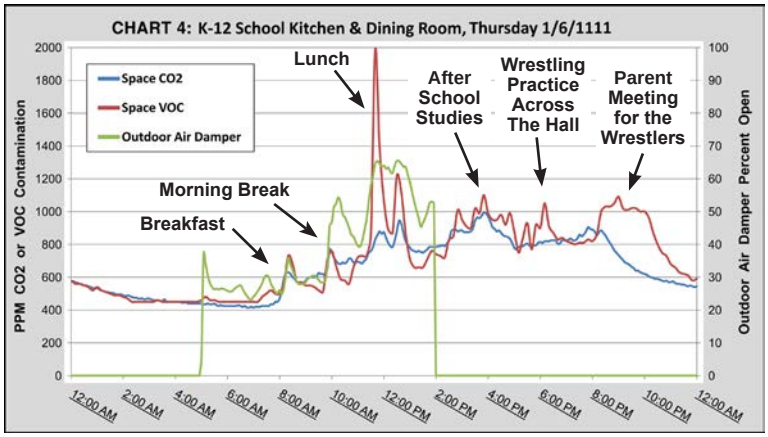


Chart 4, Thursday:
The daytime portion of Thursday is similar to the rest of the week with increases in VOCs and CO_2 during breakfast, midmorning break and after school studies, and spikes in VOCs due to cooking at lunch.

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.

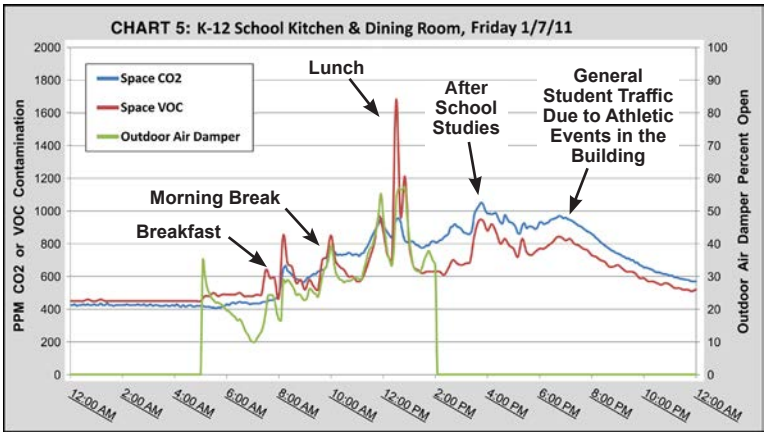


Chart 5, Friday:
The daytime portion of Friday is similar to the rest of the week with increases in VOCs and CO_2 during breakfast, midmorning break and after school studies, and spikes in VOCs due to cooking at lunch.

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.

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Using the BAPI VOC Sensor for Demand Controlled Ventilation

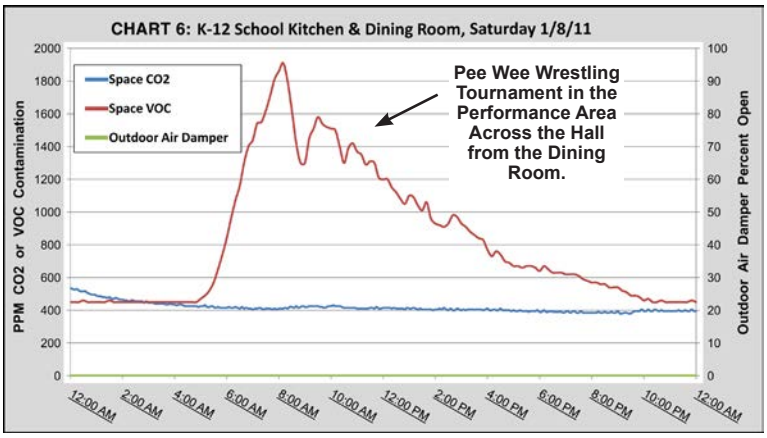


Chart 6, Saturday:
The space is considered unoccupied on Saturday so the Outdoor Air Damper is off.

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 CO_2 sensor would not ventilate away these VOCs and odors.

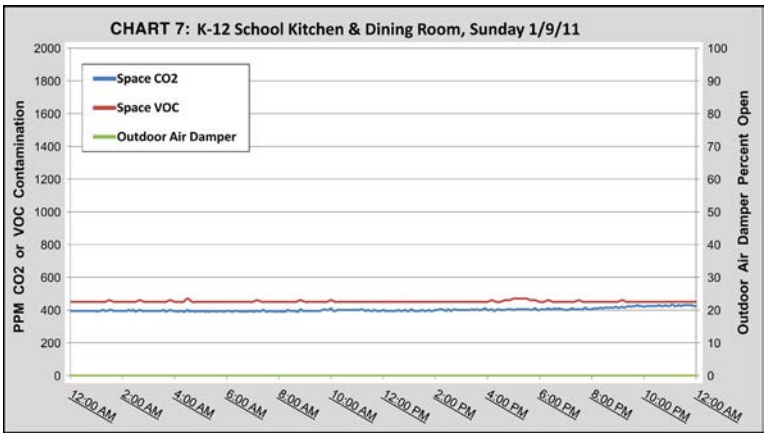


Chart 7, Sunday:
Sunday is the only day with no activity in the kitchen and dining area or the surrounding spaces, so there is only background levels of VOCs and CO_2.

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 CO_2 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 CO_2 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 CO_2 sensor would not have sensed the contaminant from the molding machine.

Using the BAPI VOC Sensor for Demand Controlled Ventilation

Rev. 10/16/12

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 run[2].

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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Calibration Methods for Single and Dual Channel CO_2 Sensors

Carbon Dioxide (CO_2) in air is normally measured in Parts Per Million (ppm). At 1,000 ppm CO_2, one million air molecules would contain a mixture of 999,000 air molecules and 1,000 CO_2 molecules. The most common CO_2 sensors are known by the engineering term Non-Dispersive InfaRed, or NDIR. An NDIR CO_2 sensor shines infrared light through a gas sample in a sample chamber (see Figure 1). Sensitive photo-detectors measure the intensity of the infrared light after it passes through the gas sample. CO_2 molecules are opaque to 4.26 micron infrared light while the rest of the air molecules are not. So the intensity of the infrared light is diminished proportionally to the number of CO_2 molecules that are present. Measuring the resultant light intensity measures the number of CO_2 molecules present.

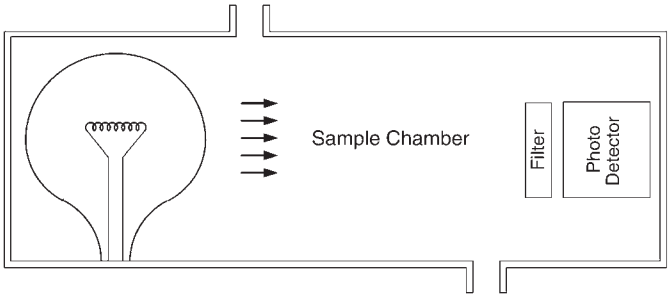


Figure 1: Single Channel CO_2 Sensor

Sensor Drift

The most common light source for NDIR sensors is an incandescent light bulb. In these bulbs, an electric current passes through a metal filament and heats it until it starts to glow. The glowing filament is extremely hot and some of the metal atoms boil off the filament and fly around inside the bulb. Most of these atoms re-adhere to the filament when the power is turned off, but some move far enough away from the filament that they condense onto the glass envelope. Over time, this thin metal coating slightly reduces the amount of light emitted by the bulb. This reduction is perceived by the sensor as an increase in CO_2 concentration. Also, when the metal atoms condense back onto the filament, they can slowly shift the spectrum of the emitted light which can affect the perceived infrared light intensity and CO_2 concentration.

Automatic Background Calibration

One way to compensate for sensor drift is through automatic background calibration. Outdoor levels of CO_2 are generally around 400 ppm. Since people are the main source of CO_2 inside a building, when a building is unoccupied for 4 to 8 hours the CO_2 levels tend to drop to the outside level. Automatic background calibration uses the sensor's on-board microprocessor to remember the lowest CO_2 concentration that occurs every 24 hours. The sensor assumes this low point is the outside CO_2 level. The sensor is also smart enough to discount periodic elevated readings that occur if a space is occupied for 24 hours a day over a few days. Once the sensor has collected 14 days worth of low CO_2 concentration periods, it performs a statistical analysis to see if there has been any small changes in the background levels readings that could be attributable to sensor drift. If the analysis concludes there is drift, a small correction factor is made to the sensor calibration to adjust for this change. This automatic calibration requires that at least three of the last 14 days have space CO_2 levels that reach 400 ppm for an hour or more.

Reference Channel Calibration

Another way to compensate for sensor drift is through a dual channel design. In this setup, one photo-detector and filter is used for CO_2 measurement and works the same as in a single channel design. The second photo-detector and filter is a reference and uses a wavelength that is not affected by air molecules. About once a day, the sensor takes a reading using the reference channel. Any change in this reference measurement indicates a change in the optics of the sensor which can lead to drift. The sensor then automatically corrects the CO_2 measurement from the first channel to prevent the drift.

While the reference channel corrects for changes over time, a field calibration will immediately restore the highest level of accuracy. BAPI recommends a 5-year calibration interval for the average office environment.

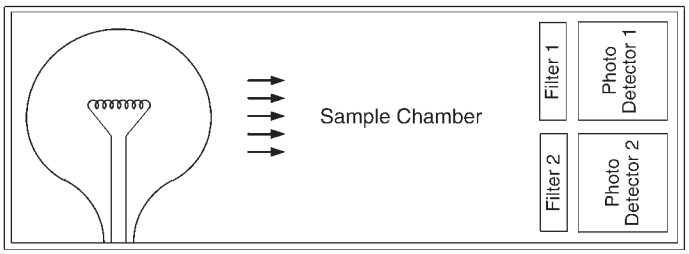


Figure 2: Dual Channel CO_2 Sensor

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E38 Common Volatile Organic Compounds Detected by BAPI's VOC Sensor

Rev. 10/16/17

Depending on the source of the information, 5,000 to 10,000 unique Volatile Organic Compounds (VOCs) exist. BAPI's VOC sensor reacts to all of them.

VOCs are chemicals that contain carbon and have boiling points below 100°C. Most can be vapors at room temperature. In their liquid form many VOCs can contaminate ground water.

Families of VOCs detected are:

- CO, CH4, LPG
- Alcohols
- Ketones. Ketones are solvents. The best known are Acetone and Methyl Ethyl Ketone or MEK.
- Organic Acids. Common organic acids are Lactic acid, Acetic acid, Formic acid, Citric acid and Oxalic acid
- Amines. Amines are derivatives of ammonia.
  Wikipedia lists 175 compounds as amines, http://en.wikipedia.org/wiki/Category:Amines
- Aliphatic Hydrocarbons. Aliphatic hydrocarbons are flammable hydrocarbons with little or no odor. Examples are hexane, paraffin, methane and acetylene.
- Aromatic Hydrocarbons. Aromatic hydrocarbons are flammable hydrocarbons with a discernable odor. Examples are benzene, furan, pyridine, toluene, asphaltene and picric acid.

A list of some of the most common VOCs and their sources follows.

VOC	Source
1-hexene	Human metabolism
1-isocyanobutane	Coatings
1,1,1-trichloroethane	Ink, Paint, Photo-resist, Photographic film
1,4-dioxane	Spot removers
2-bromopentane	Prescription drugs
(2-methylcyclohexyl) propanedinitrile	Human metabolism
2,2-dimethylbutane	Human metabolism
2,3,3-trimethylpentane	Human metabolism
2,3-dimethylpentane	Human metabolism
2,3,4-trimetylpentane	Human metabolism
3-methylhexane	Human metabolism
3,4-dimethyl-1-pentene	Human metabolism
4-methyl-1-pentene	Human metabolism
5-methyl-1-hexene	Human metabolism
6-methyl-1-heptanol	Human metabolism
Acetaldehyde	Disinfectants, Adhesives, Coatings, Plastics, Lubricants, Ripening of fruit
Acetic acid esters	Surface cleaners
Acetone	Polyester resins, Vinyl, Adhesives, Human metabolism
bis-(1,1-dimethylethyl)nitroxide	Human metabolism
Benzene	Plastics, Building materials, Furniture, Office equipment
Butoxyethanol	Surface cleaners
Butyl acetate	Surface cleaners
C6 - C10 substituted alkanes	Cleaners, Polishers
Carbon Monoxide	Automobile exhaust, Fuel based heating, Cooking appliances, Smoking
Decanal	Artificial flavors, Perfume, Human metabolism
Dichlorobenzene	Deodorizers

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Common Volatile Organic Compounds Detected by BAPI's VOC Sensor

A list of some of the most common VOCs and their sources follows, continued from previous page...

VOC	Source
Dipropylene glycol	Surface cleaners
Ethanol	Disinfectants, Human metabolism
Ethyl Alcohol	Cosmetics, Cleaners, Disinfectants, Detergents, Paints, Human Metabolism
Eucalyptol	Cosmetics, Artificial flavors, Insecticides
Formaldehyde	Biocides, Disinfectants
Heptane	Human metabolism
Hydrocarbons	Waxes, Polishes
Isobutane	Aerosol cleaners
Isobutene	Aerosol cleaners
Isoprene	Synthetic rubber, Human metabolism
Limonene	Cosmetics, Cleaners, Artificial flavors, Prescription drugs
Methane	Natural gas, Human metabolism
Methoxyethanol	Surface cleaners
Methoxyethoxyethanol	Surface cleaners
Methylcyclohexane	Human metabolism
Methylethylketone	Adhesives, coatings, Plastics, Lubricants
Methyl methacrylate	Hard surface cleaners
Naphthalene	Disinfectants, Repellants
Nonanal	Artificial flavors, Perfume, Human metabolism
Organic Chloramines	Combination of general and pool cleaning chemicals and human metabolism
Pentane	Polystyrene foam, Refrigerants
Phenol	Platics, Cosmetics, Disinfectants
Pinene	Perfume, Human metabolism
Propane	Fuel based heating, Cooking appliances, Cleaners
Siloxanes	Waxes, Polishes
Tetrachloroethene	Dry cleaning
Tetrachloroethylene	Spot cleaners
Toluene	Paints, Coatings, Cleaners, Detergents, Smoking, Polyurethane lacquers
Trichloromethane	Human metabolism
r (1-methylethyl)cyclopropane	Adhesives, Coatings, Plastics, Lubricants
Xylene	Plastics, Synthetic Rubber, Polyester clothing

E40 The Effects of Temperature and Barometric Pressure on CO_2 Sensors

Rev. 10/16/12

Carbon Dioxide (CO_2) in air is normally measured in Parts Per Million (ppm). At 1,000 ppm CO_2, a volume or air containing one million air molecules would contain a mixture of 999,000 air molecules and 1,000 CO_2 molecules.

The volume of air necessary to contain one million air molecules is affected by air temperature and air pressure, also called Barometric Pressure. As the pressure decreases, the volume needed to contain one million air molecules increases. The opposite is true of temperature. As the temperature decreases, the volume of air needed to contain one million molecules decreases. Although the volume of air is affected by temperature and pressure, the concentration of CO_2 is not affected. If you started with 1,000 ppm of CO_2, then you finish with 1,000 ppm of CO_2 despite the changes in the air volume.

The most common CO_2 sensors are known by the engineering term Non-Dispersive InfraRed, or NDIR. An NDIR CO_2 sensor shines infrared light through a gas sample in a sample chamber. Sensitive photo-detectors measure the intensity of the infrared light after it passes through the gas sample. CO_2 molecules are opaque to 4.26 micron infrared light while the rest of the air molecules are not. So the intensity of the infrared light is diminished proportionally to the number of CO_2 molecules that are present. Measuring the resultant light intensity measures the number of CO_2 molecules present.

The size of the NDIR sampling chamber is fixed and is open to the atmosphere so that air can move in and out. As explained above, the number of air molecules in a given volume is affected by temperature and air pressure but not the concentration of CO_2. At low pressures or high temperatures, there will be fewer air molecules in the sample chamber, so there will also be fewer CO_2 molecules, even though the ppm of CO_2 hasn't changed. Fewer CO_2 molecules "fools" the sensor into thinking that the CO_2 concentration is lower than it really is. At high pressures or low temperatures, there are more air molecules in the sample chamber and more CO_2 molecules, even though the CO_2 concentration hasn't changed. More CO_2 molecules "fools" the sensor into thinking that the CO_2 concentration is higher than it really is. Therefore a CO_2 sensor calibration will only be accurate at one temperature and one air pressure.

Calculating Temperature and Barometric Pressure Effects on CO_2 Measurement

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

$$ppm\ CO_{2\ corrected} = ppm\ CO_{2\ measured} * ((T_{measured} * p_{ref}) / (p_{measured} * T_{ref}))$$

- $p_{measured}$ = Current pressure, in the same units as reference pressure (not corrected to sea level)
- T_{ref} = reference temperature, usually 25°C, 77°F, converted to absolute (298.15 for °C, 536.67 for °F)
- $T_{measured}$ = Current absolute temperature, °C + 273.15, °F +459.67
- p_{ref} = reference Barometric Pressure, usually sea level, 29.92 in Hg, 760 mm Hg, 1013.207 hPa or 14.6959 psi

Table 1: CO_2 Measurement Change With Temperature

Temp. in °F	CO_2 Measured in PPM	Temp. in °F	CO_2 Measured in PPM	Temp. in °F	CO_2 Measured in PPM
32	1092	60	1033	85	985
35	1085	65	1023	90	976
40	1074	70	1013	95	968
45	1063	75	1004	100	959
50	1053	77	**1000**	105	950
55	1043	80	994	110	942

Table 1 uses the Ideal Gas Law formula above to show how the uncompensated CO_2 measurement would change with temperatures from 32 °F to 110 °F. Initial conditions are 1,000 ppm CO_2, 77°F and sea level Barometric Pressure. As seen in Table 1, the CO_2 concentration varies by 150 ppm.

Barometric Pressure is directly affected by altitude, and **Table 2** uses the Ideal Gas Law formula to show how the uncompensated CO_2 measurement would change with altitudes of -1,000 to 10,000 feet. Initial conditions are 77°F and 1,000 ppm CO_2 at sea level. As seen in Table 2, the CO_2 concentration varies by 349 ppm.

Table 2: CO_2 Measurement Change with Altitude and Barometric Pressure

Altitude in Feet	Barometric Pressure in inches Hg	CO_2 Measured in PPM
-1000	31.02	1037
0	29.92	**1000**
1000	28.85	964
2000	27.82	930
3000	26.82	896
4000	25.84	864
5000	24.9	832
6000	23.98	801
7000	23.09	772
8000	22.23	743
9000	21.39	715
10000	20.58	688

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The Effects of Temperature and Barometric Pressure on CO_2 Sensors

Weather Effects on Barometric Pressure and CO_2 Measurement

Heat entering our atmosphere creates weather patterns, and these patterns affect the Barometric Pressure by forming high pressure systems and low pressure systems. Fast moving storms can dramatically change the atmospheric pressure and effective altitude in only a few minutes.

About 15 miles from BAPI's headquarters is an internet enabled weather station on the Mississippi River bluffs above the small town of DeSoto. Looking at historical data from that weather station from 2003 to 2011, the highest pressure, the lowest pressure and the biggest one-day pressure swing are shown in Table 3.

If the actual CO_2 level was 1,000 ppm at sea level, then Table 3 shows what the measured CO_2 concentration would be in DeSoto on those days. From January 15, 2005 until October 26, 2010, weather patterns alone changed the CO_2 measurement by 75 ppm, which is the entire accuracy specification for a typical NDIR CO_2 sensor.

On the single day of January 18, 2005, weather patterns changed the CO_2 measurement by 35 ppm, which is almost 50% of the specified accuracy specification of a typical NDIR CO_2 sensor.

Table 3: CO_2 Measurement Change with Weather Patterns

Date	Barometric Pressure in inches Hg	Measured CO_2 in PPM
1/18/2005	30.71	1026
1/18/2005	29.64	991
1/15/2005	30.78	1029
10/26/2010	28.53	954

The Combined Effect of Temperature and Barometric Pressure on CO_2 Measurement

Temperature and Barometric Pressure affect CO_2 measurement individually as well as in combination. **Table 4** shows the measured CO_2 concentration for the range of Barometric Pressures recorded in DeSoto from 2005 to 2010 along with temperatures from 50 to 90°F.

If the actual CO_2 concentration was 1,000 ppm at 77°F and sea level, the measured CO_2 concentration would vary by 161 ppm across the various temperature and Barometric Pressure ranges. That variance is more than the specified accuracy of the NDIR CO_2 sensor.

Table 4: CO_2 Measurement Change with Temperature and Barometric Pressure Combined

		Barometric Pressure in Inches Hg						
		28.5	29	29.5	29.92	30	30.5	31
Temperature in °F	50	1003	1021	1038	1053	1056	1073	1091
	55	993	1011	1028	1043	1046	1063	1080
	60	984	1001	1018	1033	1035	1053	1070
	65	974	991	1009	1023	1026	1043	1060
	70	965	982	999	1013	1016	1033	1050
	75	956	973	990	1004	1006	1023	1040
	77	953	969	986	**1000**	1003	1019	1036
	80	947	964	980	994	997	1014	1030
	85	939	955	971	985	988	1004	1021
	90	930	946	963	976	979	995	1012

Dynamic CO_2 Measurement Compensation

Due to the constantly changing nature of Barometric Pressure and temperature and their effect on CO_2 measurement, the only way to get an accurate CO_2 measurement with an NDIR sensor is through temperature and Barometric Pressure compensation. That's why all BAPI CO_2 sensors have a built in Barometric Pressure sensor and temperature sensor.

Every eight seconds the BAPI sensor takes a CO_2 reading then compensates that value based on the current temperature and Barometric Pressure. That's one reason why BAPI's CO_2 sensors are the most accurate in the HVAC/R industry. There is also no need for an HVAC technician to spend valuable time manually entering the altitude value for the location into each and every sensor when it is installed. This makes the BAPI CO_2 sensor one of the easiest to install, saving time and money.

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Power Supplies and Voltage Converters

VC350A-EZ 350mA Voltage Converter

pg F2

VC350A 350mA Voltage Converter


PDM - Power Distribution Module

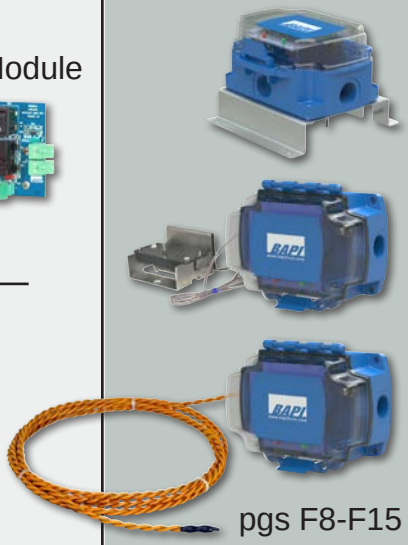
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VC2000 Voltage Conv.

pg F5

PS17 Power Supplies

pg F6

Water Leak Detector

pgs F8-F15

Door Monitor Alarm (DMA)


pg F16

BAPI-Guard

pg F18

PMPB5 - Pulse Meter Pulse Buffer
TS1 & TS2 - Transient Suppressors

pg F20

FPB - Flexible Probe Bracket

pg F22

BAPI Screwdriver and Allen Wrench

pg F23

Clean Cut Tool for BAPI-Boxes

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Trim Rings for the BAPI-Stat 4

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Adaptor Plates for Retrofit Installations

pg F26

Custom Logo Plates


pg F28

Light Level Sensor

pg F29

RJ22 Comm. Jack Adaptor
Security Screws & Spanner Bit

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Replacement Keys, Foambacks & Humidity filters

pg F31

Sealant Filled Connectors

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Pierceable Knockout Plugs for Enclosures

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Replacement Batteries


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Weather Shade for Outdoor Air Sensors

pg F35

VC350A EZ Voltage Converter

Accessories for HVAC/R

Rev. 05/26/21

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 Accidental Shorting



5 YEAR WARRANTY

VC350A EZ mounted on DIN Rail

BAPI's 350A-EZ is a cost-effective way of converting 24 VAC or VDC to 5, 12, 15 or 24 VDC for use on peripheral devices that require DC voltage. The converter is available with a 350 mA output. The revolutionary mounting system allows for 2.75" snaptrack, DIN rail or surface mounting.

Although most BAPI room units can run on 24 VAC power, converting to DC power eliminates the AC power "noise" which can affect the room sensor readings. BAPI's tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same cable as the signal lines. All fixed outputs of 5, 10, 12 or 15 VDC are adjustable ±10%. The adjustable model has an output of 5 to 24 VDC.

Ordering Information

Part Number	Description	List Price
BA/VC350A-EZ-5	5 VDC Output at 350 mA	$33
BA/VC350A-EZ-10	10 VDC Output at 350 mA	$33
BA/VC350A-EZ-12	12 VDC Output at 350 mA	$33
BA/VC350A-EZ-15	15 VDC Output at 350 mA	$33
BA/VC350A-EZ-ADJ	5 to 24 VDC Adjustable Output at 350 mA	$33

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

*Depends on output voltage

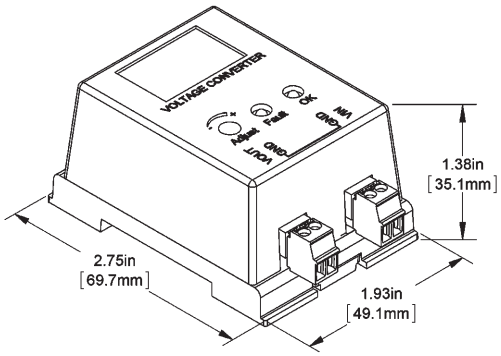
Environmental Operation Range:
0 to 95% RH non-condensing
-40 to 149°F (-40 to 65°C) 350 mA @ any output voltage
-40 to 158°F (-40 to 70°C) 350 mA @ 5 VDC
330 mA @ 10 VDC
280 mA @ 12 VDC
224 mA @ 15 VDC
140 mA @ 24 VDC

Environmental Storage Range:
-40 to 176°F (-40 to 80°C)

Wiring: 4 wires, 16 to 22 gauge

Rectification: Half-Wave Rectified

Grounding:
AC & DC Ground are Common



Note: The VC350A-EZ is a Class 2 circuit when it is powered from a UL Class 2 power supply.

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VC350A Voltage Converter

Accessories for HVAC/R

Overview

- Compact & Cost-Effective 350 mA Unit
- Ruggedized Circuitry and Self-resetting Thermal Fuse
- Operation & Fault LED Indicators
- Fixed or Adjustable Outputs
- Output Protected Against Overload and Accidental Shorting



VC350A mounted in optional snaptrack

BAPI's VC350A is a cost-effective way of converting 24 VAC or VDC to 5, 12, 15 or 24 VDC for use on devices that require DC voltage.

Although most BAPI room units can run on 24 VAC power, converting to DC power eliminates the AC power "noise" which can affect the room sensor readings. BAPI's tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same cable as the signal lines. All fixed outputs of 5, 10, 12 or 15 VDC are adjustable ±10%. The adjustable model has an output of 5 to 24 VDC.

EZ Voltage Converter

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



Ordering Information

Part Number	Description	List Price
BA/VC350A-5	5 VDC at 350 mA Voltage Converter	$25
BA/VC350A-10	10 VDC at 350 mA Voltage Converter	$25
BA/VC350A-12	12 VDC at 350 mA Voltage Converter	$25
BA/VC350A-15	15 VDC at 350 mA Voltage Converter	$25
BA/VC350A-ADJ	5 to 24 VDC (adj.) at 350 mA Voltage Converter	$25
BA/VC350A-5-TRK	5 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$30
BA/VC350A-10-TRK	10 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$30
BA/VC350A-12-TRK	12 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$30
BA/VC350A-15-TRK	15 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$30
BA/VC350A-ADJ-TRK	5-24 VDC (adj.) at 350 mA with a 1.25" wide piece of 2.75" snaptrack	$30

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

*Depends on output voltage

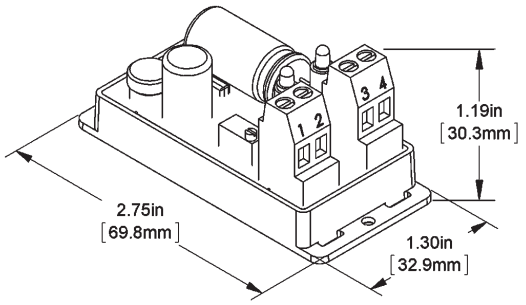
Environmental Operation Range:
0 to 95% RH non-condensing
-40 to 149°F (-40 to 65°C) 350 mA @ any output voltage
-40 to 158°F (-40 to 70°C) 350 mA @ 5 VDC,
330 mA @ 10 VDC,
280 mA @ 12 VDC,
224 mA @ 15 VDC,
140 mA @ 24 VDC

Environmental Storage Range:
-40 to 176°F (-40 to 80°C)

Wiring: 4 wires, 16 to 22 gauge

Rectification: Half-Wave Rectified

Ground: AC & DC Ground are Common



Note: The VC350A is a Class 2 circuit when it is powered from a UL Class 2 power supply.

PDM - Power Distribution Module

Accessories for HVAC/R

Rev. 05/26/21

Features & Options

- 3 or 5 Circuit Power Distribution
- 12 to 30 VAC/VDC Operation
- Master Power Switch w/ 10 Amp Breaker
- Individual Circuit Power Switches
- Individual 3 Amp Circuit Protection
- Power and Fault LEDs



PDM - Power Distribution Module (BA/PDM-5-B)

5 YEAR WARRANTY

The PDM - Power Distribution Module is a low voltage (12 to 30 VAC/VDC) power distribution module designed to take a single power source and distribute that power to multiple circuits. It comes in 3 or 5 circuit models which can be linked together to achieve multiple circuits. A common On/Off switch and 10 amp breaker powers the distributed circuits. Each individual circuit has an On/Off switch, field connection terminals, 3 amp fuse or 3 amp breaker and individual power and fault LEDs.

Ordering Information

Part Number	Description	List Price
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

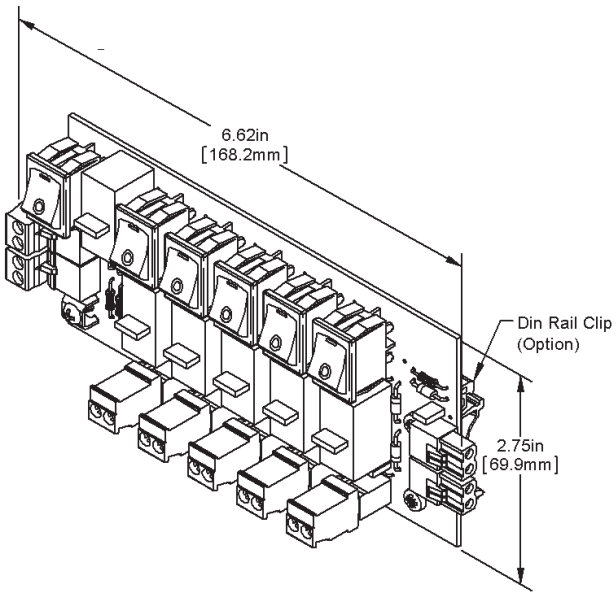
On/Off Switching:
Master.....Common rocker switch
Circuit .....Individual rocker switch

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

Mounting: 2.75" snaptrack

Ambient: -40 to 158ºF (-40 to 70ºC)

Warranty: 5 years



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Features & Options

- Compact and Cost-Effective
- Regulated and Adjustable 1.2 VDC to 24 VDC Output
- Output Protected Against Overload and Accidental Short Circuit

BAPI's VC2000 Voltage Converters are accurate, rugged and reliable power sources designed for commercial energy management applications.

The 2 Amp Voltage Converter accepts a 24 VAC input which can be field adjusted to a regulated output of 1.2 VDC to 24 VDC (factory set for 24 VDC). The input can be field configured for full or half wave rectification. The unit includes an output fuse to protect against overload and short circuits, a power indication LED, and is available with or without a backplate on the steel mounting bracket. Self-resetting or cartridge fuses may be specified at the time of order.



VC2000 with backplate and cartridge fuse

5 YEAR WARRANTY

Ordering Information

Part Number	Description	List Price
BA/VC2A-F	Converter without backplate, cartridge fuse	$120
BA/VC2A-P	Converter without backplate, self-resetting fuse	$120
BA/VC2B-F	Converter with backplate, cartridge fuse	$120
BA/VC2B-P	Converter with backplate, self-resetting fuse	$120

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

Specifications

Input Voltage Range: 24 VAC (100 VA)

Fuse Protection: 4 Amp, output side

Output Voltage Range: 1.2 VDC to 24 VDC

Maximum Output Current: 2.0 Amps

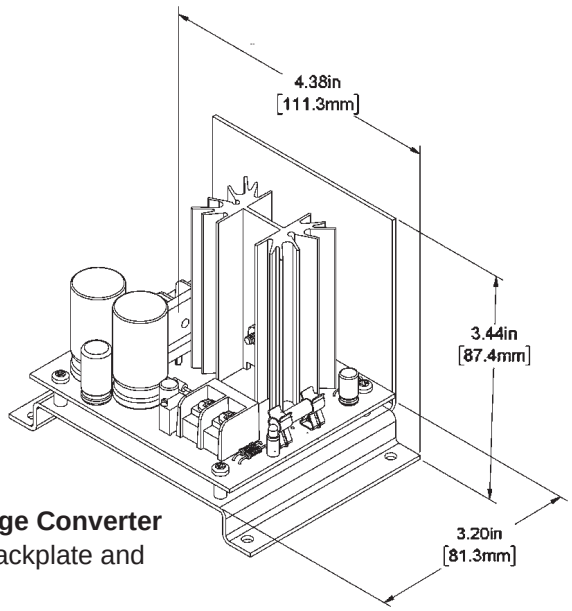
Operating Range: -40 to 158ºF (-40 to 70ºC)

Rectification: Field Selectable as Full or Half Wave

Wiring: 16 to 22 AWG

Warranty: 5 years

Note: The VC2000 is a Class 2 circuit when it is powered from a UL Class 2 power supply.



VC2000 Voltage Converter
(shown with backplate and cartridge fuse)

PS17RF, PS18RF & PS19RF - Power Supplies

Accessories for HVAC/R

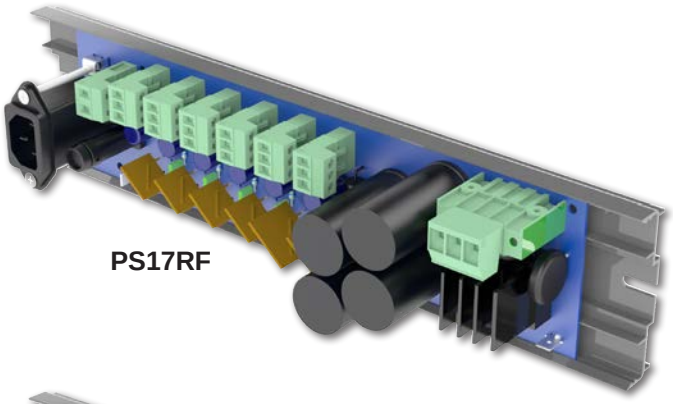
Rev. 5/26/21

Overview

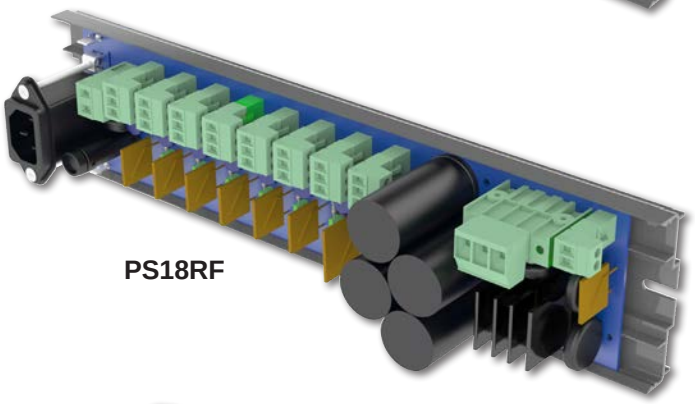
The PS17RF, PS18RF and PS19RF Power Supplies provide multiple 33 VDC* outputs with over-current protection to operate any of BAPI's ETA modules except the RS-485 communication modules. All power supplies are furnished with standard 2.75" snaptrack and include a green LED to indicate when power is supplied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

The power supplies use a customer-supplied 24 VAC* transformer with a rating of 200 to 600 VA depending upon current consumption (See transformer info below). Pluggable screw terminals allow easy termination of the transformer.

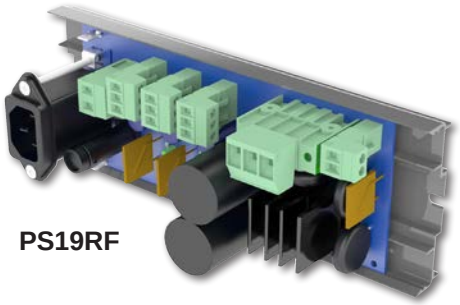
All three units provide a transient line filter for the line voltage input to the transformer. Plug a standard computer power cord into a duplex outlet and then into the line filter to power the units.



PS17RF



PS18RF



PS19RF

5 YEAR WARRANTY

All units shown in the supplied 2.75" snaptrack

Specifications

Input Power
120 to 240 VAC; Amps depend on transformer selected. Standard IEC 320 Line Filter

Output Voltage
Nominal 33 VDC* (using 24 VAC transformer)

PS17RF Outputs (Nominally-Rated)
6 Outputs: Four at 2.5 Amps, two at 3.75 Amps

PS18RF Outputs (Nominally-Rated)
8 Outputs: Six at 2.5 Amps, two at 3.75 Amps

PS19RF Outputs (Nominally-Rated)
3 Outputs: Two at 2.5 Amps, one at 3.75 Amps

Warranty: 5 years

CUSTOMER SUPPLIED TRANSFORMER SPECS

Unit Model	Transformer Power
PS19RF	Nominal 200 VA
PS17RF	Nominal 400 VA
PS18RF	Nominal 600 VA

*The VDC output voltage from the unit is dependent on the VAC input voltage. Generally the output will equal 1.4 times the input.

9 VAC input = 12 VDC output
18 VAC input = 24 VDC output
20 VAC input = 28 VDC output
24 VAC input = 33 VDC output

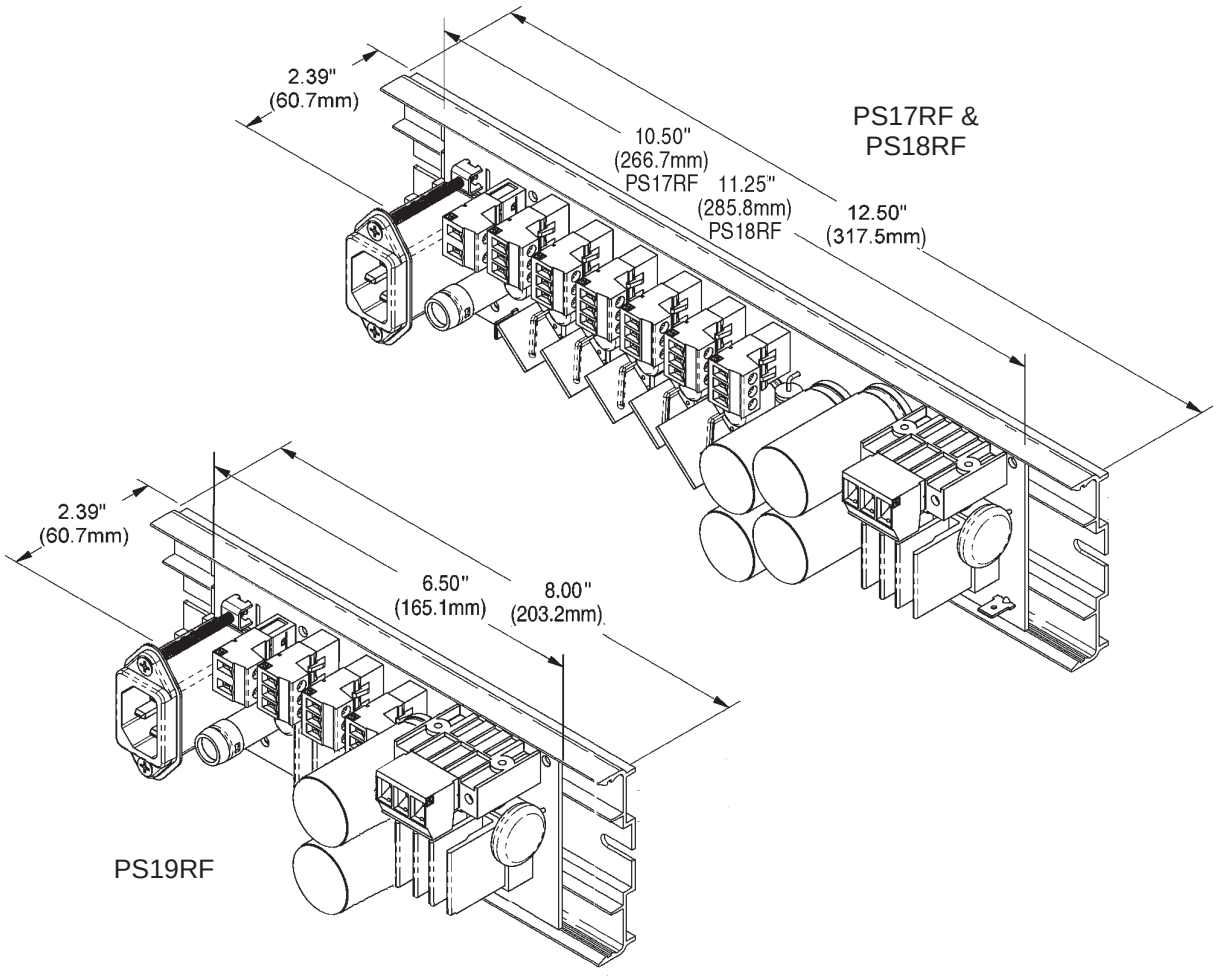
BAPI
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Ordering Information

Part Number	Description	List Price
BA/PS17RF	6 Output Unit with Self-Resetting Fuses	$303
BA/PS18RF	8 Output Unit with Self-Resetting Fuses	$413
BA/PS19RF	3 Output Unit with Self-Resetting Fuses	$265
BA/PWR-CORD-18”	18” Power Cord for PS17 Power Supply	$25
BA/PWR-CORD-36”	36” Power Cord for PS17 Power Supply	$25

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

Dimensions



Water Leak Detector – 0.5 Amp Relays

Accessories for HVAC/R

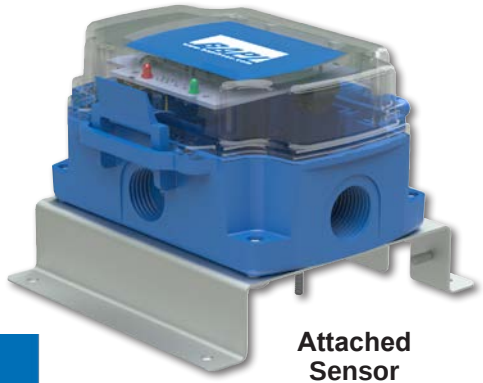
Rev. 09/01/21

Features & Options

- Detection Within 5 Seconds with Local LED Alarm Indication
- Alarm Output 0.5 Amp Relays
- Attached Sensor or Remote Sensor
- Usable in Industrial Electromagnetic Environments
- 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

5 YEAR WARRANTY



Liquid Tight Fitting



Flex Connector



Remote Sensor

Specifications

Power: 24VAC/VDC ±10%, 3.9VA max @ 24VAC, 90mA max @ 24VDC (Reverse Polarity Protected)
Note: This unit does not require a separate isolated power supply.

Rectification: Half Wave

Wiring:
Screw Terminals: 2 to 3 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 Output Relays:
Two SPST (Form A) Relays field selectable for Normally Open or Normally Closed. When configured as Normally Closed, the relay will change state with loss of power. 0.5A relay outputs, 10W max. Relay is not intended to switch a load.

Alarm Reset Action: Field selectable for Auto (Non-Latching) or Manual (Latching)
Auto: Relay automatically resets after water is removed (default)
Manual: Relay stays in alarm until manually reset or power is cycled

Local Indication: 1 Green Power LED, 1 Red Alarm LED

Operating Environment
Remote Sensor: -4 to 158ºF (-20 to 70ºC), 0 to 100%RH, condensing
Detector in BAPI-Box: -4 to 158ºF (-20 to 70ºC), 0 to 95%RH, Non-condensing

Enclosure Material and Ratings: NEMA 4 (IP66), UV-Resistant Polycarbonate, UL94 V-0

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

Warranty: 5 years

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Water Leak Detector – 0.5 Amp Relays

Accessories for HVAC/R

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

Water Leak Detector Option Selection Guide

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

#1: Leak Detector Transmitter (required)		**List Price**
LDT2	Water leak detector with two 0.5 Amp SPST contacts	$151

#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

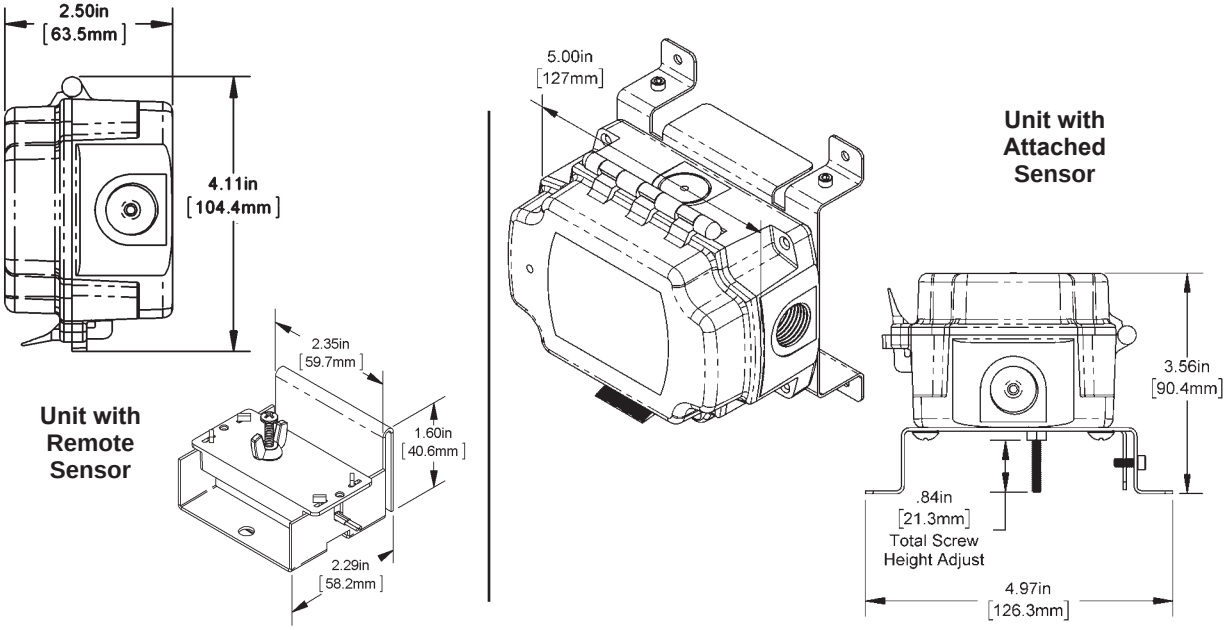
Example Number: BA/ (**LDT2**) - (**RS10**) - (**BB**)
Actual Number (with parenthesis removed): BA/LDT2-RS10-BB
Description: Detector with Two 0.5A Relays, 10' Remote Sensor and BAPI-Box Enclosure
List Price: $151 (Two 0.5A Relays) + $41 (10' Remote Sensor) + $12 (BAPI-Box) = $204 List Price

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 wtih 25 foot FEP cable	$56

Dimensions



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Water Leak Detector w/Rope Sensor – 0.5 Amp Relays

Accessories for HVAC/R

Rev. 09/01/21

Features & Options

- Detection Within 5 Seconds with Local LED Alarm Indication
- Alarm Output 0.5 Amp Relays
- Rope Detects Water Along Its Entire Length
- Usable in Industrial Electromagnetic Environments
- 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





Flex Connector



Liquid Tight Fitting

Rope Sensor Mounting Bracket

The BAPI Rope Sensor Mounting Bracket is specifically designed to hold the rope taut and prevent rope slippage allowing for maximum contact with the monitored surface. Bracket can be easily mounted to flat surfaces utilizing the industrial adhesive backing or the built in screw holes.

Part Number: BA/LDT-RR-MB (Pack of 25)



Specifications

Power:
24VAC/VDC ±10%, 3.9VA max @ 24VAC, 90mA max @ 24VDC (Reverse Polarity Protected)
Note: This unit does not require a separate isolated power supply.

Rectification: Half Wave

Wiring:
Screw Terminals: 2 to 3 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: Plenum-rated sensor cable, detects 1/8" of water. Max length: 100' (30.5m)

Alarm Output Relays:
Two SPST (Form A) Relays field selectable for Normally Open or Normally Closed. When configured as Normally Closed, the relay will change state with loss of power. 0.5A relay outputs, 10W max. Relay is not intended to switch a load.

Alarm Reset Action: Field selectable for Auto (Non-Latching) or Manual (Latching)
Auto: Relay automatically resets after water is removed (default)
Manual: Relay stays in alarm until manually reset or power is cycled

Local Indication: 1 Green Power LED, 1 Red Alarm LED

Operating Environment
Rope Sensor: 32 to 167ºF (0 to 75ºC), 0 to 95%RH, Non-condensing
Detector in BAPI-Box: -4 to 158ºF (-20 to 70ºC), 0 to 95%RH, Non-condensing

Enclosure Material and Ratings: NEMA 4 (IP66), UV-Resistant Polycarbonate, UL94 V-0

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

Warranty: 5 years

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Water Leak Detector w/Rope Sensor – 0.5 Amp Relays

Accessories for HVAC/R

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

Water Leak Detector Option Selection Guide

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

#1: Leak Detector Transmitter (required)		**List Price**
LDT2	Water leak detector with two 0.5 Amp SPST contacts	$151

#2: Rope 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/ (**LDT2**) - (**RR10**) - (**BB**)
Actual Number (with parenthesis removed): BA/LDT2-RR10-BB
Description: Detector with Two 0.5A Relays, 10' Remote Rope Sensor and BAPI-Box Enclosure
List Price: $151 (Two 0.5A Relays) + $174 (10' Rope Sensor) + $12 (BAPI-Box) = $337 List Price

Your Number: BA/

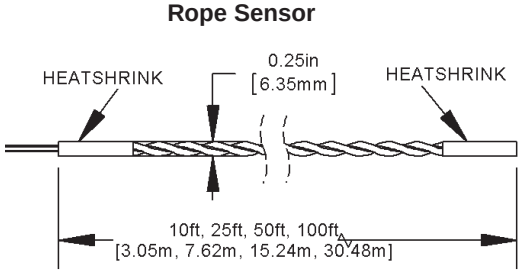
Replacement Sensors and Mounting Brackets

Part Number	**Sensor Type**	**List Price**
BA/RR10	Remote Rope Sensor with 10 foot plenum-rated sensor cable	$174
BA/RR25	Remote Rope Sensor with 25 foot plenum-rated sensor cable	$423
BA/RR50	Remote Rope Sensor with 50 foot plenum-rated sensor cable	$839
BA/RR100	Remote Rope Sensor with 100 foot plenum-rated sensor cable	$1,671
BA/LDT-RR-MB	Mounting Bracket for Rope Sensor (Pack of 25)	$110

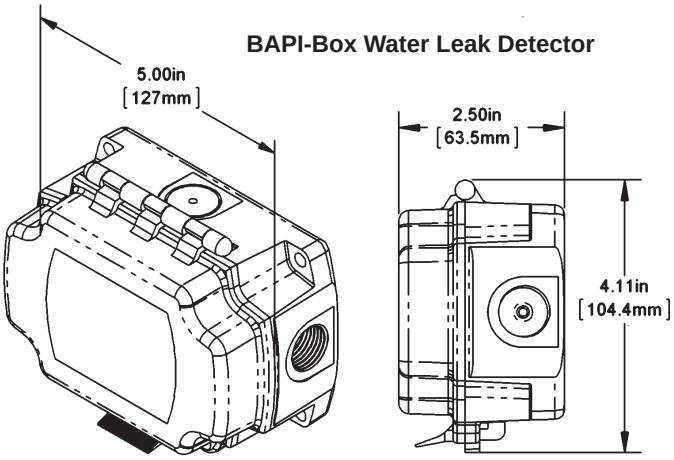
Gray shaded items follow the Buy and Resale Multiplier.

Dimensions

Rope Sensor



BAPI-Box Water Leak Detector



Water Leak Detector – 5 Amp Relays

Accessories for HVAC/R

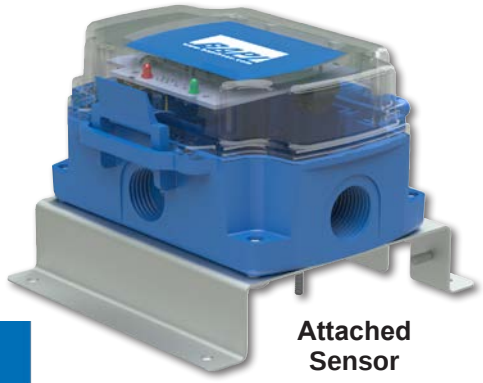
Rev. 08/30/21

Features & Options

- Detection Within 5 Seconds with Local LED Alarm Indication
- Alarm Output 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

5 YEAR WARRANTY



Remote Sensor



Liquid Tight Fitting



Flex Connector

Specifications

Power: 24VAC ±10% (If VDC power is required, call your BAPI rep.), 5 Amp Relays: 4 Watt / 4 VA max

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.)

Latching and Supervised Relay Options:
Latching.....Relay stays in alarm until manually reset or power is cycled
Non-Latching.....Relay automatically resets after water is removed (default)
Unsupervised.....Relay energizes on water detection
Supervised.....Relay de-energizes on water detection (default) Note: Relay de-energizes on loss of power

Reset Action: If latching, local pushbutton or power interrupt

Local Indication: One green power LED, one red alarm LED

Alarm Relay Contacts:
LDT3: One SPDT, 5 Amp relay output
LDT4: Two SPDT, 5 Amp relay outputs

Operating Environment
Remote Sensor: -4 to 158ºF (-20 to 70ºC), 0 to 100%RH, condensing
Detector in BAPI-Box: -4 to 158ºF (-20 to 70ºC), 0 to 95%RH, non-condensing

Enclosure Material and Ratings: NEMA 4 (IP66), UV-resistant polycarbonate, UL94 V-0

Agency: RoHS, UL

Warranty: 5 years

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

Water Leak Detector Option Selection Guide

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

#1: Leak Detector Transmitter (required)		**List Price**
LDT3	Water leak detector with one 5A relay, SPDT contacts	$120
LDT4	Water leak detector with two 5A relays, SPDT contacts	$130

#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

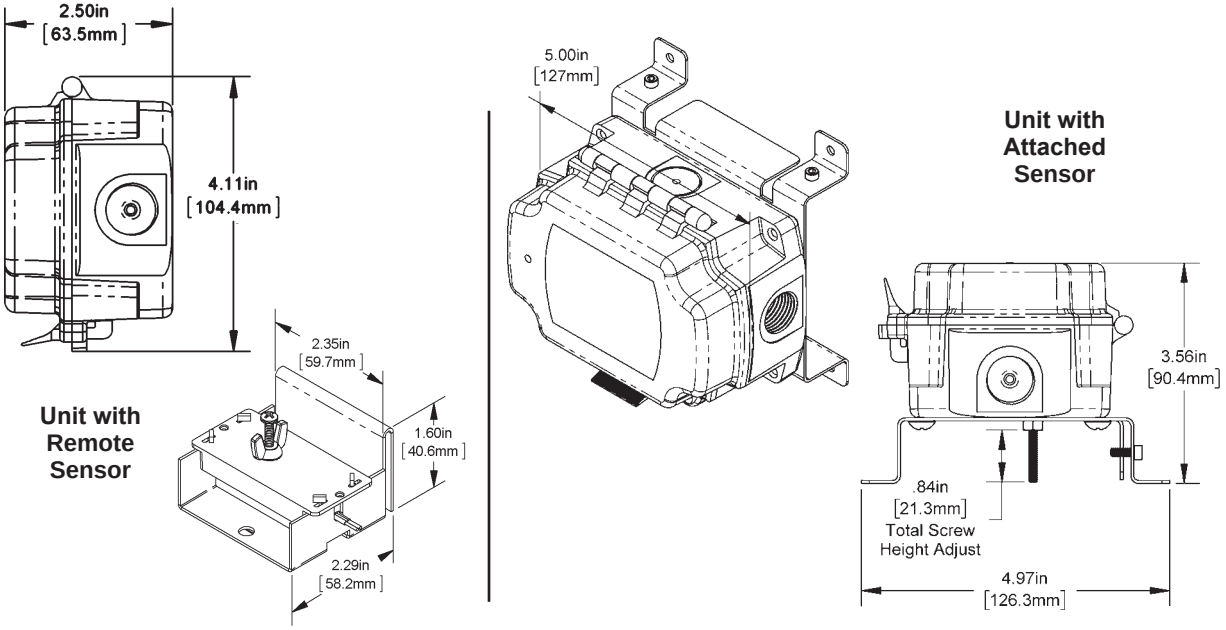
Example Number: BA/ (**LDT4**) - (**RS10**) - (**BB**)
Actual Number (with parenthesis removed): BA/LDT3-RS10-BB
Description: Detector with Two 5A Relays, 10' Remote Sensor and BAPI-Box Enclosure
List Price: $130 (Two 5A Relays) + $41 (10' Remote Sensor) + $12 (BAPI-Box) = $183 List Price

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 wtih 25 foot FEP cable	$56

Dimensions



Water Leak Detector w/Rope Sensor – 5 Amp Relays

Accessories for HVAC/R

Rev. 09/01/21

Features & Options

- Detection Within 5 Seconds with Local LED Alarm Indication
- Alarm Output 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





Flex Connector



Liquid Tight Fitting

Rope Sensor Mounting Bracket

The BAPI Rope Sensor Mounting Bracket is specifically designed to hold the rope taut and prevent rope slippage allowing for maximum contact with the monitored surface. Bracket can be easily mounted to flat surfaces utilizing the industrial adhesive backing or the built in screw holes.

Part Number: BA/LDT-RR-MB (Pack of 25)



Specifications

Power: 24VAC ±10% (If VDC power is required, call your BAPI rep.), 5 Amp Relays: 4 Watt / 4 VA max

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

Rope Sensor:
Plenum-rated sensor cable, detects 1/8" of water. Max length: 100' (30.5m)

Latching and Supervised Relay Options:
Latching.....Relay stays in alarm until manually reset or power is cycled
Non-Latching.....Relay automatically resets after water is removed (default)
Unsupervised.....Relay energizes on water detection
Supervised.....Relay de-energizes on water detection (default) Note: Relay de-energizes on loss of power

Reset Action: If latching, local pushbutton or power interrupt

Local Indication: One green power LED, one red alarm LED

Alarm Relay Contacts:
LDT3: One SPDT, 5 Amp relay output
LDT4: Two SPDT, 5 Amp relay outputs

Operating Environment
Rope Sensor: 32 to 167ºF (0 to 75ºC), 0 to 95%RH, non-condensing
Detector in BAPI-Box: -4 to 158ºF (-20 to 70ºC), 0 to 95%RH, non-condensing

Enclosure Material and Ratings: NEMA 4 (IP66), UV-resistant polycarbonate, UL94 V-0

Agency: RoHS, UL

Warranty: 5 years

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Water Leak Detector w/Rope Sensor – 5 Amp Relays

Accessories for HVAC/R

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

Water Leak Detector Option Selection Guide

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

#1: Leak Detector Transmitter (required)		**List Price**
LDT3	Water leak detector with one 5A relay, SPDT contacts	$120
LDT4	Water leak detector with two 5A relays, SPDT contacts	$130

#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: $130 (Two 5A Relays) + $174 (10' Rope Sensor) + $12 (BAPI-Box) = $316 List Price

Your Number: BA/

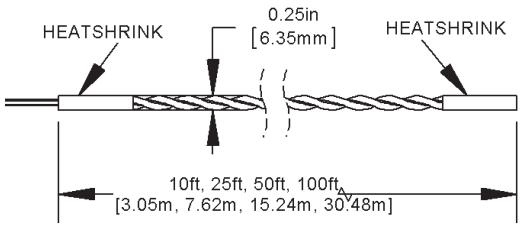
Replacement Sensors and Mounting Brackets

Part Number	**Sensor Type**	**List Price**
BA/RR10	Remote Rope Sensor with 10 foot plenum-rated sensor cable	$174
BA/RR25	Remote Rope Sensor with 25 foot plenum-rated sensor cable	$423
BA/RR50	Remote Rope Sensor with 50 foot plenum-rated sensor cable	$839
BA/RR100	Remote Rope Sensor with 100 foot plenum-rated sensor cable	$1,671
BA/LDT-RR-MB	Mounting Bracket for Rope Sensor (Pack of 25)	$110

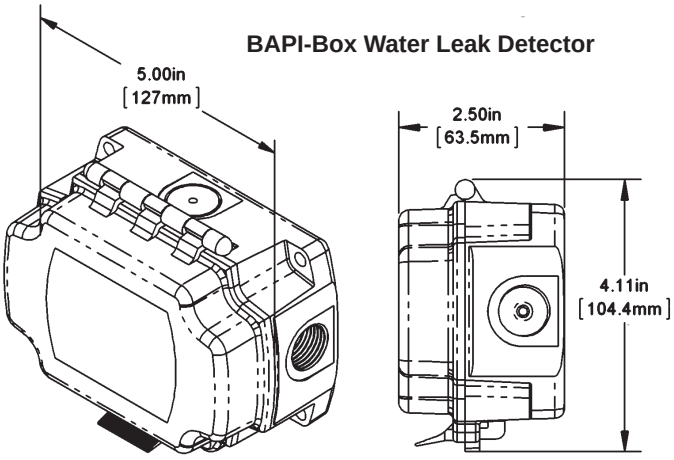
Gray shaded items follow the Buy and Resale Multiplier.

Dimensions

Rope Sensor



BAPI-Box Water Leak Detector



Door Monitor Alarm (DMA)

Accessories for HVAC/R

Rev. 06/30/21

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.

A green LED inside the unit illuminates whenever power is present and red LEDs inside the illuminate when the auxiliary relays are energized to assist with installation and troubleshooting.



Door Monitor Alarm (DMA)



Green Status

Amber Status

Red Status

Specifications

Power: 24 VAC or 24 VDC (UL Listed Class 2 Power Source only)

Power Consumption (max): 7.5 VA @ 24 VAC, 200 mA @ 24 VDC

Door Switch Contacts:
Normally Closed (NC) = door open is alarm condition
Normally Open (NO) = door closed is alarm condition

Auxiliary Relay Contact Rating: 1.0 Amp @ 30 VAC/VDC

Audible Annunciator: 90dB; 2,730 Hz

Wiring: 16 to 22 AWG

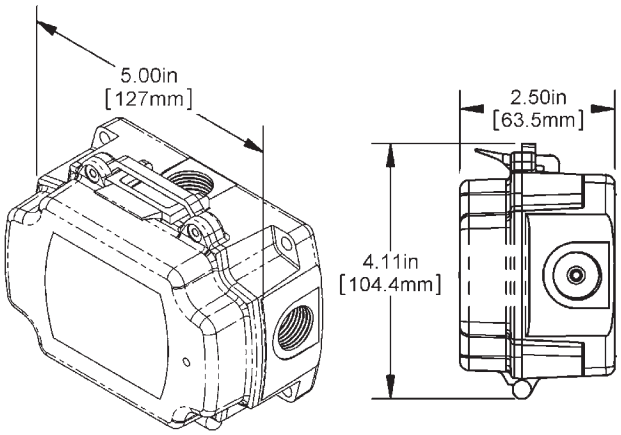
Environmental Operation Range:
Temp: 32 to 140 °F (0 to 60 °C)
Humidity: 5 to 95%, non-condensing

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

Enclosure Rating: IP66, NEMA 4

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

Warranty: 5 years



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

Ordering Information

Part Number	Description	List Price
BA/DMA	Door Monitor Alarm (DMA)	$805

REED SWITCH FOR THE DMA

BA/DMA-RSW1	Press Fit Magnetic Contact, 3/4” (19mm) diameter	$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

BAPI-Guard™ Thermostat Protector

Accessories for HVAC/R

Rev. 05/26/21

Features & Options

- Prevents Tampering, Damage and Unauthorized Adjustment
- Exceptional Airflow for Proper Thermostat Operation
- Made from Thick, Durable Polycarbonate
- Key Lock Protected
- Low Profile Design with Two Sizes to Fit Most Thermostats
- Horizontal or Vertical Mounting with Hardware Included

The BAPI-Guard prevents tampering, physical damage and unauthorized adjustment of thermostats. The attractive design is available in two sizes to fit most thermostats.

The BAPI-Guard is made of thick, durable polycarbonate and features exceptional airflow, key lock protection, horizontal or vertical mounting and easy installation with hardware included.



BAPI-Guard 2 Mounted Over a BAPI-Stat "Quantum" Sensor

Ordering Information

Part Number	Description	List Price
BA/BG	Larger BAPI-Guard Thermostat Protector	$45
BA/BG2	Smaller BAPI-Guard 2 Thermostat Protector	$35
BA/KEY16187	Replacement Key for BAPI-Guard and BAPI-Guard 2 (*Net Price, no multiplier)	$2*

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

Specifications

Material: Polycarbonate

Material Rating: UL94 V-0

The BAPI-Guard fits
these common thermostats

BAPI-Stat "Quantum Prime"
Honeywell T7300, T7350, T7560, T7770 and T7790 Series
Johnson Controls Metastat

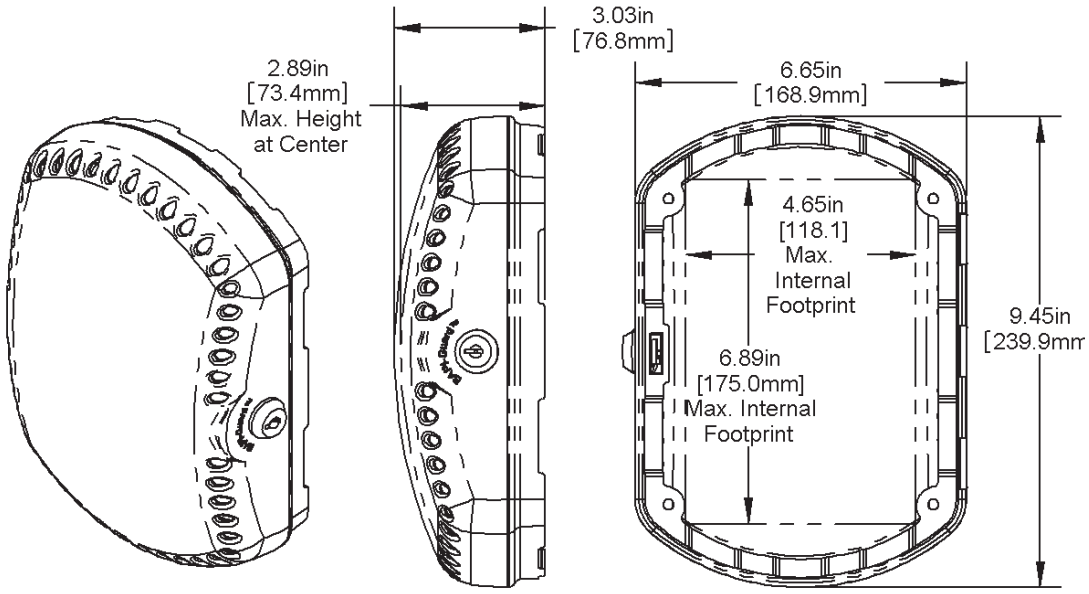
The BAPI-Guard 2 fits
these common thermostats

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

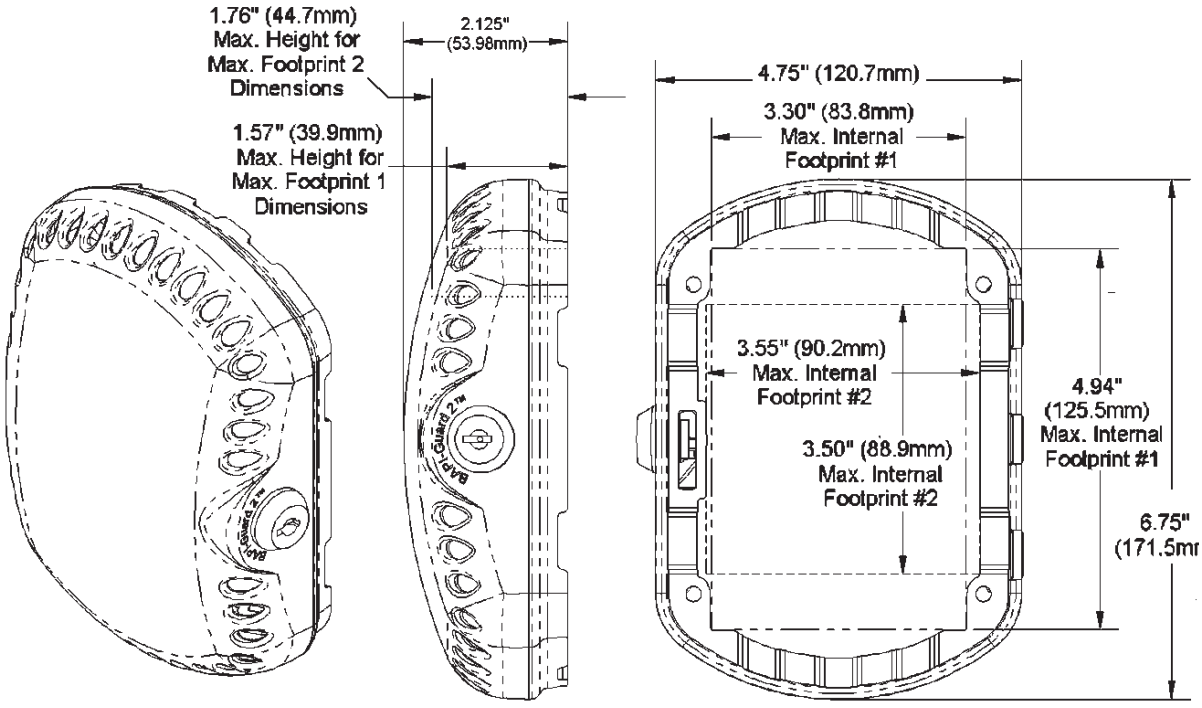
If you have a question about whether a model will fit a specific thermostat, please call BAPI.

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Dimensions



BAPI-Guard



BAPI-Guard 2

PMPB5 - Pulse Meter Pulse Buffer

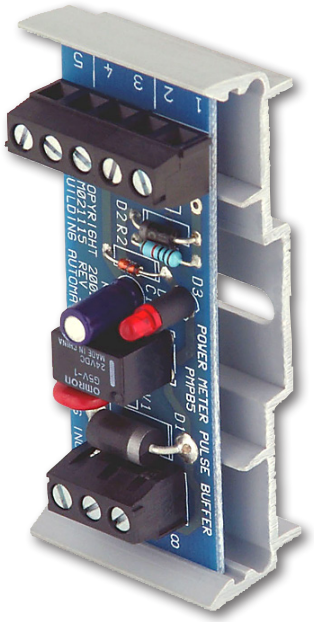
Accessories for HVAC/R

Rev. 07/12/21

Overview

Many electrical, water or gas meters provide a pulse output with each pulse representing a specific quantity of the media being measured. These pulse outputs often need to be electrically isolated from the controller's input by a buffer.

The PMPB5 provides that buffer by receiving the pulses from the meter and recreating them as dry contact closures. An LED lights whenever the buffer contacts are closed. The PMPB5 fits standard 2.75" snaptrack.



PMPB5 mounted in optional 2.75" snaptrack

Ordering Information

Part Number	Description	List Price
BA/PMPB5	PMPB	$27.50
BA/PMPB5-TRK	PMPB with 1.25" piece of 2.75" Snaptrack	$32.50

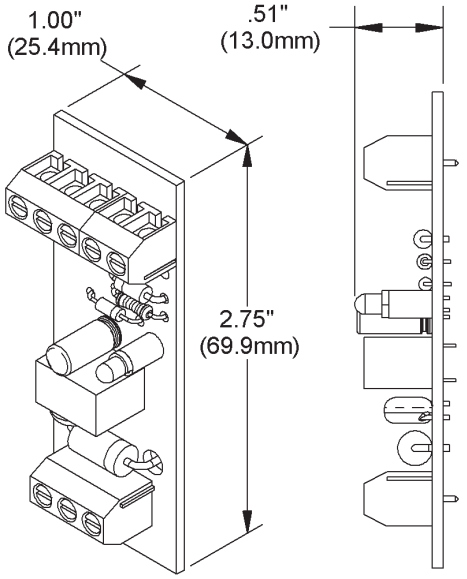
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

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

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

Contact Repetition Rate:
2 seconds per pulse maximum



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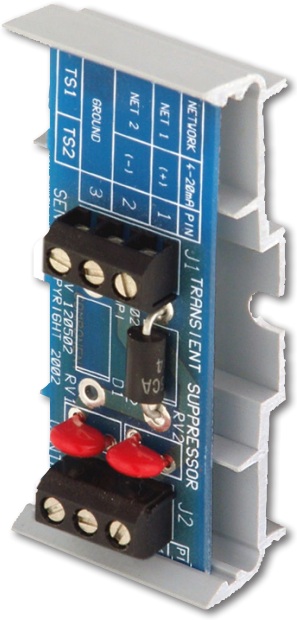
TS1 & TS2 - Transient Suppressor

Overview

HVAC control systems can be subjected to electrical transients (temporary excess voltage) from various sources. Damage to control systems can occur if static electricity, lightning or contractors produce transients of sufficient magnitude and duration to overwhelm the protection built into the control system components. The TS1 and TS2 can significantly increase the transient protection and reduce the possibility of damage to the control system. Both modules fit in standard 2.75” snaptrack

The TS1 is specifically designed for network communications between control system components. The TS1 clamps voltages to 10 VAC or ±14 VDC Line to ground and 7.5 VDC line to line. *Note: The added capacitance of the TS1 may be unsuitable for some combinations of communications line length and high speed data. For best operation you may have to reduce line lengths and add data repeaters.*

The TS2 is designed to protect 4 to 20 mA current loops. The TS2 clamps the signal return line to 5 volts above ground and 1 volt below ground. The voltage supply line is clamped to ±39 VDC Line to ground.



TS1 or TS2 Transient Suppressor with optional 2.75” snaptrack

Ordering Information

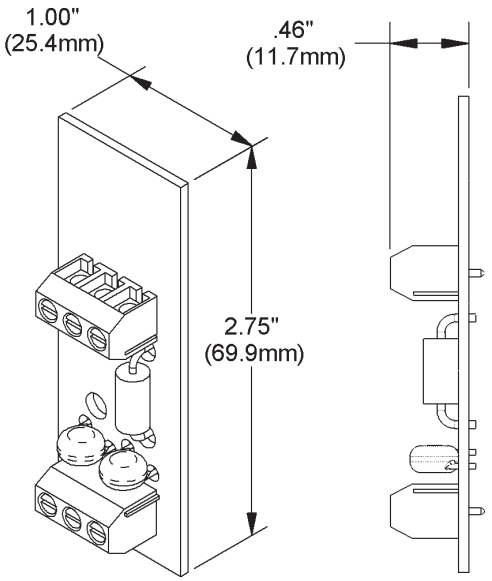
Part Number	Description	List Price
BA/TS1	TS1 Transient Suppressor (voltage)	$7.50
BA/TS2	TS2 Transient Suppressor (current)	$7.50
BA/TS1-TRK	TS1 Transient Suppressor (voltage) with 1.25” piece of 2.75” Snaptrack	$12.50
BA/TS2-TRK	TS2 Transient Suppressor (current) with 1.25” piece of 2.75” Snaptrack	$12.50

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

Specifications

TS1 Clamping Voltage:
10 VAC or ±14 VDC Line to Ground,
±7.5 VDC Line to Line

TS2 Clamping Voltage:
5 VDC Above Ground, Signal Return Line
1 VDC Below Ground, Signal Return Line
±39 VDC Line to Ground, Power Supply Line



FPB - Flexible Probe Bracket

Accessories for HVAC/R

Rev. 09/28/18

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

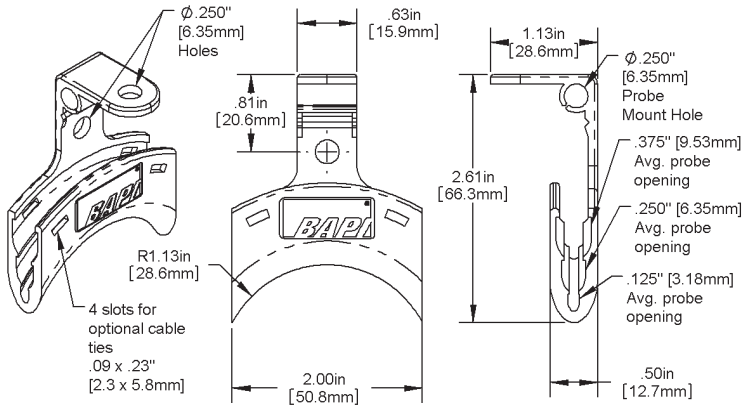
Rating: UL94 V-2 (plenum rated), RoHS Compliant

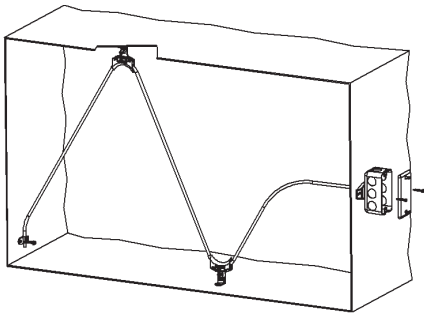
Mounting: Two ¼” holes, on the top and side.

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

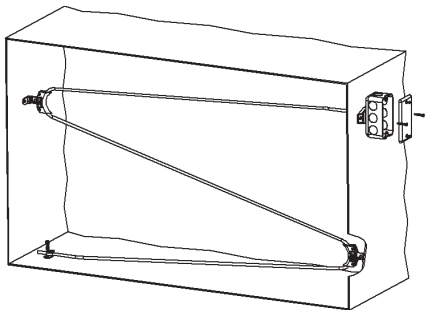
Bracket Arc: 1.125” radius

Operational Temp: -22 to 167ºF, (-30 to 75ºC)

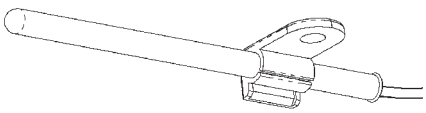




Vertical Mounting of the Averaging Sensor



Horizontal Mounting of the Averaging Sensor



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

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BAPI Screwdriver & Allen Wrench

Features & Options

- Flathead Screwdriver for Terminal Block screws
- 1/16” Allen Wrench for Cover Locking Screws
- Works on Delta, PreCon, Powers and all BAPI-Stat Room Unit Enclosures



6.75” model (top) and 6” model (bottom)

BAPI Screwdriver & Allen Wrench Combinations are especially useful for installing BAPI room units. The flathead screwdriver can be used to turn the screws on the circuit board terminal block while the 1/16” Allen wrench is used for the locking screws on the removable cover. One 6” screwdriver (BA/116) is included with every 25 room units ordered. This model is not designed for prolonged use. The 6.75” model (BA/116W) is designed for prolonged use.

Ordering Information

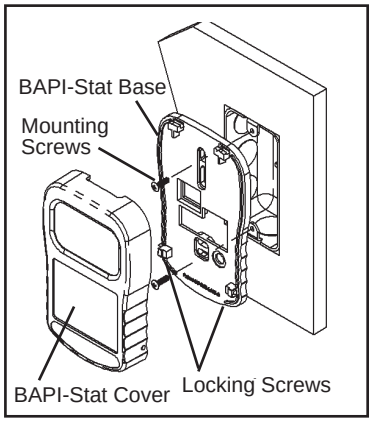
Part Number	Description	List Price
BA/116W	BAPI 6.75” Screwdriver & Allen Wrench Combination	$20
BA/116	BAPI 6” Screwdriver & Allen Wrench Combination	$5

Gray shaded items follow the Buy and Resale Multiplier.

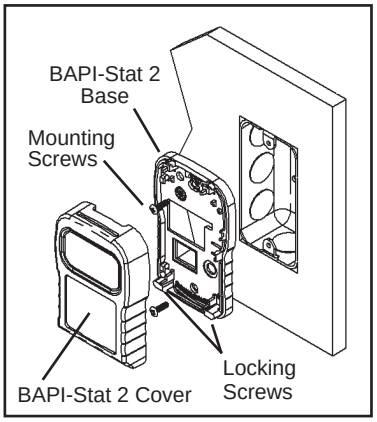
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Allen Wrench Locking Screw Locations for BAPI Room Units

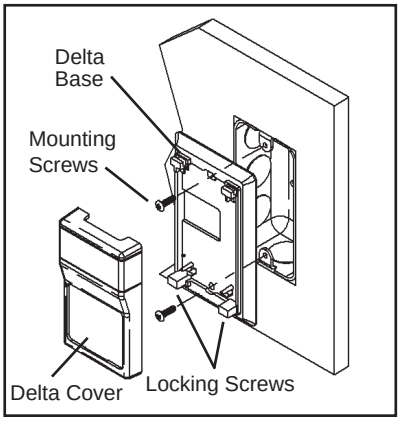
The figures below show the location of the locking screws on 5 of BAPI’s room unit enclosures. The BAPI Screwdriver can be used with all of them. Simply snap the cover in place and turn the locking screws counterclockwise with the Allen wrench, backing them out to lock the cover in place.



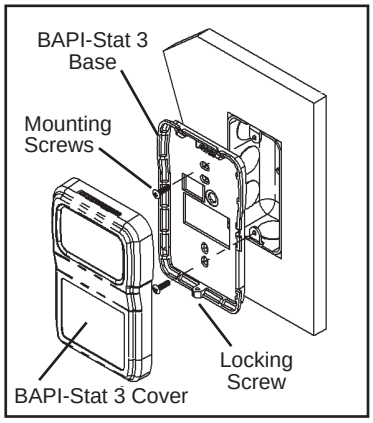
BAPI-Stat Stye Enclosure



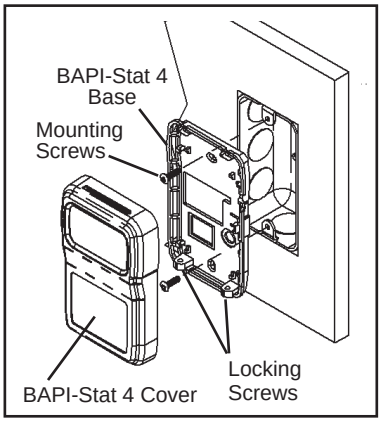
BAPI-Stat 2 Stye Enclosure



Delta Style Enclosure



BAPI-Stat 3 Stye Enclosure



BAPI-Stat 4 Stye Enclosure

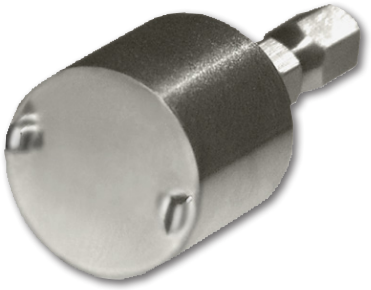
Clean-Cut Tool

Accessories for HVAC/R

Rev. 04/10/13

Features & Options

- Quick, Easy and Professional Looking Knockouts for the BAPI-Box, and BAPI-Box 2 Enclosures
- One Step Cutting Bit
- Standard Hex Drill Bit Shaft
- Quick Disconnect Shaft
- Built in Rim Stop Prevents Damage to Internal Components
- Stainless Steel Construction
- Comes with Blade Sheath



Clean-Cut Tool

The Clean-Cut hole cutter is designed to cut out the plastic plugs in the ½" NPSM threaded ports of the BAPI-Box and BAPI-Box 2 polycarbonate enclosures. This tools make removing the plastic plug fast and easy and produce a professional-looking .65" diameter hole.

A built-in stop prevents the tool from pushing through and possibly damaging sensitive electronics within the box, so there's no need to remove the items to drill the hole. The Stainless Steel construction keeps its edge and lasts for over 1,000 operations in both directions. The tool can be sharpened with a hand grinder or file and comes with a protective sheath to protect the blades and user.

Ordering Information

BA/CLN-CUT-50 **List Price**

Clean-Cut - ½" threaded knockout cutting tool for BAPI-Box and BAPI-Box 2 .....$100

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

Specifications

Material: 316 Stainless Steel

Rim Stop: 0.04" (1mm), in from edge

Shaft Stem: 0.95" (24.1mm) long with quick disconnect shaft

Drill Chuck: Quarter inch Hex

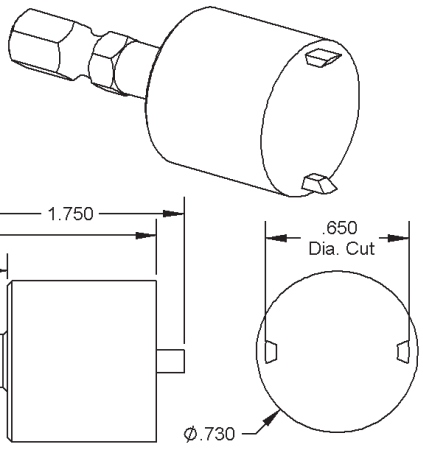
Sharpening: Hand grinder or file (As needed)

Weight: 0.11lb (50.0g)

Outer Diameter: Smooth 0.73" (18.5mm)

Cutting Blades: 0.125" (3.175mm) long, 0.05" (1.27mm) wide

Hole Cut: 0.65" (16.51mm)



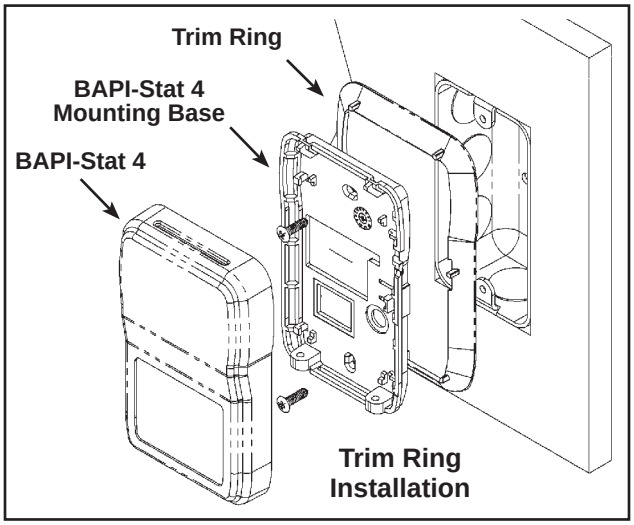
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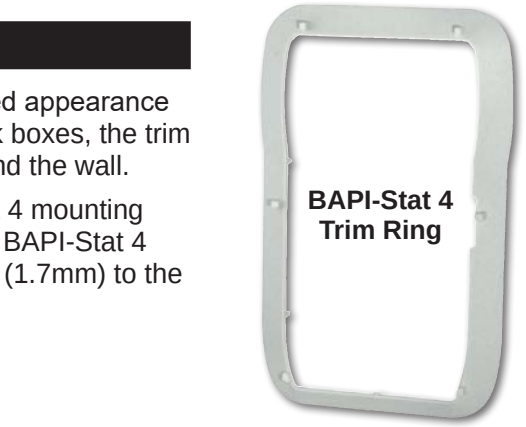
BAPI-Stat 4 Trim Ring

Overview

The BAPI-Stat 4 Trim Ring provides a professionally finished appearance for the BAPI-Stat 4 Room Enclosures. If you are using back boxes, the trim ring covers any wall imperfections between the back box and the wall.

To install, place the trim ring on the wall, nest the BAPI Stat 4 mounting base into the ring and attach everything to the wall with the BAPI-Stat 4 mounting screws. The BS4 trim ring only adds 0.07 inches (1.7mm) to the depth of the BAPI Stat 4.







BAPI-Stat 4 with and without Trim Ring

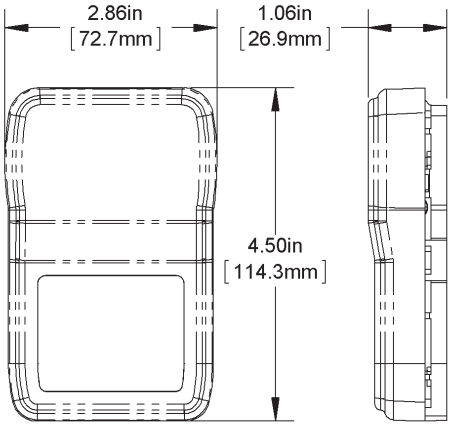
Ordering Information

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

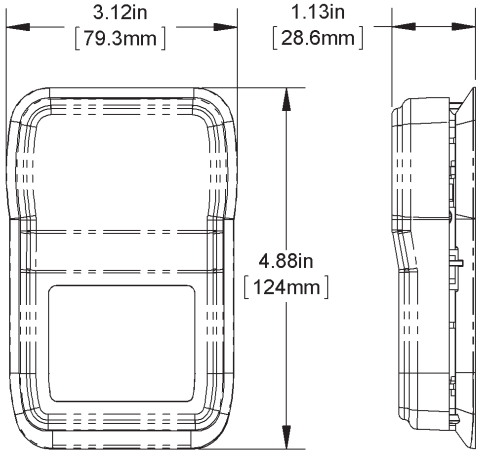
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

Material: ABS plastic, Flame-retardant, UL 94, V-0
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

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Adaptor Plates for Retrofits

Accessories for HVAC/R

Rev. 04/23/21

Features & Options

BAPI Adaptor Plates are designed to cover wall imperfections when installing wall sensors or thermostats. They come in three sizes and five colors and can be painted or wall papered in place if desired.



BA/ADP-525-7-WMW



BA/ADP-53-53-WMW



BA/ADP-37-55-WMW



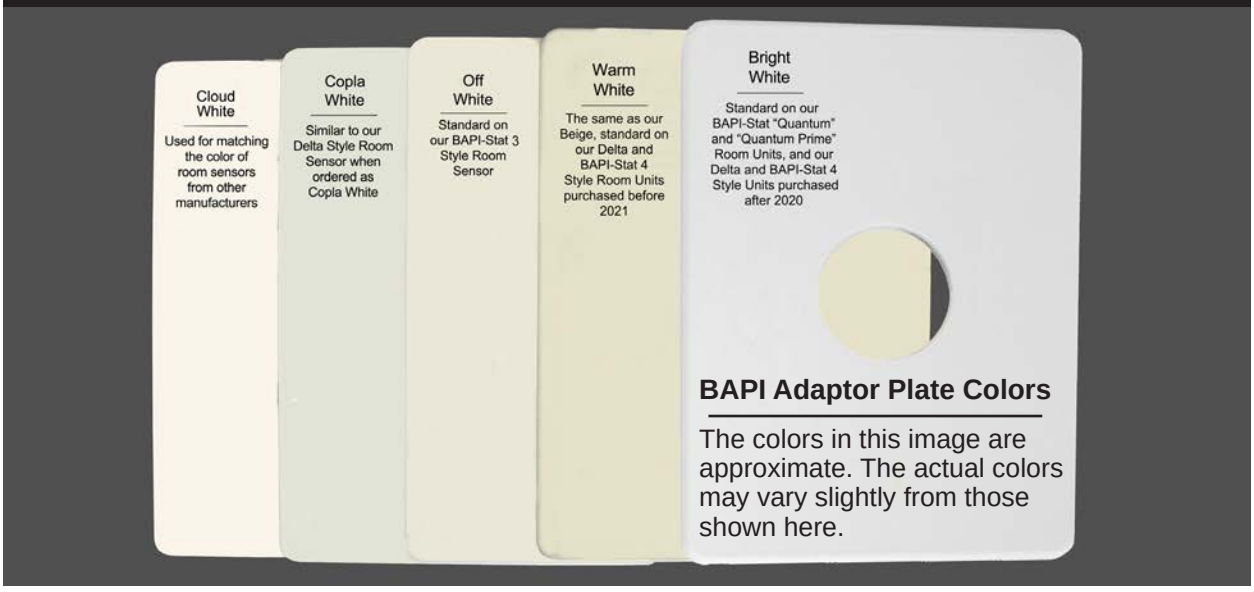
BA/ADP-37-55-WMW-UK

Ordering Information

BA/ADP-525-7-BW	Adaptor Plate, 5.25 x 7" Bright White	$18
BA/ADP-525-7-WMW	Adaptor Plate, 5.25 x 7" Warm White	$18
BA/ADP-525-7-OFW	Adaptor Plate, 5.25 x 7" Off White	$18
BA/ADP-525-7-CPW	Adaptor Plate, 5.25 x 7" Copla White	$21
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-WMW	Adaptor Plate, 5.3 x 5.3" Warm White	$18
BA/ADP-53-53-OFW	Adaptor Plate, 5.3 x 5.3" Off White	$18
BA/ADP-53-53-CPW	Adaptor Plate, 5.3 x 5.3" Copla White	$21
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-WMW	Adaptor Plate, 3.75 x 5.5" Warm White	$18
BA/ADP-37-55-OFW	Adaptor Plate, 3.75 x 5.5" Off White	$18
BA/ADP-37-55-CPW	Adaptor Plate, 3.75 x 5.5" Copla White	$21
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-WMW-UK	Adaptor Plate (Europe), 3.75 x 5.5" Warm White	$18
BA/ADP-37-55-OFW-UK	Adaptor Plate (Europe), 3.75 x 5.5" Off White	$18
BA/ADP-37-55-CPW-UK	Adaptor Plate (Europe), 3.75 x 5.5" Copla White	$21

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

Color Reference



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

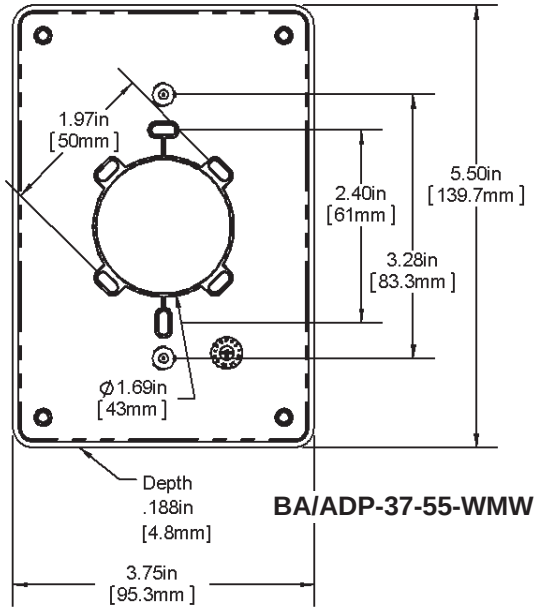
BW, Bright White .....BAPI-Stat "Quantum" and "Quantum Prime" Room Units (Approx. Pantone Bright White) also Delta and BAPI-Stat 4 Units purchased after 2020

WMW, Warm White..... Delta & BAPI-Stat 4 purchased before 2021, EU, BAPI-Box (Approx. Pantone Warm Gray 2)

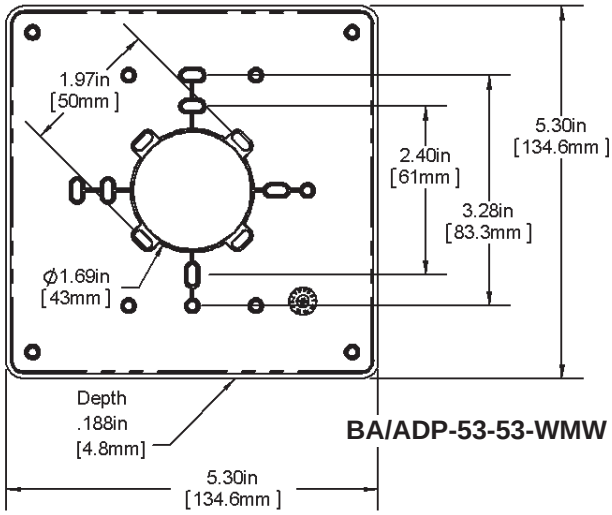
OFW, Off White ..... BAPI-Stat 3 (Approximately Pantone Warm Gray 1)

CPW, Copla White.... Delta, BAPI-Stat 4 (Approximately Pantone Cool Gray 2)

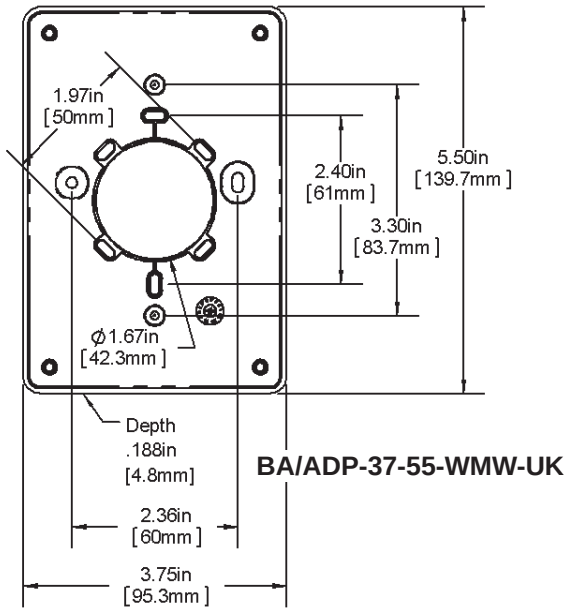
CDW, Cloud White.... Delta, BAPI-Stat 4 (Approximately Pantone Cool Gray 1)



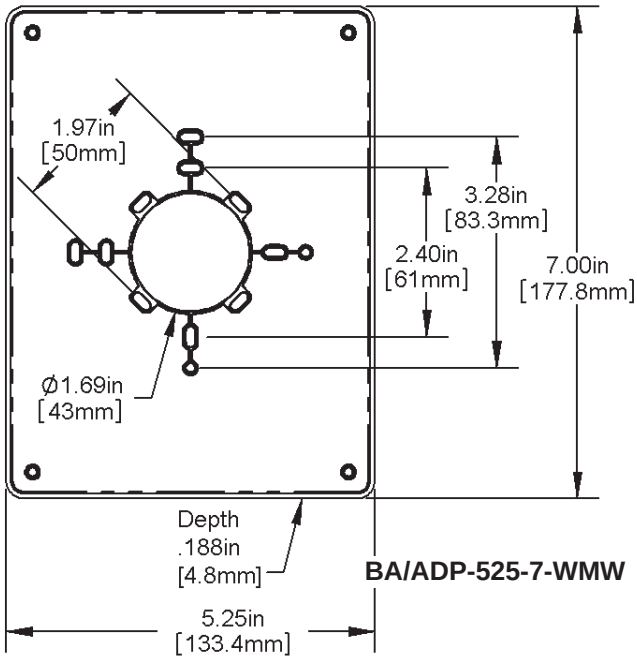
BA/ADP-37-55-WMW



BA/ADP-53-53-WMW



BA/ADP-37-55-WMW-UK



BA/ADP-525-7-WMW

Custom Logo Plates

Accessories for HVAC/R

Rev. 07/30/19

Overview

If you'd like to personalize the look of your sensor, the BAPI-Stat "Quantum" and "Quantum Prime" room sensors, the ZPM pressure, the BAPI-Box, BAPI-Box 2 and BAPI-Box Crossover enclosures are available with your company's individual logo printed on the front.

To create the custom logo plate, you will need to provide BAPI with a digital version of your logo, preferably in Adobe Illustrator or another vector-based program format. You will also need to provide your company's Pantone® (PMS) colors if you desire a color match.

Lead time and logo plate costs vary with the style of enclosure, the number of colors and the quantity of logo plates ordered.

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



BAPI-Stat "Quantum Prime"



BAPI-Stat "Quantum"



BAPI-Box Crossover



BAPI-Box 2



ZPM Pressure



BAPI-Box

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Outdoor Light Level Sensor

Features & Options

- Available with Foot Candle or Lux Ranges
- Extremely Sensitive, Even in Dim Lighting (<10 Foot Candle or 108 Lux)
- Multiple Factory Selectable Light Level Ranges
- 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

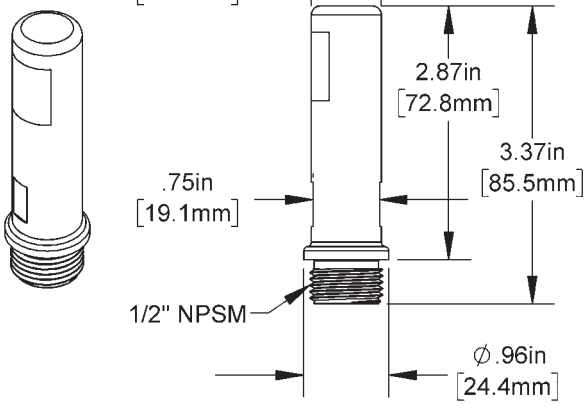
Accuracy:
10 Lux ±10% of reading.

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

Enclosure Material:
UV-Inhibited Polycarbonate

Material Rating:
UL94 V-0

Enclosure Rating:
IP66, NEMA 4



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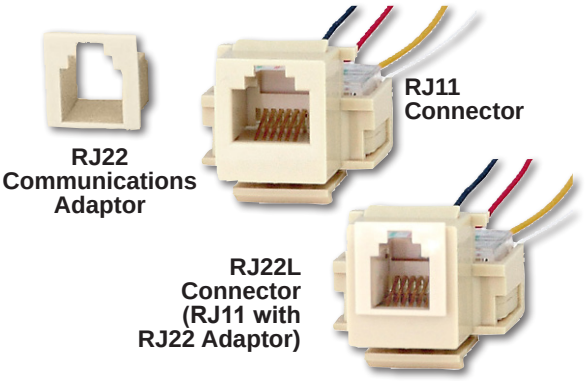
RJ22 Communications Adaptor

Accessories for HVAC/R

Rev. 10/16/16

Overview

Some automation providers use the smaller RJ22 (telephone handset connector) instead of the RJ11 (telephone wall connector) for their in-the-zone network communications devices. The BAPI RJ22 Communications Adapter converts the standard RJ11 jack used in BAPI sensors to the smaller RJ22 dimensions.



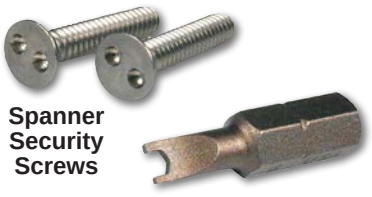
ORDERING INFORMATION

Part Number	Description	List Price
BA/RJ22	Communications Adaptor	$8
BA/RJ22L	Communications Connector	$28

Spanner Security Screws & Spanner Bit

Overview

Spanner Security Screws add an extra level of protection for Wall Plate Units. The Security Screws and associated Spanner Bit are available for any Stainless Steel Wall Plate Unit.



ORDERING INFORMATION

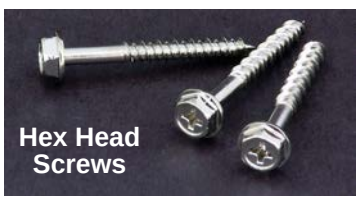
Part Number	Description	List Price
BA/SP632x1	Spanner Security Screws, 6-32x1” (box 50)	$40
BA/SPBIT	Spanner Bit for Spanner Security Screws	$6.50

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

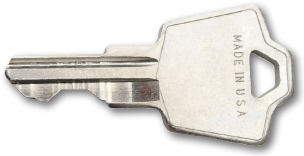
Part Number	Description	List Price
BA/Screw-Pan-1.5x10-SS-100	1.5” #10 Pan Head SS Screw, Pack of 100	$12
BA/Screw-Hex-Concrete-1.5x10-SS-100	1.5” #10 Hex Head SS Concrete Screw, Pack of 100	$12

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

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Overview

Replacement keys are available for Wall Plate temperature sensors with Keyswitch Occupant Override, and the BAPI-Guard and BAPI-Guard 2 thermostat protectors.



Replacement Key

ORDERING INFORMATION

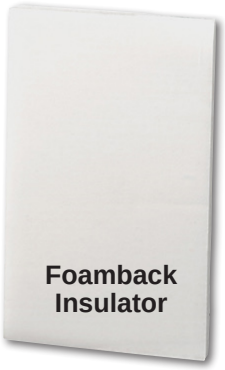
Part Number	Description	List Price
BA/KEY12718	Key for Wall Plate with Keyswitch Override	$2
BA/KEY16187	Replacement Key for BAPI-Guard and BAPI-Guard 2	$2

Gray shaded items follow the Buy and Resale Multiplier.

BAPI Foamback Insulator

Overview

Made of closed cell foam, the Foamback Insulator ensures that room sensors are reading the temperature of the room, not the temperature of the wall. They also guard against condensation from mixing of room air and wall air around the room unit. The foambacks measure 2.6” wide by 4.4” high and feature an adhesive backing. They are available in a thickness of 0.25” or 0.125”. Note: Several BAPI products come standard with foambacks including wall plates and duct units.



Foamback Insulator

ORDERING INFORMATION

Part Number	Description	List Price
BA/FOAMBACK-25	White Foamback, 0.125” thick, pack of 25	$82
BA/FOAMBACK-50	White Foamback, 0.125” thick, pack of 50	$88
BA/FOAMBACK-100	White Foamback, 0.125” thick, pack of 100	$100
BA/FOAMBACK-ROOM-25	White Foamback, 0.25” thick, pack of 25	$82
BA/FOAMBACK-ROOM-50	White Foamback, 0.25” thick, pack of 50	$88
BA/FOAMBACK-ROOM-100	White Foamback, 0.25” 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

Sealant Filled Connectors

Accessories for HVAC/R

Rev. 07/21/20

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 (105ºC), 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

Part Number	Description	List Price
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

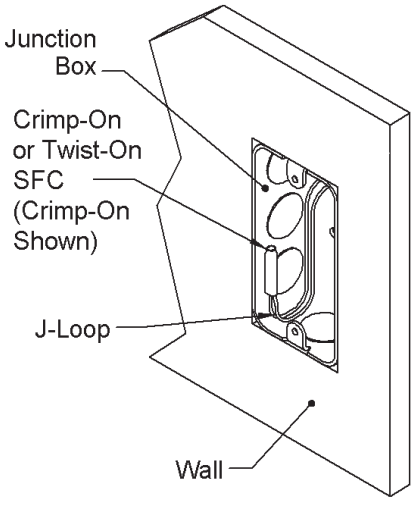
Gray shaded items follow the Buy and Resale Multiplier.

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

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.



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Pierceable Knockout Plugs for Enclosure Ports

Features & Options

- Quick and Easy to Install and Forms an Excellent Cable Seal
- Pierceable Center Membrane for Simple Cable Insertion
- Works in Non-Threaded Ports of the BAPI-Box and Junction Box Enclosures
- Works in Panels with a Metal Thickness of .118” or Smaller



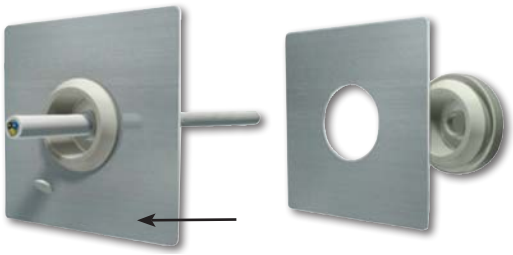
Top and bottom view of a Pierceable Knockout Plug

Pierceable Knockout Plugs are available for the open port in the BAPI-Box Crossover and BAPI-Box 4 Enclosure, as well as the non-threaded ports in the BAPI-Box, BAPI-Box 2 and Junction Box 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 installation and wire insertion.



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

Ordering Information

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

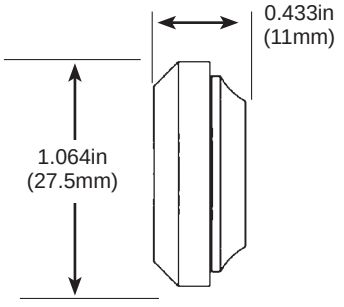
Temperature Operating Range: -58°F to 257°F (-50°C to 125°C)

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)



Replacement Batteries

Accessories for HVAC/R

Rev. 11/30/17

Features & Options

BA/LI3620
The BA/LI3620 Lithium Ion AA battery is the ideal replacement for all BAPI wireless room and non-room transmitters (except the Wireless Food Probe). Each transmitter takes two batteries, giving the unit a battery life of 8 years.



BA/LI3620
(for all BAPI Wireless Transmitters except the Wireless Food Probe)

BA/BAT-5AA-HIT
The BA/BAT-5AA-HIT High Temperature Lithium ½AA battery is the ideal replacement for the BAPI Wireless Food Probe transmitter. Each probe takes one battery, giving the unit a battery life of 4 years.



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

Ordering Information

Part Number	Description	Net Pricing
BA/LI3620	Replacement Battery for Transmitters (except the Food Probe)	$3 Net
BA/BAT-5AA-HIT	Replacement Battery for the Wireless Food Probe	$6 Net

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

Specifications

BA/LI3620 Battery

Type & Size: Lithium Ion, AA
Nominal Voltage: 3.6V
Nominal Capacity: 2.25 Ah @2mA, to 2V
Operation Temp:
-76 to 185°F (-60 to 85°C)
0 to 95 %RH Non-Condensing
Agency: RoHS

BA/BAT-5AA-HIT Battery

Type & Size: Lithium (High Temp), ½AA
Nominal Voltage: 3.6V
Nominal Capacity: 0.9 Ah @ 1mA, to 2V
Operating Temp:
-67 to 257°F (-55 to 125°C)
0 to 95 %RH Non-Condensing
Agency: RoHS

Weather Shade Kit

F35

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
BA/WSK	Weather Shade Kit	$150
	(Includes a pre-assembled shade and DIN rail bracket, two capped mount tubes, one adjustable clamp and one adjustable clamp with retention plate.)	

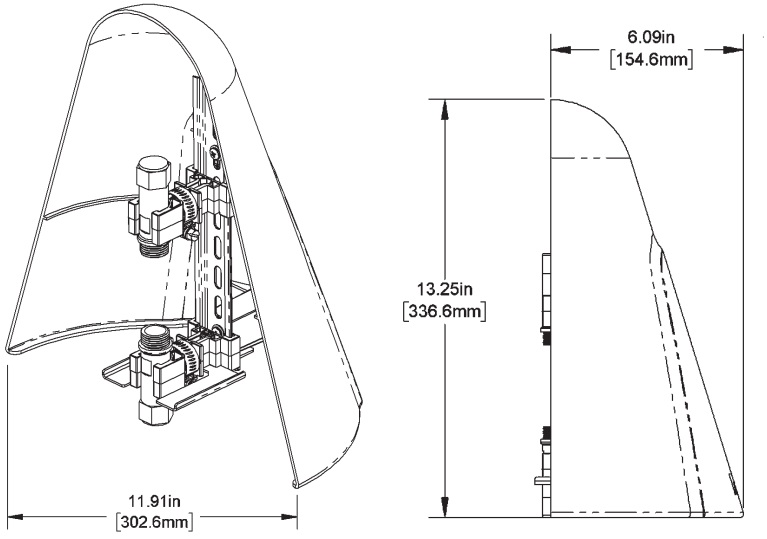
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

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”.



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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

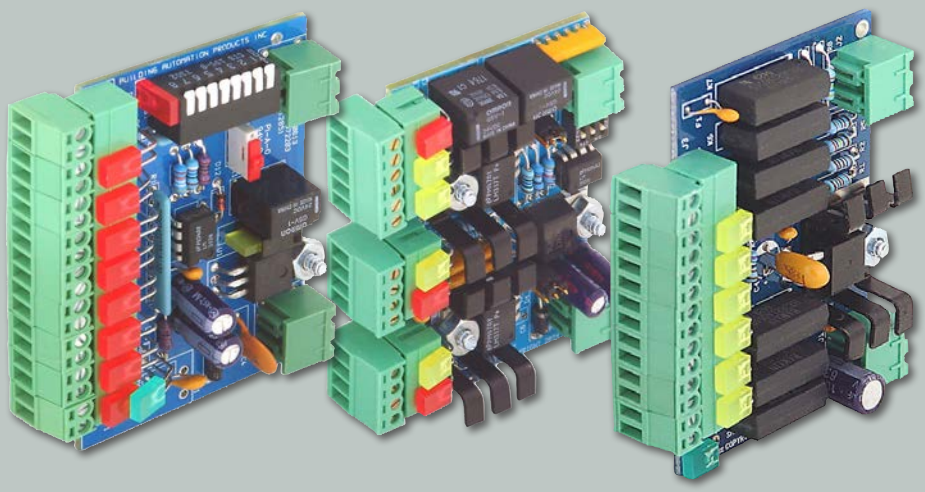
The BAPI-Guard prevents tampering, physical damage and unauthorized adjustment of thermostats. The attractive design is available in two sizes to fit most thermostats. It is made of thick, durable polycarbonate and features exceptional airflow, key lock protection, horizontal or vertical mounting and easy installation with hardware included.

ETA Product Line Overview

BAPI's **E**lectronic **T**echnician **A**ssistant (ETA) products are a uniform line of interface and communication devices that complement a DDC installation. They consolidate many of the components being used at present and provide a more complete picture of the system than a laptop computer alone.

The ETA devices simplify wiring and troubleshooting by providing a pluggable screw terminal for each and every wire in the system, making it easy to break the system into sections to quickly isolate a problem. The devices cut down on control panel clutter because they plug into specially designed backplanes which distribute power through the mounting connectors, greatly reducing the number of wires in the panel.

The ETA devices are also a practical and inexpensive way to pick up feedback signals which are currently ignored in many systems, such as non-critical alarm points or actuator feedback signals. Having convenient LED display of these signals at the control panel, or summarizing multiple feedback signals into a single input to the controller, provides a more complete picture, helping the facility manager and technicians keep the system performing at its optimum level.



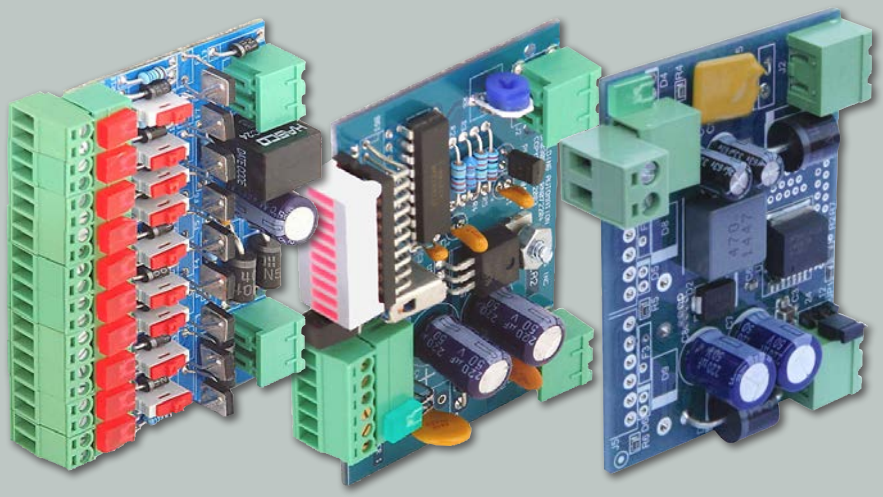


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ETA Line

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DS8 - Discrete Summary Module ..... pg. G4
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. G5
Simplifies the wiring and troubleshooting of Belimo® style 2-position actuators with auxiliary switch position feedback.

EA2 - Modulating Actuator Interface ..... pg. G6
Simplifies the wiring and troubleshooting of Belimo style actuators with voltage feedback.

OAM - Output Adjust Module ..... pg. G7
Works with an EA2 module to let you stroke an actuator to any position without additional equipment.

CDSP - CO_2 Sensor Power Supply ..... pg. G8
Provides 24VDC power and terminations for up to three CO_2 sensors.

CDSP2 - CO_2 Sensor Power Supply ..... pg. G9
Provides 12 or 24VDC power and terminations for up to two CO_2 sensors.

SQ4 - Four-Step Sequencer ..... pg. G10
Simplifies proportional control by sequencing multiple on-off devices based on a single analog output from the controller.

3312VC & 3324VC - Voltage Converters ..... pg. G11
Converts the 33 VDC output from the PS17 Power Suppy into the 12 or 24 VDC required by some ETA modules.

R49 - Relay Interface, 9 Output ..... pg. G12
Conserves critical controller space by turning on or off up to 9 relays using only one controller output.

DS6R - Dry Switch Monitor ..... pg. G13
Monitors six dry switch closure devices and provides one resistive output to the controller.

PMPB5, TS1 & TS2 Modules ..... pg. G14
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. G15
Allows convenient interconnection between a Controller and a DX unit thermostat terminal block.

Backplanes ..... pg. G16
The Backplane and Vertical Backplane provide mounting and power for the ETA modules.

TRK Snaptrack & PAN 16 Panduit ..... pg. G18
Provides easy mounting and wire guides for the ETA devices.

PS17, PS18 & PS19 - Power Supplies ..... pg. G19
Provide multiple 33 VDC outputs with over-current protection to operate BAPI's ETA modules.

COMBLK & COMBLK2 ..... pg. G20
Small circuit board terminal blocks that simplify the termination.

COMSRG - Comm. Surge Protector ..... pg. G21
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. G22
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. G24
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. G26
Converts RS-485 data to single-mode fiber optic signal then converts it back again.

TB18 - Pluggable Terminal Block ..... pg. G27
Small circuit board terminal block that simplifies termination.

RBP - Communications Repeater Backplane ..... pg. G28
Distributes power and communications for up to four FOX, SOX or RPTR modules.

RBP Power Bridge & Extender ..... pg. G29
Power Bridge - Bridges power and breaks out the communication lines.
Extender - Raises the connections for easy access

SRBP - Comm. Repeater Backplane ..... pg. G30
Distributes power and communications for a single FOX, SOX or RPTR module.

TUCOM - Term. Unit Comm. Block ..... pg. G31
The **TUCOM** adds 3 pluggable terminals to the Carrier Comfort System controller.

BELCON - Mating Pair Belimo Connectors ..... pg. G31
The **BELCON** allows a 4-pole pluggable connection between a peripheral and controller.

IRM4 - Interposing Relay Module ..... pg. G32
Four independent channels that convert a relay output to a contact output or a voltage output.

LRCA - Link Router Comm. Adapter ..... pg. G33
Adds an RJ jack to a Carrier i-Vu Link/Router.

PSOCL - Power Supply Current Limiter ..... pg. G33
Buffers the output of the BAPI PS17 Power Supply when powering the Carrier i-Vu Link/Router.

UCRB - Universal Controller Relay Board ..... pg. G34
Interconnects a controller's digital outputs to any device that requires a conventional thermostat input.

SS-AC - Selector Switch/Alarm Counter ..... pg. G35
Monitors a multitude of 4-position selector switches to regulate the speed of VFD fans.

SD2 - Status Display, Dual 7 Segment ..... pg. G36
Displays a program error code with a manual reset switch to route a reset signal to a controller.

PE4 - Pulse Extender ..... pg. G37
Takes the input pulse to the board and extends the output down the channel to a controller or monitor.

MXV - Dry Switch Monitor, 5 Input ..... pg. G38
The MXV monitors five dry switch closure devices and provides one 0 to 10V output to the controller.

Steel Enclosures and Accessories ..... pg. G39
Steel enclosures in three sizes, Backplates & Cable Guides, designed to accomodate all ETA devices.

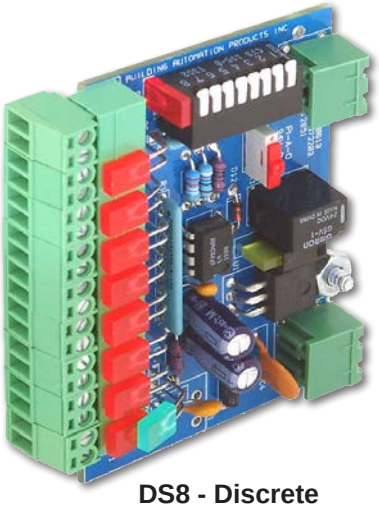
DS8 - Discrete Summary Module

ETA Line

Rev. 11/19/19

Overview

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.



DS8 - Discrete Summary Module

The DS8 is great for grouping alarms which you will want to distinguish in the field, but don't need to distinguish on the central computer. Examples include dirty filter alarms, condensate float switches, VFD faults, moisture monitors, door switches, etc. A technician can glance at the DS8 and quickly determine which filter to change; which drain to check or which VFD to inspect.

The DS8 plugs into the BP2, BP4, BP4-V or BP8 backplane and accepts up to eight independent dry switch contacts on easy-to-use connectors at the front of the module. Each input has an LED to indicate when the contact is closed. An eight-position DIP switch allows the user to set the alarm threshold. The output is also user switchable to a NO or NC dry contact.

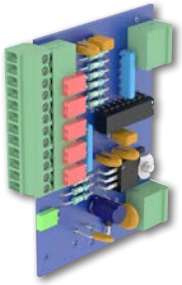
The DS8 can also be used to monitor multiple auxiliary contacts when multiple discrete points are controlled using an R49. Typical applications include lighting controls and small fan controls.

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

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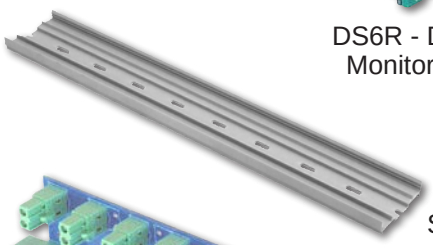
Associated Products

MXV - Dry Switch Monitor, 5 Input (p. G40)

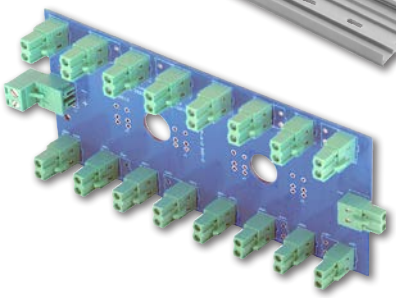




DS6R - Dry Switch Monitor (p. G13)

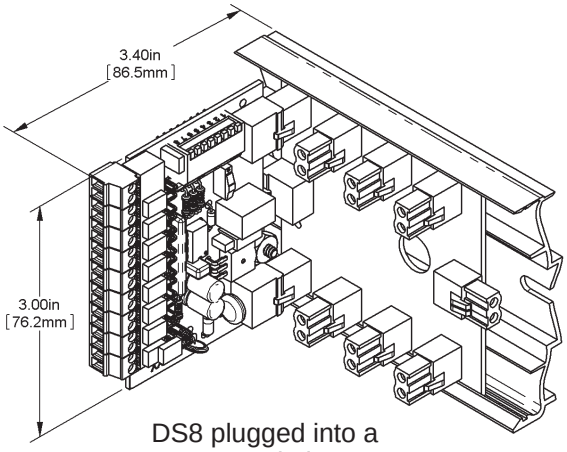


TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 Interface Backplane (p. G16)

Specifications



DS8 plugged into a BP4 Backplane

Power Voltage: 24 to 34 VDC
20 to 24 VAC

Power Current: 35 mA max. (1.2VA max)

Input Sensing Voltage: 24 VDC

Input Sensing Current: 2.4 mA

Output: Dry relay contacts
NEC Class 2 circuits only

Output Current: 1 mA to 1 Amp

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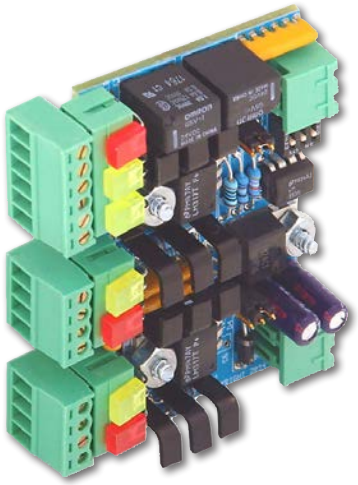
EA1 - Two Position Actuator Interface

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

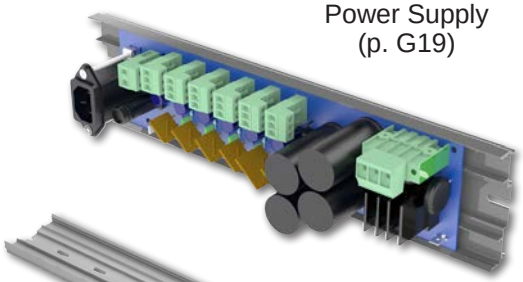
Belimo is a trademark of Belimo Aircontrols (USA) Inc. registered in the United States and other countries.

Part Number	Description	List Price
BA/EA1	2 Position Actuator Interface	$105

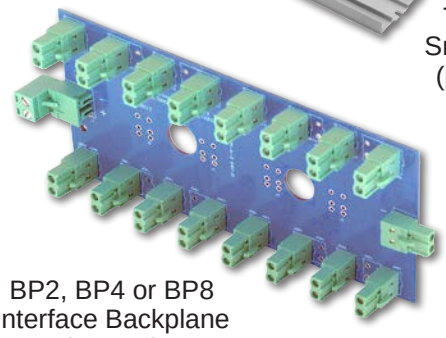
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

PS17/18/19RF Power Supply (p. G19)



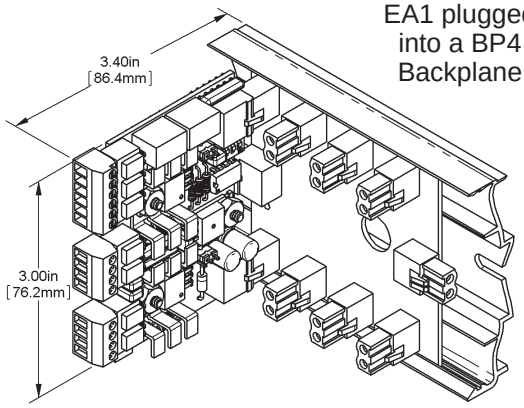
TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 Interface Backplane (p. G16)

Specifications

EA1 plugged into a BP4 Backplane



Power Voltage: 28 to 36 VDC, 24 VAC

Power Current: 50 mA max. plus actuators (1.7 VA max plus actuator)

Actuator Control Voltage: 0 or 24 VDC @ 7mA max

Actuator Power Voltage: 24 VDC

Actuator Power Current: 2 output of 250 mA max. (12 Watts total)

EA2 - Modulating Actuator Interface

ETA Line

Rev. 11/05/20

Overview

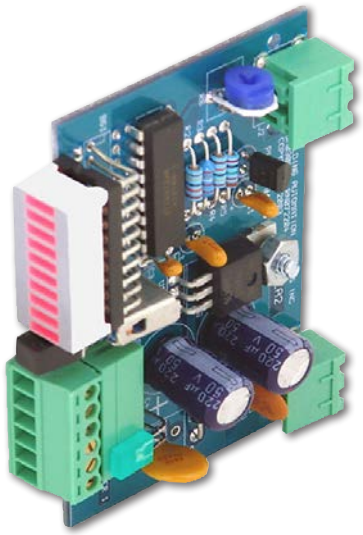
The EA2 simplifies the wiring and troubleshooting of Belimo® style modulating actuators with voltage feedback, saving time and money every time you install or check an actuator. The connector plug on the front of the EA2 module makes terminations quick and easy for the controller and the actuator. The four actuator wires and the controller's output signal terminate on the connector plug. The EA2 provides regulated and fused power for the actuator from the backplane.

The EA2 module is an excellent troubleshooting tool because the technician does not need to gain physical access to the actuator to determine if the actuator is in the correct position. The EA2 display shows the actuator position based on the actuator's feedback signal. An easy push of a button on the EA2 and the display shows the position which the controller is requesting. Troubleshooting is a simple comparison of the two. If they don't match, you have a problem; the actuator is either stuck, manually overridden, not terminated properly or dead.

The EA2 plugs into a BP2, BP4, BP4-V or BP8 backplane. A green LED on the EA2 indicates when power is present.

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

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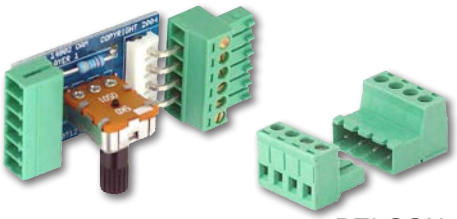


EA2 - Modulating Actuator Interface

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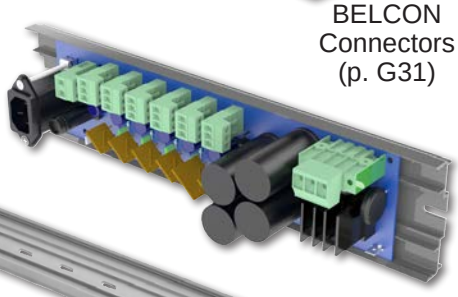
Associated Products

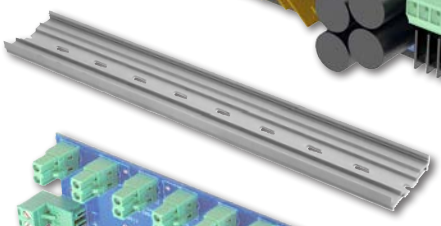
OAM - Output Adjust Module (p. G7)



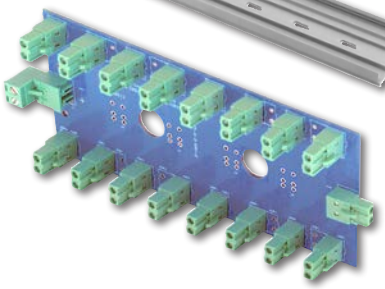
PS17RF Power Supply (p. G19)

BELCON Connectors (p. G31)





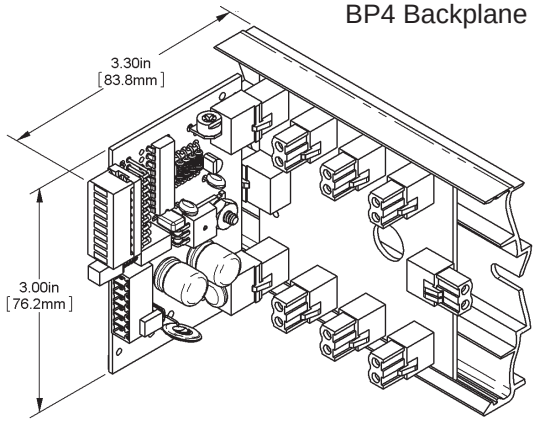
TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 or Interface Backplane (p. G16)

Specifications

EA2 plugged into a BP4 Backplane



Power Voltage: 28 to 35 VDC
20 to 26 VAC

Power Current: 50 mA max. plus actuators
(1.7 VA max plus actuator)

Actuator Control Voltage: 2 to 10 VDC

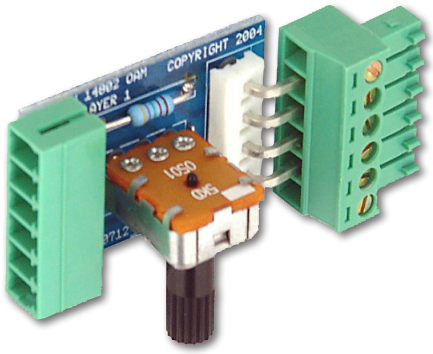
Actuator Power Voltage: 24 VDC

Actuator Power Current:
500 mA max (12 Watts total)

Overview

Many times, it is necessary to move an actuator throughout its entire range of motion to troubleshoot the mechanical linkage. In DDC systems, this procedure may require a laptop computer, communications interface and special software. Then you have to know which controller to interface with, that controller's individual address and which output connects to the actuator you need to troubleshoot. Now the battery is going dead on your laptop and there is nowhere to plug in the charger.

There is a better way. If you use the EA2 module (p.G6) to drive your modulating actuators, the OAM (Output Adjust Module) accessory allows you to stroke your actuator to any position without any additional equipment. Simply plug the actuator cable into the OAM and then plug the OAM into the EA2. Turning the knob on the OAM allows you to set the actuator's position anywhere in its range. Push the button on the EA2 to see your commanded position, release the button to see the actuator's position.

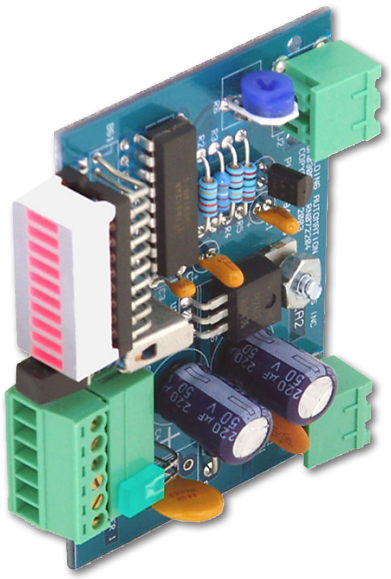


OAM - Output Adjust Module

Part Number	Description	List Price
BA/OAM	Output Adjust Module	$23

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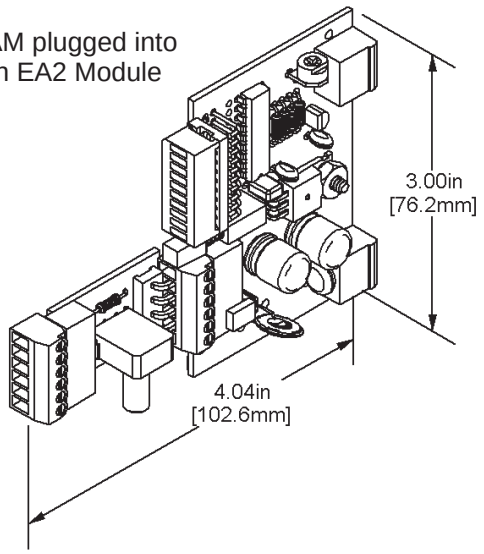
Associated Products



EA2 - Modulating Actuator Interface (p. G6)

Specifications

OAM plugged into an EA2 Module



Input Voltage: 24VDC from the EA2

Output Signal Voltage: 0 to 10 VDC nominal

Output Signal Current: 2 mA

(Actuator power passes through the OAM from the EA2)

CDSP - Carbon Dioxide Sensor Power Supply

ETA Line

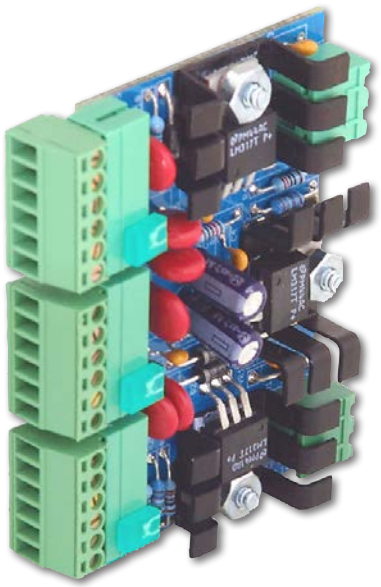
Rev. 11/06/20

Overview

Many facilities use Carbon Dioxide (CO_2) sensors for demand-controlled ventilation. Although BAPI makes CO_2 sensors that can run on AC or DC power, many sensors require 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 CDSP module removes the clutter and the wiring hassles by providing the power and terminations for up to three CO_2 (or other) sensors. Additional CDSP modules can be mounted neatly in the associated backplane to accommodate an unlimited number of CO_2 sensors throughout the facility.

The CDSP plugs into a BP2, BP4, BP4-V or BP8 backplane. Three green LEDs indicate when power is present to the CO_2 sensors. Another green LED indicates when power is present to the CDSP module. The CDSP can be used for most low-power, four-wire sensors requiring 24 VDC.

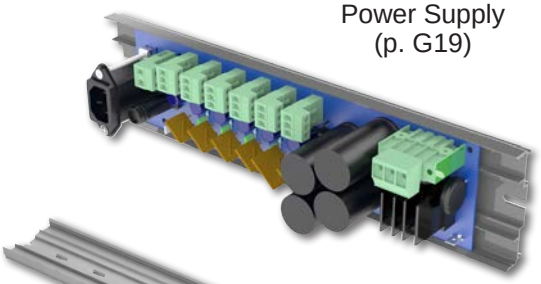


CDSP - Carbon Dioxide Sensor Power Supply

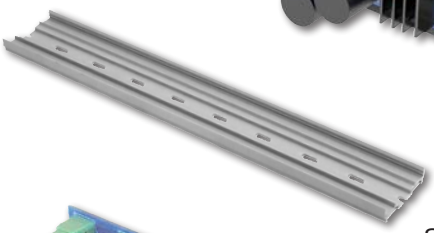
Part Number	Description	List Price
BA/CDSP	Carbon Dioxide Sensor Power Supply	$60

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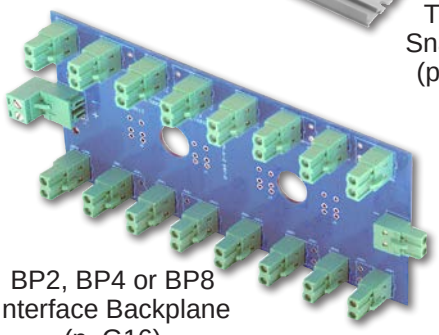
Associated Products



PS17/18/19RF Power Supply (p. G19)

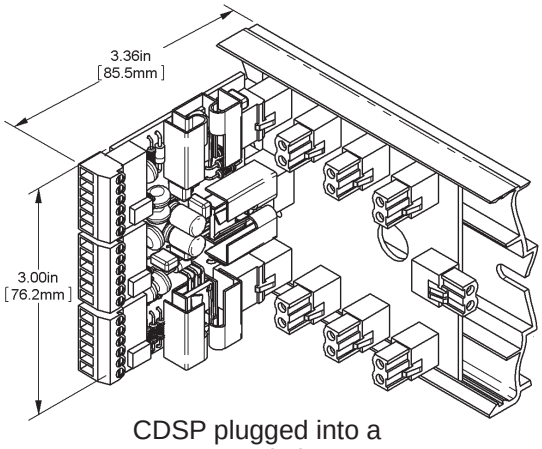


TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 Interface Backplane (p. G16)

Specifications



CDSP plugged into a BP4 Backplane

Input Voltage: 26 to 36 VDC or 24 VAC

Input Current: 350 mA max. (12 VA max.)

Output Voltage: 24 VDC

Output Current: 75 mA on each output (225 mA total)

Signal Line Surge Protection: Nominally 39V, (+) to GND and (-) to GND

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CDSP2 - Carbon Dioxide Sensor Power Supply

Rev. 11/06/20

ETA Line

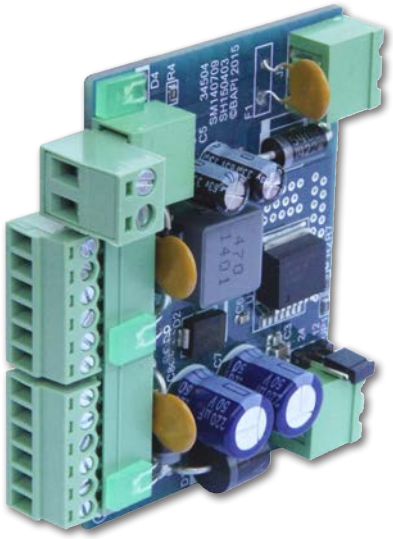
Overview

Many facilities use Carbon Dioxide (CO_2) sensors for demand-controlled ventilation. Although BAPI makes CO_2 sensors that can run on AC or DC power, many sensors require 12 or 24 VDC to operate and additional terminations to land the wiring. The extra power supplies, wiring and terminations can clutter up the control panel or the control room.

The CDSP2 module removes the clutter and the wiring hassles by providing the power and terminations for two CO_2 sensors. Additional CDSP2 modules can be mounted neatly in the associated backplane to accommodate an unlimited number of sensors throughout the facility. The 12 or 24 VDC output power of the module is field selectable with a jumper setting. All three outputs will be the same voltage.

The CDSP2 plugs into the BP2, BP4, BP4-V or BP8 Backplane. The CDSP2 receives power from the backplane which is powered by a BAPI PS17/18/19RF or other suitable power supply.

Three green Output Power LEDs light whenever power is present at the output terminals.

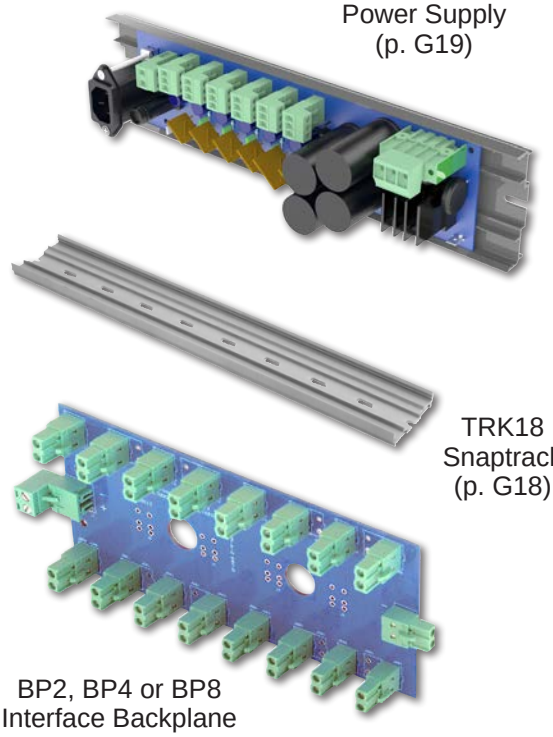


CDSP2 - Carbon Dioxide Sensor Power Supply

Part Number	Description	List Price
BA/CDSP2	Carbon Dioxide Sensor Power Supply	$130

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

Associated Products

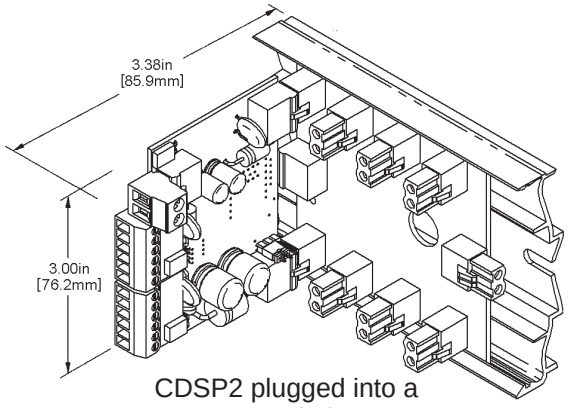


PS17/18/19RF Power Supply (p. G19)

TRK18 Snaptrack (p. G18)

BP2, BP4 or BP8 Interface Backplane (p. G16)

Specifications



CDSP2 plugged into a BP4 Backplane

Input Voltage
24VDC Output: 28 to 36 VDC or 24 VAC
12 VDC Output: 16 to 36 VDC or 24 VAC

Input Current: 1.45A max (12VA max)

Output Voltage: 12 or 24VDC

Output Current: 0.5A on each output
1.5A total

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SQ4 - Four-Step Sequencer

ETA Line

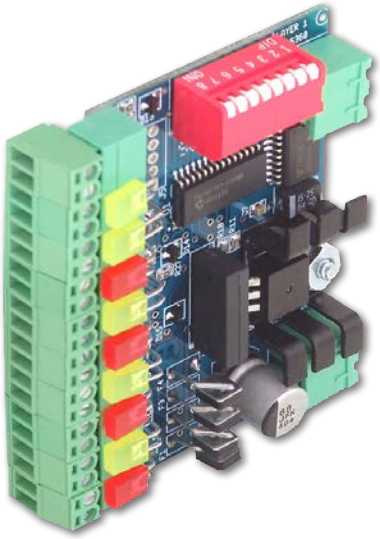
Rev. 11/06/20

Overview

The high cost of energy today makes proportional control of HVAC systems a necessity, not a luxury. With proportional control you use only the energy needed to get the job done.

Proportional control is easy for water valves and air dampers, but more complex and cost prohibitive for electric heat units, fans and refrigeration systems. The SQ4 module simplifies the job by sequencing multiple on-off devices based on a single analog output from the controller. Now items such as cooling towers with multiple two-speed fans, staged electric heaters and multi-compressor chillers can be controlled to provide the utmost efficiency and consistency for the load at hand – all at a reasonable price.

Each SQ4 module provides four outputs that trigger at four fixed voltages across the 0 to 5 or 0 to 10 control voltage range. Two SQ4 modules can be cascaded to provide eight independent output stages. When energized, each output provides 24 VDC at 120 mA. In addition, sequencer modules are available that provide a rotational sequence as well as status contact monitoring with alarm output.



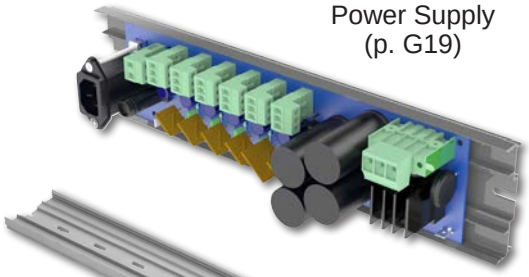
SQ4-RA Four-Step Sequence Module

Part Number	Description	List Price
BA/SQ4	4-Step Sequence Module	$105
BA/SQ4-R	4-Step Sequence Module (Rotational)	$105
BA/SQ4-A	4-Step Sequence Module (with Alarm)	$280
BA/SQ4-RA	4-Step Sequence Module (Rotational with Alarm)	$280

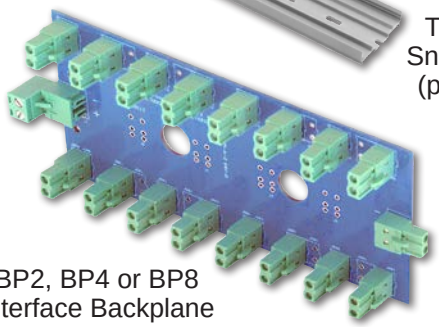
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

PS17/18/19RF Power Supply (p. G19)



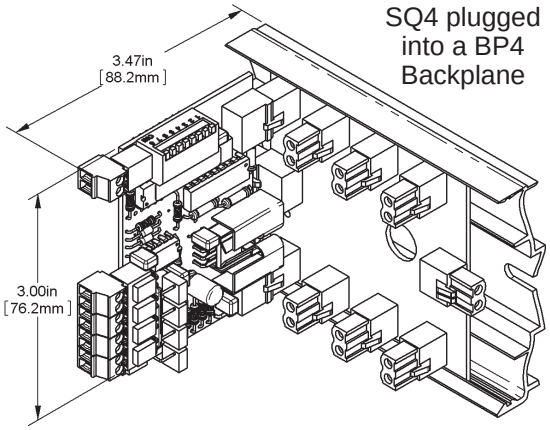
TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 Interface Backplane (p. G16)

Specifications

SQ4 plugged into a BP4 Backplane



Power Voltage: 26 to 36 VDC or 24 VAC

Power Current: 50 mA max. plus output (1.7 VA max plus output)

Input Control Voltage: 0 to 5 or 0 to 10 VDC

Output Power Voltage: Nominal 24 VDC (23 to 32 VDC)

Output Power Current: 4 outputs of 80 mA max. (10 Watts total)

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3312VC & 3324VC - Voltage Converters

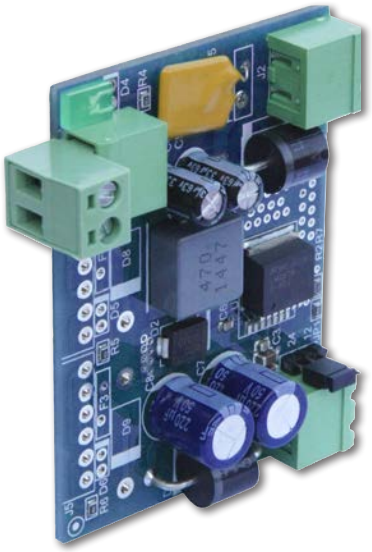
Overview

Some of BAPI's ETA products require regulated power of 12 VDC, including the FOX and SOX - RS-485 Fiber Optic Transceivers and the RPTR - RS-485 Repeater. The 3312VC is perfect for these. Many devices such as energy meters require 24VDC but need more power than available from CDSP2. 3324VC is perfect for these. The 12 or 24 VDC output is still field selectable with a jumper setting, so you really get two modules in one!

The 3312VC and 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 3312VC and 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.

If the 3312VC is powering a FOX, SOX or RPTR module, the 12 VDC output from the 3312VC is sent to a RBP4, RBP8 or SRBP Repeater Backplane. The Repeater Backplane then provides power, communications and mounting for the FOX, SOX and RPTR modules.

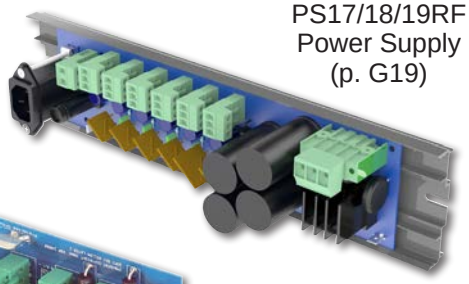


3324VC - Voltage Converter

Part Number	Description	List Price
BA/3312VC	Voltage Converter (33VDC to 12VDC)	$120
BA/3324VC	Voltage Converter (33VDC to 24VDC)	$120

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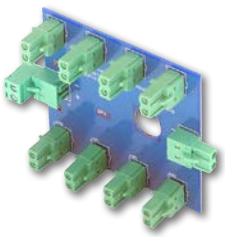
Associated Products



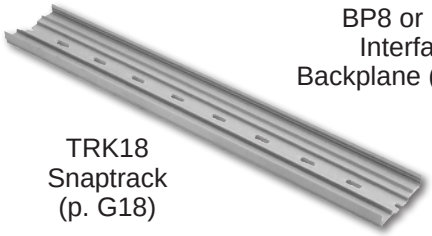
PS17/18/19RF Power Supply (p. G19)



RBP or SRBP Repeater Backplanes (p. G30-32)

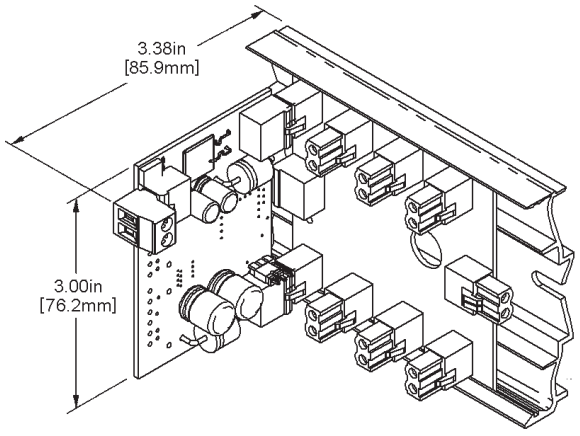


BP8 or BP4 Interface Backplane (p. G16)



TRK18 Snaptrack (p. G18)

Specifications



3324VC plugged into a BP4 Backplane

Input Voltage:
12 VDC Output: 16 to 36 VDC or 24 VAC
24 VDC Output: 28 to 36 VDC or 24 VDC

Input Current: 1.5A Max at 28 VDC

Output Voltag: 12 or 24 VDC ± 0.25 VDC

Output Current: 1.5 Amp Max (30VA max)

R49 - Relay Interface, 9 Output

ETA Line

Rev. 11/03/20

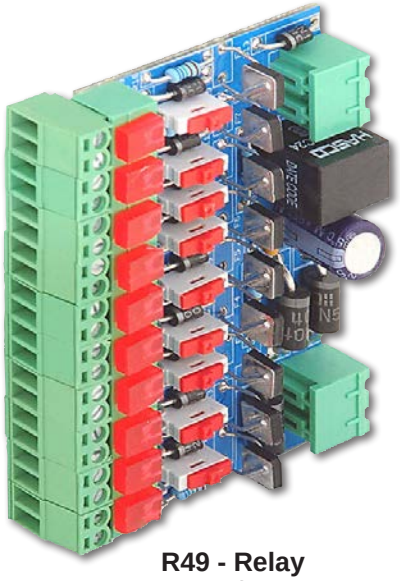
Overview

It is often necessary to perform several tasks simultaneously in an HVAC system – for example, turn on an auxiliary supply fan, turn on an exhaust fan, open purge dampers and close return dampers. Rather than tying up four outputs on the controller to perform these tasks, the BAPI R49 conserves critical controller points by turning on or off up to nine relays using only one controller output.

Each output on the R49 module has a switch so that some loads may be turned off while others are turned on as the input changes state.

Each R49 output supplies a nominal 24 VDC at 120 mA allowing it to control most common relays or small contactors. Each output has a red LED to indicate when power is present.

The R49 plugs into a BP2, BP4 or BP8 Backplane. A green LED indicates that power is present to the module.



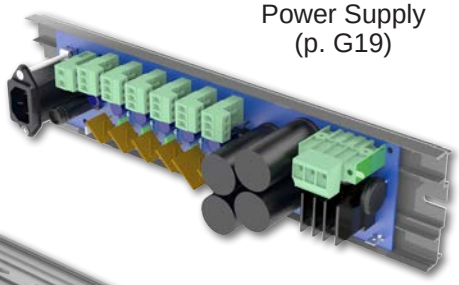
R49 - Relay Interface

Part Number	Description	List Price
BA/R49	Relay Interface Module, 9 Output	$125

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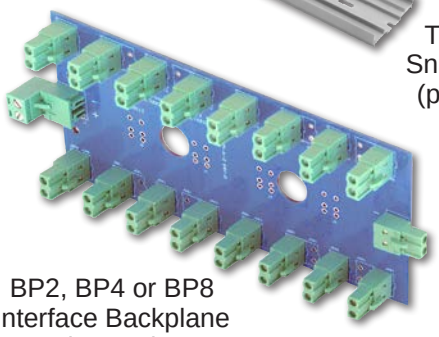
Associated Products

PS17/18/19RF Power Supply (p. G19)





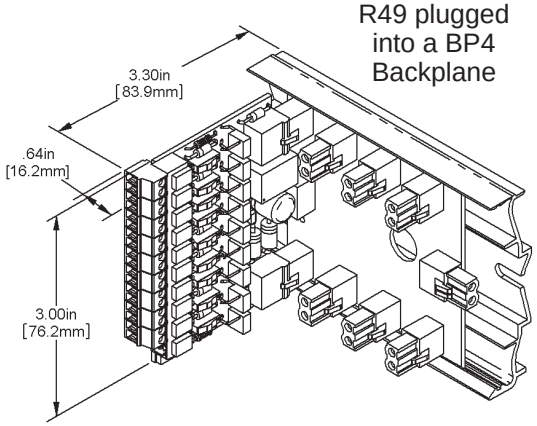
TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 Interface Backplane (p. G16)

Specifications

R49 plugged into a BP4 Backplane



Power Voltage: 26 to 34 VDC; 24 VAC

Power Current: 50 mA max. plus relays (1.7 VA max. plus relays)

Input Control Voltage: 0 or 24 VDC @ 7 mA max.

Output Power Voltage: Nominal 24 VDC (23 to 32 VDC)

Output Power Current: 9 outputs of 120 mA max. (26 Watts total)

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DS6R - Dry Switch Monitor

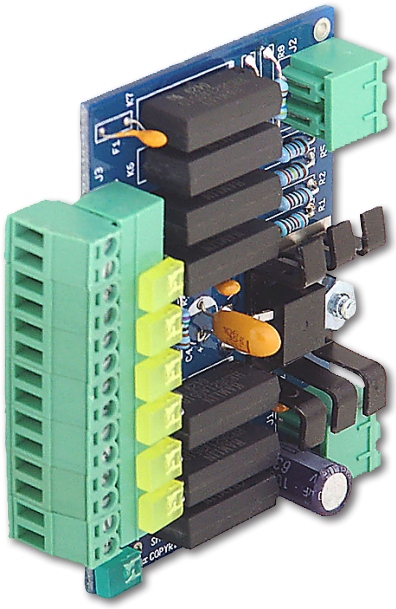
Overview

The DS6R module monitors six dry switch closure devices and provides one resistive output to the controller.

Each switch closure subtracts a precise resistance from the output so a simple subtraction algorithm at the controller decodes which switches are set.

Each switch terminates on an independent plug on the front of the DS6R module and an LED associated with each input indicates switch closure for simple troubleshooting.

The DS6R plugs into the BP2, BP4, BP4-V or BP8 backplane.

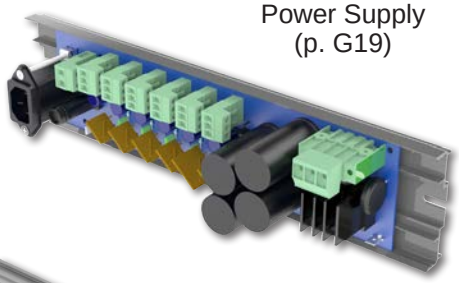


DS6R - Dry Switch Monitor

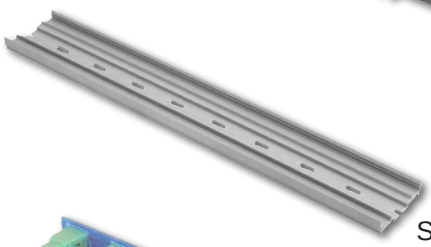
Part Number	Description	List Price
BA/DS6R	Dry Switch Monitor, 30K Output	$95
BA/DS6R-10K	Dry Switch Monitor, 10K Output	$95

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

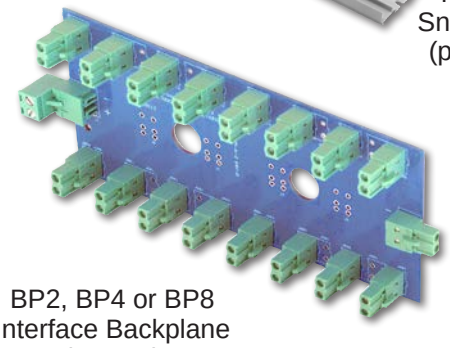
Associated Products



PS17/18/19RF
Power Supply
(p. G19)



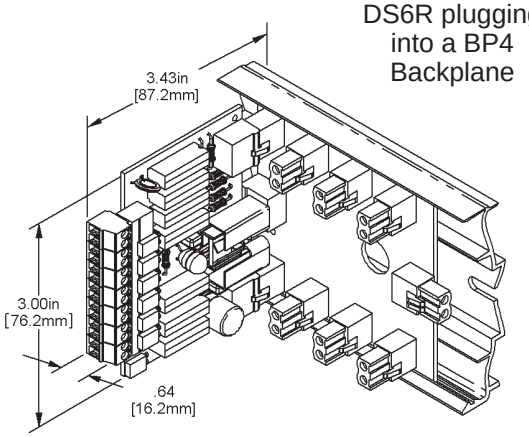
TRK18
Snaptrack
(p. G18)



BP2, BP4 or BP8
Interface Backplane
(p. G16)

Specifications

DS6R plugging into a BP4 Backplane



Power Voltage: 10 to 42 VDC
20 to 26 VAC

Power Current: 70 mA maximum
(2.4 VA maximum)

Switch Voltage: 7 VDC

Switch Current: 10mA

Output Resistance:
DS6R ..... 29.505KΩ - All Switches Open
DS6R-10K .. 9.806KΩ - All Switches Open

(Full output resistance tables are available in the installation and operation instructions)

PMPB5 - Pulse Meter Pulse Buffer

ETA Line

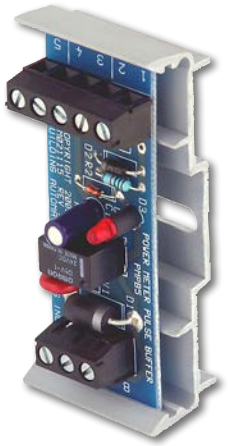
Rev. 11/06/20

Overview

Many electrical, water or gas meters provide a pulse output with each pulse representing a specific quantity of the media being measured. These pulse outputs often need to be electrically isolated from the controller's input by a buffer. The PMPB5 provides that buffer by receiving the pulses from the meter and recreating them as dry contact closures. An LED lights whenever the buffer contacts are closed. The PMPB5 fits standard 2.75" snaptrack.

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

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



PMPB5 mounted in the optional 2.75" snaptrack

Specifications

Power ..... 24VAC 50/60HZ @ 25mA (0.6VA)
Contact rating ..... 1A @ 24VAC/DC max, 1mA @ 5VDC min*
Contact repetition rate ..... 2 seconds per pulse maximum

*Return pulse from the relay contact is clamped at 5V to ground.

TS1 & TS2 - Transient Suppressor

Overview

HVAC control systems can be subjected to electrical transients (temporary excess voltage) from various sources. Damage to control systems can occur if static electricity, lightning or contactors produce transients of sufficient magnitude and duration to overwhelm the protection built into the control system components. The TS1 and TS2 can significantly increase the transient protection and reduce the possibility of damage to the control system. Both modules fit in standard 2.75" snaptrack

The TS1 is specifically designed for network communications between control system components. The TS1 clamps voltages to 10 VAC or ±14 VDC Line to ground and 7.5 VDC line to line. *Note: The added capacitance of the TS1 may be unsuitable for some combinations of communications line length and high speed data. Line lengths may have to be reduced or repeaters added for best operation.*

The TS2 is designed to protect 4 to 20 mA current loops. The TS2 clamps the signal return line to 5 volts above ground and 1 volt below ground. The voltage supply line is clamped to ±39 VDC Line to ground.

Part Number	Description	List Price
BA/TS1	Transient Suppressor (voltage)	$7.50
BA/TS2	Transient Suppressor (current)	$7.50

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

Specifications

TS1 Clamping Voltage..... 10 VAC or ±14 VDC Line to Ground, ±7.5 VDC Line to Line

TS2 Clamping Voltage..... 5 VDC Above Ground, Signal Return Line
1 VDC Below Ground, Signal Return Line
±39 VDC Line to Ground, Power Supply Line

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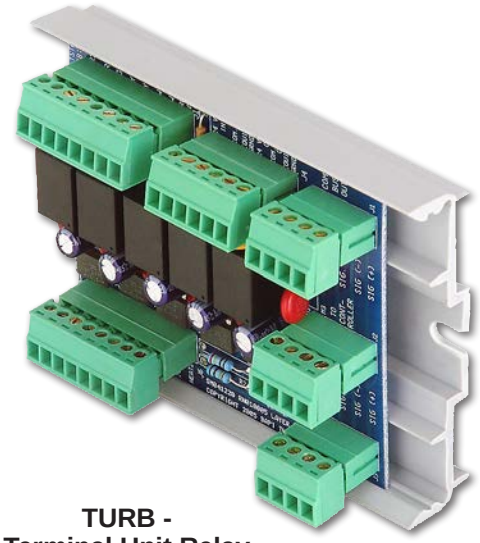
TURB - Terminal Unit Relay Board

Overview

Today's energy costs are forcing older buildings to be retrofitted with Building Management Systems - keeping the occupied spaces comfortable while reducing the overall energy use. The TURB - Terminal Unit Relay Board is an interface board that allows convenient interconnection between a Digital Controller and a DX unit's conventional thermostat terminal block. The TURB eliminates the wiring mess and provides a neat professional look that simplifies maintenance to eliminate costly callbacks.

The TURB provides an easily pluggable interface between the modules and provides fused power to the controller from the "R" terminal of the DX unit. Dry-contact pilot duty relays interface between the Digital Controller and the conventional thermostat inputs of the DX unit.

The TURB also provides a "mini communications block" with surge protection to provide a clean and easily pluggable connection to the controller. All this is packaged on a board that mounts in a 2.75" snaptrack in one orientation, or a 3.25" snaptrack in the other orientation, depending on how you want to install the module.



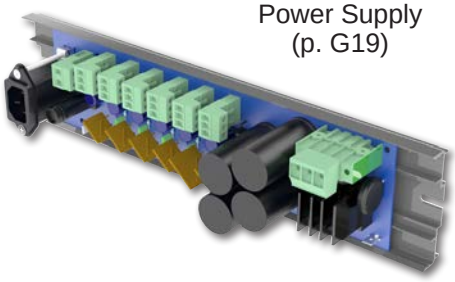
TURB - Terminal Unit Relay Board mounted in the optional 2.75" snaptrack

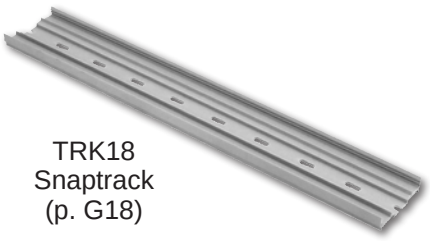
Part Number	Description	List Price
BA/TURB	Terminal Unit Relay Board	$57
BA/TURB-TRK	TURB with 4" piece of 2.75" snaptrack	$65

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Associated Products

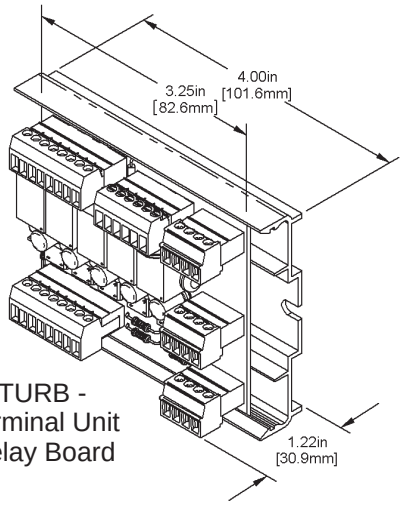
PS17/18/19RF Power Supply (p. G19)





TRK18 Snaptrack (p. G18)

Specifications



TURB - Terminal Unit Relay Board

Relay Input Power: 24 VAC @ 10mA each

Relay Output Contacts:
2 Amps @ 24 VAC, 24 VDC

Communications Clamping Voltage:
7.5 V positive, 1 V negative

BP2, BP4 or BP8 Backplane

ETA Line

Rev. 11/06/20

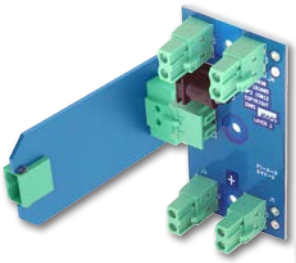
Overview

The BP2, BP4 and BP8 Backplanes provide a convenient way to mount and power the BAPI ETA devices and eliminate control panel clutter. All backplanes fit standard 2.75" snaptrack.

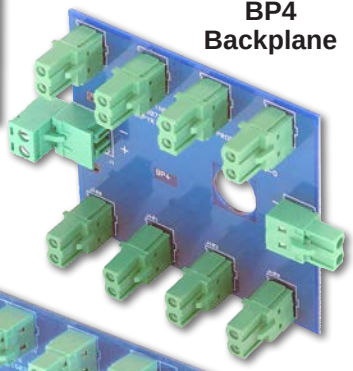
ETA modules plug into the sockets on the face of the backplane. BP2, BP4, and BP8 backplanes accommodate 2, 4, and 8 ETA modules, respectively.

The Backplanes receive power from PS17/18/19RF or a customer-furnished power supply. The Backplanes can be plugged together using the end-to-end connectors to handle many modules. The BP2 and BP4 can receive power from BAPI's VC350 voltage converter depending on the application (in Accessories section). While DC is recommended, most ETA modules will work with 24VAC input.

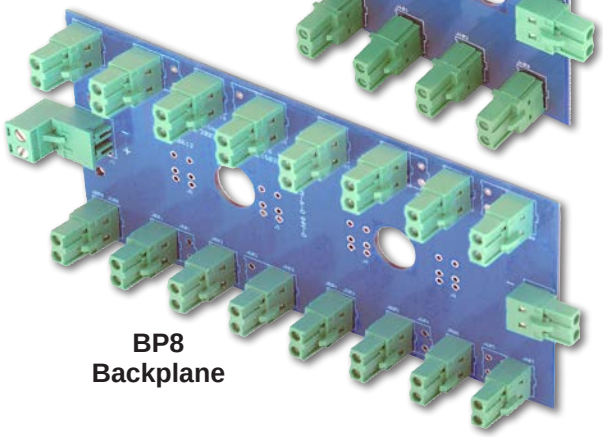
The BPCX extends the backplane power input plug to make it more accessible for service.



BP2 Backplane with BPCX installed



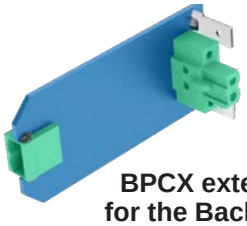
BP4 Backplane



BP8 Backplane

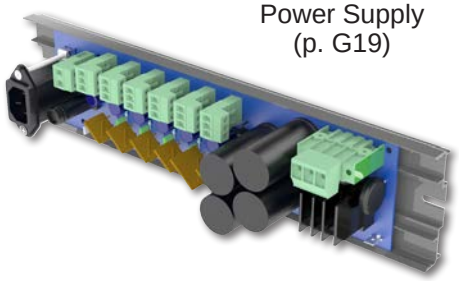
Part Number	Description	List Price
BA/BP2	2-Position Interface Backplane	$30
BA/BP4	4-Position Interface Backplane	$40
BA/BP8	8-Position Interface Backplane	$65
BA/BPCX	Backplane Power Input Extender	$10.70

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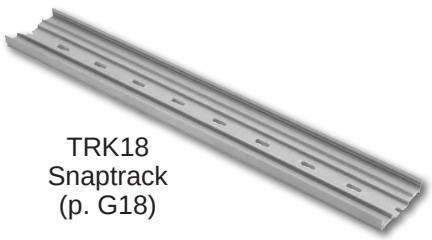


BPCX extender for the Backplane power input

Associated Products

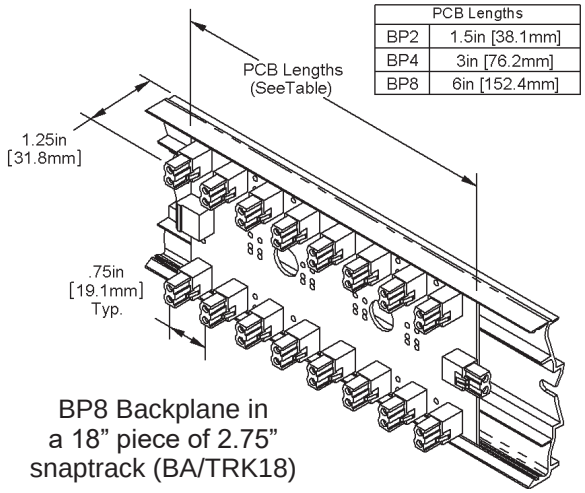


PS17/18/19RF Power Supply (p. G19)



TRK18 Snaptrack (p. G18)

Specifications



BP8 Backplane in a 18" piece of 2.75" snaptrack (BA/TRK18)

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

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BP4-V - Vertical Backplane & BP-BR - Power Bridge

Rev. 11/09/20

ETA Line

Overview

The BP4-V - Vertical Backplane was designed to add additional ETA boards into a congested panel where the only space for the snaptrack is vertical. The BP4-V allows the use of any vertical spaces that may go unused. Each BP4-V accommodates four ETA modules.

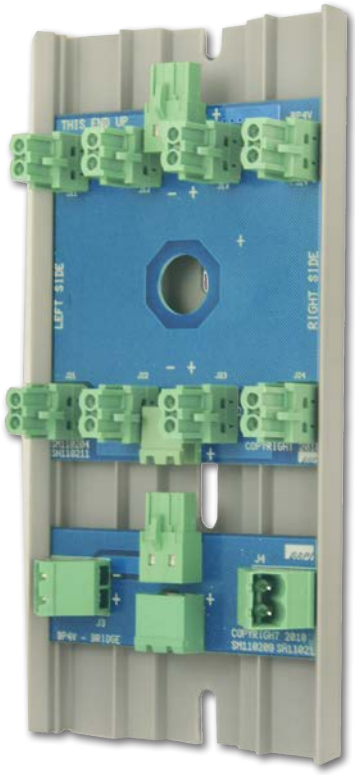
If more than one BP4-V is needed, they should be connected together with a BP-BR -Power Bridge. The BP-BR bridges the power between the backplanes and provides clearance from one BP4-V to the other for easy insertion of the ETA modules. The BP-BR also provides two additional power entry points in case the bottom plug location is not easily accessible.

For large control systems, the BP4-V receives power from a PS17/18/19RF Power Supply. For small control systems, the BP4-V can receive power from BAPI's VC350 voltage converters. While not recommended, most ETA modules will also work with 24VAC input.

Note: Do not use the BP4-V in horizontal snaptrack. Use the BP2, BP4 or BP8 instead.

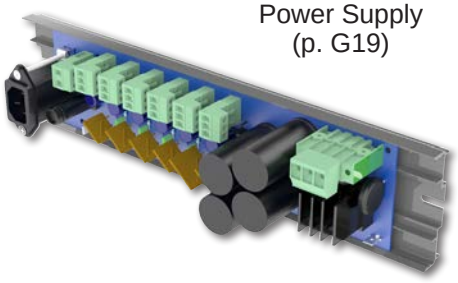
Part Number	Description	List Price
BA/BP4-V	Vertical Backplane	$40
BA/BP-BR	Bridge (to connect Vertical Backplanes)	$22

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

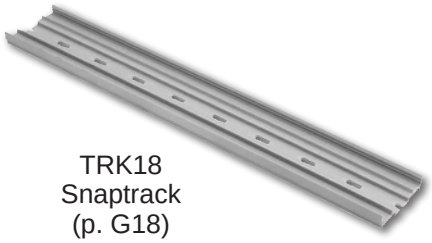


BP4-V - Vertical Backplane and a BP-BR - Power Bridge in a 2.75" wide piece of snaptrack (sold separately)

Associated Products



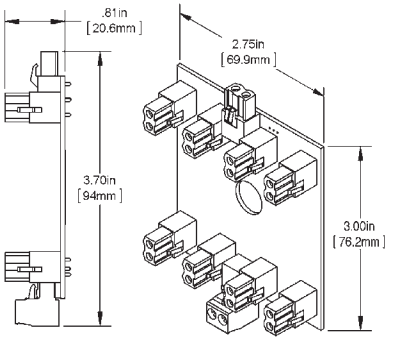
PS17/18/19RF Power Supply (p. G19)



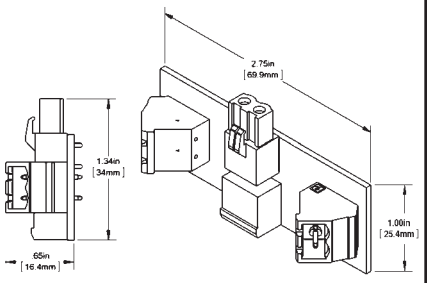
TRK18 Snaptrack (p. G18)

Specifications

BP4-V - Vertical Backplane



BA/BP-BR - Power Bridge



Power Voltage: 34 VDC max, 24 VAC max

Power Current: 4 Amp max.

TRK - 2.75” Snaptrack (TR2)

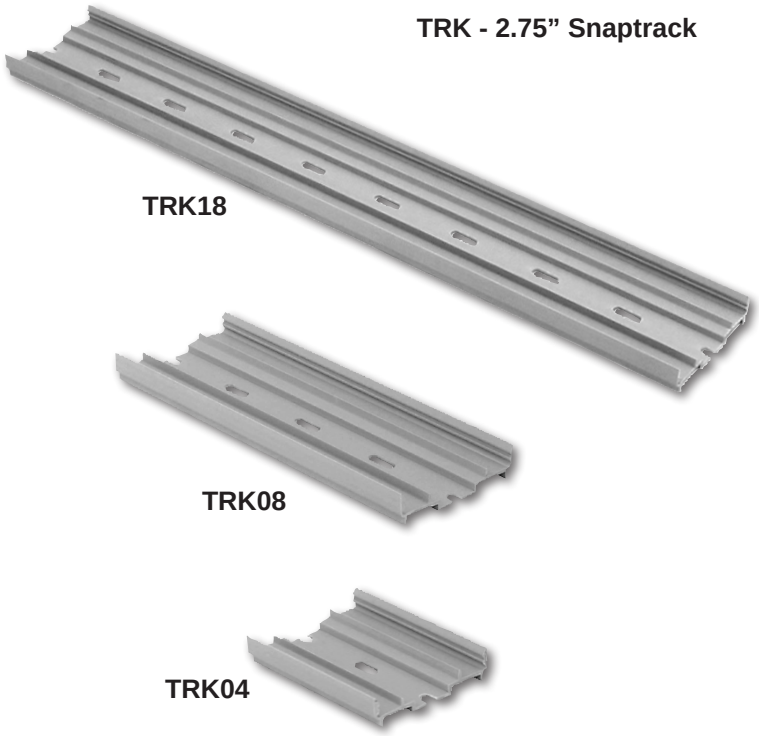
ETA Line

Rev. 11/06/20

Overview

All good projects need to start out with a proper foundation and BAPI’s ETA modules are no exception. The TRK - Snaptrack provides a sturdy, secure and easy mounting method for many products in the ETA line. The standard 2.75” snaptrack is available in several convenient lengths to accommodate all ETA products and enclosures.

The snaptrack firmly holds the ETA interface and communications backplanes, terminal blocks and other products in place so you can build neat, accurate and cost effective control panels. The plastic track is easy to cut in the field to fit any application.



Part Number	Description
BA/TRK01	TR2 Snaptrack, 1.25” length
BA/TRK02	TR2 Snaptrack, 2” length
BA/TRK04	TR2 Snaptrack, 4” length
BA/TRK08	TR2 Snaptrack, 8” length
BA/TRK12	TR2 Snaptrack, 12” length
BA/TRK18	TR2 Snaptrack, 18” length
BA/TRK48	TR2 Snaptrack, 48” length

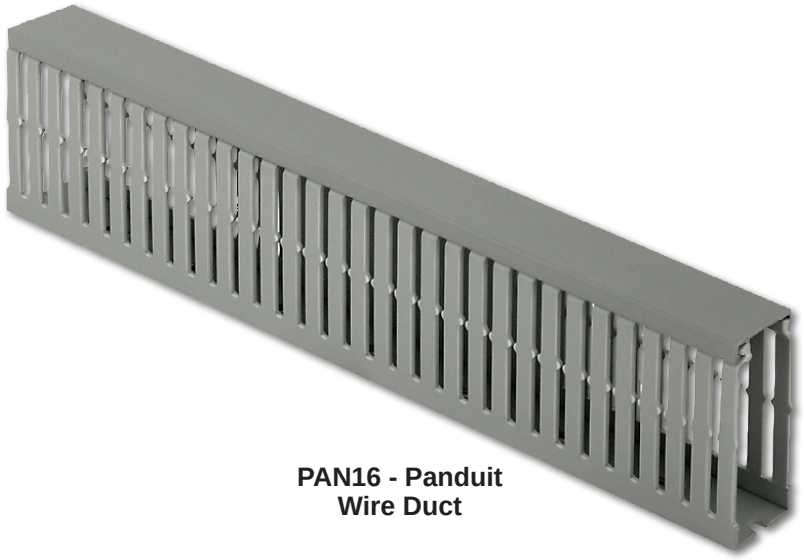
Gray shaded items follow the Buy and Resale Multiplier.

PAN16 - Panduit 1x3x16” Wire Duct

Overview

BAPI’s PAN16 - Panduit wire duct easily mounts in any control panel with a few #8 machine screws.

The PAN16 guides the wire around the control panel for a very neat installation.



PAN16 - Panduit Wire Duct

Part Number	Description	List Price
BA/PAN16	Panduit 1x3x16” Wire Duct	$39

Gray shaded items follow the Buy and Resale Multiplier.

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

PS17RF, PS18RF & PS19RF - Power Supplies

ETA Line

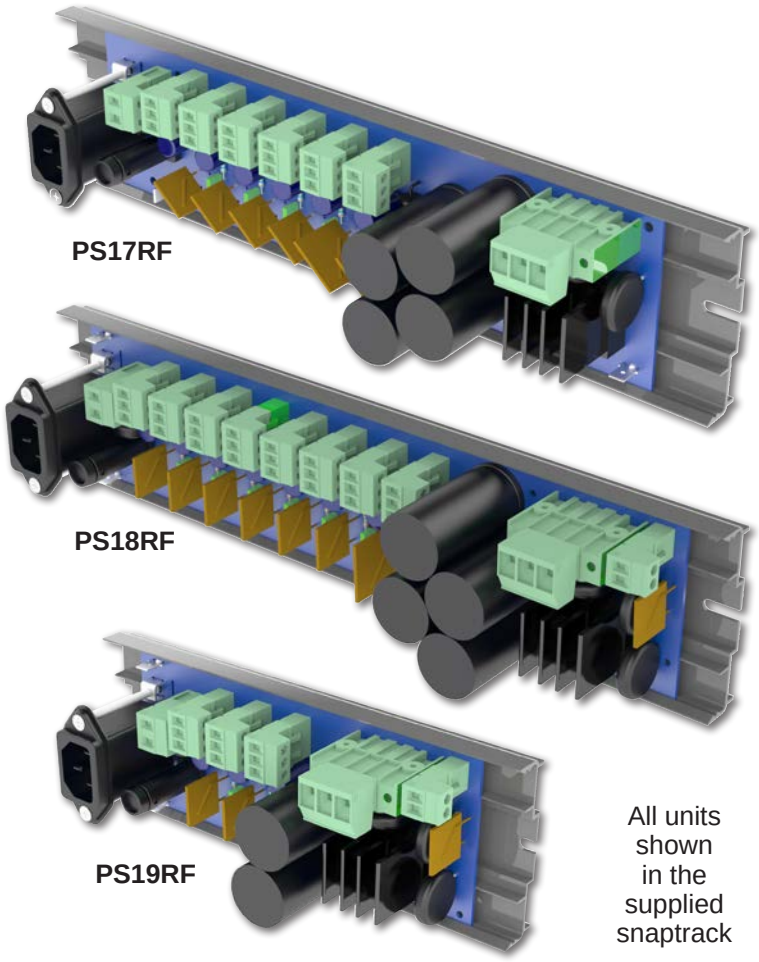
Rev. 11/06/20

Overview

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

The power supplies use a customer-supplied 24 VAC* transformer with a rating of 200 to 600 VA depending upon current consumption (See Transformer Specs). Pluggable screw terminals allow easy termination of the transformer.

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



All units shown in the supplied snaptrack

Part Number	Description	List Price
BA/PS17RF	6 Output Unit with Self-Resetting Fuses	$303
BA/PS18RF	8 Output Unit with Self-Resetting Fuses	$413
BA/PS19RF	3 Output Unit with Self-Resetting Fuses	$265

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

Specifications

Input Power
120 to 240 VAC; Amps depend on transformer selected. Standard IEC 320 Line Filter

Output Voltage
Nominal 33 VDC* (using 24 VAC transformer)

PS17RF Outputs (Nominally-Rated)
Six Outputs: Four at 2.5 Amps, two at 3.75 Amps

PS18RF Outputs (Nominally-Rated)
8 Outputs: Six at 2.5 Amps, two at 3.75 Amps

PS19RF Outputs (Nominally-Rated)
3 Outputs: Two at 2.5 Amps, one at 3.75 Amps

Customer Supplied Transformer Specs

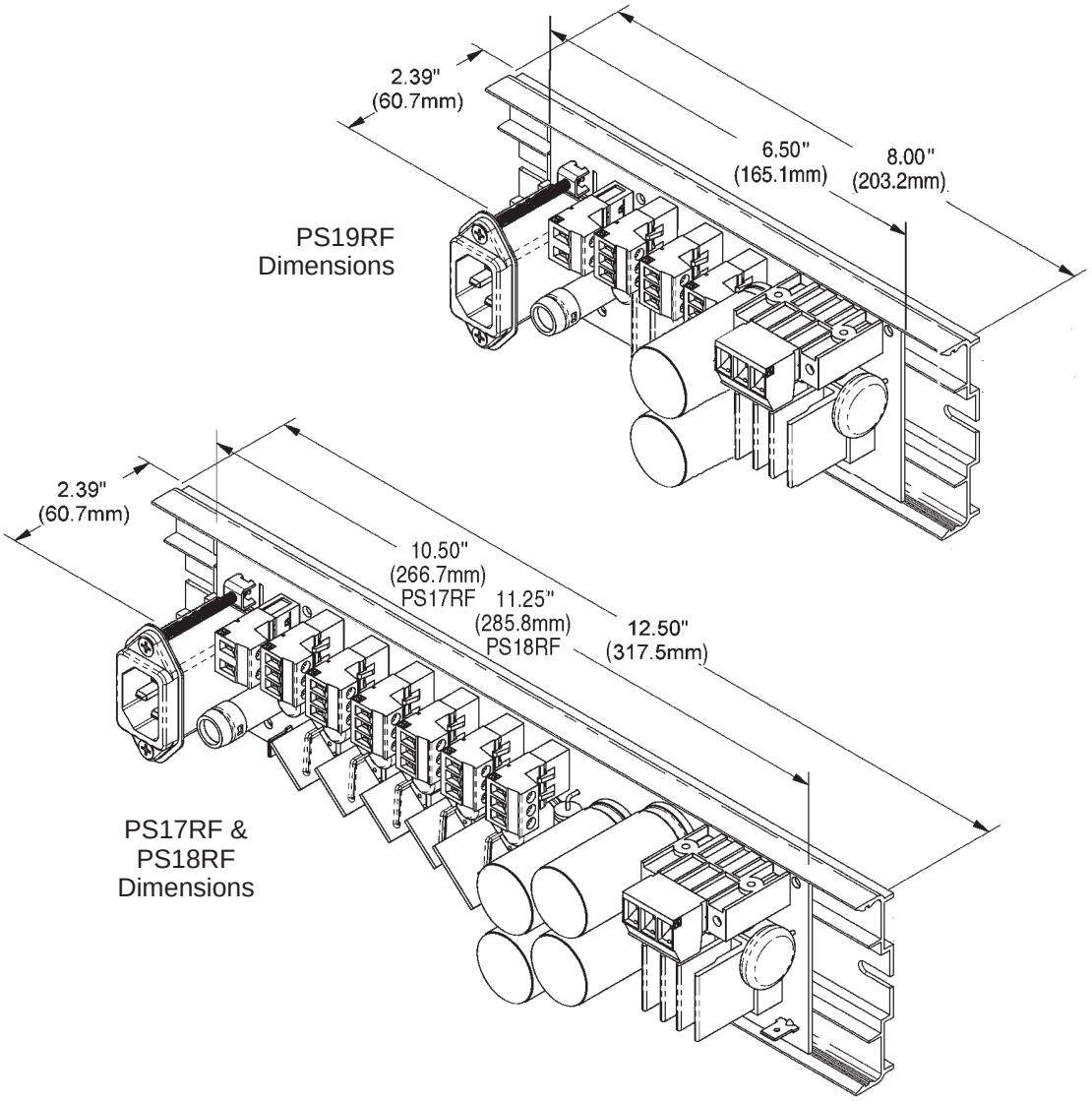
Unit Model	Transformer Power
PS19RF	Nominal 200 VA
PS17RF	Nominal 400 VA
PS18RF	Nominal 600 VA

*The VDC output voltage from the unit is dependent on the VAC input voltage. Generally the output will equal 1.4 times the input.

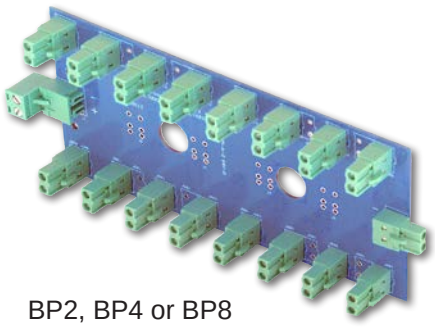
9 VAC input = 12 VDC output
18 VAC input = 24 VDC output
20 VAC input = 28 VDC output
24 VAC input = 33 VDC output

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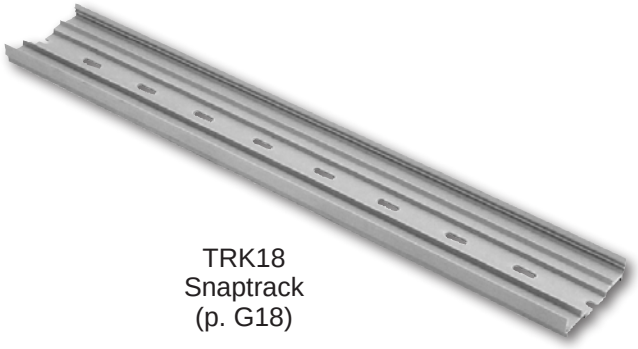
Dimensions



Associated Products



BP2, BP4 or BP8
Backplane (p. G16)



TRK18
Snaptrack
(p. G18)

COMBLK - Comm. Cable Terminal Block

ETA Line

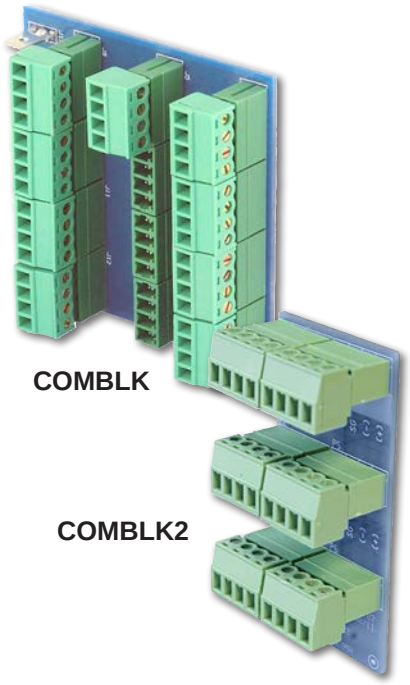
Rev. 03/17/21

Overview

The COMBLK and COMBLK2 Communication Terminal Blocks simplify the task of terminating communications wiring.

The COMBLK has four independent circuits and the COMBLK2 two independent circuits. Each independent circuit includes three connectors — bus in, bus out and wiring to the controller. Either COMBLK allows the in and out bus segments to be quickly isolated and tested, thus greatly simplifying the troubleshooting. A common ground connector provides an easy way to ground all shield drain wires. Also, both COMBLKs accommodate the COMSRG surge suppressor, which plugs directly inline between the COMBLK and the communications bus segment terminated on the plug.

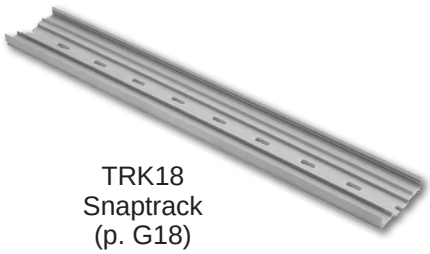
Either COMBLK is suitable for RS-485 wiring, Modbus, BACnet or virtually any other communications standard that talks over two or three wires. The small size of the COMBLK2 makes it ideal for installing within VFD enclosures, power meter cabinets, etc. where Modbus or other protocol communication must be connected to a remote communicating device. Both fit into industry standard 2.75" snaptrack and COMBLK2 is furnished with a TRK02.



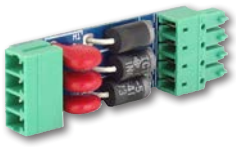
Part Number	Description	List Price
BA/COMBLK	Comm. Cable Terminal Block (NEC Class 2 Circuits, 4 Amp max.)	$65
BA/COMBLK2	Comm. Cable Terminal Block (NEC Class 2 Circuits, 4 Amp max.)	$53

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Associated Products

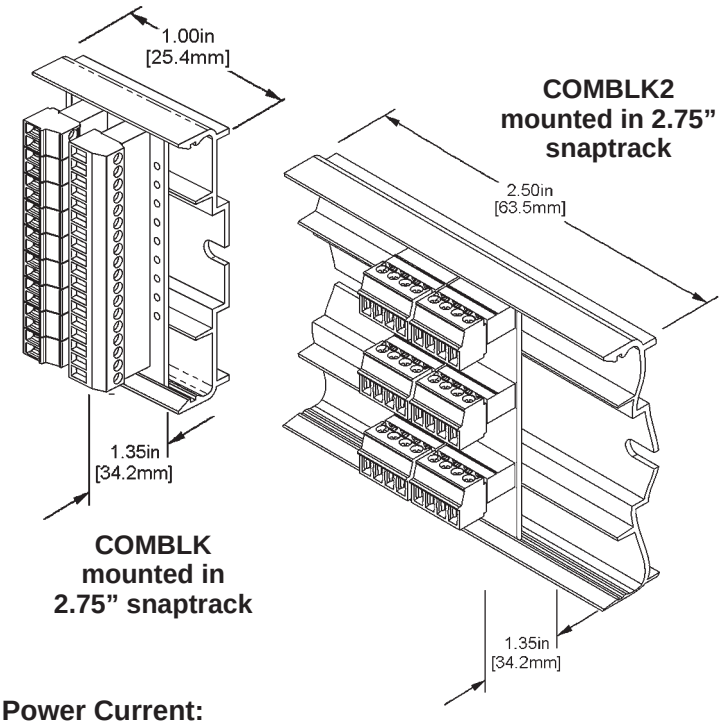


TRK18
Snaptrack
(p. G18)



COMSRG
- Communication Surge Protector
(p. G21)

Specifications



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

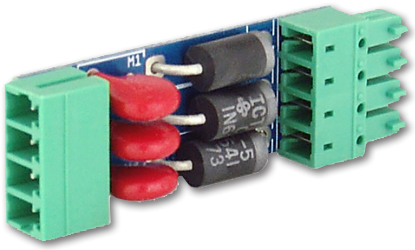
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COMSRG - Comm. Surge Protector

Overview

In some applications, the transient protection on the communications terminals of DDC controllers is inadequate. Examples are roof mounted air handlers, pad mounted air conditioners or chillers – or anything attached to the building's HVAC system but outside the building envelope.

BAPI's COMSRG provides the extra muscle necessary to prevent damage. The COMSRG plugs between the communications network and any of BAPI's RS-485 communication products, including COMBLK, COMBLK2, TUCOM, TUCOM2, LRCA, RPTR, RBP4, RBP8, RBP-PB, RBP-CX, RBP-CX2, and SRBP.



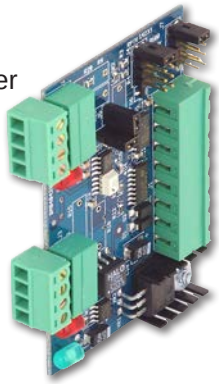
COMSRG
- Communication Surge Protector

Part Number	Description	List Price
BA/COMSRG	Communications Surge Protector	$55

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

Associated Products

RPTR
RS-485 Repeater
(p. G24)





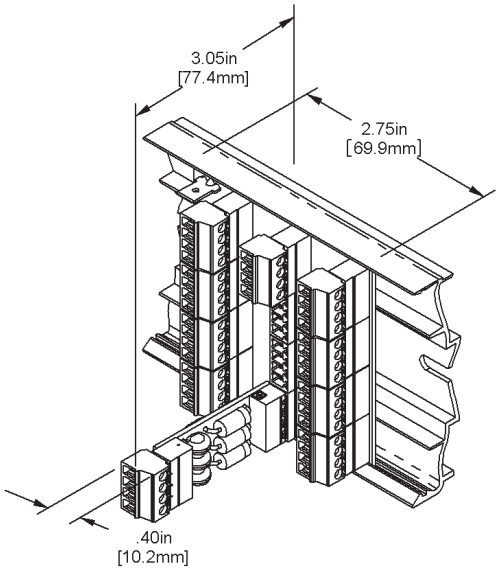
TUCOM - Terminal
Unit Comm. Block
(p. G33)



COMBLK
Comm. Cable
Terminal Block
(p. G22)

Specifications

COMSRG module plugged into a COMBLK Communications Cable Terminal Block



Clamp Voltage: 6 VDC

Clamp Energy: 2.3 Joules

RPTR - RS-485 Repeater

ETA Line

Rev. 11/08/20

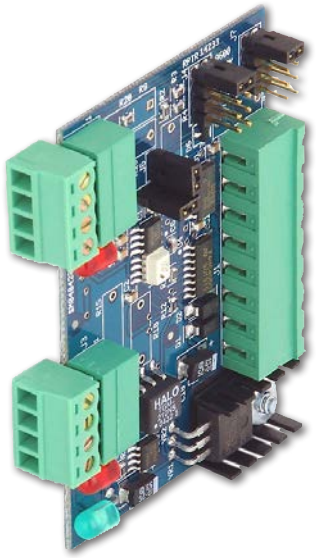
Overview

RS-485 is the most common communications standard for DDC controllers; however, it is limited to 32 unit loads and 4,000 feet. Extending the network beyond 32 unit loads or 4,000 feet requires repeaters.

BAPI's RPTR connects two RS-485 segments together. Data from one segment repeats to the other segment and vice versa. Each RPTR module allows an additional 32 unit loads or 4,000 feet.

The RPTR module plugs into the communications repeater backplanes (RBP4, RPB8, SRBP). Additional RPTR modules plugged into the backplane will form a star network, allowing multiple segments to connect to the same point. Each repeater module consumes one unit load for the primary RS-485 network and one unit load for the repeated network.

A green power LED indicates that 12 VDC is present to the module. A red LED at each RS-485 network connector flashes when data is transmitted.



RPTR - RS-485 Repeater

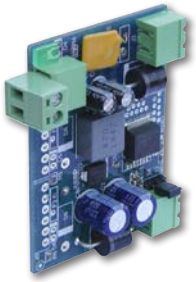
Part Number	Description	List Price
BA/RPTR	RS-485 Repeater	$215
BA/RPTR-KIT	RS-485 Repeater Communication Kit (see page G25)	$335

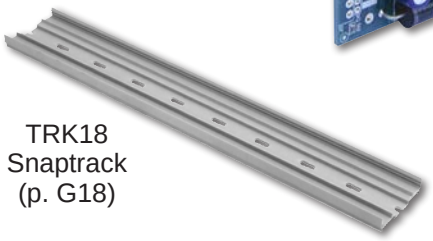
Kit includes one RS-485 Repeater (RPTR) Module, a 350 mA voltage converter (VC350A), a Single Repeater Backplane (SRBP) and a 4" piece of 2.75" snaptrack

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

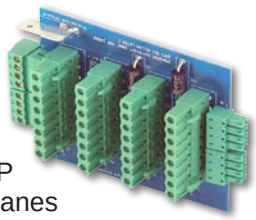
Associated Products

3312VC Voltage Converter (p. G11)





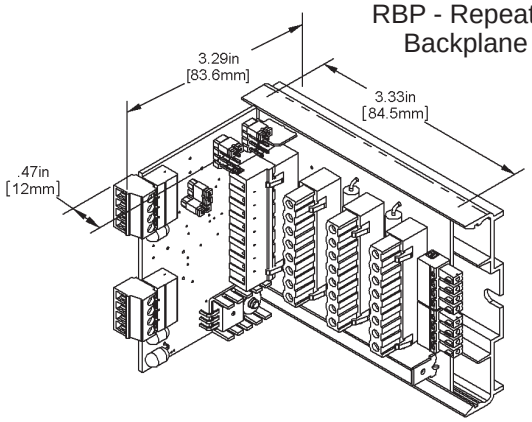
TRK18 Snaptrack (p. G18)



RBP or SRBP Repeater Backplanes (p. G30-32)

Specifications

RPTR module plugged into a RBP - Repeater Backplane



Power Voltage: 11 to 13 VDC

Power Current: 250 mA max. (3 VA max.)

Communications Rates: 9.6K, 19.2K and 38.4K Baud

Network Load: 1 unit load

Network Length: 4,000 ft (1.2 Km)

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RS-485 Repeater Communication Kit

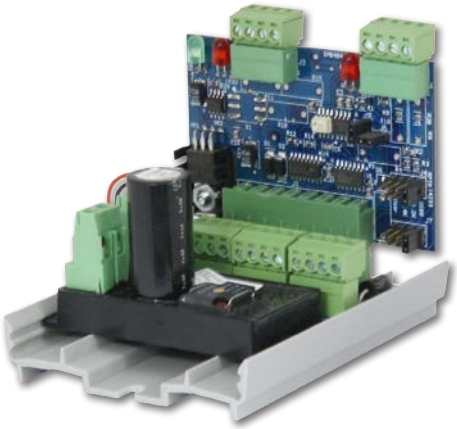
Overview

RS-485 is the most common communications standard for DDC controllers; however, it is limited to 32 unit loads and 4,000 feet. Extending the network beyond 32 unit loads or 4,000 feet requires repeaters.

The RS-485 Repeater Communication Kit provides all the functions for one repeater and remote RS-485 network, plus it comes in a self-contained, easy-to-apply and cost effective assembly. The kit also aids in troubleshooting because LEDs indicate when power is applied and communications are present.

The RS-485 Repeater Communication Kit includes:

- One RS-485 Repeater (RPTR) module which connects two RS-485 segments together. Data from one segment repeats to the other segment and vice versa. Each RPTR module allows an additional 32 unit loads and 4,000 feet;
- A 350 mA voltage converter (VC350) to provide the higher current necessary for flawless communications;
- A Single Repeater Back Plane (SRBP) to mount the RPTR module and provide pluggable connectors for power and three RS-485 cables;
- A four inch long piece of 2.75” snaptrack to easily mount the entire assembly.



RS-485 Repeater Communication Kit
(includes one RS-485 Repeater Module, a 350 mA voltage converter, a Single Repeater Backplane and a 4” piece of 2.75” snaptrack)

Part Number	Description	List Price
BA/RPTR-KIT	RS-485 Repeater Communication Kit (see page G25)	$335
	Kit includes one RS-485 Repeater (RPTR) Module, a 350 mA voltage converter (VC350A), a Single Repeater Backplane (SRBP) and a 4” piece of 2.75” snaptrack	

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

Specifications

Input Voltage: 18 to 30 VAC, 15 to 28 VDC

Input Current Max: 760mA (18.25 VA)

Environmental Operation Range:
0 to 50°C (32 to 122°F)
0 to 95%RH Non-Condensing

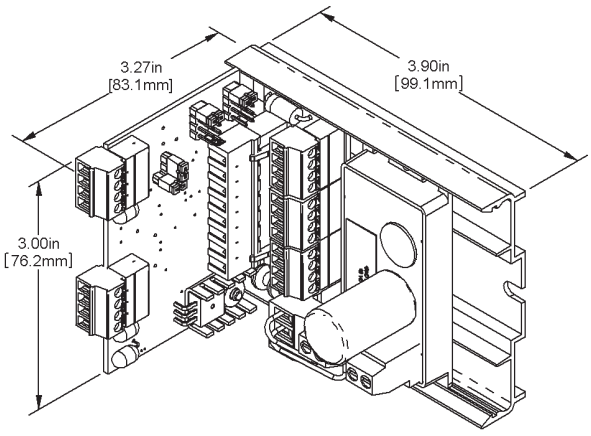
Rectification: Half-Wave Rectified

Grounding: AC and DC Ground are common

Communication Rates:
9.6K, 19.2K and 38.4K Baud

Network Load:
1 unit load on each RS-485 bus

RS-485 Network Length: 4,000ft (1.2Km)



RS-485 Repeater Communication Kit

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FOX - RS-485 Fiber Optic Transceiver

ETA Line

Rev. 11/06/20

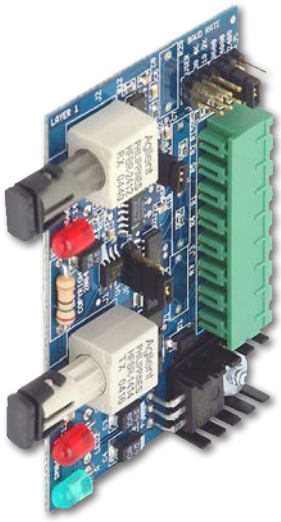
Overview

BAPI recommends fiber optic cable for HVAC communications networks that travel between buildings.

The 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.



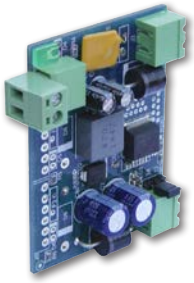
FOX - RS-485 Fiber Optic Transceiver

Part Number	Description	List Price
BA/FOX	RS-485 Fiber Optic Transceiver	$340
BA/FOX-KIT	FOX Communication Kit (see page G25)	$460
	Kit includes one Fiber Optic Transceiver (FOX) Module, a 350 mA voltage converter (VC350A), a Single Repeater Backplane (SRBP) and a 4" piece of 2.75" snaptrack	

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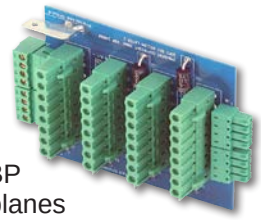
Associated Products

3312VC Voltage Converter (p. G11)





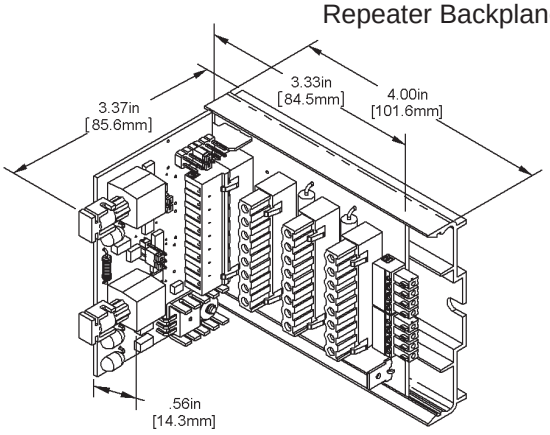
TRK18 Snaptrack (p. G18)



RBP or SRBP Repeater Backplanes (p. G30-32)

Specifications

FOX module plugged into an RBP4 - Repeater Backplane



Power Voltage: 11 to 13 VDC

Power Current: 250 mA max. (3 VA max)

Communications Rates:
2.4K, 4.8K, 9.6K, 19.2K and 38.4K Baud

Network Load: 1 unit load (RS-485 side)

Optical Network Length:
10,500 ft (3,200 meters)
(max. attenuation of 4 dB/Km)

RS-485 Network Length: 4,000 ft (1.2Km)

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FOX Communication Kit

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
	Kit includes one Fiber Optic Transceiver (FOX) Module, a 350 mA voltage converter (VC350A), a Single Repeater Backplane (SRBP) and a 4” piece of 2.75” snaptrack	

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

Specifications

Input Voltage: 18 to 30 VAC, 15 to 28 VDC

Input Current Max: 760mA (18.25 VA)

Environmental operation Range:
0 to 50°C (32 to 122°F)
0 to 95 %RH Non-Condensing

Rectification: Half-Wave Rectified

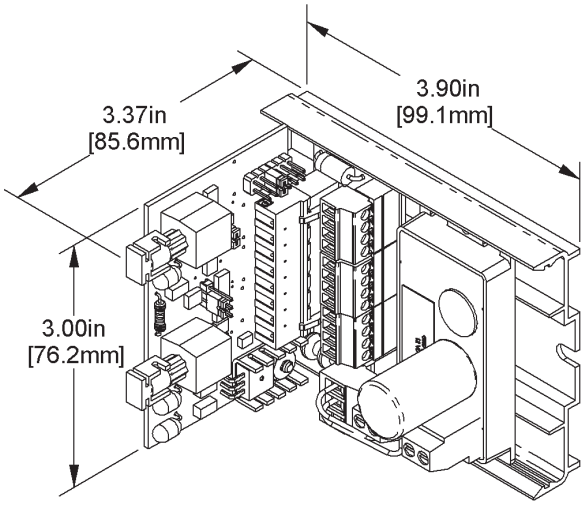
Grounding: AC and DC Ground are common

Communication Rates:
2.4K, 4.8K, 9.6K, 19.2K and 33.4K Baud

Network Load: 1 unit load (RS-485 side)

Optical Network Length:
10,500 Ft (3,200 meters)
(Maximum attenuation of 4db/Km)

RS-485 Network Length: 4,000ft (1.2Km)



FOX Communication Kit

SOX - RS-485 Fiber Optic Transceiver

ETA Line

Rev. 11/06/20

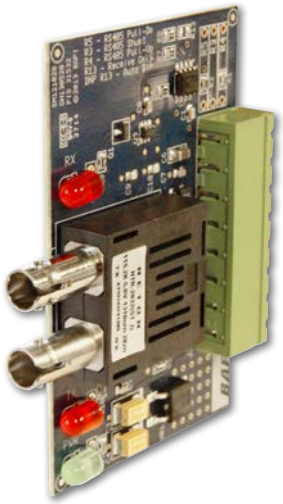
Overview

BAPI recommends fiber optic cable for HVAC communications networks that travel between buildings.

The SOX - Fiber Optic Transceiver converts the RS-485 data from the copper network to a fiber optic signal for transmission to other buildings. A SOX in the other building converts the fiber optic signal back into RS-485 for the remote copper network.

The SOX module accepts single-mode fiber (9/125um) cable on standard ST connectors. The copper RS-485 connection is made on the 8-pole plug along with the power and ground connections. The SOX also plugs into the communications repeater backplanes (RBP4, RBP8, SRBP).

A green power LED indicates that 12 VDC is present to the module. Red LEDs flash when data is transmitted or received.



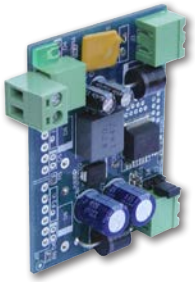
SOX - RS-485 Fiber Optic Transceiver

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

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

Associated Products

3312VC Voltage Converter (p. G11)





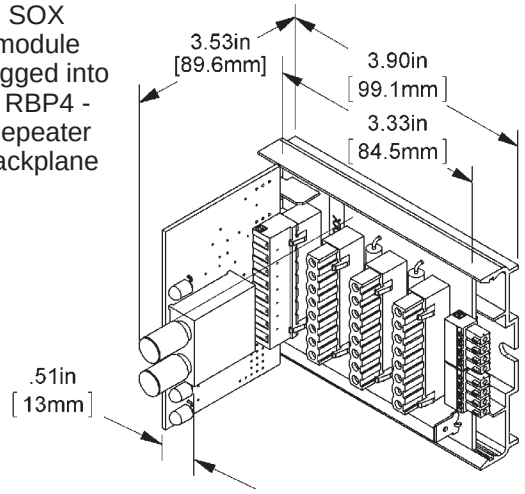
TRK18 Snaptrack (p. G18)



RBP4, RBP8 or SRBP Repeater Backplanes (p. G30-32)

Specifications

SOX module plugged into a RBP4 - Repeater Backplane



Power Voltage: 7 to 18 VDC

Power Current: 50 mA max.

Communications Rates:
Auto-sensing 1200 to 115.2K Auto Baud

Optical Network Length:
65,600 ft (20,000 meters)

RS-485 Network Length: 4,000 ft (1.2Km)

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TB18 - Pluggable Terminal Block

Overview

The TB18 - 18-Pole Pluggable Terminal Block is a small circuit board designed to simplify the task of wire termination. The TB18 is easier to apply and troubleshoot than a bunch of wires under a large wire nut or the typical barrier strip.

The TB18 board fits into the ETA line TRK Snaptrack or any other industry standard 2.75” snaptrack, and provides a straight through connection for nine pairs of wire on individual plugs.

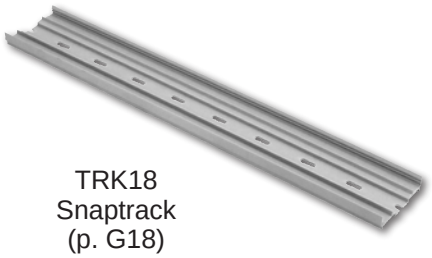


TB18 Pluggable Terminal Block

Part Number	Description	List Price
BA/TB18	Pluggable Terminal Block (NEC Class 2 Circuits, 4 Amp max.)	$55
BA/TB18C	Pluggable Terminal Block (NEC Class 2 Circuits, 4 Amp max.) All odd numbered terminals are common	$90
BA/TB18C2	Pluggable Terminal Block (NEC Class 2 Circuits, 4 Amp max.) All odd numbered terminals are common and all even numbered terminals are common (furnished w/ 18 2-pole plugs)	$125

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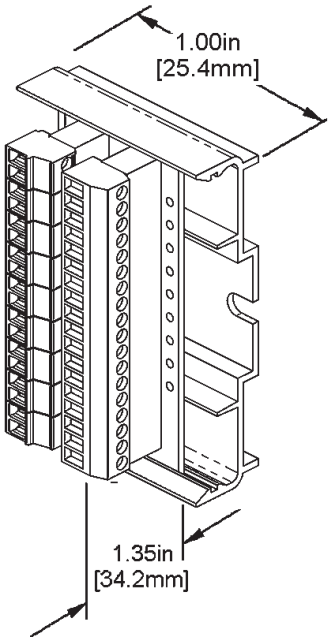
Associated Products



TRK18
Snaptrack
(p. G18)

Specifications

TB18 mounted in 2.75” snaptrack



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

RBP - Comm. Repeater Backplane

ETA Line

Rev. 11/06/20

Overview

The RBP - Communications Repeater Backplane fits into 2.75” snaptrack (TRK18) and provides power, communications and convenient mounting for the RPTR, FOX and SOX modules.

Connectors on the face of the RBP mate with connectors on the RPTR, FOX and SOX. The RPTR, FOX and SOX share data across the RBP backplane which provides transient protection for the communications network and power connection. Several RBP backplanes can be plugged together to share data and power through the backplane end connectors, allowing all the RPTR, FOX and SOX to form a large communications hub.

The RBP backplane receives 12 VDC power from a 3312VC voltage converter.

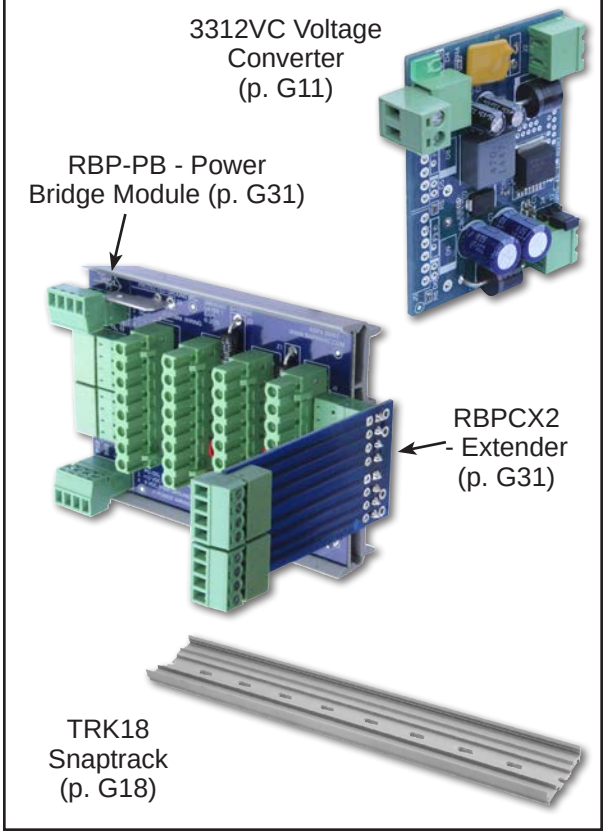


RBP4 - Communications Repeater Backplane

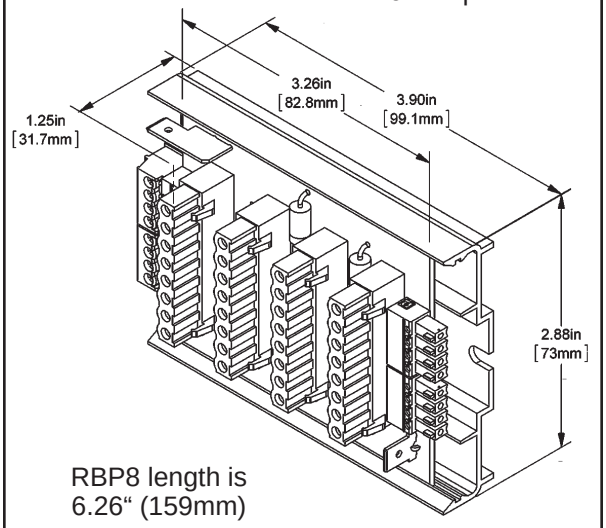
Part Number	Description	List Price
BA/RBP4	Comm. Repeater Backplane, supports 4 communication modules	$90
BA/RBP4-TRK	Comm. Repeater Backplane with 4” piece of 2.75” snaptrack	$98
BA/RBP8	Comm. Repeater Backplane, supports 8 communication modules	$145
BA/RBP8-TRK	Comm. Repeater Backplane with 6” piece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

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Associated Products



Specifications



Power Voltage: 11 to 13 VDC

Power Current: 4 Amp max.

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RBP-PB - Repeater Backplane Power Bridge

Rev. 11/06/20

ETA Line

Overview

The Repeater Backplane Power Bridge (RBP-PB) is used between Communication Repeater Backplanes (RBP4, RBP8) to bridge the power but break the RS-485 communications between the backplanes. The Power Bridge snaps into the same snaptrack as the Backplanes it bridges.

This allows simplified power wiring of a multi-protocol communications hub such as the BACnet and Modbus. The upper communcations plug connects to the bus on the right; the lower plug connects to the bus on the left.



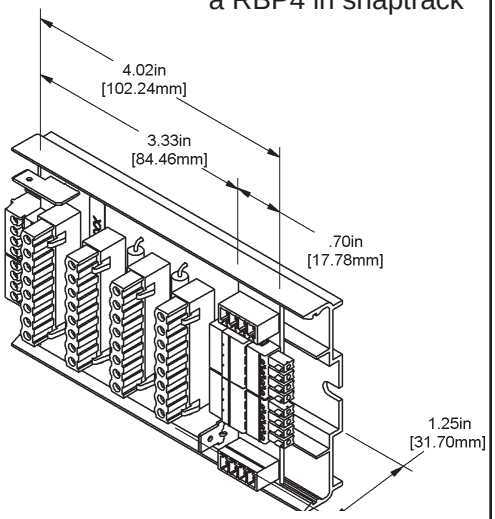
RBP-PB
Power Bridge

Part #	Description	List Price
BA/RBP-PB	Repeater Backplane Power Bridge	$62

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

Specifications

RBP-PB plugged into a RBP4 in snaptrack



Power Voltage: 12 VDC
Power Current: 4 Amp Maximum

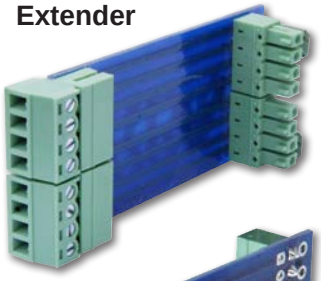
RBPCX, RBPCX2 - Connector Extenders

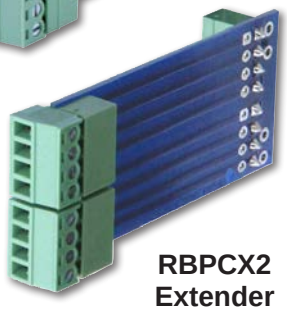
Overview

In some congested panels it is difficult to reach the connectors on the ends of the RBP - Repeater Backplanes.

The RBPCX and RBPCX2 - Repeater Backplane Connector Extenders bring the connectors out from deep in the panel to be level with the front edge of comm. modules that are plugged into the Repeater Backplane where they are easy to access.

RBPCX
Extender

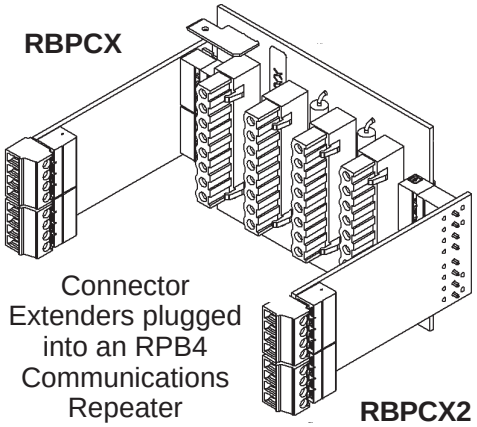




RBPCX2
Extender

Specifications

RBPCX



Connector Extenders plugged into an RPB4 Communications Repeater Backplane

RBPCX2

Power Voltage: 12 VDC
Power Current: 4 Amp Maximum

Part #	Description	List Price
BA/RBPCX	Left Side Repeater Backplane Extender	$55
BA/RBPCX2	Right Side Repeater Backplane Extender	$55

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

SRBP - Single Repeater Backplane

ETA Line

Rev. 11/09/20

Overview

Many times you need to place only one communications repeater at a specific point in a communications network. A four-position Communications Repeater Backplane (RBP4) and it's associated power supplies is clearly overkill. The BAPI SRBP - Single Repeater Back Plane teamed with a BAPI VC350 voltage converter (in Accessories section) and a FOX, SOX or RPTR module provides a convenient single repeater solution.

The SRBP fits into the standard 2.75" snaptrack. Pluggable connectors on the face of the SRBP allow quick and easy connections for power and RS-485 communications buses. One FOX, SOX or RPTR module plugs into a mating connector. Built-in surge suppression protects the network and power connections.

The SRBP receives 12VDC power from either a 3312VC or a BAPI VC350 voltage converter (shown in the Accessories section).

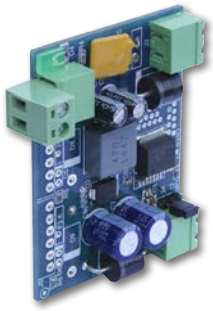


SRBP - Single Repeater Backplane

Part Number	Description	List Price
BA/SRBP	Single Repeater Backplane	$50
BA/SRBP-TRK	SRBP with 2" piece of 2.75" snaptrack	$56

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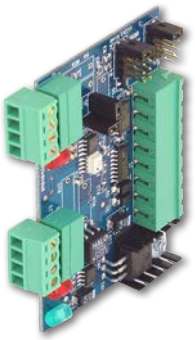
Associated Products



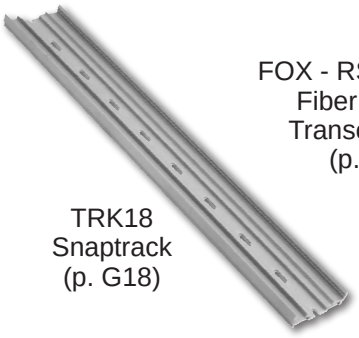
3312VC Voltage Converter (p. G11)



SOX - RS-485 Fiber Optic Transceiver (p. G26)



RPTR - RS-485 Repeater (p. G22)



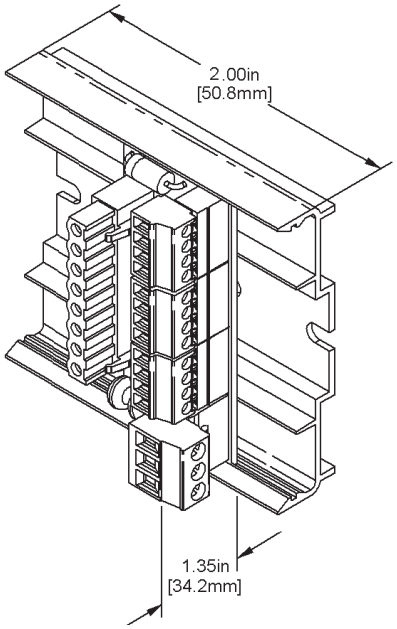
TRK18 Snaptrack (p. G18)

FOX - RS-485 Fiber Optic Transceiver (p. G24)



Specifications

SRBP - Single Repeater Backplane mounted in the optional 2.75" snaptrack



Power Voltage: 12 VDC

Power Current: 250mA max.

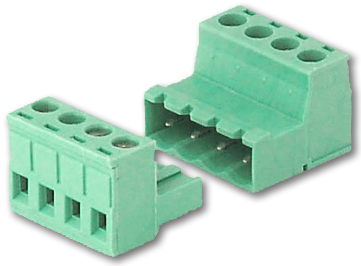
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BELCON - Mating Pair Belimo® Connectors

Overview

Many HVAC peripherals come with a short pigtail wire for connecting to the rest of your system. Running wire from your control panel to the peripheral and connecting them together is your headache. Most of the time it's twist the wires together and apply wire nuts. Later, when you need to disconnect the peripheral for troubleshooting, the inconvenient wire nuts get lost and the loose wires short out ruining the controller.

BAPI's BELCON connector pair allows a four-pole pluggable connection between your peripheral and the control wiring. You can quickly disconnect any peripheral without fear of wires shorting together or to any conductive surface.



BELCON
Mating Pair of
Belimo® Connectors

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

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

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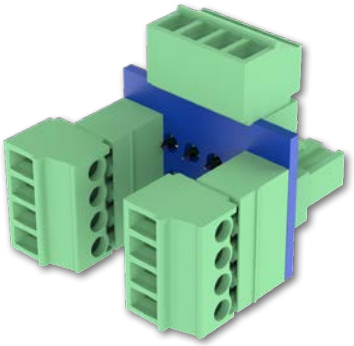
TUCOM - Terminal Unit Comm. Block

Overview

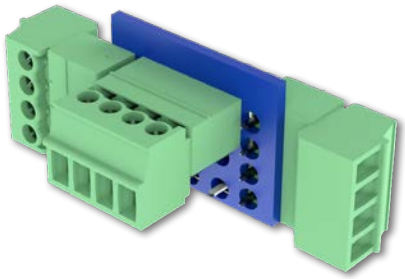
The TUCOM and TUCOM2 are specific purpose connectors that add pluggable screw terminals for any zone or unitary controller having a 3P, 5mm or 5.08mm communication connection. Two options are available to fit in the tightest spaces.

The zone or other unitary controller only provides one communications plug, whereas you often need to terminate three cables on it. The TUCOM plugs into the controller's communications port and expands it into three pluggable screw terminals. Now you have one a separate plug for each segment in the network (comm in, comm out and zone sensor). Troubleshooting a communications problem becomes vastly easier.

The TUCOM and TUCOM2 will accept the COMSRG for surge protection in extreme environments.



TUCOM - Terminal Unit Communications Block



TUCOM2 - Terminal Unit Communications Block

Part Number	Description	List Price
BA/TUCOM	Terminal Unit Communications Block (NEC Class 2 Circuits, 4 Amp max.)	$22
BA/TUCOM2	Terminal Unit Communications Block with alternate plug arrangement (NEC Class 2 Circuits, 4 Amp max.)	$22

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

IRM4 - Interposing Relay Module

ETA Line

Rev. 11/06/20

Overview

The IRM4 - Interposing Relay Module has four independent channels that can be used for three typical interposing relay applications: Voltage in, Contact Out; Voltage In, Voltage Out; and Contact In, Contact out. The relay is energized by an external power source for the “Voltage In” options and from the IRM4 Module for the “Contact In” option. “Voltage Output” is always sourced via the backplane. Jumpers are used to set the mode for each individual channel and the wiring for each channel terminates via 4-pole 3.5mm connectors.

The unit is mounted in a BP2, BP4, BP8 or BP4-V Backplane with power provided by the Backplane. The Backplane is typically powered by a PS17/18/19RF Power Supply.

Each relay on the IRM4 Module has a 24VDC coil switching Form C contacts. A SPDT switch allows each output to be configured as NO/NC. LEDs provide power status of the unit as well as the state of each individual relay.

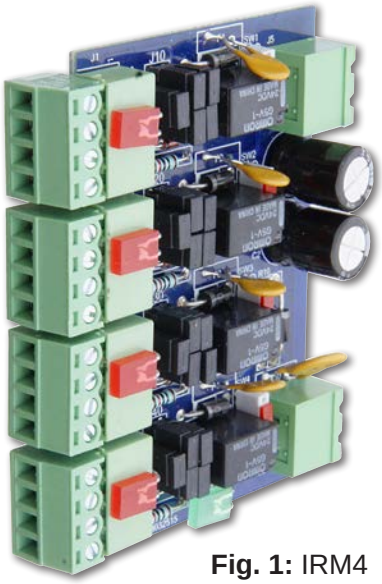
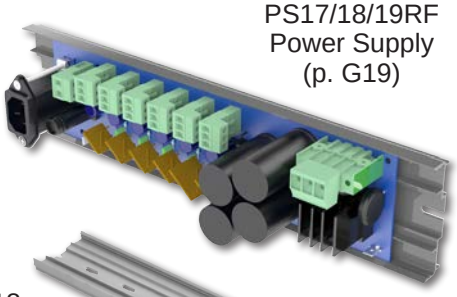


Fig. 1: IRM4 Interposing Relay Module

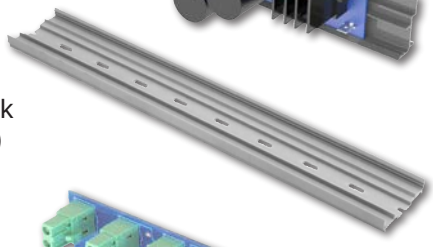
Part Number	Description	List Price
BA/IRM4	Interposing Relay Module	$153

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

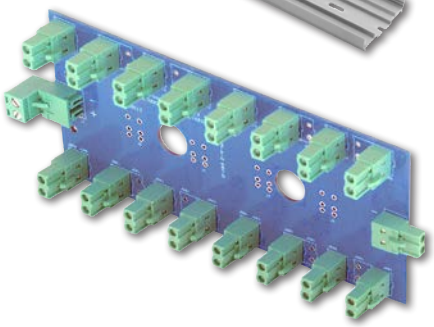
Associated Products



PS17/18/19RF Power Supply (p. G19)

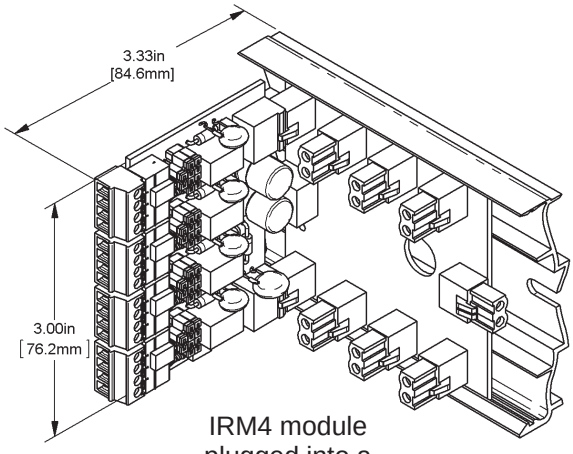


TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 Interface Backplane (p. G16)

Specifications



IRM4 module plugged into a BP4 Backplane

Power Voltage: 26 to 30VDC; 20 to 24VAC

Power Current: 1 Amp Max

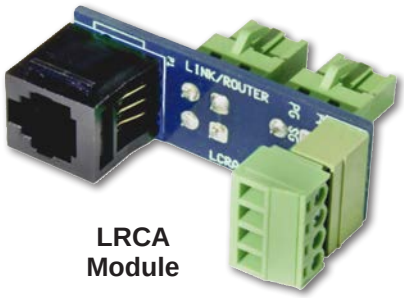
Contact sensing voltage is the same is the power input voltage.

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Overview

LRCA Module

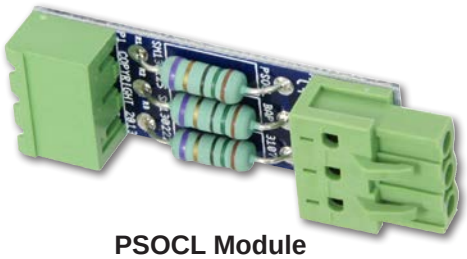
The Link Router Communications Adapter (LRCA) replaces the 5-pole CCN plug on a Carrier® i-Vu Link/Router. It also provides an RJ jack for local laptop access and a BAPI standard comm plug for network termination. This will accept a COMSRG surge suppressor.



LRCA Module

PSOCL Module

The Power Supply Output Current Limiter (PSOCL) is used to buffer the output of the BAPI PS17/18/19RF Power Supplies when used to power the Carrier® i-Vu Link/Router. BAPI recommends that only one Link/Router be powered from each PSCOL. Do not power any other load through the PSCOL.



PSOCL Module

Part Number	Description	List Price
BA/LRCA	Link Router Communications Adapter	$31.75
BA/PSOCL	Power Supply Output Current Limiter	$32.15

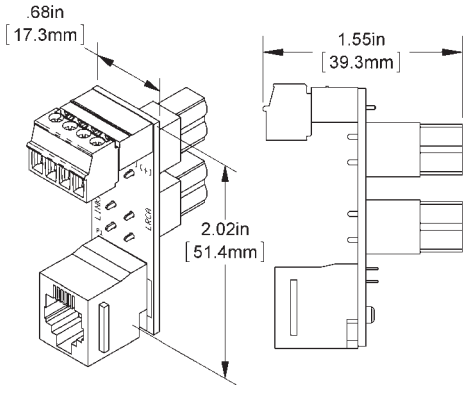
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Specifications

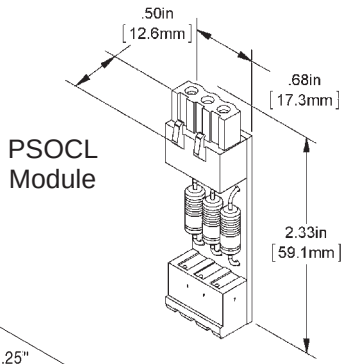
LRCA Specifications

Connectors:
Screw terminals, 16 to 22 AWG

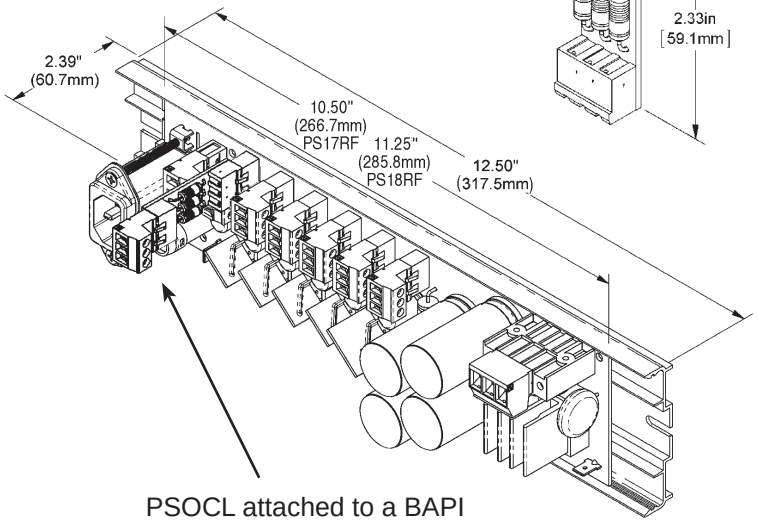
Computer:
RJ11 Communications Jack



LRCA Module



PSOCL Module



PSOCL attached to a BAPI PS17 Power Supply

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UCRB2 - Universal Controller Relay Board

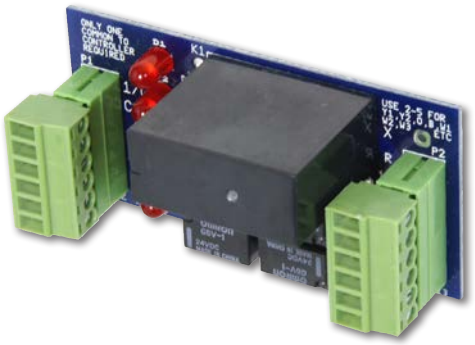
ETA Line

Rev. 11/06/20

Overview

The Universal Controller Relay Board (UCRB2) is used to interconnect a DDC controller's digital outputs to any device that requires a conventional thermostat input. The output plug has terminals for R, G, Y1, Y2, W1, W2.

There are five inputs that control five relays. The first relay's output (1/G) is an interlock for the other four, outputs 2, 3, 4 or 5 will not change state until output 1/G is on. In other words, heating/cooling will be disabled if the fan is turned off. The UCRB2 fits into 2.75" snaptrack and requires 1.4" of track.



UCRB2 Module

Part Number	Description	List Price
BA/UCRB2	Universal Controller Relay Board	$100

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

Specifications

Input Voltage
23 to 26 VDC (1/G, 2, 3, 4 & 5)

Input Current
1/G ..... 22 mA @ 24 VDC
2, 3, 4 & 5 .... 6.25 mA @ 24 VDC

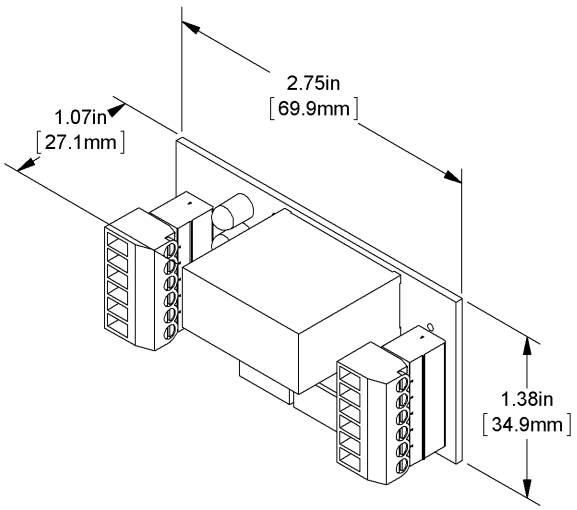
Output Current
1/G ..... 8A @ 24 VAC
2, 3, 4 & 5 .... 0.8A @ 24 VAC

Temperature
Operating ..... -40°F to 158°F (-40°C to 70°C)
Storage ..... -40°F to 158°F (-40°C to 70°C)

Humidity
0 to 95% RH noncondensing

Screw Terminals
16 to 28 AWG (1.29mm to 0.32mm)

PCB
FR4 94V0



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SS-AC Selector Switch/Alarm Counter 8

Overview

The SS-AC Selector Switch/Alarm Counter will monitor up to 8 dry contacts and output one or two voltage or mA signals. The output signals are based on the highest-ranked contact when the module is in Selector Mode, or the number of closed contacts with the module is in Counter Mode.

Outputs are switch selectable as 0 to 10V, 2 to 10V, 0 to 20mA, or 4 to 20mA. Switch counter may be one output based on 8 contact inputs or 2 outputs (upper and lower) based on 4 contact inputs each. Selector mode is always 2 outputs based on 4 input contacts.

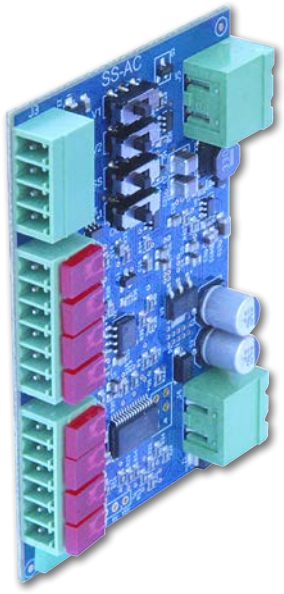


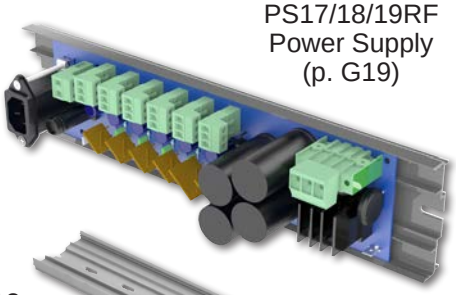
Fig. 1:
SS-AC Selector Switch/Alarm Counter Module

Part Number	Description	List Price
BA/SS-AC	Selector Switch/Alarm Counter	$225

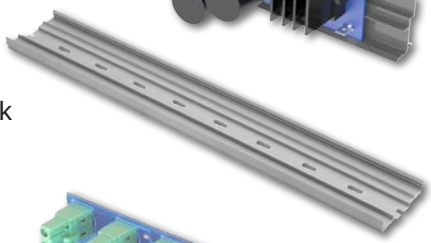
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

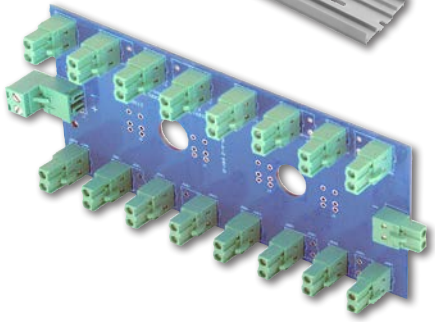
PS17/18/19RF Power Supply (p. G19)



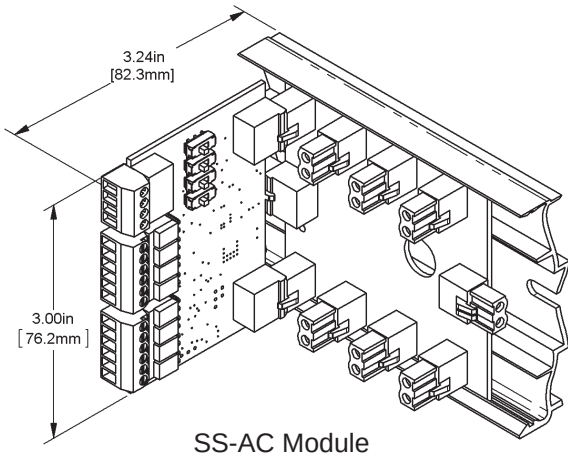
TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 Interface Backplane (p. G16)



Specifications



SS-AC Module plugged into a BP4 Backplane

Input Power Voltage: 0 to 40 VAC or VDC
Power Current: 50mA Maximum
Contact Sensing Voltage: 5VDC

SD2 Status Display, Dual 7-Segment Display

ETA Line

Rev. 12/07/20

Overview

The SD2 is an ETA module that is used to indicate a program error code which may require a manual reset by a local maintenance technician or operator in the field. The module includes a manual reset switch that can be pressed to send a dry contact reset signal to a controller or other device.

The output of the reset switch can be set to Normally Open (NO) or Normally Closed (NC). The value of the signal from the controller is displayed on two 7-segment displays on the front edge of the module, scaled from 0 to 10 up to 0 to 50, depending on a jumper setting. It can accept a current input of either 0 to 20mA or 4 to 20mA or a voltage input of 0 to 10V or 2 to 10V depending on switch settings.

The unit is typically mounted in a BP2, BP4, BP8 or BP4-V Backplane with power provided by a PS17RF, PS18RF, PS19RF, or other DC supply. The green LED indicates that power is available to the module.

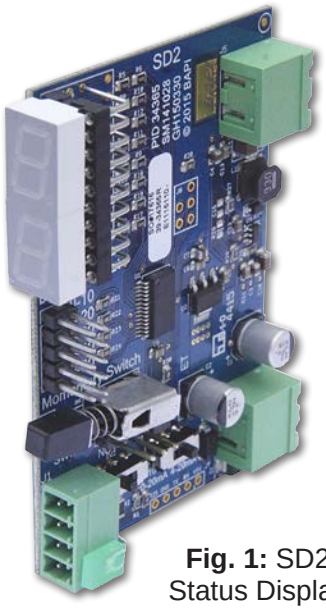


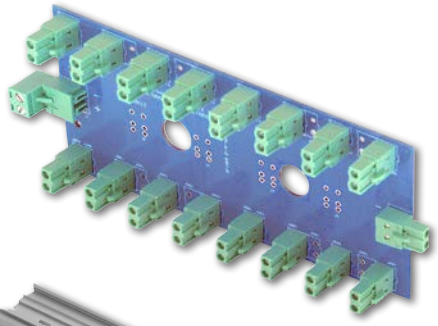
Fig. 1: SD2 Status Display Module

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

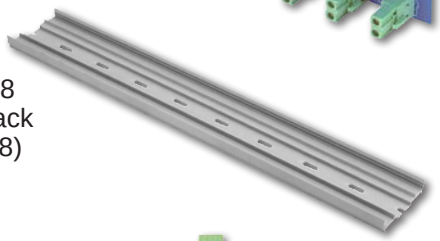
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

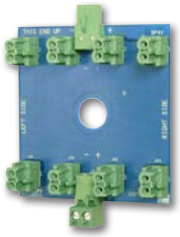
BP2, BP4 or BP8 Interface Backplane (p. G16)



TRK18 Snaptrack (p. G18)

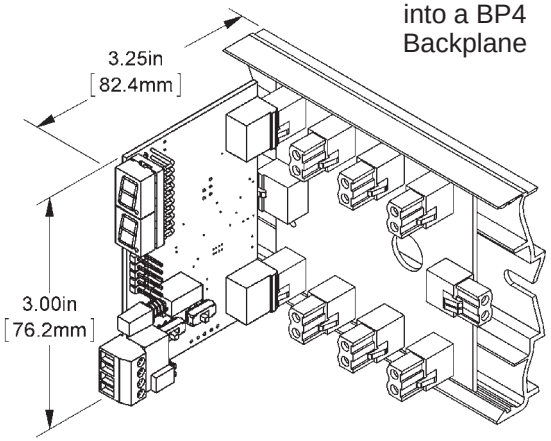


BP4-V Vertical Backplane (p. G17)



Specifications

SD2 plugged into a BP4 Backplane



Output Display: 5 Ranges up to 0 to 50

Input Signals:
0 to 20 mA, 4 to 20 mA, 0 to 10 V, 2 to 10 V

Power Voltage: 16 to 35 VDC or 24 VAC

Power Current: 50mA Max

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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.

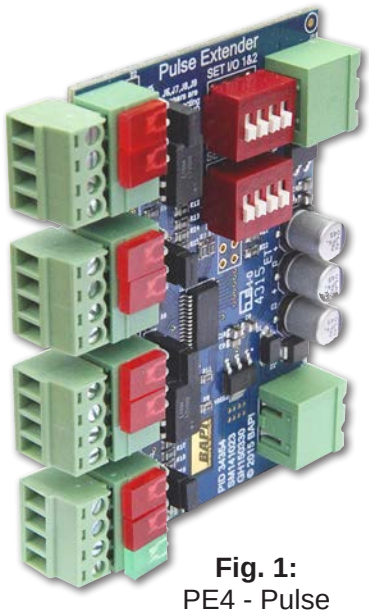


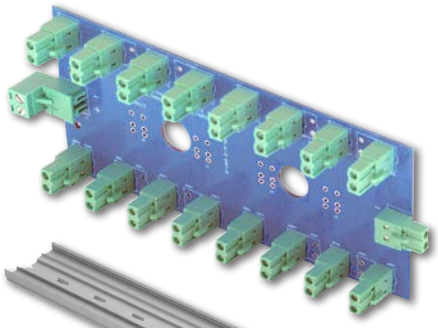
Fig. 1:
PE4 - Pulse Extender

Part Number	Description	List Price
BA/PE4	PE4 - Pulse Extender, 4 Output	$180

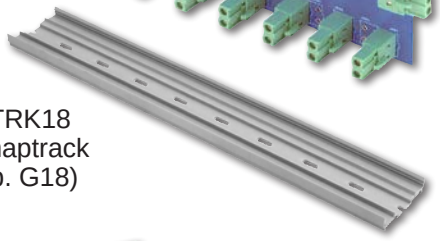
Submittal datasheets without List Prices are available on our website at www.bapihvac.com

Associated Products

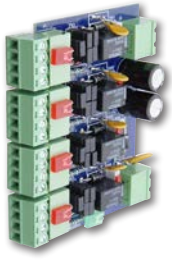
BP2, BP4 or BP8 Interface Backplane (p. G16)



TRK18 Snaptrack (p. G18)



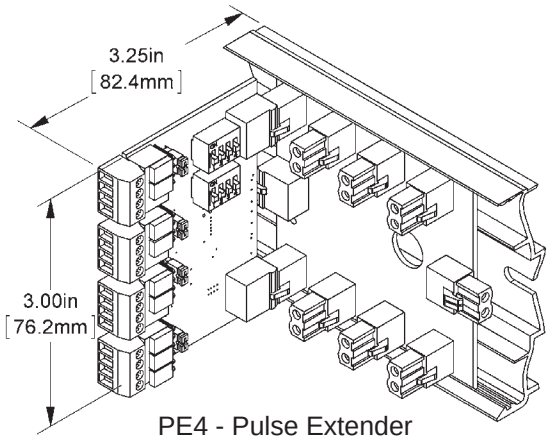
IRM4 - Interposing Relay Module (p. G34)



PMPB5 - Pulse Meter Pulse Buffer (p. G14)



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)

MXV - Dry Switch Monitor, 5 Input

ETA Line

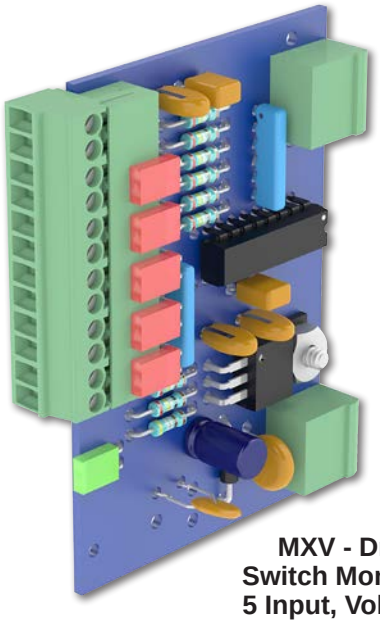
Rev. 11/09/20

Overview

The MXV monitors five dry switch closure devices and provides one 0 to 10V analog output to the controller. Each switch closure adds a precise voltage to the output so a simple subtraction algorithm lets the controller know which switches are closed at any time.

The MXV plugs into either the BP2, BP4, BP4-V or BP8 backplane and receives its power from the backplane. Each switch terminates on an independent plug on the front of the module and an LED associated with each input indicates when the switch is closed.

The MXV can be combined with other BAPI ETA modules, such as the DS8 Discreet Summary Module, to monitor additional switches.

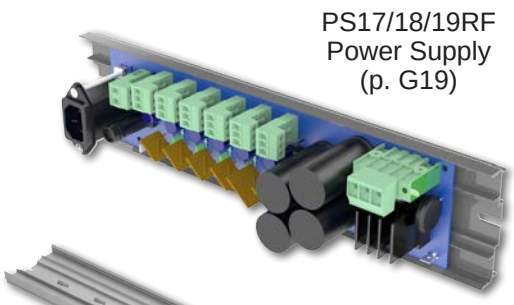


MXV - Dry Switch Monitor, 5 Input, Voltage Output

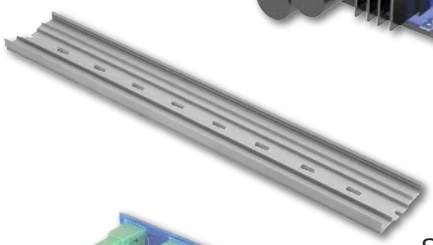
Part Number	Description	List Price
BA/MXV	Dry Switch Monitor, 5 Input, Voltage Output	$303

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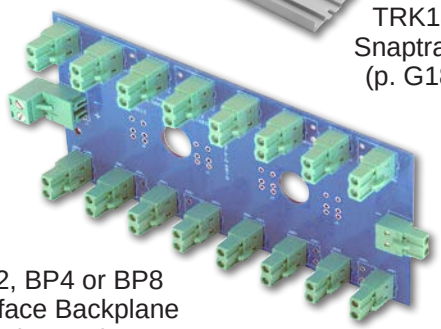
Associated Products



PS17/18/19RF Power Supply (p. G19)

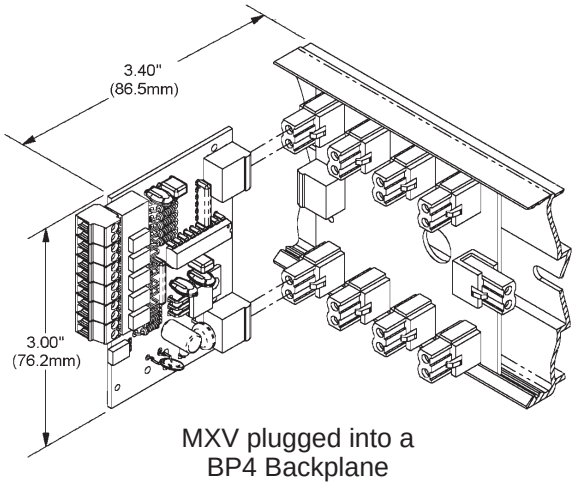


TRK18 Snaptrack (p. G18)



BP2, BP4 or BP8 Interface Backplane (p. G16)

Specifications



MXV plugged into a BP4 Backplane

Power Voltage: 24 to 34 VDC, 20 to 24VAC
Power Current: 35mA max (1.2VA max)
Input Sensing Voltage: 15VDC
Input Sensing Current: 2mA
Output Voltage: 0 to 10 VDC
Output Current: 5mA max sourcing, 10KΩ resistance pull down sinking

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44”x20”x8” Steel Enclosures

Overview

BAPI makes a NEMA 1 and NEMA 4X 14-gauge painted steel enclosure in the 44”x20”x8” size. The NEMA 1 model weighs approximately 90 pounds, while the NEMA 4X watertight model features a door seal with latches and weighs approximately 95 pounds.

Two permanent dividers provide a wireway for input and output conduit connections at the top of the enclosure and a high voltage compartment at the bottom of the enclosure for the power supply.

Flipping the enclosure 180 degrees accommodates left and right hand door openings. No knockouts are provided; drill and punch where you need conduit openings.

Each NEMA 1 and NEMA 4X models come with a Large Backplate (BP185X285), a Small Backplate (BP6X185) and two Bracket Cable Guides (BCG).



44208N1S - NEMA 1 Steel Enclosure 44”x20”x8”

Part Number	Description	List Price
BA/44208N1S.....	NEMA 1X Steel Enclosure, 44”x20”x8”.....	Call for Pricing
BA/44208N4XS	NEMA 4X Steel Enclosure, 44”x20”x8”.....	Call for Pricing

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

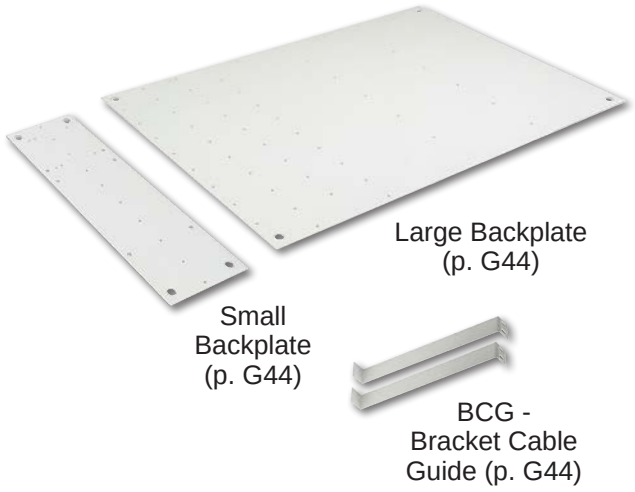
Associated Products

Enclosure Backplates and Bracket Cable Guides

The appropriate size backplate(s) and two Bracket Cable Guides are included with each BAPI enclosure.

The Backplates are made of 12-gauge painted steel and pierced with a hole pattern that accommodates the various components which will be installed in the enclosure including snaptrack, panduit wire duct, bracket cable guides, transformers and DDC controllers.

More information on the Backplates and Bracket Cable Guides is found on page G44.



20x20x8 Steel Enclosure

ETA Line

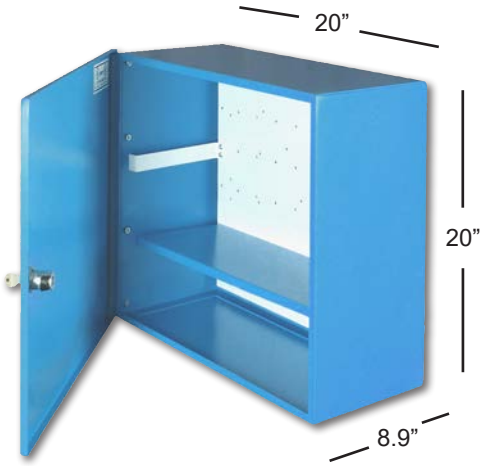
Rev. 06/08/17

Overview

The BAPI 20208N1S is a NEMA 1, 14-gauge painted steel enclosure that weighs approximately 47 pounds. One field-installed divider provides a high voltage compartment in the enclosure to isolate a power supply.

Flipping the enclosure 180 degrees accommodates left and right hand door openings. Mount the enclosure by drilling holes in the back to fit your application. No knockouts are provided; drill and punch where you need conduit openings.

Each BAPI 20208N1S comes with a backplate and two Bracket Cable Guides (BCG).



20208N1S - Painted Steel Enclosure 20x20x8

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

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

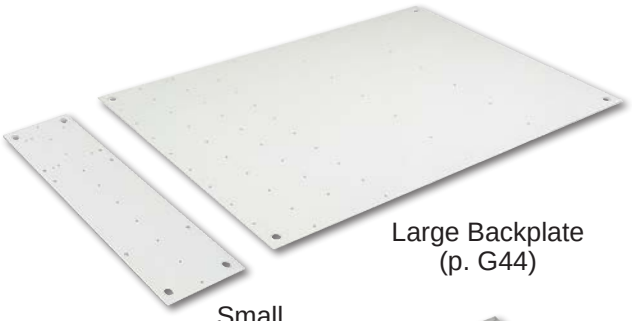
Associated Products

Enclosure Backplates and Bracket Cable Guides

The appropriate size backplate(s) and two Bracket Cable Guides are included with each BAPI enclosure.

The Backplates are made of 12-gauge painted steel and pierced with a hole pattern that accommodates the various components which will be installed in the enclosure including snaptrack, panduit wire duct, bracket cable guides, transformers and DDC controllers.

More information on the Backplates and Bracket Cable Guides is found on page G44.



Large Backplate (p. G44)

Small Backplate (p. G44)

BCG - Bracket Cable Guide (p. G44)

BP185X285 - Large Backplate (for 44x20x8)

Overview

The BP185x285 - Large Backplate is made of 12-gauge painted steel and pierced with a hole pattern that accommodates the BAPI TRK18, PAN16 and the Carrier® Comfort Controller 1600 and 6400.

The Large Backplate mounts to the enclosure with four threaded studs welded to the back of the enclosure.



BP185X285
Large Backplate
(for 44x20x8 Enclosure)

Part Number	Description	List Price
BA/BP185X285	Large Backplate (for 44x20x8 Encl.)	$80

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

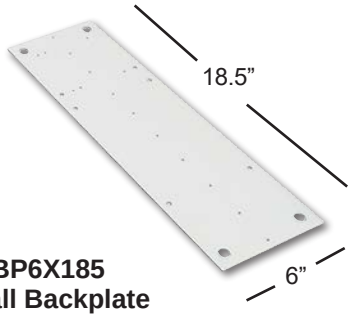
Carrier® is a trademark of Carrier Corporation, Registered in the United States and other countries.

BP6X185 - Small Backplate

Overview

The BP6x185 - Small Backplate is made of 12-gauge painted steel and pierced with a hole pattern that accommodates the BAPI TRK18 and power transformers.

The Small Backplate mounts to the enclosure with four threaded studs welded to the back of the enclosure.



BP6X185
Small Backplate

Part Number	Description	List Price
BA/BP6X185	Small Backplate	$35

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

BCG - Bracket Cable Guide

Overview

The BCG - Bracket Cable Guide screws to the edge of the enclosure backplate. The non-pierced ear is placed against the enclosures lip forming a wire holding loop with the enclosure side. The 14-gauge BCG will hold all but the largest wire. The BCG measures 7” long by .79” high.



BCG -
Bracket Cable Guide

Part Number	Description	List Price
BA/BCG	Bracket Cable Guide (Set of 2)	$16

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

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Temperature, Humidity & Pressure Sensor Overview

There are many facilities and locations today that rely on temperature, pressure and humidity sensors and transmitters to provide a stable, secure environment, such as hospitals, clean rooms and data centers. The sensor or transmitter itself can make or break the system, therefore they must be dependable, accurate and 100% compatible with the building control system. More demanding environments, advances in technology, and changing customer needs keep the industry striving for new and improved sensors and transmitters. As the industry continues to change, BAPI will be at the forefront providing high performance solutions for real world applications.

BAPI offers a wide range of temperature, humidity and pressure sensors and transmitters in all of our room, duct, immersion and outside air units so that they are 100% compatible with the facility's control system.

Temperature Sensors & Transmitters

THERMISTORS - pages H2 - H8

Thermistors are thermally sensitive resistors known for exhibiting a large change in resistance with only a small change in temperature. A thermistor's change in resistance is non-linear. It follows a pre-defined curve which is provided by the thermistor manufacturer.

RTDs - pages H9 - H12

RTDs (Resistance Temperature Detectors) are thermally sensitive resistive elements that exhibit a small change in resistance per degree of temperature change. RTDs are especially recognized for excellent linearity throughout their temperature range with a high degree of accuracy and repeatability.

TEMPERATURE TRANSMITTERS - pages H13 - H14

Temperature transmitters incorporate a 10KΩ thermistor or a 1KΩ platinum RTD and an amplifier. These devices provide an accurate and predictable 4 to 20mA output over a specified temperature range. They are specifically designed for temperature sensing and transmission over long distances without degradation of the 4 to 20mA signal.

Humidity Transmitters & Pressure Sensors

HUMIDITY TRANSMITTERS - pages H15 - H16

Humidity transmitters provide a high accuracy 4 to 20mA, 0 to 5V or 0 to 10V humidity measurement. Accuracies of 2% or 3% Relative Humidity (RH) are available. BAPI room units are protected by a molded housing with an integral filter, while duct and outside air units come with a removeable 80 micron sintered stainless steel filter. The sensor is unaffected by volatile organic compounds (VOC's) or surface contamination.

PRESSURE SENSORS - pages H17

The heart of every BAPI Pressure Sensor is a micro-machined, single-crystal silicon, piezoresistive pressure sensor that changes resistance as a function of applied pressure. Each sensor is fabricated using the same integrated circuit technology used to make millions of cell phones, game machines and personal computers. Since silicon strain gauges have high output levels in relation to the pressure applied, the pressure levels in the BAPI diaphragm can be lower than in other non-silicon strain gauges. This means a more accurate measurement of lower pressure levels.

Thermistor Overview

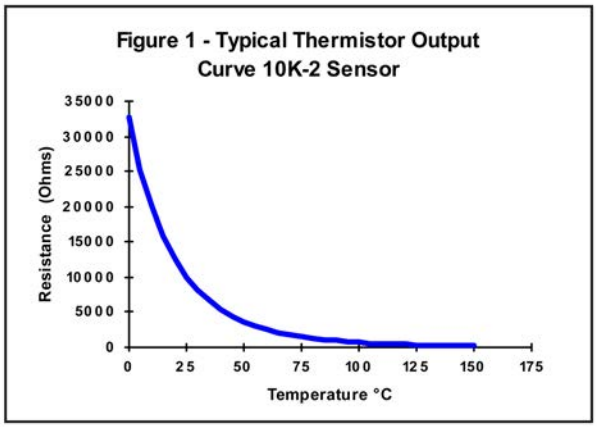
BAPI Sensor Specifications

CE*

Rev. 05/07/21

Thermistor Description

BAPI Thermistors are thermally sensitive resistors known for exhibiting a large change in resistance with only a small change in temperature. It is important to note that a thermistor's change in resistance is non-linear. It follows a pre-defined curve which is provided by the thermistor manufacturer. An example of a thermistor output curve can be seen in **Figure 1**.



Thermistors are manufactured to follow a specific curve with a high degree of accuracy. All BAPI thermistors have a standard accuracy of ± 0.2 °C throughout the commercial temperature range of 0 to 70 °C. BAPI also has available a higher accuracy sensor for meeting tougher specs. The extra precision [XP] line has an initial accuracy of ± 0.1 °C throughout the commercial temperature range of 0 to 70 °C. Please call for availability and pricing on [XP] line thermistors. Both accuracy levels allow BAPI thermistors to be interchanged without the extra expense of offsetting the controller.

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

Thermistor Specifications

DEFINITION OF SPECIFICATION TERMS

Interchangeability Tolerance (Accuracy):
The maximum amount that thermistors following the same curve will differ from each other.

Dissipation Constant:
The power needed to raise the thermistor's body temperature by 1°C. At the heart of all BAPI thermistor products is a sensor with a 2.7 mW/°C dissipation constant to ensure that self-heating stays at an absolute minimum.

Stability (drift):
The amount that the resistance characteristics of a thermistor will change. BAPI uses only the highest quality, "pre-aged" thermistors with very small drift values. Over a ten year span, BAPI thermistors will not change more than 0.1°C.

Operating Range:
The operating range shown is for the thermistor only. The mounting package may further limit the operating range and is described on each mounting type specification. The thermal time constant will also be affected based on the added mass of the stainless steel probe and moisture protection encapsulation.

Thermal Time Constant
Bare sensors are typically measured and specified in still air and are timed at the statistical 63.2% of the step temperature change. A stirred liquid test will typically result in a much faster response time and is also timed at 63.2% of the step temperature change. The time constant is always the same whatever the temperature step change may be.

Thermistor Specifications

Interchangeability Tolerance (Accuracy):
Standard Sensor: ± 0.2 °C (0 to 70 °C)
High Accuracy [XP] Sensor: ± 0.1 °C (0 to 70 °C)

Dissipation Constant: 2.7 mW/°C

Stability (drift): Less than 0.02 °C / year

Thermal Time Constant: 5 seconds (bead in still air)
.5 seconds (stirred liquid)

Sensor Type	Reference Resistance	Operating Range
1.8K	1.8 KΩ @ 25 °C	-55 to 150 °C
2.2K	2.2 KΩ @ 25 °C	-55 to 150 °C
3K**	3 KΩ @ 25 °C	-55 to 150 °C
3.3K	3.3 KΩ @ 25 °C	-55 to 150 °C
10K-2**	10 KΩ @ 25 °C	-55 to 150 °C
10K-3**	10 KΩ @ 25 °C	-55 to 150 °C
10K-3(11K)**	5.2 KΩ @ 25 °C	-55 to 150 °C
10K-4	10 KΩ @ 25 °C	-55 to 150 °C
20K**	20 KΩ @ 25 °C	-55 to 150 °C
47K	47 KΩ @ 25 °C	-55 to 150 °C
50K	50 KΩ @ 25 °C	-80 to 150 °C
100K**	100 KΩ @ 25 °C	-55 to 150 °C

Other Thermistors are available. Contact BAPI for availability and specifications of additional thermistors.

**Available as an [XP] high accuracy sensor. Minimum quantities and long lead times may apply. 10K-2[XP] and 10K-3[XP] thermistors are typically stocked items

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1.8K Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	37793	37	2.78	4493	113	45.00	869
-37	-38.33	35455	39	3.89	4279	115	46.11	836
-35	-37.22	33277	41	5.00	4077	117	47.22	805
-33	-36.11	31248	43	6.11	3886	119	48.33	775
-31	-35.00	29356	45	7.22	3705	121	49.44	747
-29	-33.89	27591	47	8.33	3534	123	50.56	720
-27	-32.78	25945	49	9.44	3371	125	51.67	693
-25	-31.67	24408	51	10.56	3216	127	52.78	668
-23	-30.56	22972	53	11.67	3070	129	53.89	644
-21	-29.44	21619	55	12.78	2932	131	55.00	622
-19	-28.33	20365	57	13.89	2801	133	56.11	600
-17	-27.22	19193	59	15.00	2676	135	57.22	578
-15	-26.11	18096	61	16.11	2558	137	58.33	558
-13	-25.00	17069	63	17.22	2445	139	59.44	539
-11	-23.89	16107	65	18.33	2339	141	60.56	520
-9	-22.78	15205	67	19.44	2237	143	61.67	502
-7	-21.67	14360	69	20.56	2140	145	62.78	485
-5	-20.56	13568	71	21.67	2048	147	63.89	469
-3	-19.44	12818	73	22.78	1961	149	65.00	453
-1	-18.33	12120	75	23.89	1878	151	66.11	437
1	-17.22	11466	77	25.00	1799	153	67.22	423
3	-16.11	10850	79	26.11	1724	155	68.33	409
5	-15.00	10272	81	27.22	1653	157	69.44	395
7	-13.89	9728	83	28.33	1585	159	70.56	382
9	-12.78	9217	85	29.44	1520	161	71.67	370
11	-11.67	8736	87	30.56	1457	163	72.78	358
13	-10.56	8283	89	31.67	1398	165	73.89	346
15	-9.44	7853	91	32.78	1342	167	75.00	335
17	-8.33	7451	93	33.89	1289	169	76.11	324
19	-7.22	7073	95	35.00	1237	171	77.22	314
21	-6.11	6716	97	36.11	1189	173	78.33	304
23	-5.00	6379	99	37.22	1142	175	79.44	295
25	-3.89	6062	101	38.33	1097	177	80.56	285
27	-2.78	5762	103	39.44	1055	179	81.67	277
29	-1.67	5479	105	40.56	1014	181	82.78	268
31	-0.56	5212	107	41.67	975	183	83.89	260
33	0.56	4957	109	42.78	938	185	85.00	252
35	1.67	4718	111	43.89	903	187	86.11	244

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

3K Thermistor Output Table

BAPI Sensor Specifications

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3K Thermistor Output Table

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

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10K-2 Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	323839	37	2.78	28365	113	45.00	4367
-37	-38.33	300974	39	3.89	26834	115	46.11	4182
-35	-37.22	279880	41	5.00	25395	117	47.22	4006
-33	-36.11	260410	43	6.11	24042	119	48.33	3838
-31	-35.00	242427	45	7.22	22770	121	49.44	3679
-29	-33.89	225809	47	8.33	21573	123	50.56	3525
-27	-32.78	210443	49	9.44	20446	125	51.67	3380
-25	-31.67	196227	51	10.56	19376	127	52.78	3242
-23	-30.56	183068	53	11.67	18378	129	53.89	3111
-21	-29.44	170775	55	12.78	17437	131	55.00	2985
-19	-28.33	159488	57	13.89	16550	133	56.11	2865
-17	-27.22	149024	59	15.00	15714	135	57.22	2751
-15	-26.11	139316	61	16.11	14925	137	58.33	2642
-13	-25.00	130306	63	17.22	14180	139	59.44	2538
-11	-23.89	121939	65	18.33	13478	141	60.56	2438
-9	-22.78	114165	67	19.44	12814	143	61.67	2343
-7	-21.67	106939	69	20.56	12182	145	62.78	2252
-5	-20.56	100218	71	21.67	11590	147	63.89	2165
-3	-19.44	93909	73	22.78	11030	149	65.00	2082
-1	-18.33	88090	75	23.89	10501	151	66.11	2003
1	-17.22	82670	77	25.00	10000	153	67.22	1927
3	-16.11	77620	79	26.11	9526	155	68.33	1855
5	-15.00	72911	81	27.22	9078	157	69.44	1785
7	-13.89	68518	83	28.33	8653	159	70.56	1718
9	-12.78	64419	85	29.44	8251	161	71.67	1655
11	-11.67	60592	87	30.56	7866	163	72.78	1594
13	-10.56	57017	89	31.67	7505	165	73.89	1536
15	-9.44	53647	91	32.78	7163	167	75.00	1480
17	-8.33	50526	93	33.89	6838	169	76.11	1427
19	-7.22	47606	95	35.00	6530	171	77.22	1375
21	-6.11	44874	97	36.11	6238	173	78.33	1326
23	-5.00	42317	99	37.22	5960	175	79.44	1279
25	-3.89	39921	101	38.33	5697	177	80.56	1234
27	-2.78	37676	103	39.44	5447	179	81.67	1190
29	-1.67	35573	105	40.56	5207	181	82.78	1149
31	-0.56	33599	107	41.67	4981	183	83.89	1109
33	0.56	31732	109	42.78	4766	185	85.00	1070
35	1.67	29996	111	43.89	4561	187	86.11	1034

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

10K-3 Thermistor Output Table

BAPI Sensor Specifications

CE*

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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

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10K-3 (11K) Thermistor Output Table

°F	°C	Ohms
-39	-39.44	10502
-37	-38.33	10470
-35	-37.22	10437
-33	-36.11	10401
-31	-35.00	10364
-29	-33.89	10325
-27	-32.78	10284
-25	-31.67	10241
-23	-30.56	10196
-21	-29.44	10148
-19	-28.33	10099
-17	-27.22	10048
-15	-26.11	9994
-13	-25.00	9938
-11	-23.89	9879
-9	-22.78	9818
-7	-21.67	9755
-5	-20.56	9689
-3	-19.44	9620
-1	-18.33	9549
1	-17.22	9475
3	-16.11	9399
5	-15.00	9320
7	-13.89	9239
9	-12.78	9155
11	-11.67	9068
13	-10.56	8979
15	-9.44	8887
17	-8.33	8793
19	-7.22	8696
21	-6.11	8597
23	-5.00	8496
25	-3.89	8392
27	-2.78	8286
29	-1.67	8178
31	-0.56	8068
33	0.56	7955
35	1.67	7841
37	2.78	7725
39	3.89	7608
41	5.00	7489
43	6.11	7369
45	7.22	7247
47	8.33	7124
49	9.44	7001
51	10.56	6875
53	11.67	6749
55	12.78	6623
57	13.89	6497
59	15.00	6370
61	16.11	6244
63	17.22	6117
65	18.33	5990
67	19.44	5863
69	20.56	5736
71	21.67	5611
73	22.78	5486
75	23.89	5361
77	25.00	5238
79	26.11	5116
81	27.22	4995
83	28.33	4875
85	29.44	4756
87	30.56	4638
89	31.67	4522
91	32.78	4408
93	33.89	4295
95	35.00	4185
97	36.11	4076
99	37.22	3968
101	38.33	3863
103	39.44	3760
105	40.56	3657
107	41.67	3558
109	42.78	3460
111	43.89	3365
113	45.00	3271
115	46.11	3180
117	47.22	3090
119	48.33	3003
121	49.44	2918
123	50.56	2834
125	51.67	2753
127	52.78	2673
129	53.89	2596
131	55.00	2521
133	56.11	2448
135	57.22	2377
137	58.33	2307
139	59.44	2240
141	60.56	2173
143	61.67	2110
145	62.78	2048
147	63.89	1987
149	65.00	1929
151	66.11	1872
153	67.22	1817
155	68.33	1763
157	69.44	1711
159	70.56	1660
161	71.67	1611
163	72.78	1563
165	73.89	1517
167	75.00	1472
169	76.11	1429
171	77.22	1387
173	78.33	1346
175	79.44	1307
177	80.56	1268
179	81.67	1231
181	82.78	1195
183	83.89	1160
185	85.00	1126
187	86.11	1094

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

20K Thermistor Output Table

BAPI Sensor Specifications

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20K Thermistor Output Table

°F	°C	Ohms
-39	-39.44	776470
-37	-38.33	719538
-35	-37.22	667144
-33	-36.11	618900
-31	-35.00	574453
-29	-33.89	533481
-27	-32.78	495691
-25	-31.67	460818
-23	-30.56	428619
-21	-29.44	398615
-19	-28.33	371140
-17	-27.22	345732
-15	-26.11	322223
-13	-25.00	300459
-11	-23.89	280301
-9	-22.78	261622
-7	-21.67	244304
-5	-20.56	228239
-3	-19.44	213201
-1	-18.33	199368
1	-17.22	186518
3	-16.11	174575
5	-15.00	163471
7	-13.89	153140
9	-12.78	143526
11	-11.67	134575
13	-10.56	126236
15	-9.44	118397
17	-8.33	111156
19	-7.22	104402
21	-6.11	98099
23	-5.00	92214
25	-3.89	86719
27	-2.78	81583
29	-1.67	76783
31	-0.56	72294
33	0.56	68057
35	1.67	64129
37	2.78	60451
39	3.89	57005
41	5.00	53777
43	6.11	50750
45	7.22	47912
47	8.33	45249
49	9.44	42750
51	10.56	40383
53	11.67	38180
55	12.78	36111
57	13.89	34165
59	15.00	32336
61	16.11	30615
63	17.22	28996
65	18.33	27472
67	19.44	26037
69	20.56	24674
71	21.67	23400
73	22.78	22200
75	23.89	21068
77	25.00	20001
79	26.11	18994
81	27.22	18043
83	28.33	17145
85	29.44	16297
87	30.56	15488
89	31.67	14731
91	32.78	14016
93	33.89	13339
95	35.00	12699
97	36.11	12092
99	37.22	11519
101	38.33	10975
103	39.44	10461
105	40.56	9969
107	41.67	9507
109	42.78	9069
111	43.89	8654
113	45.00	8260
115	46.11	7886
117	47.22	7531
119	48.33	7194
121	49.44	6874
123	50.56	6567
125	51.67	6278
127	52.78	6004
129	53.89	5742
131	55.00	5494
133	56.11	5258
135	57.22	5033
137	58.33	4819
139	59.44	4616
141	60.56	4420
143	61.67	4235
145	62.78	4059
147	63.89	3892
149	65.00	3732
151	66.11	3579
153	67.22	3434
155	68.33	3295
157	69.44	3163
159	70.56	3035
161	71.67	2914
163	72.78	2799
165	73.89	2689
167	75.00	2584
169	76.11	2484
171	77.22	2388
173	78.33	2296
175	79.44	2208
177	80.56	2123
179	81.67	2043
181	82.78	1966
183	83.89	1892
185	85.00	1822
187	86.11	1754

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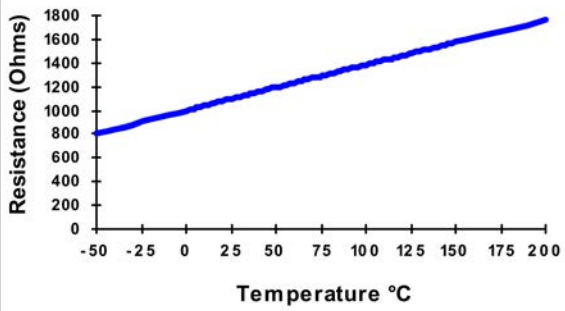
RTD Description

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.

Figure 2 - Typical RTD Output Curve
1000 Ohm Sensor



Standard & Extreme Temperature Ranges for the 1 KΩ Platinum RTD

Range	°C	°F
Standard	-60 to 150	-76 to 302
Low Temp **[1]**	-200 to 0	-328 to 32
High Temp **[2]**	25 to 260	77 to 500
Very High Temp **[3]**	25 to 600	77 to 1,112

When ordering a sensor with an “extreme” temperature range, include the number in brackets **[ ]** after the sensor type. Ex: **BA/1K[2]** is a 1KΩ RTD with an operating range of 25 to 260°C.

RTD Specifications

Definition of Specification Terms

Tolerance of Resistance (Accuracy)

The maximum amount any RTD will differ from the standard resistance curve.

Stability (drift)

The amount that the resistance characteristics of a RTD will change over time under certain conditions.

Operating Range

The operating range shown is for the RTD sensor only. The mounting package may further limit the operating range and is described on each mounting type specification.

RTD Specifications

Tolerance of Resistance (Accuracy):
Single Point Standard: 0.12% at 0 °C
Single Point Class A: 0.06% at 0 °C
Averaging Standard: 0.2% at 0 °C

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

Stability (drift):
0.14 °C with 6,000 continuous hours at 400 °C

Sensitivity:
1KΩ: 3.85Ω/°C (2.14Ω/°F)

Self Heating (1K RTD only):
0.4°C/mW at 0°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

BAPI Sensor Specifications

Rev. 10/16/12

1K (375) Platinum RTD Output Table

°F	°C	Ohms
-40	-40.00	846.64
-38	-38.89	850.92
-36	-37.78	855.20
-34	-36.67	859.48
-32	-35.56	863.76
-30	-34.44	868.07
-28	-33.33	872.34
-26	-32.22	876.62
-24	-31.11	880.89
-22	-30.00	885.16
-20	-28.89	889.43
-18	-27.78	893.69
-16	-26.67	897.96
-14	-25.56	902.22
-12	-24.44	906.52
-10	-23.33	910.79
-8	-22.22	915.04
-6	-21.11	919.30
-4	-20.00	923.56
-2	-18.89	927.81
0	-17.78	932.07
2	-16.67	936.32
4	-15.56	940.57
6	-14.44	944.86
8	-13.33	949.11
10	-12.22	953.35
12	-11.11	957.60
14	-10.00	961.84
16	-8.89	966.08
18	-7.78	970.32
20	-6.67	974.56
22	-5.56	978.80
24	-4.44	983.07
26	-3.33	987.31
28	-2.22	991.54
30	-1.11	995.77
32	0.00	1,000.00
34	1.11	1,004.23
36	2.22	1,008.46
38	3.33	1,012.68
40	4.44	1,016.90
42	5.56	1,021.16
44	6.67	1,025.39
46	7.78	1,029.61
48	8.89	1,033.82
50	10.00	1,038.04
52	11.11	1,042.25
54	12.22	1,046.47
56	13.33	1,050.68
58	14.44	1,054.89
60	15.56	1,059.14
62	16.67	1,063.35
64	17.78	1,067.55
66	18.89	1,071.76
68	20.00	1,075.96
70	21.11	1,080.16
72	22.22	1,084.36
74	23.33	1,088.56
76	24.44	1,092.76
78	25.56	1,096.99
80	26.67	1,101.18
82	27.78	1,105.38
84	28.89	1,109.57
86	30.00	1,113.76
88	31.11	1,117.95
90	32.22	1,122.13
92	33.33	1,126.32
94	34.44	1,130.50
96	35.56	1,134.72
98	36.67	1,138.90
100	37.78	1,143.08
102	38.89	1,147.26
104	40.00	1,151.44
106	41.11	1,155.61
108	42.22	1,159.79
110	43.33	1,163.96
112	44.44	1,168.13
114	45.56	1,172.33
116	46.67	1,176.50
118	47.78	1,180.67
120	48.89	1,184.83
122	50.00	1,189.00
124	51.11	1,193.16
126	52.22	1,197.32
128	53.33	1,201.48
130	54.44	1,205.63
132	55.56	1,209.83
134	56.67	1,213.98
136	57.78	1,218.13
138	58.89	1,222.28
140	60.00	1,226.43
142	61.11	1,230.58
144	62.22	1,234.73
146	63.33	1,238.87
148	64.44	1,243.02
150	65.56	1,247.20
152	66.67	1,251.34
154	67.78	1,255.48
156	68.89	1,259.61
158	70.00	1,263.75
160	71.11	1,267.89
162	72.22	1,272.02
164	73.33	1,276.15
166	74.44	1,280.28
168	75.56	1,284.45
170	76.67	1,288.57
172	77.78	1,292.70
174	78.89	1,296.82
176	80.00	1,300.95
178	81.11	1,305.07
180	82.22	1,309.19
182	83.33	1,313.31
184	84.44	1,317.42
186	85.56	1,321.58

1K (Ni) Nickel RTD Output Table

°F	°C	Ohms
-40	-40.00	699.28
-38	-38.89	704.37
-36	-37.78	709.47
-34	-36.67	714.58
-32	-35.56	719.70
-30	-34.44	724.84
-28	-33.33	729.98
-26	-32.22	735.14
-24	-31.11	740.31
-22	-30.00	745.49
-20	-28.89	750.68
-18	-27.78	755.89
-16	-26.67	761.11
-14	-25.56	766.35
-12	-24.44	771.60
-10	-23.33	776.86
-8	-22.22	782.14
-6	-21.11	787.44
-4	-20.00	792.75
-2	-18.89	798.07
0	-17.78	803.41
2	-16.67	808.76
4	-15.56	814.13
6	-14.44	819.52
8	-13.33	824.92
10	-12.22	830.34
12	-11.11	835.77
14	-10.00	841.22
16	-8.89	846.69
18	-7.78	852.17
20	-6.67	857.66
22	-5.56	863.18
24	-4.44	868.71
26	-3.33	874.25
28	-2.22	879.81
30	-1.11	885.39
32	0.00	890.98
34	1.11	896.59
36	2.22	902.21
38	3.33	907.85
40	4.44	913.51
42	5.56	919.18
44	6.67	924.87
46	7.78	930.57
48	8.89	936.29
50	10.00	942.02
52	11.11	947.77
54	12.22	953.53
56	13.33	959.31
58	14.44	965.11
60	15.56	970.92
62	16.67	976.74
64	17.78	982.59
66	18.89	988.44
68	20.00	994.31
70	21.11	1000.20
72	22.22	1006.10
74	23.33	1012.02
76	24.44	1017.95
78	25.56	1023.89
80	26.67	1029.86
82	27.78	1035.83
84	28.89	1041.82
86	30.00	1047.83
88	31.11	1053.85
90	32.22	1059.89
92	33.33	1065.94
94	34.44	1072.00
96	35.56	1078.08
98	36.67	1084.18
100	37.78	1090.29
102	38.89	1096.42
104	40.00	1102.56
106	41.11	1108.71
108	42.22	1114.89
110	43.33	1121.07
112	44.44	1127.27
114	45.56	1133.49
116	46.67	1139.72
118	47.78	1145.97
120	48.89	1152.24
122	50.00	1158.52
124	51.11	1164.81
126	52.22	1171.12
128	53.33	1177.45
130	54.44	1183.79
132	55.56	1190.15
134	56.67	1196.53
136	57.78	1202.92
138	58.89	1209.33
140	60.00	1215.75
142	61.11	1222.19
144	62.22	1228.65
146	63.33	1235.12
148	64.44	1241.62
150	65.56	1248.13
152	66.67	1254.65
154	67.78	1261.20
156	68.89	1267.76
158	70.00	1274.34
160	71.11	1280.93
162	72.22	1287.55
164	73.33	1294.18
166	74.44	1300.83
168	75.56	1307.50
170	76.67	1314.19
172	77.78	1320.89
174	78.89	1327.62
176	80.00	1334.36
178	81.11	1341.12
180	82.22	1347.90
182	83.33	1354.70
184	84.44	1361.52
186	85.56	1368.36

1KΩ Platinum RTD Output Table

BAPI Sensor Specifications

Rev. 10/16/12

1KΩ Platinum RTD Output Table

°F	°C	Ohms
-40.00	-40.00	842.75
-38.00	-38.89	847.14
-36.00	-37.78	851.53
-34.00	-36.67	855.91
-32.00	-35.56	860.30
-30.00	-34.44	864.72
-28.00	-33.33	869.10
-26.00	-32.22	873.48
-24.00	-31.11	877.86
-22.00	-30.00	882.24
-20.00	-28.89	886.61
-18.00	-27.78	890.99
-16.00	-26.67	895.36
-14.00	-25.56	899.73
-12.00	-24.44	904.14
-10.00	-23.33	908.51
-8.00	-22.22	912.88
-6.00	-21.11	917.24
-4.00	-20.00	921.61
-2.00	-18.89	925.97
0.00	-17.78	930.33
2.00	-16.67	934.69
4.00	-15.56	939.05
6.00	-14.44	943.45
8.00	-13.33	947.80
10.00	-12.22	952.16
12.00	-11.11	956.51
14.00	-10.00	960.86
16.00	-8.89	965.21
18.00	-7.78	969.56
20.00	-6.67	973.91
22.00	-5.56	978.25
24.00	-4.44	982.64
26.00	-3.33	986.98
28.00	-2.22	991.32
30.00	-1.11	995.66
32.00	0.00	1000.00
34.00	1.11	1004.34
36.00	2.22	1008.67
38.00	3.33	1013.01
40.00	4.44	1017.34
42.00	5.56	1021.71
44.00	6.67	1026.04
46.00	7.78	1030.37
48.00	8.89	1034.70
50.00	10.00	1039.02
52.00	11.11	1043.35
54.00	12.22	1047.67
56.00	13.33	1051.99
58.00	14.44	1056.31
60.00	15.56	1060.67
62.00	16.67	1064.99
64.00	17.78	1069.30
66.00	18.89	1073.62
68.00	20.00	1077.93
70.00	21.11	1082.24
72.00	22.22	1086.55
74.00	23.33	1090.86
76.00	24.44	1095.17
78.00	25.56	1099.51
80.00	26.67	1103.81
82.00	27.78	1108.12
84.00	28.89	1112.42
86.00	30.00	1116.72
88.00	31.11	1121.02
90.00	32.22	1125.31
92.00	33.33	1129.61
94.00	34.44	1133.90
96.00	35.56	1138.24
98.00	36.67	1142.53
100.00	37.78	1146.82
102.00	38.89	1151.11
104.00	40.00	1155.39
106.00	41.11	1159.68
108.00	42.22	1163.96
110.00	43.33	1168.25
112.00	44.44	1172.53
114.00	45.56	1176.85
116.00	46.67	1181.12
118.00	47.78	1185.40
120.00	48.89	1189.68
122.00	50.00	1193.95
124.00	51.11	1198.22
126.00	52.22	1202.49
128.00	53.33	1206.76
130.00	54.44	1211.03
132.00	55.56	1215.34
134.00	56.67	1219.60
136.00	57.78	1223.87
138.00	58.89	1228.13
140.00	60.00	1232.39
142.00	61.11	1236.65
144.00	62.22	1240.91
146.00	63.33	1245.17
148.00	64.44	1249.42
150.00	65.56	1253.72
152.00	66.67	1257.97
154.00	67.78	1262.22
156.00	68.89	1266.47
158.00	70.00	1270.72
160.00	71.11	1274.97
162.00	72.22	1279.21
164.00	73.33	1283.46
166.00	74.44	1287.70
168.00	75.56	1291.98
170.00	76.67	1296.22
172.00	77.78	1300.46
174.00	78.89	1304.69
176.00	80.00	1308.93
178.00	81.11	1313.16
180.00	82.22	1317.40
182.00	83.33	1321.63
184.00	84.44	1325.86
186.00	85.56	1330.12

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

Temperature Transmitter Description

BAPI temperature transmitters incorporate a 1KΩ 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.

T1K Transmitter Specifications

Sensor: 1KΩ Platinum RTD

Supply Voltage: 7 to 40 VDC

Output: 4 to 20 mA

Max. Loop Resistance: 850Ω at 24VDC

Span: Min 16.6°C (30°F), Max 555°C (1000°F)

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

Field Adjustments: (Unit is factory calibrated, field adjustment will void calibration warranty)
Zero: +/- 10% • Span: +/- 10%

Accuracy: ±0.065% of Span (8 & 16mA outputs)

Linearity: ±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:
±0.009% of Span 7 to 40VDC

Connections:
Four 22-gauge etched Teflon leads or terminal blocks

Operating Temperature:
Transmitter: -20 to 70°C
Sensor: -65 to 105°C (standard)
-200 to 600°C (available)

Matched errors are
±((Span * Linearity Error) + (Reference Thermometer uncertainty)
Where Linearity Error = Square Root((Transmitter Linearity)^2 + (RTD Linearity)^2) =
Square Root((0.125%)^2 + (0.2%)^2) = 0.234%

Examples:
BA/T1K(-30 to 130F)
Span = 130 - (-30) = 160
Matched error = ±((160*0.234%) + (0.05°F) = ±0.42°F

BA/T1K(45 to 95F)
Span = 95 - 45 = 50
Matched error = ±((50*0.234%) + (0.05°F) = ±0.17°F

These accuracies are for the entire range of the sensor, although the accuracies in the midband of the sensor will be tighter than those near the endpoints of the specified range. Other matching and/or certification options may be available, please contact your BAPI representative for details.

BAPI temperature transmitters come in a ruggedized package for all 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.

Temp. Transmitter Output Table

BAPI Sensor Specifications

Rev. 01/04/22

0-100 ºF Temp. Transmitter Output Table

°F	°C	mA
0	-17.78	4.000
1	-17.22	4.160
2	-16.67	4.320
3	-16.11	4.480
4	-15.56	4.640
5	-15.00	4.800
6	-14.44	4.960
7	-13.89	5.120
8	-13.33	5.280
9	-12.78	5.440
10	-12.22	5.600
11	-11.67	5.760
12	-11.11	5.920
13	-10.56	6.080
14	-10.00	6.240
15	-9.44	6.400
16	-8.89	6.560
17	-8.33	6.720
18	-7.78	6.880
19	-7.22	7.040
20	-6.67	7.200
21	-6.11	7.360
22	-5.56	7.520
23	-5.00	7.680
24	-4.44	7.840
25	-3.89	8.000
26	-3.33	8.160
27	-2.78	8.320
28	-2.22	8.480
29	-1.67	8.640
30	-1.11	8.800
31	-0.56	8.960
32	0.00	9.120
33	0.56	9.280
34	1.11	9.440
35	1.67	9.600
36	2.22	9.760
37	2.78	9.920
38	3.33	10.080
39	3.89	10.240
40	4.44	10.400
41	5.00	10.560
42	5.56	10.720
43	6.11	10.880
44	6.67	11.040
45	7.22	11.200
46	7.78	11.360
47	8.33	11.520
48	8.89	11.680
49	9.44	11.840

°F	°C	mA
50	10.00	12.000
51	10.56	12.160
52	11.11	12.320
53	11.67	12.480
54	12.22	12.640
55	12.78	12.800
56	13.33	12.960
57	13.89	13.120
58	14.44	13.280
59	15.00	13.440
60	15.56	13.600
61	16.11	13.760
62	16.67	13.920
63	17.22	14.080
64	17.78	14.240
65	18.33	14.400
66	18.89	14.560
67	19.44	14.720
68	20.00	14.880
69	20.56	15.040
70	21.11	15.200
71	21.67	15.360
72	22.22	15.520
73	22.78	15.680
74	23.33	15.840
75	23.89	16.000
76	24.44	16.160
77	25.00	16.320
78	25.56	16.480
79	26.11	16.640
80	26.67	16.800
81	27.22	16.960
82	27.78	17.120
83	28.33	17.280
84	28.89	17.440
85	29.44	17.600
86	30.00	17.760
87	30.56	17.920
88	31.11	18.080
89	31.67	18.240
90	32.22	18.400
91	32.78	18.560
92	33.33	18.720
93	33.89	18.880
94	34.44	19.040
95	35.00	19.200
96	35.56	19.360
97	36.11	19.520
98	36.67	19.680
99	37.22	19.840
100	37.78	20.000

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

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

				BAPI Room Sensors													
				Units Without Display			Units With Display								Units With or Without Display		
	Designator	Output Range	Span	Delta Style	"Quantum" without Display	BAPI-Stat 4 without Display	RµP	RµPS	Decora	"Quantum" Pushbutton Setpoint & BAPI-Stat 4M	"Quantum" Slider Setpoint & BAPI-Stat 4S	X-Combo***	T1K Room Trans	"Quantum Prime" and BAPI-Stat 3* Temp or Humidity Units	BAPI-Stat 4* with Humidity or Dew Point	"Quantum Prime" and BAPI-Stat 3* VOC or CO2 Units	BAPI-Com
Volts	00	0 to 5 V	5 Volts	x		x	x	x	x	x	x	Ch 1,2,3		x	x		x
	01	1 to 5 V	4 Volts	x		x	x		x	x				x			x
	02	3.7 to 0.85 V	2.85 Volts	x		x	x		x	x				x			x
	03	5 to 0 V	5 Volts	x		x	x	x	x	x	x	Ch 3		x		x	x
	04	4.2 to 1.2 V	3 Volts	x		x	x		x	x				x			x
	07	2.773 to 0.43 V	2.343 Volts	x		x	x		x	x				x			x
	10	0 to 10 V	10 Volts	x		x			x	x	x			x	x	x	x
	11	2 to 10 V	8 Volts	x		x			x	x				x			x
Current	16	4 to 20 mA	16 mA									Ch 1,2	x	x			
<1KΩ Span	20	889 to 111 Ω	778 Ω				x		x	x				x			x[2]
	21	792 to 208 Ω	584 Ω				x		x	x				x			x[2]
	22	695 to 305 Ω	390 Ω				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[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 to1286	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]
1KΩ Span	40	0 to 1 KΩ	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	41	500 to 1500 Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	42	2 to 3 KΩ	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	43	249 to 1249 Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	44	10 to 11 KΩ	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	45	12.5K-11.5K Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	46	1K to 0 Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
	47	182 to 1182 Ω	1 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	x
2KΩ Span	48	0 to 2 KΩ	2 KΩ							x		x					x
	55	0 to 1.5 KΩ	2 KΩ														x
5KΩ Span	50	0 to 5 KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
	51	7.87K to 2.87KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
	52	10.0K to 15.0KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
	53	2.5K to 7.5KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
	54	1K to 6KΩ	5 KΩ	x	x	x	x	x	x	x	x	x	x	x	x		x
10KΩ Span	60	0 to 10 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	61	15K to 5 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	62	9577 to 1422 Ω	8.16K				x		x	x		x		x			x
	63	1 to 11 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	64	200 to 10.2 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	65	10.4K to 400Ω	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	66	10 KΩ to 0	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	67	5K to 15 KΩ	10 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	68	9629 to 806 Ω	10 KΩ[1]				x	x	x	x		x	x	x	x		x
	[XL]**	10.6K to 600Ω	9.62 KΩ	x		x	x	x	x	x	x	x					x
20KΩ Span	80	0 to 20 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	81	4.75 to 24.75 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	82	6.19 to 26.19 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	83	7.87 to 27.87 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	84	10 to 30 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	85	24.75 to 4.75 KΩ	20 KΩ	x	x	x	x	x	x	x	x	x	x	x	x	x	x
100KΩ	90	0 to 100 KΩ	100 KΩ	x	x	x	x	x	x	x	x		x	x	x	x	
50KΩ	91	25K to 75 KΩ	50 KΩ				x		x	x				x			

*Setpoint range must be within displayed temperature range

**XL10 Option

***The X-Combo unit uses a unique set of designators for the ranges, not the designators listed on this page. See the X-Combo ordering grid for the designators.

[1]Only available with pushbutton style setpoint sensors.

[2]The resolution is 40Ω per step with 250 steps.

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

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

Setpoint Display Ranges for BAPI Room Sensors

Designator	Setpoint Display Range**				BAPI Room Sensors With Display							
	°F	°C	Humidity	Generic	RµP	RµPS	"Quantum", Decora & BAPI-Stat 4	X-Combo*	T1K Room Trans	"Quantum Prime" or BAPI-Stat 3* Temp & Humidity	"Quantum Prime" or BAPI-Stat 3* VOC & CO2	BAPI-Com**
A				-3 to +3	x	x	x	x	x	x	x	x
B				-5 to +5	x	x	x	x	x	x	x	x
C	50 to 90°F	10 to 32°C			x	x	x	x	x	x	x	x
D	55 to 85°F	13 to 30°C			x	x	x	x	x	x	x	x
E	60 to 80°F	15 to 27°C			x	x	x	x	x	x	x	x
F	65 to 80°F	18 to 27°C			x	x	x	x	x	x	x	x
G	45 to 96°F	7 to 35°C			x		x	x	x	x	x	x
H	-20 to 120°F	-29 to 49°C							x	x	x	x
J	68 to 78°F	20 to 26°C			x	x	x	x	x	x	x	x
K	65 to 95°F	18 to 35°C			x		x	x	x	x	x	x
L	70 to 74°F	21 to 23°C			x	x	x	x	x	x	x	x
M			0 to 100%RH					x		x		x
N			35 to 70%RH					x		x		x
P				-2 to +2	x	x	x	x	x	x	x	x
X	40 to 80°F	4 to 27°C			x	x	x	x	x	x	x	x
AA	60 to 85°F	15 to 30°C			x		x	x	x	x	x	x
BB	54 to 90°F	12 to 32°C			x		x	x	x	x	x	x
CC	41 to 85°F	5 to 30°C			x		x	x	x	x	x	x
DD	32 to 100°F	0 to 38°C			x		x	x	x	x	x	x
EE	67 to 77°F	19 to 25°C			x		x	x	x	x	x	x
FF				-10 to +10	x		x	x	x	x	x	x
GG	0 to 100°F	-18 to 38°C							x		x	x
JJ	40 to 90°F	4 to 32°C			x		x	x	x	x	x	x
KK	32 to 185°F	0 to 85°C							x	x	x	x
MM	-40 to 140°F	-40 to 60°C							x	x	x	x
NN	69 to 75°F	21 to 24°C			x		x	x	x	x	x	x
PP				-4 to +4	x		x	x	x	x	x	x
QQ	55 to 95°F	13 to 35°C			x		x	x	x	x	x	x
RR	32 to 212°F	0 to 100°C							x			
SS	25 to 50°F	-4 to 10°C							x	x	x	x
TT	50 to 86°F	10 to 30°C			x	x	x	x	x	x	x	x
	Maximum Temperaure Display Range ->				32 to 110°F 0 to 43°C	32 to 110°F 0 to 43°C	32 to 99°F 0 to 60°C	32 to 158°F 0 to 70°C	-147 to 999°F	-40 to 185°F -40 to 85°C	-40 to 140°F -40 to 60°C	-40 to 140°F -40 to 60°C

An "x" in the box indicates that the output range is available for that room unit.
*Setpoint range must be within displayed temperature range
**Range describes the Output Module Range as well as the Display Range if used with the BAPI-Com.

Resistance Output Values for Units with Fan Speed Control

Designator	Fan Speed Control Selection & Resistance Output Value						Room Sensor Models
	OFF	AUTO	LO	MED	HI	ON	
XLD	5K	10K	15K	20K	25K		RuPM, BAPIStat 2 & 4
X01	4.89K	2.33K	10.63K	13.24K	16.33K		RuPM, BAPIStat 2 & 4
X02	2K	4K	6K	8K	10K		RuPM, BAPIStat 2 & 4
X03	5K	10K				15K	RuPM, BAPIStat 2 & 4
X05	4.89K	2.33K				15.8K	RuPM, BAPIStat 2 & 4
X06	6.5K		8.5K	10.5K	12K		BAPIStat 2 & 4 Only
X07	5K					15K	BAPIStat 2 & 4 Only
X08	12.686K	11.86K				13.86K	RuPM, BAPIStat 2 & 4

Resistance Output Values for BAPI-Stat 2 & 4 Units with Heat/Cool and Off/Auto Control

Designator	Mode Control Selection & Resistance Output Value						Room Sensor Models
		Heat	Cool	Auto	Off		
H02		5K	10K	15K	20K		BAPIStat 2 & 4 Only

Resistance Output Values for Units with Heat/Off/Cool Mode and On/Auto Fan Control

Designator	Mode Control Selection & Resistance Output Value						Room Sensor Models
	Heat/Auto	Off/Auto	Cool/Auto	Heat/On	Off/On	Cool/On	
HCF	5K	10K	15K	20K	25K	30K	RuPM, BAPIStat 2 & 4
H01	0K	2K	4K	6K	8K	10K	RuPM, BAPIStat 2 & 4

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

BAPI-Stat “Quantum” Optional Selections

BAPI Application Notes

Rev. 01/08/21

Below is a complete list of the “Optional Selections” available for the BAPI-Stat “Quantum” and “Quantum Prime” room units.

BAPI-Stat "Quantum" and "Quantum Prime" Available Options								
Designator	**Option Description**	**"Quantum" No Display Unit - Temp Only**	**"Quantum" Display Unit - Temp Only, Pushbutton Setpoint**	**"Quantum" Display Unit - Temp Only, Slider Setpoint**	**"Quantum" Display or No Display Unit - Temp & Humidity, or Humidity Only**	**"Quantum Prime" Unit - Temp Only, Humidity Only or Temp & Humidity**	**"Quantum" Unit - CO2 or VOC Only**	**"Quantum Prime" Unit - Temp and/or Humidity with CO2 or VOC**
A	Differential Ground	X	X	X	X	X		X
B	Comm Jack C35	X	X	X	X	X		X
C	Comm Jack C11		X	X	X*	X		
D	Comm Jack C22		X	X	X*	X		
E	5 Volt Power		X	X				
F	Test & Balance	X	X	X	X	X		X
G	XLD Fan Speed		X					
H	X01 Fan Speed		X					
I	X02 Fan Speed		X					
J	X06 Fan Speed		X					
K	HCF Fan Speed		X					
L	H01 Fan Speed		X					
M	LED Override Indicator	X						

*Comm Jacks C11 and C22 are not available for No Display Units

ADDITIONAL DESCRIPTIONS

Comm Jack C35: 3.5mm Phono Style Jack with Leads Attached

Comm Jack C11: RJ11 (4 pin) Style Jack with Leads Attached

Comm Jack C22: RJ22 (4 pin) Style Jack with Leads Attached

5 Volt Power: Unit can operate on 5 VDC power (0 to 5V or resistive outputs only)

Test & Balance: Three-Position Switch - “Low” & “High” values vary, “Normal” is live sensor value

XLD Fan Speed: Pushbutton Fan Speed Adjustment [Off (5K), Auto (10K), Lo (15K), Med (20K), Hi (25K)] with LCD Indication

X01 Fan Speed: Pushbutton Fan Speed Adjustment [Off (4.89K), Auto (2.33K), Lo (10.63K), Med (13.24K), Hi (16.33K)] with LCD Indication

X02 Fan Speed: Pushbutton Fan Speed Adjustment [Off (2K), Auto (4K), Lo (6K), Med (8K), Hi (10K)] with LCD Indication

X06 Fan Speed: Pushbutton Fan Speed Adjustment [Off (6.5K), Lo (8.5K), Med (10.5K), Hi (12K)] with LCD Indication

HCF Fan Speed: Pushbutton Mode [Heat/Auto (5K), Off/Auto (10K), Cool/Auto (15K), Heat/On (20K), Off/On (25K), Cool/On (30K)] with LCD Indication

H01 Fan Speed: Pushbutton Mode [Heat/Auto (0Ω), Off/Auto (2K), Cool/Auto (4K), Heat/On (6K), Off/On (8K), Cool/On (10K)] with LCD Indication

BAPI offers six enclosure styles for our non-room sensors. These include the BAPI-Box Crossover, Junction Box, BAPI-Box, BAPI-Box 2, BAPI-Box 4 and the Weatherproof Enclosure (“Bell Box”).

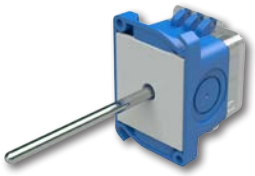
INDOOR ENCLOSURES

BAPI-Box Crossover

The BAPI-Box Crossover is made of UV-resistant polycarbonate and nylon and carries an IP10 rating. It is IP44 with a pierceable knockout plug installed in the open port.

IP10: Protected against solid foreign objects greater than 50mm diameter

IP44: Protected against solid foreign objects greater than 1mm diameter and protected against splashing water.



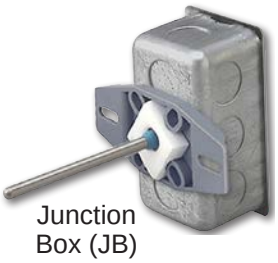
BAPI-Box Crossover

Junction Box

The Junction Box is made of galvanized steel with an IP20 and NEMA 1 rating.

IP20: Protected against solid objects greater than 12.5mm diameter.

NEMA 1: Constructed for indoor use to provide a degree of protection against falling dirt.



Junction Box (JB)

BAPI-Box 4 Enclosure

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

IP10: Protected against solid foreign objects greater than 50mm diameter

IP44: Protected against solid foreign objects greater than 1mm diameter and protected against splashing water.



BAPI-Box 4 (BB4)

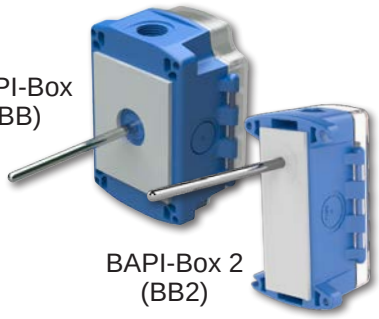
INDOOR/OUTDOOR ENCLOSURES

BAPI-Box and BAPI-Box 2 Enclosures

The BAPI-Box and BAPI-Box 2 are made of polycarbonate and carry an IP66 and NEMA 4 rating.

IP66: Dust tight & protected against powerful water jets from any direction.

NEMA 4: Constructed for indoor or outdoor use to provide a degree protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water; and that will be undamaged by the external formation of ice.



BAPI-Box (BB)

BAPI-Box 2 (BB2)

Weatherproof Enclosure (“Bell Box”)

The Weatherproof Enclosure is made of cast aluminum and carries an IP24 and NEMA 3R rating.

IP24: Protected against solid foreign objects greater than 12.5mm diameter, and protected against splashing water.

NEMA 3R: Constructed for indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow; and that will be undamaged by the external formation of ice.

Note: The Weatherproof Enclosure is not watertight. If this enclosure will be subjected to driving rain, sprinkler systems or jets of water, then it may need a 3/16” weep hole drilled in the lowest horizontal face of the box.



Weatherproof (WP)

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

IEC Enclosure Ratings

BAPI Application Notes

Rev. 10/16/12

The IEC (International Electrotechnical Commission) is an international committee that develops and publishes its recommendations for standardizing international wiring devices and products. Ingress Protection (IP) is the grades of protection against external solids contacting the conductors of a wiring device and against the penetration of liquids into the wiring device.

The IP designation consists of the letters IP followed by two numerals. The first characteristic numeral indicates the degree of protection provided by the enclosure with respect to persons and solid foreign objects entering the enclosure. The second characteristic numeral indicates the degree of protection provided by the enclosure with respect to the harmful ingress of water. The degrees of protection are listed below:

1st IP#	Degree of protection against access to hazardous parts and ingress of solid objects
0	No protection
1	Protected against solid foreign objects greater than 50mm diameter
2	Protected against solid foreign objects greater than 12.5mm diameter
3	Protected against solid foreign objects greater than 2.5mm diameter
4	Protected against solid foreign objects greater than 1.0mm diameter
5	Dust Protected
6	Dust tight

2nd IP#	Degree of protection against the ingress of water
0	No protection
1	Protected against vertically falling water drops
2	Protected against vertically falling water drops when enclosure titled up 15°
3	Protected against spraying water
4	Protected against splashing water
5	Protected against water jets
6	Protected against powerful jets from any direction
7	Protected against the effects of total water immersion up to 1M
8	Protected against the effects of total water immersion beyond 1M

Therefore an IP66 rated enclosure is “dust tight and protected against powerful jets of water from any direction.”

If you have any questions about BAPI enclosures please call your BAPI representative.

Reference: IEC Publication 60529 - Classification of Degrees of Protection Provided by Enclosures

The **N**ational **E**lectrical **M**anufacturers **A**ssociation **(NEMA)** Standards Publication No. 250 defines 13 different enclosure "types" for non-hazardous locations. These NEMA types define the applications and the environmental conditions that enclosures are designed to protect against when properly installed.

Type 1: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment, and to provide a degree of protection against falling dirt.

Type 2: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment, to provide a degree of protection against falling dirt, and to provide a degree of protection against dripping and light splashing of liquids.

Type 3: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and that will be undamaged by the external formation of ice on the enclosure.

Type 3R: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow; and that will be undamaged by the external formation of ice on the enclosure.

Type 3S: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and in which the external mechanism(s) remain operable when ice laden.

Type 4: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.

Type 4X: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water; and corrosion; and that will be undamaged by the external formation of ice on the enclosure.

Type 5: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against settling airborne dust, lint and fiber flyings; and to provide a degree of protection against dripping and light splashing of liquids.

Type 6: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose directed water and the entry of water during occasional temporary submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.

Type 6P: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose directed water and the entry of water during prolonged submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.

Type 12: Enclosures constructed (without knockouts) for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint and fiber flyings; and against dripping and light splashing of liquids.

Type 12K: Enclosures constructed (with knockouts) for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint, fiber flyings; and against dripping and light splashing of liquids.

Type 13: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint and fiber flyings; and against spraying splashing, and seepage of water, oil and noncorrosive coolants. If you have any questions about BAPI enclosures or NEMA ratings, please call your BAPI representative.

Reference: NEMA Standard 250-1997, "Enclosures for Electrical Equipment (1000 Volts Maximum)"

UL94 Flammability Rating

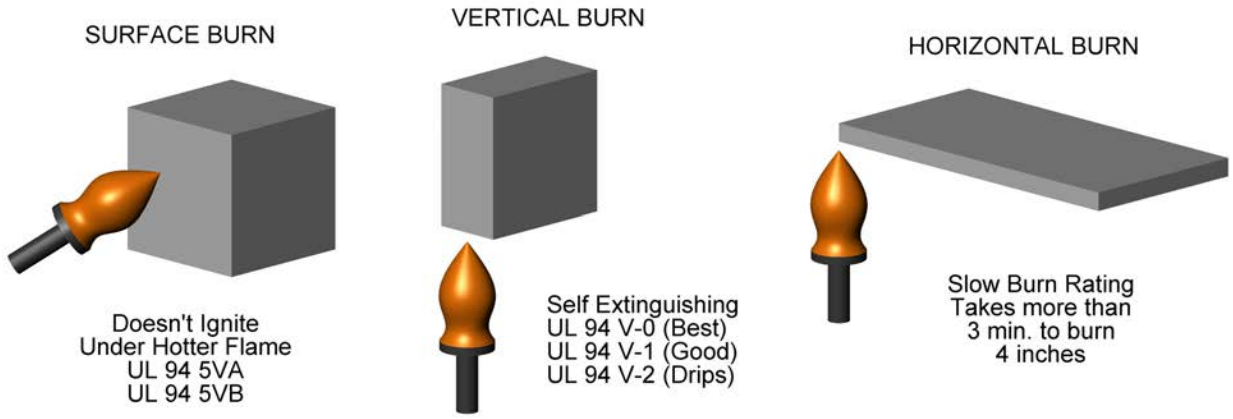
BAPI Application Notes

Rev. 10/16/12

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 94HB test describes the Horizontal Burn method. Methods 94V and 94VTM are used for Vertical Burn, a more stringent test than 94HB. The 94-5V test is for enclosures for products that are not easily moved or are attached to a conduit system. The 94HBF and HF are used for nonstructural foam materials.



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.
H-B Horizontal Burn	Slow horizontal burning on a 3mm thick specimen with a burning rate is less than 3"/min or stops burning before the 5" mark. H-B rated materials are considered "self-extinguishing". This is the lowest (least flame retardant) UL94 rating.

If you have any questions about BAPI enclosures please call your BAPI representative.

Why Use DC Power Instead of AC Power on a Sensor?

Most modern HVAC control systems have 24 VAC available, and most of BAPI's products can run on 24 VAC, yet BAPI recommends powering them with DC voltage. Why?

Twisted wire cables have high wire-to-wire capacitance. Capacitors totally block DC voltage, but allow a little bit of AC voltages to couple from wire to wire. A portion of the 50 Hz or 60 Hz, 24 VAC running through one pair of wires in a multi-wire cable will combine with the normal signals on all the other wires in the cable. The Laws of physics mandate that this will happen no matter whose sensor is used.

The AC noise coupled into a sensor signal in a multi-wire cable may cause the controller to think that the measured parameter is changing back and forth rapidly. The controller may drive the mechanical equipment into an oscillation that overdrives the actuators and causes the mechanical equipment to wear out prematurely. For example, in a room at 72°F, BAPI's tests show that for a nominal 25-foot sensor wire length, the 60Hz noise in a multi-wire cable can change a 10K thermistor's temperature measurement from 69.4°F to 74.7°F. The controller thinks that the zone temperature is fluctuating by 5°F and drives the output actuators more than necessary.

There are two ways to avoid this situation. The first way is to convert the AC power to DC power with a voltage converter (such as BAPI's VC350A or VC350A-EZ) at the controller end of the cable. If you power the sensor with DC voltage, then there is no AC noise within the multi-wire cable to influence the temperature reading. But remember, the DC converter has to be mounted at the controller end of the wire, not at the sensor end, otherwise there will still be AC power within the multi-wire cable.

If you choose to power the sensor with 24 VAC, then the second way to avoid the AC noise is to run the AC power in a separate, shielded cable with the shield connected to a good building ground at the controller end. In this situation, the capacitance from the 24 VAC wires to the sensor's signal wires is so low it is effectively ZERO. No AC voltage combines with your sensor's signal, but you must run two separate cables.

Either of these methods will prevent the AC noise from influencing the sensor's signal, but BAPI recommends converting the AC power to DC power because we feel it is easier and more economical to install a low cost voltage converter rather than making two cable runs.

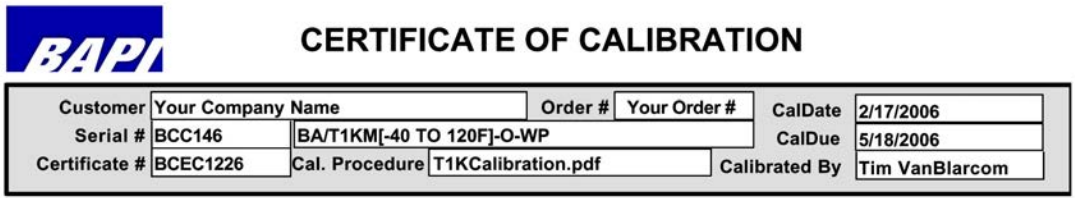
If you need further information about this topic, request the application note Understanding Noise from AC Power from your BAPI representative or download it from our website at bapihvac.com.

BAPI Certification Form Overview

BAPI Application Notes

Rev. 10/16/12

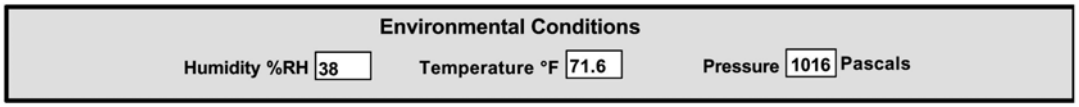
Recently BAPI changed its certification form to match the requirements of the National Institute of Standards and Technology data reporting standard.



CERTIFICATE OF CALIBRATION

Customer	Your Company Name	Order #	Your Order #	CalDate	2/17/2006
Serial #	BCC146	BA/T1KM[-40 TO 120F]-O-WP		CalDue	5/18/2006
Certificate #	BCEC1226	Cal. Procedure	T1KCalibration.pdf	Calibrated By	Tim VanBlarcom

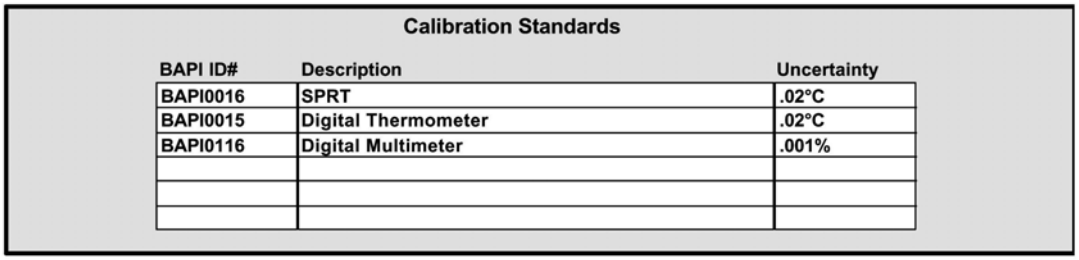
The first section (shown above) indicates the product being certified, the customer and the order number.



Environmental Conditions

Humidity %RH 38 Temperature °F 71.6 Pressure 1016 Pascals

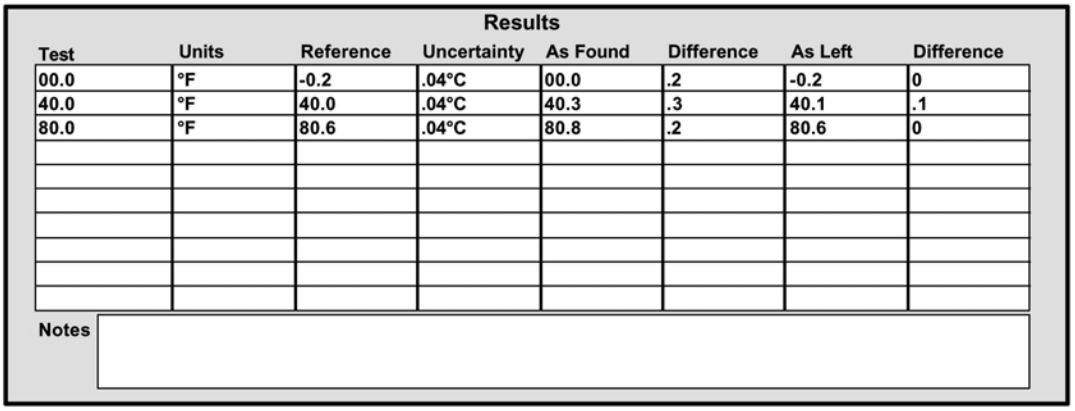
The second section (shown above) records the relative humidity, temperature and atmospheric pressure of the test laboratory.



Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0016	SPRT	.02°C
BAPI0015	Digital Thermometer	.02°C
BAPI0116	Digital Multimeter	.001%

The third section (shown above) is an inventory of the equipment used to perform the certification. Uncertainty is the tolerance of the instrument's measurement as determined during its last calibration at a NIST certified calibration center.



Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
00.0	°F	-0.2	.04°C	00.0	.2	-0.2	0
40.0	°F	40.0	.04°C	40.3	.3	40.1	.1
80.0	°F	80.6	.04°C	80.8	.2	80.6	0

Notes

The fourth section (shown above) details the certification results. The column labeled Test defines the test procedure or procedures that were used to certify the product. The column labeled Units defines the units of measure used for the test. The three test conditions for this certification were 0°F, 40°F and 80°F.

The column labeled Reference is the actual test condition as measured by the Calibration Standards referenced in the inventory described above. For the test shown, the test condition at 0°F was actually -0.2°F, we achieved 40°F and 80°F was actually 80.6°F. The next column labeled Uncertainty is the tolerance of Calibration standards used to measure the test condition temperature.

The column labeled As Found is the transmitters output before any corrections are made to the transmitter. If the output is a 4 to 20mA current loop, the output is changed to the units of the parameter being measured, in this case Fahrenheit temperature. The next column labeled Difference is the difference or offset of the As Found to the Reference.

The column labeled As Left is the transmitters output after any corrections are made to the transmitter. This is how the equipment is sent to you. If the output is a 4 to 20mA current loop, the output is changed to the units of the parameter being measured, in this case Fahrenheit temperature. The next column labeled Difference is the difference or offset of the As Left to the Reference. This last Difference column is the offset you should use in your controller to correct the temperature.

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

The last section (shown above) notifies you that all instruments used to certify the equipment are properly calibrated and traceable to NIST.

Additional information on specific Temperature, Pressure and Humidity Certification documents is found on the following three pages.

If you have any questions about the certification documents, please contact your BAPI representative.

Temperature Transmitter Certification

BAPI Application Notes

Shown below is an NIST Traceable Certificate of Calibration for a recent T1K order.

Each transmitter is calibrated for its range using precision resistors. A Class A RTD is given a unique serial number and attached to the transmitter. The RTD is subjected to each temperature certification point and the temperature transmitter's output is recorded at each point. BAPI normally tests at 25%, 50% and 75% of temperature span. BAPI will test at any temperature that you specify. BAPI can generate and certify temperatures between -45°C and 150°C.

If you require the temperature transmitter to be certified at more than the three standard temperatures, please contact your BAPI representative for pricing. If you have any questions about the certification document, please contact your BAPI representative.

CERTIFICATE OF CALIBRATION

Customer	Your Company Name	Order #	Your Order #	CalDate	2/17/2006
Serial #	BCC146	BA/T1KM[-40 TO 120F]-O-WP		CalDue	5/18/2006
Certificate #	BCEC1226	Cal. Procedure	T1KCalibration.pdf	Calibrated By	Tim VanBlarcom

Environmental Conditions

Humidity %RH 38 Temperature °F 71.6 Pressure 1016 Pascals

Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0016	SPRT	.02°C
BAPI0015	Digital Thermometer	.02°C
BAPI0116	Digital Multimeter	.001%

Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
00.0	°F	-0.2	.04°C	00.0	.2	-0.2	0
40.0	°F	40.0	.04°C	40.3	.3	40.1	.1
80.0	°F	80.6	.04°C	80.8	.2	80.6	0

Notes

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

BAPI measures and records the output of every ZPS pressure transmitter at several points before we send them to our customers. For calibration, BAPI has a digital pressure controller that produces pressures accurate to ±0.0011 inches of water. When a customer requests an NIST Traceable Certificate of Calibration, the data for that specific sensor is collected from our calibration database. Because the data is kept in our calibration database, customers may request certifications at any time. Please provide the transmitter serial number for ease of retrieval. The figure below is actual data from an order. If you have any questions about the certification documents, please contact your BAPI representative.

CERTIFICATE OF CALIBRATION

Customer	Your Company Name	Order #	Your Order #	CalDate	2/17/2006
Serial #	BCC146	ZPS-20-SR07-NT-250-FMK		CalDue	5/18/2006
Certificate #	BCEC1226	Cal. Procedure	Test calibration filename	Calibrated By	Tim VanBlarcom

Environmental Conditions

Humidity %RH 38 Temperature °F 71.6 Pressure 1016 Pascals

Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0002	Digital Pressure Controller	0.0011" h2o
BAPI0119	Digital Multimeter	.001%
BAPI0018	Power supply	1%

Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
0 To .10	in W.C.	.070	.001%	.0697	-.0003	.0697	-.0003
-0.10 to 0.10	in W.C.	.070	.001%	.0698	-.0002	.0698	-.0002
-0.25 to 0.25	in W.C.	.070	.001%	.0704	.0004	.0704	.0004
0 to 0.25	in W.C.	.070	.001%	.0709	.0009	.0709	.0009
0 to 1.00	in W.C.	.50	.001%	.5007	.0007	.5007	.0007
-1.00 to 1.00	in W.C.	.50	.001%	.5011	.0011	.5011	.0011
-2.5 to 2.5	in W.C.	2.00	.001%	2.0115	.0115	2.0115	.0115
0 to 2.50	in W.C.	2.00	.001%	2.0070	.007	2.0070	.007
0 to 5.00	in W.C.	2.00	.001%	2.0065	.0065	2.0065	.0065
-5.00 to 5.00	in W.C.	2.00	.001%	2.0220	.022	2.0220	.022

Notes

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

Humidity Transmitter Certification (Non-Room)

BAPI Application Notes

Rev. 06/11/19

BAPI's standard product accuracy for Duct and Outside Air Humidity units is either ±2.0% or ±3.0% relative humidity. BAPI can provide a NIST Traceable Certificate of Calibration for each transmitter assembly as shown in the figure below. Each certified sensor/ transmitter pair has a unique certification and BAPI retains certification data for future reference.

Each sensor is placed into a precision humidity chamber that can hold a relative humidity condition to within ±0.5%RH. The humidity transmitter's output is recorded at each humidity certification point. BAPI normally tests at 25%, 50% and 75% relative humidity at 23°C (73°F). BAPI's humidity chamber has temperature test limits of 10 to 60°C (50 to 140°F) and humidity test limits of 15%RH to 85%RH. BAPI will test at any relative humidity and temperature that you specify within the humidity chambers capability.

If you require the humidity reading to be certified at more than one temperature, please contact your BAPI representative for pricing. Please allow additional lead time when ordering certified units. If you have any questions about the certification documents, please contact your BAPI representative.

CERTIFICATE OF CALIBRATION

Customer	Your Company Name	P.O.	Your P.O. #	Order #	Your Order #
Serial #	994459	BA/H200-D-BB		CalDate	6MAY2019
Certificate	BCEC69122	Cal. Procedure	CA0052	CalDue	No Recal
				Calibrated By	Tim Van Blarcom

Environmental Conditions

Humidity %RH 38% Temperature °F 74 Pressure 1016 Pascals

Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0003	Environmental Chamber	0.5%RH 0.1°C

Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
25%	%RH	25%	0.5000	23.92	1.08	23.92	1.08
50%	%RH	50%	0.5000	49.75	0.25	49.75	0.25
75%	%RH	75%	0.5000	74.30	0.70	74.30	0.70

Notes

Cal Tech:_____ Date: _____

Certified By: _____ Date: _____

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

Humidity Transmitter Certification (Room Units)

BAPI's standard product accuracy for Humidity Room Sensors is ±2.0%. BAPI can provide a NIST Traceable Certificate of Calibration for each sensor assembly as shown in the figure below. Each certified sensor has a unique certification and BAPI retains certification data for future reference.

Each sensor is placed into a precision humidity chamber that can hold a relative humidity condition to within ±0.5%RH. The humidity sensors output is recorded at each humidity certification point. BAPI normally tests at 25%, 50% and 75% relative humidity at 25°C (77°F). BAPI's humidity chamber has temperature test limits of 10 to 60°C (50 to 140°F) and humidity test limits of 15%RH to 85%RH. BAPI will test at any relative humidity and temperature that you specify within the sensors operating range and humidity chambers capability.

If you require the humidity reading to be certified at more than one temperature, please contact your BAPI representative for pricing. Please allow additional lead time when ordering certified units. If you have any questions about the certification documents, please contact your BAPI representative.

CERTIFICATE OF CALIBRATION

Customer	Your Company Name	P.O.	Your P.O. #	Order #	Your Order #
Serial #	994459	BA/HQF-B-C-1-C80-J		CalDate	6MAY2019
Certificate	BCEC69122	Cal. Procedure	CA0052	CalDue	No Recal
				Calibrated By	Tim Van Blarcom

Environmental Conditions

Humidity %RH 38% Temperature °F 74 Pressure 1016 Pascals

Calibration Standards

BAPI ID#	Description	Uncertainty
BAPI0003	Environmental Chamber	0.5%RH 0.1°C

Results

Test	Units	Reference	Uncertainty	As Found	Difference	As Left	Difference
25%	%RH	25%	0.5000	23.92	1.08	23.92	1.08
50%	%RH	50%	0.5000	49.75	0.25	49.75	0.25
75%	%RH	75%	0.5000	74.30	0.70	74.30	0.70

Notes

Cal Tech:_____ Date: _____

Certified By: _____ Date: _____

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

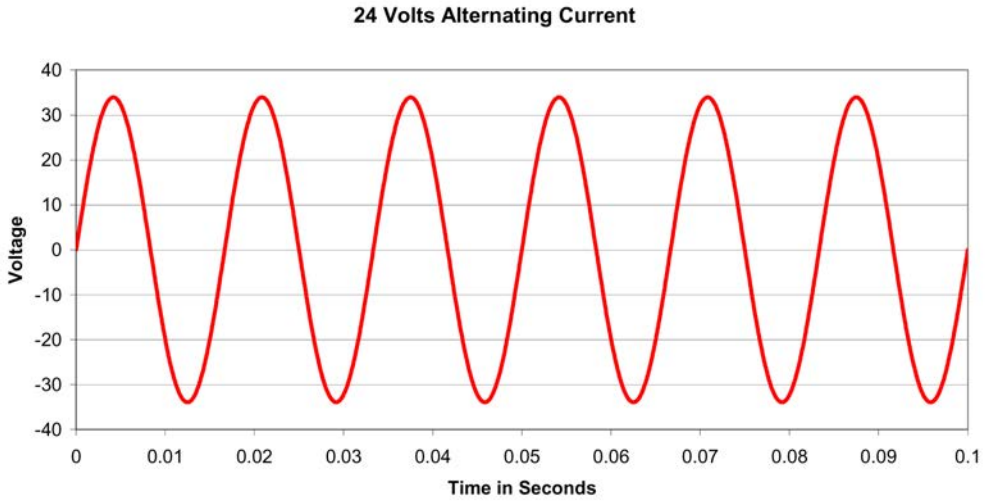
For recalibration and recertification of this unit or for other testing or calibration services contact:

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills,WI 54631

Phone (608) 735-4800
Fax (608) 735-4804

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.

Pressure Sensor Terms Defined

BAPI Application Notes

Rev. 10/16/12

Below is a list of Pressure Sensor Terms and their definitions:

1. **Burst pressure**
   Maximum pressure that may be applied to the sensor without rupture. No physical damage is allowed to the sensor, but it may need factory recalibration as it may strain the sensors internal mounting. BAPI's ZPS burst pressure is 10psi. To date, no ZPS unit has required factory recalibration when subjected to these pressures.
2. **Proof pressure**
   Maximum pressure that may be applied without changing the transducer performance beyond specified tolerances. BAPI's ZPS proof pressure is 5psi.
3. **Bidirectional**
   Takes the specified range and turns it into plus or minus of that range. The output signal is at the center of the range at zero pressure. The procedure used to turn the ZPS into a bidirectional unit is in the ZPS Installation and Operation document 13086_ins_zps_display.pdf available through your friendly BAPI representative.
4. **Auto Zero**
   Field calibration of the zero pressure output. The procedure used to auto zero the ZPS is in the ZPS Installation and Operation document 13086_ins_zps_display.pdf available through your friendly BAPI representative.
5. **Range**
   Specified endpoint pressures
6. **Span**
   Arithmetic difference between two pressure endpoints
7. **Sensitivity**
   Ratio of output signal change to a corresponding input pressure change
8. **Pressure**
   Force per unit area
9. **Velocity**
   Displacement per unit time
10. **Absolute Pressure**
    Pressure measured relative to a perfect vacuum
11. **Differential Pressure**
    Pressure difference measured between two pressure sources
12. **Gauge Pressure**
    Differential pressure between the local ambient pressure and another pressure source
13. **Static pressure**
    Pressure on the walls of a vessel at right angle to any flow. Static pressure is usually measured with a static pressure probe. ZPS/ACC07 or ZPS/ACC08
14. **Velocity pressure**
    Pressure caused by the momentum of moving air Velocity pressure is usually measured with a Pitot tube assembly. ZPS/ACC11 or ZPS/ACC12
15. **Total pressure**
    Arithmetic sum of static pressure and velocity pressure. Total pressure is usually measured with a total pressure tube.

If you have any additional questions, please contact your BAPI representative.

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

Recommended wire lengths for various power loads

When an electric current flows through a wire there is a drop in voltage due to the resistance of the wire. The voltage drop is found from Ohm's Law: ***E=IR***, or ***Voltage Drop = Wire Resistance x Amps of Current***.

The wire length recommendations below represent a 10% voltage drop in a 24 VAC or VDC circuit for various wire gauges and maximum currents. The voltage drop is linear, therefore cutting the wire length in half would result in a 5% voltage drop rather than a 10% voltage drop. The currents in the two tables represent the various models of power supplies and voltage converters available from BAPI.

Wire length recommendations in Table 1 are based on a wire temperature of 70 ºF. If the wire is run in a portion of the building where temperatures can increase to 140 ºF, such as an unventilated attic, then decrease the recommended wire length by 5%, as shown in Table 2.

The minimum wire gauge is determined by the maximum worst-case load. When in doubt, use the next larger size wire. All wiring must comply with the National Electric Code (NEC) and local codes.

Table 1: Recommended wire lengths at 70 ºF and below (10% maximum drop in voltage)

Wire gauge	Ω/1000 ft (305 M) @ 70ºF	Distance @ 75 mA	Distance @ 100 mA	Distance @ 350 mA	Distance @ 1.5 Amp	Distance @ 3 Amps
22	16.8	1905 ft (581 M)	1429 ft (435 M)	408 ft (124 M)	95 ft (29 M)	48 ft (15 M)
20	10.5	3048 ft (929 M)	2286 ft (697 M)	653 ft (199 M)	152 ft (46 M)	76 ft (23 M)
18	6.6	4848 ft (1478 M)	3636 ft (1109 M)	1039 ft (317 M)	242 ft (74 M)	121 ft (37 M)
16	4.2	7619 ft (2322 M)	5714 ft (1742 M)	1633 ft (498 M)	381 ft (116 M)	190 ft (58 M)

Table 2: Recommended wire lengths above 70 ºF (10% maximum drop in voltage)

Wire gauge	Ω/1000 ft (305 M) @ 70ºF	Distance @ 75 mA	Distance @ 100 mA	Distance @ 350 mA	Distance @ 1.5 Amp	Distance @ 3 Amps
22	16.8	1810 ft (522 M)	1357 ft (414 M)	388 ft (118 M)	90 ft (27 M)	45 ft (14 M)
20	10.5	2895 ft (882 M)	2171 ft (662 M)	620 ft (189 M)	145 ft (44 M)	72 ft (22 M)
18	6.6	4606 ft (1404 M)	3455 ft (1053 M)	987 ft (301 M)	230 ft (70 M)	115 ft (35 M)
16	4.2	7238 ft (2206 M)	5429 ft (1655 M)	1551 ft (473 M)	362 ft (110 M)	181 ft (55 M)

If you have any additional questions, please contact your BAPI representative.

Mounting Outdoor Sensors

BAPI Application Notes

Rev. 09/23/20

The physical placement of BAPI outdoor temperature and humidity sensors depends on its application.

If the outside air is being used for economizing, the sensor should be placed close to the economizer damper without being in the air draft. If the economizer damper is on the roof, the sensor should be on the roof. If the economizer damper comes through the building wall, the sensor should be on the wall. If you want meteorological data, showing building occupants the outdoor weather conditions, mount the sensor on the side of building.

Place the sensor in a location where it does not receive direct sunlight because this can cause solar heat gain and affect readings. BAPI's tests show that readings can be affected by as much as 30% from solar heat gain. In far northern or southern latitudes, be aware that at sunrise or sunset the sun can illuminate all sides of a building.

The BAPI Weather Shade effectively reduces the solar heat gain, improving the accuracy of outdoor sensors. The shape of the cone and spacing from the wall creates a chimney which draws radiant heat from solar gain away from the sensor. The "domed" top also prevents bird nesting while the smooth surface minimizes hosting of insects. On humidity sensors, the Weather Shade also protects the probe filter from precipitation and grit, extending the life of the filter.

When mounting the sensor, drill the mounting holes as shown in the sensor's installation instructions. The best practice is to mount the unit with the sensor probes pointing down at a minimum of four feet above the ground or roof. Four feet isolates the sensor from any water puddles that would cause erroneous readings.

Water is the enemy of building materials and electrical connections. Carefully seal everything to get a good watertight seal. Be sure to seal the box plugs, conduit and conduit fittings.

Attach the sensor with the mounting hardware provided. **DO NOT** drill through the back of weatherproof boxes. Holes destroy the integrity of the box and may void the warranty.

Route the wires into the box and terminate with sealant filled connectors. BAPI's sealant filled connectors prevent water from attacking the connection, thereby preventing costly callbacks. The best practice is to seal the wiring hole after the wires are installed.

If you need any help mounting BAPI products or have any additional questions, please call your BAPI representative.

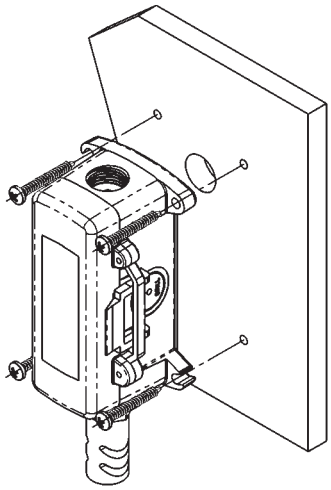


Fig. 1: The BAPI-Box 2 enclosure outside mounting. The probe and shield should be pointing downward.

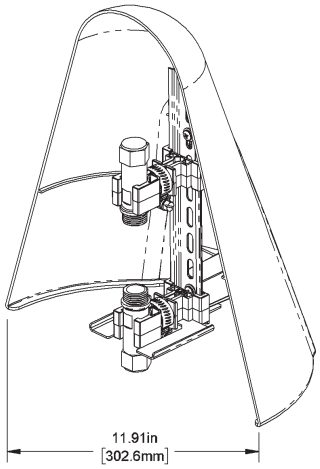


Fig. 2: Weather Shade Kit.

References

http://weather.gov/om/coop/standards.htm

The State Climatologist (1985) Publication of the American Association of State Climatologists: Heights and Exposure Standards for Sensors on Automated Weather Stations, v. 9, No. 4 October, 1985.

EPA (1987). On-Site Meteorological Program Guidance for Regulatory Modeling Applications, EPA-450/4-87-013. Office of Air Quality Planning and Standards, Research Triangle Parks, North Carolina 27711.

WMO (1983). Guide to Meteorological Instruments and Methods of Observation. World Meteorological Organization No. 8, 5th edition, Geneva Switzerland.

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

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.

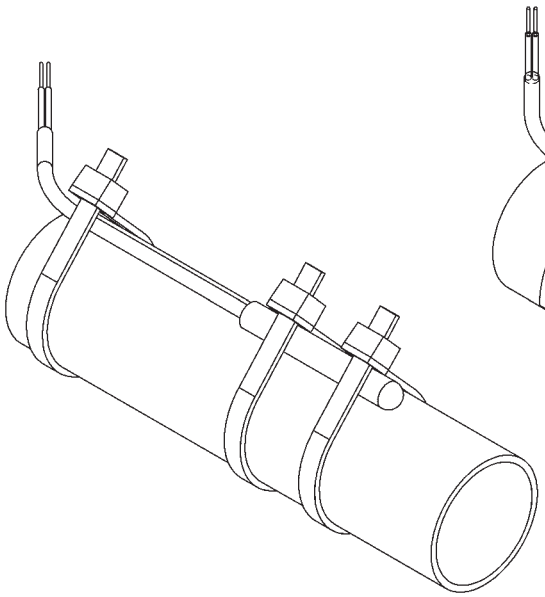


Figure 1: Remote probe with FEP jacketed cable strapped directly to pipe.

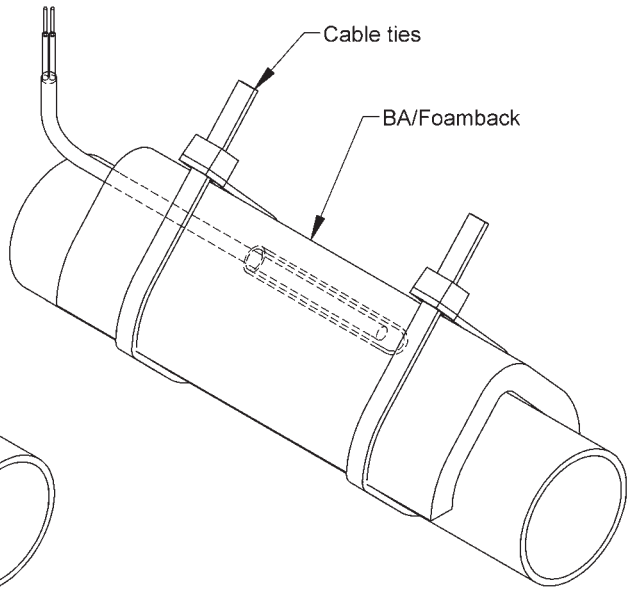


Figure 2: Remote probe with FEP jacketed cable applied beneath a FOAMBACK insulator.

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

Continued on next page...

Terms & Conditions

Ordering continued...

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 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.

Flat Rate Shipping Terms & Conditions

BAPI offers flat rate ground shipping on order shipments being shipped within the contiguous United States. Orders requiring expediting or vendor freight charges – as well as orders to Hawaii, Alaska, Guam and Puerto Rico – will qualify for a discounted published shipping rate that will be added to the invoice. BAPI will not bill third party or bill 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 the flat rate shipping program. Any additional expedited costs will be added to the invoice. Residential customers do qualify for BAPI's flat rate shipping program. Customers may request a preference for one of BAPI's three preferred carriers: UPS, Fed Ex and SpeeDee. Customers who provide invalid addresses will have additional charges added to their invoice. BAPI's flat rate shipping program is subject to change without notice.

International shipping and expedited charges will coincide with BAPI's discounted International shipping rates. 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 the flat rate shipping program.

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 of UPS account number for shipping charges if units are to be returned. Purchase orders will not be accepted for return shipping. In cases where units are repairable but not covered under BAPI’s warranty, customers may elect to have BAPI repair the unit.

The foregoing warranty is in lieu of all warranties, express, implied or statutory, including but not limited to, any implied warranty of merchantability for a particular purpose. BAPI’s liability for

Continued on next page...

Terms & Conditions

Warranty continued...

breach of warranty is limited to repair or replacement. If the goods cannot be replaced, warranty is limited to a refund of the purchase price. In no instance shall BAPI be liable for incidental or consequential damages arising from a breach of warranty or from the use or installation of its products. Under no circumstance does BAPI agree to provide a product credit to repair or replace our product without prior specific written authorization.

No representative or person is authorized to give any warranty other than as set out above or to assume for BAPI any other liability in connection with the sale of its products.

This warranty is limited to the original customer only. It cannot be transferred or assigned to third parties unless the intent to transfer to a third party is expressly indicated in a purchase order and/or warranty processing arrangements have been agreed upon in writing by BAPI.

***Product Credit**

BAPI Backed product credits beyond the repair or replacement of the failed product are issued in the form of a product credit only[1]. Requests for BAPI Backed product credits must be submitted to BAPI in writing. Under no circumstance does BAPI agree to provide a product credit associated with the repair or replacement of our products without prior specific written authorization from a BAPI officer[2]. BAPI reserves the right to refute or refuse BAPI Backed product credits that do not meet the specified terms and conditions. Please contact BAPI for further details and requirements.

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

[2]BAPI may refute or refuse product credit requests when it relates to a component vendor issue.

****Warranties**

Recommended product calibration intervals are excluded from the warranty period. Devices that are used frequently or in non-standard environments may require more frequent calibration than what is recommended by BAPI.

Blü-Test rechargeable battery life is excluded from the warranty period. The battery in the Blü-Test products are rated to be recharged 300 times before performance degrades. Batteries can be replaced via BAPI's Blü-Test refurbishment service.

Design and Specifications

BAPI reserves the right to make changes in the design, specifications, and/or support documentation of any product as technological advances or necessity requires without notification. Please contact BAPI for updated product information.

Information in our descriptive literature is based on product specifications that are current at the time of publication. Product specifications, designs and descriptive literature are subject to change as improvements are introduced. Although we announce changes as they occur, we cannot guarantee notification to every customer. BAPI warrants delivered product to conform to the most current specifications, designs and descriptive literature.

Custom Products

In many cases, BAPI products can be modified to meet your custom requirements. Additional charges and longer lead times may apply. Contact your salesperson for a quote on your special requirements.

NIST Traceable Certificates of Accuracy & Calibration

BAPI offers NIST Traceable Certificates of Accuracy & Calibration for its temperature, humidity and pressure products.

Part Number **Net Price**

CERT-HUM-AMBIENT **$20.00**
NIST Traceable Certification of Accuracy for Humidity at Ambient – Price includes one point.

CERT-HUM-SPEC **$50.00**
NIST Traceable Certification of Calibration for Humidity at Specific Points (Customer Specified) – Price includes one, two or three humidity points at one temperature.

CERT-TEMP-AMBIENT **$20.00**
NIST Traceable Certification of Accuracy for Temperature Sensor at Ambient – Price includes one point.

CERT-TEMP-SPEC **$50.00**
NIST Traceable Certification of Calibration for Temperature Sensor at Specific Points (Customer Specified) – Price includes one, two or three points.

CERT-PRESS-SR ..... **No Additional Charge**
NIST Traceable Certification of Accuracy for Pressure – All Standard Ranges verified at one point.

CERT-PRESS-SPECIFIC **$50.00**
NIST Traceable Certification of Calibration for Pressure at Specific Points (Customer Specified) – Price includes one, two or three points.

CAL-420CO-AMBIENT **$50.00**
Calibration of BAPI's Carbon Monoxide Sensor (BA/420CO) at ambient temperature.

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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