

2018 FULL PRODUCT CATALOG





Rev. 08/31/15

BAPI-BACKED Confidence



Most sensor manufacturers will replace their defective products, but only BAPI has the confidence to replace our products **AND PAY YOUR LABOR** to do so.¹

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 pay for your labor to do so.

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
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Rev. 08/31/15

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BAPI Application NotesSection I

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



Terms and Conditions.....Section J

Ordering Information • Warranties • Certificates of Accuracy and Calibration • 100 Percent Compatibility Guarantee



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We make it easy for you.



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



Temperature



Humidity



Air Quality



Pressure



ETA



Accessories



Wireless

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



Our products are built to last, which is why we offer a 5 year warranty across all of our products. Of course, all companies offer a warranty, but we take it step further. If our product fails due to a manufacturing defect we will not only repair or replace the unit, but we will also pay the labor to do so. 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. Free Ground Shipping



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™

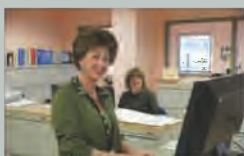


- Original solutions to common HVAC/R problems
- Driven by customer feedback

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



99.94%
Manufacturing
Efficiency Rate



Live Support



Manufactured
in the USA



On-Site,
Multi-Step Testing



Computer Aided
Workstations

Marketing Support

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

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

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

Sales Support

Our sales & customer service team offer the following:

Order Verification:

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

Joint Customer Calls & Visits:

When schedules permit, BAPI salespeople are able to travel to your office for in-office training or hold a webinar for your staff.

Product Samples:

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



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website: www.bapihvac.com



Company Background

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

Website Resources - www.bapihvac.com

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

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

Instruction Sheets, Datasheets & Price

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

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



The BAPI-Guard Video

The BAPI Difference

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

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

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

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

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

BAPI-BACKED Confidence - Most sensor manufacturers will replace their defective products, but only BAPI has the confidence to replace our products and pay your labor to do so.





Rev. 10/27/15

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Temperature Sensors



Room Temperature Sensors

BAPI-Stat "Quantum Series" of Room Sensors

The Latest Sensor Innovation from BAPI



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BAPI-Stat 4 with LCD

Large Display with Temp Setpoint



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RpP Sensors

Display & Temp Setpoint



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BAPI-Stat 3

for Operating Rooms



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"X-Combo"

Temp & Humidity Setpoint



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Room Units without LCD

Optional setpoint & Override



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Decora Style Sensor

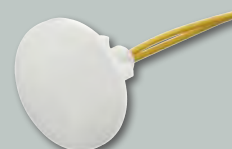
Fits inside a Wall Plate



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"Button" Sensor

Smaller than a Quarter



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T1K Transmitters

4 to 20 mA Output



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BAPI-Com

2-Wire Sensor



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"L-Temp"

Echelon Sensor



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Wall Plates

w/ optional Override

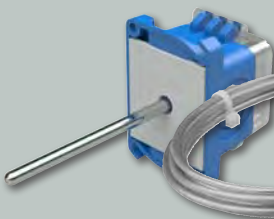


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BAPI Non-Room Temperature Sensors

Duct Sensors



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Duct Averaging



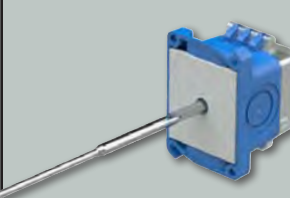
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Submersible Duct



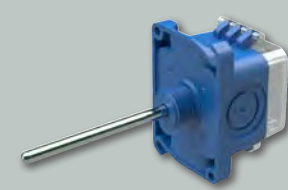
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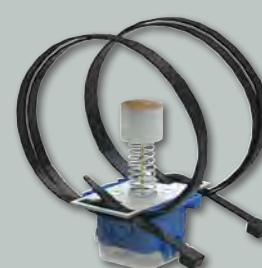
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Strap-On Sensors



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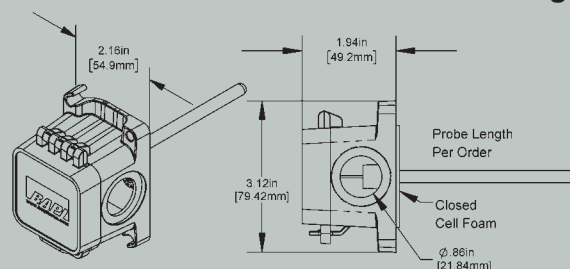
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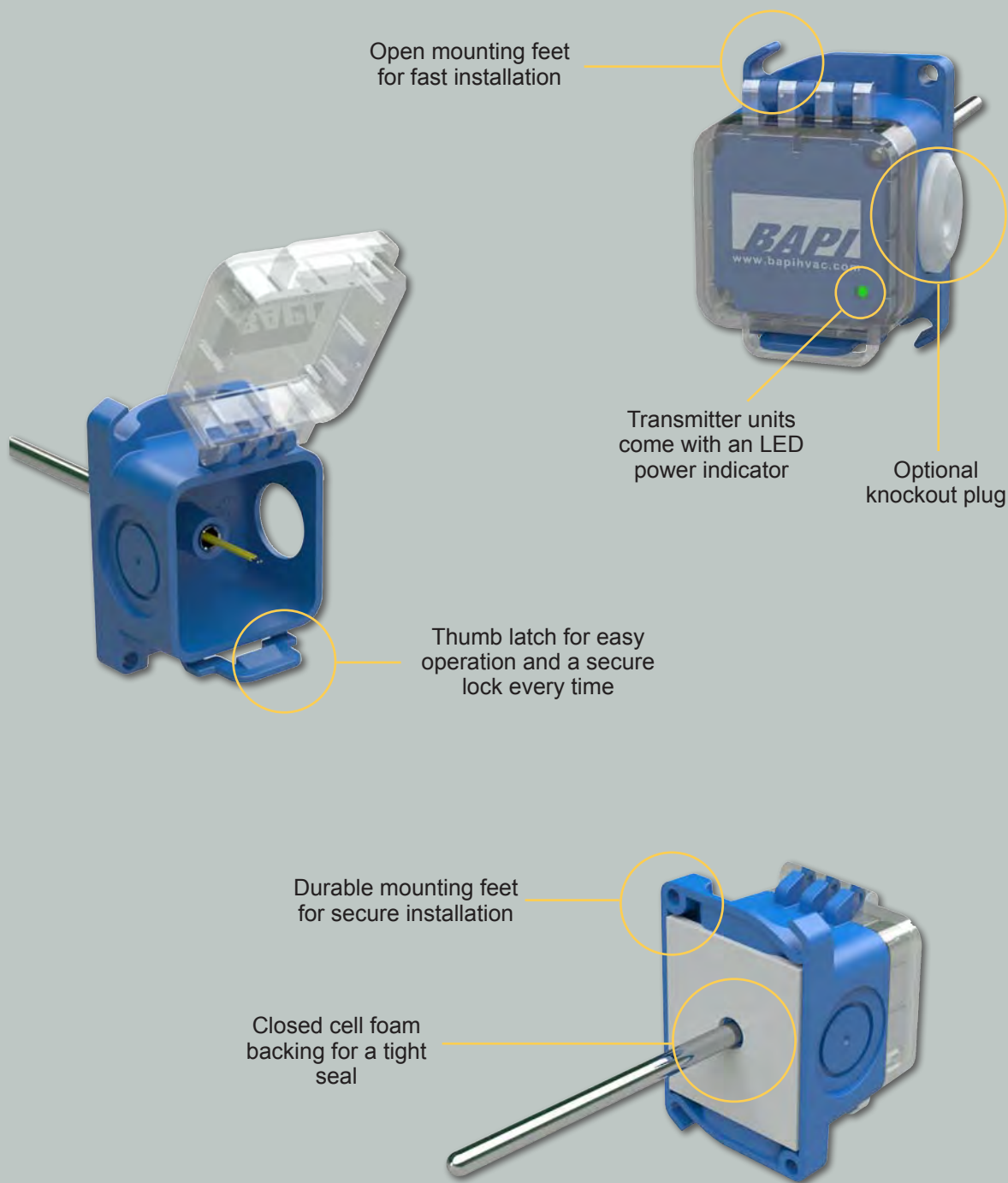


The BAPI-Box Crossover Enclosure

A3

Temperature Sensors

The new 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.





Features & Options

- New 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 new 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 optional occupancy override can be configured in parallel with the sensor or setpoint, or as a separate output. An optional 3.5mm (1/8"), RJ11 or RJ22 Communication Jack can be mounted in the base to provide direct access to the network.

Fan Speed and Mode Control is also available for applications with fan coils, heat pumps or unit ventilators.



BAPI-Stat
"Quantum"
Sensors

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

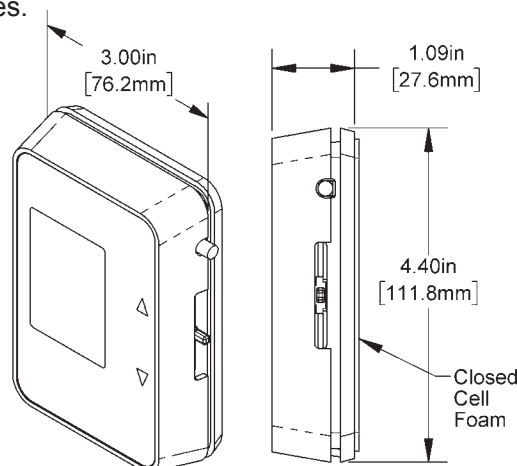
Environmental Operation Range:

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

Humidity: 0 to 95%, non-condensing

Agency: RoHS

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





BAPI-Stat "Quantum" with Display

A5

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)

#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 \$9
H 3K Thermistor

#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 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

#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, °F Display, 10K-2 Thermistor Temperature Sensor, Slider Setpoint Adjustment, 50 to 90°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Override as a Separate Output, No additional optional selections.

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

Your Number: BA/





Features & Options

- New 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.



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



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

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. SensorPassive RTD or Thermistor

Inputs:

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

Sensing Elements for Active Outputs and Display:

Temperature 10K-2 Thermistor
 Humidity.....Capacitive Polymer, ±2%RH

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

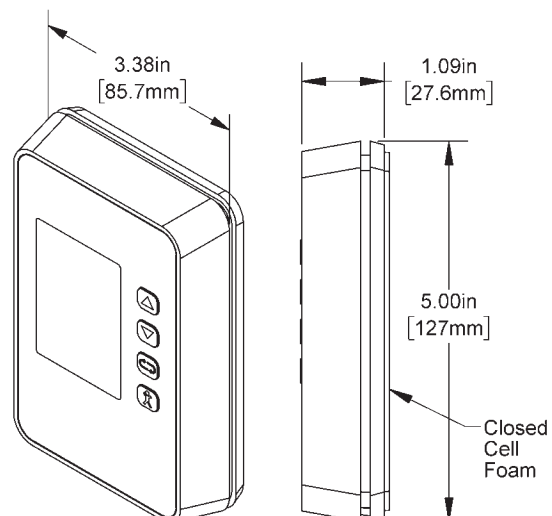
Environmental Ambient:

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

Wiring: 2 to 6 pair of 16 to 22 AWG

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

Agency: RoHS



*AC power requires a separate pair of shielded wires.

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





Rev. 11/09/17

BAPI-Stat “Quantum Slim” Sensor

A7**Temperature Sensors**

Features & Options

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

The new BAPI-Stat “Quantum Slim” Temperature Room Sensor is designed for applications where a temperature output is required with a sleek, low profile room enclosure. Available with thermistor and RTD elements. Ideal for locations where aesthetics are as important as the temperature measurement.

**BAPI-Stat “Quantum Slim” Sensors**

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 | \$42 |
| 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..... | \$47 |
| 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 |

Specifications

Wiring:

One pair of 16 to 22 AWG wires

Mounting:

Surface or drywall mount (screws provided)

Sensing Element:

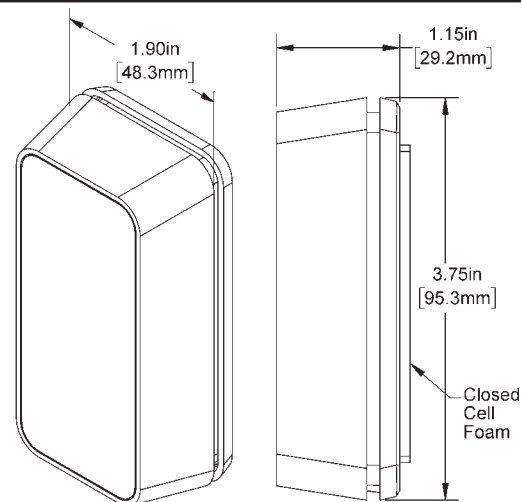
Thermistor or RTD (See Sensors Sect. for Specs.)

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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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
(with Warm
White and
Gray Logo
Plate)**



Specifications

Power for 24VDC Power Units:

0 to 5 VDC Setpoint or Resistive Setpoint 9 to 40 VDC (24 VDC nominal)
 0 to 10 VDC Setpoint or Resistive Setpoint ... 15 to 40 VDC (24 VDC nominal)
 Any Allowed Setpoint..... 15 to 28 VAC (24 VAC nominal)

Note: AC power requires a separate pair of shielded wires.

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

Sensing Element:

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

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

Communication Jack:

Optional 3.5mm (1/8") Phono Jack

Mounting:

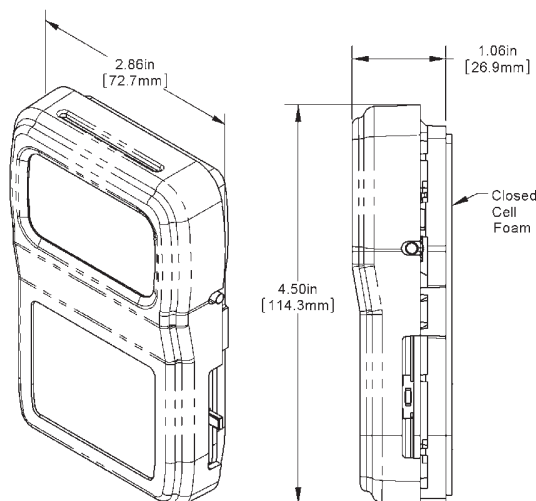
Standard 2x4" J-box or drywall mount (screws provided)

Environmental Operation Range:

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

Humidity: 0 to 95%, non-condensing

Agency: RoHS & CE



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





BAPI-Stat 4™ Room Unit with Display

Temperature Sensors

A9

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) - (#10)

#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 3.5 mm 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\$9

1 1K Platinum RTD (385 curve)

18 1.8K Thermistor

3 3K Thermistor

102 10K-2 Thermistor

103 10K-3 Thermistor

10311 10K-3[11K] Thermistor

20 20K Thermistor

#9: Common Ground Config. (required)

CG Common Ground

#10: Logo Plate Color (required)

WMW Warm White (matches enclosure)

GRY Gray

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**) - (**WMW**)

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

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., Warm White Logo Plate Color

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

Your Number: BA/



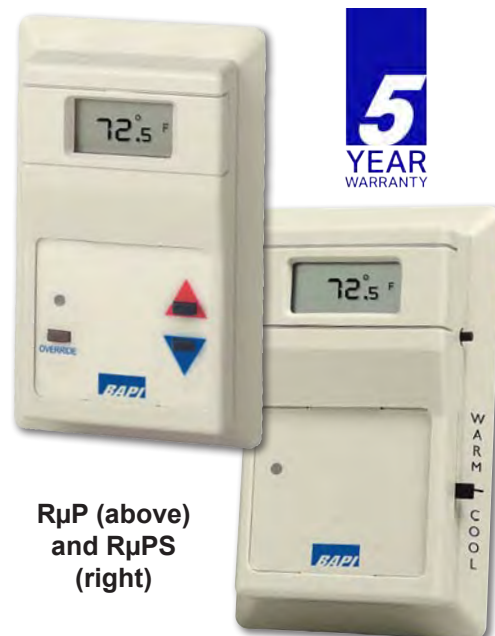


Features & Options

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

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

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



R_μP (above)
and R_μPS
(right)

Specifications

Power R_μP:

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

Power R_μPS:

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

Power Consumption:

10 mA max. DC, .2 VA maximum AC

Sensing Element:

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

Mounting:

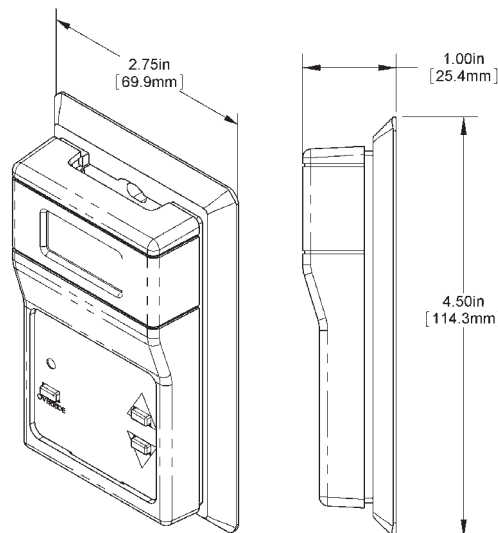
Standard 2"x4" J-box or drywall mount (screws provided)

Environmental Operation Range:

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

Enclosure Material & Rating:

ABS Plastic, UL94 HB



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

Associated Products

The BAPI-Guard

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



VC350A "EZ" - Voltage Converter

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





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

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



RuP & RuPS Option Selection Guide:

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

#1: Room Sensor Style (required)

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

RuPS Slider Setpoint Adjustment..... \$125

#2: °F or °C Display (required)

F Temperature Displayed in °F

C Temperature Displayed in °C

#3: Setpoint Display Range (optional)

A -3 to +3

B -5 to +5

C 50 to 90 °F or 10 to 32 °C

D 55 to 85 °F or 13 to 30 °C

E 60 to 80 °F or 15 to 27 °C

F 65 to 80 °F or 18 to 27 °C

#4: Setpoint Output Range (optional)

00 0 to 5 V

10 0 to 10 V

60 0 to 10 kΩ

80 0 to 20 kΩ

81 4.75 k to 24.75 kΩ

82 6.19 k to 26.19 kΩ

84 10 k to 30 kΩ

#5: Occupant Override (required)

J Override as a Separate Output

N Override in Parallel (//) with Sensor

P Override in Parallel (//) with Setpoint

Z No Override

#6: Communication Jack (optional)

C35L..... 3.5 mm 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 \$9

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

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**)

Actual Number (with parenthesis removed): BA/BS4M-F-E80-N-C35L-24-102-NL-CG

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.

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

Your Number: BA/





Features & Options

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

The BAPI-Stat 3 is designed for operating rooms, clean rooms and elder care facilities. It features a large display and membrane pushbuttons for wipedown cleaning. It is available with temperature and humidity measurement, temperature and humidity setpoint and occupant override.

The unit includes a number of field adjustments including °F or °C display, temperature and humidity offset and setpoint lockout. The display can also be set to show a large temperature and small %RH reading, a large %RH and a small temperature reading, or to alternate between the two. This unit can be configured with up to four transmitted variables. Contact your BAPI representative for details.



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

Ordering Information

The BAPI-Stat 3 is a very powerful unit with many options. Please call your BAPI representative for ordering. We will provide a quote and keep it on record for future orders

Specifications

Power:

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

Note: 15 to 24 VDC recommended for VDC unit.

Power Consumption:

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

RH/Temp Sensor Construction:

Communicating Integrated Circuit

Humidity: Capacitive Polymer, $\pm 2\%$ RH (10% to 90%)
@25°C, Fully Compensated

Temp: Semiconductor Band Gap, $\pm 0.3^\circ\text{C}$ @ 25°C

Optional Direct Temp. Sensor:

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

Mounting:

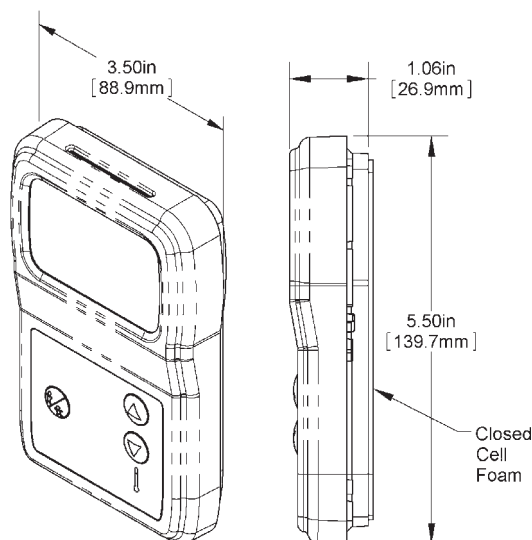
2" x 4" J-box or drywall mount - screws provided

Environmental Specifications:

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

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

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



*AC power requires a separate pair of shielded wires.

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





Rev. 12/14/17

BAPI-Stat 4 "X-Combo" Room Unit

A13*Temperature Sensors*

Features & Options

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

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

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

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

Optional Direct Temp. Sensor:

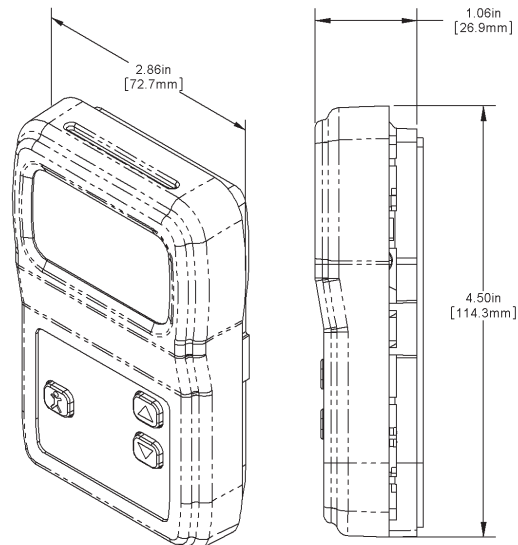
Thermistor or RTD (See Sensors Sect. for Specs.)

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 122°F (0 to 50°C)

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

Agency: RoHS

*AC power requires a separate pair of shielded wires.

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



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Features & Options

- BAPI-Stat “Quantum”, BAPI-Stat 4 and Delta Style Enclosures
- Optional Setpoint, Override and Communication Jack
- Pressure Pickup Port available for BAPI-Stat “Quantum” and Delta Style Units without Setpoint or Override
- Limited Lifetime Warranty

Setpoint & Legend

Setpoint is available as a slidepot in various ranges with “Cool/Warm” setpoint legend.

Override

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

Communication Jack

Available with a 3.5 mm phono plug style jack.

Pressure Pickup Port

Pressure Pickup Ports are available for the BAPI-Stat “Quantum” and Delta Style Enclosures without Setpoint or Override. See “Pressure Pickup Ports” in the Pressure Section for ordering.



BAPI-Stat “Quantum”



Delta Style Unit



BAPI-Stat 4 Units

Specifications

Environmental Operation Range:

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

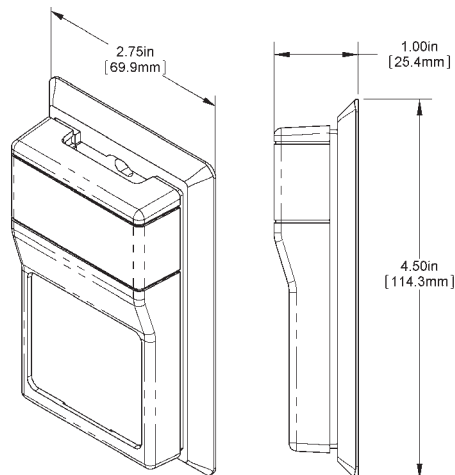
Humidity: 0 to 95%, non-condensing

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

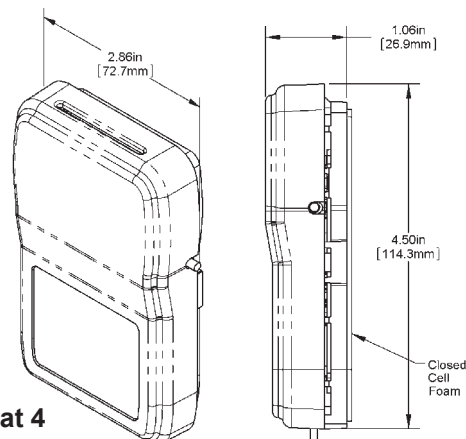
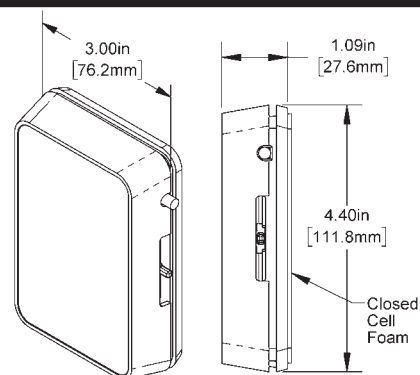
Sensing Element:

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

Agency: RoHS & CE



Delta Style

BAPI-Stat
“Quantum”

BAPI-Stat 4





BAPI Room Units Without LCD

A15

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 and Delta Style 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 | \$35 |
| 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" | \$7 |
| B4 | BAPI-Stat 4 | \$7 |
| R | Delta Style Enclosure | |

#3: Setpoint Output Range (optional)

| | | |
|----------|----------------------------------|-----|
| 60 | 0 to 10 k Ω | \$6 |
| 80 | 0 to 20 k Ω | \$6 |
| 81 | 4.75 k to 24.75 k Ω | \$6 |
| 82 | 6.19 k to 26.19 k Ω | \$6 |
| 84 | 10 k to 30 k Ω | \$6 |

#4: Setpoint Legend

(Required for units with Setpoint)

| | |
|----------|----------------------------------|
| L8 | Up/Down Arrows (Quantum Only) |
| L6 | Cool/Warm (Delta or BAPI-Stat 4) |
| L0 | No Legend (Delta or BAPI-Stat 4) |

#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 | 3.5 mm Phono Style Jack | \$7 |
|-----------|-------------------------------|-----|

#7: Common or Differential Gnd (required)

| | |
|----------|---------------------|
| CG | Common Ground |
| DF | Differential Inputs |

#8: BAPI-Stat 4 Logo Plate Color

(required for BAPI-Stat 4 Units)

| | |
|-----------|--------------------------------|
| WMW | Warm White (matches enclosure) |
| GRY | Gray |

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 BAPI-Stat "Quantum" and 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**) - (**WMW**)

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

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, Warm White Logo Plate

List Price: \$18 (Thermistor) + \$6 (Setpoint) + \$5 (Override) + \$7 (Comm. Jack) = \$36 List Price

Your Number: BA/





Features & Options

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

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

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



**Decora Style
Units with
and without
Setpoint
Adjustment**

Specifications

Power: 5 VDC to 12 VDC $\pm 5\%$

Power Consumption: 0.5 mA

Sensing Element:

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

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

Mounting:

Standard 2"x4" J-box with Decora Style Trim Plate

Environmental Operation Range:

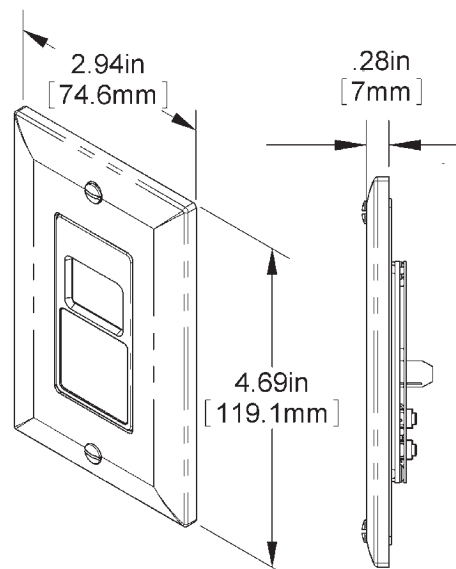
Temperature: 32 to 122 °F (0 to 50 °C)

Humidity: 0 to 95%, non-condensing

Material: ABS Plastic

Material Rating: UL94, V-0

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



Associated Products

VC350A "EZ" - Voltage Converter

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





Rev. 12/12/16

Decora Style Room Unit

Temperature Sensors**A17**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... \$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: Temperature Sensor (required)

1375 1K Platinum RTD (375 curve)

1NI 1K Ω Nickel RTD \$9

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: \$125 (Decora Style Unit) = \$125 List Price**Your Number:** BA/

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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 tape strip. 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.



Specifications

Thermistor

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

RTD

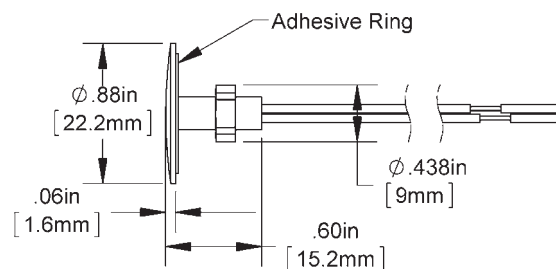
| | |
|------------------------|---|
| Platinum (PT)..... | 100 Ω or 1K Ω @ 0°C , 385 curve |
| Platinum (PT)..... | 1K Ω @ 0°C , 375 curve |
| PT Accuracy (Std)..... | 0.12% @Ref, or $\pm 0.55^{\circ}\text{F}$, ($\pm 0.3^{\circ}\text{C}$) |

| | |
|-----------------------|---|
| PT Stability | $\pm 0.25^{\circ}\text{F}$, ($\pm 0.14^{\circ}\text{C}$) |
| PT Self Heating | 0.4 $^{\circ}\text{C}/\text{mW}$ @ 0°C |
| PT Probe range | -40° to 221°F , (-40 to 105°C) |
| Nickel (Ni) | 1000 Ω @ 70°F , JCI curve |
| Ni Probe range | -40° to 221°F (-40 to 105°C) |

Sensitivity

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

Wiring: One pair of 22 AWG wires



Wire Insulation:

Etched Teflon, Plenum rated

Mounting: 1/2" hole, push in plastic sheath with peel off tape strip.

Enclosure Material and Ratings:

Plastic, NEMA 1, UL94

Ambient (Encl.)

0 to 100% RH, Non-condensing
 -40°F to 185°F , (-40° to 85°C)

Agency: RoHS, CE





Rev. 12/12/16

Low Profile "Button" Sensor

Temperature Sensors

A19Submittal sheets without List Prices are available on our website at www.bapihvac.com

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



Button Sensor Option Selection Guide:

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

#1: Temperature Sensor (required)

| | | |
|---------------|----------------------------------|------|
| 1K[375] | 1K Platinum RTD (375 curve)..... | \$25 |
| 1K[NI] | 1K Ω Nickel RTD | \$35 |
| 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 (required, 6" 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/

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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, °F or °C and a new stylish look.

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



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 122°F (0 to 50°C)
Temperature, BS4: 15°F to 130°F, (-9° to 54°C)
Humidity: 0 to 95%, non-condensing

Mounting:

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

Wiring:

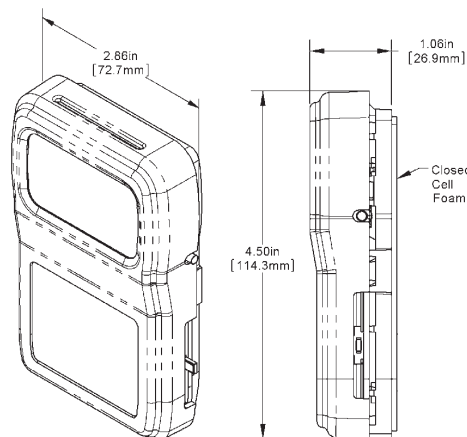
1 to 3 pair of 16 to 22AWG

Material & Rating:

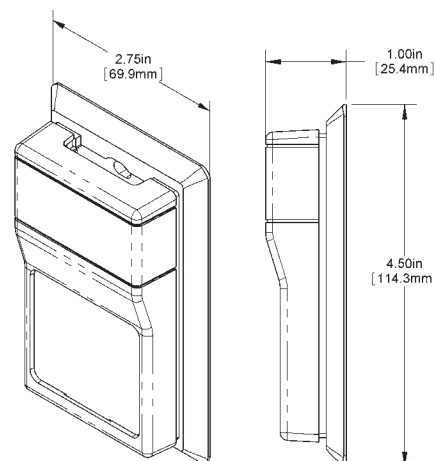
BAPI-Stat 4: ABS Plastic, UL94 V-0
Delta Style: ABS Plastic, UL94 HB

Agency: RoHS

**BAPI-Stat 4
Enclosure**



**Delta Style
Enclosure**





T1K Transmitter Room Unit

A21

Temperature Sensors

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

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



T1K Room Transmitter Option Selection Guide

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

#1: Temp Measurement Range (required)

0 to 100F ..0 to 100°F Temperature Range
50 to 90F ..50 to 90°F Temperature Range
40 to 90F ..40 to 90°F Temperature Range
45 to 96F ..45 to 96°F Temperature Range
4 to 35C4 to 35°C Temperature Range
0 to 35C0 to 35°C Temperature Range
0 to 50C0 to 50°C Temperature Range
0 to 100C ..0 to 100°C Temperature Range

#2: Display (required)

B4SDBAPI-Stat 4 with Display \$185
B4SXBAPI-Stat 4, No Display \$150
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
C50 to 90 °F or 10 to 32 °C
D55 to 85 °F or 13 to 30 °C
E60 to 80 °F or 15 to 27 °C
F65 to 80 °F or 18 to 27 °C
XNo Setpoint Display

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)

JOverride as a Separate Output \$5
NOverride in Parallel with Sensor... \$5
POverride in Parallel with Setpoint.. \$5
ZNo 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-WMW .Common Ground
DF-WMW..Differential Inputs

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

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

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 Config., Warm White Logo Plate Color

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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Features & Options

- Power and Communication on Just Two Wires
- Available with Temperature Setpoint and Optional Override, Display and %RH Sensing
- Thermistor, Voltage, Resistance or Dry Contact Outputs
- Up to 500 Foot Wire Runs — Perfect for Existing Wires

Many existing buildings have two wire sensors that lack the features people expect in today's sophisticated systems. The BAPI-Com uses those existing two wires and offers the owner a full function sensor with temperature setpoint, occupant override, an optional easy-to-read display and optional %RH sensing.

This retrofit sensor can update old systems to a new look without pulling new wire or disrupting the occupants while saving on labor.

The sensors are powered and communicate over two wires to a Communication Output Module for use by a BAS system. The outputs are configurable as a thermistor, voltage, resistance or dry contact override output. The sensor is powered by the Communication Output Module which itself is supplied by any 24VDC/VAC source.



BAPI-Com Room Sensors & Communication Output Module

Ordering Information

The BAPI-Com 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

ROOM SENSOR SPECS

Power: 18VDC, from the Comm. Output Module

Wiring: 2 wires, Up to 500ft (new or existing)

AWG gauge: 22 to 14AWG (Shielding Preferred)

Temp Sensor: Thermistor, $\pm 0.36^{\circ}\text{F}$ ($\pm 0.2^{\circ}\text{C}$)

RH/Temp Sensor Construction:

Communicating Integrated Circuit

Humidity: Capacitive Polymer, $\pm 2\%$ RH

(10 to 90%) @ 25°C , Fully Compensated

Temp: Semi-conductor Band Gap, $\pm 0.3^{\circ}\text{C}$ @ 25°C

Pole Rate: 400 ms

Ambient:

32 to 122°F (0 to 50°C),

0 to 95%RH, non-condensing

COMMUNICATION OUTPUT MODULE SPECS

Power in: 24VDC/AC, 30mA

Terminations:

Comm. & PWR 2 wires to the sensor

Power in 2 wires, 12 to 28 AWG

Output 2 wires per output, 12 to 28 AWG

Override Input 2 wires, 16 to 30 AWG

Outputs:

Volts 0 to 5 or 0 to 10VDC, 10k Ω min

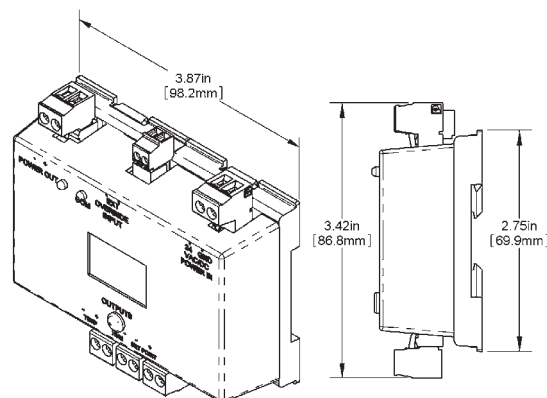
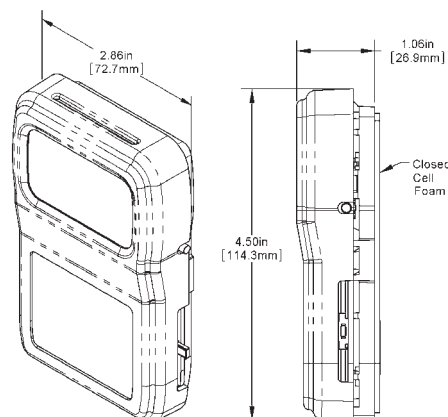
Resistance 400 Ω to 20K Ω span

Thermistor 10K-2 or 10K-3

Input (DI): Ext. Override Dry Contact,
Closed = Occupied

EZ Mounting: DIN Rail, Snaptrack or surface

Material: ABS Plastic, UL94V-0, RoHS





Rev. 12/12/16

Echelon® Compatible “L-Temp”

Temperature Sensors

A23

Features & Options

- Optional Setpoint, Display, %RH 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.



L-Temp Unit with Setpoint & Override

Ordering Information

| <u>Part Number</u> | <u>Description</u> | <u>List Price</u> |
|--------------------------|--|-------------------|
| BA/LC-R | L-Temp Unit..... | \$240 |
| BA/LC-RD | L-Temp Unit with Display | \$275 |
| BA/LC-RSOD | L-Temp Unit with Setpoint, Override and Display | \$286 |
| BA/LC-H2-R | L-Temp Unit with Humidity | \$320 |
| BA/LC-H2-RD | L-Temp Unit with Humidity and Display | \$355 |
| BA/LC-H2-RSOD ... | L-Temp Unit with Humidity, Setpoint, Override and Display..... | \$366 |

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, $\pm 0.3^{\circ}\text{C}$

Humidity - Capacitive Polymer, $\pm 2\%$ RH Accuracy

Wiring: 4 wire, twisted pair 22 AWG minimum

Communication:

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

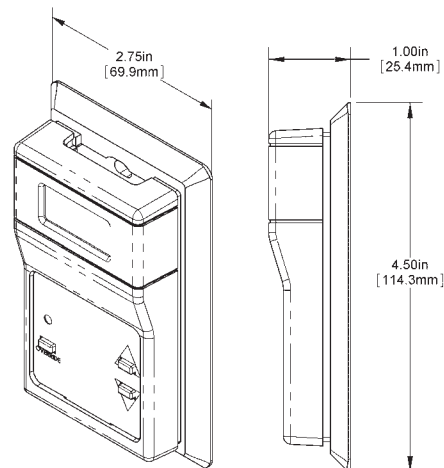
Mounting: 2x4" J-box or drywall - screws provided

Material & Rating: ABS Plastic, UL94 HB

Temperature Range: -40 to 85°C

Environmental Specifications:

Temperature: 32 to 122 °F (0 to 50 °C) • 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” and “L-Combo” were 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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Features & Options

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

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

Override

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



Color and Finish Options

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



Specifications

Material:

Aluminum or Stainless Steel

Sensing Element:

Thermistor or RTD

(See Sensors Sect. for Specs.)

Environmental Operation Range:

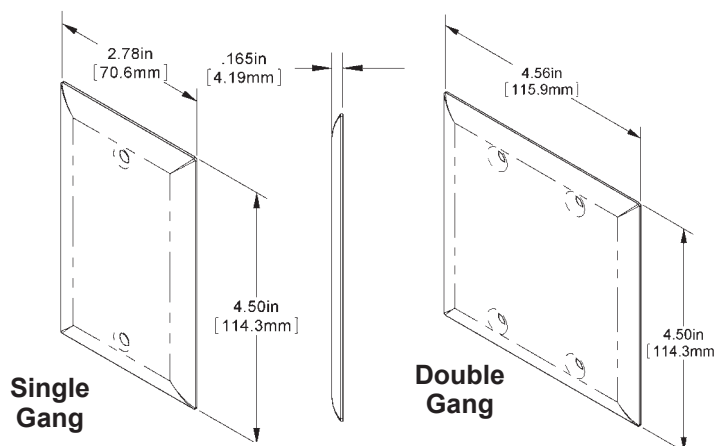
Temperature:

-40 °C to 100 °C

-20 °C to 70 °C with transmitter

Humidity:

0 to 95%, non-condensing



Associated Products

Spanner Security Screws & Spanner Bit

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





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

Use the Option Selection 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 | \$35 |
| 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/





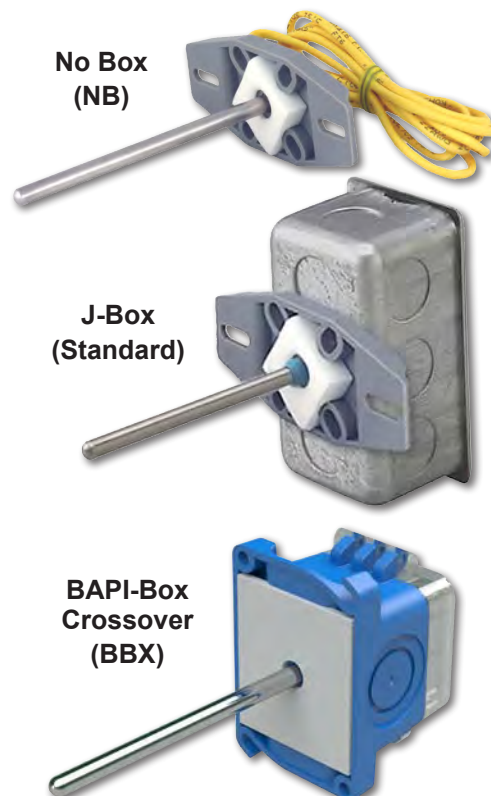
Features & Options

- 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.



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 105 °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:

UV-resistant polycarbonate, UL94, V-0

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.)





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 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 | \$35 |
| 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" Leads | \$0 |
| NB-5'..... No Box, 5' Leads | \$2 |
| NB-10'..... No Box, 10' Leads | \$4 |
| NB-15'..... No Box, 15' 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 | \$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/





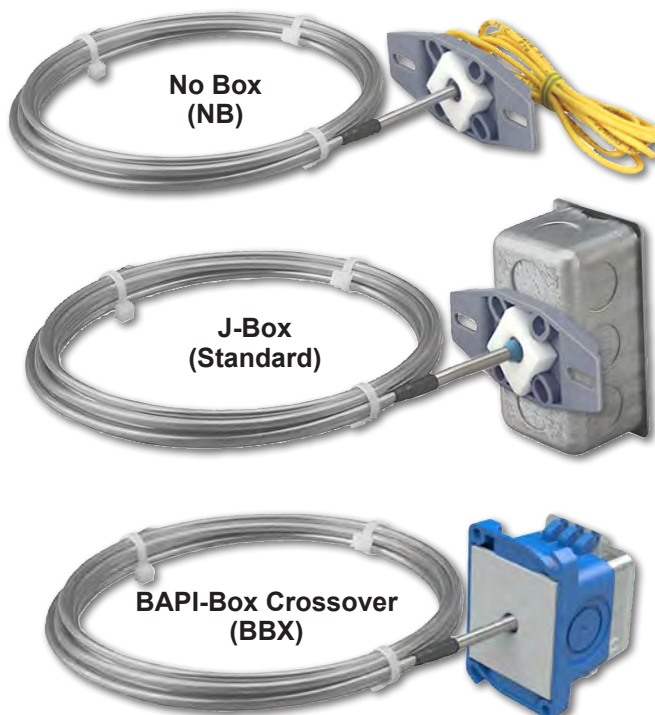
Features & Options

- Averaging Lengths: 8', 12' and 24'
- Three Enclosure Styles
- Limited Lifetime Warranty

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.



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:

Bendable Aluminum, 3/16" diameter

Enclosure Material:

Junction Box: Galvanized Steel

BAPI-Box Crossover:

UV-resistant polycarbonate, UL94, V-0

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.)





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 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 | \$35 |
| 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 | \$7 |

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.





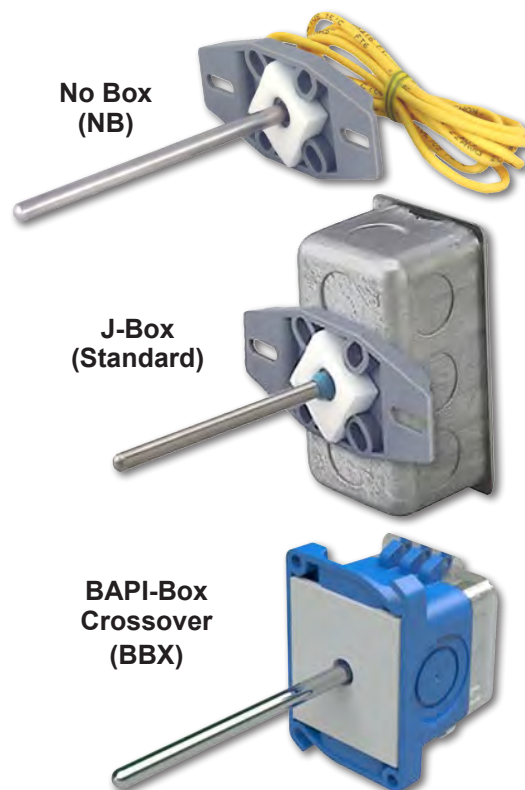
Features & Options

- 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:

UV-resistant polycarbonate, UL94, V-0

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.)





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.



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 | \$35 |
| 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 |
| <i>Matched Transmitters are also available. Contact your BAPI representative for ordering.</i> | |
| #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 | \$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/





Features & Options

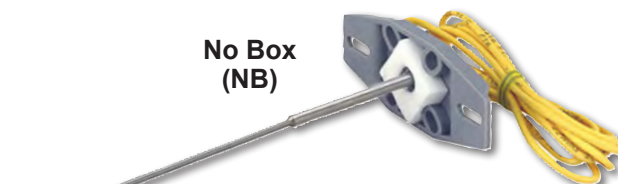
- 304 Stainless Steel Probes: 12", 18", 24", 36" & 48" lengths
- Very Thin Probe to Fit Between Coil Fins
- Three Enclosure Styles

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.

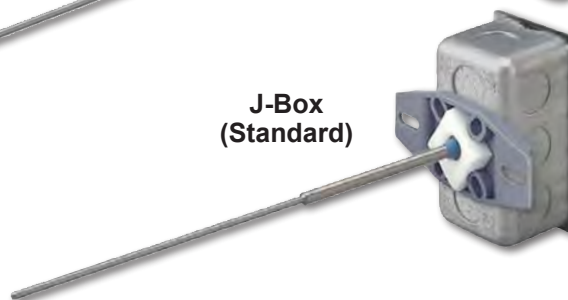
Submersible Duct Units are available in probe lengths of 12", 18", 24", 36" and 48". Custom probe lengths are also available.

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.

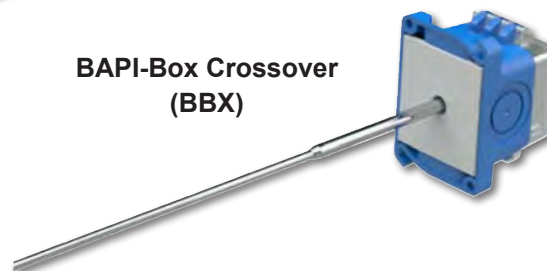
No Box
(NB)



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:

UV-resistant polycarbonate, UL94, V-0

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.)





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.



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 | \$35 |
| 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 | \$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.





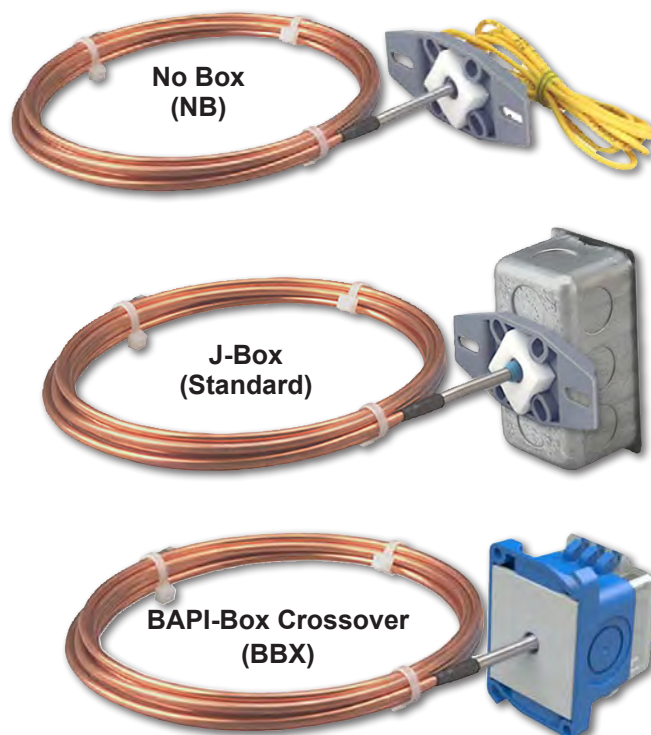
Features & Options

- 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:

UV-resistant polycarbonate, UL94, V-0

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.)





Submersible Averaging Temperature Sensors

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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.



Submersible 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 | \$35 |
| 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)

| | | |
|-------------|---|-------|
| SA-2' | Submersible Averaging, 2' (0.6m) length | \$120 |
| SA-4' | Submersible Averaging, 4' (1.2m) length | \$120 |
| SA-8' | Submersible Averaging, 8' (2.4m) length | \$135 |

#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 | \$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**) - (**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

List Price: \$18 (10K-2 Thermistor) + \$120 (Probe 2' Length) = \$138 List

Your Number: BA/

Gray shaded items follow the Buy and Resale Multiplier.



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



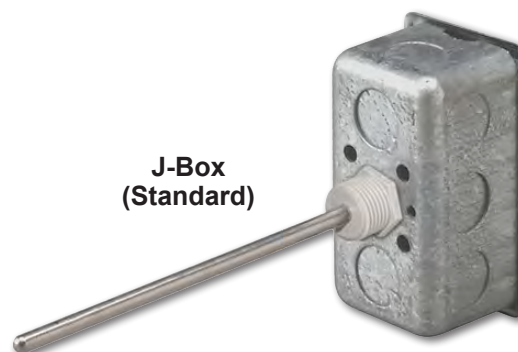
Features & Options

- 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

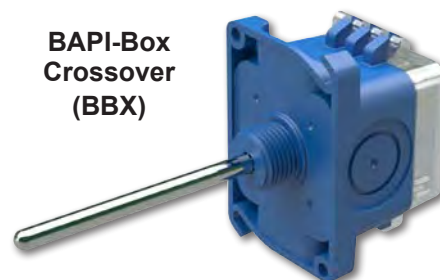
Immersion Units are available in 2", 4" and 8" probe lengths. The sensor is potted inside a 1/4" stainless steel probe with thermally conductive compound.

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 metal Weatherproof enclosure or the new BAPI-Box Crossover enclosure.



**J-Box
(Standard)**



**BAPI-Box
Crossover
(BBX)**

The BAPI-Box Crossover

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



(Shown with knockout plug sold separately.)

BAPI Thermowells

Immersion Unit Probes are designed to be inserted into a Thermowell. For more info on Thermowells, see page A40.



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:

UV-resistant polycarbonate, UL94, V-0

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.)





Immersion Probes w/ nylon fitting

Temperature Sensors

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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.



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 | \$35 |
| 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) | | |
|---|------------------------------------|-----|
| 1-2" | Immersion, 2" (51mm) length | \$7 |
| 1-4" | Immersion, 4" (102mm) length | \$7 |
| 1-8" | Immersion, 8" (203mm) length | \$7 |

| #3: Enclosure and Lead Length (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 | \$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**) - (**1-2"**) - (**BBX**) - ()

Actual Number (with parenthesis removed): BA/10K-2-1-2"-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/





Features & Options

- Probe Lengths: 2", 4" and 8"
(fit standard BAPI Thermowell lengths)
- Series 304 Stainless Steel Probes
- Double Encapsulated Sensors
- Two Optional Watertight 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.

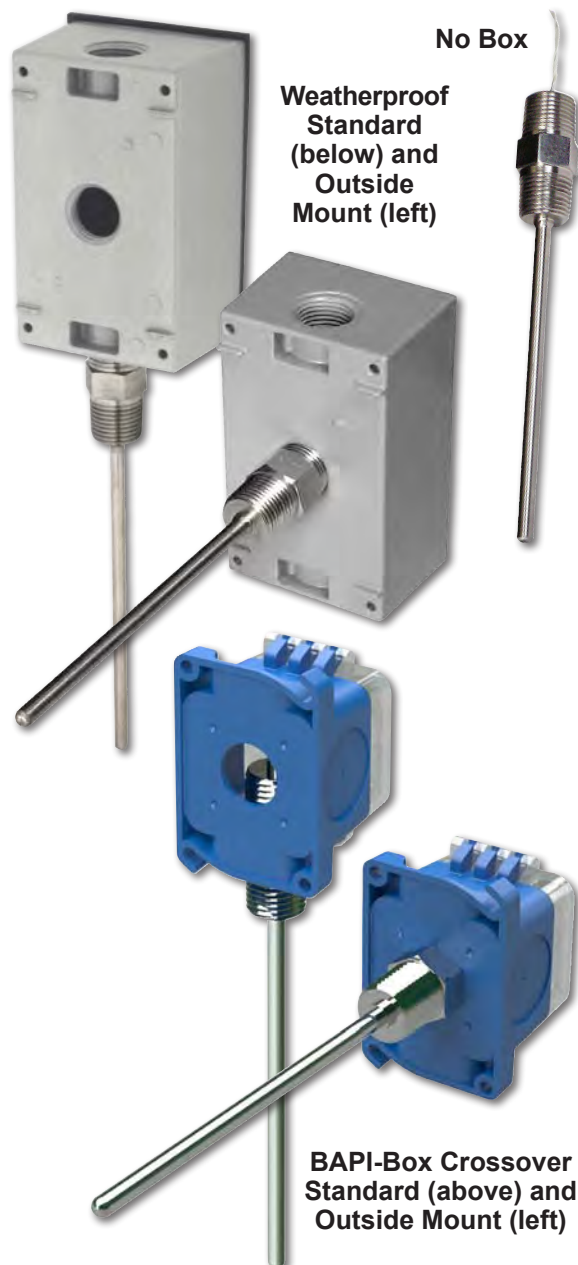
The sensors are potted inside the probe with a thermally conductive compound. All units have etched Teflon leadwires and double encapsulated sensors to create a watertight package that can withstand high humidity and condensation. Immersion Probes are available with a metal Weatherproof enclosure or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



Specifications

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

Enclosure Material:
Weatherproof: Cast Aluminum
BAPI-Box Crossover:
UV-resistant polycarb., UL94, V-0

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

Probe Material:
Stainless Steel, 1/4" diameter

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, turn to the end of the section.)





Immersion Probes w/ stainless steel fitting

Temperature Sensors

A39

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 | \$35 |
| 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"-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 |
| 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 | \$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/





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

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.

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.

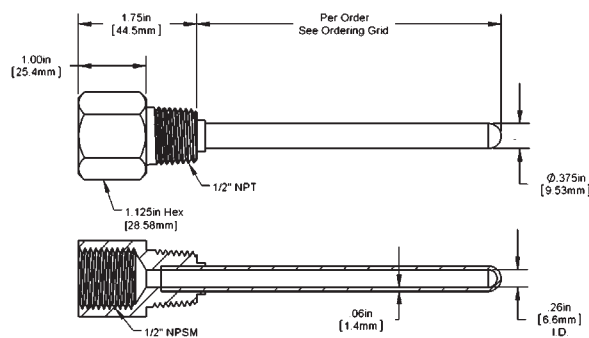


Machined Thermowell

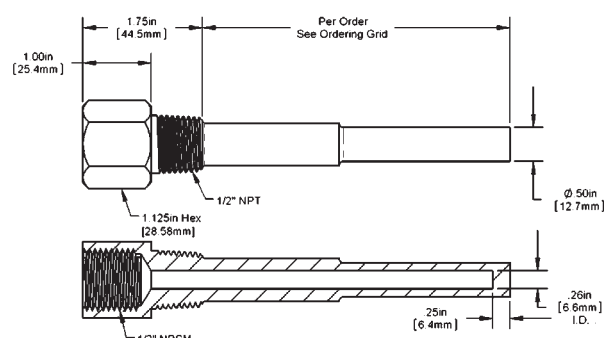


Two Part (welded) Thermowell

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)





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" | \$32 |
| BA/4"M304 | Machined 304 Stainless Steel - 4" | \$44 |
| BA/8"M304 | Machined 304 Stainless Steel - 8" | \$65 |
| BA/2"M316 | Machined 316 Stainless Steel - 2" | \$44 |
| BA/4"M316 | Machined 316 Stainless Steel - 4" | \$50 |
| BA/8"M316 | Machined 316 Stainless Steel - 8" | \$80 |
| BA/2"MB | Machined Brass - 2" | \$23 |
| BA/4"MB | Machined Brass - 4" | \$26 |
| BA/8"MB | Machined Brass - 8" | \$45 |

Note: Standard thread size is 1/2" NPT external, and 1/2" NPSM internal. 2" units have an insertion length of 2.5" (5.1 cm). 4" units have an insertion length of 4.5" (11.43 cm). 8" units have an insertion length of 7.5" (19.05 cm).

Gray shaded items follow the Buy and Resale Multiplier.

Comparing the Wake Frequency and the Resonant Frequency

Well failures, in most cases, are not due to the effects of pressure or temperature on the well. 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 wells are subjected. Fluid, flowing by the well, forms a turbulent wake (called the Von Karman Trail) which has a definite frequency, based on the diameter of the well and the velocity of the fluid. It is important that the well have sufficient stiffness so that the wake frequency will never equal the resonant (natural) frequency of the well itself. If the resonant frequency of the well coincided with the wake frequency, the well would vibrate to destruction and break off in the piping. Wells are also safe if the resonant frequency is well **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 well, 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 | - | - | - | - |
| Welded 304 S.S. | 982 | 820 | 675 | 604 | 550 | 510 | 299 |
| 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 |
| Welded 304 S.S. | Air/Steam | 169 | 61 | 20 |
| | Water | 88 | 20 | 10 |
| 304 S.S. | Air/Steam | 300 | 109 | 39.5 |
| | Water | 148 | 82.2 | - |

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





Boiler, Stack or Cryogenic

Features & Options

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

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

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

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

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

Specifications

Sensor Type: Platinum 1KΩ RTD (3.85 Ω/°C)

Reference Resistance: 1KΩ at 0°C

Operating Range: -328 to 1,112°F (-200 to 600°C)

Humidity: 0 to 100%, non-condensing

Standard Accuracy: 0.1% at 0°C

Wiring to Probe:

PTFE Jacketed Cable or Fiberglass Insulated Leadwire

[1] PTFE Jacketed, -328 to 32°F (-200 to 0°C)

[2] PTFE Jacketed, 77 to 500°F (25 to 260°C)

[3] Fiberglass Ins., 77 to 1,112°F (25 to 600°C)

Enclosure Material:

Weatherproof: Cast Aluminum

BAPI-Box Crossover:

UV-resistant polycarb., UL94, V-0

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)





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 1/4" Diameter, 316 SS Probe, double-ended 1/2" NPT | \$0 |
| I-4" 5.5" length of 1/4" Diameter, 316 SS Probe, double-ended 1/2" NPT | \$17.50 |
| I-8" 8.5" length of 1/4" 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 |

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 |

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

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

Description: 10K-2 Thermistor, 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.





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 new 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.

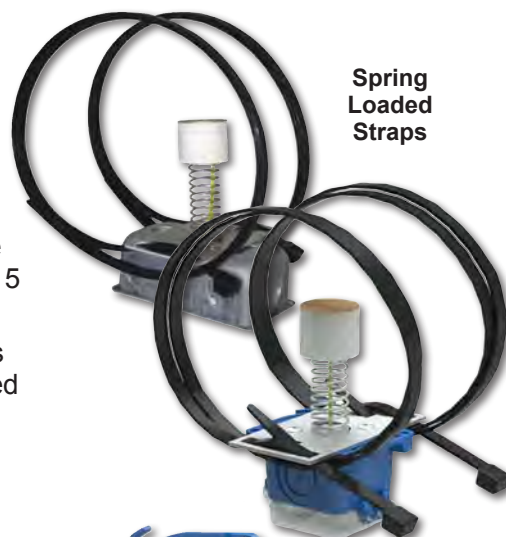
Spring-Loaded Strap – Instead of removing the pipe insulation, the spring loaded sensing pad is held against the pipe through a hole cut in the insulation. It can be used with 5 to 14.5" (13 to 37 cm) dia. pipes with up to 2" of insulation.

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.)



Clamp-On Units



Spring Loaded Straps



Remote Probe

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

Enclosure Material:

Junction Box: Galvanized Steel
BAPI-Box Crossover:
UV-resistant polycarb., UL94, V-0

Environmental Operation Range:

Temperature Sensor:
Clamp On: -40 to 85 °C,
Spring Loaded: -40 to 85 °C
Remote Probe: -40 to 105 °C
Temperature Transmitter: -20 to 70 °C
Humidity: 0 to 95%, non-condensing

Enclosure Rating:

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

Sensing Element:

Thermistor or RTD (See Sensors Section for Specs.)

Encl. Dimensions: H x W x D

BAPI-Box Crossover... 3.1 x 2.2 x 1.9" (79 x 56 x 49mm)
Junction Box: 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.)





Strap Units and Remote Probe Units

A45**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.



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 | \$35 |
| 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 & Enclosure (optional)

| | | |
|-------------------|---|------|
| 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 Rate 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 and Lead Length (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 | \$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/



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Features & Options

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

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

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



Outside Air Temperature Sensor in a BAPI-Box 2 Enclosure

Weather Shade

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



(See Accessories for more info.)

Specifications

Environmental Operation Range:

Temperature Sensor: -40 to 85 °C

Temperature Transmitter: -20 to 70 °C

Humidity: 0 to 100%, non-condensing

Sensing Element:

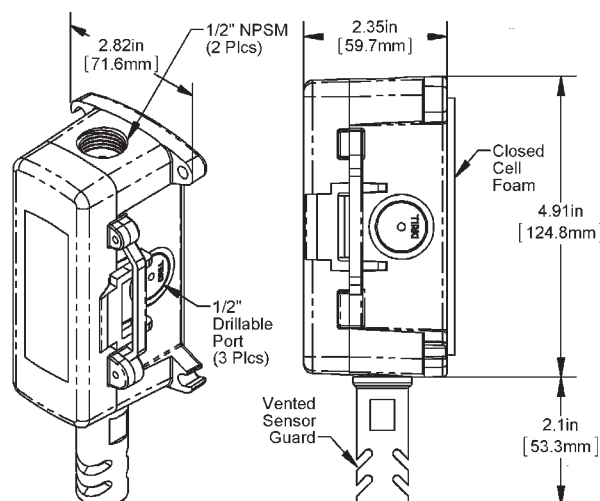
Thermistor or RTD

(See Sensors Section for Specs.)

Enclosure Rating: IP66, NEMA 4

Enclosure Material:

UV-resistant polycarbonate, UL94, V-0





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

Use the Option Selection 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 | \$35 |
| 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 | \$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/





Features & Options

- Etched Teflons Leads on Remote Sensors
- Plenum Cable or FEP Cable on Remote Probes
- Double Encapsulated Sensors on Remote Probes

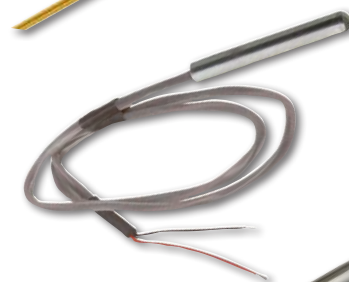
BAPI Remote Sensors feature a .75" long encapsulation shell and etched Teflon leads in lengths of 6", 18", 5', 10', 15', 20', and 25'. Remote Sensors are perfect for tight locations. Additional cable options, lead lengths and probe styles are available.

Remote Probes feature a 1.75" long stainless steel probe with either Plenum-Rated Cable or FEP Jacketed 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.



Remote Sensor with Epoxy Shell



Remote Probe with FEP Cable



Remote Probe with Plenum Cable



BAPI-Box Crossover (BBX)



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

Environmental Operation Range:

Temperature Sensor: -40 to 105 °C
 Temperature Transmitter: -20 to 70 °C
 Humidity: 0 to 100%, non-condensing

Probe Material:

Round Probe: Stainless Steel
 Concave Probe: Brass

Enclosure Material:

UV-resist. polycarb., UL94, V-0

BAPI-Box Crossover Enclosure Rating:

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)

(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 | \$35 |
| 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 - 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 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 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

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 |

#3: Enclosure and Lead Length

(optional, required for units with a transmitter)

| | | |
|-----------|---------------------------------|-----|
| BBX | BAPI-Box Crossover (IP10) | \$0 |
|-----------|---------------------------------|-----|

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/





Features & Options

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

The Concave Probes feature a 0.81" long brass encapsulation shell with a concave indentation so that they fit on the outside of pipes such as condensor lines. Remote Probes feature a 1.75" long stainless steel probe without an indentation.

Both probes come with FEP-jacketed cable in a choice of 5 colors and lead lengths.

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

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

The BAPI-Box Crossover

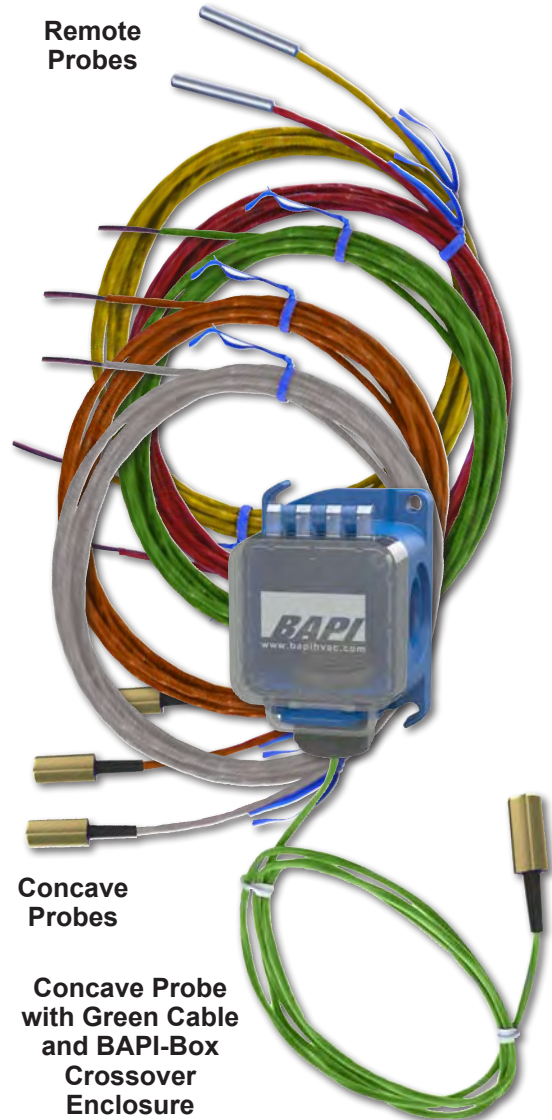
The new BAPI-Box Crossover enclosure features a hinged cover with thumb latch for



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 Probes



Concave Probes

Concave Probe with Green Cable and BAPI-Box Crossover Enclosure

Specifications

Environmental Operation Range:

Temperature Sensor: -40 to 105 °C

Humidity: 0 to 100%, non-condensing

Sensing Element:

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

Probe Material:

Remote Probe: Stainless Steel

Concave Probe: Brass

Enclosure Material:

UV-resist. polycarb., UL94, V-0

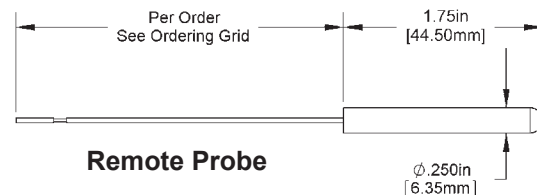
BAPI-Box Crossover Enclosure Rating:

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

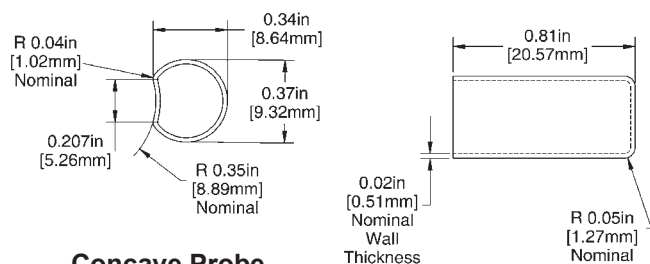
Encl. Dimensions: H x W x D

3.1 x 2.2 x 1.9" (79 x 56 x 49mm)

(For BAPI-Box Crossover dimension drawings, turn to the end of the section.)



Remote Probe



Concave Probe





Concave & Remote Probes with Colored Cable

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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 | \$35 |
| 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 - 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)

| | | |
|------------|---------------|-----|
| 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 |
|-----------|---------------------------------|-----|

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/



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

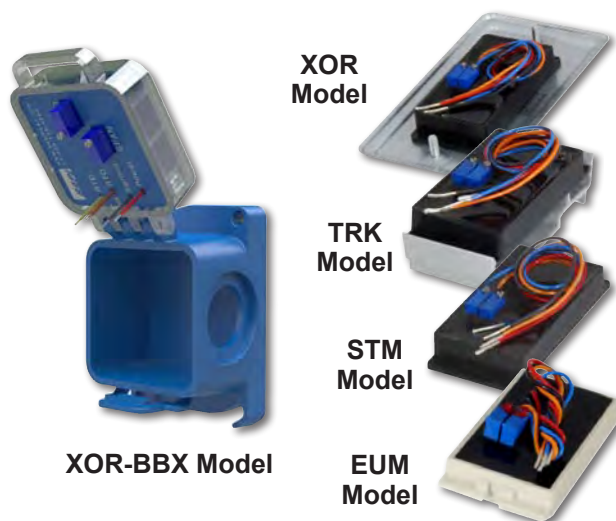


Features & Options

- 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.



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. 30°F (16.6°C), Max 1000°F (555°C)

Calibration Zero:

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

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:

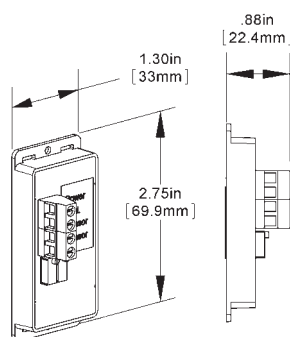
-4 to 158°F, (-20° to 70°C)
0 to 95% RH, Non-condensing

BAPI-Box Crossover Encl. Material:

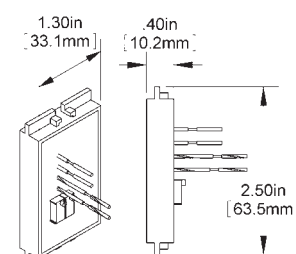
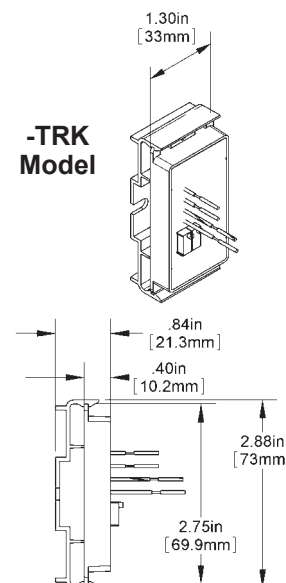
Polycarbonate, UL94V-0, UV-Rated

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

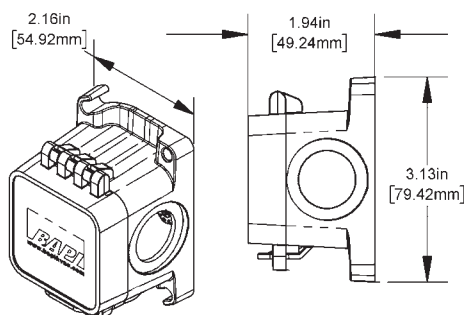
Agency: RoHS



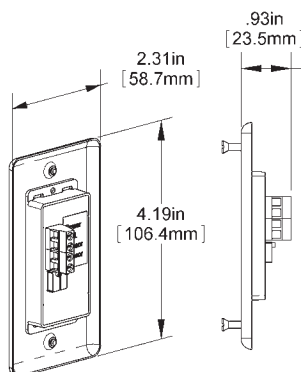
-STM Model
(shown with optional Terminal Strip)



-EUM Model



XOR-BBX Model



-XOR Model
(shown with optional Terminal Strip)





4 to 20 mA Temperature Transmitters

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Rev. 03/23/17

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.



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/





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 in Stainless Steel or Aluminum

The BAPI Thermobuffer Temperature Sensor is used to simulate more closely 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.



**Refrigerator
(1" Hanging
Bracket)**



**Walk-in Freezer
(BAPI-Box w/ 2"
Cylinder)**



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

Probe: Stainless steel

Wire: 22 awg stranded, 2 or 3 wires

Insulation:

Etched Teflon, PVC or FEP Jacketed

Buffer Chamber Construction:

M304.....Bar stock 304 Stainless Steel

MALBar stock Aluminum

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

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

Enclosure Material:

BAPI-Box Crossover..... Polycarb., UV rated, UL94 V-0

Hanging Bracket..... SS Bracket with Steel Clip

Environmental Operating Range:

Temp. Sensor -40 to 185°F (-40 to 85°C)

Temp. Transmitter.... -4 to 158°F (-20 to 70°C)

Humidity..... 0-100%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)

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

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





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 | \$35 |
| 1K.....1K Plat. RTD (385 curve) .. | \$25 |

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.

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 cable) | \$7 |

| #4: Enclosure Style (required) | |
|--|-----|
| BBX.....BAPI-Box Crossover (IP10, NEMA 1) | \$0 |
| 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 | \$7 |

Example Number:

BA/ (**10K-2**) - (**TB-M304-1**) - () - (**BBX**) - () - () = BA/10K-2-TB-M304-1-BBX6

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/





Features & Options

- Plenum-rated Etched Teflons 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 $\pm 0.36^{\circ}\text{F}$, ($\pm 0.2^{\circ}\text{C}$)
Probe Range -40° to 221°F (-40° to 105°C)

RTD:

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

Probe Material:

Rigid Stainless Steel, 0.25" OD

Probe Length:

1.75 to 48" or custom per order

Lead Wire:

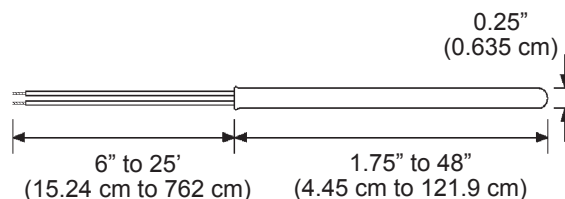
Twin lead 22awg stranded

Wire Insulation:

Etched Teflon, PVC or FEP Plenum Rated

Agency:

RoHS





Replacement Temperature Probes

A57

Rev. 12/14/16

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) - (#4) - (#5)

#1: Temperature Sensor (required)

| | | |
|------------------|------------------------------|------|
| 1K[375] | 1K Platinum RTD (375 curve). | \$25 |
| 1K[NI] | 1K Ω Nickel RTD | \$35 |
| 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 |

#3: Etched Teflon Leads (Optional)

| | | |
|---------------|-----------------------------------|------|
| 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 |

#4: Plenum-Rated Cable (Optional)

| | | |
|--------------|----------------------------------|------|
| 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 |

#5: FEP Jacketed Cable (Optional)

| | | |
|---------------|----------------------------------|------|
| 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 |

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**) - (**P-4.5"**) - (**TFE-18"**) - () - () - ()

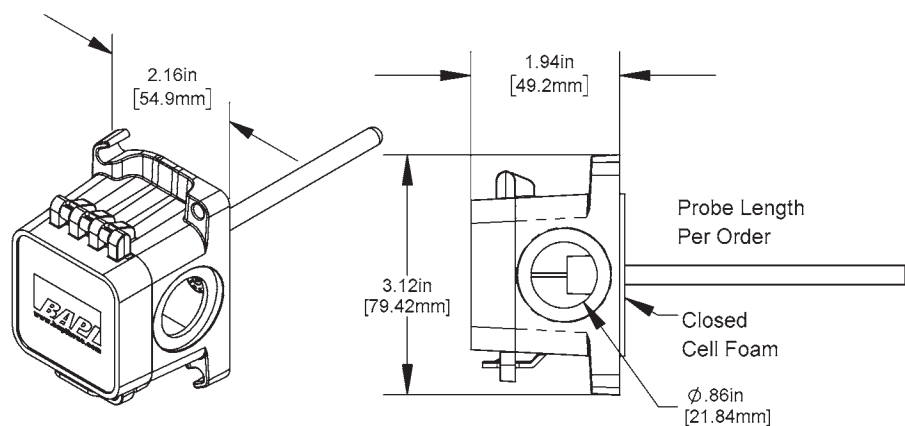
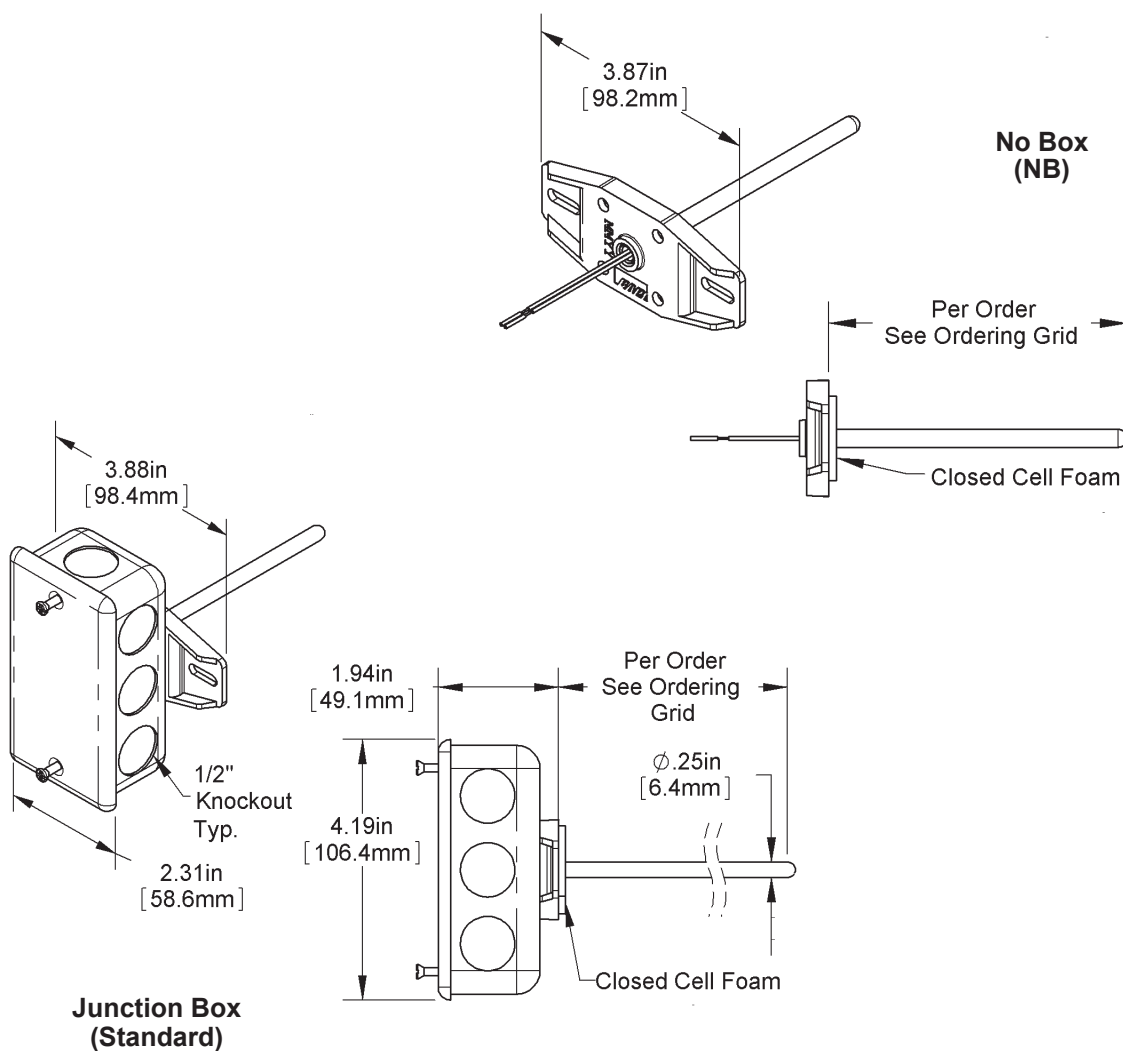
Actual Number (with brackets removed): BA/10K-2-P-4.5"-TFE-18"

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/





BAPI-Box Crossover (BBX)



Rev. 12/14/16

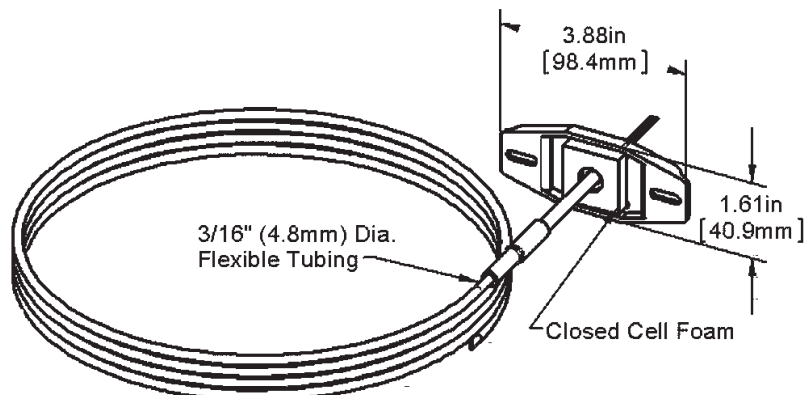
Duct Averaging Sensor Enclosures

Temperature Sensors

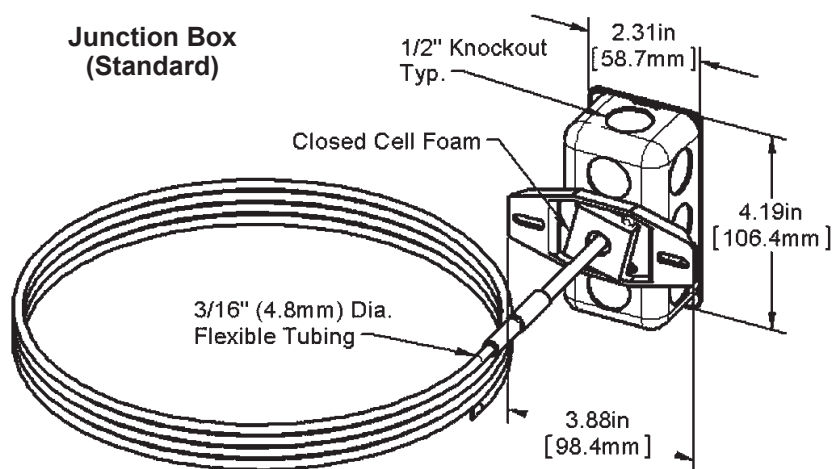
A61



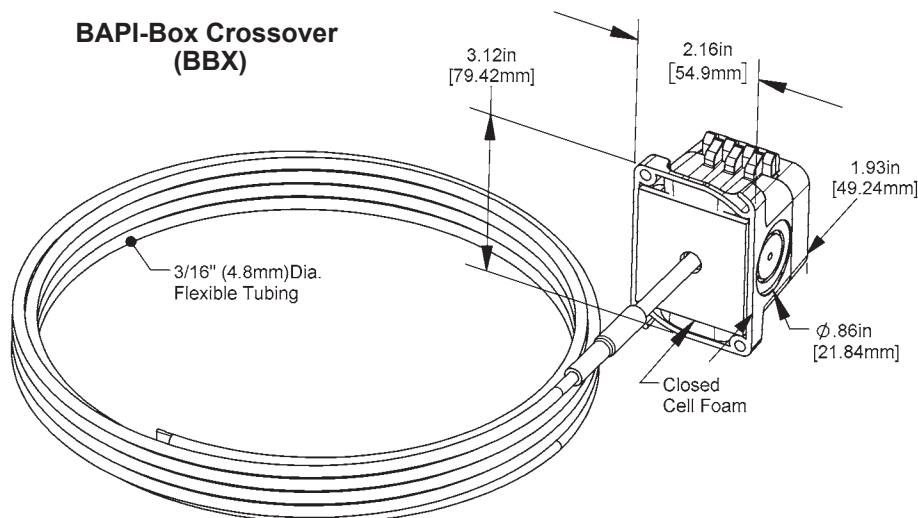
No Box (NB)

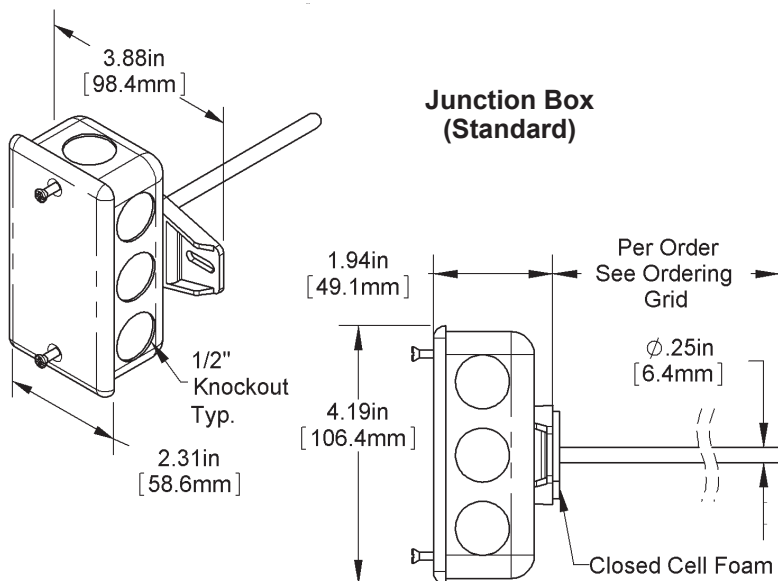
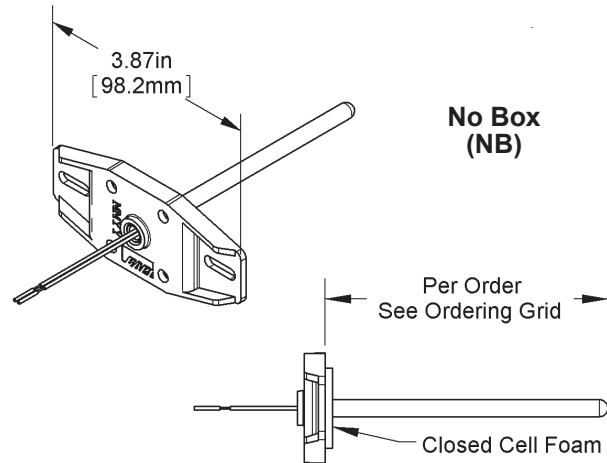


Junction Box (Standard)

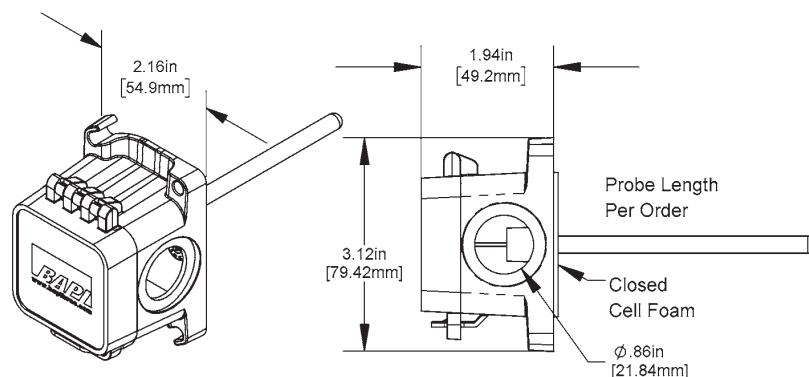


BAPI-Box Crossover (BBX)





BAPI-Box Crossover (BBX)



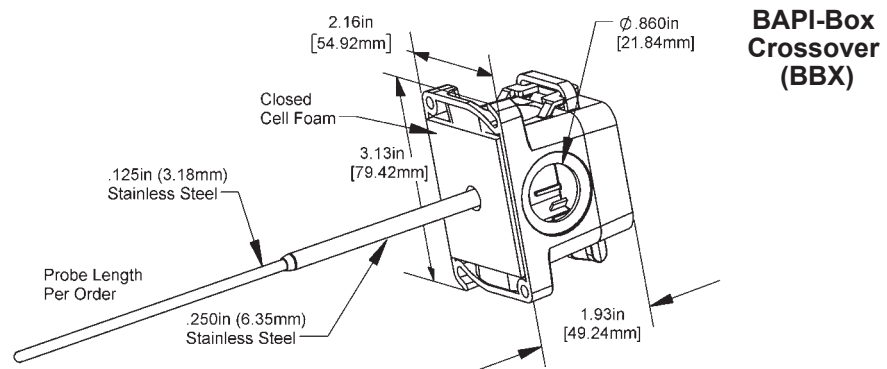
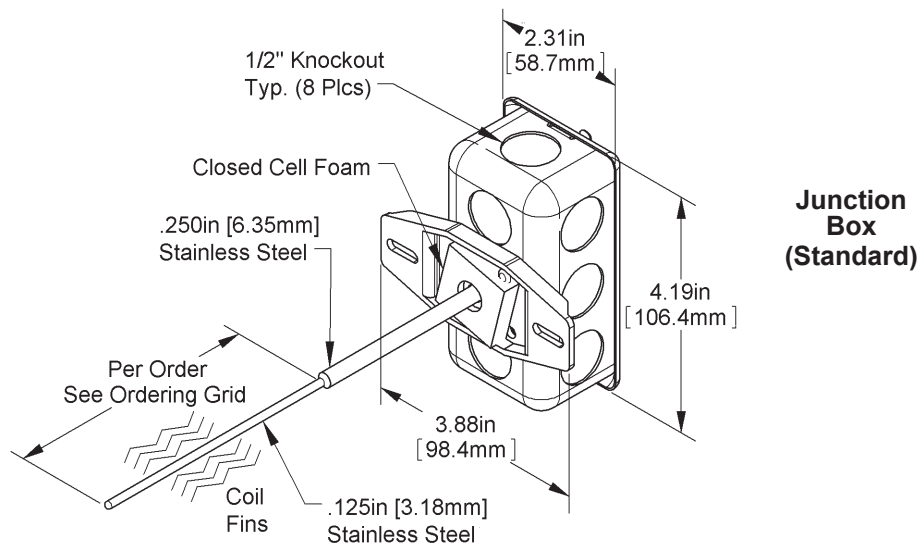
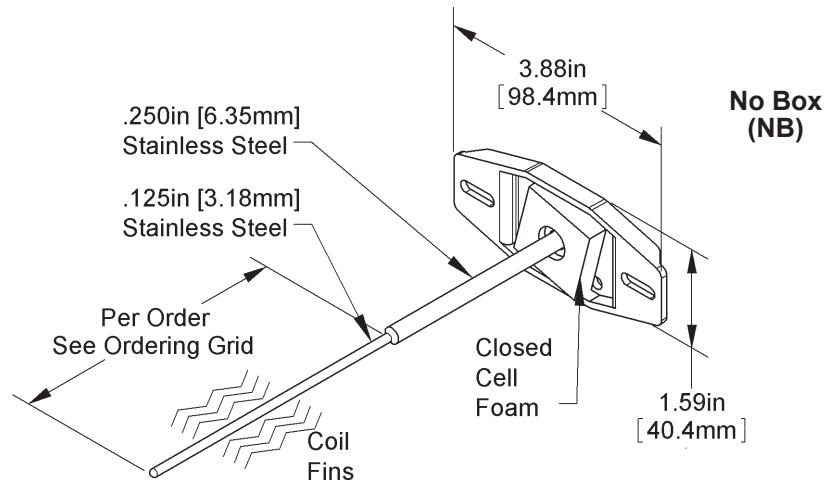


Submersible Duct Sensor Enclosures

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Rev. 12/14/16

Temperature Sensors

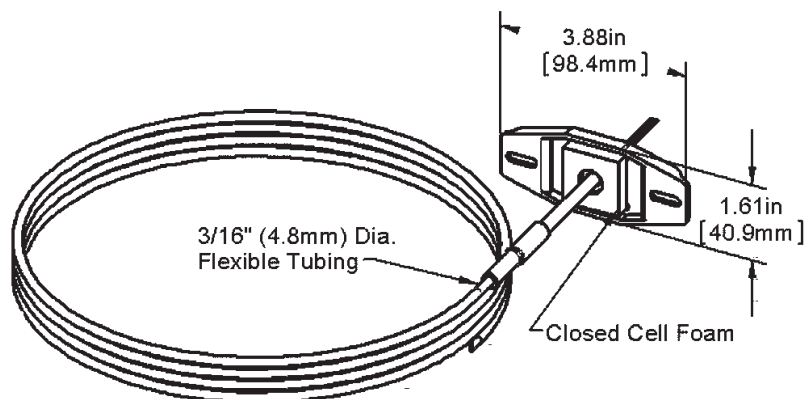


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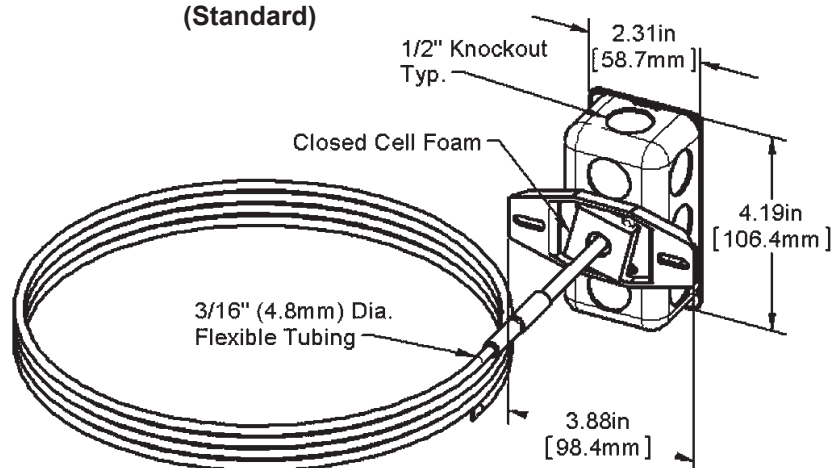
Tel: +1-608-735-4800 • Fax: +1-608-735-4804 • Email: sales@bapihvac.com • Web: www.bapihvac.com



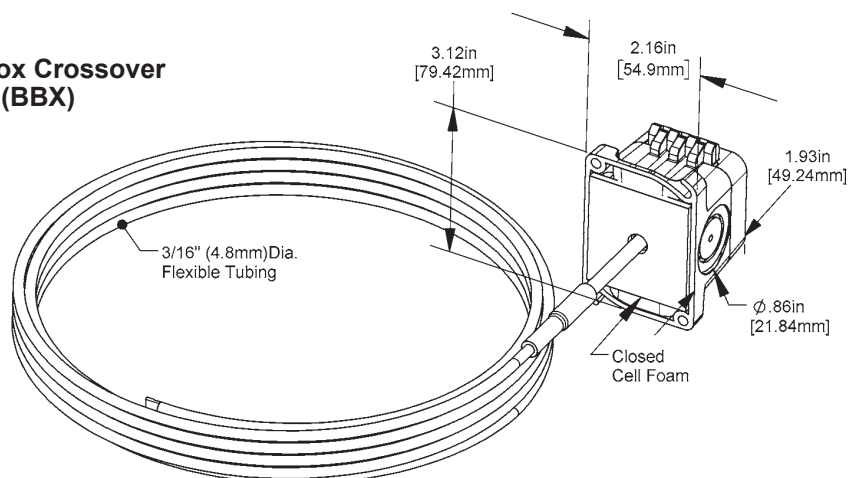
No Box (NB)



Junction Box (Standard)



BAPI-Box Crossover (BBX)



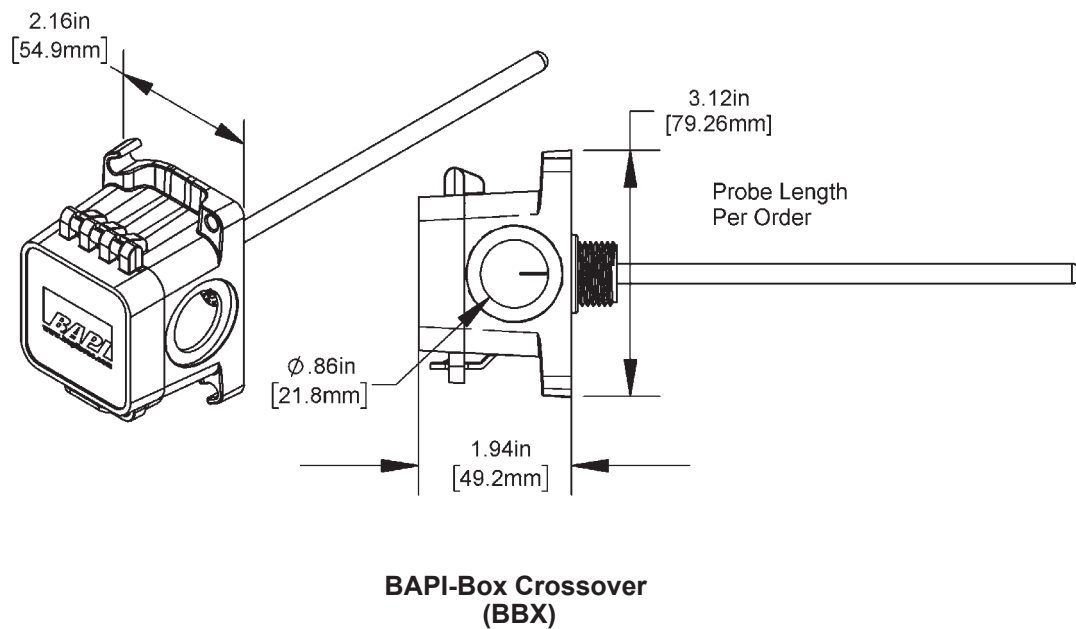
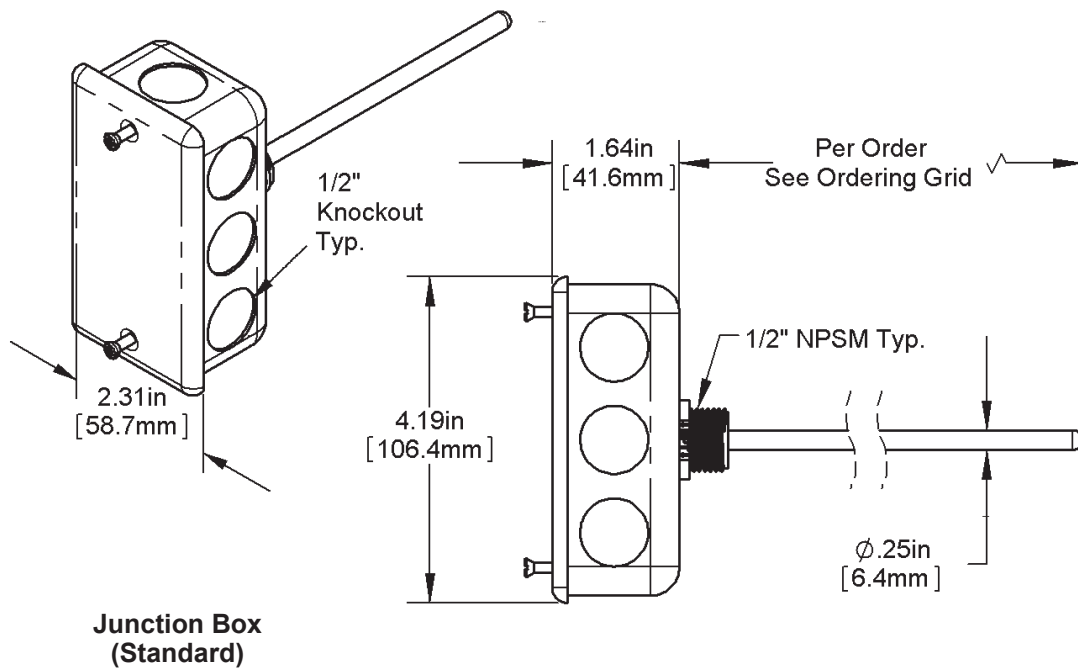


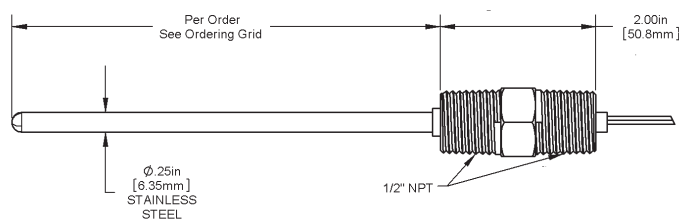
Immersion Probes w/ nylon fitting Enclosures

A65

Rev. 12/14/16

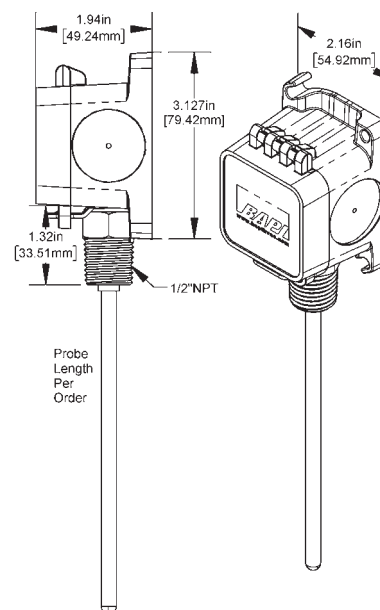
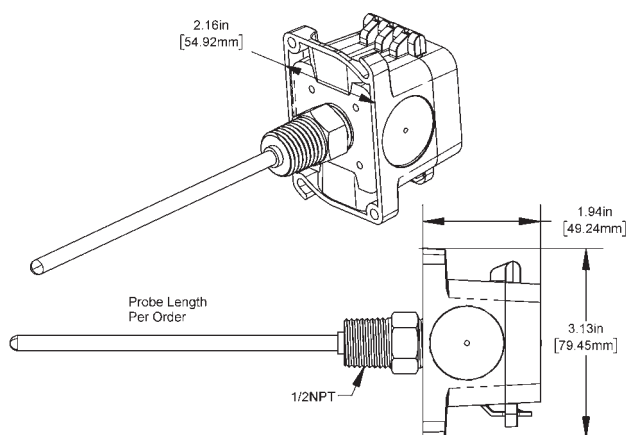
Temperature Sensors





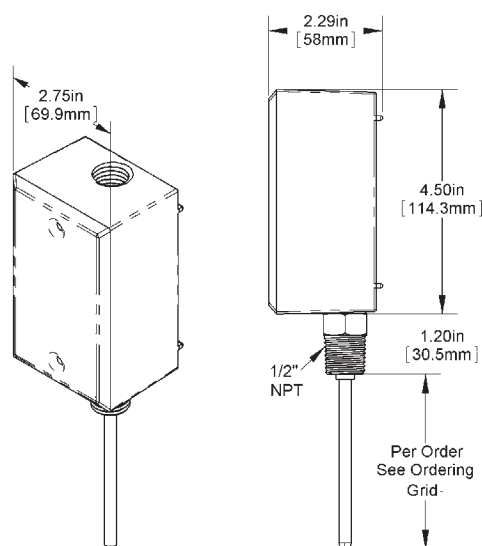
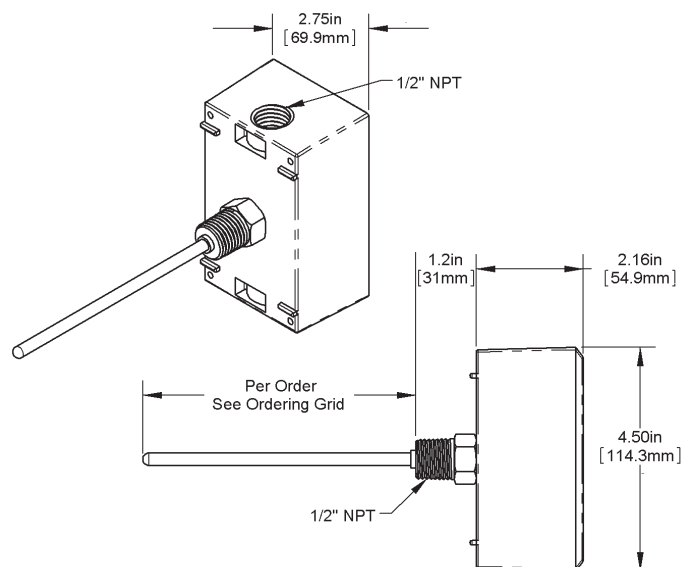
**Probe
without
Enclosure**

**BAPI-Box
Crossover
(BBX6)**



**BAPI-Box Crossover (BBX6)
in an "Outside Mount"
Configuration**

**Weatherproof
(WP)**



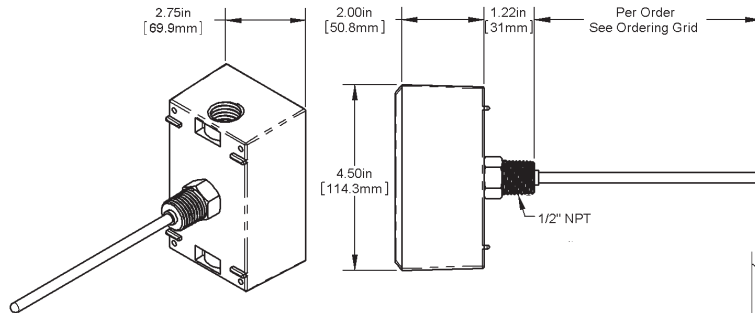
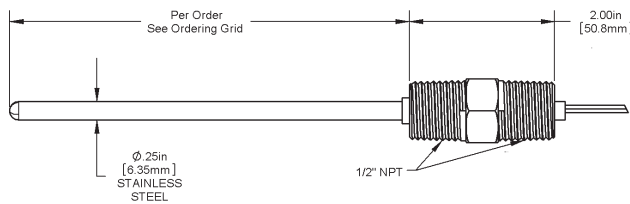
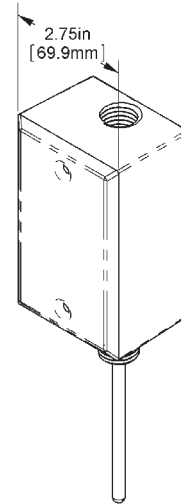
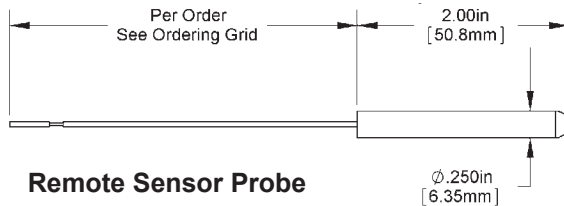
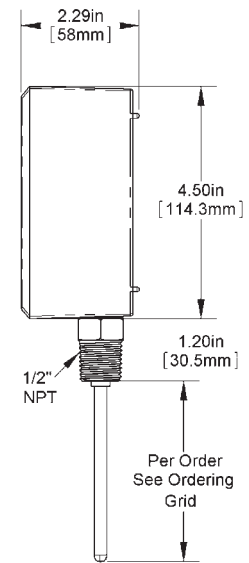
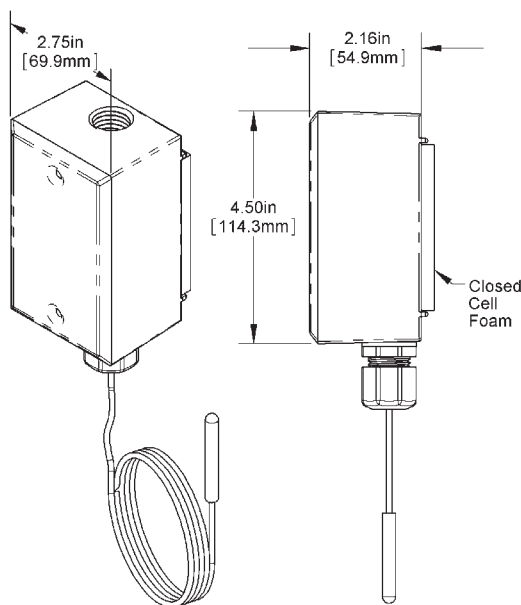
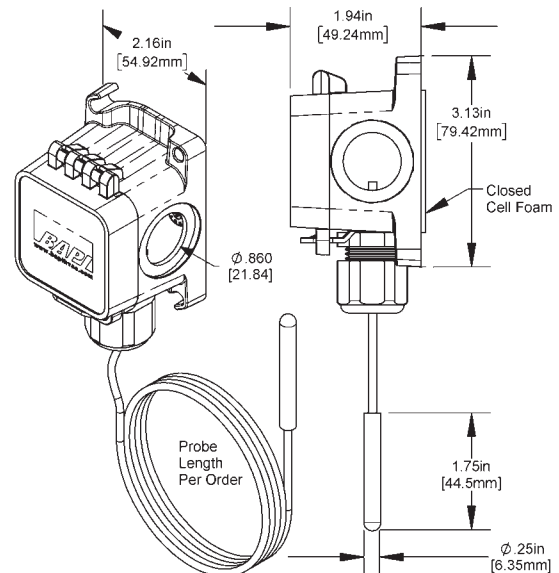
**Weatherproof (WPO) in an
"Outside Mount" Configuration**



Extreme Temp. Platinum RTDs - Immersion & Remote

A67

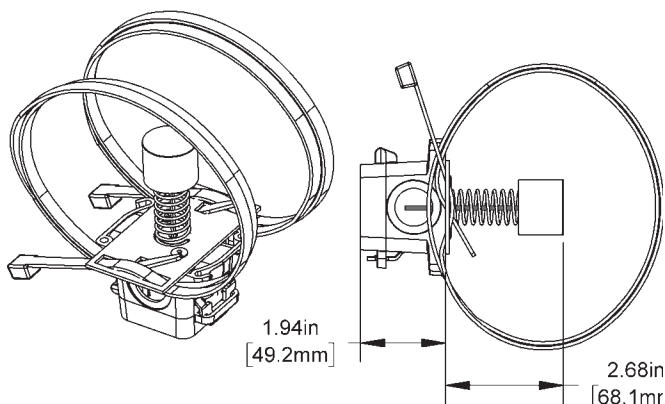
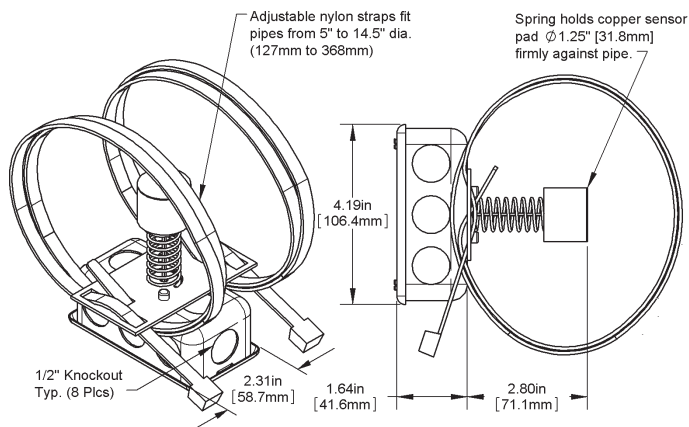
Rev. 7/12/17

Temperature Sensors**Immersion Weatherproof Standard Mount (WP)****Immersion Probe without Enclosure****Immersion Weatherproof Outside Mount (WPO)****Remote Sensor Probe****Remote Weatherproof (WP)****BAPI-Box Crossover (BBX)**



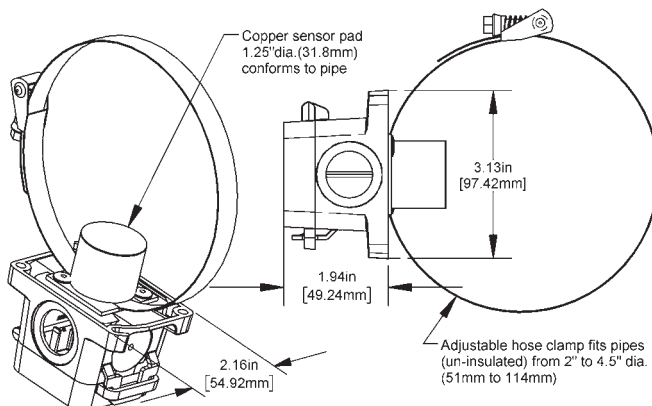
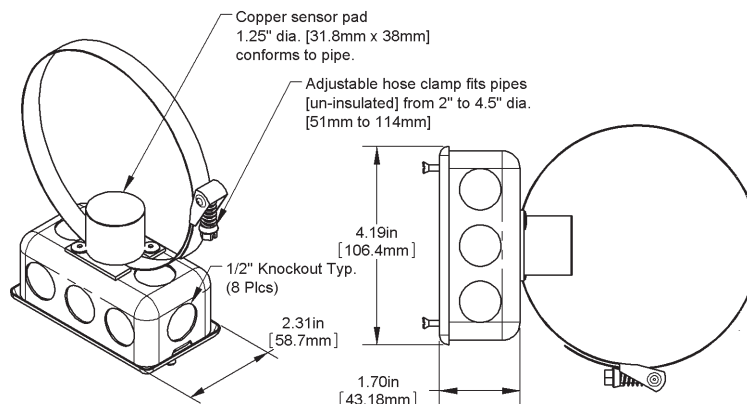
**For Remote
Probe
Dimension
Drawings,
See Page A69**

**Spring-Loaded
Strap Junction
Box (JB)**



**Spring-Loaded Strap
BAPI-Box Crossover
(BBX or BBX6)**

**Clamp-On
Strap
Junction
Box (JB)**



**Clamp-On
Strap BAPI-Box
Crossover
(BBX)**

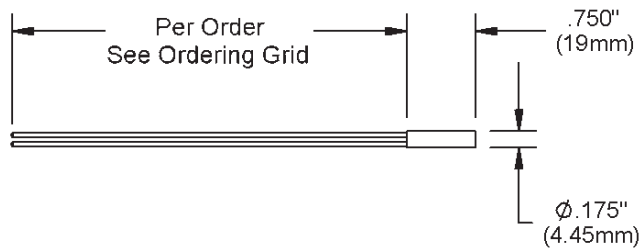


Rev. 12/14/16

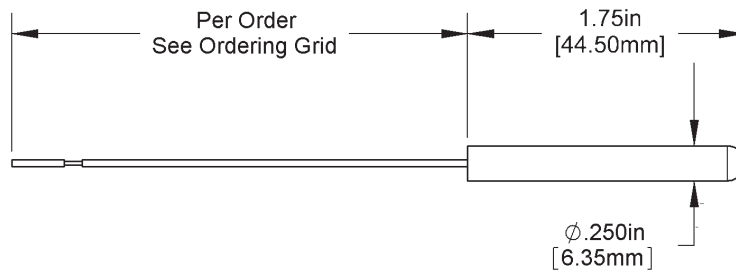
Remote Sensors & Probes

A69

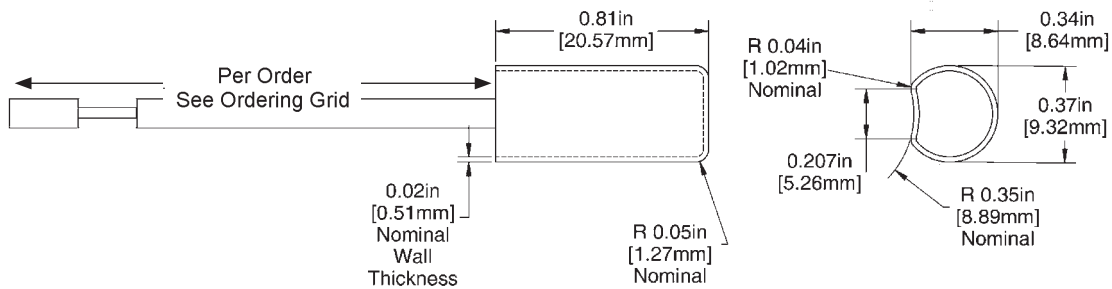
Temperature Sensors



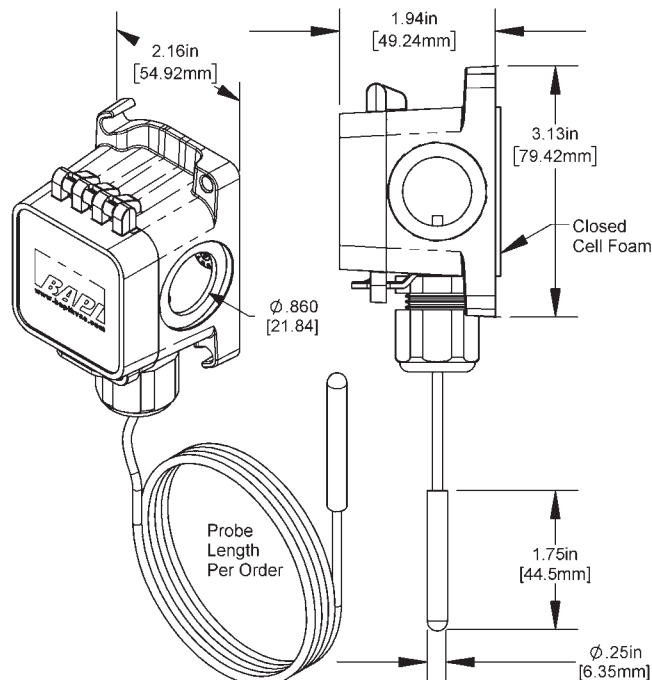
**Remote
Sensor
-PP**



**Remote
Probe
-RPP**

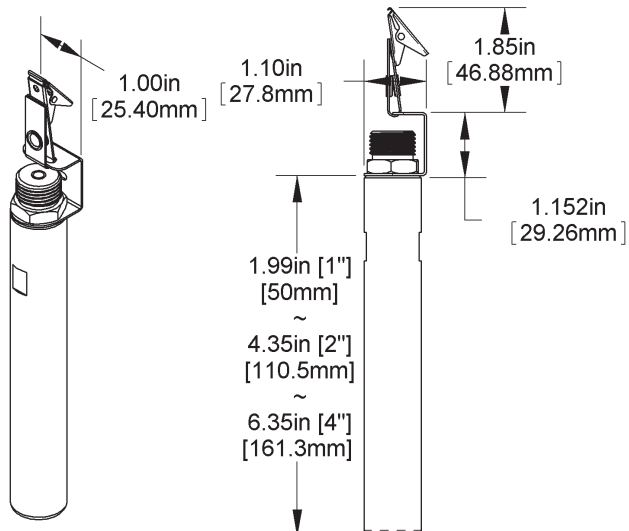


**Concave
Probe
-CPFEP**



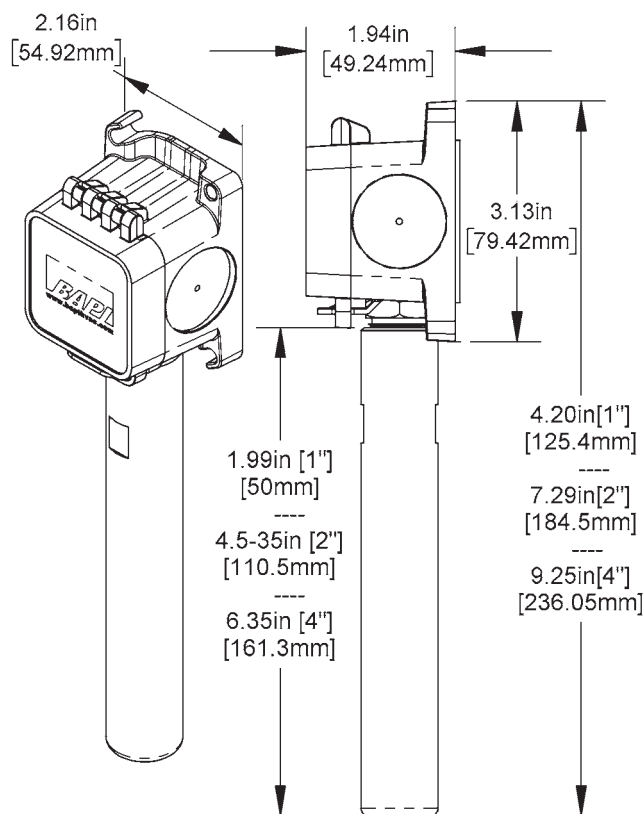
**BAPI-Box
Crossover
(BBX)**





**Hanging
Bracket
(HB)**

**BAPI-Box
Crossover
(BBX)**





Rev. 12/14/16

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Humidity & Combination Temp/Humidity Sensors

BAPI Humidity Only or Temperature/Humidity Sensors

BAPI-Stat "Quantum" Series of Room Sensors The Latest Sensor Innovation from BAPI



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BAPI-Stat 4 Large Display with Setpoint



pg B4

"Quantum" & BAPI-Stat 3 Wipedown Units for ORs



"Quantum Prime" - pg 6

BAPI-Stat 3 - pg 7

Delta Style Sensors with Optional Display



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"X-Combo" Temp & Humidity Setpoint



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BAPI-Com 2-Wire Sensor



pg B11

Dew Point Sensor with optional Temp Setpoint



pg B12

Vivarium Sensor Flush-mount Washdown Sensor



pg B14

Modbus Sensor in the BAPI-Stat 4



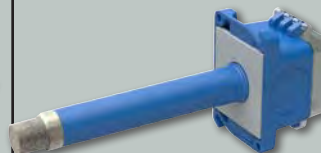
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Outside Air with new BAPI-Box Crossover



pg B18

Duct Sensor with new BAPI-Box Crossover



pg B20

"L-Combo" Temp & Humidity Lon Unit



pg B22





Features & Options

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

BAPI's new 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.

The optional occupancy override can be configured in parallel with the sensor or setpoint, or as a separate output. 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
"Quantum"
Room
Sensors

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

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 5 pair of 16 to 22 AWG*

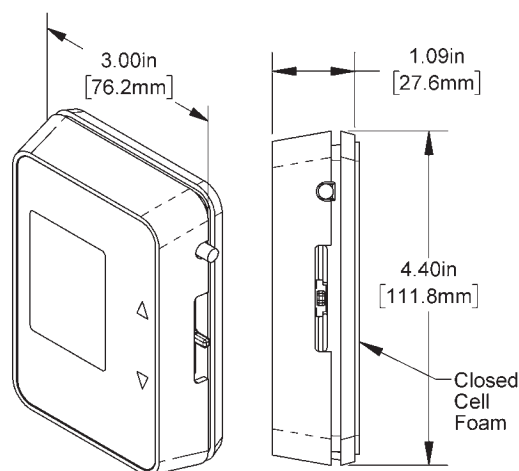
Mounting: Standard 2"x4" J-box or drywall mount - screws provided

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



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





BAPI-Stat "Quantum" Humidity Sensors

B3

Humidity or Combination Temp/Humidity Sensors

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

Ordering Information

*Select humidity output within brackets to complete salesname. A = 4 to 20mA, B = 0 to 5V, C = 0 to 10V

HUMIDITY ONLY, NO DISPLAY UNITS

LIST PRICE

BA/HQX-X-A-X-XX-X

BAPI-Stat "Quantum" Room Humidity Sensor, No Display, Humidity Output 4 to 20mA..... \$260

BA/HQX-X-B-X-XX-X

BAPI-Stat "Quantum" Room Humidity Sensor, No Display, Humidity Output 0 to 5V \$260

BA/HQX-X-C-X-XX-X

BAPI-Stat "Quantum" Room Humidity Sensor, No Display, Humidity Output 0 to 10V \$260

UNITS WITH °F DISPLAY

BA/HQF-X-[A/B/C]-X-XX-X

BAPI-Stat "Quantum" Room Sensor w/ Display, Humidity Output see note* \$295

BA/HQF-A-[A/B/C]-X-XX-X

BAPI-Stat "Quantum" Room Sensor w/ °F Display, 1K RTD Temp Sensor, Humidity Output see note* \$320

BA/HQF-B-[A/B/C]-X-XX-X

BAPI-Stat "Quantum" Room Sensor w/ °F Display, 10K-2 Thermistor Temp Sensor, Humidity Output see note* ... \$313

BA/HQF-C-[A/B/C]-X-XX-X

BAPI-Stat "Quantum" Room Sensor w/ °F Display, 10K-3 Thermistor Temp Sensor, Humidity Output see note* ... \$313

UNITS WITH °F DISPLAY AND TEMP SETPOINT & OVERRIDE

BA/HQF-A-[A/B/C]-1-D84-P

BAPI-Stat "Quantum" Room Sensor w/ °F Display, 1K RTD Temp Sensor, Humidity Output see note*,
Temp Setpoint 10K to 30K Output at 55 to 85°F Range, Override in Parallel w/ Setpoint \$331

BA/HQF-B-[A/B/C]-1-D84-P

BAPI-Stat "Quantum" Room Sensor w/ °F Display, 10K-2 Thermistor Temp Sensor, Humidity Output see note*,
Temp Setpoint 10K to 30K Output at 55 to 85°F Range, Override in Parallel w/ Setpoint \$324

BA/HQF-C-[A/B/C]-1-D84-P

BAPI-Stat "Quantum" Room Sensor w/ °F Display, 10K-3 Thermistor Temp Sensor, Humidity Output see note*,
Temp Setpoint 10K to 30K Output at 55 to 85°F Range, Override in Parallel w/ Setpoint \$324

UNITS WITH °C DISPLAY

BA/HQC-X-[A/B/C]-X-XX-X

BAPI-Stat "Quantum" Room Sensor w/ Display, Humidity Output see note* \$295

BA/HQC-A-[A/B/C]-X-XX-X

BAPI-Stat "Quantum" Room Sensor w/ °C Display, 1K RTD Temp Sensor, Humidity Output see note* \$320

BA/HQC-B-[A/B/C]-X-XX-X

BAPI-Stat "Quantum" Room Sensor w/ °C Display, 10K-2 Thermistor Temp Sensor, Humidity Output see note*... \$313

BA/HQC-C-[A/B/C]-X-XX-X

BAPI-Stat "Quantum" Room Sensor w/ °C Display, 10K-3 Thermistor Temp Sensor, Humidity Output see note*... \$313

UNITS WITH °C DISPLAY AND TEMP SETPOINT & OVERRIDE

BA/HQC-A-[A/B/C]-1-D84-P

BAPI-Stat "Quantum" Room Sensor w/ °C Display, 1K RTD Temp Sensor, Humidity Output see note*,
Temp Setpoint 10K to 30K Output at 13 to 30°C Range, Override in Parallel w/ Setpoint..... \$331

BA/HQC-B-[A/B/C]-1-D84-P

BAPI-Stat "Quantum" Room Sensor w/ °C Display, 10K-2 Thermistor Temp Sensor, Humidity Output see note*,
Temp Setpoint 10K to 30K Output at 13 to 30°C Range, Override in Parallel w/ Setpoint..... \$324

BA/HQC-C-[A/B/C]-1-D84-P

BAPI-Stat "Quantum" Room Sensor w/ °C Display, 10K-3 Thermistor Temp Sensor, Humidity Output see note*,
Temp Setpoint 10K to 30K Output at 13 to 30°C Range, Override in Parallel w/ Setpoint..... \$324

Call for additional options not listed above. Common Ground configuration is the default.



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





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 Warm
White and Gray
Logo Plates**

**5
YEAR
WARRANTY**

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*

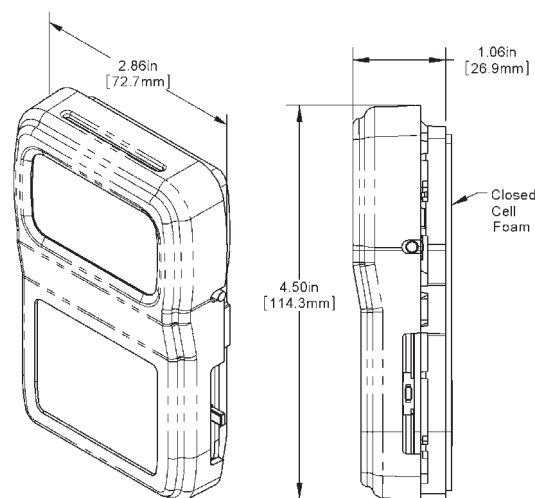
Mounting: Standard 2"x4" J-box or drywall mount
- screws provided

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.





BAPI-Stat 4™ Style Humidity Sensor

Humidity or Combination Temp/Humidity Sensors

B5

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) - (#10)

#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 10 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 | \$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: Setpoint Output Range (optional)

| | |
|----------|--------------------|
| 60 | 0 to 10 kΩ |
| 80 | 0 to 20 kΩ |
| 81 | 4.75 k to 24.75 kΩ |
| 82 | 6.19 k to 26.19 kΩ |
| 84 | 10 k to 30 kΩ |

#6: Setpoint Legend (required)

| | |
|----------|-----------|
| L6 | Cool/Warm |
| L0 | No Legend |

#7: Occupant Override (required)

| | | |
|---------|--|-----|
| J | Override as a Separate Output | \$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 |
|----------|---------------|

#10: Logo Plate Color

| | |
|-----------|--------------------------------|
| WMW | Warm White (matches enclosure) |
| GRY | Gray |

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) - (C35L) - (CG) - (WMW)

Actual Number (with parenthesis removed): BA/1K-2-H205-B4DF-E80-L6-N-C35L-CG-WMW

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, 3.5mm Phono Style Comm. Jack, Common Ground Config., Warm White Logo Plate Color

List Price:

\$18 (Thermistor) + \$260 (Humidity) + \$35 (Display) + \$5 (Override) + \$10 (Comm. Jack) = \$328 List Price

Your Number: BA/



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Features & Options

- New 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.



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



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

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. SensorPassive RTD or Thermistor

Inputs:

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

Sensing Elements for Active Outputs and Display:

Temperature 10K-2 Thermistor
 Humidity.....Capacitive Polymer, ±2%RH

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

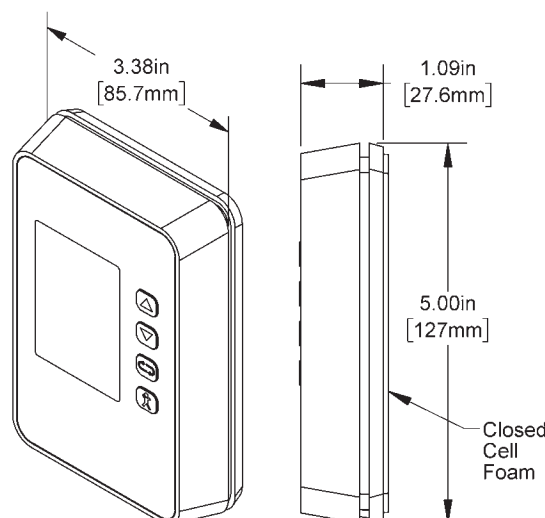
Environmental Ambient:

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

Wiring: 2 to 6 pair of 16 to 22 AWG

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

Agency: RoHS



*AC power requires a separate pair of shielded wires.

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





Rev. 12/12/16

BAPI-Stat 3™ Temp/Humidity Unit

*Humidity or Combination Temp/Humidity Sensors***B7**

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.



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, $\pm 2\%$ RH (10% to 90%)
 @25°C, Fully Compensated

Temp: Semiconductor Band Gap, $\pm 0.3^\circ\text{C}$ @ 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

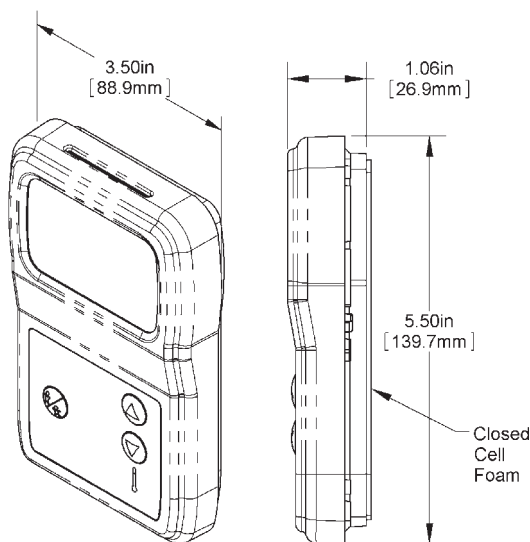
Environmental Specifications:

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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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), 20 to 80%RH

%RH Calibration Adjustment: ±5% POT

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

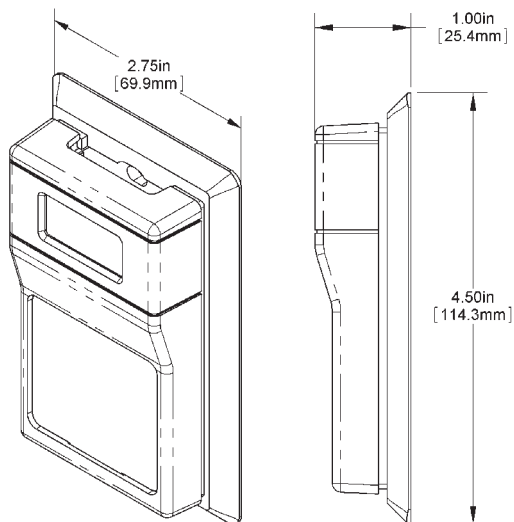
Mounting: 2"x4" J-box or drywall mount - screws provided

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



*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.





Delta Style Room Humidity Units

Humidity or Combination Temp/Humidity Sensors

B9

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 | \$240 |
| H210 | 0 to 10 Output | \$240 |
| H212 | 2 to 10V Output | \$240 |

#3: Display and Indication (required)

| | | |
|----------|--------------------|------|
| RD | With Display | \$35 |
| R | No Display | |

#4: Communication Jack (optional)

| | | |
|------------|-------------------------------|------|
| C35L | 3.5 mm Phono Style Jack | \$10 |
|------------|-------------------------------|------|

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**) - ()

Actual Number (with parenthesis removed): BA/10K-2-H200-RD-C35L

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

List Price: \$18 (Thermistor) + \$240 (Humidity) + \$35 (Display) + \$10 (Comm. Jack) = \$303 List Price

Your Number: BA/





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.

Temp & Humidity Setpoint Adjustment



**BAPI-Stat 4
"X-Combo"
Units with
Warm White
and Gray
Logo Plate**

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

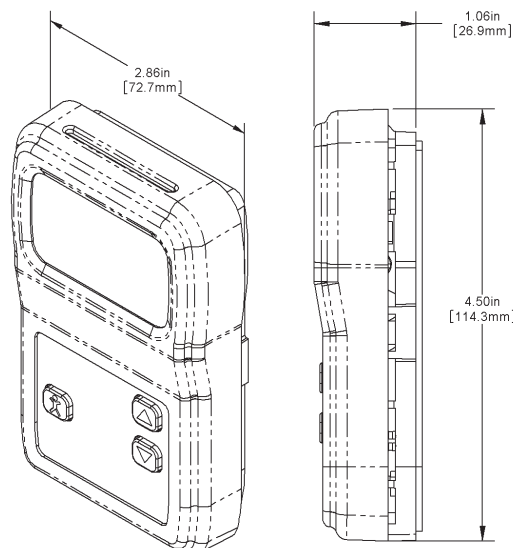
Enclosure Material: ABS Plastic, UL94V-0

Ambient (Enclosure):

Temperature: .32 to 122°F (0 to 50°C)

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

Agency: RoHS



*AC power requires a separate pair of shielded wires.

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





Rev. 12/16/16

BAPI-Com, Two-wire Multifunction Sensor

Humidity or Combination Temp/Humidity Sensors

B11

Features & Options

- Power and Communication on Just Two Wires
- Available with Temperature Setpoint and Optional Override, Display and %RH Sensing
- Thermistor, Voltage, Resistance or Dry Contact Outputs
- Up to 500 Foot Wire Runs — Perfect for Existing Wires

Many existing buildings have two wire sensors that lack the features people expect in today's sophisticated systems. The BAPI-Com uses those existing two wires and offers the owner a full function sensor with temperature setpoint, occupant override, an optional easy-to-read display and optional %RH sensing.

This retrofit sensor can update old systems to a new look without pulling new wire or disrupting the occupants while saving on labor.

The sensors are powered and communicate over two wires to a Communication Output Module for use by a BAS system. The outputs are configurable as a thermistor, voltage, resistance or dry contact override output. The sensor is powered by the Communication Output Module which itself is supplied by any 24VDC/VAC source.



BAPI-Com Room Sensors & Communication Output Module

Ordering Information

The BAPI-Com 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

ROOM SENSOR SPECS

Power: 18VDC, from the Comm. Output Module

Wiring: 2 wires, Up to 500ft (new or existing)

AWG gauge: 22 to 14AWG (Shielding Preferred)

Temp Sensor: Thermistor, $\pm 0.36^{\circ}\text{F}$ ($\pm 0.2^{\circ}\text{C}$)

RH/Temp Sensor Construction:

Communicating Integrated Circuit

Humidity: Capacitive Polymer, $\pm 2\%$ RH

(10 to 90%) @25°C, Fully Compensated

Temp: Semi-conductor Band Gap, $\pm 0.3^{\circ}\text{C}$ @ 25°C

Pole Rate: 400 ms

Ambient:

32 to 122°F (0 to 50°C),

0 to 95%RH, non-condensing

COMMUNICATION OUTPUT MODULE SPECS

Power in: 24VDC/AC, 30mA

Terminations:

Comm. & PWR 2 wires to the sensor

Power in..... 2 wires, 12 to 28 AWG

Output..... 2 wires per output, 12 to 28 AWG

Override Input..... 2 wires, 16 to 30 AWG

Outputs:..... Three Maximum

Volts..... 0 to 5 or 0 to 10VDC, 10k Ω min

Resistance..... 400 Ω to 20K Ω span

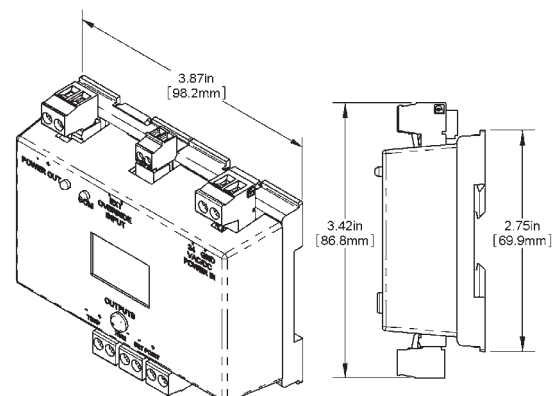
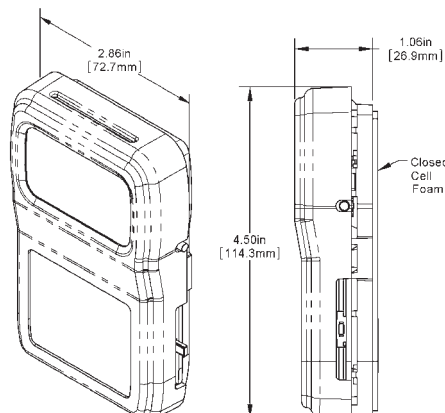
Thermistor 10K-2 or 10K-3

Input (DI): Ext. Override Dry Contact,

Closed = Occupied

EZ Mounting: DIN Rail, Snaptrack or surface

Material:..... ABS Plastic, UL94V-0, RoHS



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Features & Options

- Accurate Dew Point and Dry Bulb Temperature in One Unit
- $\pm 1.8^{\circ}\text{F}$ (1°C) Dew Point Accuracy for the Normal Range
- No Installation Calibration or Recalibration Required

The green revolution is increasing the use of chilled beams and chilled ceilings in commercial buildings. Chilled water is pumped through hollow beams or special hollow ceiling tiles. Radiation cools the space eliminating air handlers, VAV boxes, fan-coil units and the energy to run them.

The temperature of the chilled water has to be regulated above the space's air dew point temperature. If the beam or ceiling temperature is below the space's dew point, they will "sweat", causing mold and dripping water.

BAPI's Dew Point Sensor is an easy and economical way to measure the dew point temperature. The unit is available with an optional display, temperature setpoint slider and an occupant override pushbutton. The large LCD can display Dew Point Temperature and Dry Bulb Temperature and is field adjustable between $^{\circ}\text{F}$ or $^{\circ}\text{C}$.



Dew Point Sensors with Setpoint, Display and Override

Specifications

Power: 15 to 35 VDC @ 4 mA max

Sensing Element:

Humidity – Capacitive Polymer,
 $\pm 2\%$ RH Accuracy, 10% to 90% @ 25°C

Optional Temperature Sensor

Thermistor or RTD

(See "Sensors" Section for Specs.)

Mounting:

2"x4" J-Box or drywall mount, screws provided

Dew Point Temperature Range:

-4 to 122°F (-20 to 50°C)

Operating Environment:

Temperature: 32 to 122°F (0 to 50°C)

Humidity: 0 to 95%RH non-condensing

Response Time: Less Than 60 Seconds

Display: 3.5 digit numeric (Dew Pt & Dry Bulb Temp)

Measurement Offsets (field adjustable)

$\pm 5^{\circ}$ (F or C) in 0.1° or 0.5° increments – DB

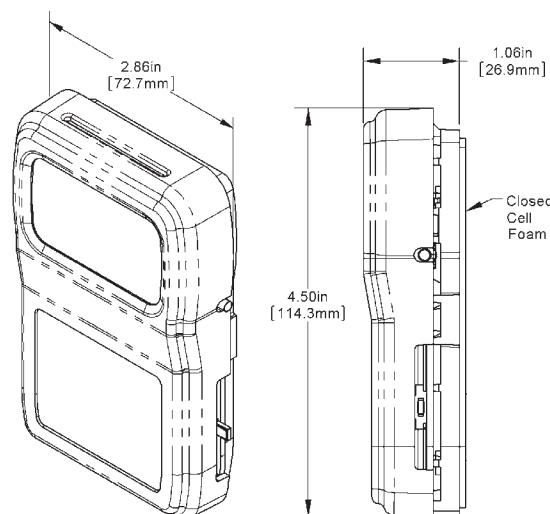
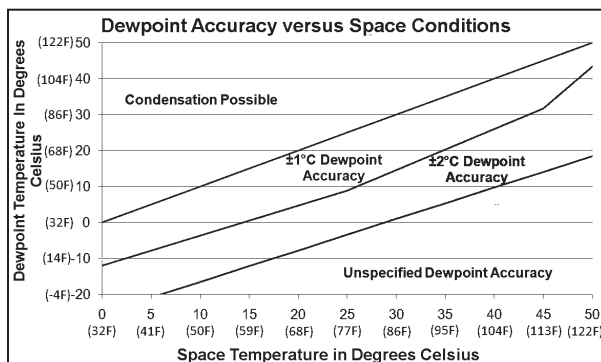
$\pm 5\%$ RH in 0.1% or 0.5% increments – RH

Analog Output (0 to 5 or 0 to 10VDC, 1K Ω impedance)

Dew Point Temperature: -4 to 122°F (-20 to 50°C)

Material: ABS Plastic, Material Rated UL94V-0

Certifications: CE, RoHS



Note: 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.





Rev. 12/16/16

Dew Point Sensor

Humidity or Combination Temp/Humidity Sensors

B13Submittal 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: Dew Point Output** (required)

DP05..... 0 to 5V Dew Point Output\$260
 DP10..... 0 to 10V Dew Point Output\$260

#2: 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

#3: Display and Indication (required)

B4DF..... Temperature Displayed in °F.....\$35
 B4DC..... Temperature Displayed in °C\$35
 B4DX..... No Display

#4: Setpoint Display Range (optional)

A..... -3 to +3
 B..... -5 to +5
 C..... 50 to 90 °F or 10 to 32 °C
 D..... 55 to 85 °F or 13 to 30 °C
 E..... 60 to 80 °F or 15 to 27 °C
 F..... 65 to 80 °F or 18 to 27 °C

#5: Setpoint Output Range (optional)

60..... 0 to 10 kΩ
 80..... 0 to 20 kΩ
 81..... 4.75 k to 24.75 kΩ
 82..... 6.19 k to 26.19 kΩ
 84..... 10 k to 30 kΩ

#6: Setpoint Legend (required)

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

#7: Occupant Override (required)

J..... Override as a Separate Output
 N..... Override in Parallel (//) with Sensor
 P..... Override in Parallel (//) with Setpoint
 Z..... No Override

#8: Communication Jack (optional)

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

#9: Logo Plate Color (required)

WMW..... Warm White (matches enclosure)
 GRY..... Gray

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/ (**DP05**) - (**10K-2**) - (**B4DF**) - (**E**)(**80**) - (**L6**) - (**N**) - () - (**WMW**)

Actual Number (with parenthesis removed): BA/DP05-10K-2-B4DF-E80-L6-N-WMW

Description: 0 to 5V Dew Point Output, 10K-2 Thermistor Temperature Sensor, BAPI-Stat 4 Unit with Display and °F Indication, 60 to 80°F Setpoint Display Range, 0 to 20KΩ Setpoint Output Range, Cool/Warm Setpoint Legend, Override in Parallel with Sensor, Warm White Logo Plate Color

List Price: \$260 (Dew Point) + \$18 (Thermistor) + \$35 (Display) = \$313 List Price

Your Number: BA/



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Features & Options

- Flush Mount Stainless Steel Wall Plate for Washdown Applications
- Temperature and Humidity Combination Sensor
- Optional Remote Display for Temp and Humidity Setpoint Adjustment and Alarms
- 30 Day Data Logging

The Vivarium Wall Plate features a flush mount stainless steel wall plate with internal splash guard for washdown applications. The chamber behind the vented slots on the stainless steel plate, protects the sensing element while allowing necessary airflow for accurate sensing. It is available as a humidity sensor alone or as a temperature/humidity combination sensor.

The optional Remote Wireless Display allows for temperature and humidity setpoint adjustment, room monitoring, data logging and alarm notification. Alarm notification can be accomplished through an audible alarm located on the remote display.

Typical applications for the unit include vivariums, greenhouses, pharmaceutical laboratories, food production, schools and hospitals.



Vivarium Wall Plate Sensor and Remote Wireless Display



Specifications

STAINLESS STEEL WALL PLATE SPECS

Power:

7 to 35 VDC or 12 to 28 VAC* (0 to 5V outputs)

15 to 35 VDC or 15 to 28 VAC* (0 to 10V outputs)

*AC power requires a separate pair of shielded wires.

Power Consumption:

14 mA max @ 12VDC; .28 VA maximum AC

RH/Temp Sensor Construction

Communicating Integrated Circuit

Humidity: Capacitive Type, $\pm 2\%$ RH, 0 to 90% @23°C

Temp: Semi-conductor Band Gap, $\pm 0.2^\circ\text{C}$, 0 to 60°C

Optional Direct Temperature Sensor:

Thermistor or Semiconductor

Wiring: 4 to 8 22AWG flying leads**

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

REMOTE WIRELESS DISPLAY

Power: 120 VAC converted to 5.25V with the provided Micro USB Power Supply

Power Consumption: 2.4 Amps

Mounting: Drywall Mount or Self Standing

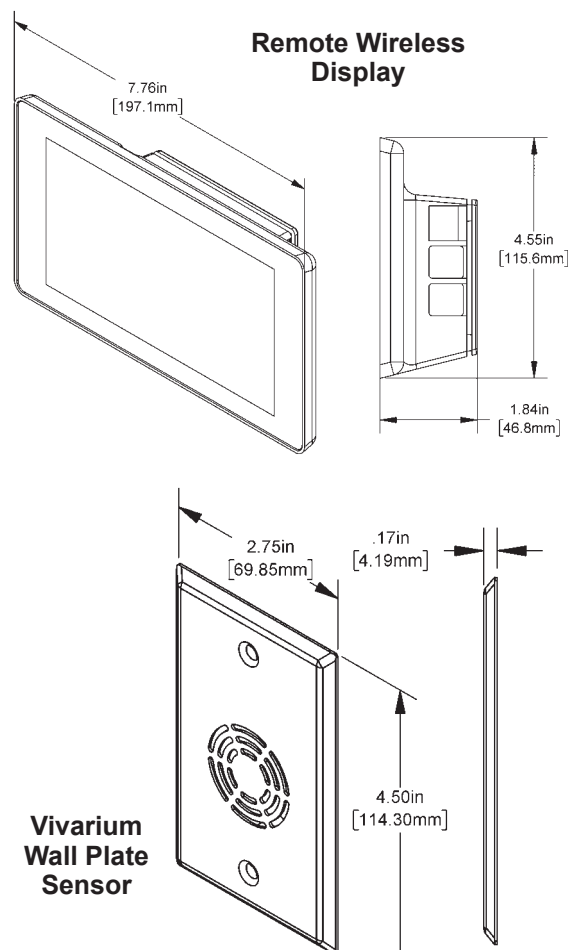
SPECS FOR WALL PLATE AND DISPLAY

Environmental Operation Range:

Temperature: 0 to 120 °F (-18 to 49 °C)

Humidity: 0 to 95%, non-condensing

Agency: RoHS and FCC



Vivarium Wall Plate Sensor





Vivarium Washdown Wall Plate Sensor

B15

Rev. 03/17/17

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.

Vivarium Unit Option Selection Guide:

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

#1: Direct Temperature Sensor or Temperature Voltage Output (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
 00 0 to 5 V
 10 0 to 10 V
 X No Temperature Sensor

#2: Temperature Voltage Output Span (required)

G 45 to 96F or 7 to 36C
 C 50 to 90F or 10 to 32C
 D 55 to 85F or 13 to 30C
 E 60 to 80F or 16 to 26C
 GG 0 to 100F or -18 to 38C
 TT 0 to 100F or -18 to 49C
 X No Temp Voltage Output Span

#3: Humidity Voltage Output (required)

B 0 to 5 V (0 to 100%RH)
 C 0 to 10 V (0 to 100%RH)

#4: Remote Wireless Display (required)

D Remote Display, includes wall mount bracket and power cord
 X No Remote Wireless 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

Example Number: BA/V(00)(E) - (C) - (D)

Actual Number (with parenthesis removed): BA/V00E-C-D

Description: Vivarium Wall Plate, 0 to 10V Temperature Output, 60 to 80°F Temperature Voltage Output Span, 0 to 10V Humidity Output, with Remote Display.

List Price: Call for Pricing

(Wall Plate units starting at \$550 List Price. Remote Wireless Display option starting at \$800 List Price.)

Your Number: BA/





Features & Options

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

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

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

VC350A "EZ" - Voltage Converter

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



BAPI-Stat
4MB
Units

Specifications

Power:

9 to 40 VDC (24 VDC nominal)

24 VAC +20%/-30%.

Note: AC power requires a separate pair of shielded wires.

Power Consumption:

7 mA max DC; .28 VA maximum AC

Sensing Element:

Thermistor or Semiconductor

Sensor Accuracy:

Temp: $\pm 0.2^{\circ}\text{C}$ from 32 to 122°F (0 to 50°C)

%RH: $\pm 2\%$ RH @ 25°C (77°F), 20 to 80%RH

Wiring: 2 pair of 14 to 22 AWG*

Mounting:

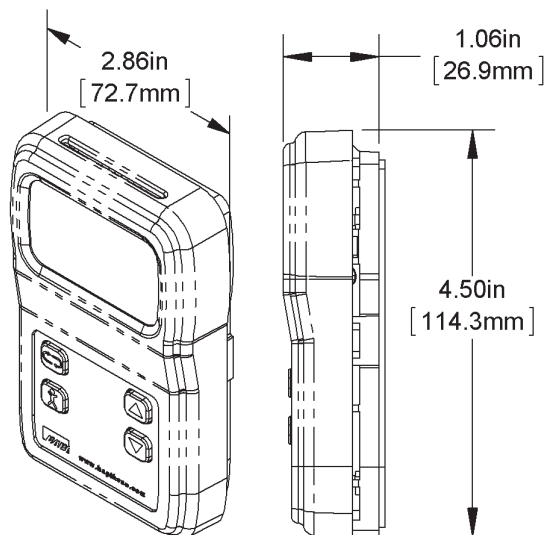
Standard 2" by 4" J-box
or drywall mount (screws provided)

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.





BAPI-Stat 4 Modbus Room Sensor

B17

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



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.

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.)

BAPI-Box 2 Enclosure



BAPI-Box Enclosure

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



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 | \$35 |
| 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 | $\pm 2\%$ Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA | \$240 |
| H210 | $\pm 2\%$ Humidity Transmitter with 0 to 10 V Output | \$240 |
| H212 | $\pm 2\%$ Humidity Transmitter with 2 to 10 V Output | \$240 |
| H300 | $\pm 3\%$ Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA | \$240 |
| H310 | $\pm 3\%$ Humidity Transmitter with 0 to 10 V Output | \$240 |
| H312 | $\pm 3\%$ 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/





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.

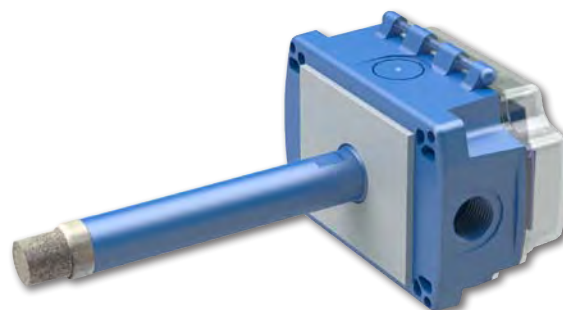
The Duct Units are also extremely dependable, featuring two of the most watertight enclosures available today. The BAPI-Box and BAPI-Box Crossover Enclosures are made of UV-resistant polycarbonate and carry an IP66 rating. The BAPI-Box is only available for units with a temperature transmitter and a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

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.

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 | \$35 |
| 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 $\pm 2\%$ Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA | \$240 |
| H210 $\pm 2\%$ Humidity Transmitter with 0 to 10 V Output | \$240 |
| H212 $\pm 2\%$ Humidity Transmitter with 2 to 10 V Output | \$240 |
| H300 $\pm 3\%$ Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA | \$240 |
| H310 $\pm 3\%$ Humidity Transmitter with 0 to 10 V Output | \$240 |
| H312 $\pm 3\%$ 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/





Features & Options

- Optional LCD with User Selectable °C or °F Display
- 2% RH Accuracy with Full-range Temp Compensation
- Optional Setpoint Adjustment and Occupancy Override



The Echelon compatible “L-Combo” Room Unit features measurement of local temperature and relative humidity. Units with an LCD can also display outdoor temperature and outdoor humidity.

Additional options include Temperature Setpoint, Humidity Setpoint and Local Override. An onboard Neuron® chip allows connection directly to a LONWORKS® network using star, bus, or loop topology. The LCD can toggle between temperature and humidity at a user adjustable rate, and the user can select °C or °F.



L-Combo Unit with Setpoint & Override

Ordering Information

| <u>Part Number</u> | <u>Description</u> | <u>List Price</u> |
|--------------------|--|-------------------|
| BA/LC-H2-R | L-Combo Temp/Humidity Unit without Display | \$320 |
| BA/LC-H2-RD | L-Combo Temp/Humidity Unit with Display | \$355 |
| BA/LC-H2-RSOD ... | L-Combo Temp/Humidity Unit with Setpoint, Override and Display | \$366 |

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, $\pm 0.3^{\circ}\text{C}$

Optional Humidity - Capacitive Polymer, $\pm 2\%$ RH Accuracy

Wiring: 4 wire, twisted pair 22 AWG minimum

Communication:

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

Mounting:

Standard 2x4" J-box or drywall - screws provided

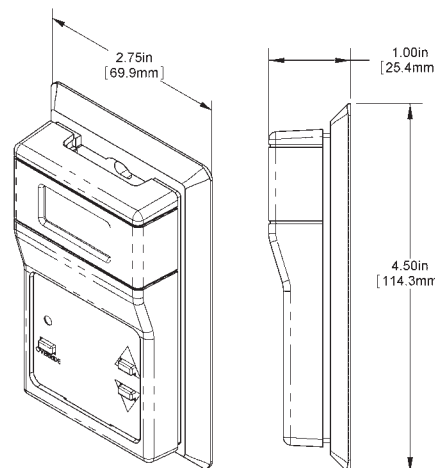
Environmental Specifications:

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

Humidity: 0 to 95%, non-condensing

Material & Rating: ABS Plastic, UL94 HB

Range: -40 to 85°C



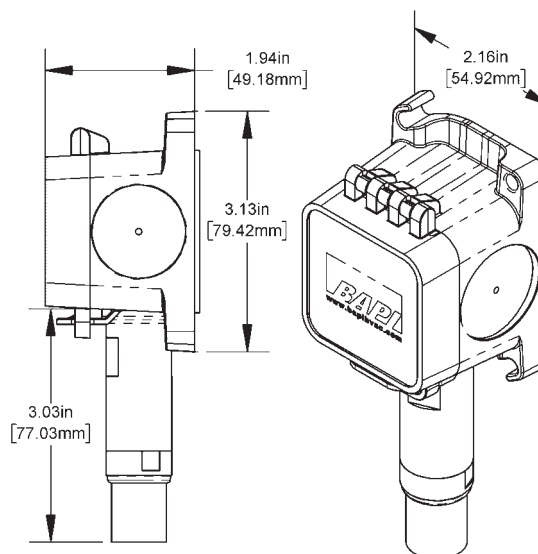
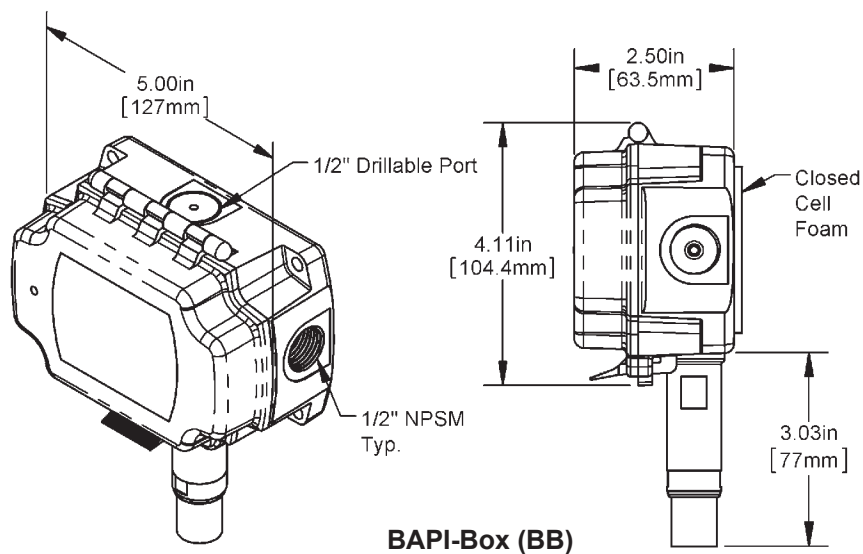
*BAPI recommends that you do not run wiring for the Room Units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils. For additional wiring info and requirements, refer to Echelon's Bulletin titled "Junction Box and Wiring Guidelines for Twisted Pair LONWORKS® Networks" which can be found at the following URL: www.echelon.com/support/documentation/Bulletin/005-0023-01K.pdf

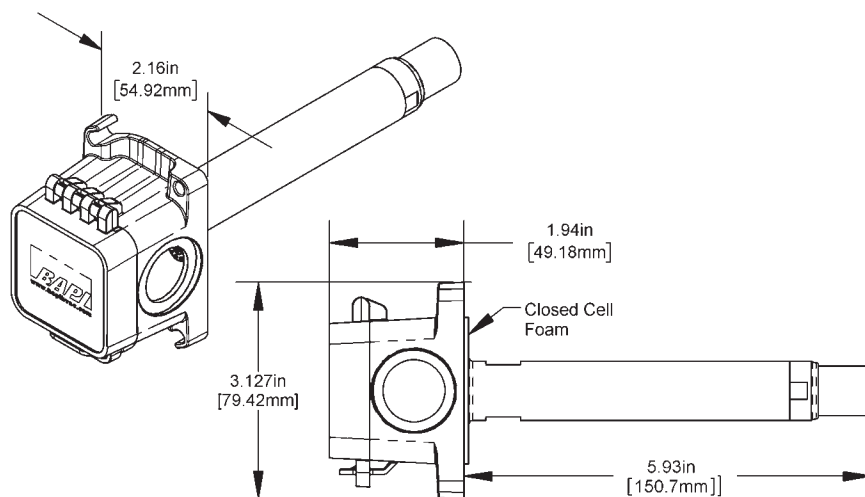
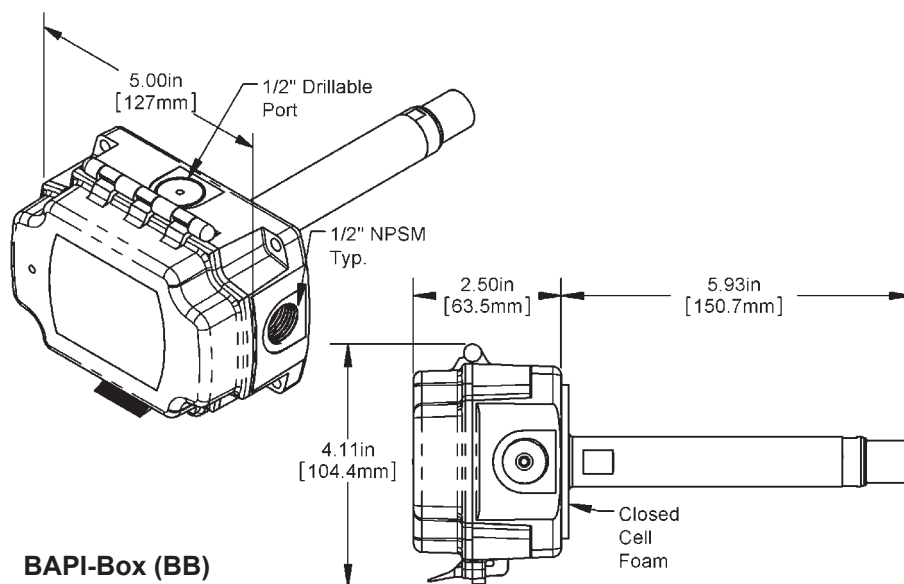
The “L-Temp” and “L-Combo” were designed following the LonMark® Interoperability Guidelines, and incorporate standard configuration property types (SCPT). A complete SNVT/SCPT list with definitions is available upon request. Echelon®, LONWORKS®, Neuron®, and 3120® are trademarks of Echelon Corporation 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.





Rev. 01/31/17







Rev. 01/19/17

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C1

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Features & Options

- 10 Pressure Ranges & Three Outputs – All Field Selectable
- 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 Pressure Unit
- Snaptrack, DIN Rail or Surface Mounting

Measuring building pressure, air velocities and volumes doesn't get any easier than with the BAPI EZ Pressure Sensor. The revolutionary mounting system allows for 2.75" snaptrack, DIN rail or surface mounting, and the three Outputs and 10 Pressure Ranges are field selectable by simply turning the rotary switch and pressing the "Next" button.

Besides being easy to set up and install, it is also accurate, rugged and economical. The heart of the unit is a micro-machined silicon pressure sensor with excellent accuracy, repeatability and stability. The unit also features short circuit proof outputs and reverse polarity protected inputs to perform under real world conditions.

The LCD display helps with troubleshooting because it displays the actual differential pressure over the entire operational range regardless of which individual pressure range is selected for output to the system controller.

**EZ Pressure Sensor**

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 1K Ω minimum

Accuracy for Standard Pressure Ranges at 72°F:

$\pm 0.25\%$ of range

Accuracy for Low Pressure Ranges at 72°F:

$\pm 0.5\%$ of range for the three lowest unidirectional and bidirectional ranges

$\pm 0.25\%$ of range all other ranges

Stability: $\pm 0.25\%$ 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)*

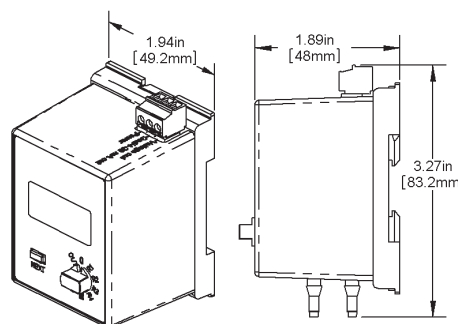
Humidity: 0 to 95% RH, non-condensing

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 Mountable



*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.





EZ Pressure Sensor (Standard and Low Ranges)

C3

Zone Pressure Sensors (ZPS)

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

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

| PART NUMBER | DESCRIPTION | LIST PRICE |
|-----------------|---|------------|
| ZPS-SR-EZ-NT-IN |Standard Range Unit, Inches WC, Display, No Tube or Probe included | \$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

LR51.. 0 to 0.10
LR52.. 0 to 0.25
LR53.. 0 to 0.50
LR54.. 0 to 0.75
LR55.. 0 to 1.00
LR56.. -0.10 to 0.10
LR57.. -0.25 to 0.25
LR58.. -0.50 to 0.50
LR59.. -0.75 to 0.75
LR60.. -1.00 to 1.00

Pascal Ranges

LR61..... 0 to 30
LR62..... 0 to 50
LR63..... 0 to 100
LR64..... 0 to 175
LR65..... 0 to 250
LR66..... -30 to 30
LR67..... -50 to 50
LR68..... -100 to 100
LR69..... -175 to 175
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

SR71.. 0 to 1.00
SR72.. 0 to 2.00
SR73.. 0 to 2.50
SR74.. 0 to 3.00
SR75.. 0 to 5.00
SR76.. -1.00 to 1.00
SR77.. -2.00 to 2.00
SR78.. -2.50 to 2.50
SR79.. -3.00 to 3.00
SR80.. -5.00 to 5.00

Pascal Ranges

SR81..... 0 to 250
SR82..... 0 to 300
SR83..... 0 to 500
SR84..... 0 to 1,000
SR85..... 0 to 1,250
SR86..... -250 to 250
SR87..... -300 to 300
SR88..... -500 to 500
SR89.. -1,000 to 1,000
SR90.. -1,250 to 1,250

#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-





Features & Options

- 10 Field Selectable Pressure Ranges and 5 Field Selectable Outputs
- Optional Display Shows Pressure Over the Entire Operational Range Regardless of Which Pressure Range is Selected
- Standard, Low and High Range Units
- Ranges and Outputs Can Be Set Without Power
- Free NIST Certificate Included with Each Unit

BAPI's Zone Pressure Multi-Sensor is the most flexible pressure sensor on the market. Output, range, units, directionality, and response time are quickly set in the field with no tools, no power and no small components.

The optional LCD display helps with troubleshooting because it displays the actual differential pressure over the entire operational range regardless of which individual pressure range is selected for output to the system controller. Three LEDs on the face of the unit indicate when the pressure is "Out of Range Low", "In Range" or "Out of Range High".



ZPM Pressure Multi-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 6K to 10K Ω minimum

Accuracy for Standard Pressure Ranges at 72°F:
 $\pm 0.25\%$ of range

Accuracy for Low Pressure Ranges at 72°F:
 $\pm 0.5\%$ of range for the three lowest unidirectional and bidirectional ranges, $\pm 0.25\%$ of range all other ranges

Accuracy for High Pressure Ranges at 72°F:
 $\pm 0.25\%$ on all ranges

Stability: $\pm 0.25\%$ F.S. per year

Environmental Op. Range: -4 to 140°F (-20 to 60°C)

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

Temperature Error Low Range:

0.04% FS/°F (0.07% FS/°C)
($\pm 1.0"$ W.C @ -4 to 140°F (-20 to 60°C))

Temperature Error Standard Range:

0.01% FS/°F (0.02% FS/°C)
($\pm 5.0"$ W.C @ -4 to 140°F (-20 to 60°C))

Temperature Error High Range:

0.015% FS/°F (0.025% FS/°C)
(0 to 30" W.C @ -4 to 140°F (-20 to 60°C))

Overpressure:

Proof: 300.1 WC (10.83 PSI)
Burst: 512.6 WC (18.5 PSI)

Wiring:

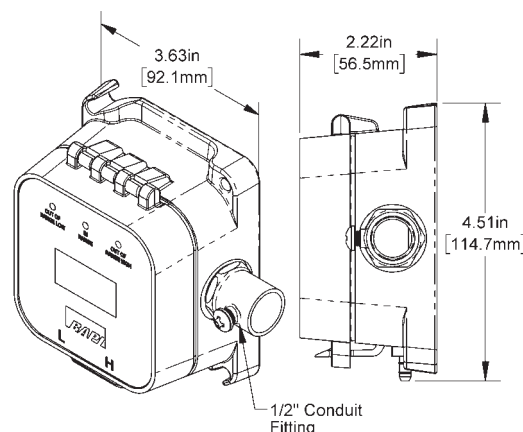
2 wires (4 to 20mA Current loop)*
3 wires (AC or DC powered, Voltage out)*

Humidity: 0 to 95% RH, non-condensing

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

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

Enclosure Rating: IP44, NEMA 2



*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.





Pressure Multi-Sensor, Standard, Low & High Ranges

C5

Rev. 04/07/17

Zone Pressure Multi-Sensors (ZPM)

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

Ordering Information

STANDARD RANGE UNITS

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

LOW RANGE UNITS

| | | |
|-----------------------|---|-------|
| BA/ZPM-LR-NT-D | ZPM Low Range Unit, No Tube or Probe included, with Display | \$320 |
| BA/ZPM-LR-ST-D | ZPM Low Range Unit, with Static Pressure Tube, with Display | \$320 |
| BA/ZPM-LR-AT-D | ZPM Low Range Unit, with Attached Static Tube, with Display | \$320 |
| BA/ZPM-LR-NT-ND | ZPM Low Range Unit, No Tube or Probe included, No Display | \$320 |
| BA/ZPM-LR-ST-ND | ZPM Low Range Unit, with Static Pressure Tube, No Display | \$320 |
| BA/ZPM-LR-AT-ND | ZPM Low Range Unit, with Attached Static Tube, No Display | \$320 |

HIGH RANGE UNITS

| | | |
|-----------------------|--|-------|
| BA/ZPM-HR-NT-D | ZPM High Range Unit, No Tube or Probe included, with Display | \$320 |
| BA/ZPM-HR-ST-D | ZPM High Range Unit, with Static Pressure Tube, with Display | \$320 |
| BA/ZPM-HR-AT-D | ZPM High Range Unit, with Attached Static Tube, with Display | \$320 |
| BA/ZPM-HR-NT-ND | ZPM High Range Unit, No Tube or Probe included, No Display | \$320 |
| BA/ZPM-HR-ST-ND | ZPM High Range Unit, with Static Pressure Tube, No Display | \$320 |
| BA/ZPM-HR-AT-ND | ZPM High Range Unit, with Attached Static Tube, 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





Features & Options

- Touch Interface Through the Cover, No More Dip Switches
- Field Selectable Output, Pressure Ranges and WC or Pascal Units
- Free NIST Certificate Included with Each Pressure Unit
- 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)
- Custom Pressure Ranges Can be Created in the Field

BAPI's Zone Pressure "Touch" (ZPT) sensor is an accurate, rugged and economical solution for measuring building pressure, air velocities and volumes. The heart of the unit is a micro-machined silicon pressure sensor with excellent accuracy, repeatability and stability.

The touch interface allows for quick and easy set up of all parameters including pressure ranges, output ranges and WC or Pascal units. The interface can even be used to create custom ranges in the field.

The LCD helps with troubleshooting because it displays the actual differential pressure over the entire operational range regardless of which individual pressure range is selected for output to the system controller.



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 1K Ω minimum

Accuracy for Standard Pressure Ranges at 72°F:

$\pm 0.25\%$ of range

Accuracy for Low Pressure Ranges at 72°F:

$\pm 0.5\%$ of range for the three lowest unidirectional and bidirectional ranges

$\pm 0.25\%$ of range all other ranges

Stability: $\pm 0.25\%$ 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:

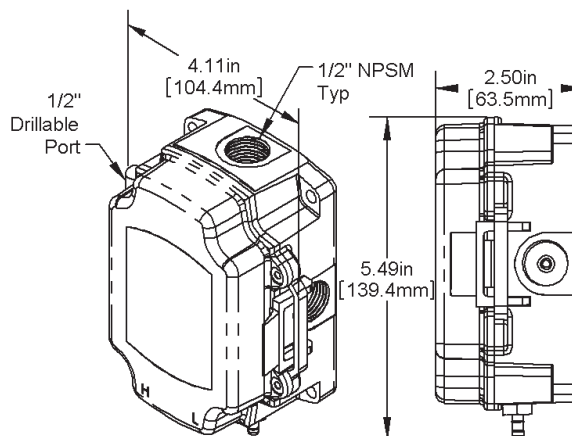
1/4" tubing (1/8" to 3/16" I.D.)

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.





"Touch" Pressure Sensor (Standard & Low Ranges)

C7

Zone Pressure Touch Sensors (ZPT)

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

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

| PART NUMBER | DESCRIPTION | LIST PRICE |
|----------------|---|------------|
| 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

LR51.. 0 to 0.10
LR52.. 0 to 0.25
LR53.. 0 to 0.50
LR54.. 0 to 0.75
LR55.. 0 to 1.00
LR56.. -0.10 to 0.10
LR57.. -0.25 to 0.25
LR58.. -0.50 to 0.50
LR59.. -0.75 to 0.75
LR60.. -1.00 to 1.00

Pascal Ranges

LR61..... 0 to 30
LR62..... 0 to 50
LR63..... 0 to 100
LR64..... 0 to 175
LR65..... 0 to 250
LR66..... -30 to 30
LR67..... -50 to 50
LR68..... -100 to 100
LR69..... -175 to 175
LR70..... -250 to 250

#2: Pressure Range continued...

STANDARD RANGES

WC Ranges

SR71.. 0 to 1.00
SR72.. 0 to 2.00
SR73.. 0 to 2.50
SR74.. 0 to 3.00
SR75.. 0 to 5.00
SR76.. -1.00 to 1.00
SR77.. -2.00 to 2.00
SR78.. -2.50 to 2.50
SR79.. -3.00 to 3.00
SR80.. -5.00 to 5.00

Pascal Ranges

SR81..... 0 to 250
SR82..... 0 to 300
SR83..... 0 to 500
SR84..... 0 to 1,000
SR85..... 0 to 1,250
SR86..... -250 to 250
SR87..... -300 to 300
SR88..... -500 to 500
SR89.. -1,000 to 1,000
SR90.. -1,250 to 1,250

#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)

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

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-



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Features & Options

- 10 Field Selectable Pressure Ranges
- 3 Field Selectable Outputs
- 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 Pressure Unit

BAPI's Zone Pressure Sensor with Display is an accurate, rugged and economical solution for measuring building pressure, air velocities and volumes. The heart of the unit is a micro-machined silicon pressure sensor with excellent accuracy, repeatability and stability.

The optional LCD display helps with troubleshooting because it displays the actual differential pressure over the entire operational range (-5 to +5 inches W.C. or -1,250 to 1,250 Pascals) regardless of which individual pressure range is selected for output to the system controller.

5
YEAR
WARRANTY

Patent
Pending



**ZPS 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 1K Ω minimum

Accuracy for Standard Pressure Ranges at 72°F:

$\pm 0.25\%$ of range

Accuracy for Low Pressure Ranges at 72°F:

$\pm 0.5\%$ of range for the three lowest unidirectional and bidirectional ranges

$\pm 0.25\%$ of range all other ranges

Stability: $\pm 0.25\%$ 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)
($\pm 5.0"$ W.C. @ 14 to 140°F [-10 to 60°C])

Temperature Error for Low Ranges:

0.04% FS/°F (0.07% FS/°C)
($\pm 1.0"$ 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.)

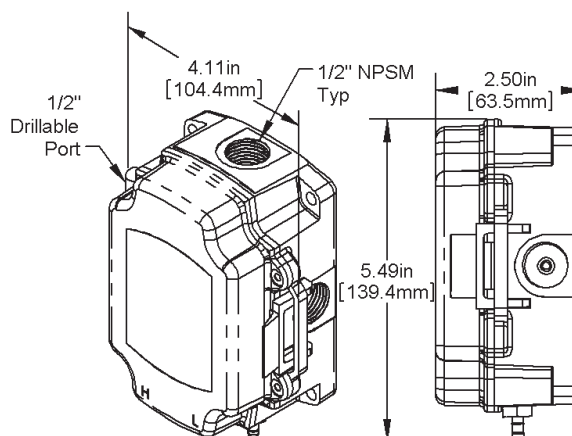
Enclosure Material:

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.





Pressure Sensor (Standard and Low Ranges)

C9

Zone Pressure Sensors (ZPS)

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

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

| PART NUMBER | DESCRIPTION | LIST PRICE |
|----------------------|--|------------|
| ZPS-SR-BB-NT-D-IN... | Standard Range Unit, Inches WC, Display, No Tube or Probe included | \$350 |
| ZPS-SR-BB-NT-D-PA .. | Standard Range Unit, Pascals, Display, No Tube or Probe included | \$350 |
| ZPS-SR-BB-ST-D-IN... | Standard Range Unit, Inches WC, Display with Static Pressure Probe | \$350 |
| ZPS-SR-BB-ST-D-PA.. | Standard Range Unit, Pascals, Display with Static Pressure Probe | \$350 |
| ZPS-SR-BB-AT-D-IN... | Standard Range Unit, Inches WC, Display with Attached Static Probe..... | \$350 |
| ZPS-SR-BB-AT-D-PA.. | Standard Range Unit, Pascals, Display with Attached Static Probe..... | \$350 |
| ZPS-LR-BB-NT-D-IN... | Low Range Unit, Inches WC, Display, No Tube or Probe included | \$350 |
| ZPS-LR-BB-NT-D-PA.. | Low Range Unit, Pascals, Display, No Tube or Probe included | \$350 |
| ZPS-LR-BB-ST-D-IN... | Low Range Unit, Inches WC, Display with Static Pressure Probe | \$350 |
| ZPS-LR-BB-ST-D-PA.. | Low Range Unit, Pascals, Display with Static Pressure Probe | \$350 |
| ZPS-LR-BB-AT-D-IN... | Low Range Unit, Inches WC, Display with Attached Static Probe..... | \$350 |
| ZPS-LR-BB-AT-D-PA.. | Low Range Unit, Pascals, 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 ZPS 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
12..... 2 to 10 V
15..... 1 to 5 V

#2: Pressure Range (required)

LOW RANGES

WC Ranges

LR51.. 0 to 0.10
LR52.. 0 to 0.25
LR53.. 0 to 0.50
LR54.. 0 to 0.75
LR55.. 0 to 1.00
LR56.. -0.10 to 0.10
LR57.. -0.25 to 0.25
LR58.. -0.50 to 0.50
LR59.. -0.75 to 0.75
LR60.. -1.00 to 1.00

Pascal Ranges

LR61 0 to 30
LR62 0 to 50
LR63 0 to 100
LR64 0 to 175
LR65 0 to 250
LR66 -30 to 30
LR67 -50 to 50
LR68 -100 to 100
LR69 -175 to 175
LR70 -250 to 250

#2: Pressure Range continued...

STANDARD RANGES

WC Ranges

SR71.. 0 to 1.00
SR72.. 0 to 2.00
SR73.. 0 to 2.50
SR74.. 0 to 3.00
SR75.. 0 to 5.00
SR76.. -1.00 to 1.00
SR77.. -2.00 to 2.00
SR78.. -2.50 to 2.50
SR79.. -3.00 to 3.00
SR80.. -5.00 to 5.00

Pascal Ranges

SR81..... 0 to 250
SR82..... 0 to 300
SR83..... 0 to 500
SR84..... 0 to 1,000
SR85..... 0 to 1,250
SR86..... -250 to 250
SR87..... -300 to 300
SR88..... -500 to 500
SR89.. -1,000 to 1,000
SR90.. -1,250 to 1,250

#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

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

Example Number: ZPS - (05) - (SR72) - (BB-ST) - (D)

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

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

List Price: \$350 for all units

Your Number: ZPS-



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Patent
Pending

Features & Options

- 5 Field Selectable Pressure Ranges & 3 Field Selectable Outputs
- Optional LCD Shows Pressure Over the Entire Operational Range Regardless of Which Individual Pressure Range is Selected
- Inches of Water Column (W.C.) or Pascal Operation
- Free NIST Certificate Included with Each Pressure Unit
- Simple Auto-Zero Process
- Three Year Warranty

BAPI's High Pressure Sensor is an accurate, rugged and economical solution for measuring duct/building static pressure, room-to-room differential pressure or air velocities/volumes. The heart of the unit is a micro-machined silicon sensor with excellent accuracy, repeatability and stability.

The LCD aids in troubleshooting by displaying the actual differential pressure over the entire operational range (0 to 30 W.C. or 0 to 7,400 Pascals) regardless of which individual pressure range is selected for output to the controller.

The unit comes in a rugged, IP66-rated enclosure with short circuit proof outputs and reverse polarity protected inputs. The unit accepts standard 1/8" or 5/32" I.D. tubing to the pressure ports. The various Output Ranges and Pressure Ranges are all field selectable with DIP switches, and the auto-zeroing process is very simple (flip a switch, wait five seconds, flip it back and walk away).



**ZPS Pressure
Sensor**



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)

Load Resistance:

0 to 5 VDC or 0 to 10 VDC Output - 1 k Ω minimum

4 to 20 mA Output - 850 Ω max @ 24 VDC

Power Consumption:

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

20 mA max, DC only at 4 to 20 mA Output

Accuracy at 72 °F: $\pm 0.25\%$ on all ranges

Stability: $\pm 0.25\%$ F.S. (full scale) per year

Temperature Error:

Zero: $\pm 0.025\%$ F.S. per °C,

Span: max $\pm 0.03\%$ F.S. per °C

Environmental Operation Range:

14°F to 140°F (-10°C to 60°C)

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

Overpressure: Proof: 2 PSI, Burst: 3 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 High Pressure & 1 Low Pressure for push-on 1/4-inch tubing (1/8" to 3/16" I.D.)

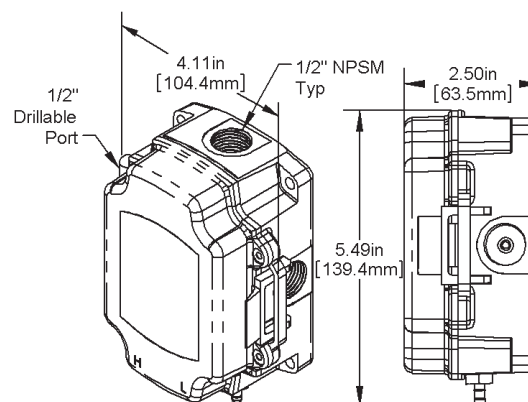
Enclosure Material:

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.





High Pressure Sensor (up to 30" W.C.)

C11

Zone Pressure Sensors (ZPS)

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

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

| PART NUMBER | DESCRIPTION | LIST PRICE |
|-------------------|---|------------|
| ZPS-HR-BB-NT-D-IN | ZPS High Pressure with Display, W.C. Ranges, No Tube or Probe included | \$350 |
| ZPS-HR-BB-ST-D-IN | ZPS High Pressure with Display, W.C. Ranges with Static Pressure Probe | \$350 |
| ZPS-HR-BB-AT-D-IN | ZPS High Pressure with Display, W.C. Ranges with Attached Static Tube | \$350 |
| ZPS-HR-BB-NT-D-PA | ZPS High Pressure with Display, Pascal Ranges, No Tube or Probe included | \$350 |
| ZPS-HR-BB-ST-D-PA | ZPS High Pressure with Display, Pascal Ranges with Static Pressure Probe | \$350 |
| ZPS-HR-BB-AT-D-PA | ZPS High Pressure with Display, Pascal Ranges with Attached Static Tube | \$350 |
| ZPS-HR-BB-NT-IN | ZPS High Pressure without Display, W.C. Ranges, No Tube or Probe included | \$350 |
| ZPS-HR-BB-ST-IN | ZPS High Pressure without Display, W.C. Ranges with Static Pressure Probe | \$350 |
| ZPS-HR-BB-AT-IN | ZPS High Pressure without Display, W.C. Ranges with Attached Static Tube | \$350 |
| ZPS-HR-BB-NT-PA | ZPS High Pressure without Display, Pascal Ranges, No Tube or Probe | \$350 |
| ZPS-HR-BB-ST-PA | ZPS High Pressure without Display, Pascal Ranges with Static Pressure Probe | \$350 |
| ZPS-HR-BB-AT-PA | ZPS High Pressure without Display, Pascal Ranges with Attached Static Tube | \$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

High Range ZPS 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 |
| 12 | 2 to 10 V |
| 15 | 1 to 5 V |

#2: High Pressure Range (Required)

WC Ranges

| | |
|------|---------|
| HR31 | 0 to 5 |
| HR32 | 0 to 10 |
| HR33 | 0 to 15 |
| HR34 | 0 to 25 |
| HR35 | 0 to 30 |

Pascal Ranges

| | |
|------|------------|
| HR41 | 0 to 1,250 |
| HR42 | 0 to 2,500 |
| HR43 | 0 to 4,000 |
| HR44 | 0 to 6,000 |
| HR45 | 0 to 7,400 |

#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 |
|---|-----|

Example Number: ZPS - (05) - (HR32) - (BB-ST) - (D)

Actual Number (with parenthesis removed): ZPS-05-HR32-BB-ST-D

Description: 0-5 V Output, 0 to 10" WC Pressure Range, ZPS Unit with Static Tube and Display.

List Price: \$350 for all units

Your Number: ZPS-





Features & Options

- Single Pressure Range and Single Output Range
- Multiple Color LED Pressure Indication
- Free NIST Certificate Included with Each Pressure Unit
- Simple Auto-Zero Process
- Reverse Wiring Protection

BAPI's Fixed Range Pressure Sensor (FRP) is an economical solution for any cost-conscious application. The FRP features one factory-set pressure range and one factory-set output range.

A single button is used to auto-zero the unit, and a 5-color LED indicates the pressure status.



Sensor with Attached Static Tube

The unit is available with an Attached Static Tube so it doesn't require two trades to install. Choose the **(-AT)** option in the Static Pressure Tube section.



**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

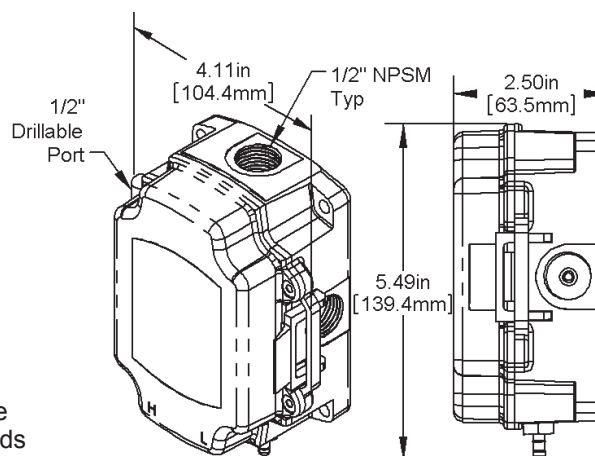
Enclosure Rating: IP66, NEMA 4

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





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

FR51.. 0 to 0.10
FR52.. 0 to 0.25
FR53.. 0 to 0.50
FR55.. 0 to 1.00
FR91.. 0 to 1.25
FR73.. 0 to 2.50
FR74.. 0 to 3.00
FR75.. 0 to 5.00

Pascal Ranges

FR61..... 0 to 30
FR62..... 0 to 50
FR63..... 0 to 100
FR65..... 0 to 250
FR82..... 0 to 300
FR83..... 0 to 500
FR84..... 0 to 1,000
FR85..... 0 to 1,250

#2: Pressure Ranges continued...

BIDIRECTIONAL RANGES

WC Ranges

FR56.. -0.10 to 0.10
FR57.. -0.25 to 0.25
FR58.. -0.50 to 0.50
FR60.. -1.00 to 1.00
FR96.. -1.25 to 1.25
FR78.. -2.50 to 2.50
FR79.. -3.00 to 3.00
FR80.. -5.00 to 5.00

Pascal Ranges

FR66..... -30 to 30
FR67..... -50 to 50
FR68..... -100 to 100
FR70..... -250 to 250
FR87..... -300 to 3000
FR88..... -500 to 500
FR89.. -1,000 to 1,000
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-





Wall & Ceiling Pressure Pickup Ports & Temp./Pressure Pickup Combos

Features & Options

- Economical & Easy to Install
- Includes 80 Micron Filter
- Accommodates 1/8" I.D. to 5/32" I.D. Tubing

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.



Wall Plate



BAPI-Stat
"Quantum"
Enclosure



Low Profile
Port



Ceiling Mount
Square Cover

Specifications

Environ. Oper. Range:

Wall & Ceiling Plates

Temp: 32 to 122°F

(0 to 50°C)

Humidity: 0% to 95% RH,
non-condensing

Low Profile Port

Temp: -40 to 185°F

(-40 to 85°C)

Humidity: 0% to 100% RH,
non-condensing

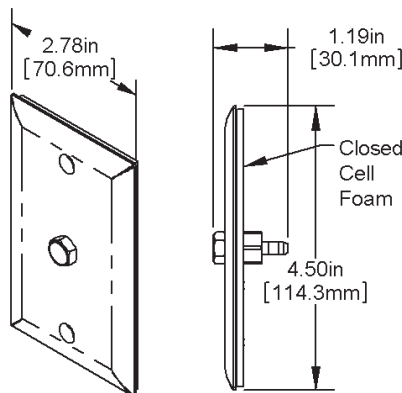
Material:

Delta Style & Low Profile:

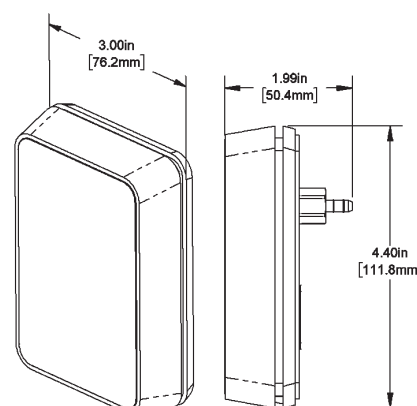
ABS Plastic, UL 94, V-0

Wall & Ceiling Plates:

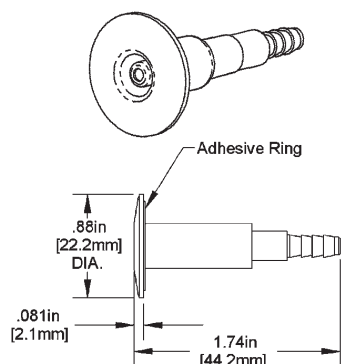
Stainless Steel



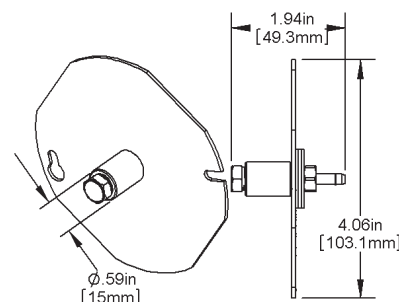
Wall Plate



BAPI-Stat "Quantum" Encl.



Low Profile Port



Ceiling Mount Cover





Rev. 12/19/16

Zone Pressure Pickup Ports

C15

Zone Pressure Sensors (ZPS)

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

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

Pressure Pickup Ports Option Selection Guide

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

#1: Pickup Port (required)

| | | |
|---------|---|------|
| 01..... | 2" X 4" Stainless Steel Wall Plate with Static Pickup | \$18 |
| 03..... | Room Mount Delta Style Enclosure with Static Pickup | \$15 |
| 04..... | BAPI-Stat "Quantum" Enclosure with Static Pickup | \$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, 06 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(**03**) - (**102**)**Actual Number (with parenthesis removed):** ZPS-ACC03-102**Description:** Delta Style Enclosure with Static Pickup, 10K-2 Thermistor Temperature Sensor.**List Price:** \$15 (Delta Style Enclosure) + \$18 (Thermistor) = \$33 List Price**Your Number:** ZPS/ACC



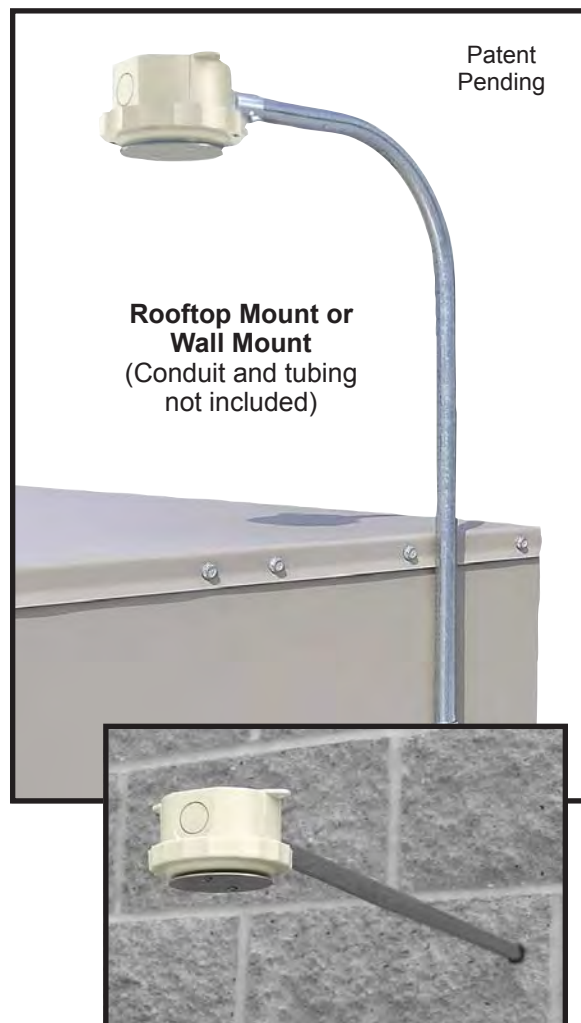
Features & Options

- Rooftop, Wall or Vertical Mount
- Helps Stabilize Readings by Reducing Fluctuations from Wind Gusts

BAPI's Outside Air Pressure Pickup Port is an easy, economical and attractive way of measuring outdoor static pressure. The pickup port also helps stabilize readings because it significantly reduces the pressure fluctuations caused by wind gusts.

Differences in building pressure are caused by the operation of supply fans or exhaust fans and usually measure less than .1 inches of water column (W.C.). A gentle breeze of 10 MPH provides a pressure of .048 inches W.C., while a strong wind of 40 MPH provides .772 inches W.C. A gale of 75 MPH can measure over 2.7 inches. BAPI's pickup port significantly reduces these wind pressures for a stable and accurate reading at the pressure sensor and controller.

The unit is also very rugged with a UV-resistant and flame-retardant housing to perform and last under harsh conditions. It is available in Rooftop or Wall Mount or Vertical Mount for building soffits or ceilings.



Ordering Information

| Part Number | Description |
|-------------------|----------------------------|
| ZPS-ACC10..... | Rooftop or Wall Mount Unit |
| ZPS-ACC10-V | Vertical Mount Unit |

Specifications

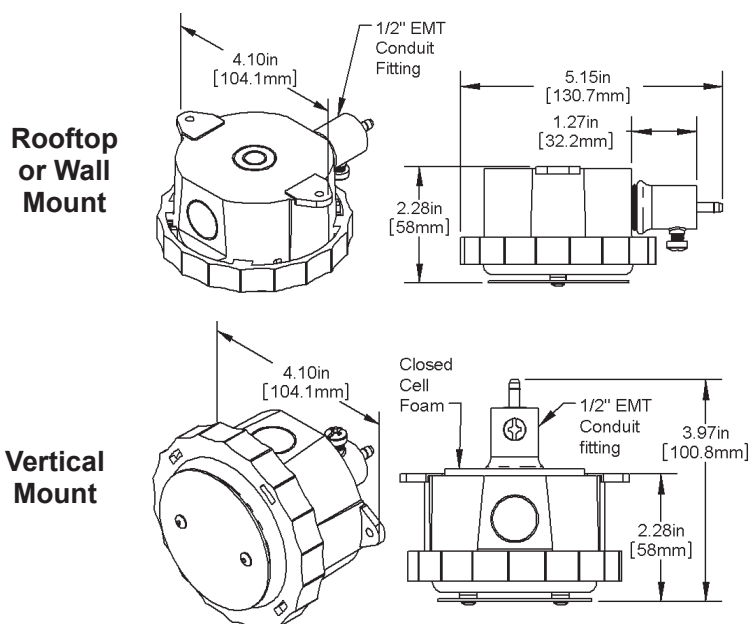
Environmental Operation Range:

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

Humidity:
0% to 100% RH,
condensing

Material:

UV-resistant plastic





Outside Air Pressure Pickup Port

C17**Zone Pressure Sensors (ZPS)**Datasheets without List Prices are available on our website at www.bapihvac.com

Ordering Information

| <u>PART NUMBER</u> | <u>DESCRIPTION</u> | <u>LIST PRICE</u> |
|--------------------|---|-------------------|
| ZPS-ACC10..... | Rooftop or 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 C14-15



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Pressure Probe Assemblies

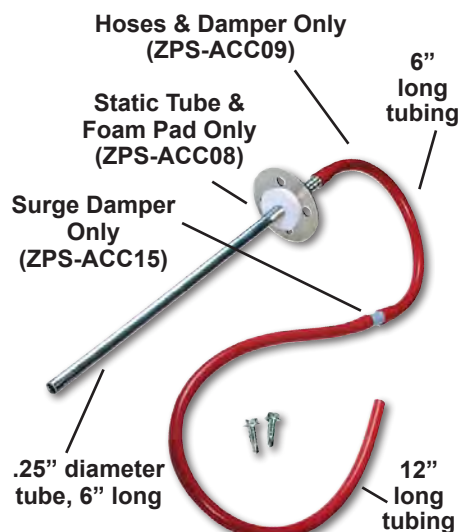
Overview

The Static Pressure Probe and Total Pressure Probe Assemblies connect to the BAPI Zone Pressure Sensor to provide duct static pressure or duct air velocity. The angled total probe faces into the airflow to sense the moving air's total pressure while the static probe senses static pressure.

Both probe assemblies include a tube and rubber hose with built in surge damper to smooth out variations in airflow for a more stable reading. The Static Pressure Probe is available individually while the Pitot Pressure Probe Assembly includes the total probe and the static probe assemblies.

ORDERING INFORMATION

- ZPS-ACC07...** Static Pressure Probe Assembly, 6" long
- ZPS-ACC08...** Aluminum static Tube Only (6") w/ Circular Foam
- ZPS-ACC09...** Rubber Hoses w/ Surge Damper (includes a bulk head fitting)
- ZPS-ACC11...** Pitot Pressure Probe Assembly, 3.5" long (includes the Static & Total Probe Assemblies)
- ZPS-ACC12...** Pitot Pressure Probe Assembly, 6" long (includes the Static & Total Probe Assemblies)
- ZPS-ACC13...** Total Tube Only (3.5") with Circular Foam (doesn't include hoses & damper)
- ZPS-ACC14...** Total Tube Only (6") with Circular Foam (doesn't include hoses & damper)
- ZPS-ACC15...** Surge Damper Only, 5 micron
- ZPS-ACC17...** Static Tube Only (0.5") with Circular Foam (doesn't include hoses & damper)
- ZPS-ACC18...** 2 Static Pressure Tube Assemblies, 6" Long
- ZPS-ACC21...** Stainless Steel Static Tube Only (6") with Circular Foam and Mounting Screws (doesn't include hoses & damper)
- ZPS-ACC22...** Static Tube Only, Zero Length, with Circular Foam and Mounting Screws



Static Pressure Probe Assembly



Total Pressure Probe Assembly



Static Tube Only, Zero Depth

Silicone Rubber Tubing

Overview

Made from a material that's used for green house glazing, this synthetic rubber tubing maintains its flexibility and resiliency over time.

Specifications:

- ID:** 1/8 inch • **OD:** 1/4 inch • **Bend Radius:** 1/4 inch
- Hardness:** 50 durometer • **Tensile Strength:** 1100 psi
- Application Temperature:** -94 to 392°F (-70 to 200°C)
- Material:** Silicone Rubber

ORDERING INFORMATION

- ZPS-SIL-250-125-50** 50 foot roll of silicone rubber tubing



Silicone Rubber Tubing





Pressure Probe Assemblies

Ordering Information

| <u>PART #</u> | <u>DESCRIPTION</u> | <u>LIST PRICE</u> |
|---------------|---|-------------------|
| ZPS-ACC07 | Static Pressure Probe Assembly | \$28 |
| ZPS-ACC08 | Aluminum Static Tube & Foam Pad Only (doesn't include hoses & damper) | \$13 |
| ZPS-ACC09 | Rubber Hoses with Built-In Surge Damper (includes a bulk head fitting)..... | \$15 |
| ZPS-ACC11 | Pitot Pressure Probe Assembly, 3.5" long (includes static & total probe assemblies)..... | \$72 |
| ZPS-ACC12 | Pitot Pressure Probe Assembly, 6" long (includes ZPS-ACC07)..... | \$72 |
| ZPS-ACC13 | Total Tube Only (3.5") with Circular Foam (doesn't include hoses & damper) | \$14 |
| ZPS-ACC14 | Total Tube Only (6") with Circular Foam (doesn't include hoses & damper) | \$14 |
| ZPS-ACC15 | Surge Damper Only, 5 micron | \$8 |
| ZPS-ACC17 | Static Tube Only (0.5") with Circular Foam (doesn't include hoses & damper)..... | \$10.50 |
| ZPS-ACC18 | 2 Static Pressure Tube Assemblies, 6" Long..... | \$56 |
| ZPS-ACC21 | Stainless Steel Static Tube Only (6") with Circular Foam and Mounting Screws (doesn't include hoses & damper)..... | \$30 |
| ZPS-ACC22 | Static Tube Only, Zero Length, with Circular Foam and Mounting Screws | \$7.50 |

Silicone Rubber Tubing

| <u>PART NUMBER</u> | <u>DESCRIPTION</u> | <u>LIST PRICE</u> |
|--------------------|---|-------------------|
| ZPS-SIL-250-125-50 | 50 foot roll of silicone rubber tubing..... | \$73.50 |

Gray shaded items follow the Buy and Resale Multiplier.





Features & Options

- Easy to Access Field Adjustable Setpoint from 0.1" to 35" W.C.
- UL 353 Listing So the Unit Can Be Used for Safety Controls
- 5 Amp Silver Contacts
- 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. Because of its UL 353 Limit Control Listing, the BAPI Switch can be used in safety circuits to protect heating appliances, heating systems, processing systems and HVAC/R systems.

The setpoint is field adjustable from 0.1" to 35" W.C, and the unit can measure positive pressure, vacuum or true differential pressure. The seven pressure ranges are field selectable by changing a color-coded spring. The spring for the range that you order is preinstalled, and the other six 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, and the pressure barbs accept 3/16" or 1/4" tubing.

The unit also features an extremely high proof pressure of 100" W.C. so that it will continue to function properly even if it is accidentally connected to an unusually high or low pressure.



Differential Pressure Switch

Ordering Information

| Part Number | Description |
|-------------|--|
| ZPS-SW1: | Differential Pressure Switch, 0.12" to 0.52" W.C. (30 Pa to 130 Pa) |
| ZPS-SW2: | Differential Pressure Switch, 0.40" to 1.40" W.C. (100 Pa to 350 Pa) |
| ZPS-SW3: | Differential Pressure Switch, 1.20" to 2.40" W.C. (300 Pa to 600 Pa) |
| ZPS-SW4: | Differential Pressure Switch, 2.40" to 6.42" W.C. (600 Pa to 1,600 Pa) |
| ZPS-SW5: | Differential Pressure Switch, 5.22" to 12.84" W.C. (1,300 Pa to 3,200 Pa) |
| ZPS-SW6: | Differential Pressure Switch, 11.64" to 23.68" W.C. (2,900 Pa to 5,900 Pa) |
| ZPS-SW7: | Differential Pressure Switch, 21.68" to 35.32" W.C. (5,400 Pa to 8,800 Pa) |

BA/SQ1BIT:Square Screwdriver Bit to turn the Pressure Adjustment Screw



Specifications

Measurement Media: Air, Combustion Gases

Operating Temperature: -40 to 185°F (-40 to 85°C)

Operating Humidity: 5 to 95% RH non-condensing

Contact Ratings: 28 VA pilot duty, 24 VAC
1/10 HP, 120-277 VAC
125 VA Pilot Duty, 125 VAC
2.5 A Inductive, 125 VAC
5 A Resistive, 125 VAC
0.1 A, 30 VDC

Proof Pressure: 100" W.C. (3.6 PSI, 24,900 Pa)

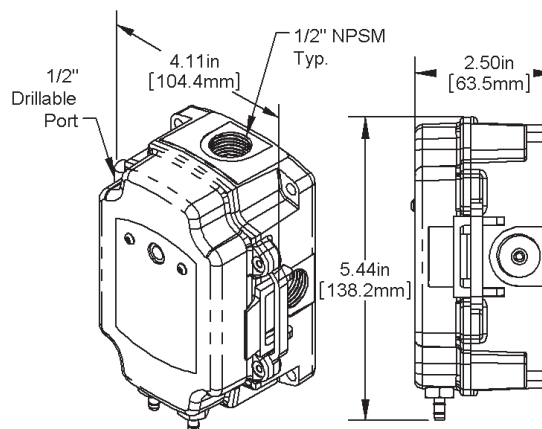
Pressure Ports: 1/4" Barbed Fittings

Switch Type: SPDT (Silver Contacts)

Limit Controls: UL 353 Listed

Repeatability: <10% of Setting

Hysteresis: 0.07 to 0.09 Inch W.C. For All Ranges



Differential Pressure Switch





Differential Pressure Switch

C21

Zone Pressure Sensors (ZPS)

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

Ordering Information

| <u>PART NUMBERS</u> | <u>DESCRIPTION</u> | <u>LIST PRICE</u> |
|-------------------------|--|-------------------|
| ZPS-SW1: | Differential Pressure Switch, 0.12" to 0.52" W.C. (30 Pa to 130 Pa) | \$84 |
| ZPS-SW2: | Differential Pressure Switch, 0.40" to 1.40" W.C. (100 Pa to 350 Pa) | \$84 |
| ZPS-SW3: | Differential Pressure Switch, 1.20" to 2.40" W.C. (300 Pa to 600 Pa) | \$84 |
| ZPS-SW4: | Differential Pressure Switch, 2.40" to 6.42" W.C. (600 Pa to 1,600 Pa) | \$98 |
| ZPS-SW5: | Differential Pressure Switch, 5.22" to 12.84" W.C. (1,300 Pa to 3,200 Pa) | \$98 |
| ZPS-SW6: | Differential Pressure Switch, 11.64" to 23.68" W.C. (2,900 Pa to 5,900 Pa)... | \$98 |
| ZPS-SW7: | Differential Pressure Switch, 21.68" to 35.32" W.C. (5,400 Pa to 8,800 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.

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" 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 C14-15



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Features & Options

The Beck Adjustable Pressure Switch is designed for monitoring overpressure, vacuum and differential pressure of air or other non-combustible, non-aggressive gases.

A field-adjustable dial allows you to select any trip value within each pressure range. Tubing and two total tubes included.

Possible fields of application include:

- Monitoring air filters and fan status
- Monitoring industrial cooling-air circuits
- Monitoring flows in ventilation ducts
- Used as an air flow proving switch for heater control and frost prevention circuits



Pressure Switch and included Probes and Tubing

Ordering Information

| Part Number | Pressure Range | Repeatability | List Price |
|----------------|--------------------------------------|-------------------------------------|------------|
| BA/APSW1 | 0.08 TO 1.2" WC / 20 TO 300 Pa | ±5% / min. ±0.2" WC (±5 Pa) | \$25 |
| BA/APSW2 | 0.2 TO 2" WC / 50 TO 500 Pa | ±2.5% / min. ±0.2" WC (±5 Pa) | \$25 |
| BA/APSW3 | 0.8 TO 4" WC / 200 TO 1,000 Pa | ±1% / min. ±0.2" WC (±5 Pa) | \$25 |

Specifications

Burst Pressure: 40" WC (10 kPa) for all pressure ranges

Medium: Air, non-combustible and non-aggressive gases

Operating Temperature: -4° to +185°F (-20 to +85°C)

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

Accuracy:

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

Diaphragm Material:

Silicone, tempered at 392°F (200°C), free of gas emissions

Pressure Connections:

2 plastic pipe connection pieces, external dia. 0.24" (6mm)

Marked "+" to higher pressure, marked "-" to lower pressure

Body and Cover Material: UV-resistant plastic

Mechanical Working Life: Over 1,000,000 switching operations

Electrical Rating:

0.4A Inductive, 250 VAC • 1.5A Resistive, 250 VAC

0.8A Inductive, 125 VAC • 3.0A Resistive, 125 VAC

0.4A, 30VDC • 0.1A, 24 VDC

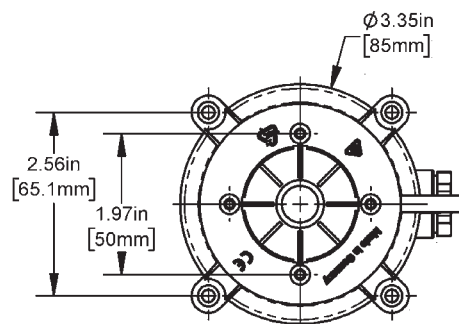
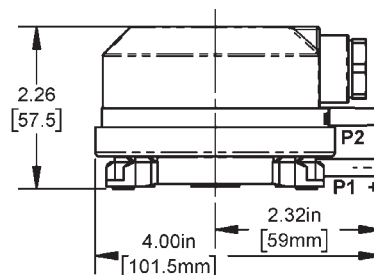
Electrical connections:

1/4" Spade Plug (AMP flat plug), 0.25" x 0.03" (6.3 x 0.8mm) in accordance with DIN 46244 or push-on screw terminals included

Protection Category: IP54 with cover (protection against dust and splashing water)

CE Conformity: Each depending on technical specification

Low Voltage Directive 2006/95/EC; RoHS Directive 2011/65/EC; ANSI UL508; CSA



Gray shaded items follow the Buy and Resale Multiplier.





Rev. 07/14/17

Table of Contents

Air Quality Sensors

D1

VOC Sensors

A better way to ensure true Indoor Air Quality

Quantum Prime



pg D2

Quantum



pg D4

BAPI-Stat 3



pg D6



Duct & Rough Service

pg D8

CO₂ Sensors

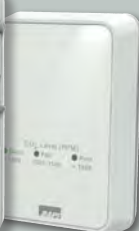
with continuous automatic Barometric pressure compensation

Quantum Prime



pg D10

Quantum



pg D12

BAPI-Stat 3



pg D14

BAPI-Stat 4



pg D16



Duct & Rough Service

pg D18

CO Sensors

for Room, Duct or Rough Service

BAPI-Stat 4



pg D20



Duct and Rough Service

pg D21

NO₂ Duct & Rough Service Sensor



pg D22

Refrigerant Leak Detector



pg D23

Calibration and Verification Kits



VOC

CO₂

pg D24

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

- BAPI VOC Sensor Offers an Alternative to CO₂ for Demand Controlled Ventilation, pg 25
- Using the BAPI VOC Sensor for Demand Controlled Ventilation, pgs 26-30
- Calibration Methods for Single and Dual Beam CO₂ Sensors, pg 31
- Common VOCs Detected by BAPI's VOC Sensor, pgs 32-33
- The Effects of Temperature and Altitude on CO₂ Measurement, pgs 34-35



Features & Options

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

Humans respire Volatile Organic Compounds (VOCs) as well as CO₂. The BAPI sensor is able to measure these VOCs and indicate when a space is occupied just as well as a CO₂ sensor.

The advantage of the VOC sensor is that it measures air contaminants from other sources besides respiration, such as building materials, cleaners, perfumes and furniture and carpet off-gassing. Using this sensor for Demand Controlled Ventilation then is a way of achieving true indoor air quality, rather than just CO₂ dilution.

A further benefit is that it requires no additional work on your part. That's because the sensor converts the VOC reading to a CO₂ equivalent level. This lets you use ASHRAE's CO₂-based VRP schedule to ventilate.

The new BAPI-Stat "Quantum Prime" 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. The VOC level is indicated as "Good, Fair or Poor" by three discrete green, yellow and red LED's on the front of the unit. The red LED will begin to flash when the unit exceeds 2,000ppm, indicating that fresh air needs to be brought in.



BAPI-Stat "Quantum Prime" VOC Sensor with Optional Temperature Setpoint and Occupancy 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 CO₂ 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

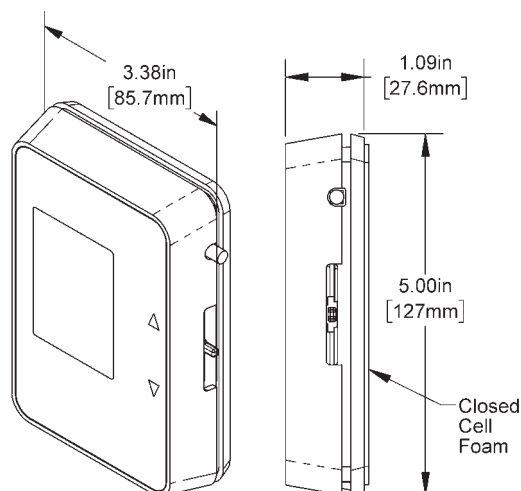
Material: ABS Plastic, Material Rated UL94V-0

LED VOC/CO₂ Equivalent Level Indicator:

Good, Green < 1,000 PPM
 Fair, Yellow = 1,000 to 1,500 PPM
 Poor, Red > 1,500 PPM

Certifications: RoHS

Warranty Period: 5 years





VOC Room Sensor, BAPI-Stat "Quantum Prime"

D3

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:

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

#1: Display Style (required)

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

#2: VOC Output (required)

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

#3: Temperature Sensor (required)

A1K Platinum RTD (385 curve)..... \$25
B10K-2 Thermistor..... \$18
C10K-3 Thermistor..... \$18
D10K-3[11K] Thermistor..... \$18
E20K Thermistor..... \$18
F1.8K Thermistor..... \$18
G1K Ω Nickel RTD \$35
H3K Thermistor..... \$18
XNo Temperature Sensor

#4: Humidity Output (required)

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

#5: Setpoint Adjustment (required)

1Slider Setpoint Adjustment \$6
XNo Setpoint Adjustment

#6: Setpoint Display Range (required)

A-3 to +3
B-5 to +5
C50 to 90 °F or 10 to 32 °C
D55 to 85 °F or 13 to 30 °C
E60 to 80 °F or 15 to 27 °C
F65 to 80 °F or 18 to 27 °C
XNo Setpoint Adjustment

#7: Setpoint Output Range (required)

00.....0 to 5 V
10.....0 to 10 V
40.....0 to 1 k
60.....0 to 10 kΩ
80.....0 to 20 kΩ
81.....4.75 k to 24.75 kΩ
82.....6.19 k to 26.19 kΩ
84.....10 k to 30 kΩ
XNo Setpoint Adjustment

#8: Occupant Override (required)

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

#9: Optional Selections* (optional)

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

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

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/BQP (F) - (A) - (B) - (A) - (1) - (F) (80) - (N)

Actual Number (with brackets removed): BA/BQPF-A-B-A-1-F80-N

Description: BAPI-Stat "Quantum Prime" VOC Sensor, °F Display, 0 to 5V VOC Output, 10K-2 Thermistor Temperature Sensor, 0 to 5V Humidity Output, Slider Setpoint Adjustment, 65 to 80 Temp Setpoint Display Range, 0 to 20K Temp Setpoint Output Range, Override in Parallel with the temp sensor, No Additional Options

List Price: \$35 (°F Display) + \$475 (VOC Unit) + \$18 (Thermistor) + \$80 (Humidity) + \$6 (Setpoint) + \$5 (Override) = \$619 List

Your Number: BA/





Features & Options

- Achieves True Indoor Air Quality, Not Just CO₂ Dilution
- Output is Correlated to a CO₂ Value Allowing You to Ventilate Using ASHRAE's CO₂-Based VRP Algorithm
- BAPI-Stat "Quantum" Enclosure with 0 to 5 or 0 to 10 VDC Output

Humans respire Volatile Organic Compounds (VOCs) as well as CO₂. The BAPI sensor measures these VOCs and indicates when a space is occupied just as well as a CO₂ sensor.

The advantage of the VOC sensor is that it measures air contaminants from other sources besides respiration, such as building materials, cleaners, perfumes and furniture and carpet off-gassing. Using this sensor for Demand Controlled Ventilation then is a way of achieving true indoor air quality, rather than just CO₂ dilution.

A further benefit is that it requires no additional work on your part. That's because the sensor converts the VOC reading to a CO₂ equivalent level. This lets you use ASHRAE's CO₂-based VRP schedule to ventilate. (More information on the CO₂ equivalent output is available on our website or in the Application Notes at the end of this section of the catalog.)

The BAPI-Stat "Quantum" VOC Room Sensor features 0 to 5 VDC or 0 to 10 VDC output. The VOC level is indicated as "Good, Fair or Poor" by three discrete green, yellow and red LED's on the front of the unit. If the output reaches 2,000 PPM, the red LED will begin to flash because it has hit its maximum output.



VOC Sensor in the BAPI-Stat "Quantum" Enclosure



Specifications

Power:

12 to 24 VDC, 35 mA Peak
18 to 24 VAC, 4 VA Peak

Measurement Range:

0 to 2,000 PPM CO₂ Equivalent

Selectable Output:

0 to 5 or 0 to 10 VDC > 4KΩ impedance

Sensing Element: Micro-machined Metal Oxide

Termination: 3 Terminals, 16 to 22 AWG

Wiring: 2 Pair

Operating Environment:

32 to 122°F (0 to 50°C)
5 to 95%RH non-condensing

Enclosure Material:

ABS Plastic, Material Rated UL94V-0

VOC Detection Range: 0 to 2,000 ppm CO₂ Equivalent

Start-Up Time: 15 Minutes

Response Time:

Less Than 2 Minutes (after Start-Up Time)

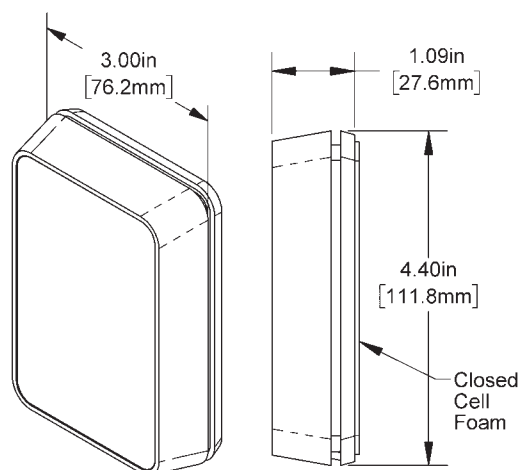
Mounting: 2"x4" J-Box or drywall – screws provided

LED VOC Level Indicator:

Good, Green < 1,000 PPM
Fair, Yellow = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

Certifications: RoHS

Warranty Period: 5 Years





VOC Room Sensor, BAPI-Stat “Quantum”

Air Quality Sensors

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

Ordering Information: BAPI-Stat Quantum VOC Sensor

| <u>Part #</u> | <u>Description</u> | <u>List Price</u> |
|-----------------------|--|--------------------------|
| BA/BQX-A | BAPI-Stat “Quantum” VOC Sensor, 0 to 5V Output..... | \$425 |
| BA/BQX-B | BAPI-Stat “Quantum” VOC Sensor, 0 to 10V Output..... | \$425 |



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Features & Options

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

Humans respire Volatile Organic Compounds (VOCs) as well as CO₂. The BAPI sensor is able to measure these VOCs and indicate when a space is occupied just as well as a CO₂ sensor.

The advantage of the VOC sensor is that it measures air contaminants from other sources besides respiration, such as building materials, cleaners, perfumes and furniture and carpet off-gassing. Using this sensor for Demand Controlled Ventilation then is a way of achieving true indoor air quality, rather than just CO₂ dilution.

A further benefit is that it requires no additional work on your part. That's because the sensor converts the VOC reading to a CO₂ equivalent level. This lets you use ASHRAE's CO₂-based VRP schedule to ventilate. (More information on the CO₂ 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 CO₂ 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/CO₂ Equivalent Level Indicator:

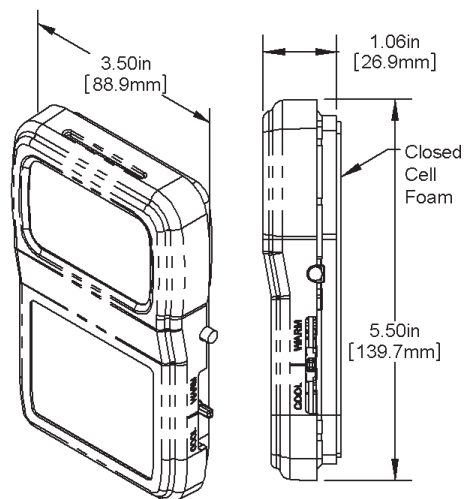
Good, Green < 1,000 PPM
Fair, Yellow = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

Material:

ABS Plastic, Material Rated UL94V-0

Certifications: RoHS

Warranty Period: 5 years





VOC Room Sensor, BAPI-Stat 3 Enclosure

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Rev. 12/19/16

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.

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)

FUnit with Display and °F indication ...\$35
CUnit with Display and °C indication...\$35
XUnit 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
C50 to 90 °F or 10 to 32 °C\$6
D55 to 85 °F or 13 to 30 °C.....\$6
E60 to 80 °F or 15 to 27 °C.....\$6
F65 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
ARWBlack Arrow on Display
BNKNo 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/



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Features & Options

- Corresponds to ASHRAE's CO₂-Based DCV Algorithm
- Duct Aspiration Tube or Rough Service Ventilated BAPI-Box
- 0 to 5 VDC or 0 to 10 VDC Output

Humans respire Volatile Organic Compounds (VOCs) as well as CO₂. The BAPI sensor measures these VOCs and indicates when a space is occupied just as well as a CO₂ sensor.

The advantage of the VOC sensor is that it measures air contaminants from other sources besides respiration, such as building materials, cleaners, perfumes and furniture and carpet off-gassing. Using this sensor for Demand Controlled Ventilation then is a way of achieving true indoor air quality, rather than just CO₂ dilution.

A further benefit is that it requires no additional work on your part. That's because the sensor converts the VOC reading to a CO₂ equivalent level. This lets you use ASHRAE's CO₂-based VRP schedule to ventilate. (More information on the CO₂ equivalent output is available on our website or in the Application Notes at the end of this section.)

The Duct Sensor samples duct air using an aspiration tube, while the Rough Service unit features a ventilated BAPI-Box and is ideal for areas such as outdoor air plenums, equipment rooms, green houses and warehouses. The VOC level is indicated as "Good, Fair or Poor" by three discrete green, yellow and red LED's on the front of the unit. If the output reaches 2,000 PPM, the red LED will begin to flash because it has hit its maximum output.



VOC Duct Sensor



VOC Rough Service Sensor

Specifications

Power:

12 to 24 VDC, 50 mA Peak
18 to 24 VAC, 1.5 VA Peak

Analog Outputs:

0 to 5VDC or 0 to 10VDC, >10KΩ impedance
VOC Contaminants: 0 to 2,000 PPM CO₂ Equivalent

VOC Sensing Element: Micro-machined Metal Oxide

VOC Detection Range:

0 to 2,000 ppm CO₂ Equivalent

Response Time: Less Than 60 Seconds

Start-Up Time: 15 minutes

Operating Environment:

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

Enclosure Rating:

Unventilated BAPI-Box: NEMA 4, IP66

Enclosure Material:

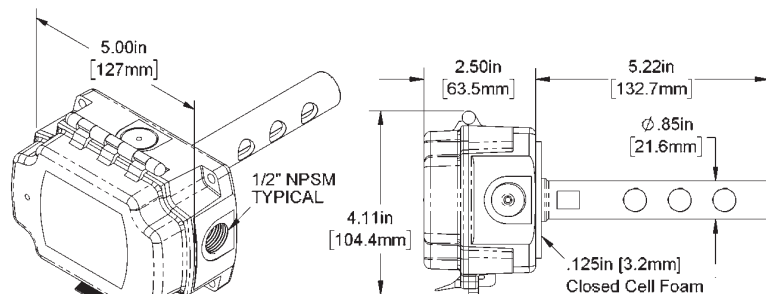
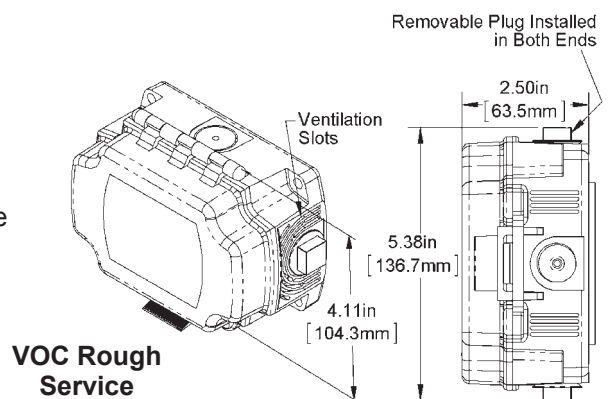
Polycarbonate, UL94 V-0

Certifications:

RoHS

LED VOC/CO₂ Level Indicator:

Good, Green < 1,000 PPM
Fair, Yellow = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM





VOC Duct and Rough Service Sensor

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Air Quality Sensors

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

Ordering Information: Duct or Rough Service VOC Sensor

| Part # | Description | List Price |
|----------------------------|---|-------------------|
| BA/VOC05-D-BB | Duct VOC Sensor, 0 to 5V Output | \$487 |
| BA/VOC10-D-BB | Duct VOC Sensor, 0 to 10V Output | \$487 |
| BA/VOC05-V-BB | Rough Service VOC Sensor, 0 to 5V Output | \$555 |
| BA/VOC10-V-BB | Rough Service VOC Sensor, 0 to 10V Output | \$555 |





Features & Options

- New BAPI-Stat "Quantum Prime" Enclosure Style
- 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 CO₂ Sensor is an accurate and reliable way of incorporating demand controlled ventilation into a building's HVAC strategy. It measures the CO₂ in a range of 0 to 2,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

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 from altitude or weather patterns can affect CO₂ sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric pressure sensor that continuously compensates the output for accurate readings despite the weather or altitude of the installation.

The BAPI-Stat "Quantum Prime" unit can be ordered as CO₂ alone, or as a combination temperature and humidity sensor. The CO₂ level is indicated as "Good, Fair or Poor" by three discrete green, yellow and red LED's on the front of the unit. The red LED will begin to flash when the unit exceeds 2,000ppm, indicating that fresh air needs to be brought in.



BAPI-Stat "Quantum Prime" CO₂ Sensor with Optional Temperature Setpoint and Occupancy 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.)

CO₂ Sensor:

Single Channel 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 UL94V-O

CO₂ Detection Range: 0 to 2,000 ppm

Start-Up Time: <2 Minutes

Response Time:

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

CO₂ Accuracy (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

CO₂ Accuracy (Dual Channel "24/7" Units):

75ppm or 10% of reading (whichever is greater)

CO₂ Drift Stability (Dual Channel "24/7" Units):

<5% of full scale over life of product.

Mounting: 2"x4" J-Box or drywall
– screws provided

LED CO₂ Level Indicator:

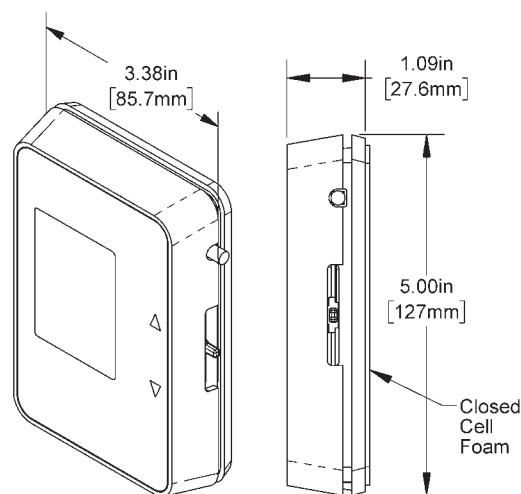
Good, Green < 1,000 PPM

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

Poor, Red > 1,500 PPM

Certifications: RoHS

Warranty Period: 5 Years





CO₂ Room Sensor, BAPI-Stat “Quantum Prime”

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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.

BAPI-Stat “Quantum Prime” CO₂ Sensor Option Selection Guide:

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

#1: Display Style (required)

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

#2: CO₂ Output (required)

ASingle Channel, 0 to 5V Output \$475
BSingle Channel, 0 to 10V Output \$475
CDual Channel, 0 to 5V Output \$505
DDual Channel, 0 to 10V Output \$505

#3: Temperature Sensor (required)

A1K Platinum RTD (385 curve) \$25
B10K-2 Thermistor \$18
C10K-3 Thermistor \$18
D10K-3[11K] Thermistor \$18
E20K Thermistor \$18
F1.8K Thermistor \$18
G1K Ω Nickel RTD \$35
H3K Thermistor \$18
XNo Temperature Sensor

#4: Humidity Output (required)

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

#5: Setpoint Adjustment (required)

1Slider Setpoint Adjustment \$6
XNo Setpoint Adjustment

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

#6: Setpoint Display Range (required)

A-3 to +3
B-5 to +5
C50 to 90 °F or 10 to 32 °C
D55 to 85 °F or 13 to 30 °C
E60 to 80 °F or 15 to 27 °C
F65 to 80 °F or 18 to 27 °C
XNo Setpoint Adjustment

#7: Setpoint Output Range (required)

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

#8: Occupant Override (required)

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

#9: Optional Selections* (optional)

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

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

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, Slider Setpoint Adjustment, 65 to 80 Temp Setpoint Display Range, 0 to 20K Temp Setpoint Output Range, Override in Parallel with the temp sensor, No Additional Options

List Price: \$35 (°F Display) + \$475 (CO₂ Unit) + \$18 (Thermistor) + \$80 (Humidity) + \$6 (Setpoint) + \$5 (Override) = \$619 List

Your Number: BA/



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Features & Options

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

The BAPI-Stat "Quantum" CO₂ Sensor is an accurate and reliable way of incorporating demand controlled ventilation into a building's HVAC strategy. It measures the CO₂ in ranges of 0 to 2,000, 0 to 5,000, 0 to 10,000 and 0 to 50,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

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.

Air pressure changes from altitude or weather patterns can affect the output of CO₂ sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in barometric sensor that continuously compensates the output for accurate readings despite the weather or altitude of the installation.

For 0 to 2000 PPM units, the CO₂ level is indicated as "Good, Fair or Poor" by three discrete green, yellow and red LED's on the front of the unit. If it reaches the top of the PPM range, the red LED will begin to flash.



CO₂ Sensor
in the
BAPI-Stat
"Quantum"
Enclosure



Specifications

Power:

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

CO₂ Sensing Elements:

Single Channel 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-0

CO₂ Detection Range:

0 to 2,000, 0 to 5,000, 0 to 10,000 and 0 to 50,000

Start-Up Time: <2 Minutes

Response Time:

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

Mounting: 2"x4" J-Box or drywall – screws provided

CO₂ 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

CO₂ Accuracy (Dual Channel "24/7" Units):

75ppm or 10% of reading (whichever is greater)

CO₂ Drift Stability (Dual Channel "24/7" Units):

<5% of full scale over life of product.

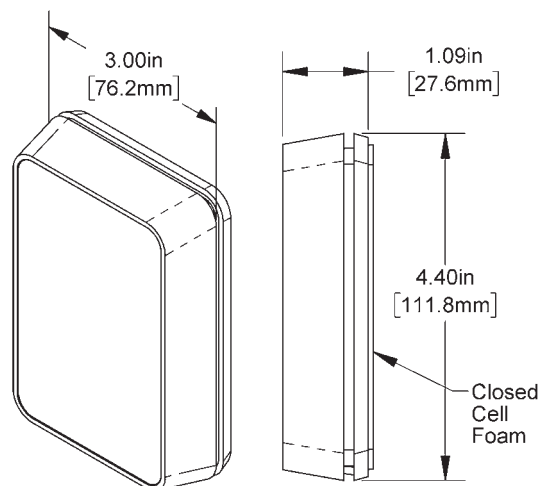
LED CO₂ Level Indicator

(for 0 to 2,000 PPM units only):

Good, Green < 1,000 PPM
Fair, Yellow = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

Certifications: RoHS

Warranty Period: 5 Years





CO₂ Room Sensor, BAPI-Stat “Quantum”

Air Quality Sensors

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

Ordering Information: BAPI-Stat “Quantum” CO₂ Sensor

| Part # | Description | List Price |
|---------------|---|------------|
| BA/AQX-A..... | Single Channel for Periodically Unoccupied Areas, 0 to 5 V Output, 0 to 2,000 PPM Range | \$425 |
| BA/AQX-B..... | Single Channel for Periodically Unoccupied Areas, 0 to 10 V Output, 0 to 2,000 PPM Range | \$425 |
| BA/AQX-C..... | Dual Channel for Continuously Occupied Areas, 0 to 5 V Output, 0 to 2,000 PPM Range | \$455 |
| BA/AQX-D..... | Dual Channel for Continuously Occupied Areas, 0 to 10 V Output, 0 to 2,000 PPM Range | \$455 |
| BA/AQX-E..... | Dual Channel for Continuously Occupied Areas, 0 to 5 V Output, 0 to 5,000 PPM Range | Call |
| BA/AQX-F..... | Dual Channel for Continuously Occupied Areas, 0 to 10 V Output, 0 to 5,000 PPM Range | Call |
| BA/AQX-G..... | Dual Channel for Continuously Occupied Areas, 0 to 5 V Output, 0 to 10,000 PPM Range | Call |
| BA/AQX-H..... | Dual Channel for Continuously Occupied Areas, 0 to 10 V Output, 0 to 10,000 PPM Range | Call |
| BA/AQX-I..... | Dual Channel for Continuously Occupied Areas, 0 to 5 V Output, 0 to 50,000 PPM Range | Call |
| BA/AQX-J..... | Dual Channel for Continuously Occupied Areas, 0 to 10 V Output, 0 to 50,000 PPM Range | Call |

Your Number: BA/

Associated Products

BAPI VC350A or VC350A-EZ VOLTAGE CONVERTERS

The CO₂ unit requires 240mA of current to operate correctly. If this is more current than can be provided by the controller power output, then the unit can be powered by a BAPI VC350A or VC350A-EZ Voltage Converter. See the Accessories section for more info.



VC350A-EZ Voltage Converter



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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 CO₂ Sensor is an accurate and reliable way of incorporating demand controlled ventilation into a building's HVAC strategy. It measures the CO₂ in a range of 0 to 2,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

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 CO₂ sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric pressure sensor that continuously compensates the output for accurate readings despite the weather or altitude of the installation.

The unit can be ordered as CO₂ alone, or with optional temp, temp setpoint, override and humidity. Optional indication of CO₂ level as "Good, Fair or Poor" is available as a three-color LED or as an arrow on the display.



CO₂
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 CO₂: Single Channel Non-Dispersive Infrared (NDIR)

DCD Unit CO₂: 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

CO₂ Detection Range: 0 to 2,000 ppm

Start-Up Time: <2 Minutes

Response Time:

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

CO₂ Accuracy (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

CO₂ Accuracy (Dual Channel DCD "24/7" Units):

75ppm or 10% of reading (whichever is greater)

CO₂ Drift Stability (Dual Channel DCD "24/7" Units):

<5% of full scale over life of product.

Mounting: 2"x4" J-Box or drywall
– screws provided

LED CO₂ Level Indicator:

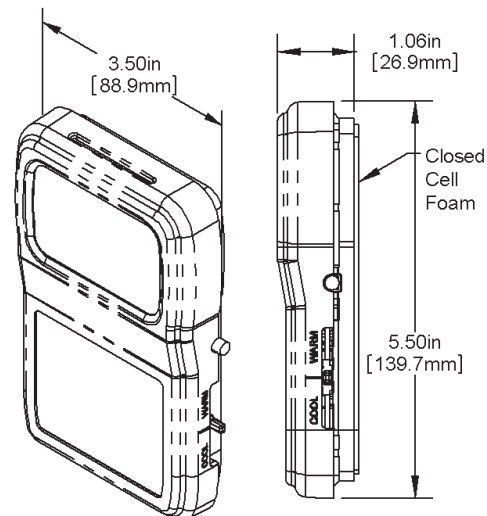
Good, Green < 1,000 PPM

Fair, Orange = 1,000 to 1,500 PPM

Poor, Red > 1,500 PPM

Certifications: RoHS

Warranty Period: 5 Years





CO₂ Room Sensor, BAPI-Stat 3 Enclosure

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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)

FUnit with Display and °F indication...\$35
CUnit with Display and °C indication...\$35
XUnit 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
C50 to 90 °F or 10 to 32 °C\$6
D55 to 85 °F or 13 to 30 °C.....\$6
E60 to 80 °F or 15 to 27 °C.....\$6
F65 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
ARWBlack Arrow on Display
BNKNo 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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Features & Options

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

The CO₂ Sensor in the BAPI-Stat 4 Enclosure is an accurate and reliable way of incorporating demand controlled ventilation into a building's HVAC strategy. It measures the CO₂ in ranges of 0 to 2,000, 0 to 5,000 and 0 to 50,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

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 three-point calibration process for enhanced accuracy and reliability.

Air pressure changes from altitude or weather patterns can affect the output of CO₂ sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in barometric sensor that continuously compensates the output for accurate readings despite the weather or altitude of the installation.

For 0 to 2,000 ppm range units, CO₂ level indication of "Good, Fair or Poor" comes as a 3-color LED.



CO₂ Sensor in the BAPI-Stat 4 Enclosure

Specifications

Power:

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

CO₂ Sensing Elements:

Single Channel: Non-Dispersive Infrared, ABC Algorithm
Dual Channel: Non-Dispersive Infrared, 3-Point Calibration

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

CO₂ Detection 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)

Mounting: 2"x4" J-Box or drywall – screws provided

CO₂ 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

CO₂ Accuracy, Dual Channel "24/7" Units:

75ppm or 10% of reading (whichever is greater)

CO₂ Drift Stability, Dual Channel "24/7" Units:

<5% of full scale over life of product.

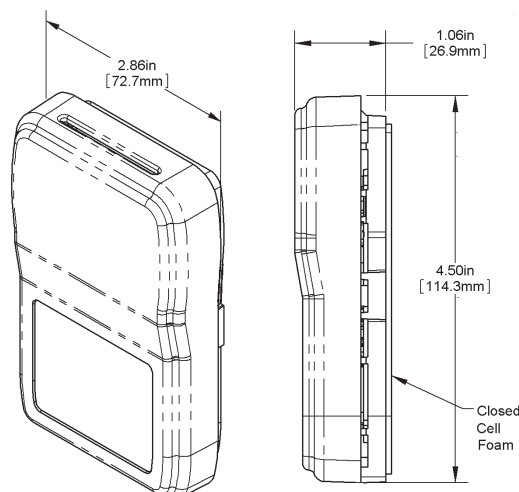
Optional LED CO₂ Level Indicator:

Good, Green < 1,000 PPM
Fair, Orange = 1,000 to 1,500 PPM
Poor, Red > 1,500 PPM

(LED available for 0 to 2,000 ppm units only.)

Certifications: RoHS

Warranty Period: 5 Years





CO₂ Room Sensor, BAPI-Stat 4 Enclosure

Air Quality Sensors

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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/BS4-ACD05

Single Channel BAPI-Stat 4 CO₂ Room Sensor, 0 to 5V Output, 0 to 2,000 PPM Range\$425

BA/BS4-ACD10

Single Channel BAPI-Stat 4 CO₂ Room Sensor, 0 to 10V Output, 0 to 2,000 PPM Range\$425

DUAL CHANNEL "24/7" UNITS FOR CONTINUOUSLY OCCUPIED AREAS

LIST PRICE

BA/BS4-DCD05

Dual Channel "24/7" BAPI-Stat 4 CO₂ Room Sensor, 0 to 5V Output, 0 to 2,000 PPM Range.....\$455

BA/BS4-DCD10

Dual Channel "24/7" BAPI-Stat 4 CO₂ Room Sensor, 0 to 10V Output, 0 to 2,000 PPM Range.....\$455

BA/BS4-DCD05-5K

Dual Channel "24/7" BAPI-Stat 4 CO₂ Room Sensor, 0 to 5V Output, 0 to 5,000 PPM Range.....\$455

BA/BS4-DCD10-5K

Dual Channel "24/7" BAPI-Stat 4 CO₂ Room Sensor, 0 to 10V Output, 0 to 5,000 PPM Range.....\$455

BA/BS4-DCD05-50K

Dual Channel "24/7" BAPI-Stat 4 CO₂ Room Sensor, 0 to 5V Output, 0 to 50,000 PPM Range.....\$455

BA/BS4-DCD10-50K

Dual Channel "24/7" BAPI-Stat 4 CO₂ Room Sensor, 0 to 10V Output, 0 to 50,000 PPM Range.....\$455

Associated Products

BAPI VC350A or VC350A-EZ VOLTAGE CONVERTERS

The CO₂ unit requires 240mA of current to operate correctly. If this is more current than can be provided by the controller power output, then the unit can be powered by a BAPI VC350A or VC350A-EZ Voltage Converter. See the Accessories section for more info.



**VC350A-EZ
Voltage Converter**



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Features & Options

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

The BAPI CO₂ Duct Sensor is an accurate and reliable way of incorporating demand controlled ventilation. It measures CO₂ in ranges of 0 to 2,000, 0 to 5,000 and 0 to 50,000 ppm with a field selectable output of 0 to 5 or 0 to 10 VDC.

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 CO₂ sensors, even putting them outside of their specified accuracy. The BAPI unit has a built-in Barometric pressure sensor that continuously compensates the output for accurate readings despite the weather or altitude.

The Duct unit samples duct air using an aspiration tube. The Rough Service unit features a ventilated BAPI-Box and is ideal for areas such as outdoor air plenums, equipment rooms, green houses and warehouses. For 0 to 2,000 PPM units, the CO₂ level is indicated as "Good, Fair or Poor" by three LED's on the front of the unit. If it reaches the top of the PPM range, the red LED will begin to flash.



Duct Sensor

Rough Service Sensor

Specifications

Power:

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

Field Selectable Voltage Output:

0 to 5 or 0 to 10 VDC

Termination:

3 Terminals, 16 to 22 AWG

Operating Environment:

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

CO₂ Sensing Elements:

Single Channel: Non-Dispersive Infrared, ABC Algorithm
Dual Channel: Non-Dispersive Infrared, 3-Point Cal.

Enclosure Rating:

Unventilated BAPI-Box: NEMA 4, IP66

Encl. Material:

Polycarbonate, UL94 V-O

CO₂ 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 CO₂ Level Indicator

(0 to 2,000 PPM units only):

Good, Green < 1,000 PPM

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

Poor, Red > 1,500 PPM

CO₂ Drift Stability, "24/7" Units:

<5% of full scale over life of product.

CO₂ Accuracy, "24/7" Units:

75ppm or 10% of reading (whichever is greater)

CO₂ Accuracy, Single Channel (ABC) Units:

400 to 1,250 ppm: ±30ppm or 3% of reading, whichever is greater

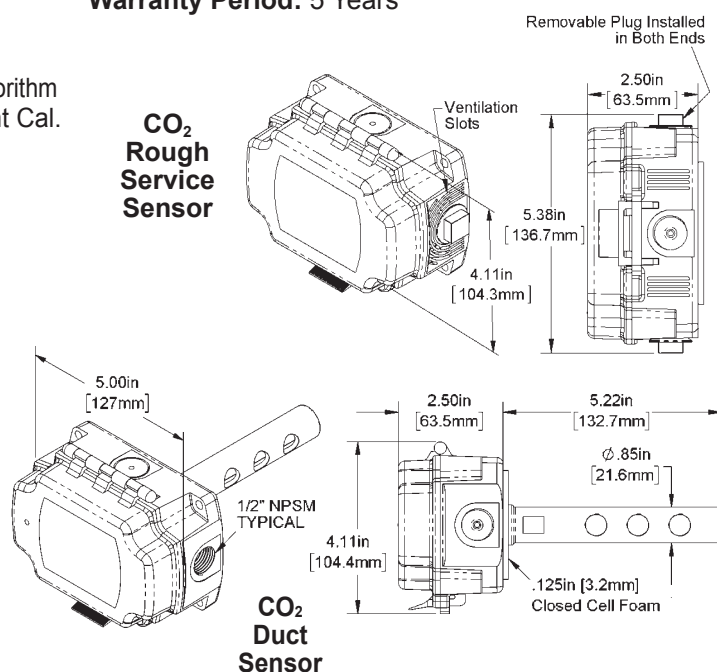
1,250 to 2,000 ppm: ±5% of reading + 30ppm

Certifications:

RoHS

Warranty Period:

5 Years



CO₂ Rough Service Sensor

CO₂ Duct Sensor





CO₂ Duct and Rough Service Sensor

Air Quality Sensors

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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 CO₂ Duct Sensor, 0 to 5V Output, 0 to 2,000 PPM Range\$470

BA/ACD05-V-BB

Single Channel CO₂ Rough Service Sensor, 0 to 5V Output, 0 to 2,000 PPM Range\$550

BA/ACD10-D-BB

Single Channel CO₂ Duct Sensor, 0 to 10V Output, 0 to 2,000 PPM Range\$470

BA/ACD10-V-BB

Single Channel CO₂ 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" CO₂ Duct Sensor, 0 to 5V Output, 0 to 2,000 PPM Range.....\$500

BA/DCD05-V-BB

Dual Channel "24/7" CO₂ Rough Service Sensor, 0 to 5V Output, 0 to 2,000 PPM Range\$580

BA/DCD10-D-BB

Dual Channel "24/7" CO₂ Duct Sensor, 0 to 10V Output, 0 to 2,000 PPM Range.....\$500

BA/DCD10-V-BB

Dual Channel "24/7" CO₂ Rough Service Sensor, 0 to 10V Output, 0 to 2,000 PPM Range\$580

BA/DCD05-5K-D-BB

Dual Channel "24/7" CO₂ Duct Sensor, 0 to 5V Output, 0 to 5,000 PPM Range.....\$500

BA/DCD05-5K-V-BB

Dual Channel "24/7" CO₂ Rough Service Sensor, 0 to 5V Output, 0 to 5,000 PPM Range\$580

BA/DCD10-5K-D-BB

Dual Channel "24/7" CO₂ Duct Sensor, 0 to 10V Output, 0 to 5,000 PPM Range.....\$500

BA/DCD10-5K-V-BB

Dual Channel "24/7" CO₂ Rough Service Sensor, 0 to 10V Output, 0 to 5,000 PPM Range\$580

BA/DCD10-50K-D-BB

Dual Channel "24/7" CO₂ Duct Sensor, 0 to 10V Output, 0 to 50,000 PPM Range.....\$500

BA/DCD10-50K-V-BB

Dual Channel "24/7" CO₂ Rough Service Sensor, 0 to 10V Output, 0 to 50,000 PPM Range\$580

Associated Products

BAPI VC350A or VC350A-EZ VOLTAGE CONVERTERS

The CO₂ unit requires 240mA of current to operate correctly. If this is more current than can be provided by the controller power output, then the unit can be powered by a BAPI VC350A or VC350A-EZ Voltage Converter. See the Accessories section for more info.



VC350A-EZ
Voltage Converter





Features & Options

- 0 to 40 ppm CO Measurement Range
- 30 ppm CO Relay Trip Level with Audible Alarm
- Field Selectable 0 to 5V, 0 to 10V or 4 to 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 Room Sensor in a
BAPI-Stat 4 Style Enclosure**

ORDERING INFORMATION

List Price

Part Number: BA/CO-B4 \$335

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

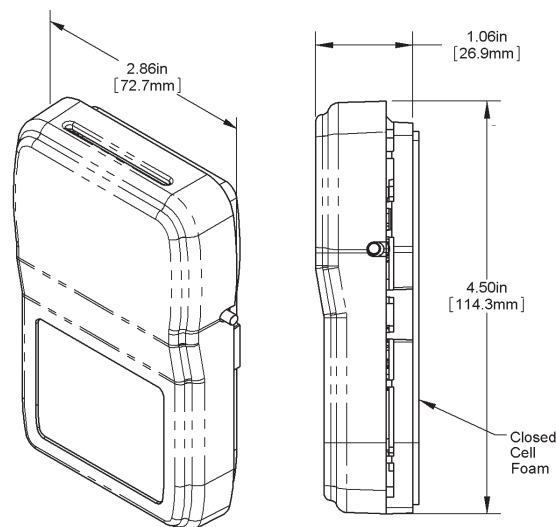
Sensor Life: 7 years typical

Response Time: 15 seconds typical

Sensor Overload Level: 5,000 ppm CO

Agency: CE, RoHS

Warranty: 5 years



BAPI-Stat 4 Style Enclosure





Rev. 03/19/18

CO Duct & Rough Service Sensor

D21*Air Quality Sensors*

Features & Options

- Field Replaceable Electrochemical Sensor with Self-Test
- Field Selectable Ranges and Outputs
- Large Display and Two Independent Alarm Contacts

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**

| 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 | \$250 |

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

Certifications:

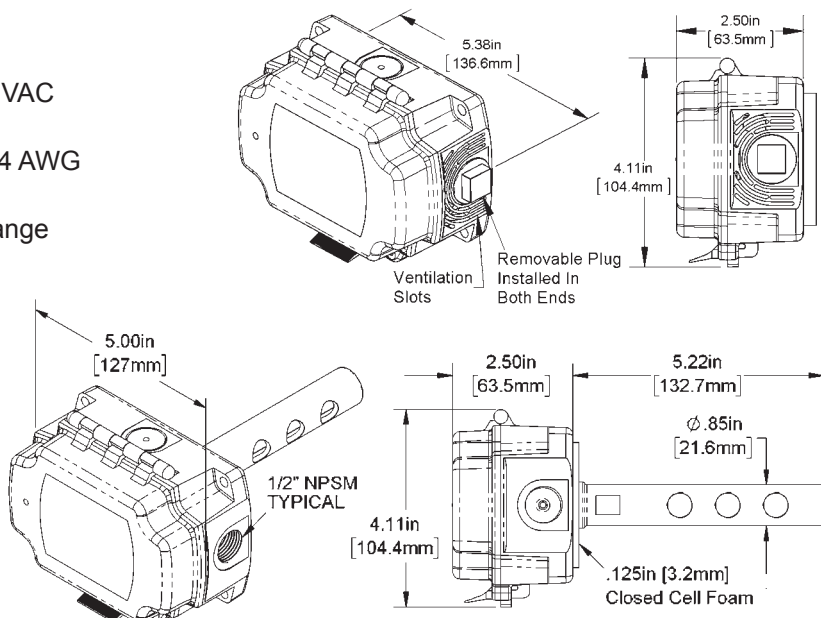
RoHS and CE

Accuracy:

<200ppm = $\pm 3\%$ FS, 32 to 122°F (0 to 50°C)
201 to 500 ppm = $\pm 5\%$ FS, 50 to 122°F (10 to 50°C)

Environmental Operation Range

14 to 122°F (-10 to 50°C) • 5 to 95%RH Noncondensing





Features & Options

- Field Replaceable Electrochemical Sensor
- Two Independent Alarm Contacts
- Field Selectable NO₂ Ranges and Outputs

BAPI's Nitrogen Dioxide Rough Service Sensor offers enhanced electrochemical sensing with outstanding accuracy at low concentrations. The Duct unit samples duct air using an aspiration tube. The Rough Service unit features a ventilated BAPI-Box and is ideal for parking ramps, equipment rooms and warehouses.

The sensor has field selectable NO₂ ranges of 0 to 2.5, 0 to 5, 0 to 7.5 and 0 to 10 ppm. It also has field selectable outputs of 0 to 5, 1 to 5, 0 to 10 and 2 to 10 VDC as well as a 3-wire 4 to 20 mA output. The LCD is backlight for 10 seconds after a button push.

Two independent SPDT alarm contacts switch at 5 field selectable NO₂ concentrations from 1 to 10 ppm. A status LED is green when the NO₂ is below the lowest relay setpoint. The LED turns red when an alarm relay is on. An alarm timer holds the output relays on for a fixed time after the NO₂ level has fallen below 80% of setpoint. This allows additional fan time to be sure that the NO₂ has been purged. Field selectable times of 0, 1, 5 and 10 minutes are provided.

The sensor element is tested daily for proper operation. When the sensor element reaches its end of life, both relays turn on, the output is set to maximum and the status LED is yellow. Sensor elements last approximately 7 years and the sensor module is field replaceable.



Rough Service (top) and Duct NO₂ Sensors

| <u>Part #</u> | <u>Description</u> | <u>List Price</u> |
|------------------------|---|-------------------|
| BA/NO2-V-BB ... | Rough Service NO ₂ Sensor, Ventilated BAPI-Box | \$1,170 |
| BA/NO2-D-BB ... | Duct NO ₂ Sensor, BAPI-Box Enclosure | \$1,100 |
| BA/NO2S | Factory Calibrated Replacement NO ₂ Module..... | \$570 |

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% of full scale

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

1.0, 2.5, 5.0, 7.5 or 10 ppm

Alarm Timer: 0, 1, 5 & 10 minutes

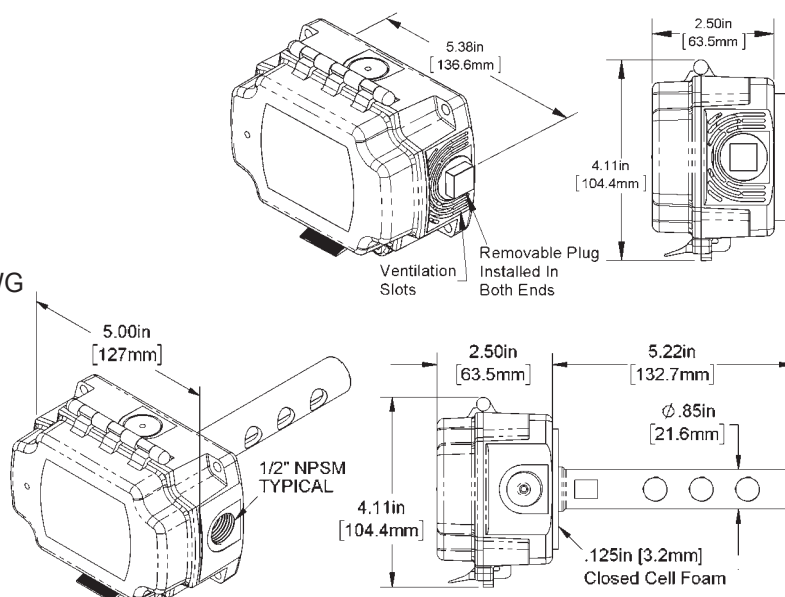
Field Selectable Analog Outputs

3-wire 4 to 20 mA
0 to 5 VDC, 1 to 5 VDC
0 to 10 VDC, 2 to 10 VDC

Environmental Operation Range

14 to 122°F (-10 to 50°C) • 5 to 95% RH Noncondensing

Lifetime: 7 Years Typical





Rev. 05/01/18

Refrigerant Leak Detector

Air Quality Sensors

D23

Features & Options

- Measures All Modern Refrigerants
- Measures Leaks and Spills
- Voltage Output
- Cost Effective

The BAPI Refrigerant Leak Detector measures the amount of R404A, R410A, R22 and/or R134A present. The Leak Detector measures leaks and spills; it is not intended for critical ppm measurements. Voltage trip levels for R22, R404A R410A or R134 leaks and spills are shown in the table. The sensor is temperature compensated for an accurate and reliable measurement.



Refrigerant Leak Detector
in a BAPI-Box Enclosure

Ordering Information

| Part Number | Description | List Price |
|-------------|---|------------|
| BA/RLD..... | Refrigerant Leak Detector in a BAPI-Box Enclosure | \$465 |

Specifications

Power:

9 to 40 VDC at 120mA max
19 to 32 VAC at 5 VA

Output Impedance: 680 Ohms

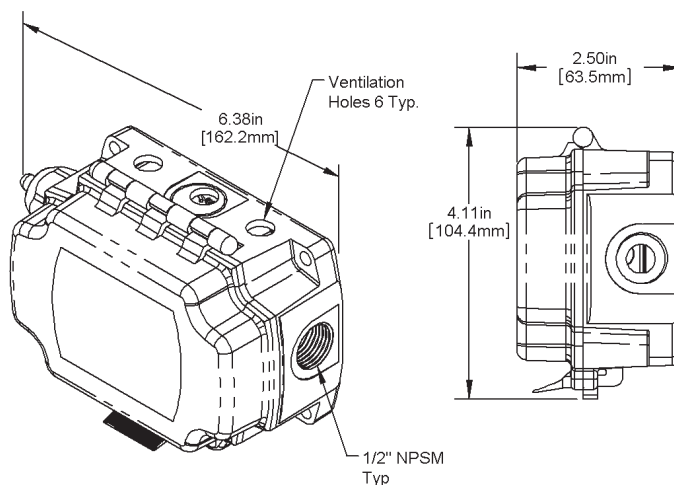
Output Voltage: 4.8V max

Ambient Temperature:

0 to 70° C (32 to 140° F)

Output Voltage for Specific Refrigerants:

| Refrigerant | Voltage Trip Level |
|-------------|--------------------|
| R22 | 2.5 VDC @ 500 ppm |
| R404A | 4.5 VDC @ 500 ppm |
| R410A | 2.5 VDC @ 500 ppm |
| R134A | 1.8 VDC @ 500 ppm |





Features & Options

- Calibrates and Verifies Proper Operation of All BAPI CO₂ Room and Duct Sensors

BAPI's CO₂ Sensor Calibration Kit verifies the proper operation and calibrates all of BAPI's room and duct CO₂ sensors.

Two calibration gas concentrations are required to perform a complete calibration*. Purchase the single point gas at a CO₂ concentration of 400 to 800 ppm, and the span gas at 1,000 to 1,200 ppm. Only one regulator is required because it can be swapped between gas cylinders.

BAPI's CO₂ Sensor Calibration Kit consists of the following:

- A software CD containing the test software and cable drivers
- A communications cable that connects a computer to the BAPI CO₂ 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 CO₂ sensor
- Shunt jumpers to place the BAPI CO₂ sensor into test mode

*Note: A single point gas may not be required. If the ambient CO₂ concentration is known, stays stable at ± 10 ppm for at least 10 minutes and is in the range of 350 to 800 ppm, you may perform the single point accuracy check and calibration without any test gas.



CO₂ Sensor Calibration Kit



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

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

VOC Sensor Verification Kit

Rev. 12/20/16

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.

| <u>Part Number</u> | <u>Description</u> | <u>List Price</u> |
|--------------------|-----------------------------------|-------------------|
| BA/VOC-KIT | VOC Sensor Verification Kit | \$18 |



VOC Sensor Verification Kit



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



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

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

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

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

Extensive research was conducted on human occupancy, VOC levels and CO₂ levels in 1,500 offices, schools and homes to determine the relationship between these three factors. The research identified a complex correlation algorithm between VOCs and CO₂, and this algorithm was used to create the output of the VOC sensor. The accuracy of this output as compared to CO₂ levels is shown in the chart at right.

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

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

Table 1 – Typical Indoor Contaminants (VOCs) and Their Source

| Contamination Source | Emission Source | VOC |
|----------------------|---------------------------------|---|
| Human Being | Breath | Acetone, Ethanol, Isoprene, CO ₂ |
| | Skin Respiration & Perspiration | Nonanal, Decanal, alpha-Pinene |
| | Flatulence | Methane, Hydrogen, |
| | Cosmetics | Limonene, Eucalyptol |
| Consumer Products | Household Supplies | Alcohols, Esters, Limonene |
| Office Equipment | Printers, Copiers, Computers | Benzene, Styrene, Phonole |
| Combustion | Engines, Appliances, Smoke | Unburnt Hydrocarbons, CO, CO ₂ |
| Building Materials | Paints, Adhesives, Carpets | Formaldehyde, Alkanes, Alcohols, Aldehydes, Ketones |
| Furniture | Poly Vinyl Chloride (PVC) | Toluene, Xylene, Decane |

Indicating Occupancy with VOCs

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

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

At 7 am, the VOC sensor picks up the breakfast cooking aromas and activities. The CO₂ sensor climbs a short time later as the students arrive to eat. The VOC sensor has slightly higher readings than the CO₂ sensor during breakfast and the morning breaks because the VOCs from the food are added to the VOCs generated by the people. This is also seen at lunch as cooking of the sausage pizza generated lots of VOCs which are added to the VOCs from the students and staff. The BAPI sensor will allow these additional VOCs to be ventilated away while the CO₂ sensor will not.

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

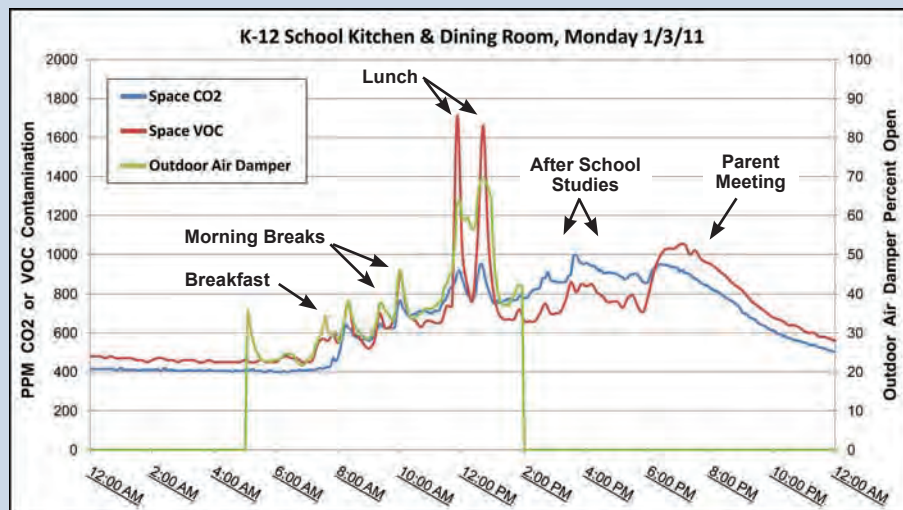
Whether it's kids or adults in the room, and whether they're studying or eating, the chart proves that the VOC sensor output directly correlates to occupancy in the room and can easily be set up for Demand Controlled Ventilation.



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Overview

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

CO₂ and Demand-Controlled Ventilation

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

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

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

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

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

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

What are VOCs and Where Do They Come From?

Table 1 Typical Indoor Contaminants (VOCs) and Their Source

| Contamination Source | Emission Source | VOC |
|----------------------|--------------------------------------|--|
| Human Being | Breath | Acetone, Ethanol, Isoprene, CO ₂ |
| | Skin Respiration & Perspiration | Nonanal, Decanal, alpha-Pinene |
| | Flatulence | Methane, Hydrogen, |
| | Cosmetics | Limonene, Eucalyptol |
| Consumer Products | Household Supplies | Alcohols, Esters, Limonene |
| Office Equipment | Printers, Copiers, Computers | Benzene, Styrene, Phonole |
| Combustion | Engines, Appliances, Smoke | Unburnt Hydrocarbons, CO, CO ₂ |
| Building Materials | Paints, Adhesives, Solvents, Carpets | Formaldehyde, Alkanes, Alcohols, Aldehydes, Ketones, Siloxanes |
| Furniture | Poly Vinyl Chloride (PVC) | Toluene, Xylene, Decane |





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

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

Space Occupancy — VOC Sensing versus CO₂ Sensing

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

These charts were taken Jan. 3-9, 2011, in a Kitchen and Dining area of a public school in Wisconsin. This location is a true multi-purpose area. It is used for breakfast, morning snacks, lunch, and after school studies during the day, and athletic practices, exercise classes and occasional meetings in the evenings.

The VOC and CO₂ sensors are located next to each other in the dining room near the kitchen entrance. The open percentage of the outdoor air damper for this area is controlled by the VOC sensor output through a PID control loop from 5 am to 2 pm on weekdays when the space is considered "occupied". The outside air damper is closed during the unoccupied period, and ventilation is accomplished by diffusion from the adjacent hallways.

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

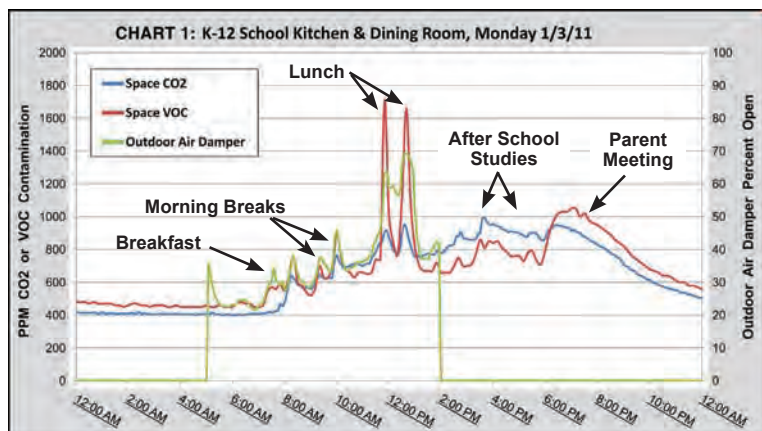
Chart 1. Monday:

The area goes into occupied mode at 5 am and the outdoor air damper -- the green line -- begins to track the output of the VOC sensor -- the red line. At 7 am, the VOC sensor picks up the breakfast cooking aromas and activities. The CO₂ sensor climbs a short time later as the students arrive to eat. The VOC sensor has slightly higher readings than the CO₂ sensor during breakfast and the morning breaks because the VOCs from the food are added to the VOCs generated by the people. This is also seen at lunch as cooking of the sausage pizza generated lots of VOCs which are added to the VOCs from the students and staff. Additional fresh air is brought in to dilute the VOCs during the lunch period.

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

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

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



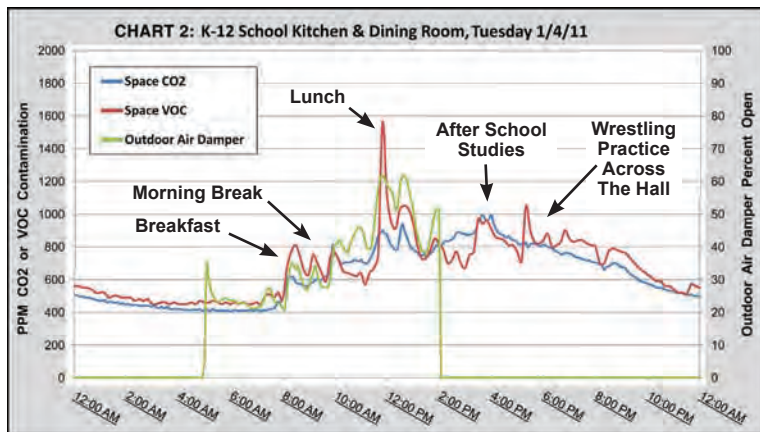


Chart 2, Tuesday:

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

There is a small spike in VOCs at about 5:45 due to Pee Wee wrestling practice which takes place in a performance area just across the hall from 6 to 8 pm. The dining room is used as a rest area for parents and as a place for the wrestlers to store their gym bags during practice, which accounts for the increase in VOCs at that time.

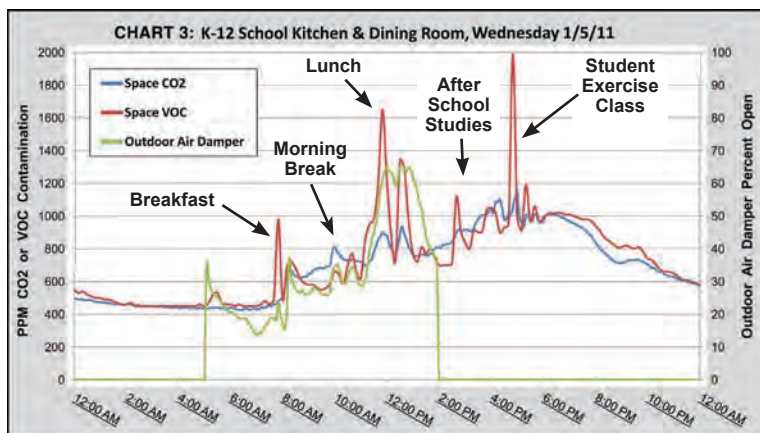


Chart 3, Wednesday:

The daytime portion of Wednesday is similar to Monday and Tuesday with increases in VOCs and CO₂ during breakfast, midmorning break and after school studies, and spikes in VOCs due to cooking at lunch.

There is a large spike in VOCs at about 4:45 pm due to a general exercise class for students. People generate more VOCs when they're exercising, and the students also brought in gym bags and put on exercise clothing which added to the VOCs at that time.

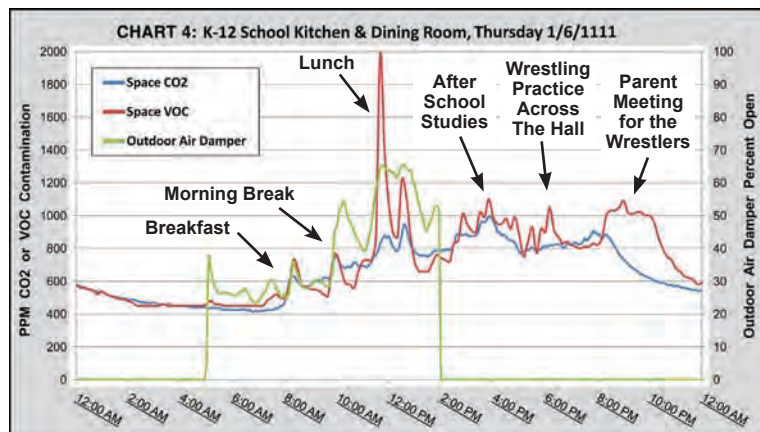


Chart 4, Thursday:

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

There is an increase in VOCs at 6 pm (similar to Tuesday) due to the Pee Wee wrestling practice in the performance area across the hall. There is another increase in VOCs at 8 to 10 pm due to a parents meeting for the wrestlers in the dining area at that time.

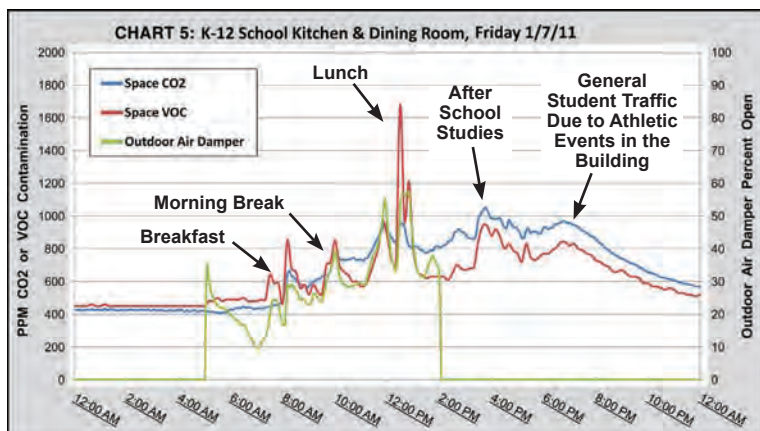
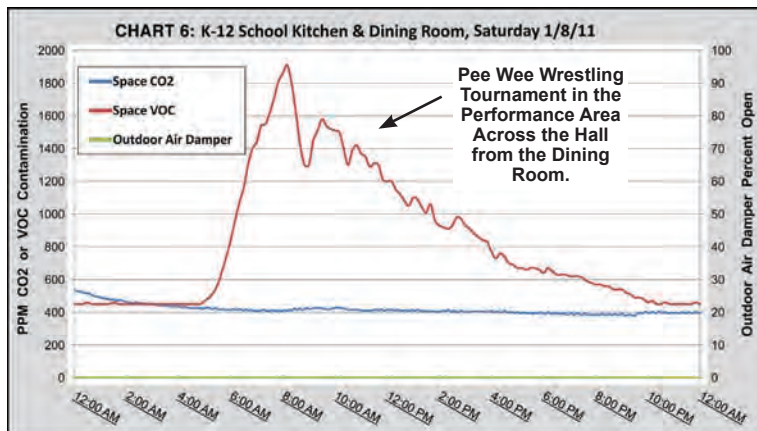


Chart 5, Friday:

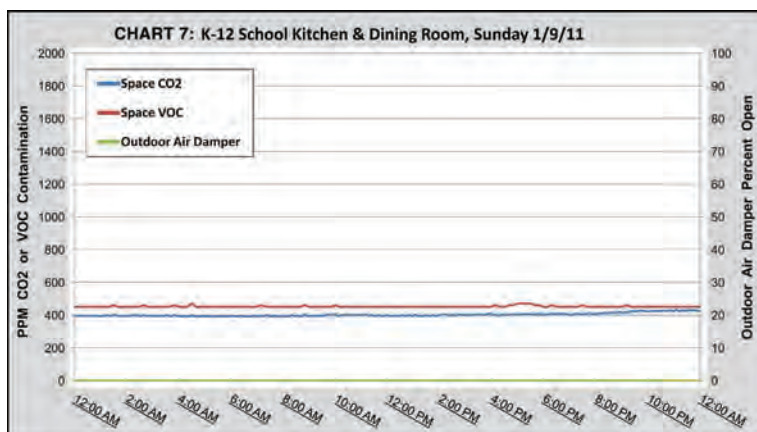
The daytime portion of Friday is similar to the rest of the week with increases in VOCs and CO₂ during breakfast, midmorning break and after school studies, and spikes in VOCs due to cooking at lunch.

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

**Chart 6, Saturday:**

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

However, VOCs are being generated in the dining room from about 6 am to noon due to a Pee Wee Wrestling Tournament in the performance center across the hall. Wrestlers store their gym bags and other belongings in the dining area during the tournament, which accounts for the VOCs during that time. A CO₂ sensor would not ventilate away these VOCs and odors.

**Chart 7, Sunday:**

Sunday is the only day with no activity in the kitchen and dining area or the surrounding spaces, so there is only background levels of VOCs and CO₂.

The True Meaning of Air Quality

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

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

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

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



The Financial Benefits of Appropriate Ventilation

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

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

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

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

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

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

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Carbon Dioxide (CO₂) in air is normally measured in Parts Per Million (ppm). At 1,000 ppm CO₂, one million air molecules would contain a mixture of 999,000 air molecules and 1,000 CO₂ molecules. The most common CO₂ sensors are known by the engineering term Non-Dispersive InfaRed, or NDIR. An NDIR CO₂ 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. CO₂ molecules are opaque to 4.26 micron infrared light while the rest of the air molecules are not. So the intensity of the infrared light is diminished proportionally to the number of CO₂ molecules that are present. Measuring the resultant light intensity measures the number of CO₂ molecules present.

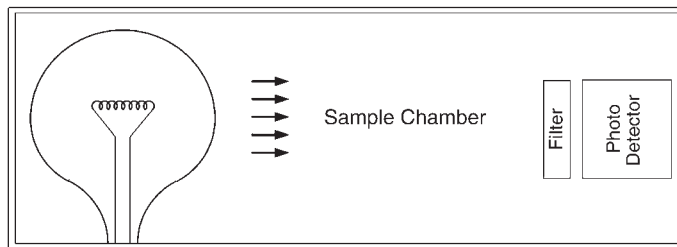


Figure 1: Single Channel CO₂ Sensor

Sensor Drift

The most common light source for NDIR sensors is an incandescent light bulb. In these bulbs, an electric current passes through a metal filament and heats it until it starts to glow. The glowing filament is extremely hot and some of the metal atoms boil off the filament and fly around inside the bulb. Most of these atoms re-adhere to the filament when the power is turned off, but some move far enough away from the filament that they condense onto the glass envelope. Over time, this thin metal coating slightly reduces the amount of light emitted by the bulb. This reduction is perceived by the sensor as an increase in CO₂ concentration. Also, when the metal atoms condense back onto the filament, they can slowly shift the spectrum of the emitted light which can affect the perceived infrared light intensity and CO₂ concentration.

Automatic Background Calibration

One way to compensate for sensor drift is through automatic background calibration. Outdoor levels of CO₂ are generally around 400 ppm. Since people are the main source of CO₂ inside a building, when a building is unoccupied for 4 to 8 hours the CO₂ levels tend to drop to the outside level. Automatic background calibration uses the sensor's on-board microprocessor to remember the lowest CO₂ concentration that occurs every 24 hours. The sensor assumes this low point is the outside CO₂ level. The sensor is also smart enough to discount periodic elevated readings that occur if a space is occupied for 24 hours a day over a few days. Once the sensor has collected 14 days worth of low CO₂ concentration periods, it performs a statistical analysis to see if there has been any small changes in the background levels readings that could be attributable to sensor drift. If the analysis concludes there is drift, a small correction factor is made to the sensor calibration to adjust for this change. This automatic calibration requires that at least three of the last 14 days have space CO₂ levels that reach 400 ppm for an hour or more.

Reference Channel Calibration

Another way to compensate for sensor drift is through a dual channel design. In this setup, one photo-detector and filter is used for CO₂ measurement and works the same as in a single channel design. The second photo-detector and filter is a reference and uses a wavelength that is not affected by air molecules. About once a day, the sensor takes a reading using the reference channel. Any change in this reference measurement indicates a change in the optics of the sensor which can lead to drift. The sensor then automatically corrects the CO₂ measurement from the first channel to prevent the drift.

While the reference channel corrects for changes over time, a field calibration will immediately restore the highest level of accuracy. BAPI recommends a 5-year calibration interval for the average office environment.

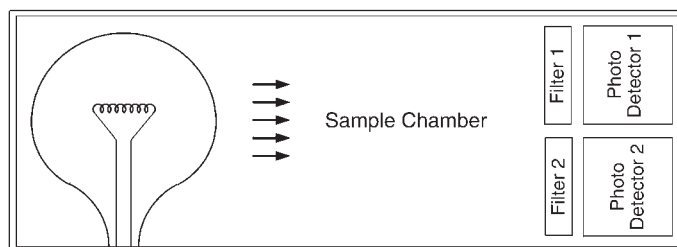


Figure 2: Dual Channel CO₂ Sensor



Depending on the source of the information, 5,000 to 10,000 unique Volatile Organic Compounds (VOCs) exist. BAPI's VOC sensor reacts to all of them.

VOCs are chemicals that contain carbon and have boiling points below 100°C. Most can be vapors at room temperature. In their liquid form many VOCs can contaminate ground water.

Families of VOCs detected are:

- CO, CH₄, LPG
- Alcohols
- Ketones. Ketones are solvents. The best known are Acetone and Methyl Ethyl Ketone or MEK.
- Organic Acids. Common organic acids are Lactic acid, Acetic acid, Formic acid, Citric acid and Oxalic acid
- Amines. Amines are derivatives of ammonia.
Wikipedia lists 175 compounds as amines, <http://en.wikipedia.org/wiki/Category:Amines>
- Aliphatic Hydrocarbons. Aliphatic hydrocarbons are flammable hydrocarbons with little or no odor. Examples are hexane, paraffin, methane and acetylene.
- Aromatic Hydrocarbons. Aromatic hydrocarbons are flammable hydrocarbons with a discernable odor. Examples are benzene, furan, pyridine, toluene, asphaltene and picric acid.

A list of some of the most common VOCs and their sources follows.

| <u>VOC</u> | <u>Source</u> |
|---|--|
| 1-hexene..... | Human metabolism |
| 1-isocyanobutane | Coatings |
| 1,1,1-trichloroethane..... | Ink, Paint, Photo-resist, Photographic film |
| 1,4-dioxane..... | Spot removers |
| 2-bromopentane | Prescription drugs |
| (2-methylcyclohexyl) propanedinitrile ... | Human metabolism |
| 2,2-dimethylbutane | Human metabolism |
| 2,3,3-trimethylpentane..... | Human metabolism |
| 2,3-dimethylpentane | Human metabolism |
| 2,3,4-trimethylpentane..... | Human metabolism |
| 3-methylhexane..... | Human metabolism |
| 3,4-dimethyl-1-pentene..... | Human metabolism |
| 4-methyl-1-pentene | Human metabolism |
| 5-methyl-1-hexene..... | Human metabolism |
| 6-methyl-1-heptanol..... | Human metabolism |
| Acetaldehyde..... | Disinfectants, Adhesives, Coatings, Plastics, Lubricants, Ripening of fruit |
| Acetic acid esters | Surface cleaners |
| Acetone | Polyester resins, Vinyl, Adhesives, Human metabolism |
| bis-(1,1-dimethylethyl)nitroxide..... | Human metabolism |
| Benzene | Plastics, Building materials, Furniture, Office equipment |
| Butoxyethanol..... | Surface cleaners |
| Butyl acetate..... | Surface cleaners |
| C6 - C10 substituted alkanes | Cleaners, Polishers |
| Carbon Monoxide | Automobile exhaust, Fuel based heating, Cooking appliances, Smoking |
| Decanal | Artificial flavors, Perfume, Human metabolism |
| Dichlorobenzene..... | Deodorizers |





Common Volatile Organic Compounds Detected by BAPI's VOC Sensor

D33

A list of some of the most common VOCs and their sources follows, continued from previous page...

| <u>VOC</u> | <u>Source</u> |
|-------------------------------------|---|
| Dipropylene glycol | Surface cleaners |
| Ethanol | Disinfectants, Human metabolism |
| Ethyl Alcohol | Cosmetics, Cleaners, Disinfectants, Detergents, Paints, Human Metabolism |
| Eucalyptol | Cosmetics, Artificial flavors, Insecticides |
| Formaldehyde..... | Biocides, Disinfectants |
| Heptane | Human metabolism |
| Hydrocarbons | Waxes, Polishes |
| Isobutane..... | Aerosol cleaners |
| Isobutene..... | Aerosol cleaners |
| Isoprene..... | Synthetic rubber, Human metabolism |
| Limonene..... | Cosmetics, Cleaners, Artificial flavors, Prescription drugs |
| Methane..... | Natural gas, Human metabolism |
| Methoxyethanol..... | Surface cleaners |
| Methoxyethoxyethanol..... | Surface cleaners |
| Methylcyclohexane..... | Human metabolism |
| Methylethylketone..... | Adhesives, coatings, Plastics, Lubricants |
| Methyl methacrylate | Hard surface cleaners |
| Naphthalene | Disinfectants, Repellants |
| Nonanal | Artificial flavors, Perfume, Human metabolism |
| Organic Chloramines..... | Combination of general and pool cleaning chemicals and human metabolism |
| Pentane | Polystyrene foam, Refrigerants |
| Phenol | Plastics, Cosmetics, Disinfectants |
| Pinene | Perfume, Human metabolism |
| Propane | Fuel based heating, Cooking appliances, Cleaners |
| Siloxanes | Waxes, Polishes |
| Tetrachloroethene..... | Dry cleaning |
| Tetrachloroethylene | Spot cleaners |
| Toluene | Paints, Coatings, Cleaners, Detergents, Smoking, Polyurethane lacquers |
| Trichloromethane..... | Human metabolism |
| r (1-methylethyl)cyclopropane | Adhesives, Coatings, Plastics, Lubricants |
| Xylene..... | Plastics, Synthetic Rubber, Polyester clothing |





Carbon Dioxide (CO₂) in air is normally measured in Parts Per Million (ppm). At 1,000 ppm CO₂, a volume of air containing one million air molecules would contain a mixture of 999,000 air molecules and 1,000 CO₂ molecules.

The volume of air necessary to contain one million air molecules is affected by air temperature and air pressure, also called Barometric Pressure. As the pressure decreases, the volume needed to contain one million air molecules increases. The opposite is true of temperature. As the temperature decreases, the volume of air needed to contain one million molecules decreases. Although the volume of air is affected by temperature and pressure, the concentration of CO₂ is not affected. If you started with 1,000 ppm of CO₂, then you finish with 1,000 ppm of CO₂ despite the changes in the air volume.

The most common CO₂ sensors are known by the engineering term Non-Dispersive InfraRed, or NDIR. An NDIR CO₂ sensor shines infrared light through a gas sample in a sample chamber. Sensitive photo-detectors measure the intensity of the infrared light after it passes through the gas sample. CO₂ molecules are opaque to 4.26 micron infrared light while the rest of the air molecules are not. So the intensity of the infrared light is diminished proportionally to the number of CO₂ molecules that are present. Measuring the resultant light intensity measures the number of CO₂ molecules present.

The size of the NDIR sampling chamber is fixed and is open to the atmosphere so that air can move in and out. As explained above, the number of air molecules in a given volume is affected by temperature and air pressure but not the concentration of CO₂. At low pressures or high temperatures, there will be fewer air molecules in the sample chamber, so there will also be fewer CO₂ molecules, even though the ppm of CO₂ hasn't changed. Fewer CO₂ molecules "fools" the sensor into thinking that the CO₂ concentration is lower than it really is. At high pressures or low temperatures, there are more air molecules in the sample chamber and more CO₂ molecules, even though the CO₂ concentration hasn't changed. More CO₂ molecules "fools" the sensor into thinking that the CO₂ concentration is higher than it really is. Therefore a CO₂ sensor calibration will only be accurate at one temperature and one air pressure.

Calculating Temperature and Barometric Pressure Effects on CO₂ Measurement

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

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

- **p_{measured}** = Current pressure, in the same units as reference pressure (not corrected to sea level)

- **T_{ref}** = reference temperature, usually 25°C, 77°F, converted to absolute (298.15 for °C, 536.67 for °F)

- **T_{measured}** = Current absolute temperature, °C + 273.15, °F + 459.67

- **p_{ref}** = reference Barometric Pressure, usually sea level, 29.92 in Hg, 760 mm Hg, 1013.207 hPa or 14.6959 psi

Table 1 uses the Ideal Gas Law formula above to show how the uncompensated CO₂ measurement would change with temperatures from 32 °F to 110 °F. Initial conditions are 1,000 ppm CO₂, 77°F and sea level Barometric Pressure. As seen in Table 1, the CO₂ concentration varies by 150 ppm.

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

| 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 |

| Altitude in Feet | Barometric Pressure in inches Hg | CO ₂ Measured in PPM |
|------------------|----------------------------------|---------------------------------|
| -1000 | 31.02 | 1037 |
| 0 | 29.92 | 1000 |
| 1000 | 28.85 | 964 |
| 2000 | 27.82 | 930 |
| 3000 | 26.82 | 896 |
| 4000 | 25.84 | 864 |
| 5000 | 24.9 | 832 |
| 6000 | 23.98 | 801 |
| 7000 | 23.09 | 772 |
| 8000 | 22.23 | 743 |
| 9000 | 21.39 | 715 |
| 10000 | 20.58 | 688 |



Weather Effects on Barometric Pressure and CO₂ Measurement

Heat entering our atmosphere creates weather patterns, and these patterns affect the Barometric Pressure by forming high pressure systems and low pressure systems. Fast moving storms can dramatically change the atmospheric pressure and effective altitude in only a few minutes.

About 15 miles from BAPI's headquarters is an internet enabled weather station on the Mississippi River bluffs above the small town of DeSoto. Looking at historical data from that weather station from 2003 to 2011, the highest pressure, the lowest pressure and the biggest one-day pressure swing are shown in Table 3.

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

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

Table 3: CO₂ Measurement Change with Weather Patterns

| Date | Barometric Pressure in inches Hg | Measured CO ₂ in PPM |
|------------|----------------------------------|---------------------------------|
| 1/18/2005 | 30.71 | 1026 |
| 1/18/2005 | 29.64 | 991 |
| 1/15/2005 | 30.78 | 1029 |
| 10/26/2010 | 28.53 | 954 |

The Combined Effect of Temperature and Barometric Pressure on CO₂ Measurement

Temperature and Barometric Pressure affect CO₂ measurement individually as well as in combination. **Table 4** shows the measured CO₂ concentration for the range of Barometric Pressures recorded in DeSoto from 2005 to 2010 along with temperatures from 50 to 90°F.

If the actual CO₂ concentration was 1,000 ppm at 77°F and sea level, the measured CO₂ concentration would vary by 161 ppm across the various temperature and Barometric Pressure ranges. That variance is more than the specified accuracy of the NDIR CO₂ sensor.

Table 4: CO₂ Measurement Change with Temperature and Barometric Pressure Combined

| | | Barometric Pressure in Inches Hg | | | | | | |
|-------------------|----|----------------------------------|------|------|-------------|------|------|------|
| | | 28.5 | 29 | 29.5 | 29.92 | 30 | 30.5 | 31 |
| Temperature in °F | 50 | 1003 | 1021 | 1038 | 1053 | 1056 | 1073 | 1091 |
| | 55 | 993 | 1011 | 1028 | 1043 | 1046 | 1063 | 1080 |
| | 60 | 984 | 1001 | 1018 | 1033 | 1035 | 1053 | 1070 |
| | 65 | 974 | 991 | 1009 | 1023 | 1026 | 1043 | 1060 |
| | 70 | 965 | 982 | 999 | 1013 | 1016 | 1033 | 1050 |
| | 75 | 956 | 973 | 990 | 1004 | 1006 | 1023 | 1040 |
| | 77 | 953 | 969 | 986 | 1000 | 1003 | 1019 | 1036 |
| | 80 | 947 | 964 | 980 | 994 | 997 | 1014 | 1030 |
| | 85 | 939 | 955 | 971 | 985 | 988 | 1004 | 1021 |
| | 90 | 930 | 946 | 963 | 976 | 979 | 995 | 1012 |

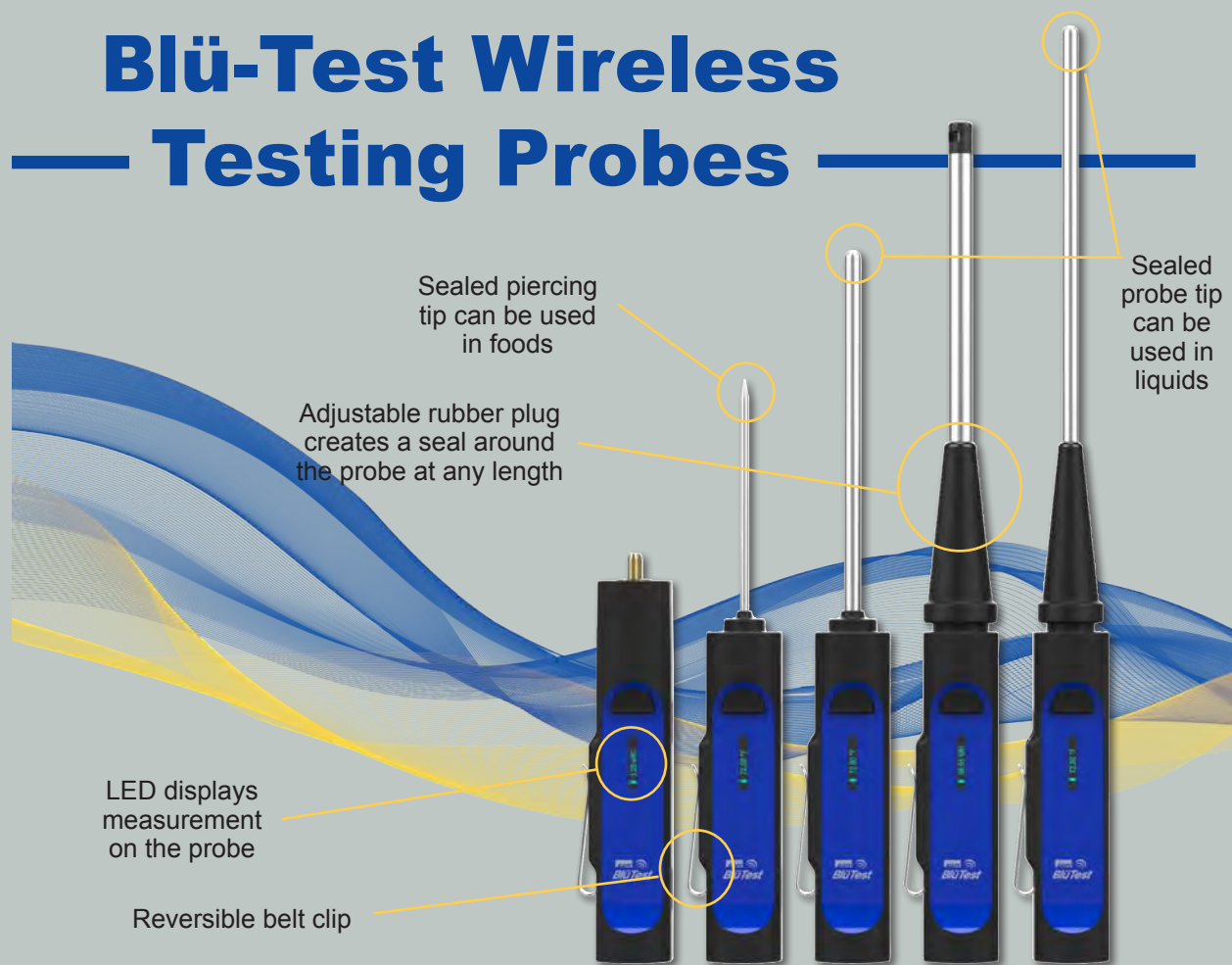
Dynamic CO₂ Measurement Compensation

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

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



Blü-Test Wireless — Testing Probes —



- Communicates via Bluetooth® with your Android™ or iOS Smart Phone or Tablet
- Temperature, Humidity and Differential Pressure Sensors
- Rechargeable Lithium Battery via Micro-USB
- Connect Up to 6 Sensors at a Time
- LED on the Probe Displays Readings

The Blü-Test is a suite of handheld testing probes that interface via Bluetooth® wireless technology to the user's enabled Android™ or iOS Smart Phone or Tablet. Each probe comes with a National Institute of Standards and Technology (NIST) traceable certificate of calibration.

Blü-Test is very simple to use. Just start up the app on your smart phone or tablet and touch-select the probe to sync Bluetooth communication. The sensor logs the data and then uploads it to the app automatically when your device is in range. You can view measurements in real-time on the gauge view or a trending graph. You can then email the data or upload it to cloud storage.



Measurement

Trending


























Rev. 05/04/18

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Ordering Information

Part Number Description

BA/BT-TP Blü-Test Temperature, 4" length piercing, 1/8" diameter (10.2 cm x .32 cm)

BA/BT-TA Blü-Test Temperature, 6" length, 1/4" diameter (15.3 cm x .64 cm)

BA/BT-TB Blü-Test Temperature Probe, 9.5" length, 1/4" diameter (24.2 cm x .64 cm)

BA/BT-TH Blü-Test Temp/Humidity Probe, 8" length, 3/8" diameter (20.3 cm x .95 cm)

BA/BT-DPLR... Blü-Test Differential Pressure, Low Range, -1 to +1" WC (-250 to +250 Pascals)

BA/BT-DPSR... Blü-Test Differential Pressure, Standard Range, -5 to +5" WC (-1,250 to +1,250 Pascals)

See end of Section E for list pricing.

Blü-Test App Specifications

Application Program: *Android OS 4.4 (SDK19) or Apple iOS 9 or higher required

Display: Display on probe or device

Measured Data Temp. (°F/°C), Temp. & %RH or Differential Pressure (inches WC or Pascals)

Time Stamp Date and 24 hour time

Location Uses location of smart phone or tablet

Save Saves current data, time & location

Log Show trend data on screen

Email Sends data log to any email address

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





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

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. To minimize the AC voltage noise, the DC converter must be mounted as close to the controller as physically possible. Do not mount the converter at the sensor end of the wire, the AC will still couple into the sensor signal if you do. All fixed outputs of 5, 10, 12 or 15 VDC are adjustable $\pm 10\%$. The adjustable model (-ADJ) has an output of 5 to 24 VDC.



**VC350A EZ
mounted on DIN Rail**

Ordering Information

| Part Number | Description |
|------------------|---|
| BA/VC350A-EZ-5 | 5 VDC Output at 350 mA |
| BA/VC350A-EZ-10 | 10 VDC Output at 350 mA |
| BA/VC350A-EZ-12 | 12 VDC Output at 350 mA |
| BA/VC350A-EZ-15 | 15 VDC Output at 350 mA |
| BA/VC350A-EZ-ADJ | 5 to 24 VDC Adjustable Output at 350 mA |

*See end of
Section E for
list pricing.*

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

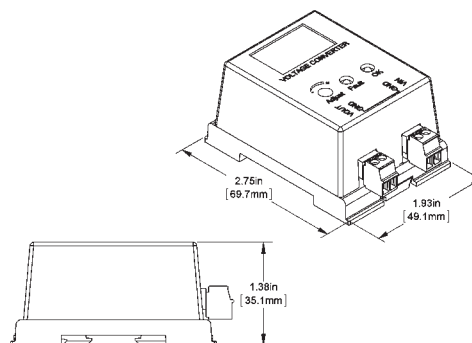
Environmental Storage Range:
-40 to 176°F (-40 to 80°C)

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.





Rev. 06/23/17

VC350A Voltage Converter

Accessories for HVAC/R**E5**

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 Short Circuit

BAPI's VC350A 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 converter is very compact and designed to fit into standard 2.75" snaptrack.



**VC350A mounted
in optional snaptrack**

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. To minimize the AC voltage noise, the DC converter must be mounted as close to the controller as physically possible. Do not mount the converter at the sensor end of the wire, the AC will still couple into the sensor signal if you do. All fixed outputs of 5, 10, 12 or 15 VDC are adjustable $\pm 10\%$. The adjustable model (-ADJ) has an output of 5 to 24 VDC.

| Part Number | Description |
|--------------------|---------------------------|
| BA/VC350A-5..... | 5 VDC at 350 mA |
| BA/VC350A-10..... | 10 VDC at 350 mA |
| BA/VC350A-12..... | 12 VDC at 350 mA |
| BA/VC350A-15..... | 15 VDC at 350 mA |
| BA/VC350A-ADJ | 5-24 VDC (adj.) at 350 mA |

Note: Add **-TRK** to the end of the part number (**BA/VC350A-5-TRK**) to include a 1.25" length of 2.75" snaptrack

See end of Section E for list pricing.

350mA EZ Voltage Converter

BAPI also makes a 350mA EZ Voltage Converter. The revolutionary mounting system allows for DIN Rail, Snaptrack or surface mounting. (See page E4 of this section.)



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

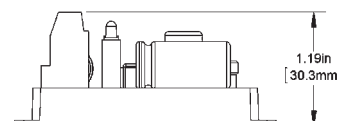
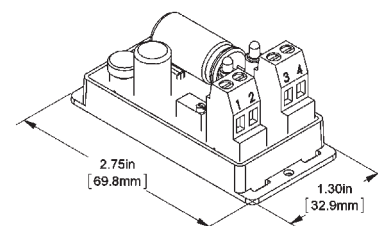
Environmental Storage Range:
-40 to 176°F (-40 to 80°C)

Wiring: 4 wires, 16 to 22 gauge

Rectification: Half-Wave Rectified

Grounding:

AC & DC Ground are Common



Note: The VC350A is a Class 2 circuit when it is powered from a UL Class 2 power supply.



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Features & Options

- 3 or 5 Circuit Power Distribution
- Expandable by Cascading Additional PDM's
- 12 to 30V AC/DC operation
- Master Power Switch w/ 10 Amp Breaker
- Individual Circuit Power Switches
- Individual 3 Amp Circuit Protection
- Power and Fault LED's



PDM - Power Distribution Module
BA/PDM-5-B

The PDM - Power Distribution Module is a low voltage (12 to 30V AC/DC) 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 with a minimum of panel space.

A common module On/Off switch and 10 amp breaker powers the distributed circuits. Each circuit has an individual On/Off switch and individual field connection terminals. The PDM has individual circuit protection with either a 3 amp fuse or 3 amp breaker with an individual power LED and fault LED per circuit.

Part Number Description

| | |
|-------------------------|---|
| BA/PDM-5-B | Five circuit Power Distribution Module, w/ breaker |
| BA/PDM-3-B | Three circuit Power Distribution Module, w/ breaker |
| BA/PDM-5-F | Five circuit Power Distribution Module, w/fuse |
| BA/PDM-3-F | Three circuit Power Distribution Module, w/fuse |

See end of Section E for list pricing.

Specifications

Supply Voltage: 12 to 30V AC/DC 10 amps max

Circuit Distribution:3 or 5 circuits

Circuit Protection:

Master Breaker..... 10 amp, push to reset

Individual Fused ...3 amp, slow blow 20mm fuse

Individual Breaker.3 amp, push to reset

Visual Indicators:

PowerGreen 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, 28-12 AWG

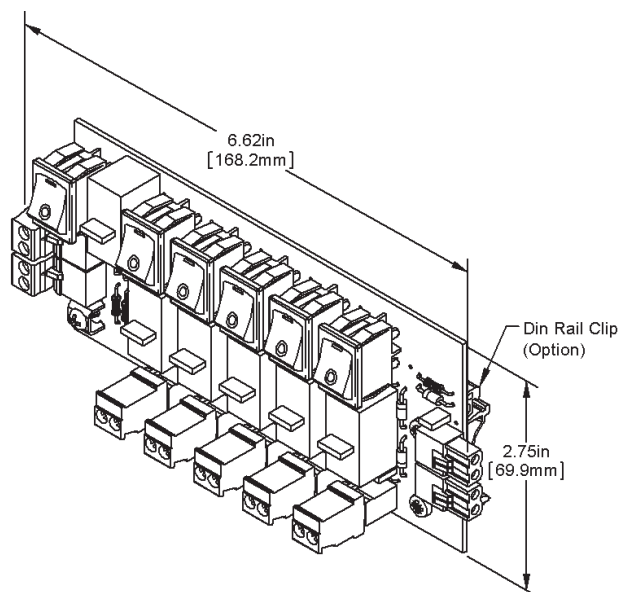
Dimension: 6.62" L x 2.75" W x 2" H
(16.9cm L x 7cm W x 5cm H)

Mounting: 2.75" snaptrack,
Module to module close connection

Ambient: -40 to 158°F (-40 to 70°C)

Warranty: 5 years

Weight: 0.3lb (0.13kg)





Rev. 06/23/17

VC2000 Voltage Converters

Accessories for HVAC/R

E7

Features & Options

- Compact and Cost-Effective
- Regulated and Adjustable 1.2 VDC to 24 VDC Output
- Output Protected Against Overload and Accidental Short Circuit

BAPI's VC2000 Voltage Converters are accurate, rugged and reliable power sources designed for commercial energy management applications.

The 2 Amp Voltage Converter accepts a 24 VAC input which can be field adjusted to a regulated output of 1.2 VDC to 24 VDC (factory set for 24 VDC). The input can be field configured for full or half wave rectification. The unit includes an output fuse to protect against overload and short circuits, a power indication LED, and is available with or without a backplate on the steel mounting bracket. Self-resetting or cartridge fuses may be specified at the time of order.



VC2000 with backplate and cartridge fuse

Ordering Information

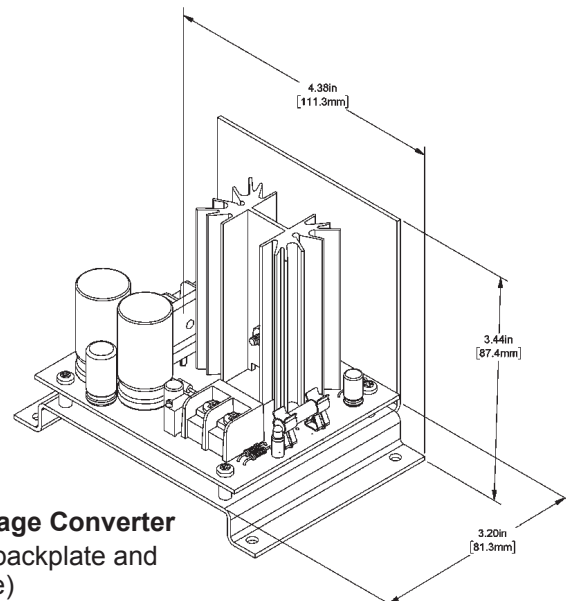
| Part Number | Description |
|-----------------|--|
| BA/VC2A-F | Converter without backplate, cartridge fuse |
| BA/VC2A-P | Converter without backplate, self-resetting fuse |
| BA/VC2B-F | Converter with backplate, cartridge fuse |
| BA/VC2B-P | Converter with backplate, self-resetting fuse |

See end of Section E for list pricing.

Specifications

Input Voltage Range: 24 VAC (100 VA)
Fuse Protection: 4 Amp, output side
Output Voltage Range: 1.2 VDC to 24 VDC
Maximum Output Current: 2.0 Amps
Operating Range: -40 to 158°F (-40 to 70°C)
Rectification: Field Selectable as Full or Half Wave
Wiring: 16 to 22 AWG

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)



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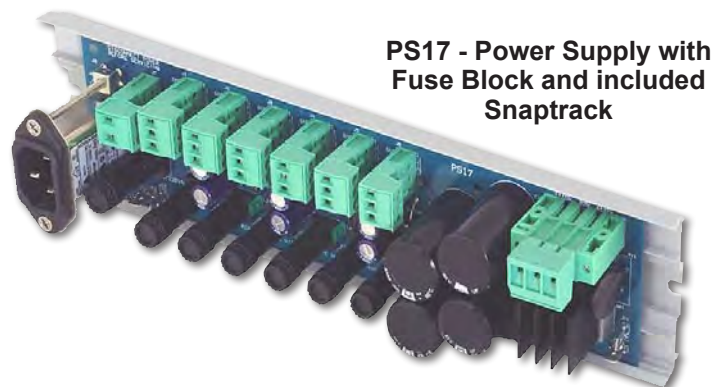


Overview

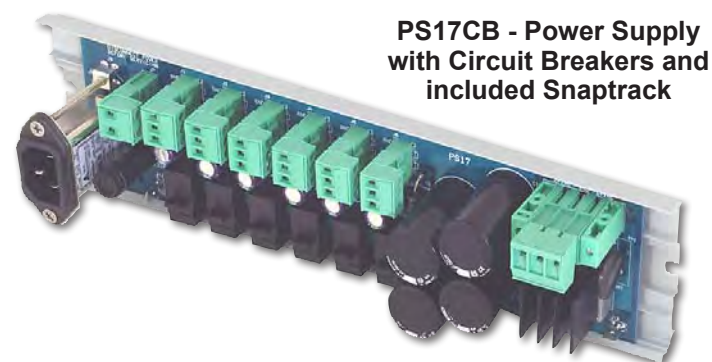
The PS17 and PS17CB Power Supplies provide up to six 33 VDC, 3 Amp power supplies each. The PS17 features a 3 Amp fuse on each output while the PS17CB features a 3.15 Amp circuit breaker on each output. Each output has a green LED, which lights to show normal power.

Both power supplies use a 120 VAC to 24 VAC transformer with a rating of 75VA to 400 VA depending upon current consumption. Total your current consumption and pick the appropriate transformer from the table at right.

The PS17CB provides a transient line filter for the 120 VAC input to the transformer. Screw terminals on the PS17CB allow convenient termination of the input and output of the transformer. Plug a standard computer power cord into a duplex outlet and then into the line filter to power the PS17CB. A green LED lights when 120 VAC is applied and the circuit breaker is not tripped. Comes with an 12.5" piece of 2.75" Snaptrack.



PS17 - Power Supply with Fuse Block and included Snaptrack



PS17CB - Power Supply with Circuit Breakers and included Snaptrack



18" Power Cord

Specifications

PS17 & PS17CB Input Power

120 VAC at 0.7 to 3.5 Amps depending on transformer selected. Standard IEC Line Filter

PS17 & PS17CB Output

Nominal 33 VDC.

Four Outputs rated at 2.25 Amps - 3 Amp Fuse or 3.15 Amp Circuit Breaker (Typically for controllers)

Ambient Temperature:
-40 to 60° C (-40 to 140° F)

Two Outputs rated at 3 Amps - 4 Amp Circuit Breaker or Fuse

Circuit Breakers are all push-to-reset style

Power Cord Specs

Input: 125 VAC at 10 Amps Max.

Wire: 3 Wire, 18 AWG

Ratings: NEMA 5-15P, UL817, CSA22.2

TRANSFORMER TABLE

| <u>Total Current Consumption</u> | <u>Transformer Power</u> |
|----------------------------------|--------------------------|
| 1.875 amps or less | 75 VA |
| 2.500 amps or less | 100 VA |
| 3.750 amps or less | 150 VA |
| 5.000 amps or less | 200 VA |
| 6.250 amps or less | 250 VA |
| 7.500 amps or less | 300 VA |
| 12.00 amps or less | 400 VA |

Note: The customer supplies the power transformer.





PS17 & PS17CB - Power Supplies

Accessories for HVAC/R

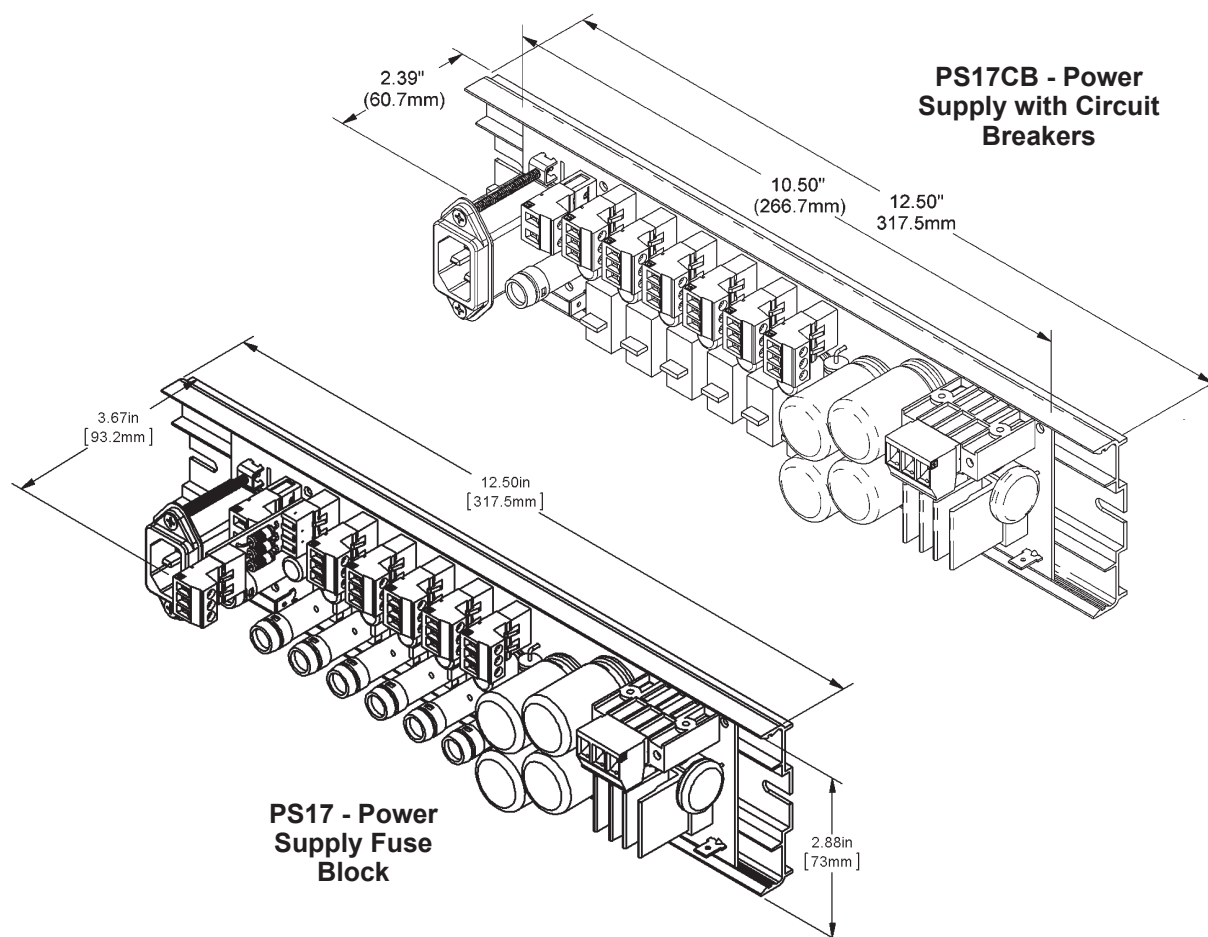
E-

Ordering Information

| Part Number | Description |
|-----------------------|---|
| BA/PS17 | PS17 Power Supply with Fuse Block |
| BA/PS17CB | PS17 Power Supply with Circuit Breakers |
| BA/PWR-CORD-18" | 18" Power Cord for PS17 Power Supply |
| BA/PWR-CORD-36" | 36" Power Cord for PS17 Power Supply |

See end of Section E for list pricing.

Dimensions





Features & Options

- Detection Within 5 Seconds with Local LED Alarm Indication
- 5 Amp or 0.5 Amp Relays @ 30VAC/DC
- One Piece, Rope or Remote Sensor Design
- NEMA 4 Enclosure

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 relays change state, and a local red LED illuminates. The transmitter can be set for latching or non-latching alarm, and normally energized or normally de-energized operation.

Detector with
Remote Sensor



Detector with
Attached Sensor



Detector with
Rope Sensor



Specifications

Power: 24VAC/VDC +/- 10%

5 Amp Relays: 4 Watt/ 4 VA max

0.5 Amp Relays: 2 Watt/ 2 VA max (not intended to switch a load)

Wiring: Flex Connector or Liquid Tight Fitting

Relays.....Up to 6 wires for Alarm Contacts

Transmitter2 wires for Power

Sensor:

AttachedSS probe w/ adjustable depth screw from 0.063 to 0.84"

RemoteSensor w/ adjustable depth from 0.062 to 0.5", Mounts to pan with industrial adhesive tape or 0.172" mounting holes

RopeLong Line Wire Sensor, Plenum Rated.
Detects 1/8" of water over the full length.

Alarm Contacts :

LDT1:..... One SPST, 0.5A relay output, 10W max.

LDT2:..... Two SPST, 0.5A relay outputs, 10W max.

LDT3: One SPDT, 5A relay output

LDT4:..... Two SPDT, 5A relay outputs

Indication: 1 Green Power LED, 1 Red Alarm LED

Reset Action: If latching, local pushbutton or power interrupt

Termination: Terminal Strip, 12 to 24 AWG

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

Enclosure Ratings:

Remote Sensor.. Submersible, with FEP plenum-rated, waterproof cable

Detector..... BAPI-Box, NEMA 4 Polycarbonate Enclosure

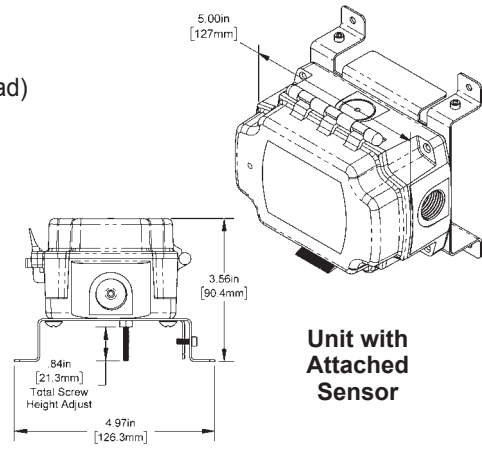
Ambient:

Remote Sensor..... -40 to 185°F (-40 to 85°C), 0 to 100%RH, Condensing

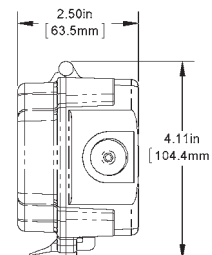
Rope Sensor..... 32 to 167°F (0 to 75°C), 0 to 95%RH, Non-condensing

Detector (BB)..... -40 to 185°F (-40 to 85°C), 0 to 95%RH, Non-condensing

Agency: RoHS, UL94V-0 , UV-rated in Enclosure

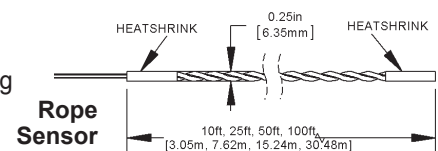
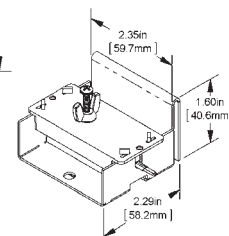


Unit with
Attached
Sensor



Unit with
Remote
or Rope
Sensor

Remote
Sensor



Rope
Sensor





Water Leak Detector

Accessories for HVAC/R

E1%

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

| | | |
|-----------|---|-------|
| LDT1..... | Water leak detector transmitter w/ one 0.5A SPST contacts | \$114 |
| LDT2..... | Water leak detector transmitter w/ two 0.5A SPST contacts..... | \$124 |
| LDT3..... | Water leak detector transmitter w/ one SPDT 5A contacts | \$120 |
| LDT4..... | Water leak detector transmitter w/ two SPDT 5A 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 |
| 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, w/ Liquid tight fitting..... | \$22 |
| BB-GFF | BAPI-Box enclosure, IP66 rated, w/ flex connector | \$13 |

Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/ (**LDT1**) - (**RR10**) - (**BB**)

Actual Number (with parenthesis removed): BA/LDT1-RR10-BB

Description: Detector with one 0.5A contact, 10' Remote Rope Sensor and BAPI-Box Enclosure

List Price: \$114 (One contact 0.5A) + \$174 (10' Rope Sensor) + \$12 (BAPI-Box) = \$300 List Price

Your Number: BA/

Replacement Remote Spot or Remote Rope Sensors

For use as updates to existing systems or built-in (-PS) probe Sensors

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

Your Number: BA/



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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. It is made of thick, durable polycarbonate and features exceptional airflow, key lock protection, horizontal or vertical mounting and easy installation with hardware included.

PART NUMBERS

BA/BG Larger BAPI-Guard Thermostat Protector

BA/BG2 Smaller BAPI-Guard 2 Thermostat Protector

BA/KEY16187 .. Replacement Key for BAPI-Guard & BAPI-Guard 2

See end of Section E for list pricing.



BAPI-Guard 2 Mounted Over a BAPI-Stat "Quantum" Sensor

Specifications

Material: Polycarbonate

Material Rating: UL 94, V-0

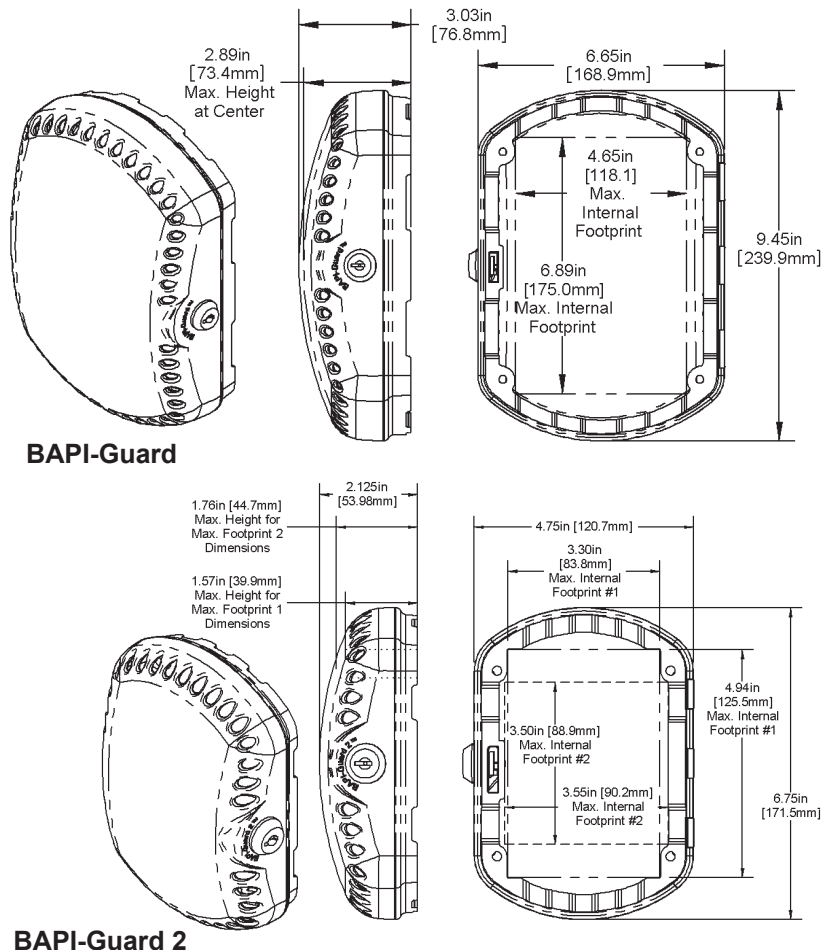
The BAPI-Guard fits these common thermostats

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 the BAPI-Guard or BAPI-Guard 2 will fit a specific thermostat, please call BAPI.





Rev. 12/20/16

FPB - Flexible Probe Bracket

E1'*Accessories for HVAC/R*

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 UL94V Nylon which limits heat/cold conduction to the probe and has multiple mounting holes to make mounting quick and easy.

ORDERING INFORMATION

Part Number Description

BA/FPB-5050 Flexible Probe Brackets

BA/FPB-100100 Flexible Probe Brackets

BA/FPB-500500 Flexible Probe Brackets

See end of Section E for list pricing.

Specifications

Material: Nylon

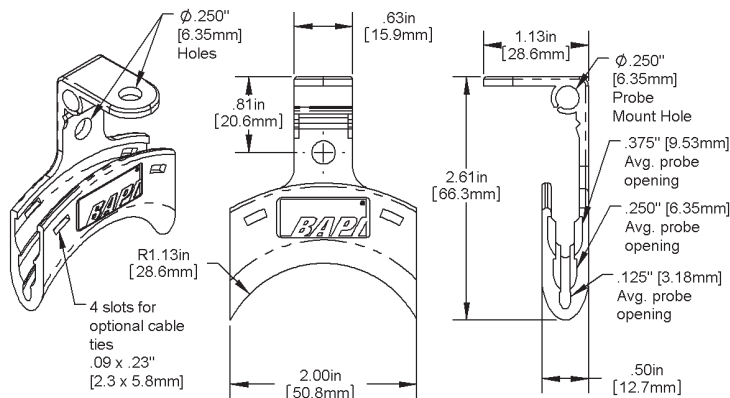
Rating: UL94V-2 (plenum rated), RoHS Compliant

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

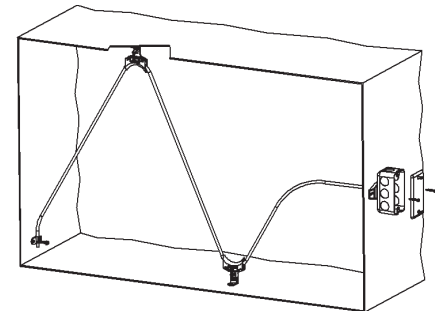
Probe Size: 1/8", 1/4", and 3/8" flexible probes
1/4" rigid probe holder, w/break off score

Bracket Arc: 1.125" radius

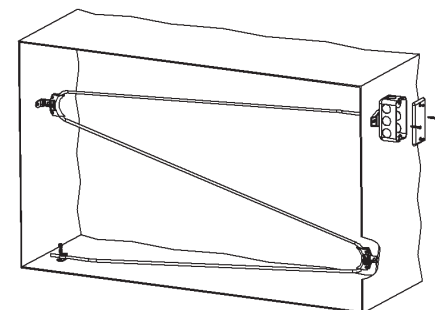
Operational Temp: -22 to 167°F, (-30 to 75°C)



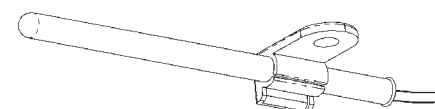
FPB - Flexible Probe Bracket



Vertical Mounting of the Averaging Sensor



Horizontal Mounting of the Averaging Sensor



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



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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

BA/PMPB5 Pulse Meter Pulse Buffer

BA/PMPB5-TRK Pulse Meter Pulse Buffer w/ 1.25" piece of 2.75" Snaptrack

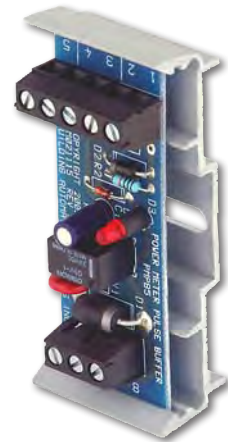
See end of Section E for list pricing.

Specifications

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

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

Contact repetition rate 2 seconds per pulse maximum



PMPB5 mounted in the optional 2.75" snaptrack

TS1 & TS2 - Transient Suppressor

Rev. 12/20/10

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. *Please 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.

Part Number

Description

BA/TS1 Transient Suppressor (voltage)

BA/TS2 Transient Suppressor (current)

BA/TS1-TRK Transient Suppressor (voltage) with 1.25" piece of 2.75" Snaptrack

BA/TS2-TRK Transient Suppressor (current) with 1.25" piece of 2.75" Snaptrack

See end of Section E for list pricing.

Specifications

TS1 Clamping Voltage 10 VAC or ± 14 VDC Line to Ground, ± 7.5 VDC Line to Line

TS2 Clamping Voltage 5 VDC Above Ground, Signal Return Line

1 VDC Below Ground, Signal Return Line

± 39 VDC Line to Ground, Power Supply Line



TS1 & TS2 - Transient Suppressors with optional 2.75" snaptrack





Rev. 10/16/12

BAPI Screwdriver & Allen Wrench

Accessories for HVAC/R

E1)

Features & Options

- Small 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



BAPI 6.75" Screwdriver & Allen Wrench Combination (top) and the 6" Screwdriver & Allen Wrench Combination (bottom)

BAPI Screwdriver & Allen Wrench Combinations are especially useful for installing BAPI Room Units.

The small, 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 (See figures below).

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

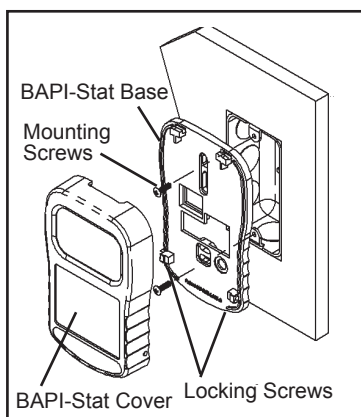
Part Number: BA/116W - BAPI 6.75" Screwdriver & Allen Wrench Combination

Part Number: BA/116 - BAPI 6" Screwdriver & Allen Wrench Combination

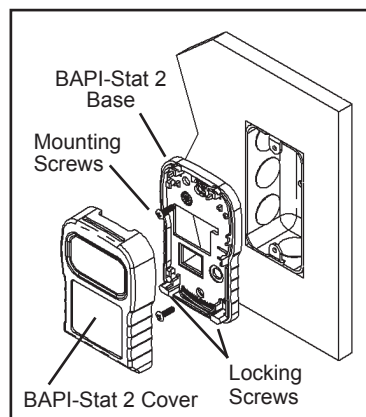
See end of Section E for list pricing.

Allen Wrench Locking Screw Locations for BAPI Room Units

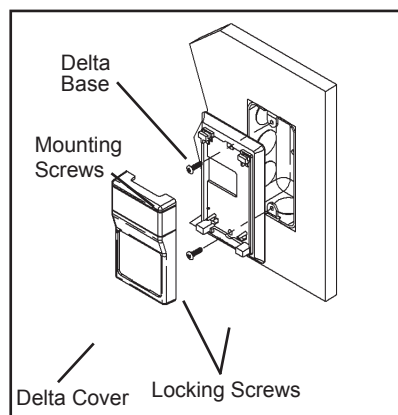
The figures below show the location of the locking screws on 5 of BAPI's room unit enclosures. The BAPI Screwdriver can be used with all of them. Simply snap the cover in place and turn the locking screws counterclockwise with the allen wrench, backing them out to lock the cover in place.



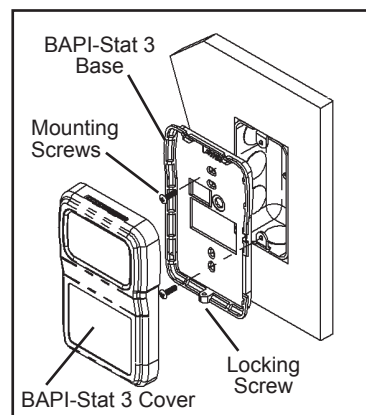
BAPI-Stat Style Enclosure



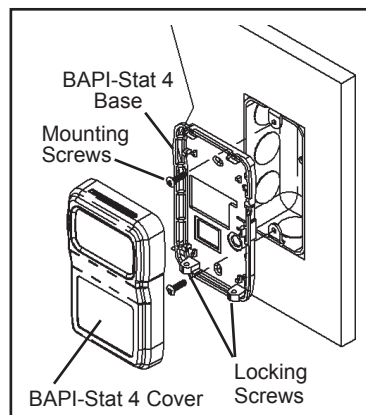
BAPI-Stat 2 Style Enclosure



Delta Style Enclosure



BAPI-Stat 3 Style Enclosure



BAPI-Stat 4 Style Enclosure



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Features & Options

- Quick, Easy and Professional Looking Knockouts for the BAPI-Box, and BAPI-Box 2 Enclosures
- One Step Cutting Bit
- Standard Hex Drill Bit Shaft
- Quick Disconnect Shaft
- Built in Rim Stop Prevents Damage to Internal Components
- Stainless Steel Construction
- Comes with Blade Sheath



Clean-Cut Tool

The Clean-Cut hole cutter is designed to cut out the plastic plugs in the 1/2" NPSM threaded ports of the BAPI-Box and BAPI-Box 2 polycarbonate enclosures. This tool makes removing the plastic plug fast and easy and produces a professional-looking .65" diameter hole.

A built-in stop prevents the tool from pushing through and possibly damaging sensitive electronics within the box, so there's no need to remove the items to drill the hole. The Stainless Steel construction keeps its edge and lasts for over 1,000 operations in both directions. The tool can be sharpened with a hand grinder or file and comes with a protective sheath to protect the blades and user.

ORDERING INFORMATION

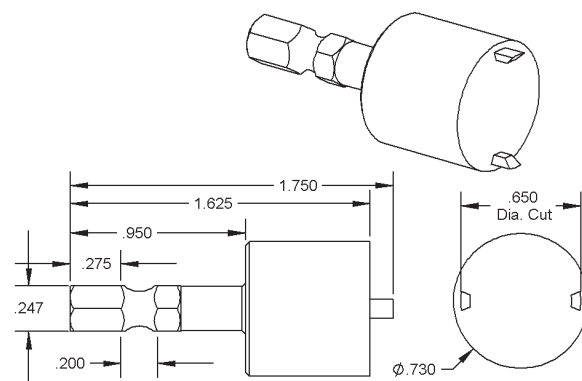
BA/CLN-CUT-50

Clean-Cut - 1/2" threaded knockout cutting tool for BAPI-Box and BAPI-Box 2

See end of Section E for list pricing.

Specifications

| | |
|-----------------------------|---|
| Material | 316 Stainless Steel |
| Rim Stop | 0.04" (1mm), in from edge |
| Shaft Stem | 0.95" (24.1mm) long with quick disconnect shaft |
| Drill Chuck | Quarter inch Hex |
| Sharpening | Hand grinder or file (As needed) |
| Weight: | 0.11lb (50.0g) |
| Outer Diameter | Smooth 0.73" (18.5mm) |
| Cutting Blades | 0.125" (3.175mm) long, 0.05" (1.27mm) wide |
| Hole Cut | 0.65" (16.51mm) |





Rev. 09/16/15

BAPI-Stat 4 Trim Ring

Accessories for HVAC/R

E1+

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.

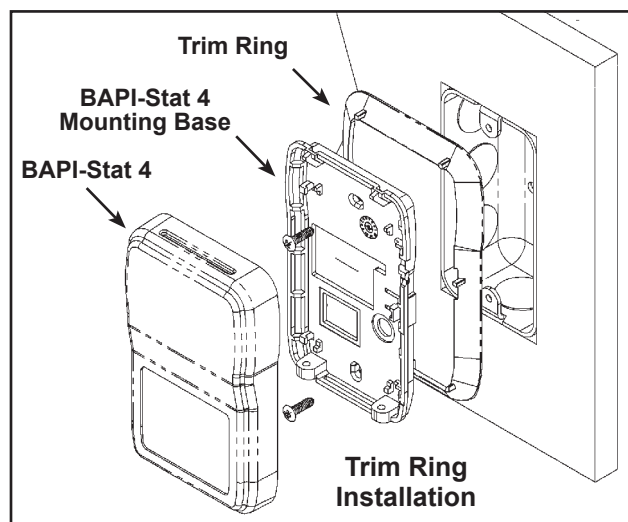
To install, place the trim ring on the wall, nest the BAPI Stat 4 mounting base into the ring and attach everything to the wall with the BAPI-Stat 4 mounting screws. The BS4 trim ring only adds 0.07 inches (1.7 mm) to the depth of the BAPI Stat 4.

ORDERING INFORMATION

BA/BS4-TR ...BAPI-Stat 4 Trim Ring *See end of Sect. E for list pricing.*



BAPI-Stat 4 Trim Ring



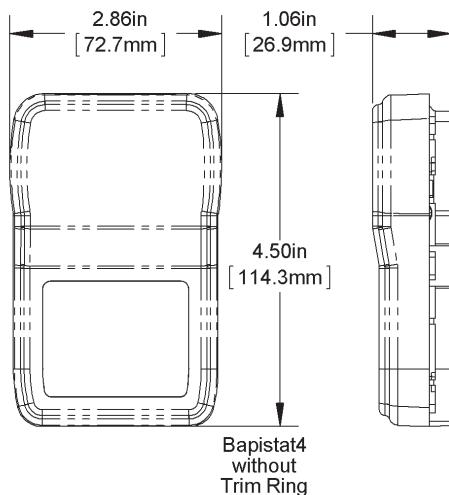
BAPI-Stat 4 Unit with and without Trim Ring

Specifications

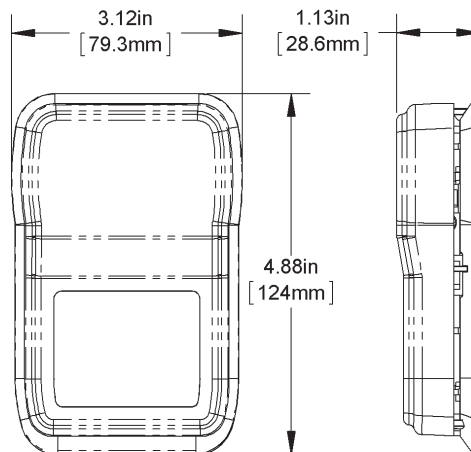
Material: ABS plastic, Flame-retardant, UL 94, V-0

Temperature: 32 to 122°F (0 to 50°C)

Humidity: 0 to 95%, non-condensing



Bapistat4 without Trim Ring



Bapistat4 with Trim Ring



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Features & Options

BAPI Adaptor Plates are designed to cover wall imperfections when installing wall sensors or thermostats. They are made in three different sizes and five different colors to match the sensor. The Adaptor Plates can be painted or wall papered in place if architecturally required.

PART NUMBERS

BA/ADP-525-7-BW Adaptor Plate, 5.25 x 7" Bright White
BA/ADP-525-7-WMW Adaptor Plate, 5.25 x 7" Warm White
BA/ADP-525-7-OFW Adaptor Plate, 5.25 x 7" Off White
BA/ADP-525-7-CPW Adaptor Plate, 5.25 x 7" Copla White
BA/ADP-525-7-CDW Adaptor Plate, 5.25 x 7" Cloud White
BA/ADP-53-53-BW Adaptor Plate, 5.3 x 5.3" Bright White
BA/ADP-53-53-WMW Adaptor Plate, 5.3 x 5.3" Warm White
BA/ADP-53-53-OFW Adaptor Plate, 5.3 x 5.3" Off White
BA/ADP-53-53-CPW Adaptor Plate, 5.3 x 5.3" Copla White
BA/ADP-53-53-CDW Adaptor Plate, 5.3 x 5.3" Cloud White
BA/ADP-37-55-BW Adaptor Plate, 3.75 x 5.5" Bright White
BA/ADP-37-55-WMW Adaptor Plate, 3.75 x 5.5" Warm White
BA/ADP-37-55-OFW Adaptor Plate, 3.75 x 5.5" Off White
BA/ADP-37-55-CPW Adaptor Plate, 3.75 x 5.5" Copla White
BA/ADP-37-55-CDW Adaptor Plate, 3.75 x 5.5" Cloud White
BA/ADP-37-55-BW Adaptor Plate (Europe), 3.75 x 5.5" Bright White
BA/ADP-37-55-WMW-UK Adaptor Plate (Europe), 3.75 x 5.5" Warm White
BA/ADP-37-55-OFW-UK Adaptor Plate (Europe), 3.75 x 5.5" Off White
BA/ADP-37-55-CPW-UK Adaptor Plate (Europe), 3.75 x 5.5" Copla White
BA/ADP-37-55-CDW-UK Adaptor Plate (Europe), 3.75 x 5.5" Cloud White



See end of Section E for list pricing.

Color Reference





Adaptor Plates for Retrofits

Accessories for HVAC/R

E%

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

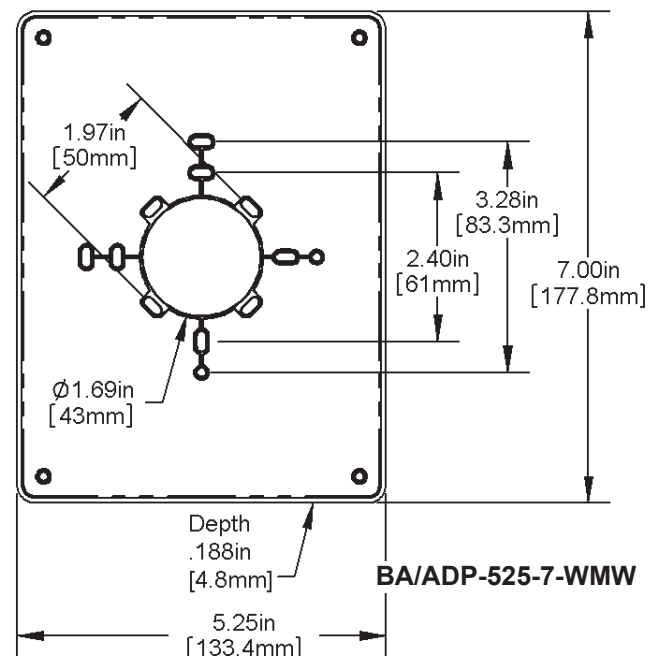
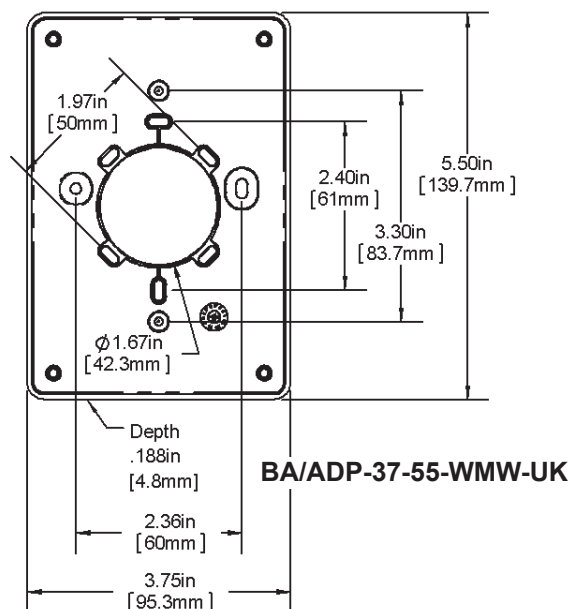
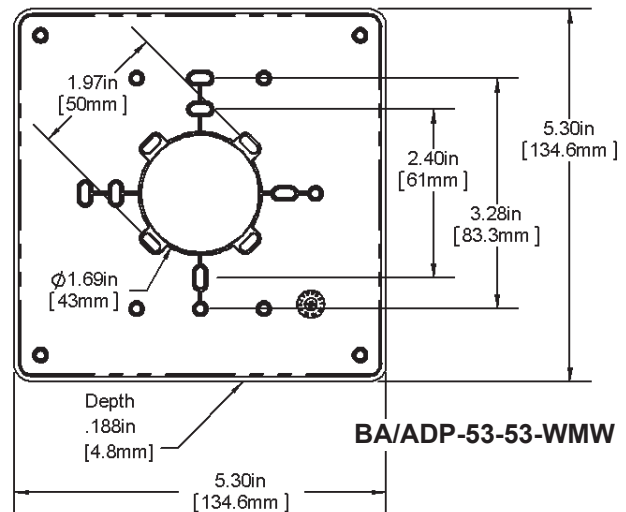
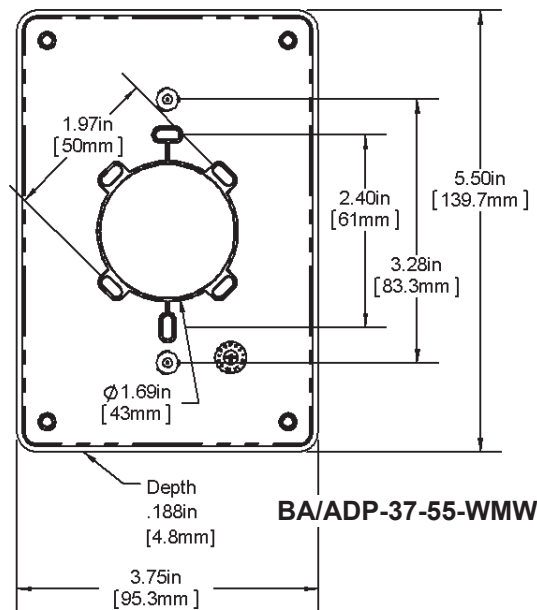
BW, Bright WhiteBAPI-Stat "Quantum" and "Quantum Prime" Room Units (Approx. Pantone Bright White)

WMW, Warm White..... Delta, BAPI-Stat 4, EU, BAPI-Box (Approximately 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)



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Overview

If you'd like to personalize the look of your temperature, humidity or pressure sensor, BAPI's Delta Style and BAPI-Stat Style Room Enclosures, as well as the BAPI-Box 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.



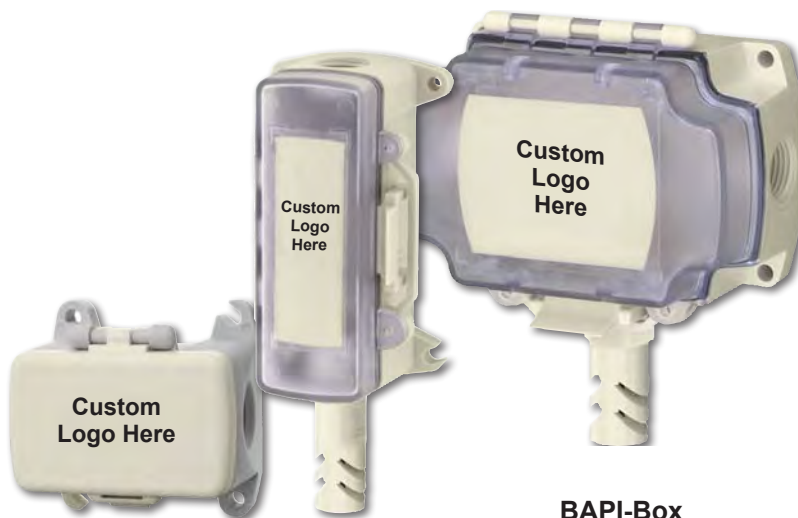
Delta Style Enclosure



BAPI-Stat 4 Style Enclosure



BAPI-Stat 3 Style Enclosure



BAPI-Box 4

BAPI-Box 2

BAPI-Box





Rev. 04/03/17

Outdoor Light Level Sensor

E2%*Accessories for HVAC/R*

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**

Ordering Information

BA/LLV-05-LX[0 TO 2000]

Sensor w/ 0 to 5V Output, 0 to 2,000 Lux Range

BA/LLV-10-LX[0 TO 2000]

Sensor w/ 0 to 10V Output, 0 to 2,000 Lux Range

BA/LLV-20-LX[0 TO 2000]

Sensor with 4 to 20mA Output, 0 to 2,000 Lux Range

BA/LLV-05-FC[0 TO 875]

Sensor w/ 0 to 5V Output, 0 to 875 Foot Candle Range

BA/LLV-10-FC[0 TO 875]

Sensor w/ 0 to 10V Output, 0 to 875 Foot Candle Range

BA/LLV-20-FC[0 TO 875]

Sensor with 4 to 20mA Output, 0 to 875 Foot Candle Range

Note: 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

See end of Section E for list pricing.



Sensor mounted in a parking lot facing north

Specifications

Power Supply:

10 to 35 VDC, 22mA max (for 0 to 5 VDC or 4 to 20 mA Outputs)

15 to 35 VDC, 6 mA max (for 0 to 10 VDC Output)

12 to 27 VAC, 0.53 VA max (for 0 to 5 VDC Output)

15 to 27 VAC, 0.14 VA max (for 0 to 10 VDC Output)

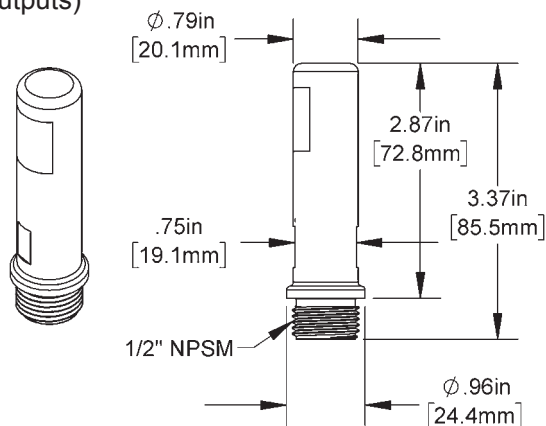
Factory Selectable Outputs:

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

Accuracy: 10 Lux \pm 10% of reading.**Environmental Operation Range:**

Temperature -40 to 185°F (-40 to 85°C)

Humidity: 0 to 100%, non-condensing

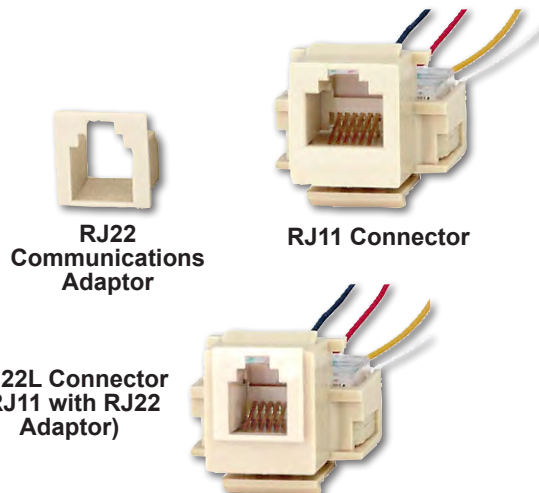
Enclosure Material: UV-Inhibited Polycarbonate**Material Rating:** UL94V-0**Enclosure Rating:** IP66, NEMA 4

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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 |
|----------------|--------------------------|
| BA/RJ22 | Communications Adaptor |
| BA/RJ22L | Communications Connector |

See end of Section E for list pricing.

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 |
|------------------|---|
| BA/SP632x1 | Spanner Security Screws, 6-32x1" (box 50) |
| BA/SPBIT | Spanner Bit for Spanner Security Screws |

See end of Section E for list pricing.



Spanner Security Screws



Spanner Bit

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 #: BA/Screw-Pan-1.5x10-SS-100

1.5" Stainless Steel #10 Pan Head Screw, Pack of 100

Part #: BA/Screw-Hex-Concrete-1.5x10-SS-100

1.5" Stainless Steel #10 Hex Head Concrete Screw, Pack of 100

See end of Section E for list pricing.



Pan Head Screws



Hex Head Screws





Rev. 01/12/16

Replacement Keys, Insulator & Filter

*Accessories for HVAC/R***E2'**

Replacement Keys

Description

Replacement keys are available for Wall Plate temperature sensors with Keyswitch Occupant Override, and the BAPI-Guard and BAPI-Guard 2 thermostat protectors.

PART NUMBER Description

BA/KEY12718..... Key for Wall Plate with Keyswitch Override (pg. A40-43)

BA/KEY16187..... Replacement Key for BAPI-Guard and BAPI-Guard 2 (pg. E8)

See end of Section E for list pricing.



Replacement Key

BAPI Foamback Insulator

Description

Made of medical grade, 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 foamback features an adhesive backing and is available in a thickness of .25" or .125".

PART NUMBERS

BA/FOAMBACK White Foamback Insulator
(2.6" wide, 4.4" high, .25" thick)

BA/FOAMBACK-ROOM White Foamback
(2.6" wide, 4.4" high, .125" thick)



Foamback Insulator

Note: Several BAPI products come standard with foambacks including wall plates and duct units.

See end of Section E for list pricing.

Replacement Humidity Filter

Description

Replacement Filter for Duct and Outside Air Humidity Sensors

The 80 micron sintered stainless steel filter protects the sensor from contamination while allowing airflow.

PART NUMBER: BA/HDOFS3 - Stainless Steel Replacement Humidity Filter



Stainless Steel Humidity Filter

See end of Section E for list pricing.



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Features & Options

- Creates a Weatherproof Wire Connection
- Crimp-On & Twist-On Styles Available

BAPI's Sealant Filled Connectors (SFC) contain a moisture-excluding sealant which encapsulates the electrical connection protecting it from moisture and oxidation. This encapsulation also reduces the potential for fire, electrocution and flashover. BAPI offers two types of SFCs: a Twist-On and a Crimp-On. The Crimp-On (SFC3000) is used for factory terminations, while the Twist-On SFC2000 is used for field terminations.

The SFC2000 accepts two 22 AWG wires or one 22 AWG and one 16 or 18 AWG wire. It has a voltage rating of 300 volts and a temperature not to exceed 221°F (105°C), and it is not UL listed.

The SFC3000 accepts two wires of 19 to 26 AWG. It has a voltage rating of 50 volts with an operating temperature of -40 to 285°F (-40 to 140°C), and it is compliant to RoHS 2011/65/EU. It is not UL listed.



Twist-On SFC2000



Crimp-On SFC3000

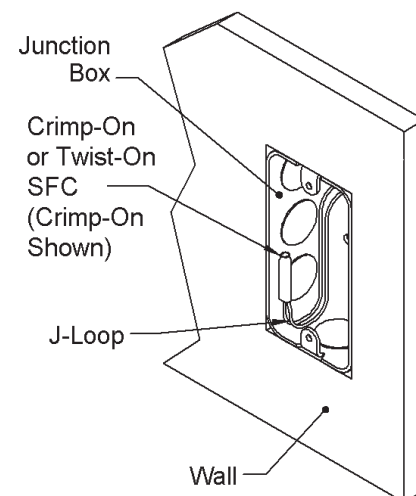
| <u>PART NUMBER</u> | <u>DESCRIPTION</u> |
|-----------------------------|---------------------------|
| BA/SFC2000-100 | 100 Twist-On Style SFCs |
| BA/SFC2000-500 | 500 Twist-On Style SFCs |
| BA/SFC2000-1000 ... | 1,000 Twist-On Style SFCs |
| BA/SFC3000-100 | 100 Crimp-On Style SFCs |
| BA/SFC3000-500 | 500 Crimp-On Style SFCs |
| BA/SFC3000-1000 ... | 1,000 Crimp-On Style SFCs |

See end of Section E for list pricing.

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.





Pierceable Knockout Plugs for Enclosure Ports

E25

Rev. 06/20/18

Accessories for HVAC/R

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

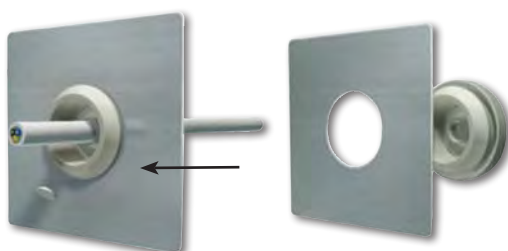


Top and bottom view of a Pierceable Knockout Plug

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 |
|-------------|---|
| BA/PKP-100 | Pierceable Knockout Plugs for Enclosure Ports, pack of 100. |

See end of Section E for list pricing.

Specifications

Material: UV-Resistant TPE (Thermoplastic Elastomer)

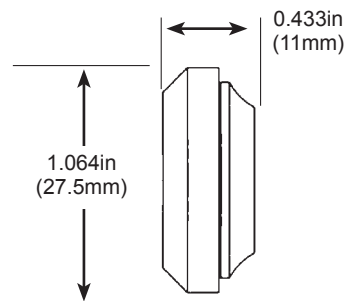
Temperature Operating Range: -58°F to 257°F (-50°C to 125°C)

Protection Rating: IP67

Pierceable Center Membrane Hole Size: 0.807" (20.5mm)

Cable Diameter Range: 0.236" to 0.512" (6 to 13mm)

Panel Thickness: 0.02" to 0.118" (0.5 to 3mm)



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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

| <u>Part Number</u> | <u>Description</u> |
|----------------------|---|
| BA/LI3620 | Lithium Ion AA Battery, 3.6V, for all BAPI Wireless Transmitters except the Wireless Food Probe |
| BA/BAT-5AA-HIT | Lithium ½AA Battery, 3.6V, for the BAPI Wireless Food Probe Transmitter |

See end of Section E for list pricing.

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





Rev. 08/02/18

Weather Shade

Accessories for HVAC/R

E27

Features & Options

- Improves the Accuracy of BAPI 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 offers the easiest assembly available on the market. It mounts quickly and securely to the BAPI-Box, BAPI-Box 2 and BAPI EU enclosures using capped tubes that thread into the enclosures. The pre-assembled Weather Shade Kit includes a shade and DIN rail bracket, two capped mount tubes, one adjustable clamp and one adjustable clamp with retention plate.



Weather Shade, front and back view.
(Back view is shown mounted to a BAPI outside air humidity sensor.)

Ordering Information

| Part Number | Description |
|--------------|---|
| BA/WSK | Weather Shade Kit. (Includes a pre-assembled shade and DIN rail bracket, two capped mount tubes, one adjustable clamp and one adjustable clamp with retention plate.) <i>See end of Section E for list pricing.</i> |

Specifications

Shade Material:

UV-stabilized Polycarbonate

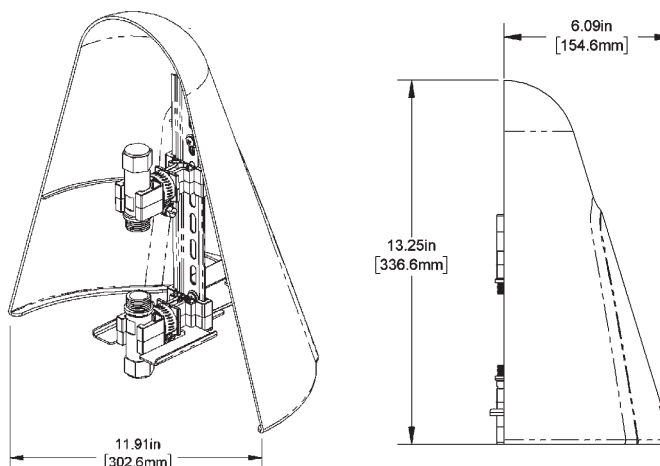
Shade Material Ratings:

Flammability: UL 94

Reflectivity: 87%

Emissivity: 0.90

For more information, see the Application Note “Reducing Solar Heat Gain on Outdoor Air Sensors with the BAPI Weather Shade” on the BAPI website at www.bapihvac.com. Find it by clicking on “Resource Library” and then on “Application Notes”.



BAPI-Guard

Thermostat Protector



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

- Prevents Tampering, Damage and Unauthorized Adjustment
- Exceptional Airflow for Proper Thermostat Operation
- Made from Thick, Durable Polycarbonate with Key Lock Protection
- Low Profile Design with Two Sizes to Fit Most Thermostats
- Horizontal or Vertical Mounting with Hardware Included

The BAPI-Guard prevents tampering, physical damage and unauthorized adjustment of thermostats. The attractive design is available in two sizes to fit most thermostats. It is made of thick, durable polycarbonate and features exceptional airflow, key lock protection, horizontal or vertical mounting and easy installation with hardware included.



Rev. 01/17/18

Accessories List Pricing

E29

Accessories for HVAC/R

| Pg | Part Number | Description | List Price |
|---|-------------------------|---|------------|
| BLÜ-TEST BLUETOOTH TEMP/HUMIDITY PROBE | | | |
| E2 | BA/BT-TP | Blü-Test Temperature Probe, 4" length piercing, 1/8" dia (10.2 cm x .32 cm) .. | \$600 |
| | BA/BT-TA | Blü-Test Temperature Probe, 6" length, 1/4" diameter (15.3 cm x .64 cm) | \$600 |
| | BA/BT-TB | Blü-Test Temperature Probe, 9.5" length, 1/4" diameter (24.2 cm x .64 cm) ... | \$600 |
| | BA/BT-TH | Blü-Test Temp/Humidity Probe, 8" length, 3/8" diameter (20.3 cm x .95 cm) .. | \$675 |
| | BA/BT-DPLR | Blü-Test Pressure Probe, Low Range, -1 to +1" WC (-250 to +250 Pascals) .. | \$800 |
| | BA/BT-DPSR | Blü-Test Pressure Probe, Standard Range, -5 to +5" WC (-1,250 to +1,250 Pascals) .. | \$800 |
| 350mA "EZ" VOLTAGE CONVERTERS | | | |
| E4 | BA/VC350A-EZ-5 | 5 VDC at 350 mA EZ Voltage Converter | \$33 |
| | BA/VC350A-EZ-10 | 10 VDC at 350 mA EZ Voltage Converter | \$33 |
| | BA/VC350A-EZ-12 | 12 VDC at 350 mA EZ Voltage Converter | \$33 |
| | BA/VC350A-EZ-15 | 15 VDC at 350 mA EZ Voltage Converter | \$33 |
| | BA/VC350A-EZ-ADJ | 5 to 24 VDC (adj.) at 350 mA EZ Voltage Converter | \$33 |
| 350mA SNAPTRACK MOUNTABLE VOLTAGE CONVERTERS | | | |
| E5 | 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 |
| PDM - POWER DISTRIBUTION MODULE | | | |
| E6 | BA/PDM-5-B | Five circuit Power Distribution Module, w/ breaker | \$364 |
| | BA/PDM-3-B | Three circuit Power Distribution Module, w/ breaker | \$277 |
| | BA/PDM-5-F | Five circuit Power Distribution Module, w/fuse | \$218 |
| | BA/PDM-3-F | Three circuit Power Distribution Module, w/fuse | \$182 |
| | BA/PDM-5-B-DIN | Five circuit Power Distribution Module, w/ breaker, DIN mount | \$364 |
| | BA/PDM-3-B-DIN | Three circuit Power Distribution Module, w/ breaker, DIN mount | \$277 |
| | BA/PDM-5-F-DIN | Five circuit Power Distribution Module, w/fuse, DIN mount | \$218 |
| | BA/PDM-3-F-DIN | Three circuit Power Distribution Module, w/fuse, DIN mount | \$182 |
| VC2000 VOLTAGE CONVERTER | | | |
| E7 | 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 |



Gray shaded items follow the Buy and Resale Multiplier.



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| Pg | Part Number | Description | List Price |
|---|-----------------------|--|---------------|
| PS17 & PS17CB - POWER SUPPLIES | | | |
| E8 | BA/PS17 | Power Supply Fuse Block | \$303 |
| | BA/PS17CB | Power Supply w/ Circuit Breakers | \$353 |
| | BA/PWR-CORD-18" | 18" Power Cord | \$5.25 |
| | BA/PWR-CORD-36" | 36" Power Cord | \$5.25 |
| WATER LEAK DETECTOR | | | |
| E10 | BA/LDTx | Water Leak Detector | See Datasheet |
| BAPI-GUARD THERMOSTAT PROTECTOR | | | |
| E12 | 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* |
| FPB - FLEXIBLE PROBE BRACKETS | | | |
| E13 | BA/FPB-50 | 50 Flexible Probe Brackets | \$157 |
| | BA/FPB-100 | 100 Flexible Probe Brackets | \$314 |
| | BA/FPB-500 | 500 Flexible Probe Brackets | \$1,443 |
| PMPB5 - PULSE METER PULSE BUFFER | | | |
| E14 | BA/PMPB5 | Pulse Meter Pulse Buffer | \$27.50 |
| | BA/PMPB5-TRK | Pulse Meter Pulse Buffer with a 1.25" wide piece of 2.75" snaptrack | \$32.50 |
| TS1 & TS2 - TRANSIENT SUPPRESSORS | | | |
| E14 | BA/TS1 | Transient Suppressor (voltage) | \$7.50 |
| | BA/TS2 | Transient Suppressor (current) | \$7.50 |
| | BA/TS1-TRK | Transient Suppressor (voltage) with a 1.25" wide piece of 2.75" snaptrack .. | \$12.50 |
| | BA/TS2-TRK | Transient Suppressor (current) with a 1.25" wide piece of 2.75" snaptrack .. | \$12.50 |
| SCREWDRIVER AND ALLEN WRENCH COMBINATION | | | |
| E15 | BA/116W | BAPI 6.75" Screwdriver & Allen Wrench Combination | \$20 |
| | BA/116 | BAPI 6" Screwdriver & Allen Wrench Combination | \$5 |
| CLEAN-CUT TOOL | | | |
| E16 | BA/CLN-CUT-50 | Clean-Cut - 1/2" threaded knockout cutting tool for the BAPI-Box & BAPI-Box 2 .. | \$100 |
| BAPI-STAT 4 TRIM RING | | | |
| E17 | BA/BS4-TR | BAPI-Stat 4 Trim Ring | \$4.00 |

Gray shaded items follow the Buy and Resale Multiplier.





| Pg | Part Number | Description | List Price |
|--|-------------------------------------|---|------------------|
| ADAPTOR PLATES | | | |
| E18 | 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-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-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-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 |
| | BA/ADP-37-55-CDW-UK | Adaptor Plate (Europe), 3.75 x 5.5" Cloud White | \$21 |
| CUSTOM LOGO PLATES | | | |
| E20 | XX | Custom Logo Plates for Room Sensors and Enclosures | Call for Pricing |
| LIGHT LEVEL SENSOR | | | |
| E21 | 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 |
| RJ22 COMMUNICATIONS ADAPTOR | | | |
| E22 | BA/RJ22 | Communications Adaptor | \$8 |
| | BA/RJ22L | Communications Connector | \$25 |
| SPANNER SECURITY SCREWS AND BIT | | | |
| E22 | BA/SP632x1 | Spanner Security Screws, 6-32x1" (box 50) | \$40.00 |
| | BA/SPBIT | Spanner Bit for Spanner Security Screws | \$6.50 |
| HEX HEAD SCREWS & PAN HEAD SCREWS | | | |
| E22 | BA/Screw-Pan-1.5x10-SS-100 | 1.5" Stainless Steel #10 Pan Head Screw, Pack of 100 | \$12 |
| | BA/Screw-Hex-Concrete-1.5x10-SS-100 | 1.5" Stainless Steel #10 Hex Head Concrete Screw, Pack of 100 | \$12 |



Gray shaded items follow the Buy and Resale Multiplier.





| Pg | Part Number | Description | List Price |
|--|------------------------|---|------------|
| REPLACEMENT KEYS | | | |
| E23 | BA/KEY12718 | Key for Wall Plate with Keyswitch Override (A26) | \$2.00 |
| | BA/KEY16185 | Key for Wall Plate with Keyswitch & Light Sensor (A30) | \$4.30 |
| | BA/KEY16187 | Replacement Key for BAPI-Guard and BAPI-Guard 2 (E6) | \$2.00 |
| FOAMBACK INSULATOR | | | |
| E23 | BA/FOAMBACK | White Foamback Insulator (2.6" wide, 4.4" high, .25" thick) | \$1 |
| | BA/FOAMBACK-ROOM | White Foamback (2.6" wide, 4.4" high, .125" thick) | \$1 |
| REPLACEMENT HUMIDITY FILTER AND CAP | | | |
| E23 | BA/HDOFS3 | Stainless Steel Humidity Filter for Duct or Outside Air Units | \$30 |
| SEALANT FILLED CONNECTORS | | | |
| E24 | 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 |
| PIERCEABLE KNOCKOUT PLUGS FOR ENCLOSURE PORTS | | | |
| E25 | BA/PKP-100 | Pierceable Knockout Plugs for Enclosure Ports, pack of 100. | \$55 |
| REPLACEMENT BATTERIES | | | |
| E26 | BA/LI3620 | Replacement Battery for Transmitters (except the Food Probe) | \$3 Net |
| | BA/BAT-5AA-HIT | Replacement Battery for the Wireless Food Probe | \$6 Met |
| WEATHER SHADE | | | |
| E27 | BA/WSK | Weather Shade Kit. | \$150 |

Gray shaded items follow the Buy and Resale Multiplier.




















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900 MHz Wireless System

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| <p>Duct Humidity or Combo Sensor</p>  <p>pg F8</p> | <p>Immersion Temp Sensor</p>  <p>pg F10</p> | <p>Remote Probe Temp Sensor</p>  <p>pg F12</p> |
| <p>Outside Air Temp Sensor</p>  <p>pg F14</p> | <p>Outside Air Temp and Humidity Sensor</p>  <p>pg F16</p> | <p>Thermobuffer Temp Sensor</p>  <p>pg F18</p> |
| <p>Wireless Food Probes</p>  <p>pg F20</p> | <p>BAPI-Stat “Quantum Slim” Temp Sensor</p>  <p>pg F22</p> | <p>BAPI-Stat “Quantum Slim” Temp/ Humidity Sensor</p>  <p>pg F24</p> |
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Features & Options

- BAPI-Stat "Quantum" unit with up to 275 foot in-building range*
- Optional temperature setpoint and occupant override
- Approximate 5 year battery life with 5 minute transmit rate
- Battery power or wired power
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

The BAPI-Stat "Quantum" 900 MHz Sensor measures the room temperature and transmits the data via 900MHz RF to a Gateway up to 275 feet away. It is available with optional setpoint and override.

The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes** for battery powered units. The unit can also be ordered with wired power rather than battery power. The transmitted temperature is picked up by a Gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP).

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".



Sensor with optional Setpoint & Override

Specifications

Power for Battery Powered Units: Two 3.6V Lith. batteries, 2,600 mAh, ~5 year battery life**

Power for Wired Power Units: 9 to 30 VDC, 50 mA max • 15 to 28 VAC, 50 mA max

Temperature Accuracy:

±0.36°F (±0.2°C) from built in thermistor

Transmitted Temperature Range:

-40 to 185°F (-40 to 85°C)

Transmission Distance: Up to 275 feet*

Environmental Operation Range:

Temp: 32 to 140°F (0 to 60°C)

Humidity: 5% to 95% RH non-condensing

Enclosure Material & Rating:

ABS Plastic, UL94 V-0

Frequency:

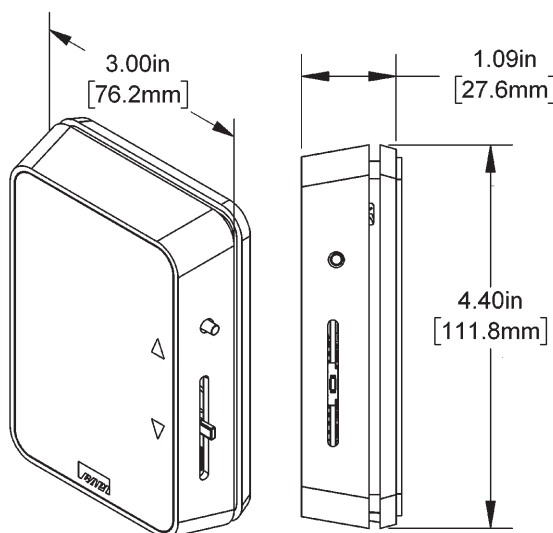
900 MHz (4 Channel, 7 MHz Spacing)

Transmission Interval:

5 minute default, user adjustable

Transmit Power: 0 dBm default, +5 dBm max

Receiver Sensitivity: -101 dBm



*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





BAPI-Stat “Quantum” Temperature Sensor

900 MHz Wireless System

F3

Ordering Information

BA/WT900-Q..... BAPI-Stat “Quantum” Temp Sensor, Battery Power

BA/WT900-Q-PWR BAPI-Stat “Quantum” Temp Sensor, Wired Power

BA/WT900-S-Q BAPI-Stat “Quantum” Temp Sensor w/ Temp Setpoint, Battery Power

BA/WT900-S-Q-PWR.. BAPI-Stat “Quantum” Temp Sensor w/ Temp Setpoint, Wired Power

BA/WT900-O-Q..... BAPI-Stat “Quantum” Temp Sensor w/ Override, Battery Power

BA/WT900-O-Q-PWR . BAPI-Stat “Quantum” Temp Sensor w/ Override, Wired Power

BA/WT900-SO-Q BAPI-Stat “Quantum” Temp Sensor w/ Setpoint & Override, Battery Power

BA/WT900-SO-Q-PWR. BAPI-Stat “Quantum” Temp Sensor w/ Setpoint & Override, Wired Power

BA/LI3620 3.6V Lithium Battery

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- BAPI-Stat "Quantum" unit with up to 275 foot in-building range*
- Optional temperature setpoint and occupant override
- Approximate 5 year battery life with 5 minute transmit rate
- Battery power or wired power
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

The BAPI-Stat "Quantum" Sensor measures the temp and humidity and transmits the data via 900 MHz RF to a Gateway up to 275 feet away. It is available with optional temp setpoint and override.

The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes** for battery powered units. The unit can also be ordered with wired power rather than battery power. The transmitted values are picked up by a Gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP).

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".



Sensor with optional Setpoint & Override

Specifications

Power for Battery Powered Units: Two 3.6V Lith. batteries, 2,600 mAh, ~5 year battery life**

Power for Wired Power Units: 9 to 30 VDC, 50 mA max • 15 to 28 VAC, 50 mA max

Sensing Elements:

Temperature - Semiconductor Band Gap,
 $\pm 0.3^{\circ}\text{C}$ ($\pm 0.54^{\circ}\text{F}$) @ 20 to 40°C (68 to 104°F)

Humidity - Capacitive Polymer,
 $\pm 2\%\text{RH}$ @ 25°C (77°F), 20 to $80\%\text{RH}$

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

Transmission Distance: Up to 275 feet*

Environmental Operation Range:

Temp: 32 to 140°F (0 to 60°C)

Humidity: 5% to $95\%\text{RH}$ non-condensing

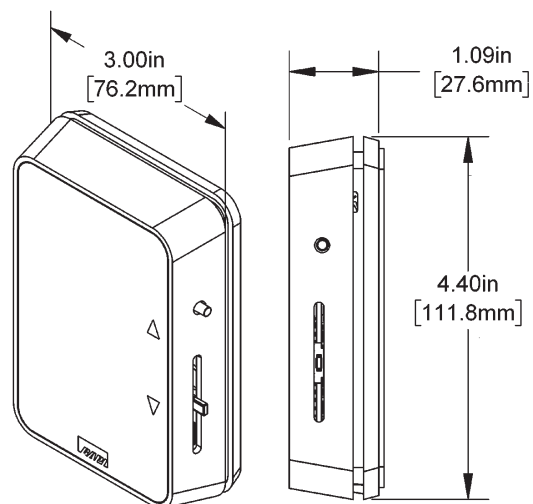
Enclosure Material & Rating: ABS Plastic, UL94 V-0

Frequency: 900 MHz (4 Channel, 7 MHz Spacing)

Transmission Interval: 5 minute default, user adjustable

Transmit Power: 0 dBm default, +5 dBm max

Receiver Sensitivity: -101 dBm



*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





BAPI-Stat “Quantum” Temp/Humidity Sensor

900 MHz Wireless System

F5

Ordering Information

BA/WTH900-Q

BAPI-Stat “Quantum” Temp/Humidity Sensor, Battery Power

BA/WTH900-Q-PWR

BAPI-Stat “Quantum” Temp/Humidity Sensor, Wired Power

BA/WTH900-S-Q

BAPI-Stat “Quantum” Temp/Humidity Sensor w/ Temp Setpoint, Battery Power

BA/WTH900-S-Q-PWR

BAPI-Stat “Quantum” Temp/Humidity Sensor w/ Temp Setpoint, Wired Power

BA/WTH900-O-Q

BAPI-Stat “Quantum” Temp/Humidity Sensor w/ Override, Battery Power

BA/WTH900-O-Q-PWR

BAPI-Stat “Quantum” Temp/Humidity Sensor w/ Override, Wired Power

BA/WTH900-SO-Q

BAPI-Stat “Quantum” Temp/Humidity Sensor w/ Temp Setpoint & Override, Battery Power

BA/WTH900-SO-Q-PWR

BAPI-Stat “Quantum” Temp/Humidity Sensor w/ Temp Setpoint & Override, Wired Power

BA/LI3620 3.6V Lithium Battery



900 MHz Gateway

The Gateway receives the data from sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Up to 275 foot in-building range*
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)



**Wireless Duct
Temperature Sensor**

BAPI's Wireless Duct Temperature 900 MHz Sensor features a rugged IP66-rated BAPI-Box enclosure and stainless steel probe with standard probe lengths from 4" to 18".

The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes.** The transmitted temperature and Barometric pressure is picked up by a Gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP).

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".

Specifications

Power: Two 3.6V Lithium batteries, 2,600 mAh, ~5 year battery life**

Temperature Sensor Accuracy:
±0.45°F (±0.25°C), 32 to 158°F (0 to 70°C)

Barometric Pressure Sensor Accuracy:
±2 mbar @ 25°C (0.40"H₂O)

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

Transmission Distance: Up to 275 feet*

Environmental Operation Range:

Temp: -40 to 185°F (-40 to 85°C)

Humidity: 0% to 100% RH, non-condensing

Enclosure Rating, Material and Material Rating:

IP66, UV-Resistant Polycarbonate, UL94 V-0

Frequency:

900 MHz (4 Channel, 7 MHz Spacing)

Transmission Interval:

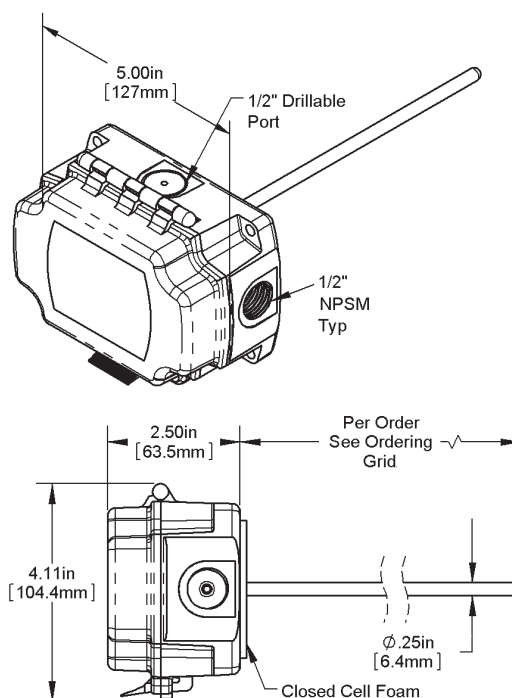
5 minute default, user adjustable

Transmit Power:

0 dBm default, +5 dBm max

Receiver Sensitivity:

-101 dBm



*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





Duct Temperature Sensor

900 MHz Wireless System

F7

Ordering Information

BA/WT900-D-4-BB Duct Temperature Transmitter, 4" Probe Length
BA/WT900-D-8-BB Duct Temperature Transmitter, 8" Probe Length
BA/WT900-D-12-BB Duct Temperature Transmitter, 12" Probe Length
BA/WT900-D-18-BB Duct Temperature Transmitter, 18" Probe Length
BA/LI3620 3.6V Lithium Battery

Custom probe lengths available.

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Up to 275 foot in-building range*
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)



Wireless Duct Temperature and Humidity Sensor

BAPI's Wireless Duct Temperature and Humidity 900 MHz Sensor features a rugged IP66-rated BAPI-Box enclosure.

The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes.** The transmitted temp, humidity and Barometric pressure is picked up by a Gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP).

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".

Specifications

Power: Two 3.6V Lithium batteries, 2,600 mAh, ~5 year battery life**

Temperature Sensor: Semiconductor Band Gap, $\pm 0.3^{\circ}\text{C}$ ($\pm 0.54^{\circ}\text{F}$) @ 20 to 40°C (68 to 104°F)

Humidity Sensor: Capacitive Polymer, $\pm 2\%\text{RH}$ @ 25°C (77°F), 20 to $80\%\text{RH}$

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

Transmitted Temperature Range: -40 to 185°F (-40 to 85°C)

Transmission Distance: Up to 275 feet*

Environmental Operation Range:

Temp: -40 to 185°F (-40 to 85°C)

Humidity: 0% to $100\%\text{RH}$, non-condensing

Enclosure Rating, Material and Material Rating: IP66, UV-Resistant Polycarbonate, UL94 V-0

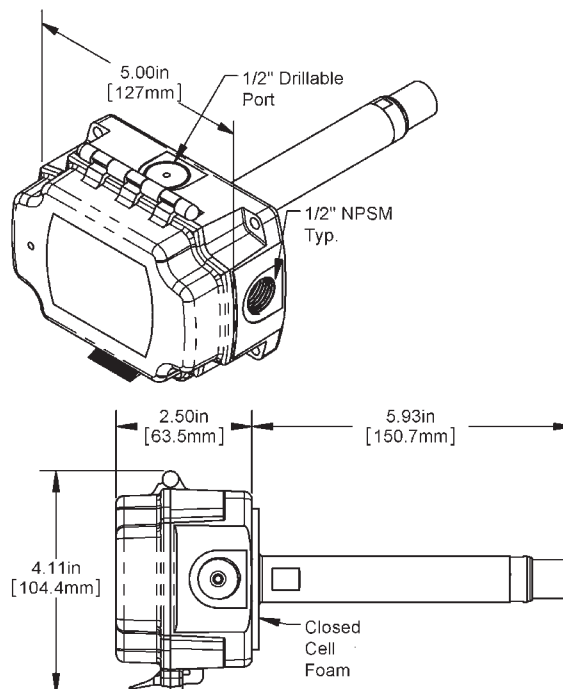
Frequency: 900 MHz (4 Channel, 7 MHz Spacing)

Transmission Interval:

5 minute default, user adjustable

Transmit Power: 0 dBm default, +5 dBm max

Receiver Sensitivity: -101 dBm



*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





Duct Temp/Humidity Sensor

900 MHz Wireless System

F9

Ordering Information

BA/WTH900-D-BB ... Wireless Duct Temp. & Humidity Sensor, 5" Probe Length

BA/LI3620 3.6V Lithium Battery

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Up to 275 foot in-building range*
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

BAPI's Wireless Immersion Temperature 900 MHz Sensor features a rugged IP66-rated BAPI-Box enclosure with 2", 4" and 8" probe lengths.

The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes.** The transmitted temperature and Barometric pressure is picked up by a Gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP).

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".



Wireless Immersion Temperature Sensor

Specifications

Power: Two 3.6V Lithium batteries, 2,600 mAh, ~5 year battery life**

Temperature Sensor Accuracy:

$\pm 0.45^{\circ}\text{F}$ ($\pm 0.25^{\circ}\text{C}$), 32 to 158 $^{\circ}\text{F}$ (0 to 70 $^{\circ}\text{C}$)

Barometric Pressure Sensor Accuracy:

± 2 mbar @ 25 $^{\circ}\text{C}$ (0.40" H₂O)

Transmitted Temp Range: -40 to 185 $^{\circ}\text{F}$ (-40 to 85 $^{\circ}\text{C}$)

Transmission Distance: Up to 275 feet*

Environmental Operation Range:

Temp: -40 to 185 $^{\circ}\text{F}$ (-40 to 85 $^{\circ}\text{C}$)

Humidity: 0% to 100% RH, non-condensing

Enclosure Rating, Material and Material Rating:

IP66, UV-Resistant Polycarbonate, UL94 V-0

Frequency:

900 MHz (4 Channel, 7 MHz Spacing)

Transmission Interval:

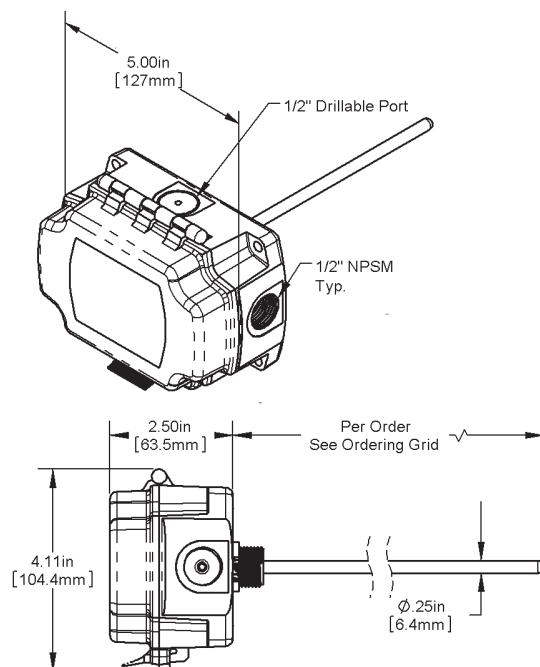
5 minute default, user adjustable

Transmit Power:

0 dBm default, +5 dBm max

Receiver Sensitivity:

-101 dBm



*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





Immersion Temperature Sensor

900 MHz Wireless System

F11

Ordering Information

BA/WT900-I-2-BBImmersion Temperature Sensor 1/4" dia. SS Probe, 2" Length

BA/WT900-I-4-BBImmersion Temperature Sensor, 1/4" dia. SS Probe, 4" Length

BA/WT900-I-8-BBImmersion Temperature Sensor, 1/4" dia. SS Probe, 8" Length

BA/LI3620Lithium Battery

Custom probe lengths are available. Call BAPI for more information.

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Up to 275 foot in-building range*
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

BAPI's Wireless Remote Temperature 900 MHz Sensor features a 1.75" long SS probe with either Plenum-Rated Cable or FEP-Jacketed Cable and a watertight BAPI-Box Enclosure. Standard lead lengths are 5', 10', 15', 20' and 25'.

The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes.** The transmitted temperature and Barometric pressure is picked up by a Gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP).

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".



**Wireless Remote
Probe Sensor**

Specifications

Power: Two 3.6V Lithium batteries, 2,600 mAh, ~5 year battery life**

Temperature Sensor Accuracy:

±0.45°F (±0.25°C), 32 to 158°F (0 to 70°C)

Barometric Pressure Sensor Accuracy:

±2 mbar @ 25°C (0.40" H₂O)

Transmitted Temp Range:

-40 to 185°F (-40 to 85°C)

Transmission Distance: Up to 275 feet*

Environmental Operation Range:

Temp: -40 to 185°F (-40 to 85°C)

Humidity: 0% to 100% RH, non-condensing

Enclosure Rating, Material and Material Rating:

IP66, UV-Resistant Polycarbonate, UL94 V-0

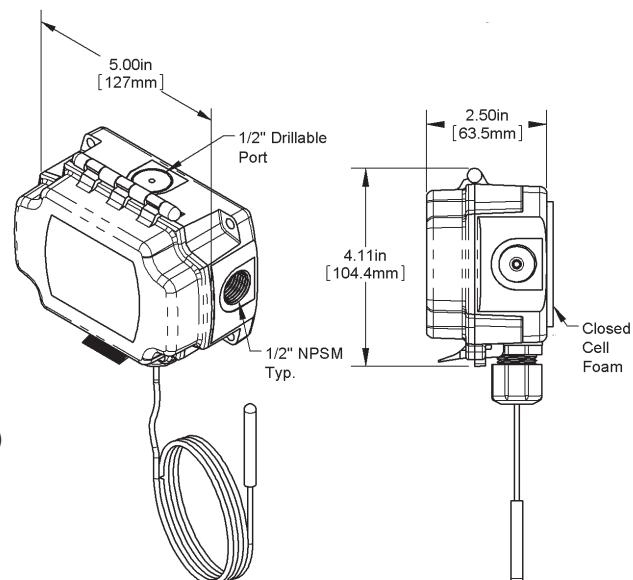
Frequency: 900 MHz (4 Channel, 7 MHz Spacing)

Transmission Interval:

5 minute default, user adjustable

Transmit Power: 0 dBm default, +5 dBm max

Receiver Sensitivity: -101 dBm



*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





Ordering Information

| | |
|-----------------------------------|---|
| BA/WT900-RPP-5-BB | Unit with Plenum-Rated Cable, 5' Leads |
| BA/WT900-RPP-10-BB | Unit with Plenum-Rated Cable, 10' Leads |
| BA/WT900-RPP-15-BB | Unit with Plenum-Rated Cable, 15' Leads |
| BA/WT900-RPP-20-BB | Unit with Plenum-Rated Cable, 20' Leads |
| BA/WT900-RPP-25-BB | Unit with Plenum-Rated Cable, 25' Leads |
| BA/WT900-RPFEP-5-BB | Unit with FEP-Jacketed Cable, 5' Leads |
| BA/WT900-RPFEP-10-BB | Unit with FEP-Jacketed Cable, 10' Leads |
| BA/WT900-RPFEP-15-BB | Unit with FEP-Jacketed Cable, 15' Leads |
| BA/WT900-RPFEP-20-BB | Unit with FEP-Jacketed Cable, 20' Leads |
| BA/WT900-RPFEP-25-BB | Unit w/ FEP-Jacketed Cable, 25' Leads |

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Up to 275 foot in-building range*
- Barometric pressure and optional light level sensing
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

BAPI's Wireless Outside Air Temperature 900 MHz Sensor features a UV-resistant plastic shield that keeps the sensor out of the sunlight and allows for excellent air circulation. It comes in a rugged IP66-rated BAPI-Box enclosure with Barometric pressure and optional light level sensing.

The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes.** The transmitted values are picked up by a Gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP).

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".



Wireless Outside Air Temperature Sensor

Specifications

Power: Two 3.6V Lith. batteries, 2,600 mAh, ~5 year battery life**

Temp Accuracy: $\pm 0.45^{\circ}\text{F}$ ($\pm 0.25^{\circ}\text{C}$), 32 to 158°F (0 to 70°C)

Temperature Transmission Range: -40 to 185°F (-40 to 85°C)

Barometric Pressure Sensor Accuracy:
 ± 2 mbar @ 25°C (0.40" H₂O)

Barometric Pressure Operational Range: 30 to 120 Kpa

Light Level Sensing Accuracy: 10 Lux + 10% of reading.

Light Level Sensing Range: 0 to 64,000 lux

Transmission Distance: Up to 275 feet*

Frequency: 900 MHz (4 Channel, 7 MHz Spacing)

Transmission Interval: 5 minute default, user adjustable

Transmit Power: 0 dBm default, +5 dBm max

Receiver Sensitivity: -101 dBm

Enclosure Rating, Material and Material Rating:
 IP66, UV-Resistant Polycarbonate, UL94 V-0

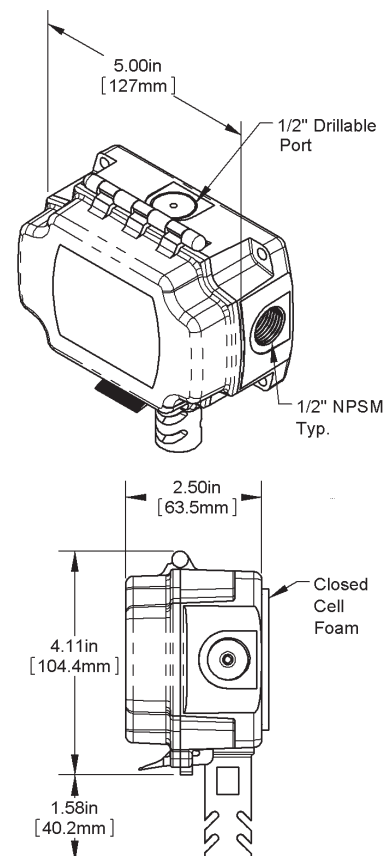
Environmental Operation Range:

Temp: -40 to 185°F (-40 to 85°C)

Humidity: 0 to 100% RH

*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





Outside Air Temperature Sensor

900 MHz Wireless System

F15

Ordering Information

| <u>PART #</u> | <u>DESCRIPTION</u> |
|--------------------------------|---|
| BA/WT900-O-BB: | Outside Air Temperature and Barometric Pressure Sensor |
| BA/WT900-LL-O-BB: | Outside Air Temperature, Light Level and Barometric Pressure Sensor |
| BA/LI3620: | 3.6V Lithium Battery |

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from one or more sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Up to 275 foot in-building range*
- Barometric pressure and optional light level sensing
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

BAPI's Wireless Outside Air Temp/Humidity 900 MHz Sensor features a UV-resistant plastic shield and stainless steel replaceable filter. It comes in a IP66-rated BAPI-Box enclosure with Barometric pressure and optional light level sensing.

The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes.** The transmitted data is picked up by a Gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Transmissions can also be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".



Wireless Outside Air Temp and Humidity Sensor

Specifications

Power: Two 3.6V Lith. batteries, 2,600 mAh, ~5 year battery life**

Temperature Sensor: Semiconductor Band Gap, $\pm 0.3^{\circ}\text{C}$ ($\pm 0.54^{\circ}\text{F}$) @ 20 to 40°C (68 to 104°F)

Temperature Transmission Range: -40 to 185°F (-40 to 85°C)

Humidity Sensor: Capacitive Polymer, $\pm 2\%\text{RH}$ @ 25°C (77°F), 20 to $80\%\text{RH}$

Humidity Transmission Range: 0 to $100\%\text{RH}$

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

Barometric Pressure Operational Range: 30 to 120 Kpa

Light Level Sensing Accuracy: 10 Lux + 10% of reading.

Light Level Sensing Range: 0 to $64,000$ lux

Transmission Distance: Up to 275 feet*

Frequency: 900 MHz (4 Channels, 7 MHz Spacing)

Transmission Interval: 5 minute default, user adjustable

Transmit Power: 0 dBm default, $+5$ dBm max

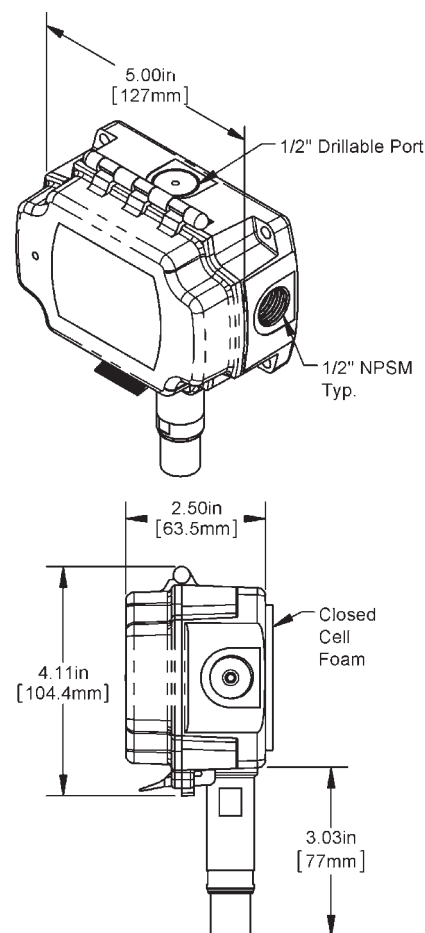
Receiver Sensitivity: -101 dBm

Enclosure Rating, Material and Material Rating: IP66, UV-Resistant Polycarbonate, UL94 V-0

Environmental Operation Range: Temp: -40 to 185°F (-40 to 85°C) • Humidity: 0 to $100\%\text{RH}$

*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





Outside Air Temp/Humidity Sensor

900 MHz Wireless System

F17

Ordering Information

BA/WTH900-O-BB:

Outside Air Temp/Humidity and Barometric Pressure Sensor

BA/WTH900-LL-O-BB:

Outside Air Temp/Humidity, Light Level and Barometric Pressure Sensor

BA/LI3620: 3.6V Lithium Battery

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from one or more sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Reduces temperature “spikes” from opening the freezer or cooler door
- Up to 275 foot in-building range*
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

The Wireless Thermobuffer 900 MHz Sensor is designed for walk-in freezers and coolers. It features a watertight BAPI-Box enclosure with a 2" or 4" buffer chamber or 1" hanging bracket which is filled with customer-provided food grade glycol. This allows the unit to track the temperature of the contents, rather than the air.

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses “smart logic” to find and secure a clean frequency channel rather than “frequency hopping”.



Unit with Attached Buffer Chamber and Hanging Bracket

Specifications

Power: Two 3.6V Lithium batteries, 2,600 mAh, ~5 year battery life**

Temperature Accuracy:

From 32 to 158°F (0 to 70°C): $\pm 0.45^\circ\text{F}$ ($\pm 0.25^\circ\text{C}$)

From -40 to 32°F (-40 to 0°C): $\pm 1.0^\circ\text{F}$ ($\pm 0.55^\circ\text{C}$)

Temperature Transmission Range:

-40°F to 185°F (-40°C to 85°C)

Barometric Pressure Sensor Accuracy:

± 2 mbar @ 25°C (0.40"H₂O)

Transmission Distance: Up to 275 feet*

Frequency:

900 MHz (4 Channels, 7 MHz Spacing)

Transmission Interval:

5 minute default, user adjustable

Transmit Power: 0 dBm default, +5 dBm max

Receiver Sensitivity: -101 dBm

Environmental Operation Range:

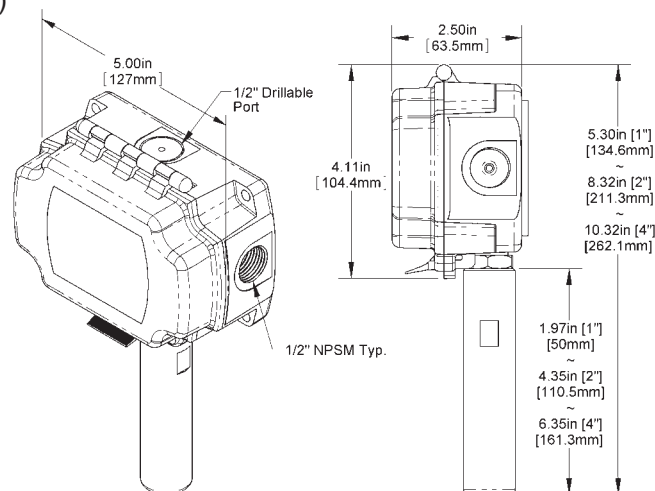
Temp: -22°F to 158°F (-30°C to 70°C)

Humidity: 0% to 100% RH, Non-condensing

Encl. Material, Encl. Rating and Material Rating:

UV-Resistant Polycarbonate, NEMA 4, IP66 UL94 V-0

Buffer Chamber: 1", 2" or 4", 304 Stainless Steel



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

*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





Thermobuffer Freezer Temperature Sensor

900 MHz Wireless System

F19

Ordering Information

BA/WT900-TB-M304-2-BB

Thermobuffer, 304 SS Chamber, 2" Buffer Chamber

BA/WT900-TB-M304-4-BB

Thermobuffer, 304 SS Chamber, 4" Buffer Chamber

BA/WT900-TB-M304-1-HB-5-BB

Thermobuffer, 1" 304 SS Hanging Bracket w/ 5' FEP-Jacketed Cable

BA/WT900-TB-M304-1-HB-10-BB

Thermobuffer, 1" 304 SS Hanging Bracket w/ 10' FEP-Jacketed Cable

BA/LI3620:

3.6V Lithium Battery

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from one or more sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Up to 275 foot in-building range*
- Customizable transmission rate and transmission power
- Waterproof construction for food service use
- NSF certified with food and fishwasher safe materials
- Many additional applications besides food

BAPI's Wireless 900 MHz Food Probes remain in the food trays to measure and transmit the temperature to a receiver up to 175 feet away. The transmitted temperature is picked up by a gateway and supplied directly to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP).

The food probes eliminate the need for an employee to hand record the temperatures with a thermometer for HACCP compliance. Bin clips are available to fit most food bins. The probe is designed for dishwasher or hand washing.

Because the probes are designed for wet, dusty or dirty environments, there are many additional applications including cooling towers, evaporative coolers, steam humidifiers, dusty or wet conveyor systems, aggregate washers and vaulted ceiling suspension.



**Wireless
Food
Probe**

**Food
Probe with
optional bin
clip inside
a bin**



Specifications

Supply Power: One 3.6V Lithium 1/2 AA Battery, 900 mAh

Battery life: One year @ default 5 minute transmit interval**

Measurement Range: -20° to 110°C (-4° to 230°F)

Accuracy: ±0.25°C (±0.5°F) from -20° to 70°C
±0.5°C (±1°F) from 70° to 110°C

Environmental Operating Range:

Probe Only: -40° to 110°C (-40° to 230°F)

Entire Unit: -15° to 85°C (5° to 185°F)

Washing Spike Temp: TBD (up to 100°C)

Humidity: 0 to 100% RH Condensing

Case Material: Food Safe Plastic

Probe Material: 304 SS, 1/8" dia.

Frequency: 900 MHz (4 Channels, 7 MHz Spacing)

Transmit Power: 0 dBm default, +5 dBm max

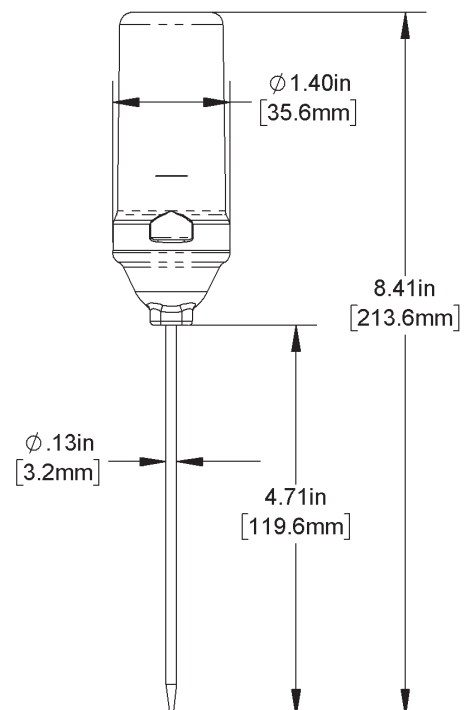
Receiver Sensitivity: -101 dBm

Transmitter Interval: Field Adjustable (5 min default)

Transmission Range: Up to 175 feet*

Cleaning: Dishwasher or Sanitizing Wipe

Agency: RoHS & NSF Certified



*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





Wireless Food Temperature Probe

900 MHz Wireless System

F21

Ordering Information

BA/WFP900-PT..... Wireless Food Probe

Other probe options available upon request.

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from one or more sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Up to 275 foot in-building range*
- Built in or Remote Temperature Sensor
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

The BAPI-Stat "Quantum Slim" Wireless Temperature 900 MHz Sensor is designed to monitor temperature inside refrigerator and freezer cases. The unit mounts on the outside of freezer units and can be mounted either inside or outside of refrigerator units. It is available with an internal or an external sensor.

The external sensor's cable can easily fit between the door seal or through hole without affecting appliance efficiency. The temperature is then transmitted to the receiver with a measurement range of -40 to 185°F (-40 to 85°C). The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes** for battery powered units. The unit can also be ordered with wired power rather than battery power.

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".



**BAPI-Stat
"Quantum
Slim" with
Remote
Probe
Sensor**

Specifications

Power for Battery Powered Units:

Two 3.6V Lithium batteries, 2,600 mAh,
~5 year life with 5 min transmission interval**

Power for Wired Power Units:

9 to 30 VDC; 50 mA max • 15 to 28 VAC; 50 mA max

Sensor: Thermistor, 10K-2

Internal: Located at Bottom of Case

External: 1.75" SS Sensor with FEP Cable
1" Thermobuffer with FEP Cable

Temp Measurement Range:

-40 to 185°F (-40 to 85°C)

Accuracy:

±0.5°F (±0.28°C) from -40 to 185°F (-40 to 85°C)

Transmitter Environmental:

-22 to 122°F (-30 to 50°C),
0 to 95% RH non-condensing

Case Material & Material Rating:

ABS Plastic, UL94 V-0

Transmitter Mounting:

Keyhole Screw Mounts (Screws included)

Ext. Probe Material: 304 Stainless Steel

Sensor Mounting:

Remote Probe: Plastic Holder (BA/FPB)

Thermobuffer: Hanging Rack Clip (Included)

Frequency: 900 MHz (4 Ch., 7 MHz Spacing)

Transmit Power: 0 dBm default, +5 dBm max

Receiver Sensitivity: -101 dBm

Transmitter Interval:

Field selectable from 30 seconds to one day in
defined intervals (5 minute default)

Transmission Distance: Up to 275 Feet*

Agency: RoHS

*Actual in-building transmission distances will
vary depending upon building construction,
transmission power setting and other factors.

**Actual battery life will vary depending upon
transmission interval setting and transmission
power setting.





BAPI-Stat “Quantum Slim” Temp Sensor

900 MHz Wireless System

F23

Ordering Information

| | |
|--------------------------------------|--|
| BA/WT900-QSL-IS | “Quantum Slim” with Internal Temp Sensor, Battery Power |
| BA/WT900-QSL-IS-PWR | “Quantum Slim” with Internal Temp Sensor, Wired Power |
| BA/WT900-QSL-RFEP5 | “Quantum Slim” w/ Remote Probe & 5’ FEP-Jacketed Cable, Battery Power |
| BA/WT900-QSL-RFEP5-PWR | “Quantum Slim” w/ Remote Probe & 5’ FEP-Jacketed Cable, Wired Power |
| BA/WT900-QSL-RFEP10 | “Quantum Slim” w/ Remote Probe & 10’ FEP-Jacketed Cable, Battery Power |
| BA/WT900-QSL-RFEP10-PWR | “Quantum Slim” w/ Remote Probe & 10’ FEP-Jacketed Cable, Wired Power |
| BA/WT900-QSL-X | “Slim” without Sensor (sensor is ordered separately), Battery Power |
| BA/WT900-QSL-X-PWR | “Slim” without Sensor (sensor is ordered separately), Wired Power |
| BA/WT900-QSL-TB-FEP5 | “Slim” w/ 1” Thermobuffer & 5’ FEP-Jacketed Cable, Battery Power |
| BA/WT900-QSL-TB-FEP5-PWR ... | “Slim” w/ 1” Thermobuffer & 5’ FEP-Jacketed Cable, Wired Power |
| BA/WT900-QSL-TB-FEP10 | “Slim” w/ 1” Thermobuffer & 10’ FEP-Jacketed Cable, Battery Power |
| BA/WT900-QSL-TB-FEP10-PWR . | “Slim” w/ 1” Thermobuffer & 10’ FEP-Jacketed Cable, Wired Power |
| BA/LI3620: | 3.6V Lithium Battery |

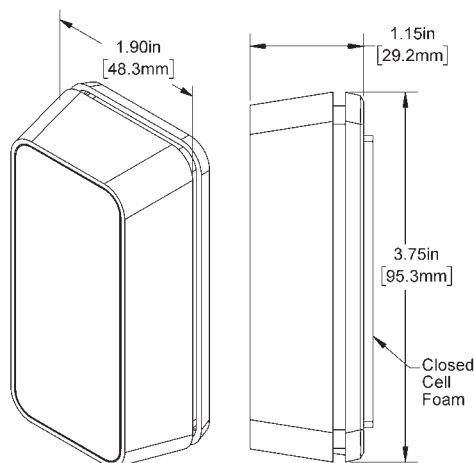
See end of Section F for list pricing.

900 MHz Gateway

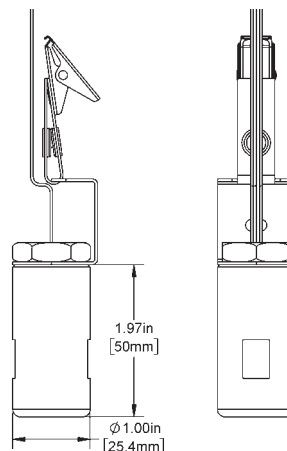
The Gateway receives the data from one or more sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.



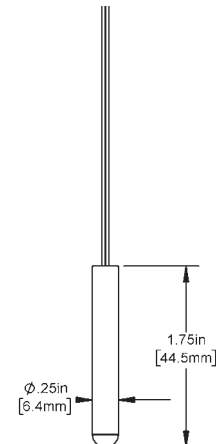
Dimensions



BAPI-Stat “Quantum Slim”



External Hanging Thermobuffer Sensor



External Remote Probe Sensor





Features & Options

- Up to 275 foot in-building range*
- Built in temperature and humidity sensor
- Approximate 5 year battery life with 5 minute transmit rate
- Customizable transmission rate and transmission power for optimum battery life and reliability of each sensor
- Gateway provides data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP)

The BAPI-Stat "Quantum Slim" Wireless Temp/Humidity 900 MHz sensor features a sleek, low profile room enclosure.

The temperature and humidity values are transmitted to the receiver with a measurement range of -40 to 185°F (-40 to 85°C). The unit has an estimated battery life of 5 years with the default transmit rate of once every 5 minutes** for battery powered units. The unit can also be ordered with wired power rather than battery power.

The unit is capable of storing all data in memory until it receives a successful reception signal from the Gateway, so that no data is lost during a communication interruption. Each sensor has customizable transmission rate and transmission power for optimum battery life and reliability. Additional transmissions can be triggered by a temperature change with a user-adjustable threshold. The system uses "smart logic" to find and secure a clean frequency channel rather than "frequency hopping".



**BAPI-Stat
"Quantum Slim"**

Specifications

Power for Battery Powered Units:

Two 3.6V Lithium batteries, 2,600 mAh,
~5 year life with 5 min transmission interval**

Power for Wired Power Units:

9 to 30 VDC; 50 mA max
15 to 28 VAC; 50 mA max

Temperature Sensor: Semiconductor Band Gap,
±0.54°F (±0.3°C) @ 20 to 40°C (68 to 104°F)

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

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

Transmitter Environmental:
-22 to 122°F (-30 to 50°C),
0 to 95% RH non-condensing

Case Material & Material Rating:
ABS Plastic, UL94 V-0

Frequency: 900 MHz (4 Ch., 7 MHz Spacing)

Mounting:

Keyhole Screw Mounts (Screws not included)

Transmit Power: 0 dBm default, +5 dBm max

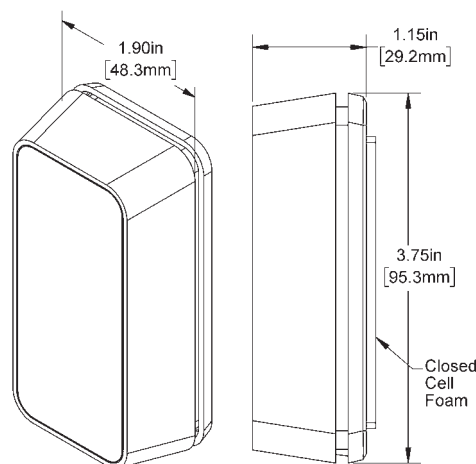
Receiver Sensitivity: -101 dBm

Transmitter Interval:

Field selectable from 30 seconds to one day in
defined intervals (5 minute default)

Transmission Distance: Up to 275 Feet*

Agency: RoHS



*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Actual battery life will vary depending upon transmission interval setting and transmission power setting.





BAPI-Stat “Quantum Slim” Temp/Humidity Sensor

900 MHz Wireless System

F25

Ordering Information

BA/WTH900-QSL-IS “Quantum Slim” with Internal Temp/Humidity Sensor, Battery Power

BA/WTH900-QSL-IS-PWR “Quantum Slim” with Internal Temp/Humidity Sensor, Wired Power

See end of Section F for list pricing.

900 MHz Gateway

The Gateway receives the data from one or more sensors up to 275 feet away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). The Gateway also sends a confirmation signal to each sensor upon a successful reception of data, allowing the sensor to release the data that it has stored in memory so that no data is lost during a communication interruption.





Features & Options

- Multiple communication options including TCP/IP, JSON & BACnet IP
- Each gateway supports up to 50 sensors** that can be configured remotely via the gateway
- The system uses “smart logic” to find and secure a clean frequency channel rather than “frequency hopping”.
- Shows sensor readings, battery and signal levels via web page
- Easily configure wireless sensors to be presented to BACnet network via either a flat or hierarchical method
- Direct access to SQL database

The 900 MHz Gateway receives the data from one or more sensors up to 275 feet* away, and provides the data to the BAS via multiple communication options (TCP/IP, JSON, BACnet IP). Sensors can be configured remotely via the gateway.

The gateway sends a confirmation signal to each sensor upon a successful reception, allowing the sensor to transmit the data it has stored in memory, so no data is lost during a communication interruption. The system uses “smart logic” to secure a clean frequency channel rather than “frequency hopping”.



900 MHz Gateway

Ordering Information

BA/GTW900-IP .. 900 MHz Gateway for BAPI 900 MHz Wireless System

See end of Section F for list pricing.

Specifications

Supply Power: 5 Volts @ 2.4 Amps, Micro-USB Plug (included)

Cable: 5' Ethernet cable with standard RJ45 connectors at each end (included)

Communication Ports:

RJ45 Ethernet:..... TCP/IP used for WEB Browser interface, Built in HTML webpage server, DHCP or static IP addressing

USB (4):..... Future growth

Capacity/Unit: Up to 50 sensors

Antenna: Thread-on Whip Antenna, 900 MHz, 3.0 dBi, 6.6" Long

Ambient: 32 to 150°F (0 to 70°C), 0 to 95% RH non-condensing

Typical Indoor Sensor to Receiver Reception Distance: Up to 275 feet*

Frequency: 900 MHz (4 Channels, 7 MHz Spacing)

Transmit Power: -5 dBm

Receiver Sensitivity: -101 dBm

Security: 128 bit AES encryption of wireless data. Configuration settings and device readings are user/password protected.

Mounting: Wall or surface mount

Default Address:

IP: DHCP or Static Configured Net Mask: 255.255.255.0 Port: 1000 (user configurable)

*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.

**Gateway supports up to 50 Sensors at 5 minute transmission interval. BAPI recommends a maximum of 25 sensors at a 30 second transmission interval.





Replacement Batteries for Wireless Sensors

F2+

Rev. 11/30/17

900 MHz Wireless System

Features & Options

BA/LI3620

The BA/LI3620 Lithium Ion AA battery is the ideal replacement for all BAPI wireless 418 MHz transmitters and 900 MHz sensors (except the Wireless Food Probe). Each unit takes two batteries.



BA/LI3620
(for all BAPI Wireless Sensors except the Wireless Food Probe)

BA/BAT-5AA-HIT

The BA/BAT-5AA-HIT High Temperature Lithium 1/2AA battery is the ideal replacement for the BAPI wireless 418 MHz Food Probe transmitter and 900 MHz Food Probe Sensor. Each unit takes one battery.



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

Ordering Information

| <u>Part Number</u> | <u>Description</u> |
|-----------------------------|--|
| BA/LI3620 | Lithium Ion AA Battery, 3.6V, for all BAPI 418 MHz Transmitters and 900 MHz Sensors except the Wireless Food Probe |
| BA/BAT-5AA-HIT | Lithium 1/2AA Battery, 3.6V, for the BAPI Wireless 418 MHz Food Probe Transmitter and 900 MHz Food Probe Sensor |

See end of Section F for list pricing.

Specifications

BA/LI3620 Battery

Type & Size: Lithium Ion, AA
Nominal Voltage: 3.6V
Nominal Capacity: 2.6 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), 1/2AA
Nominal Voltage: 3.6V
Nominal Capacity: 0.9 Ah @ 1mA, to 2V
Operating Temp:
-67 to 257°F (-55 to 125°C)
0 to 95 %RH Non-Condensing
Agency: RoHS





Features & Options

The 900 MHz Field Verifier Kit is designed to measure how far the BAPI Wireless 900 MHz signal will travel in a specific installation. Location of sensors and Gateways can be identified with a single site visit prior to submitting on a project.

The kit includes three sensors, a Gateway receiver and a wireless router so you can connect the Gateway wirelessly to a laptop computer. The kit also includes a spectrum analyzer to check the RF background noise on the frequency channels used by the BAPI system. The Gateway software provides a dBm signal strength value for the sensors so that ideal locations for the sensors can be identified.

The 900 MHz Field Verifier is available as 30 day loaner kit and includes a carrying case.



900 MHz Field Verifier Kit

Ordering Information

BA/FV900-KIT-LOAN.....900 MHz Field Verifier Kit

See end of Section F for list pricing.

Specifications

GATEWAY

Supply Power: 5 Volts @ 2.4 Amps, Micro-USB Plug (included)

Cable: 5' Ethernet cable (included)

Capacity/Unit: Up to 200 BACnet objects

Ambient: 32 to 150°F (0 to 70°C), 0 to 95%RH non-condensing

Typical Indoor Communication Distance: Up to 275 feet*

Frequency: 900 MHz (4 Channels, 7 MHz Spacing)

Transmit Power: -5 dBm

Receiver Sensitivity: -101 dBm

SENSORS

Power: Two 3.6V Lithium batteries, 2,600 mAh (One 3.6V Lithium batteries for Food Probe)

Temp Measurement Range - BAPI-Slim & BAPI-Stat Quantum: -40 to 185°F (-40 to 85°C)

Temp Measurement Range - Food Probe: -20° to 110°C (-4° to 230°F)

Environmental Op. Range - BAPI-Slim & BAPI-Stat Quantum:

32 to 140°F (0 to 60°C), 5% to 95% RH non-condensing

Environmental Operating Range - Food Probe:

-15° to 85°C (5° to 185°F), 0 to 100% RH Condensing

Frequency: 900 MHz (4 Ch., 7 MHz Spacing)

Transmit Power: 0 dBm default, +5 dBm max

Receiver Sensitivity: -101 dBm

Transmission Interval: 5 minute default, user adjustable

Transmission Distance - BAPI-Slim & BAPI-Stat Quantum: Up to 275 Feet*

Transmission Distance - Food Probe: Up to 175 feet*

*Actual in-building transmission distances will vary depending upon building construction, transmission power setting and other factors.





Wireless List Pricing - 900 MHz System

F29

Rev. 02/13/18

900 MHz Wireless System

| Page | Part Number | Description | List Price |
|------|-------------|-------------|------------|
|------|-------------|-------------|------------|

WIRELESS ROOM SENSORS

| | | | |
|----|-------------------|--|---------|
| F2 | BA/WT900-Q | BAPI-Stat "Quantum" Temp Sensor, Battery Power | \$500 |
| | BA/WT900-Q-PWR | BAPI-Stat "Quantum" Temp Sensor, Wired Power | \$555 |
| | BA/WT900-S-Q | BAPI-Stat "Quantum" Temp Sensor w/ Setpoint, Battery Power | \$506 |
| | BA/WT900-S-Q-PWR | BAPI-Stat "Quantum" Temp Sensor w/ Setpoint, Wired Power | \$561 |
| | BA/WT900-O-Q | BAPI-Stat "Quantum" Temp Sensor w/ Override, Battery Power | \$505 |
| | BA/WT900-O-Q-PWR | BAPI-Stat "Quantum" Temp Sensor w/ Override, Wired Power | \$560 |
| | BA/WT900-SO-Q | "Quantum" Temp Sensor w/ Setpoint & Override, Battery Power | \$511 |
| | BA/WT900-SO-Q-PWR | "Quantum" Temp Sensor w/ Setpoint & Override, Wired Power | \$566 |
| F4 | BA/WTH900-Q | BAPI-Stat "Quantum" Temp/Humidity Sensor, Battery Power | \$585 |
| | BA/WTH900-Q-PWR | BAPI-Stat "Quantum" Temp/Humidity Sensor, Wired Power | \$640 |
| | BA/WTH900-S-Q | "Quantum" Temp/Humidity Sensor w/ Setpoint, Battery Power | \$591 |
| | BA/WTH900-S-Q-PWR | "Quantum" Temp/Humidity Sensor w/ Setpoint, Wired Power | \$646 |
| | BA/WTH900-O-Q | "Quantum" Temp/Humidity Sensor w/ Override, Battery Power | \$590 |
| | BA/WTH900-O-Q-PWR | "Quantum" Temp/Humidity Sensor w/ Override, Battery Power | \$645 |
| | BA/WTH900-SO-Q | "Quantum" Temp/Humidity Sensor w/ Setpoint & Override, Battery Power | \$596 |
| | BA/WTH900-SO-Q | "Quantum" Temp/Humidity Sensor w/ Setpoint & Override, Battery Power | \$651 |
| | BA/LI3620 | Lithium Ion Battery, 3.6 Volt (for Wireless Sensors) | \$3 Net |

WIRELESS DUCT SENSORS

| | | | |
|----|-------------------|--|---------|
| F6 | BA/WT900-D-4-BB | Wireless Duct Temperature Sensor, 4" Probe Length | \$525 |
| | BA/WT900-D-8-BB | Wireless Duct Temperature Sensor, 8" Probe Length | \$525 |
| | BA/WT900-D-12-BB | Wireless Duct Temperature Sensor, 12" Probe Length | \$525 |
| | BA/WT900-D-18-BB | Wireless Duct Temperature Sensor, 18" Probe Length | \$525 |
| | BA/WT900-D-XX*-BB | Wireless Duct Temp. Sensor, Custom Probe Length | Call |
| F8 | BA/WTH900-D-BB | Wireless Duct Temperature and Humidity Sensor | \$610 |
| | BA/LI3620 | Lithium Ion Battery, 3.6 Volt (for Wireless Sensors) | \$3 Net |

*The "XX" represents a custom length of 1/4" dia. probe. Please call BAPI for availability and pricing.

WIRELESS IMMERSION SENSORS

| | | | |
|-----|-----------------|--|---------|
| F10 | BA/WT900-I-2-BB | Wireless Immersion Temp. Sensor, 2" Probe Length | \$525 |
| | BA/WT900-I-4-BB | Wireless Immersion Temp. Sensor, 4" Probe Length | \$525 |
| | BA/WT900-I-8-BB | Wireless Immersion Temp. Sensor, 8" Probe Length | \$525 |
| | BA/LI3620 | Lithium Ion Battery, 3.6 Volt (for Wireless Sensors) | \$3 Net |

WIRELESS REMOTE PROBE SENSORS

| | | | |
|-----|----------------------|--|---------|
| F12 | BA/WT900-RPP-5-BB | Remote Probe with Plenum Rated Cable - 5' Leads | \$537 |
| | BA/WT900-RPP-10-BB | Remote Probe with Plenum Rated Cable - 10' Leads | \$539 |
| | BA/WT900-RPP-15-BB | Remote Probe with Plenum Rated Cable - 15' Leads | \$541 |
| | BA/WT900-RPP-20-BB | Remote Probe with Plenum Rated Cable - 20' Leads | \$543 |
| | BA/WT900-RPP-25-BB | Remote Probe with Plenum Rated Cable - 25' Leads | \$545 |
| | BA/WT900-RPFEP-5-BB | Remote Probe with FEP Jacketed Cable - 5' Leads | \$540 |
| | BA/WT900-RPFEP-10-BB | Remote Probe with FEP Jacketed Cable - 10' Leads | \$545 |
| | BA/WT900-RPFEP-15-BB | Remote Probe with FEP Jacketed Cable - 15' Leads | \$550 |
| | BA/WT900-RPFEP-20-BB | Remote Probe with FEP Jacketed Cable - 20' Leads | \$555 |
| | BA/WT900-RPFEP-25-BB | Remote Probe with FEP Jacketed Cable - 25' Leads | \$560 |
| | BA/LI3620 | Lithium Ion Battery, 3.6 Volt (for Wireless Sensors) | \$3 Net |





| Page | Part Number | Description | List Price |
|------|-------------|-------------|------------|
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WIRELESS OUTSIDE AIR SENSORS

| | | | | |
|-----|-------|------------------------------|---|---------|
| F14 | | BA/WT900-O-BB | Outside Air Temp and Barometric Pressure Sensor..... | \$525 |
| | | BA/WT900-LL-O-BB: ... | Outside Air Temp, Light Level and Barometric Pressure Sensor | \$560 |
| F16 | | BA/WTH900-O-BB | Outside Air Temp/Humidity and Barometric Pressure Sensor.... | \$610 |
| | | BA/WTH900-LL-O-BB: . | Outside Air Temp/Humidity, Light Level & Barometric Press. Sensor | \$645 |
| | | BA/LI3620 | Lithium Ion Battery, 3.6 Volt (for Wireless Sensors) | \$3 Net |

THERMOBUFFER

| | | | | |
|-----|-------|------------------------------------|---|---------|
| F18 | | BA/WT900-TB-M304-2-BB | Wireless Thermobuffer, 304 SS Chamber, 2" SS Buffer Chamber | \$575 |
| | | BA/WT900-TB-M304-4-BB | Wireless Thermobuffer, 304 SS Chamber, 4" SS Buffer Chamber | \$575 |
| | | BA/WT900-TB-M304-1-HB-5-BB | Thermobuffer, 1" Hanging Bracket with 5' FEP-Jacketed Cable | \$587 |
| | | BA/WT900-TB-M304-1-HB-10-BB | Thermobuffer, 1" Hanging Bracket with 10' FEP-Jacketed Cable | \$592 |
| | | BA/LI3620 | Replacement Battery for Sensors (except Food Probe), Lithium Ion 3.6V AA..... | \$3 Net |

WIRELESS FOOD PROBES

| | | | | |
|-----|--|---------------------|--------------------------|-------|
| F20 | | BA/WFP900-PT | Wireless Food Probe..... | \$400 |
|-----|--|---------------------|--------------------------|-------|

"QUANTUM SLIM" WIRELESS TEMPERATURE SENSOR

| | | | | |
|-----|--|---------------------------------|--|-------|
| F22 | | BA/WT900-QSL-IS | "Quantum Slim" with Internal Temperature Sensor, Battery Power..... | \$500 |
| | | BA/WT900-QSL-IS-PWR | "Quantum Slim" with Internal Temperature Sensor, Wired Power..... | \$555 |
| | | BA/WT900-QSL-RFEP5 | "Quantum Slim" w/ Remote Probe Sensor & 5' FEP-Jacketed Cable, Battery Power | \$503 |
| | | BA/WT900-QSL-RFEP5-PWR | "Quantum Slim" w/ Remote Probe Sensor & 5' FEP-Jacketed Cable, Wired Power | \$558 |
| | | BA/WT900-QSL-RFEP10 | "Quantum Slim" w/ Remote Probe Sensor & 10' FEP-Jacketed Cable, Battery Power ... | \$506 |
| | | BA/WT900-QSL-RFEP10-PWR | "Quantum Slim" w/ Remote Probe Sensor & 10' FEP-Jacketed Cable, Wired Power | \$561 |
| | | BA/WT900-QSL-X | "Quantum Slim" without Sensor (sensor is ordered separately), Battery Power..... | \$500 |
| | | BA/WT900-QSL-X-PWR | "Quantum Slim" without Sensor (sensor is ordered separately), Wired Power..... | \$555 |
| | | BA/WT900-QSL-TB-FEP5 | "Quantum Slim" w/ 1" Thermobuffer & 5' FEP-Jacketed Cable, Battery Power | \$610 |
| | | BA/WT900-QSL-TB-FEP5-PWR | "Quantum Slim" w/ 1" Thermobuffer & 5' FEP-Jacketed Cable, Wired Power | \$665 |





Wireless List Pricing - 900 MHz System

900 MHz Wireless System

F31

| Page | Part Number | Description | List Price |
|---|----------------------------------|--|------------|
| | BA/WT900-QSL-TB-FEP10 | | |
| | | "Quantum Slim" w/ 1" Thermobuffer & 10' FEP-Jacketed Cable, Battery Power | \$615 |
| | BA/WT900-QSL-TB-FEP10-PWR | | |
| | | "Quantum Slim" w/ 1" Thermobuffer & 10' FEP-Jacketed Cable, Wired Power | \$670 |
| | BA/LI3620 | | |
| | | Lithium Ion Battery, 3.6 Volt (for Wireless Sensors)..... | \$3 Net |
| "QUANTUM SLIM" WIRELESS TEMP/HUMIDITY SENSOR | | | |
| F24 | BA/WTH900-QSL-IS | | |
| | | "Quantum Slim" with Internal Temp/Humidity Sensor, Battery Power | \$585 |
| | BA/WTH900-QSL-IS-PWR | | |
| | | "Quantum Slim" with Internal Temp/Humidity Sensor, Wired Power | \$640 |
| | BA/LI3620 | | |
| | | Lithium Ion Battery, 3.6 Volt (for Wireless Sensors)..... | \$3 Net |
| 900 MHz GATEWAY | | | |
| F26 | BA/GTW900-IP | 900 MHz Gateway for Wireless Sensors | \$850 |
| REPLACEMENT BATTERIES | | | |
| F27 | BA/LI3620 | | |
| | | Replacement Battery for Sensors (except Food Probe), Lithium Ion 3.6V, AA | \$3 Net |
| | BA/BAT-5AA-HIT | | |
| | | Replacement Battery for the Wireless Food Probe, Lithium 3.6V, ½AA, High Temp | \$6 Net |
| FIELD VERIFIER KIT | | | |
| F28 | BA/FV900-KIT-LOAN | | |
| | | 900MHz Field Verifier Kit | \$3,000* |

*Note: A separate PO is required for the loaner unit and only loaner units may appear on the PO. After one month, you will be expected to pay the invoice for the loaner units that are not returned. An RMA will be issued at the time of the loan so that the loaner unit can be returned expeditiously. You will receive 100% credit less shipping and handling charges if the unit is returned in working order within 30 Days from product ship date.

Gray shaded items follow the Buy and Resale Multiplier.



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Rev. 12/19/16

Electronic Technician Assistant

G1

ETA Overview

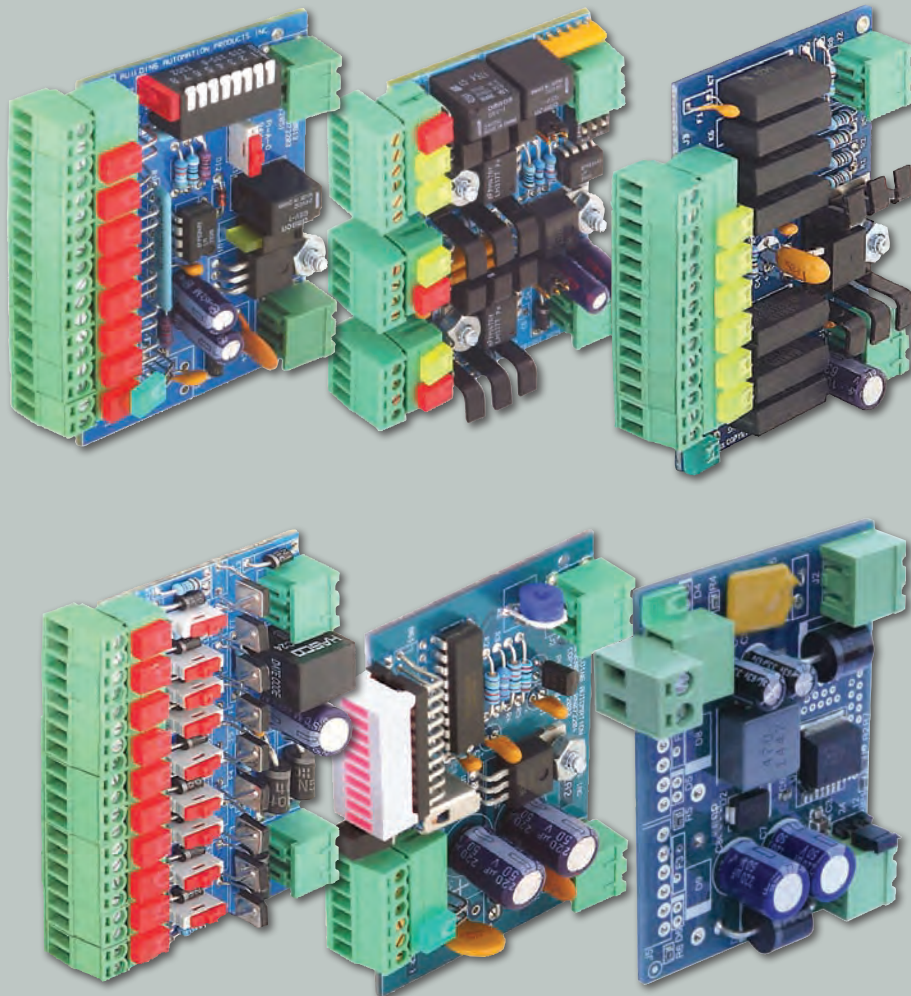
ETA Product Line Overview

BAPI's **Electronic Technician Assistant (ETA)** products are a uniform line of interface and communication devices that complement a DDC installation. They consolidate many of the components being used at present and provide a more complete picture of the system than a laptop computer alone.

The ETA devices simplify wiring and troubleshooting by providing a pluggable screw terminal for each and every wire in the system, making it easy to break the system into sections to quickly isolate a problem. The devices cut down on control panel clutter because they plug into specially designed backplanes which

distribute power through the mounting connectors, greatly reducing the number of wires in the panel.

The ETA devices are also a practical and inexpensive way to pick up feedback signals which are currently ignored in many systems, such as non-critical alarm points or actuator feedback signals. Having convenient LED display of these signals at the control panel, or summarizing multiple feedback signals into a single input to the controller, provides a more complete picture, helping the facilities manager and technicians keep the system performing at its optimum level.





| | |
|---|---------|
| 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 - CO₂ Sensor Power Supply | pg. G8 |
| Provides 24VDC power and terminations for up to three CO ₂ sensors. | |
| CDSP2 - CO₂ 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 Supply 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 & PS17CB - Power Supplies | pg. G19 |
| Provides up to six 33 VDC power supplies to operate ETA modules or other devices. | |
| COMBLK, COMBLK2 & TB18 | 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 Fiber Optic Transceiver | pg. G26 |
| Converts RS-485 data on a single-mode fiber cable to a fiber optic signal for transmission to other buildings, then converts it back again. | |
| PLCON1 & 2 - PremierLink Connectors | pg. G27 |
| of Carrier PremierLink rooftop controllers. The modules slip onto terminals on the controller and provide labeled, pluggable screw terminals. | |
| RBP - Comm. Repeater Backplane | pg. G28 |
| RBP - Distributes power and communications for up to four FOX and 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 | |
| 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. | |
| AVI - Air Valve Interface & Adaptor | pg. G32 |
| Connects jack-screw style VAV floating point actuators with mechanical end switches to DDC controllers. The Adaptor connects a VAV actuator cable when the factory connector is missing. | |
| IRM4 - Interposing Relay Module | pg. G34 |
| Four independent channels that convert a relay output to a contact output or a voltage output. | |
| LRCA - Link Router Comm. Adapter | pg. G35 |
| Adds an RJ jack to a Carrier i-Vu Link/Router. | |
| PSOCL - Power Supply Current Limiter | pg. G35 |
| Buffers the output of the BAPI PS17 Power Supply when powering the Carrier i-Vu Link/Router. | |
| UCRB - Universal Controller Relay Board | pg. G36 |
| Interconnects a controller's digital outputs to any device that requires a conventional thermostat input. | |
| SS-AC - Selector Switch/Alarm Counter | pg. G37 |
| Monitors a multitude of 4-position selector switches to regulate the speed of VFD fans. | |
| SD2 - Status Display, Dual 7 Segment | pg. G38 |
| Displays a program error code with a manual reset switch to route a reset signal to a controller. | |
| PE4 - Pulse Extender | pg. G40 |
| Takes the input pulse to the board and extends the output down the channel to a controller or monitor. | |
| Steel Enclosures and Accessories | pg. G41 |
| Steel enclosures in three sizes, Backplates & Cable Guides, designed to accomodate all ETA devices. | |





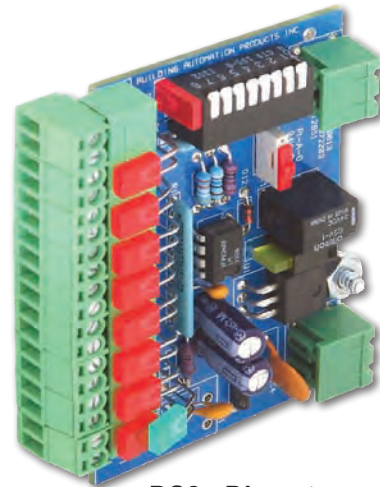
Overview

The number of discrete switch closure inputs required in an HVAC system often exceeds the number of hardware inputs available (or justifiable) on the controller. Summarizing multiple discrete points into a single system input is an easy and effective solution. The DS8 module accepts up to eight dry contact inputs and provides a single dry contact signal to the controller when the number of monitored points reaches a user-defined threshold.

The DS8 is great for grouping alarms which you will want to distinguish in the field, but don't need to distinguish on the central computer. Examples include dirty filter alarms, condensate float switches, VFD faults, moisture monitors, door switches, etc. A technician can glance at the DS8 and quickly determine which filter to change; which drain to check or which VFD to inspect.

The DS8 plugs into the BP4 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 a R49. Typical applications include lighting controls and small fan controls.



DS8 - Discrete Summary Module

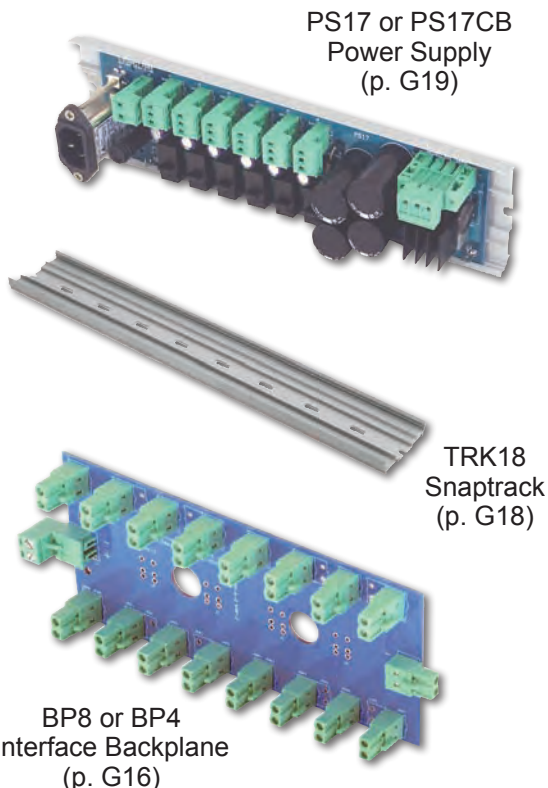
Part Number

Description

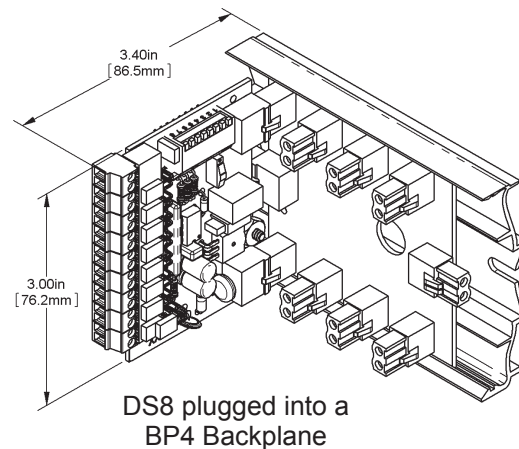
BA/DS8Discrete Summary Module, 8 Input

See end of Section G for list pricing.

Associated Products



Specifications



Power Voltage: 24 to 35 VDC
22 to 26 VAC

Power Current: 35 mA max. (1.2VA max)

Switch Voltage: 24 VDC

Switch Current: 2.4 mA

Output: Dry relay contacts
NEC Class 2 circuits only

Output Current: 1 mA to 1 Amp



EA1 - Two Position Actuator Interface

G5

Rev. 10/16/12

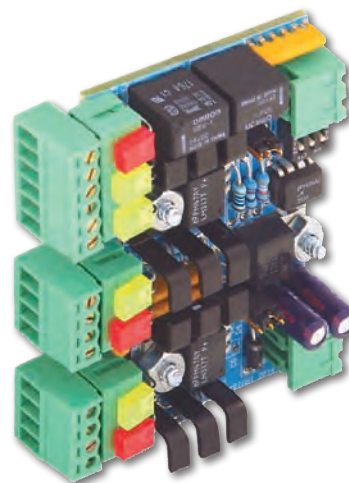
ETA Line

Overview

The EA1 simplifies the wiring and troubleshooting of “Belimo®” style two-position actuators with end switch position feedback. Each EA1 module can control two actuators from a single controller output and provide a summary dry contact status when a user-selectable number of end switches close (1,2, or more). The actuators can move together or in opposite directions based on jumper settings on the module. An additional end switch input allows multiple EA1s to be cascaded together.

The connectors on the front of the EA1 module are readily accessible and make terminations quick and easy for the controller, actuators and actuator end switches. The red and amber LEDs on the EA1 indicate when power is being supplied to the actuators and when they have reached their end states. These LEDs tell the technician the state of the controller output, when power is being sent to the actuators and if the actuator end switch is closed.

The EA1 plugs into a BP4 or BP8 backplane. A green LED on the EA1 indicates when power is present.



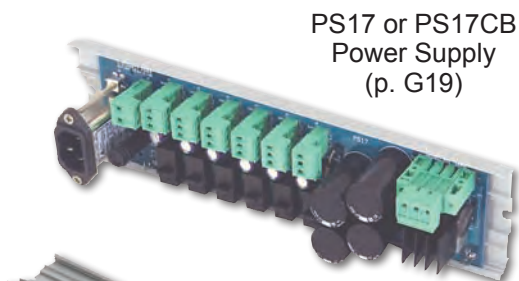
**EA1 - Two
Position Actuator
Interface**

| Part Number | Description |
|--------------|-------------------------------|
| BA/EA1 | 2 Position Actuator Interface |

See end of Section G for list pricing.

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

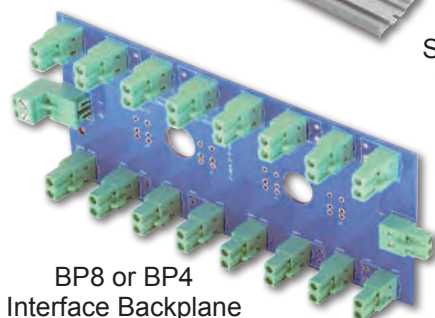
Associated Products



PS17 or PS17CB
Power Supply
(p. G19)

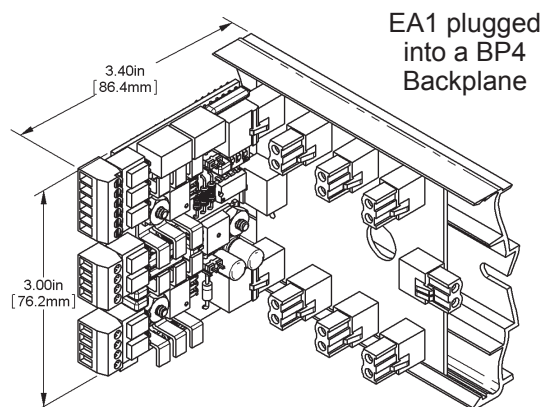


TRK18
Snaptrack
(p. G18)



BP8 or BP4
Interface Backplane
(p. G16)

Specifications



Power Voltage: 26 to 36 VDC

Power Current: 50 mA max. plus actuators
(1.7 VA max plus actuator)

Actuator Control Voltage:
0 or 24 VDC @ 7mA max

Actuator Power Voltage: 24 VDC

Actuator Power Current:
2 output of 250 mA max.
(12 Watts total)



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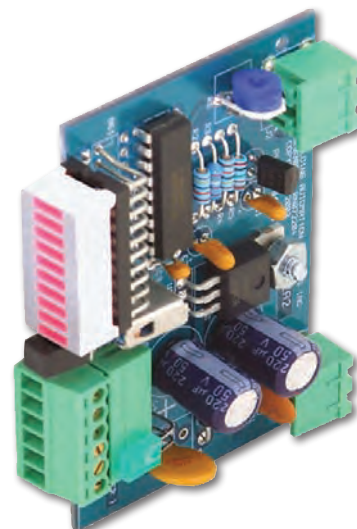


Overview

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 BP4 or BP8 backplane. A green LED on the EA2 indicates when power is present.



EA2 - Modulating Actuator Interface

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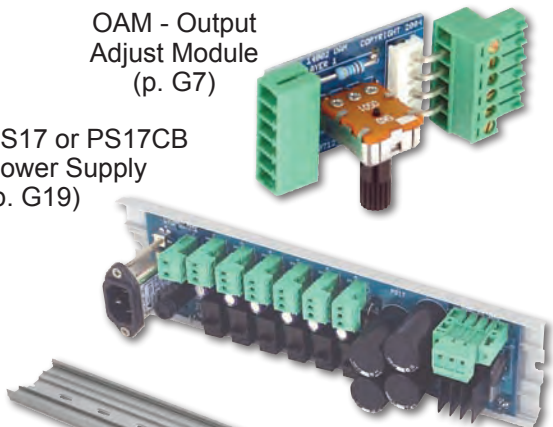
| Part Number | Description |
|--------------|------------------------------|
| BA/EA2 | Modulating Acuator Interface |

See end of Section G for list pricing.

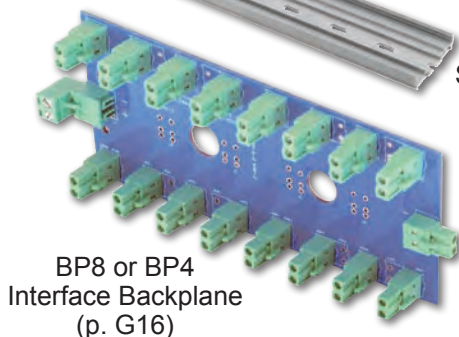
Associated Products

OAM - Output Adjust Module
(p. G7)

PS17 or PS17CB
Power Supply
(p. G19)

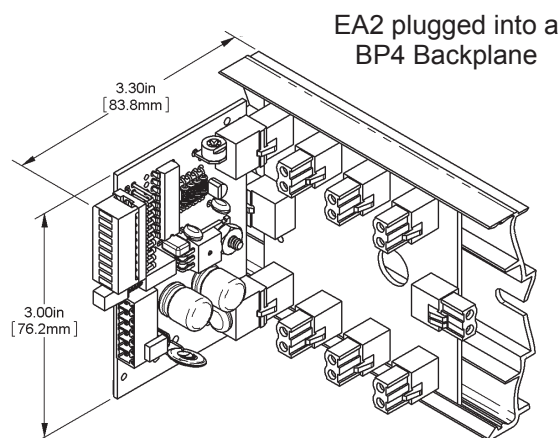


TRK18
Snaptrack
(p. G18)



BP8 or BP4
Interface Backplane
(p. G16)

Specifications



| | |
|----------------------------------|---|
| Power Voltage: | 26 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) |



Rev. 10/16/12

OAM - Output Adjust Module

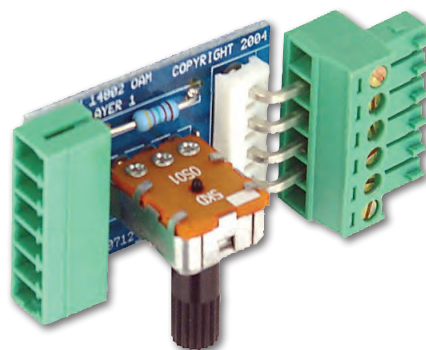
ETA Line

G7

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.

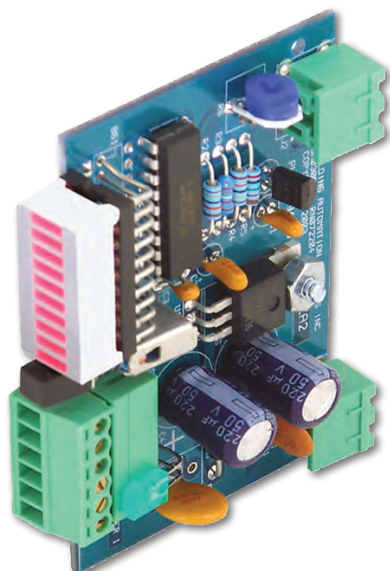


OAM - Output Adjust Module

| Part Number | Description |
|--------------|----------------------|
| BA/OAM | Output Adjust Module |

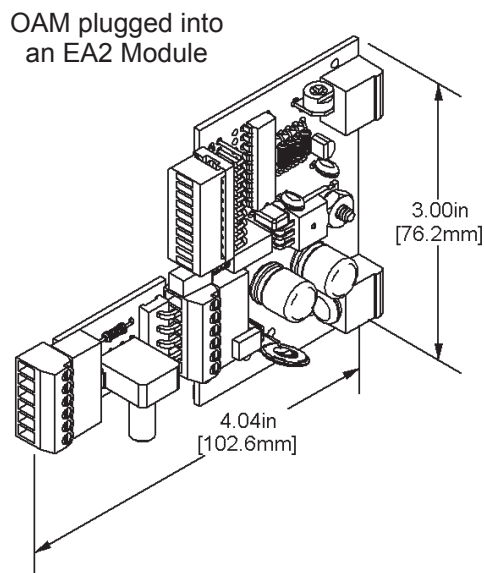
See end of Section G for list pricing.

Associated Products



EA2 - Modulating Actuator Interface
(p. G6)

Specifications



Input Voltage: 24VDC
Output Power Voltage: 0 to 10 VDC nominal
Output Power Current: 2 mA



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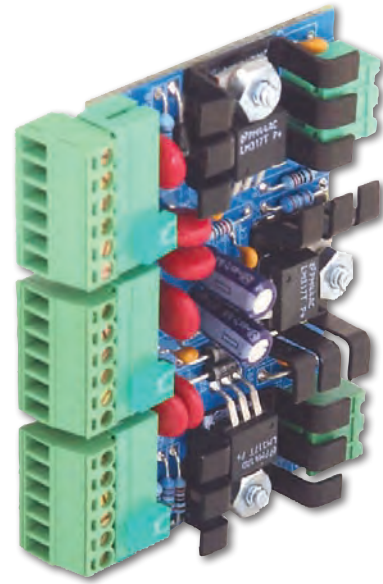


Overview

Many facilities use Carbon Dioxide (CO₂) sensors for demand-controlled ventilation. Although BAPI makes CO₂ sensors that can run on AC or DC power, other CO₂ sensors typically 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 BAPI CDSP module removes the clutter and the wiring hassles by providing the power and terminations for up to three CO₂ sensors. Additional CDSP modules can be mounted neatly in the associated backplane to accommodate an unlimited number of CO₂ sensors throughout the facility.

The CDSP module plugs into a BP4 or BP8 backplane. Three green LEDs indicate when power is present to the CO₂ sensors. Another green LED indicates when power is present to the CDSP module. The CDSP can be used to power virtually any four-wire sensor requiring 24 VDC.



**CDSP - Carbon Dioxide
Sensor Power Supply**

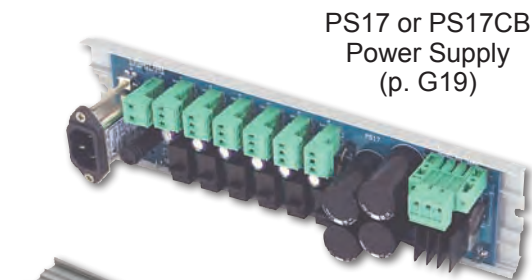
Part Number

Description

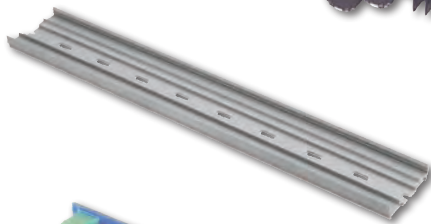
BA/CDSPCarbon Dioxide Sensor Power Supply

See end of Section G for list pricing.

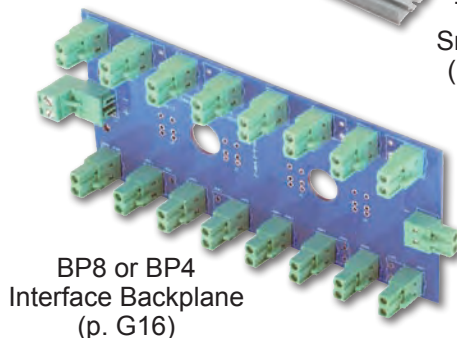
Associated Products



**PS17 or PS17CB
Power Supply
(p. G19)**

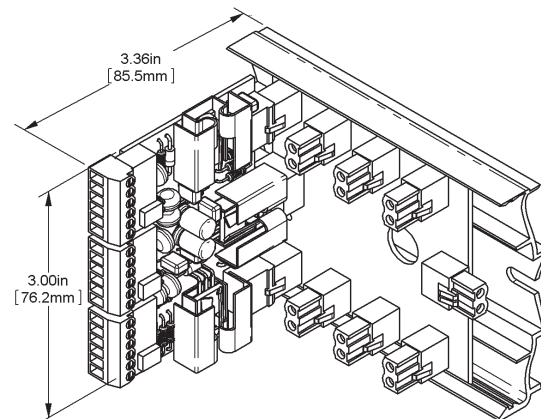


**TRK18
Snaptrack
(p. G18)**



**BP8 or BP4
Interface Backplane
(p. G16)**

Specifications



**CDSP plugged into a
BP4 Backplane**

Input Voltage: 26 to 36 VDC
Input Current: 350 mA max. (12 VA max.)
Output Voltage: 24 VDC
Output Current: 75 mA on each output
 (225 mA total)



CDSP2 - Carbon Dioxide Sensor Power Supply

G9

Rev. 09/01/15

ETA Line

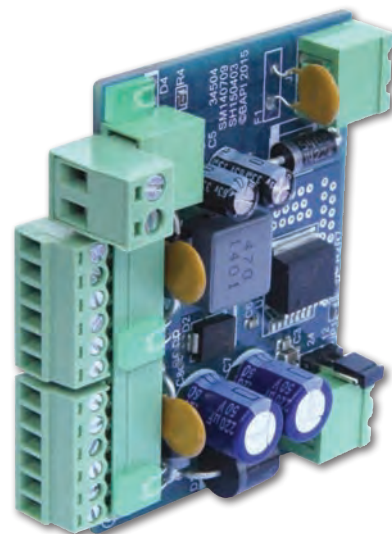
Overview

Many facilities use Carbon Dioxide (CO₂) sensors for demand-controlled ventilation. Although BAPI makes CO₂ sensors that can run on AC or DC power, other CO₂ sensors typically 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 BAPI CDSP2 module removes the clutter and the wiring hassles by providing the power and terminations for two CO₂ sensors. Additional CDSP modules can be mounted neatly in the associated backplane to accommodate an unlimited number of CO₂ sensors throughout the facility. The 12 or 24 VDC output power of the module is field selectable via a jumper on the circuit board.

The CDSP2 plugs into the BP4 or BP8 Backplane. The CDSP2 receives power from the backplane which is powered by a BAPI PS17 - Power Supply or other power supply.

Three green Output Power LEDs light whenever power is present at the output terminals.

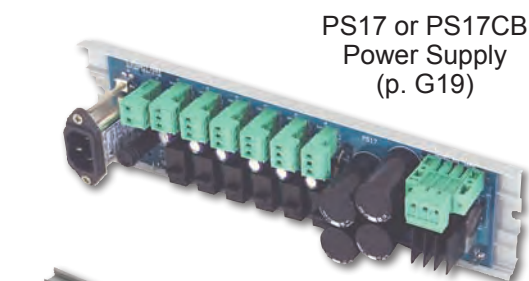


CDSP2 - Carbon Dioxide Sensor Power Supply

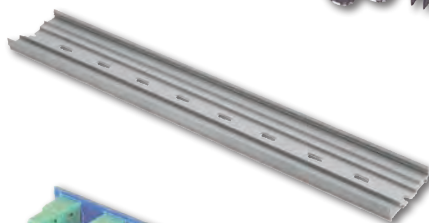
| <u>Part Number</u> | <u>Description</u> |
|--------------------|------------------------------------|
| BA/CDSP2 | Carbon Dioxide Sensor Power Supply |

See end of Section G for list pricing.

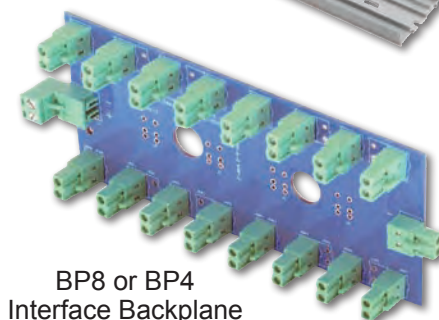
Associated Products



**PS17 or PS17CB
Power Supply
(p. G19)**

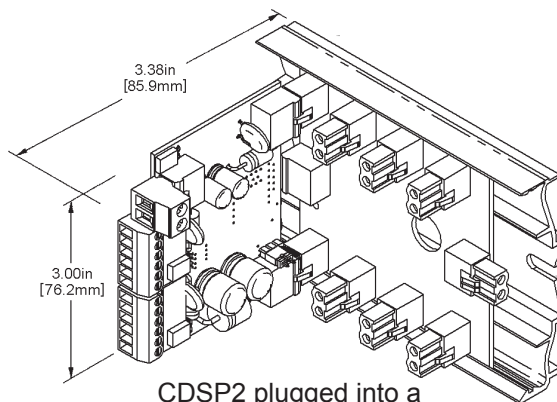


**TRK18
Snaptrack
(p. G18)**



**BP8 or BP4
Interface Backplane
(p. G16)**

Specifications



**CDSP2 plugged into a
BP4 Backplane**

Input Voltage

28 to 36 VDC for 24VDC Output (default)
16 to 36 VDC for 12 VDC Output

(Power is supplied by a PS17 - Power Supply or other customer provided power supply)

Input Current: 1.45A max (12VA max)

Output Voltage: 12 or 24VDC

Output Current: 0.5A on each output
1.5A total



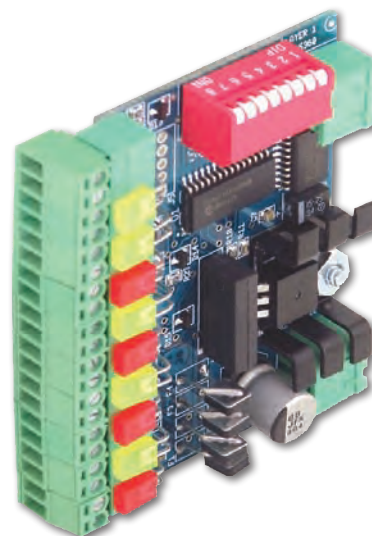


Overview

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 heat units 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 NO/NC output relays that trigger at four fixed voltages across the 0-5 or 0-10 control voltage range. Two SQ4 modules can be cascaded to provide eight independent output stages. When closed, each output relay provides 24 VDC at 120 mA. In addition, sequencer modules are available that provide a rotational sequence as well as contact monitoring and alarm output.



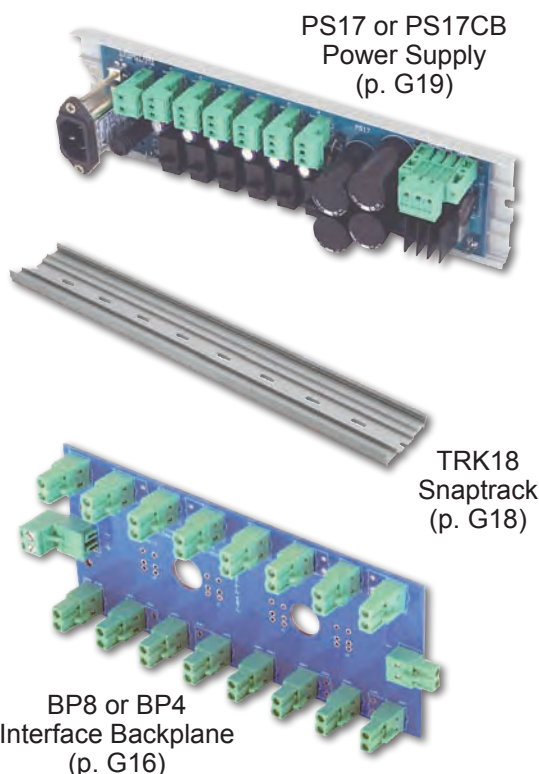
SQ4RA - Four-Step Sequence Module

| <u>Part Number</u> | <u>Description</u> |
|-----------------------|--|
| BA/SQ4 | 4-Step Sequence Module |
| BA/SQ4-R | 4-Step Sequence Module (Rotational) |

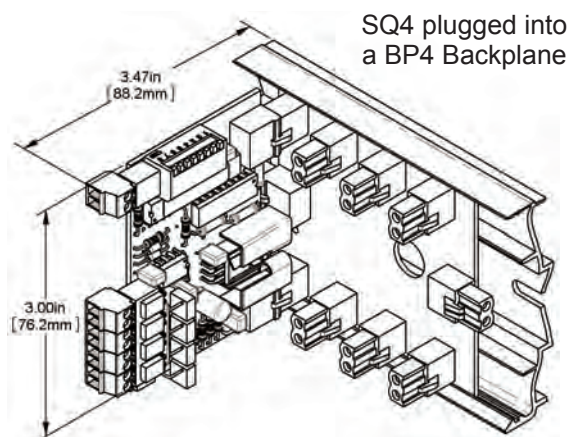
| <u>Part Number</u> | <u>Description</u> |
|------------------------|---|
| BA/SQ4-A | 4-Step Sequence Module (with Alarm) |
| BA/SQ4-RA | 4-Step Sequence Module (Rotational with Alarm) |

See end of Section G for list pricing.

Associated Products



Specifications



| | |
|-------------------------------|---|
| Power Voltage: | 26 to 36 VDC |
| 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 120 mA max. (12 Watts total) |



3312VC & 3324VC - Voltage Converters

G11

Rev. 09/01/15

ETA Line

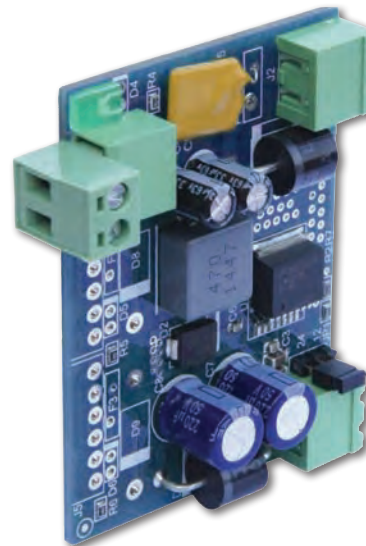
Overview

Some of BAPI's ETA products require regulated power of 12 or 24 VDC, including the FOX - RS-485 Fiber Optic Transceiver and the RPTR - RS-485 Repeater. The 3312VC and 3324VC Voltage Converters can provide the 12 or 24 VDC regulated voltage required by the other ETA units. The 12 or 24 VDC output is field selectable via a jumper on the circuit board.

The 3312VC and 3324VC can be mounted in two ways. In the first method, the units plug vertically into a BP4 or BP8 Backplane like a standard interface device. The voltage converter receives its supply power from the Backplane which is supplied by a PS17 - 33VDC Power Supply or other power supply.

The 3312VC and 3324VC can also be mounted in snaptrack. The unit is then powered with a two-wire connection from the PS17 - 33VDC Power Supply or other power supply.

If the 3312VC is powering a FOX or RPTR module, the 12 VDC output from the 3312VC is sent to a RBP - Communications Repeater Backplane or SRBP - Single Repeater Backplane. The Repeater Backplane then provides power, communications and mounting for the FOX and RPTR modules.

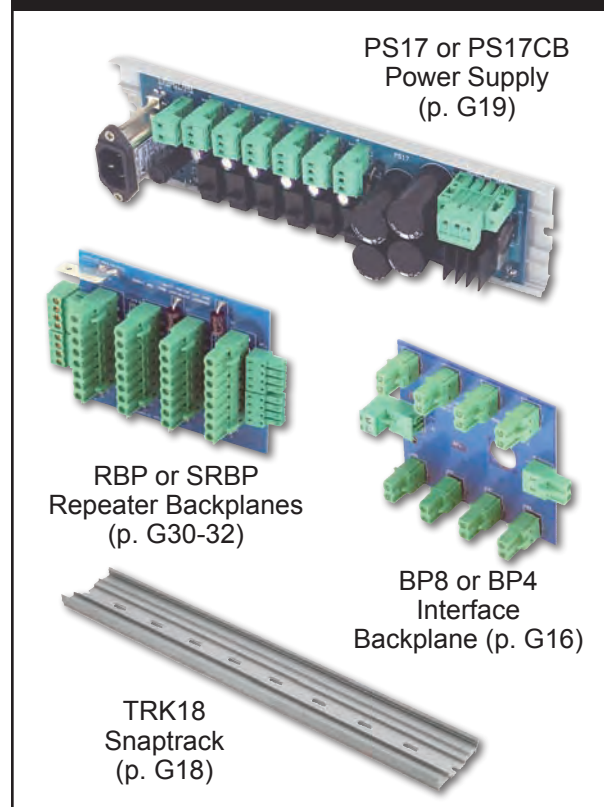


3324VC - Voltage Converter

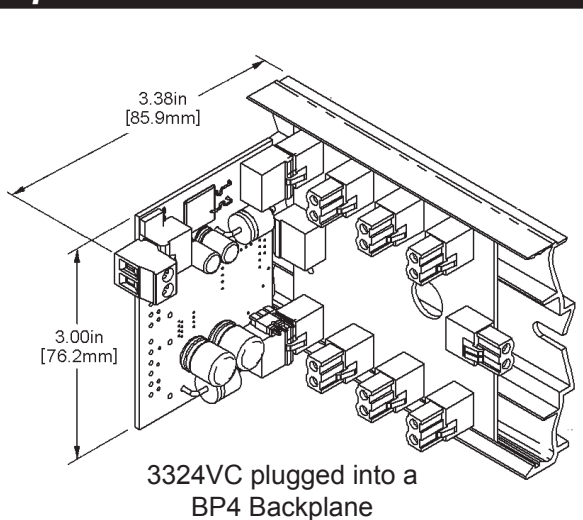
| <u>Part Number</u> | <u>Description</u> |
|------------------------|----------------------------------|
| BA/3312VC | Voltage Converter (12VDC Output) |
| BA/3324VC | Voltage Converter (24VDC Output) |

See end of Section G for list pricing.

Associated Products



Specifications



Input Voltage:

16 to 36 VDC for 12 VDC Output (BA/3312VC)
28 to 36 VDC for 24 VDC Output (BA/3324VC)

Input Current: 1.4A Max at 28 VDC

Output Voltage: 12 or 24 VDC \pm 0.25 VDC

Output Current: 1.5 Amp Max (30VA max)



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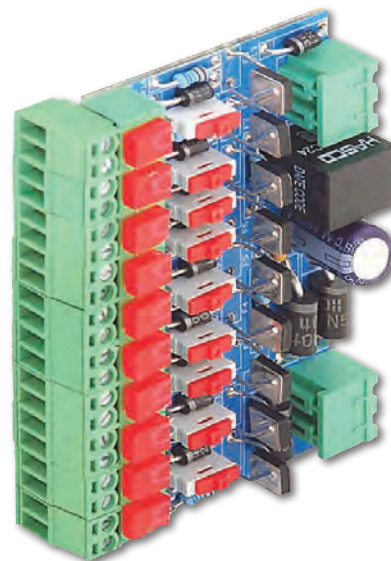
Overview

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 I/O spots on the controller to perform these tasks, the BAPI R49 conserves critical controller space by turning on or off up to nine relays using only one controller output.

Each output on the R49 module has a polarity 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

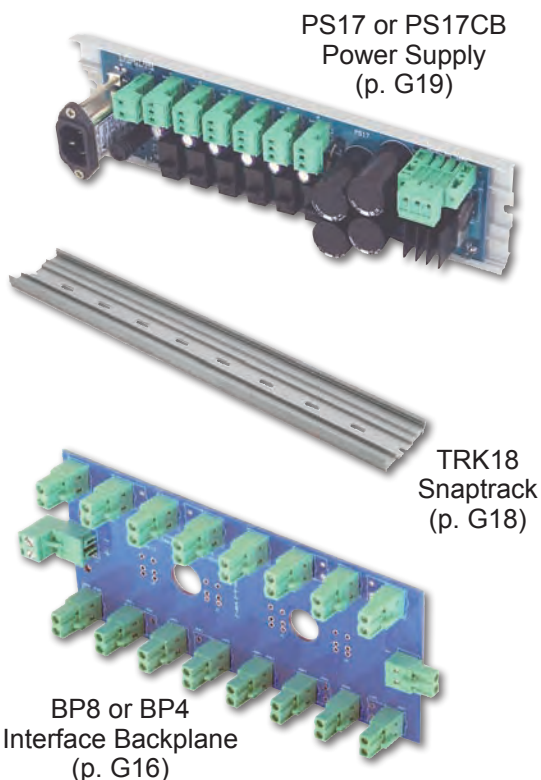
Part Number

Description

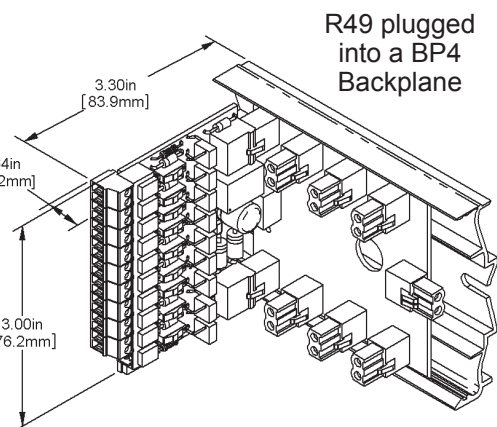
BA/R49.....Relay Interface Module, 9 Output

See end of Section G for list pricing.

Associated Products



Specifications



Power Voltage: 26 to 36 VDC

Power Current: 50 mA max. plus relays
(1.7 VA max. plus relays)

Input Control Voltage:
0 or 24 VDC @ 7 mA max.

Output Power Voltage:
Nominal 24 VDC (23 to 32 VDC)

Output Power Current:
9 outputs of 120 mA max.
(26 Watts total)



Rev. 10/16/12

DS6R - Dry Switch Monitor

ETA Line

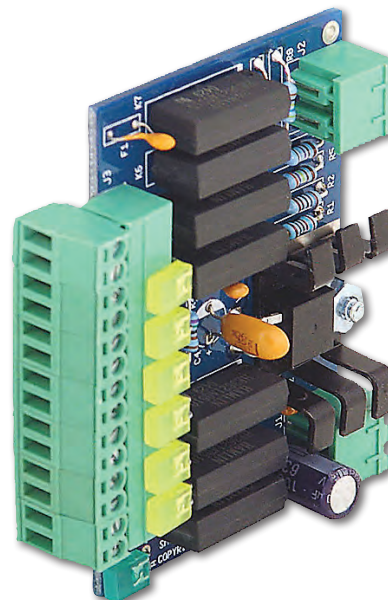
G13

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 or BP8 backplane.



DS6R - Dry Switch Monitor

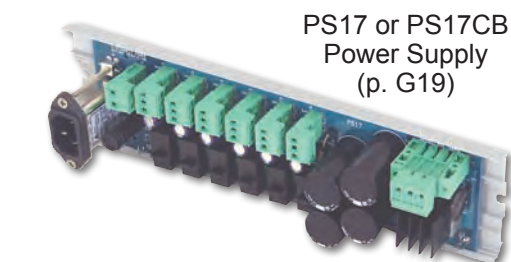
Part Number

Description

BA/DS6R.....Dry Switch Monitor, 30K Output
BA/DS6R-10K.....Dry Switch Monitor, 10K Output

See end of Section G for list pricing.

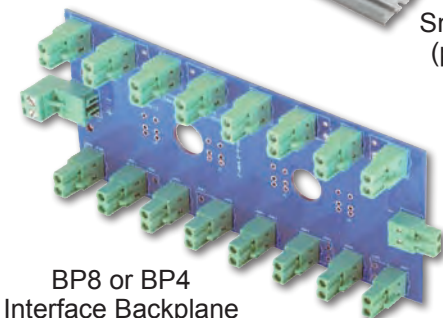
Associated Products



PS17 or PS17CB
Power Supply
(p. G19)

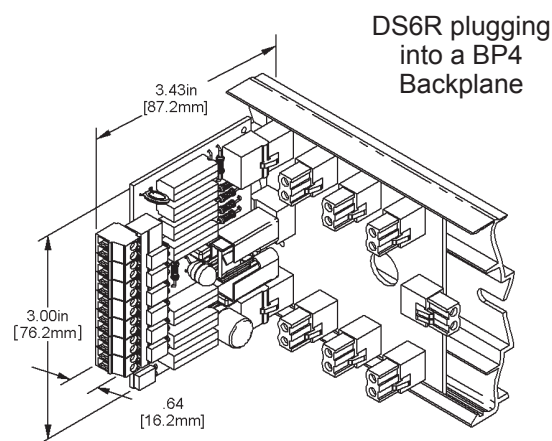


TRK18
Snaptrack
(p. G18)



BP8 or BP4
Interface Backplane
(p. G16)

Specifications



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.....29.505K Ω - All Switches Open
 DS6R-10K ..9.806K Ω - All Switches Open

(Full output resistance tables are available in the installation and operation instructions)



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**PMPB5 mounted
in the optional
2.75" snaptrack**

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Rev. 10/16/12

TURB - Terminal Unit Relay Board

ETA Line

G15

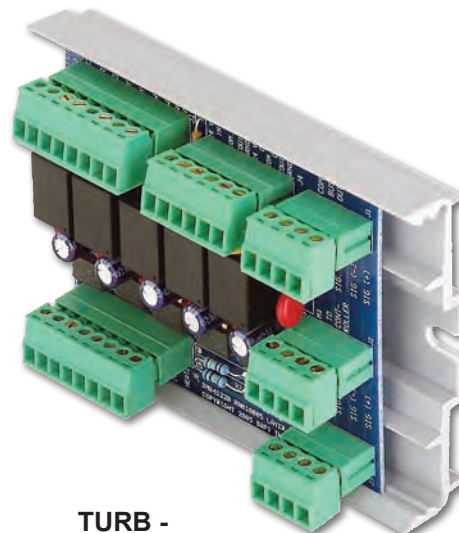
Overview

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.

For your convenience, BAPI offers the TURB with an optional 4" piece of 2.75" snaptrack.

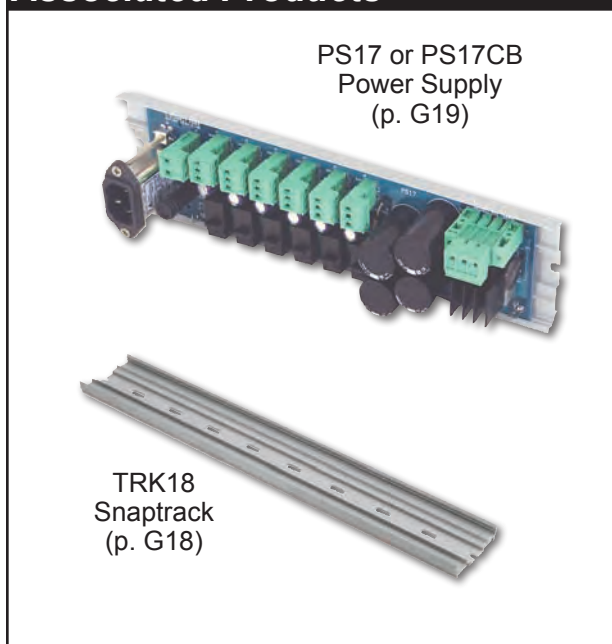


**TURB -
Terminal Unit Relay
Board mounted in
the optional 2.75"
snaptrack**

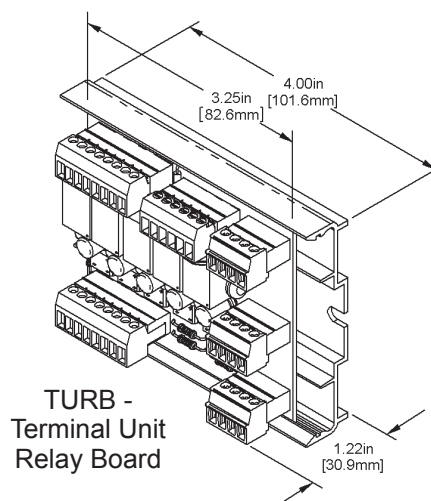
| Part Number | Description |
|---------------|--|
| BA/TURB | Terminal Unit Relay Board |
| BA/TURB-TRK.. | Terminal Unit Relay Board with 4" piece of 2.75" snaptrack |

See end of Section G for list pricing.

Associated Products



Specifications



Relay Input Power: 24 VAC @ 10mA each

Relay Output Contacts:

2 Amps @ 24 VAC, 24 VDC

Communications Clamping Voltage:

7.5 V positive, 1 V negative



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Overview

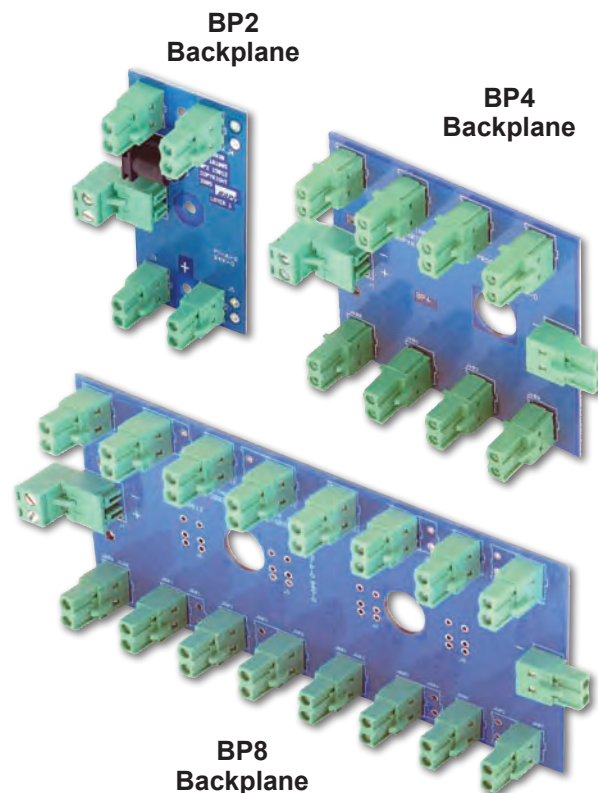
The BP2, BP4 and BP8 Backplanes provide a convenient way to mount and power the BAPI ETA interface devices which helps cut down on control panel and control room clutter. All three backplanes fit standard 2.75" snaptrack.

Connectors on the face of each Backplane plug into mating connectors on the ETA modules. The BP8 Backplane accommodates eight ETA interface modules while the BP4 Backplane accommodates four modules and the BP2 accommodates two modules.

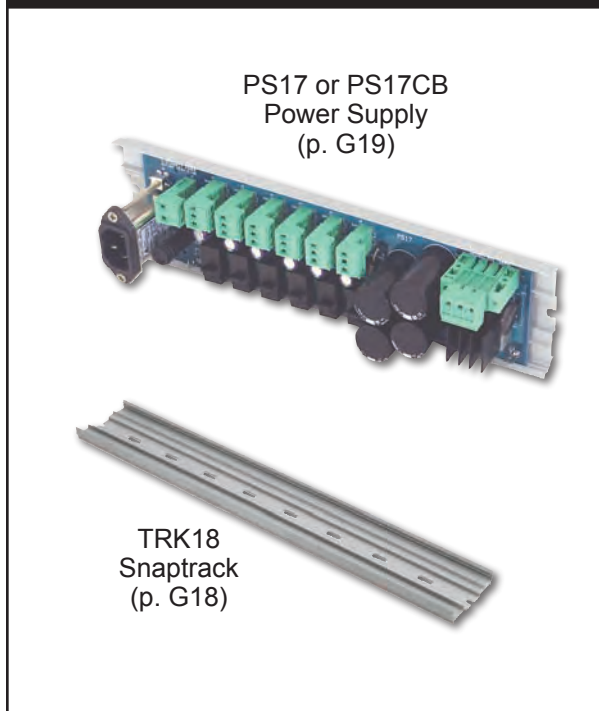
For large control systems, the Backplanes receive power from a PS17 or PS17CB Power Supply. The Backplanes can be plugged together using the end connectors to build large systems. For small control systems, the Backplanes can receive power from BAPI's VC100 or VC350 voltage converters (in Accessories section).

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------------------|
| BA/BP2 | 2-Position Interface Backplane |
| BA/BP4 | 4-Position Interface Backplane |
| BA/BP8 | 8-Position Interface Backplane |

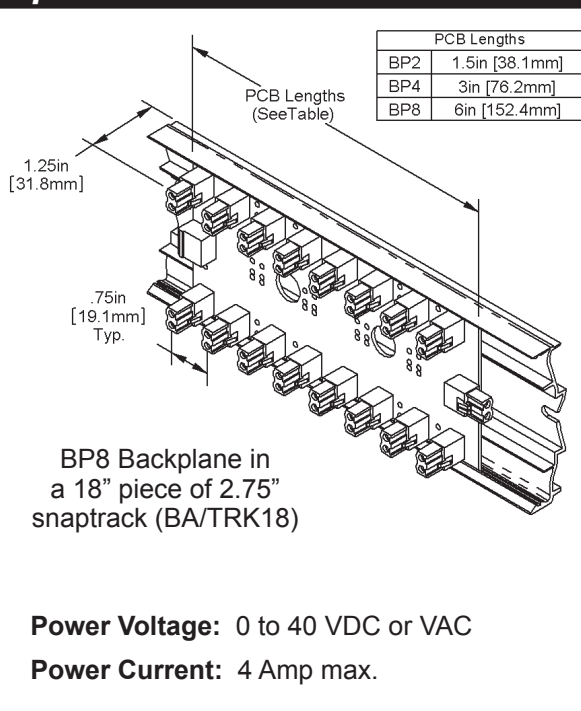
See end of Section G for list pricing.



Associated Products



Specifications



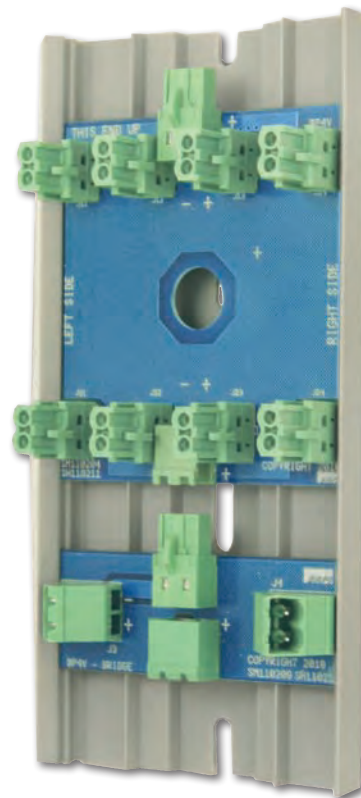


Overview

The BP4V - Vertical Backplane was designed to add additional ETA boards into a congested panel. The Vertical Backplane allows the use of small vertical spaces that may go unused. Each Vertical Backplane accommodates four ETA modules.

If there is enough space for more than one Vertical Backplane, they should be connected together with a BR - Bridge. The Bridge provides clearance from one Vertical Backplane to the other for easy insertion of the ETA modules.

For large control systems, the Vertical Backplane receives power from a PS17 or PS17CB Power Supply (See page G17 of this section). For small control systems, the Vertical Backplane can receive power from BAPI's VC350 voltage converters (See the Accessories Sections for more info on the VC350 voltage converters).

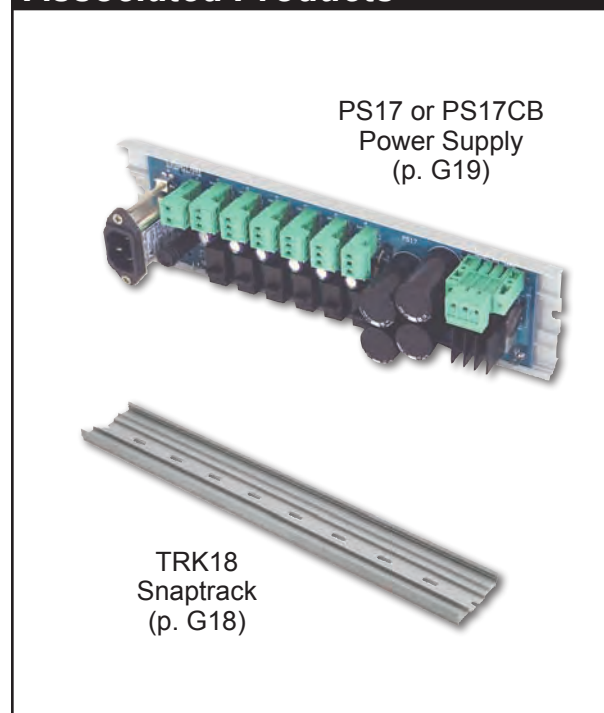


| Part Number | Description |
|----------------|---|
| BA/BP4-V | Vertical Backplane |
| BA/BP-BR | Bridge (to connect Vertical Backplanes) |

See end of Section G for list pricing.

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

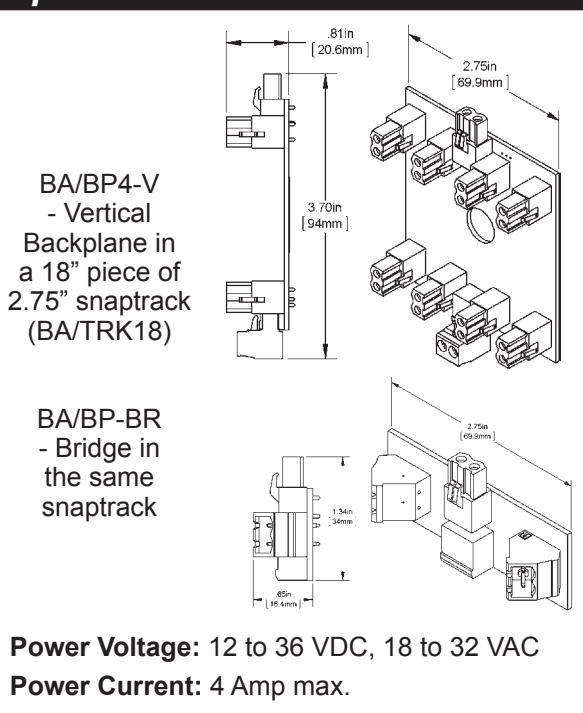
Associated Products



PS17 or PS17CB
Power Supply
(p. G19)

TRK18
Snaptrack
(p. G18)

Specifications





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 the ETA line. The standard 2.75" snaptrack is cut to a several convenient lengths for the ETA enclosures.

The snaptrack cradles the ETA interface and communications backplanes and the terminal blocks, holding them firmly in place so you can build neat, accurate and cost effective control panels.



**TRK18 -
2.75" snaptrack
18", 8" and 4" shown**

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------|
|--------------------|--------------------|

| | |
|-----------------------|-----------------------------|
| 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 |

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------|
|--------------------|--------------------|

| | |
|-----------------------|---------------------------|
| BA/TRK12 | TR2 Snaptrack, 12" length |
| BA/TRK18 | TR2 Snaptrack, 18" length |
| BA/TRK48 | TR2 Snaptrack, 48" length |

See end of Section G for list pricing.

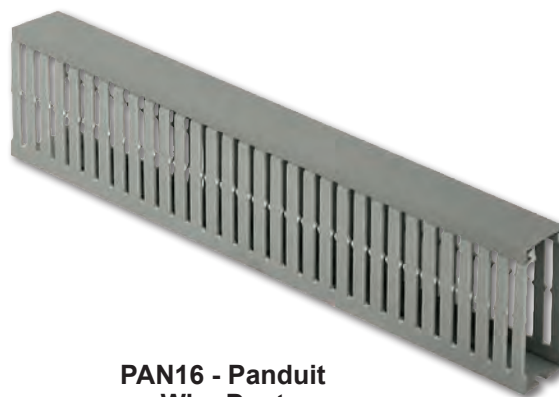
PAN16 - Panduit 1x3x16" Wire Duct

ETA Line

Overview

BAPI's PAN16 - Panduit wire duct screws to the enclosure back plate using pre-punched holes in the back plate.

The PAN16 guides the wire to the ETA device keeping clutter out of the control panel.



**PAN16 - Panduit
Wire Duct**

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------|
|--------------------|--------------------|

| | |
|-----------------------|---------------------------|
| BA/PAN16 | Panduit 1x3x16" Wire Duct |
|-----------------------|---------------------------|

See end of Section G for list pricing.



Rev. 11/24/15

PS17 & PS17CB - Power Supplies

G19**ETA Line**

Overview

The PS17CB Power Supply with Circuit Breakers provides up to six 33 VDC power supplies with circuit breakers to operate any of the BAPI ETA modules except the FOX & RPTR RS-485 communication modules. Each PS17CB output has a green LED, which lights to show normal power. Both power supplies fit standard 2.75" snaptrack

The PS17CB uses a 120 VAC to 24 VAC transformer with a rating of 75VA to 400 VA depending upon current consumption. Total your current consumption and pick the appropriate transformer from the table below.

The PS17CB provides a transient line filter for the 120 VAC input to the transformer. Screw terminals on the PS17CB allow convenient termination of the input and output of the transformer. Plug a standard computer power cord into a duplex outlet and then into the line filter to power the PS17CB. A green LED lights when 120 VAC is applied and the circuit breaker is not tripped.

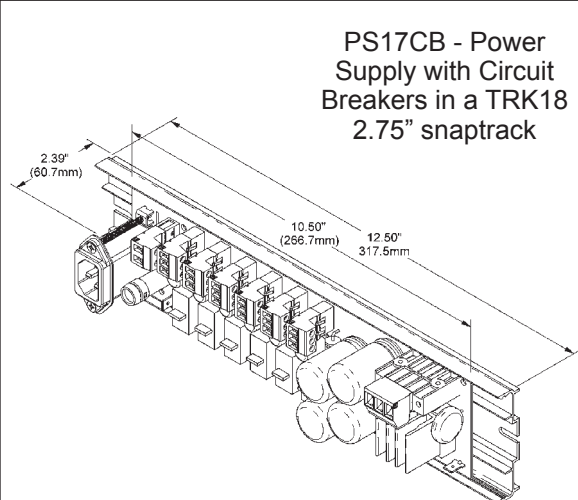
Part Number Description

BA/PS17 Power Supply Fuse Block

BA/PS17CB Power Supply w/ Circuit Breakers

See end of Section G for list pricing.

Specifications



PS17CB - Power Supply with Circuit Breakers in a TRK18 2.75" snaptrack

Input Power

120 VAC at 0.7 to 3.5 Amps depending on transformer selected. Standard IEC Line Filter

Output

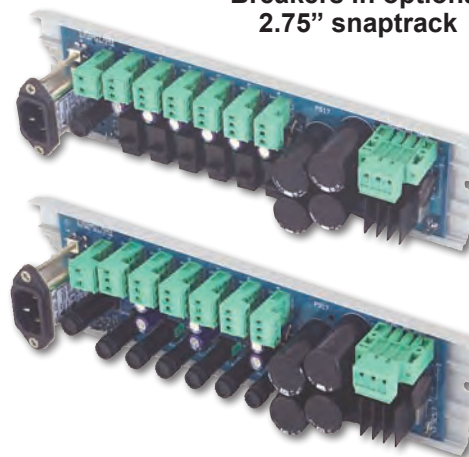
Nominal 33 VDC.

Four Outputs rated at 2.25 Amps (3.15 Amp Circuit Breaker) (Typically for controllers)

Two Outputs rated at 3 Amps (4 Amp Circuit Breaker) (Typically for ETA devices)

Circuit Breakers are all push to reset style

PS17CB - Power Supply with Circuit Breakers in optional 2.75" snaptrack



PS17 - Power Supply Fuse Block in optional 2.75" snaptrack

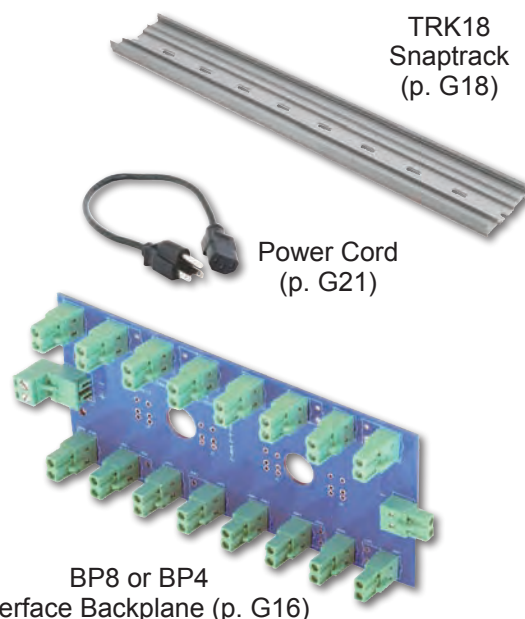
Total Current Consumption

Transformer Power

| | |
|--------------------|--------|
| 1.875 amps or less | 75 VA |
| 2.500 amps or less | 100 VA |
| 3.750 amps or less | 150 VA |
| 5.000 amps or less | 200 VA |
| 6.250 amps or less | 250 VA |
| 7.500 amps or less | 300 VA |
| 12.00 amps or less | 400 VA |

Note: The customer supplies the power transformer.

Associated Products



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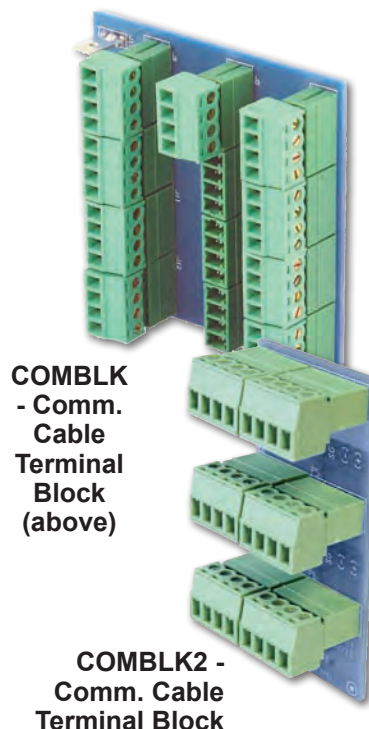


Overview

The COMBLK and COMBLK2 Communication Terminal Blocks simplify the task of terminating communications wiring.

The COMBLK contains four independent circuits and the COMBLK2 contains two independent circuits. Each independent circuit includes three connectors - one for bus in, one for bus out and a third for wiring to the controller. Either COMBLK allows each bus to be quickly isolated and tested in each direction to simplifying the troubleshooting. A common ground connector provides a convenient means of grounding all shield drain wires. Also, both COMBLKs accommodate the COMSRG surge suppressor, which plugs directly inline between the COMBLK and the communications bus segment.

Either COMBLK is suitable for RS-485, Modbus, Echelon® 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 COMBLKs fit into industry standard 2.75" snaptrack.



| Part Number | Description |
|-----------------|--|
| BA/COMBLK..... | Communications Cable Terminal Block (NEC Class 2 Circuits, 4 Amp max.) |
| BA/COMBLK2..... | Communications Cable Terminal Block (NEC Class 2 Circuits, 4 Amp max.) |

See end of Section G for list pricing.

TB18 - Pluggable Terminal Block

ETA Line



Overview

The TB18 - 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.

| Part Number | Description |
|----------------|---|
| BA/TB18..... | Pluggable Terminal Block (NEC Class 2 Circuits, 4 Amp max.) |
| BA/TB18C..... | Pluggable Terminal Block (NEC Class 2 Circuits, 4 Amp max.) All odd numbered terminals are common |
| 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 |

See end of Section G for list pricing.



**TB18
Pluggable
Terminal Block**





Rev. 10/16/12

COMSRG - Comm. Surge Protector

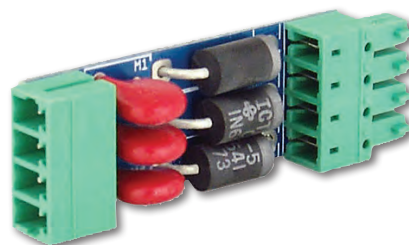
ETA Line

G2%

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 the COMBLK, RPTR or TUCOM.

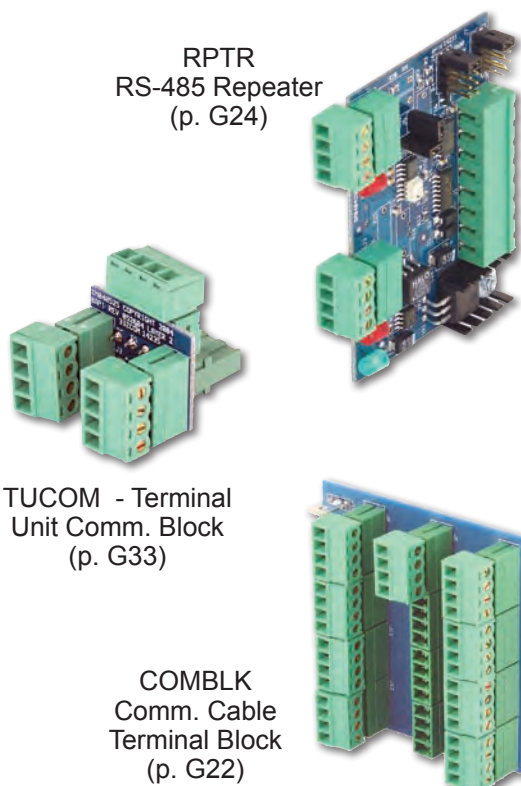


COMSRG
- Communication Surge
Protector

| <u>Part Number</u> | <u>Description</u> |
|------------------------|--------------------------------|
| BA/COMSRG | Communications Surge Protector |

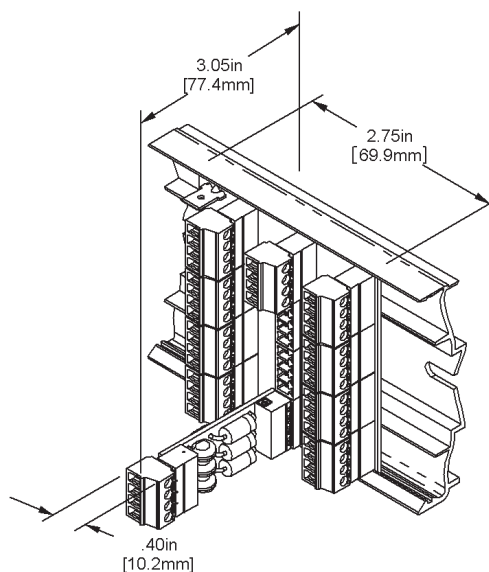
See end of Section G for list pricing.

Associated Products



Specifications

COMSRG module plugged into a COMBLK
Communications Cable Terminal Block



Clamp Voltage: 6 VDC

Clamp Power: 1.5 Joules



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G2& RPTR - RS-485 Repeater

ETA Line

Rev. 10/16/12



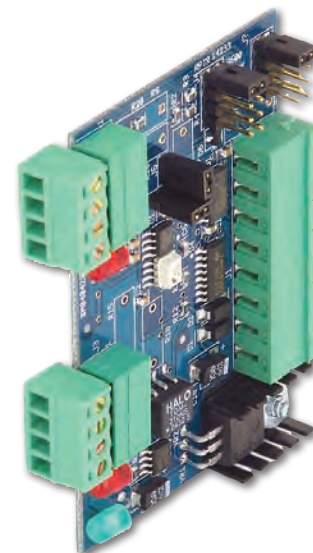
Overview

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 RS-485 repeater (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 may be installed directly into the snaptrack to form a simple stand alone bus extender as described above.

The RPTR module also plugs into the communications repeater backplane (RBP). Additional RPTR modules plugged into the backplane will form a star network, allowing multiple segments to connect to the same point. Each repeater card 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 or received.



RPTR - RS-485 Repeater

Part Number Description

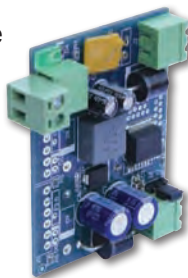
BA/RPTR..... RS-485 Repeater

BA/RPTR-KIT..... RS-485 Repeater Communication Kit (see page G25)
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

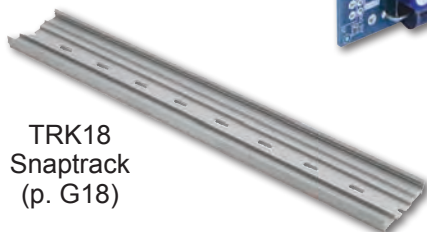
See end of Section G for list pricing.

Associated Products

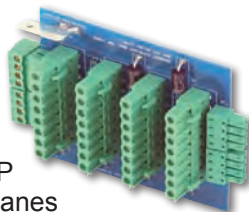
3312VC Voltage Converter
(p. G11)



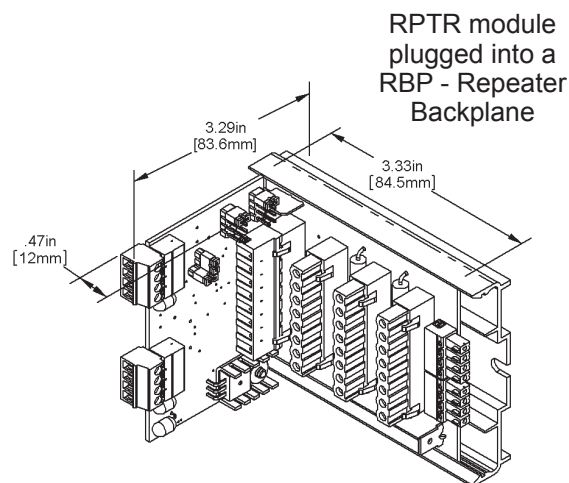
TRK18
Snaptrack
(p. G18)



RBP or SRBP
Repeater Backplanes
(p. G30-32)



Specifications



Power Voltage: 11 to 13 VDC

Power Current: 250 mA max. (3 VA max.)

Communications rates:
9.6K, 19.2K and 38.4K Baud

Network Load: 1 unit load

Network Length: 4,000 ft (1.2 Km)



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Rev. 10/16/12

RS-485 Repeater Communication Kit

ETA Line

G2'

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)

Ordering Information

| Part Number | Description |
|------------------|--|
| BA/RPTR-KIT..... | RS-485 Repeater Communication 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 |

See end of Section G for list pricing.

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

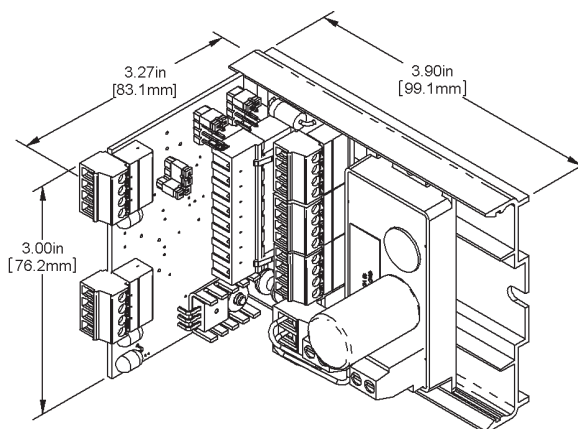
Rectification: Half-Wave Rectified

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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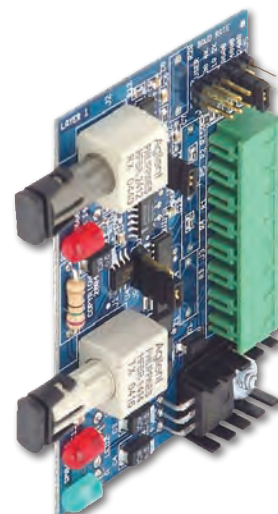
Overview

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 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 backplane (RBP). 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

BA/FOX RS-485 Fiber Optic Transceiver

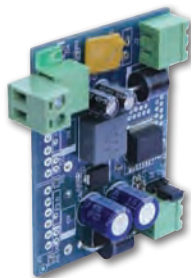
BA/FOX-KIT FOX Communication Kit (see page G25)

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

See end of Section G for list pricing.

Associated Products

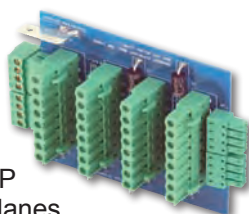
3312VC Voltage Converter
(p. G11)



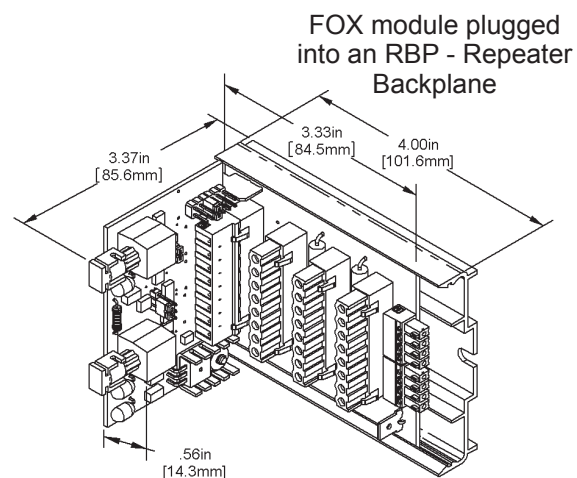
TRK18
Snaptrack
(p. G18)



RBP or SRBP
Repeater Backplanes
(p. G30-32)



Specifications



Power Voltage: 11 to 13 VDC

Power Current: 250 mA max. (3 VA max)

Communications rates:

2.4K, 4.8K, 9.6K, 19.2K and 38.4K Baud

Network Load: 1 unit load (RS-485 side)

Optical Network Length:

10,500 ft (3,200 meters)
(max. attenuation of 4 dB/Km)

RS-485 Network Length: 4,000 ft (1.2Km)



Rev. 10/16/12

FOX Communication Kit

ETA Line

G2)

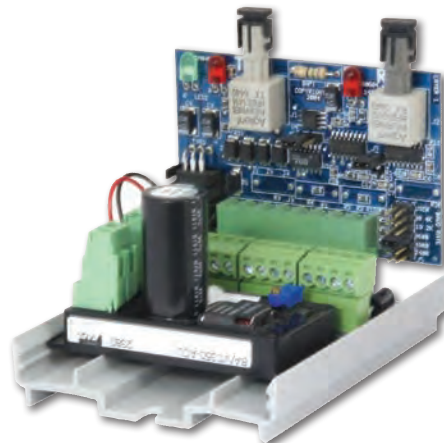
Overview

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)

Ordering Information

| Part Number | Description |
|------------------|---|
| BA/FOX-KIT | FOX Communication 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 |

See end of Section G for list pricing.

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

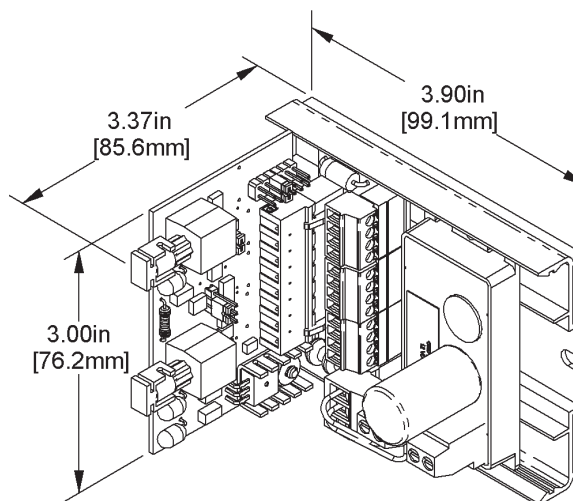
Network Load: 1 unit load (RS-485 side)

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



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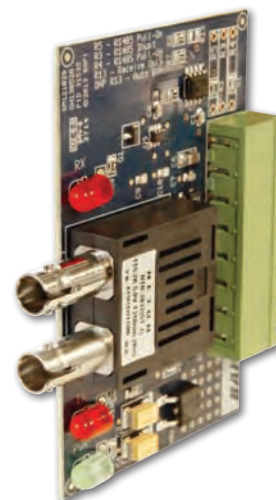
Overview

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 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 backplane (RBP).

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.



SOX - RS-485 Fiber Optic Transceiver

Ordering Information

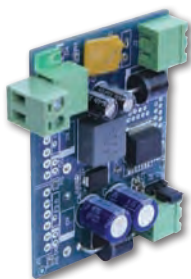
| Part Number | Description |
|-------------|-------------|
|-------------|-------------|

| | |
|-------------|--|
| BA/SOX..... | RS-485 Fiber Optic Transceiver (for single-mode fiber cable) |
|-------------|--|

See end of Section G for list pricing.

Associated Products

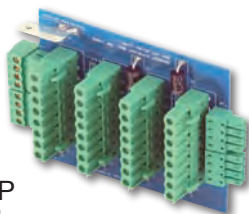
3312VC Voltage Converter
(p. G11)



TRK18
Snaptrack
(p. G18)

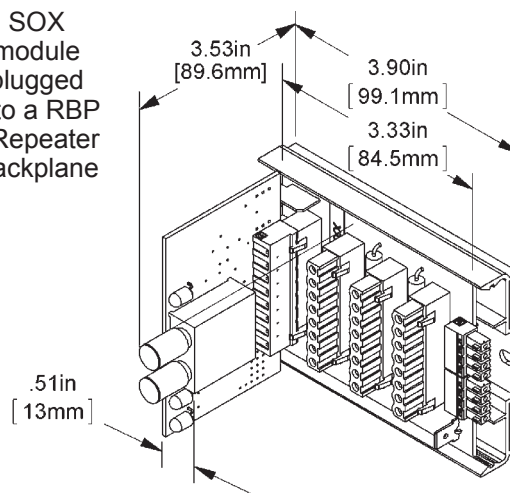


RBP or SRBP
Repeater Backplanes
(p. G30-32)



Specifications

SOX module plugged into a RBP - Repeater Backplane



Power Voltage: 7 to 18 VDC

Power Current: 50 mA max.

Communications Rates:
1200 to 115.2K Auto Baud

Optical Network Length:
65,600 ft (20,000 meters)

RS-485 Network Length: 4,000 ft (1.2Km)



Overview

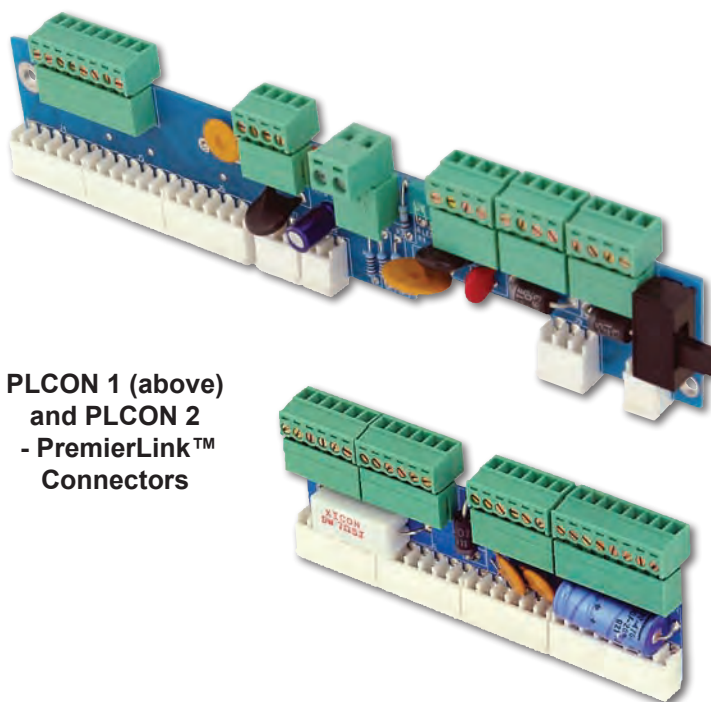
The PLCON modules are designed to simplify the field wiring of Carrier® PremierLink™ direct digital controllers. The modules provide an additional layer of protection for the controller, as well as a power ON/OFF switch and indicator light for future troubleshooting or controller resetting.

Field wiring is easier because the PLCON modules eliminate the need for special tools or hard-to-find connectors. All wires terminate in labeled, pluggable screw terminals on the PLCON so the only tools that a technician needs are a wire stripper and a small screwdriver.

The PLCON1 slips onto the power, communications, analog output and digital output connectors on the PremierLink™ controller. It includes a power ON/OFF switch, a power pilot light, a self-resetting 1.6 amp fuse and an MOV for an additional layer of protection against power surges.

The three communications connectors simplify system wiring and additional transient protection on the PLCON1 ensures reliable communications in the most challenging environments. A four-conductor plug on the PLCON1 provides power and feedback for the economizer actuator while the eight-pole connector provides termination for the relay outputs. A second transformer can be used to power the relay outputs by simply cutting a jumper wire on the PLCON1.

The PLCON2 module slips onto the analog and digital input connectors on the PremierLink™ controller. The PLCON2 provides a pluggable screw terminal for every input connection as well as a self-resetting 0.9 amp fuse for each air quality sensor.



**PLCON 1 (above)
and PLCON 2
- PremierLink™
Connectors**

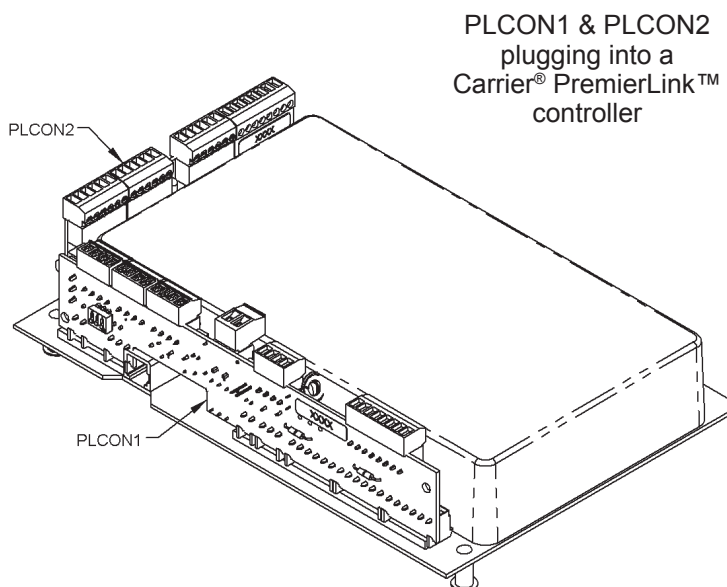
Part Number

| | |
|------------------------|--------------------------|
| BA/PLCON1 | PremierLink™ Connector 1 |
| BA/PLCON2 | PremierLink™ Connector 2 |

Description

See end of Section G for list pricing.

Specifications



PLCON1 & PLCON2
plugging into a
Carrier® PremierLink™
controller

Input Voltage: 24 VAC

Input Current: 4 Amp max.

Carrier® is a trademark of Carrier Corporation, Registered in the United States and other countries.

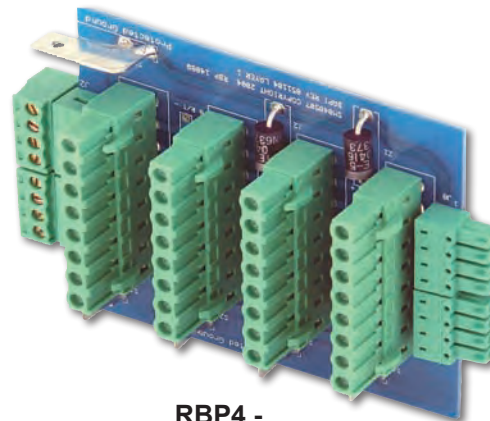


Overview

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 plug into mating 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. Several RBP backplanes can be plugged together to share data 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**

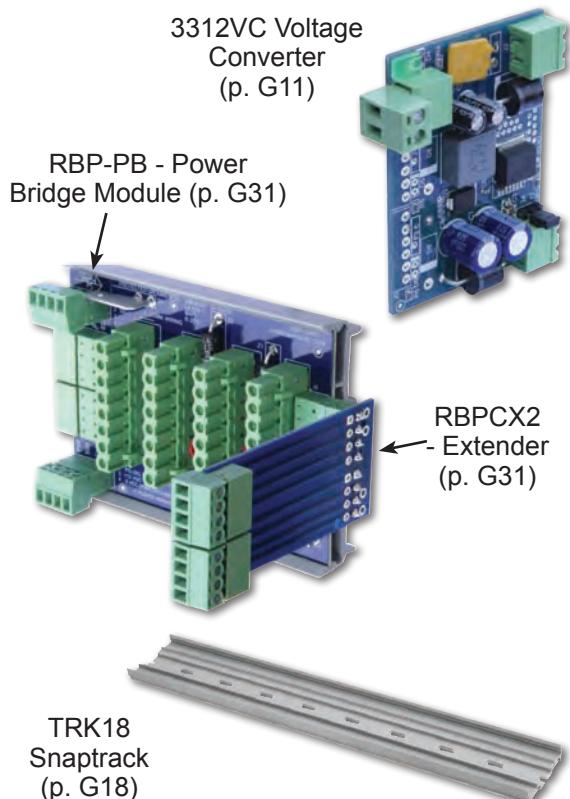
Part Number

Description

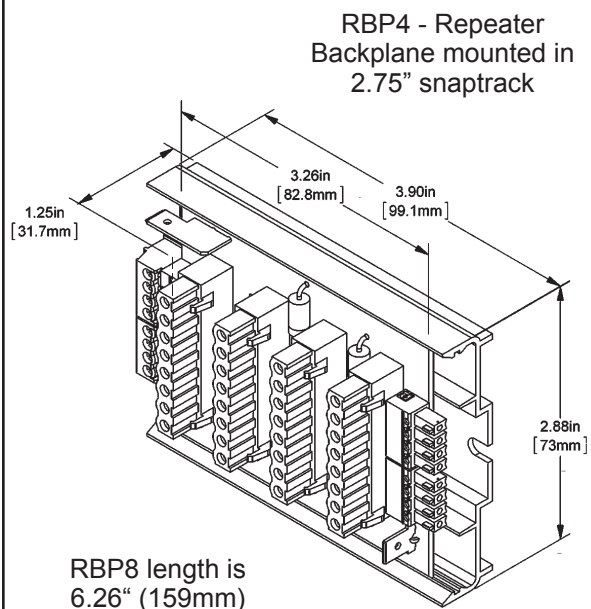
| | |
|--------------------------|--|
| BA/RBP4 | Communications Repeater Backplane, 4 Rows |
| BA/RBP4-TRK | Communications Repeater Backplane with 4" piece of 2.75" snaptrack |
| BA/RBP8 | Communications Repeater Backplane, 8 Rows |
| BA/RBP8-TRK | Communications Repeater Backplane with 4" piece of 2.75" snaptrack |

See end of Section G for list pricing.

Associated Products



Specifications



Power Voltage: 11 to 13 VDC

Power Current: 4 Amp max.



RBP-PB - Repeater Backplane Power Bridge

Rev. 12/16/15

ETA Line

G&

Overview

The Repeater Backplane Power Bridge (RBP-PB) is used between Communication Repeater Backplane (RBP) modules to bridge the power and break out the 485 communications lines to another node. 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 Carrier Comfort Network and Modbus. The upper plug connects to the bus on the right; the lower plug connects to the bus on the left.



Fig. 1:
Power Bridge
(RBP-PB)

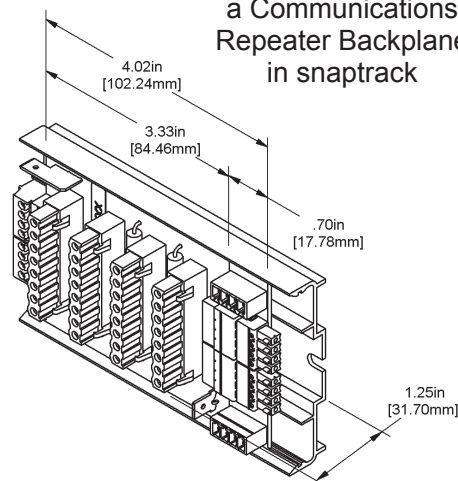
Part Number Description

BA/RBP-PB Repeater Backplane Power Bridge

See end of Section G for list pricing.

Specifications

Power Bridge module plugged into a Communications Repeater Backplane in snaptrack



Power Voltage: 12 VDC
Power Current: 4 Amp Maximum



RBPCX, RBPCX2 - Extenders

ETA Line

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 Extenders bring the connectors out from deep in the panel to the level of the ETA modules that are plugged into the Repeater Backplane where they are easy to access.

Fig. 2:
RBPCX
Extender

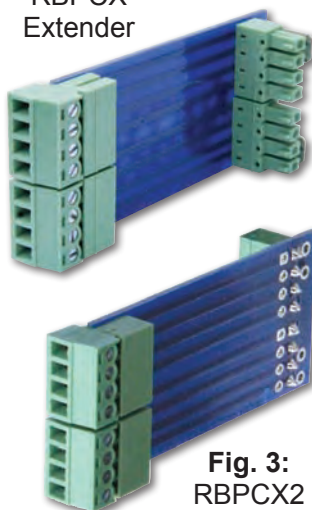


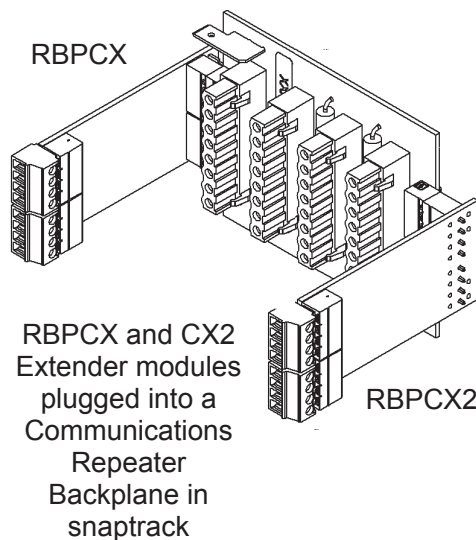
Fig. 3:
RBPCX2
Extender

Part Number Description

BA/RBPCX Left Side Repeater Backplane Extender

BA/RBPCX2 Right Side Repeater Backplane Extender

Specifications



Power Voltage: 12 VDC
Power Current: 4 Amp Maximum



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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 (RBP) and its associated power supplies is clearly overkill. The BAPI SRBP - Single Repeater Back Plane teamed with a BAPI VC350 voltage converter (in Accessories section) and a FOX 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 module or RPTR module plug into a mating connector.

The SRBP receives 12VDC power from either a 3312VC or a BAPI VC350 voltage converter (shown in the Accessories, Sec. E).



SRBP - Single Repeater Backplane

Part Number

Description

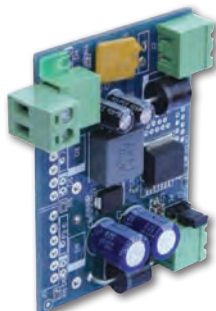
BA/SRBPSingle Repeater Backplane

BA/SRBP-TRKSingle Repeater Backplane with 4" piece of 2.75" snaptrack

See end of Section G for list pricing.

Associated Products

3312VC Voltage Converter
(p. G11)

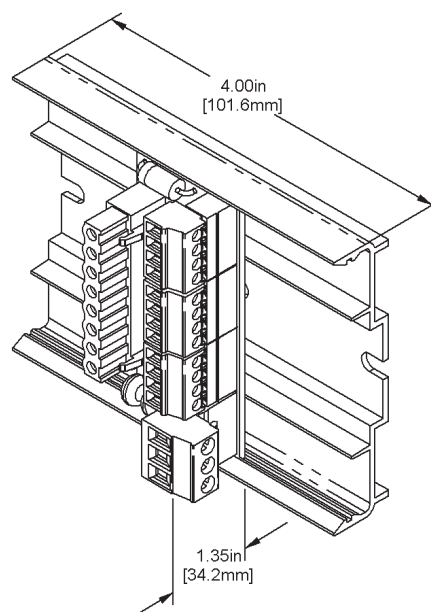


TRK18 Snaptrack
(p. G18)



Specifications

SRBP - Single Repeater Backplane mounted in the optional 2.75" snaptrack



Power Voltage: 12 VDC

Power Current: 4 Amp max.



Rev. 10/16/12

BELCON - Mating Pair Belimo® Connectors

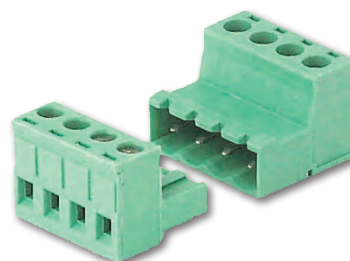
ETA Line

G3%

Overview

Many HVAC peripherals come with a short pigtail wire for connecting to the rest of your system. Running wire from your control panel to the peripheral and connecting them together is your headache. Most of the time it's twist the wires together and apply wire nuts. Later, when you need to disconnect the peripheral for troubleshooting, the inconvenient wire nuts get lost and the loose wires short out ruining the controller.

BAPI's BELCON connector pair allows a four-pole pluggable connection between your peripheral and the control wiring. You can quickly disconnect any peripheral without fear of wires shorting together or to any conductive surface.



BELCON
Mating Pair of
Belimo® Connectors

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

| <u>Part Number</u> | <u>Description</u> |
|--------------------|---|
| BA/BELCON | Mating Pair of Belimo® Connectors (NEC Class 2 Circuits, 4 Amp max.) |

See end of Section G for list pricing.

TUCOM - Terminal Unit Comm. Block

ETA Line

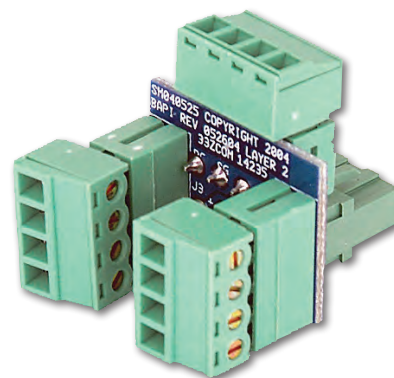


Overview

The TUCOM is a specific purpose connector which adds pluggable screw terminals for the Carrier® Comfort System zone controller.

The Carrier® zone controller only provides one communications plug, whereas you often need to terminate three cables on it. The TUCOM plugs into the zone controller's communications port and expands it into three pluggable screw terminals. Now you have one set of terminals for each wire in the network (communications in, communications out and zone sensor)

The TUCOM will accept the COMSRG (p.G23) for surge protection in extreme environments.



**TUCOM - Terminal Unit
Communications Block**

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--|
| BA/TUCOM | Terminal Unit Communications Block (NEC Class 2 Circuits, 4 Amp max.) |

Carrier® is a trademark of Carrier Corporation, Registered in the United States and other countries.

See end of Section G for list pricing.



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Overview

The Air Valve Interface (AVI) connects long-running jack-screw style Variable Air Volume (VAV) floating point actuators with mechanical end switches to DDC controllers. The unit has two input signal modes;

PULSE

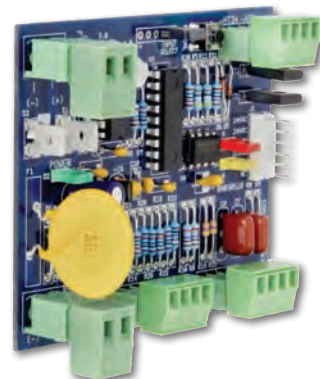
The DDC controller's 24 VAC actuator drive power pulses are timed, the timing is multiplied by the AVI's Gain Filter potentiometer setting and appropriately long 24 VAC power pulses are sent from the AVI to the air valve actuator.

ANALOG

A 0 to 10 VDC proportional control voltage is turned into 24 VAC power pulses to position the actuator accordingly, fully closed (0 VDC) to fully open (10 VDC). The Gain Filter potentiometer sets a hysteresis dead band for the input voltage to prevent motor wear due to controller hunting or noisy signal.

Additionally, the AVI provides;

- Self resetting 3-Ampere fuse
- Fused 24 VAC output to power auxiliary equipment (VAV Box Controller).
- 0 to 10 VDC proportional output that indicates damper position.
- Manual air valve actuator stroke time training switch, used to calibrate the damper position proportional output voltage.
- Duty cycle protection to prevent actuator motor failure.



AVI Module

Ordering Information

Part Number

Description

BA/AVI..... Air Valve Interface

BA/AVI-TRK Air Valve Interface with 4" piece of 2.75" snaptrack

See end of Section G for list pricing.

Specifications

ELECTRICAL

| | MIN | TYP | MAX |
|------------------------------------|-------------------------------|-------|-------------------------------|
| Input Voltage, (J3, S1, J7) | 18.0VAC | 24VAC | 32VAC Note: AC voltage ONLY |
| Input Voltage, (J5-IN 0-10V) | 0VDC | - | 10VDC |
| Output Voltage, (J4, J5-24) | Input voltage fused at 3 Amps | | |
| Output Voltage, (J7 OUT DMPPOS) | 0VDC | - | 10VDC |
| Output Current, (J7 OUT DMPPOS) | 0VDC | - | ±10mA (short circuit limited) |
| Current Draw, Dependent on load | | | 3A @ 24VAC |
| Triac Current, (J1-open, J1-close) | 250mA | 350mA | 500mA |
| Power, Dependent on loads | | | 96VA |

ENVIRONMENTAL

Temperature – Operating: -20 to 70 °C

Temperature – Storage: -40 to 85 °C

Humidity: 0 to 95% RH, Non-condensing

MECHANICAL

Screw Terminals:

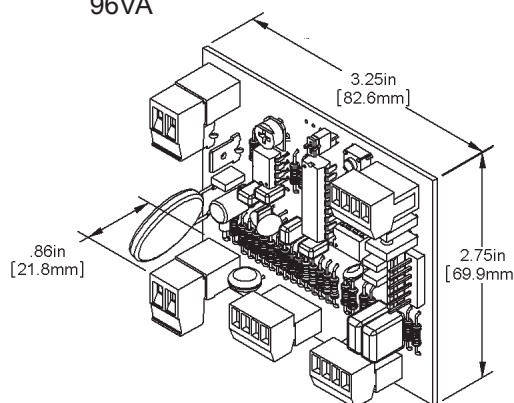
(J3, J4, J5, J6, J7), 28-16 AWG / 0.5-1.5mm

Enclosure: None

Mounting: 2.75" or 3.25" Snaptrack – not included

PCB: FR4, 94V0, 2.75" x 3.25" x 1.25"

Agencies: RoHS





Rev. 10/16/12

AVI-ADAPT - Air Valve Interface Adapter

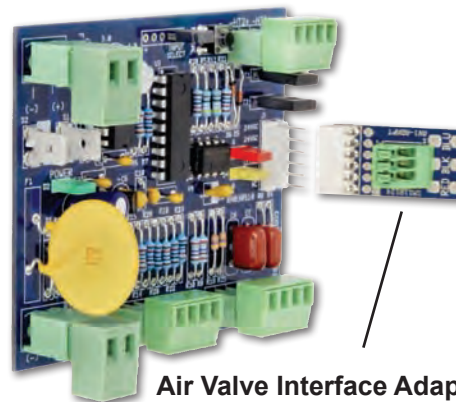
ETA Line

G3'

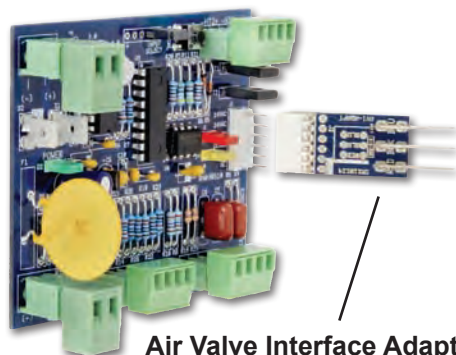
Overview

The AVI-ADAPT - Air Valve Interface Adaptors are used to connect a VAV actuator cable to an AVI - Air Valve Interface (pg. G31) when the factory installed connector is missing from the actuator cable.

The Air Valve Interface Adaptors are a press fit on the output connector of the Air Valve Interface module. One adaptor has a toggle type connector for the actuator cable while the other adaptor has 1/4" quick connects for the actuator cable.



Air Valve Interface Adapter with toggle connector and the associated connector on the Air Valve Interface Module



Air Valve Interface Adaptor with 1/4" Quick Connects and the associated connector on the Air Valve Interface Module

Ordering Information

Part Number and Description

BA/AVI-ADAPT

Air Valve Interface Adapter with toggle connector

BA/AVI-ADAPT-QC

Air Valve Interface Adapter with 1/4" Quick Connects

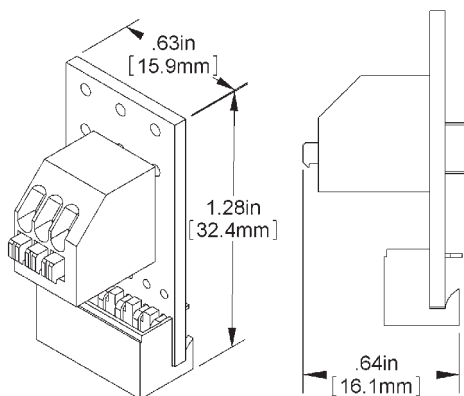
See end of Section G for list pricing.

Specifications

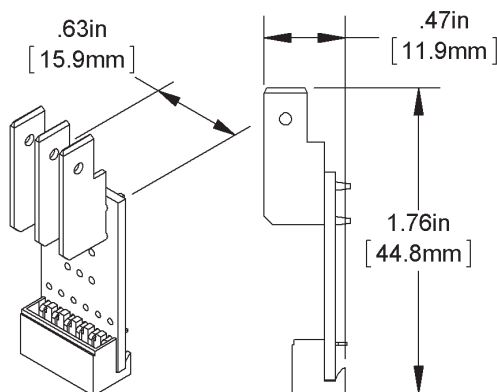
Wire Size: 20 to 26 Gauge

Voltage: NEC Class 2

Current: 500 mA Max



BA/AVI-ADAPT



BA/AVI-ADAPT-QC



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Overview

The IRM4 - Interposing Relay Module has four independent channels that convert a relay output to a contact output or a voltage output. The relay output is energized by either an external power source or power sourced on the IRM4 Module. Jumpers are used to set the mode for each individual channel and the I/O for each channel via 4-pole 3.5mm connectors.

The unit is mounted in a BP2, BP4, BP8 or BP4V Backplane with power provided by the Backplane. The Backplane is typically powered by a PS17, PS18 or PS19 Power Supply.

Each relay on the IRM4 Module has a 24VDC coil switching Form C contacts. A SPDT switch allows for configurable output contacts for each output. LEDs provide power status of the unit as well as the state of each individual channel.

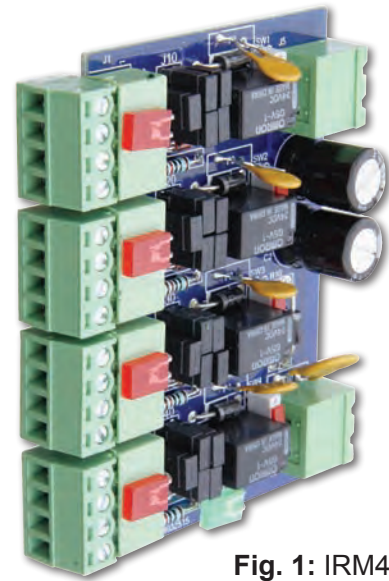


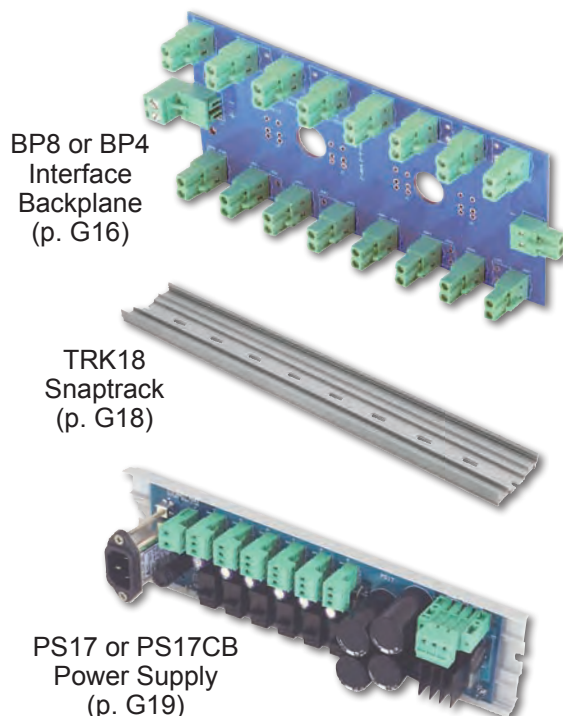
Fig. 1: IRM4 Interposing Relay Module

Ordering Information

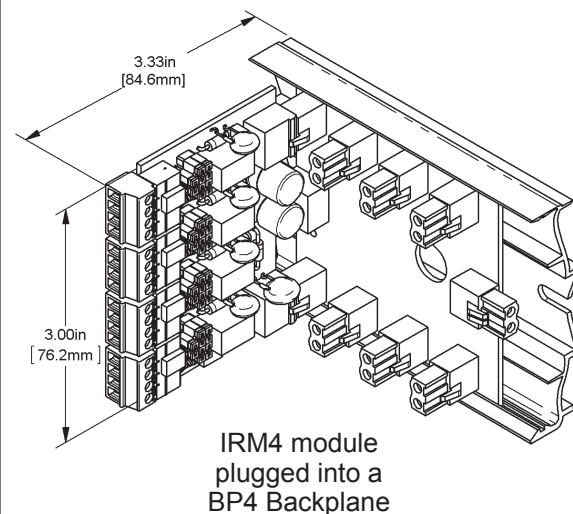
| <u>Part Number</u> | <u>Description</u> |
|--------------------|---------------------------------|
| BA/IRM4 | IRM4 - Interposing Relay Module |

See end of Section G for list pricing.

Associated Products



Specifications



Power Voltage: 26 to 30VDC

Power Current: 1 Amp Max



Rev. 07/15/13

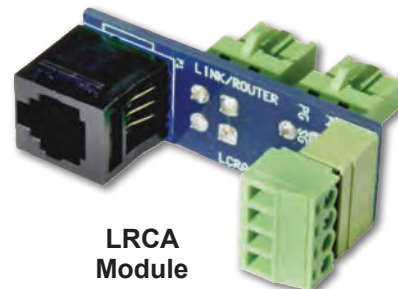
Overview

LRCA Module

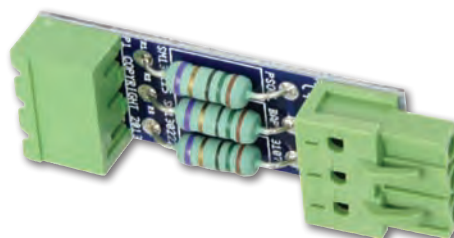
The Link Router Communications Adapter (LRCA) adds an RJ jack for computer access to a Carrier® i-Vu Link/Router.

PSOCL Module

The Power Supply Output Current Limiter (PSOCL) is used to buffer the output of the BAPI PS17, PS18 or PS19 Power Supplies when used to power the Carrier® i-Vu Link/Router. BAPI recommends that only one Link/Router be powered from each PSCOL. Do not power any other load through the PSCOL.



LRCA Module



PSOCL Module

Ordering Information

| Part Number | Description |
|----------------|-------------------------------------|
| BA/LRCA | Link Router Communications Adapter |
| BA/PSOCL | Power Supply Output Current Limiter |

See end of Section G for list pricing.

Specifications

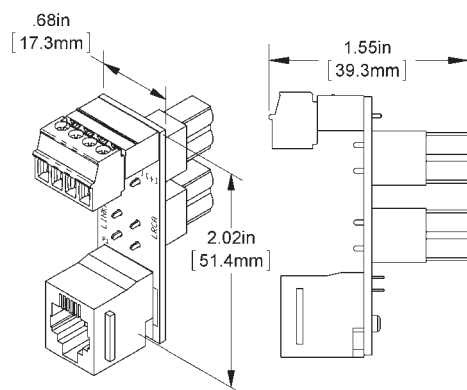
LRCA Specifications

Connectors:

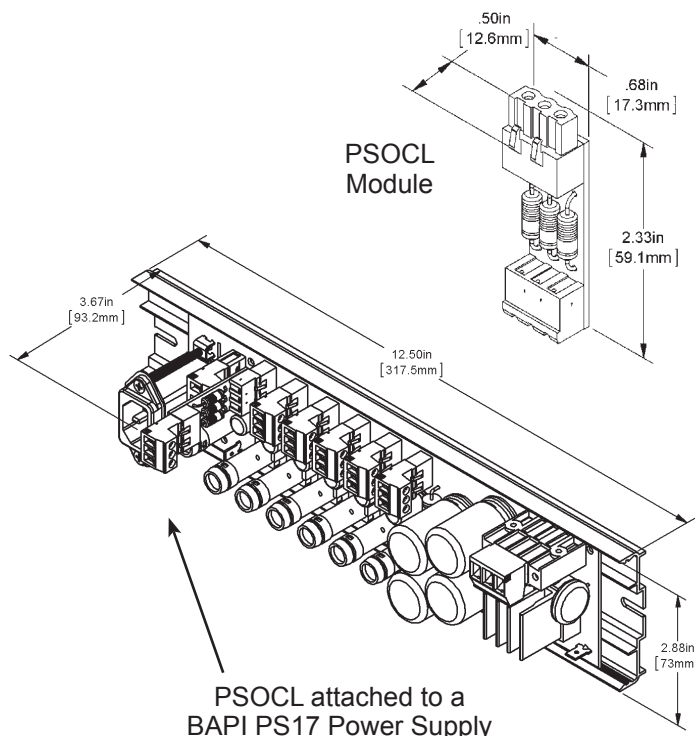
Screw terminals, 16 to 22 AWG

Computer:

RJ11 Communications Jack



LRCA Module



PSOCL attached to a BAPI PS17 Power Supply





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.

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. The UCRB2 fits into 2.75" snaptrack.



UCRB2 Module

Ordering Information

| Part Number | Description |
|----------------|----------------------------------|
| BA/UCRB2 | Universal Controller Relay Board |

See end of Section G for list pricing.

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

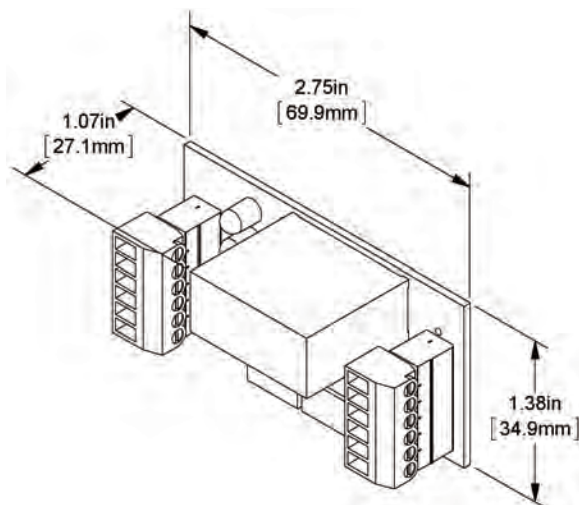
0 to 95% RH noncondensing

Screw Terminals

16 to 28 AWG (1.29 mm to 0.32 mm)

PCB

FR4 94V0





SS-AC Selector Switch/Alarm Counter 8

G3+

Rev. 11/12/15

ETA Line

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 contact when the module is in Selector Mode, or the number of closed contacts with the module is in Counter Mode.

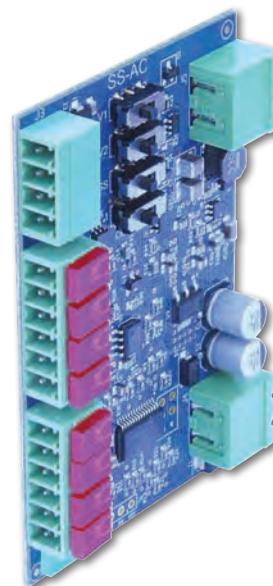


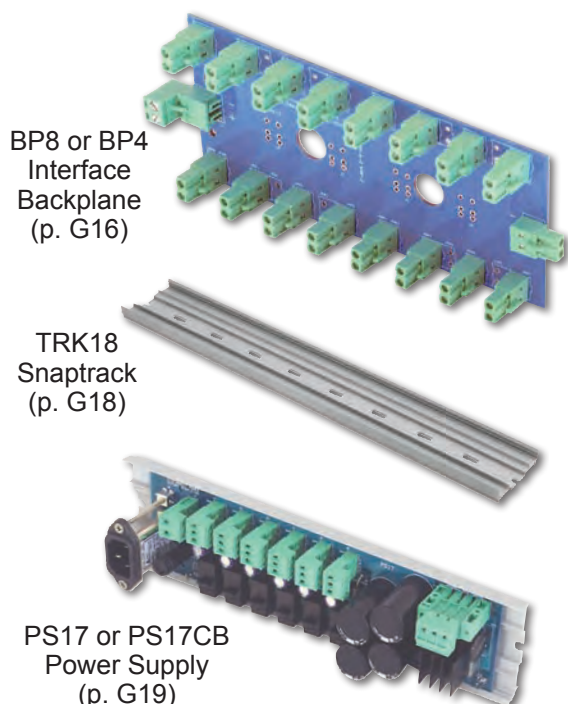
Fig. 1:
SS-AC Selector Switch/Alarm
Counter Module

Ordering Information

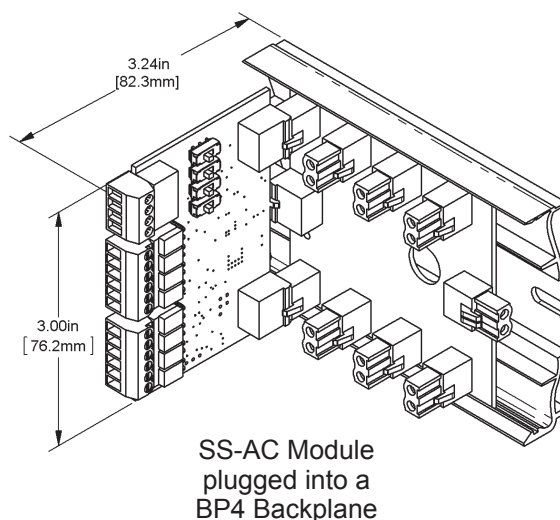
| Part Number | Description |
|---------------|-------------------------------|
| BA/SS-AC..... | Selector Switch/Alarm Counter |

See end of Section G for list pricing.

Associated Products



Specifications



Power Voltage: 0 to 40 VAC or VDC
Power Current: 50mA Maximum



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Overview

The SD2 is an ETA module that is used to indicate a program error code which requires a manual reset. The module includes a manual reset switch that can be pressed to route a reset signal to a controller.

The polarity of the reset switch can be set to Normally Open (NO) or Normally Closed (NC) operation via the jumper on J2. When the reset switch is pressed, Terminals #3 and #4 of J1 are either connected or disconnected. Two 7-segment displays are available at the edge of the module, denoting where the input signal is within the range.

The SD module receives an input signal from a controller, and then displays a number from 0 to 10 up to 0 to 50, depending on the jumper position of J3. 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.

The unit is typically mounted in a BP2, BP4, BP8 or BP4V Backplane with power provided by the Backplane; however, the unit can be powered directly with an alternate DC supply. The green LED indicates that power is available to the module.

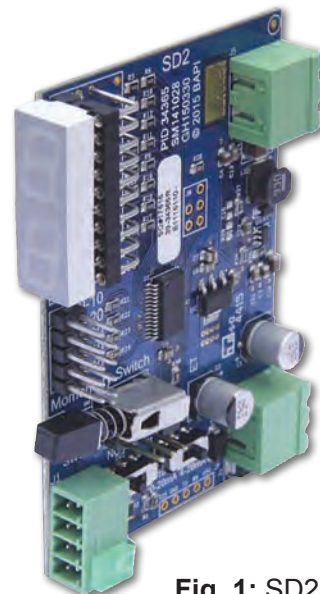


Fig. 1: SD2 Status Display Module

Ordering Information

BA/SD2

Status Display w/ Dual 7-Segment Display

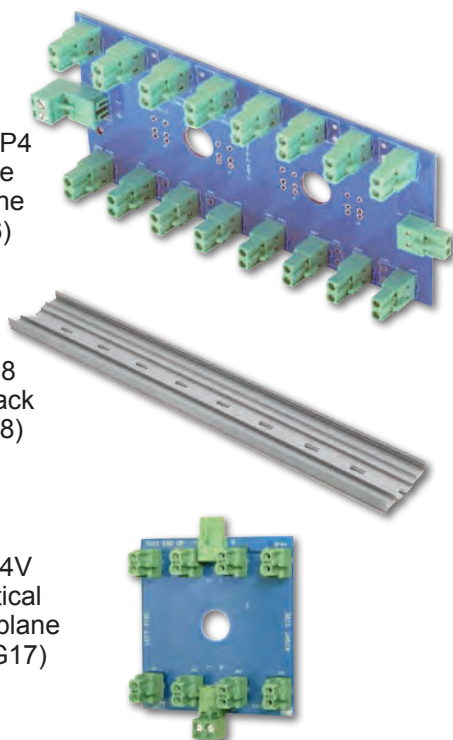
See end of Section G for list pricing.

Associated Products

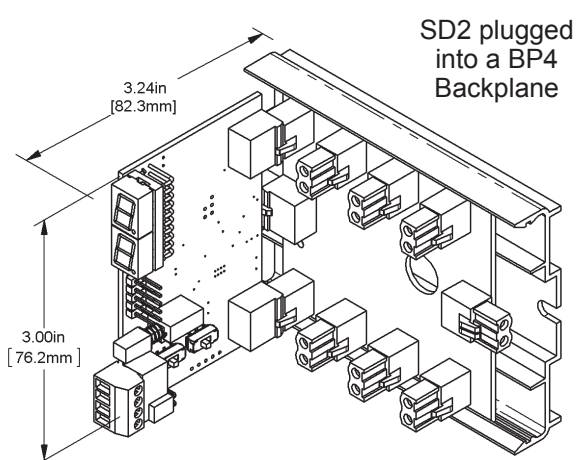
BP8 or BP4
Interface
Backplane
(p. G16)

TRK18
Snaptrack
(p. G18)

BP4V
Vertical
Backplane
(p. G17)



Specifications



- **Power Supply:** MCP2456 switching regulator. Supplies 12V which is then dropped down by linear regulator MCP1703 to 5V for the on-board circuitry, and acts as the reference for the ADC.
- **Microprocessor:** PIC16F1938 utilizing on-board ADC, LCD driver, UART, ISP and GPIO.
- **Dual 7-segment display:** LTS-1802

Power Voltage: 16 to 35VDC

Power Current: 50mA Max



Rev. 11/12/15

PE4 - Pulse Extender

ETA Line

G' -

Overview

The PE4 takes the input pulse to the board and extends the output to a controller or monitor. The pulse can be extended two different ways and then split or divided.

Extender Option 1:

Extends the pulse to 100ms

Extender Option 2:

Extends the pulse to 10s

Split:

Take one input and then produce 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.

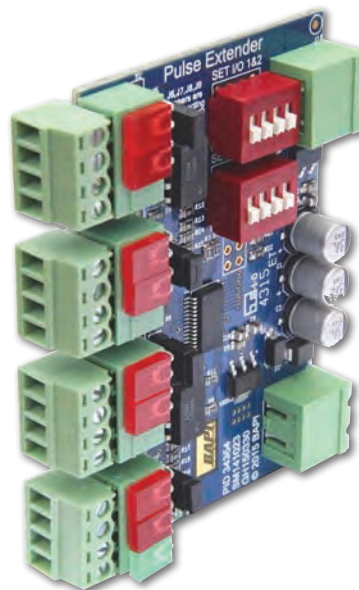


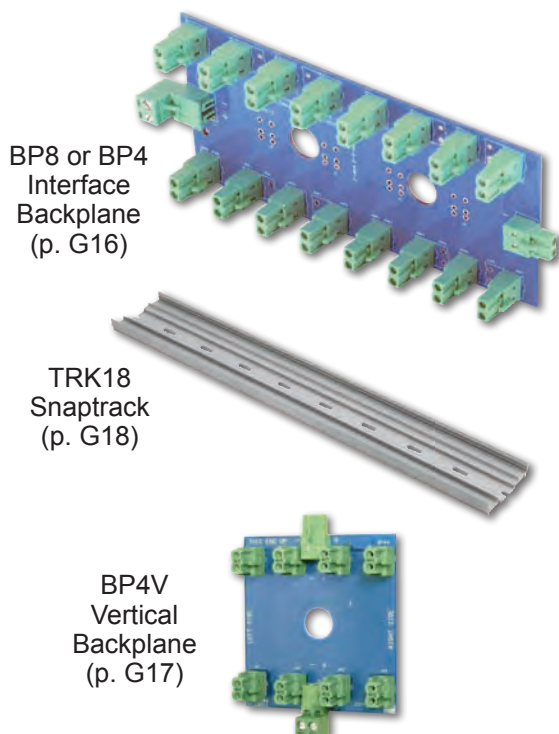
Fig. 1:
PE4 - Pulse
Extender

Ordering Information

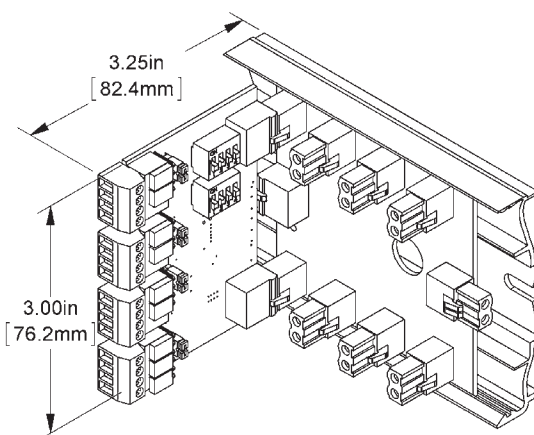
| Part Number | Description |
|-------------|----------------|
| BA/PE4..... | Pulse Extender |

See end of Section G for list pricing.

Associated Products



Specifications



PE4 - Pulse Extender
plugged into a BP4
Backplane

Power Voltage: 26 to 36V
Power Current: 125mA Max.



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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).

| Part Number | Description |
|--------------|-------------------------------------|
| BA/44208N1S | NEMA 1X Steel Enclosure, 44"x20"x8" |
| BA/44208N4XS | NEMA 4X Steel Enclosure, 44"x20"x8" |

See end of Section G for list pricing.



**44208N1S - NEMA
1 Steel Enclosure
44"x20"x8"**

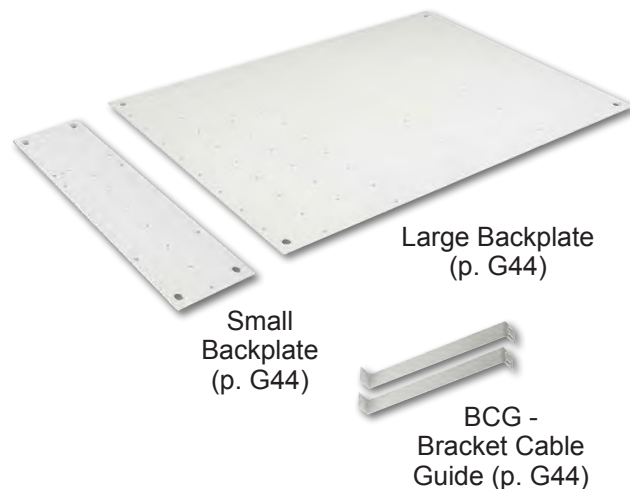
Associated Products

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.





Rev. 06/08/17

20x20x8 Steel Enclosure

ETA Line

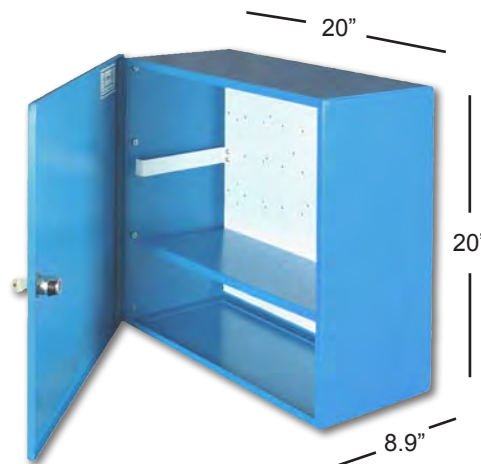
G4%

Overview

The BAPI 20208N1S is a NEMA 1, 14-gauge painted steel enclosure that weighs approximately 47 pounds. One field-installed divider provides a high voltage compartment in the enclosure to isolate a power supply.

Flipping the enclosure 180 degrees accommodates left and right hand door openings. Mount the enclosure by drilling holes in the back to fit your application. No knockouts are provided; drill and punch where you need conduit openings.

Each BAPI 20208N1S comes with a backplate and two Bracket Cable Guides (BCG).



**20208N1S - Painted
Steel Enclosure
20x20x8**

| <u>Part Number</u> | <u>Description</u> |
|--------------------------|--------------------------|
| BA/20208N1S | Steel Enclosure, 20x20x8 |

See end of Section G for list pricing.

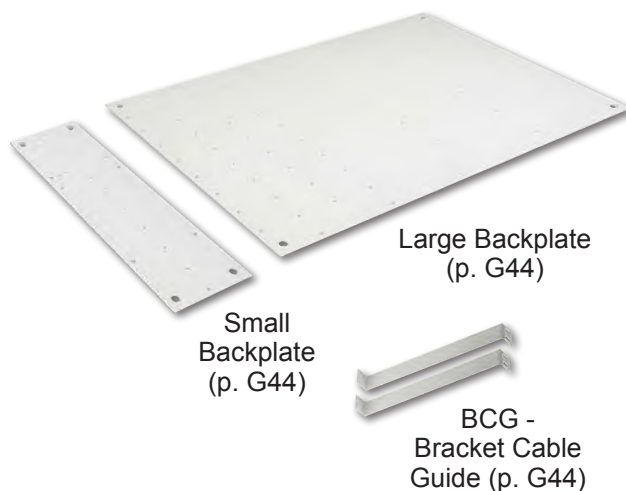
Associated Products

Enclosure Backplates and Bracket Cable Guides

The appropriate size backplate(s) and two Bracket Cable Guides are included with each BAPI enclosure.

The Backplates are made of 12-gauge painted steel and pierced with a hole pattern that accommodates the various components which will be installed in the enclosure including snaptrack, panduit wire duct, bracket cable guides, transformers and DDC controllers.

More information on the Backplates and Bracket Cable Guides is found on page G44.

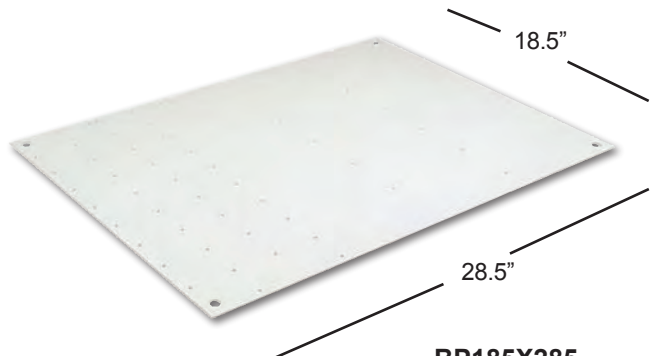




Overview

The BP185x285 - Large Backplate is made of 12-gauge painted steel and pierced with a hole pattern that accommodates the BAPI TRK18, PAN16 and the Carrier® Comfort Controller 1600 and 6400.

The Large Backplate mounts to the enclosure with four threaded studs welded to the back of the enclosure.



BP185X285
Large Backplate
(for 44x20x8 Enclosure)

| Part Number | Description |
|-------------|-------------|
|-------------|-------------|

| | |
|--------------|-------------------------------------|
| BA/BP185X285 | Large Backplate (for 44x20x8 Encl.) |
|--------------|-------------------------------------|

See end of Section G for list pricing.

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BP6X185 - Small Backplate

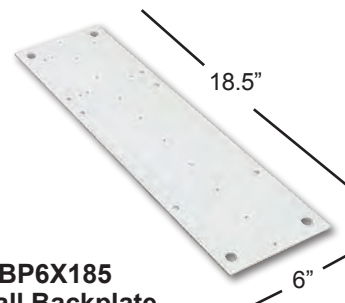
ETA Line



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 |
|-------------|-------------|
|-------------|-------------|

| | |
|------------|-----------------|
| BA/BP6X185 | Small Backplate |
|------------|-----------------|

See end of Section G for list pricing.

BCG - Bracket Cable Guide

ETA Line



Overview

The BCG - Bracket Cable Guide screws to the edge of the enclosure backplate. The non-pierced ear is placed against the enclosure lip forming a wire holding loop with the enclosure side. The 14-gauge BCG will hold all but the largest wire. The BCG measures 7" long by .79" high.



BCG -
Bracket Cable Guide

| Part Number | Description |
|-------------|-------------|
|-------------|-------------|

| | |
|--------|--------------------------------|
| BA/BCG | Bracket Cable Guide (Set of 2) |
|--------|--------------------------------|

See end of Section G for list pricing.





Rev. 01/24/18

ETA LIST PRICES

G43*ETA Line*

| Page | Part Number | Description | List Price |
|------|--------------------------|--|------------|
| G4 | BA/DS8 | Discrete Summary Module, 8 Input..... | \$95.00 |
| G5 | BA/EA1 | 2 Position Actuator Interface | \$105.00 |
| G6 | BA/EA2 | Modulating Acuator Interface | \$87.00 |
| G7 | BA/OAM | Output Adjust Module..... | \$23.00 |
| G8 | BA/CDSP | Carbon Dioxide Sensor Power Supply..... | \$60.00 |
| G9 | BA/CDSP2 | Carbon Dioxide Sensor Power Supply..... | \$130.00 |
| G10 | BA/SQ4 | 4-Step Sequence Module..... | \$105.00 |
| G10 | BA/SQ4-R | 4-Step Sequence Module (Rotational)..... | \$105.00 |
| G10 | BA/SQ4-A | 4-Step Sequence Module (with Alarm)..... | \$280.00 |
| G10 | BA/SQ4-RA | 4-Step Sequence Module (Rotational with Alarm) | \$280.00 |
| G11 | BA/3312VC | Voltage Converter (33VDC to 12VDC)..... | \$120.00 |
| G11 | BA/3324VC | Voltage Converter (33VDC to 24VDC)..... | \$120.00 |
| G12 | BA/R49 | Relay Interface Module, 9 Output | \$125.00 |
| G13 | BA/DS6R | Dry Switch Monitor, 30K Output..... | \$95.00 |
| G13 | BA/DS6R-10K | Dry Switch Monitor, 10K Output..... | \$95.00 |
| G14 | BA/PMPB5 | Pulse Meter Pulse Buffer | \$27.50 |
| G14 | BA/TS1 | Transient Suppressor (voltage)..... | \$7.50 |
| G14 | BA/TS2 | Transient Suppressor (current) | \$7.50 |
| G15 | BA/TURB | Terminal Unit Relay Board | \$57.00 |
| G15 | BA/TURB-TRK | TURB with 4" piece of 2.75" snaptrack | \$65.00 |
| G16 | BA/BP2 | 2-Position Interface Backplane | \$30.00 |
| G16 | BA/BP4 | 4-Position Interface Backplane | \$40.00 |
| G16 | BA/BP8 | 8-Position Interface Backplane | \$65.00 |
| G17 | BA/BP4-V | Vertical Backplane..... | \$40.00 |
| G17 | BA/BP-BR | Bridge (to connect Vertical Backplanes) | \$22.00 |
| G18 | BA/TRK01 | TR2 Snaptrack, 1.25" length | \$5.00 |
| G18 | BA/TRK02 | TR2 Snaptrack, 2" length | \$6.00 |
| G18 | BA/TRK04 | TR2 Snaptrack, 4" length | \$8.00 |
| G18 | BA/TRK08 | TR2 Snaptrack, 8" length | \$10.00 |
| G18 | BA/TRK12 | TR2 Snaptrack, 12" length | \$12.00 |
| G18 | BA/TRK18 | TR2 Snaptrack, 18" length | \$14.00 |
| G18 | BA/TRK48 | TR2 Snaptrack, 48" length | \$40.00 |

Gray shaded items follow the Buy and Resale Multiplier.



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| Page | Part Number | Description | List Price |
|----------|------------------------|---|------------|
| G18..... | BA/PAN16 | Panduit 1x3x16" Wire Duct | \$39.00 |
| G19..... | BA/PS17 | Power Supply Fuse Block | \$303.00 |
| G19..... | BA/PS17CB | Power Supply with Circuit Breakers | \$353.00 |
| G20..... | BA/COMBLK | Communications Cable Terminal Block..... | \$65.00 |
| G20..... | BA/COMBLK2 | Communications Cable Terminal Block..... | \$53.00 |
| G20..... | BA/TB18 | Pluggable Terminal Block..... | \$55.00 |
| G20..... | BA/TB18C | Pluggable Terminal Block (odds common)..... | \$90.00 |
| G20..... | BA/TB18C2 | Pluggable Terminal Block (odds common, evens common) . | \$125.00 |
| G21..... | BA/COMSRG | Communications Surge Protector | \$55.00 |
| G22..... | BA/RPTR | RS-485 Repeater | \$215.00 |
| G23..... | BA/RPTR-KIT | RS-485 Repeater Communication Kit..... | \$335.00 |
| G24..... | BA/FOX | RS-485 Fiber Optic Transceiver | \$340.00 |
| G25..... | BA/FOX-KIT | FOX Communication Kit..... | \$460.00 |
| G26..... | BA/SOX | RS-485 Fiber Optic Transceiver (for single-mode fiber cable). | \$315.00 |
| G27..... | BA/PLCON1 | PremierLink™ Connector 1 | \$105.00 |
| G27..... | BA/PLCON2 | PremierLink™ Connector 2..... | \$90.00 |
| G28..... | BA/RBP4 | Communications Repeater Backplane, 4 rows | \$90.00 |
| G28..... | BA/RBP4-TRK | RBP4 with 4" piece of 2.75" snaptrack..... | \$98.00 |
| G28..... | BA/RBP8 | Communications Repeater Backplane, 8 row | \$145.00 |
| G28..... | BA/RBP8-TRK | RBP with 8" piece of 2.75" snaptrack..... | \$155.00 |
| G29..... | BA/RBP-PB | Power Bridge for Comm. Repeater Backplane | \$62.00 |
| G29..... | BA/RBPCX | Left Side Extender for Comm. Repeater Backplane | \$55.00 |
| G29..... | BA/RBPCX2 | Right Side Extender for Comm. Repeater Backplane..... | \$55.00 |
| G30..... | BA/SRBP | Single Repeater Backplane..... | \$50.00 |
| G30..... | BA/SRBP-TRK | SRBP with 2" piece of 2.75" snaptrack | \$56.00 |
| G31..... | BA/TUCOM | Terminal Unit Communications Block..... | \$22.00 |
| G31..... | BA/BELCON | Mating Pair of Belimo® Connectors | \$12.00 |
| G32..... | BA/AVI | Air Valve Interface | \$150.00 |
| G33..... | BA/AVI-TRK | Air Valve Interface with 4" piece of 2.75" Snaptrack | \$158.00 |
| G33..... | BA/AVI-ADAPT | Air Valve Interface Adapter with toggle connector..... | \$14.00 |
| G33..... | BA/AVI-ADAPT-QC | Air Valve Interface Adapter with 1/4" Quick Connects..... | \$18.00 |

Gray shaded items follow the Buy and Resale Multiplier.





ETA LIST PRICES

G45*ETA Line*

| Page | Part Number | Description | List Price |
|----------|---------------------|--|------------------|
| G35..... | BA/IRM4 | Interposing Relay Module | \$153.00 |
| G35..... | BA/LRCA | Link Router Communications Adapter | \$31.75 |
| G35..... | BA/PSOCL | Power Supply Output Current Limiter | \$32.15 |
| G36..... | BA/UCRB2 | Universal Controller Relay Board | \$100.00 |
| G37..... | BA/SS-AC | Selector Switch/Alarm Counter | \$225.00 |
| G38..... | BA/SD2 | Status Display, Dual 7 Segment Display | \$295.00 |
| G39..... | BA/PE4 | Pulse Extender | \$180.00 |
| G40..... | BA/44208N1S | Steel Enclosure, 44x20x8 | Call for Pricing |
| G40..... | BA/44208N4XS | Painted Steel Encl., 44x20x8 | Call for Pricing |
| G41..... | BA/20208N1S | Steel Enclosure, 20x20x8 | Call for Pricing |
| G42..... | BA/BP185X285 | Large Backplate (for 44x20x8 Encl.) | \$80.00 |
| G42..... | BA/BP6X185 | Small Backplate | \$35.00 |
| G42..... | BA/BCG | Bracket Cable Guide (Set of 2) | \$16.00 |

Gray shaded items follow the Buy and Resale Multiplier.

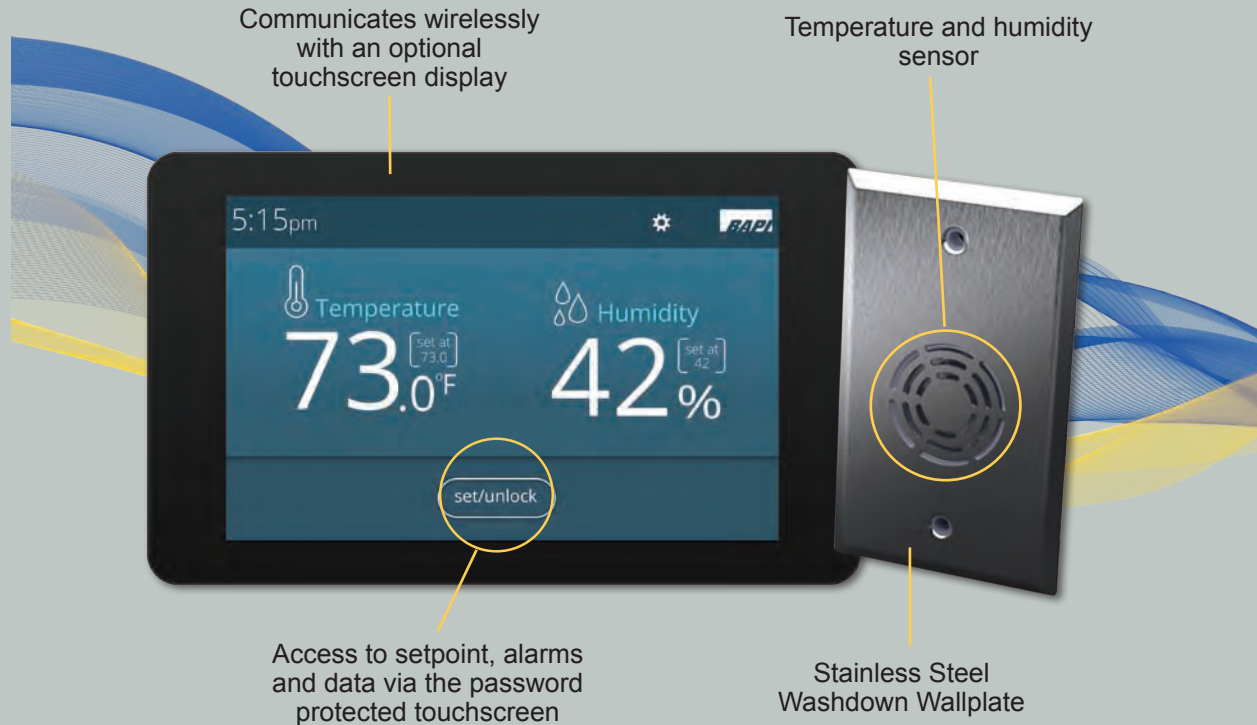


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Vivarium Washdown Wall Plate

— Temp/Humidity Sensor —



- Flush Mount Stainless Steel Wall Plate for Washdown Applications
- Temperature and Humidity Combination Sensor
- Optional Remote Display for Temp and Humidity Setpoint Adjustment and Alarms
- 30 Day Data Logging

The Vivarium Wall Plate features a flush mount stainless steel wall plate with splash guard for washdown applications. It is available as a humidity sensor alone or as a temperature/humidity combination sensor.

The optional Remote Display allows for temperature and humidity setpoint adjustment, room monitoring, data logging and alarm notification.



Temperature, Humidity & Pressure Sensor Overview

There are many facilities and locations today that rely on temperature, pressure and humidity sensors and transmitters to provide a stable, secure environment, such as hospitals, clean rooms and data centers. The sensor or transmitter itself can make or break the system, therefore they must be dependable, accurate and 100% compatible with the building control system. More demanding environments, advances in technology, and changing customer needs keep the industry striving for new and improved sensors and transmitters. As the industry continues to change, BAPI will be at the forefront providing high performance solutions for real world applications.

BAPI offers a wide range of temperature, humidity and pressure sensors and transmitters in all of our room, duct, immersion and outside air units so that they are 100% compatible with the facility's control system.

Temperature Sensors & Transmitters

THERMISTORS - pages H2 - H8

Thermistors are thermally sensitive resistors known for exhibiting a large change in resistance with only a small change in temperature. A thermistor's change in resistance is non-linear. It follows a pre-defined curve which is provided by the thermistor manufacturer.

RTDs - pages H9 - H12

RTDs (Resistance Temperature Detectors) are thermally sensitive resistive elements that exhibit a small change in resistance per degree of temperature change. RTDs are especially recognized for excellent linearity throughout their temperature range with a high degree of accuracy and repeatability.

TEMPERATURE TRANSMITTERS - pages H13 - H14

Temperature transmitters incorporate a 10K Ω thermistor or a 1K Ω platinum RTD and an amplifier. These devices provide an accurate and predictable 4 to 20mA output over a specified temperature range. They are specifically designed for temperature sensing and transmission over long distances without degradation of the 4 to 20mA signal.

Humidity Transmitters & Pressure Sensors

HUMIDITY TRANSMITTERS - pages H15 - H16

Humidity transmitters provide a high accuracy 4 to 20mA, 0 to 5V or 0 to 10V humidity measurement. Accuracies of 2% or 3% Relative Humidity (RH) are available. BAPI room units are protected by a molded housing with an integral filter, while duct and outside air units come with a removable 80 micron sintered stainless steel filter. The sensor is unaffected by volatile organic compounds (VOC's) or surface contamination.

PRESSURE SENSORS - pages H17

The heart of every BAPI Pressure Sensor is a micro-machined, single-crystal silicon, piezoresistive pressure sensor that changes resistance as a function of applied pressure. Each sensor is fabricated using the same integrated circuit technology used to make millions of cell phones, game machines and personal computers. Since silicon strain gauges have high output levels in relation to the pressure applied, the pressure levels in the BAPI diaphragm can be lower than in other non-silicon strain gauges. This means a more accurate measurement of lower pressure levels.



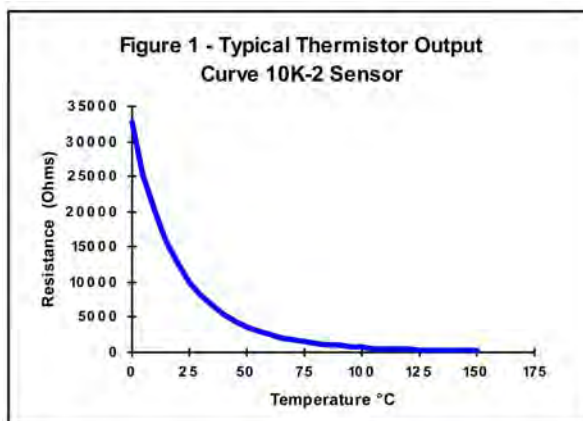


Thermistor Description

BAPI Thermistors are thermally sensitive resistors known for exhibiting a large change in resistance with only a small change in temperature. It is important to note that a thermistor's change in resistance is non-linear. It follows a pre-defined curve which is provided by the thermistor manufacturer. An example of a thermistor output curve can be seen in **Figure 1**.

Thermistors are manufactured to follow a specific curve with a high degree of accuracy. All BAPI thermistors have a standard accuracy of $\pm 0.2^\circ\text{C}$ throughout the commercial temperature range of 0 to 70 $^\circ\text{C}$. BAPI also has available a higher accuracy sensor for meeting tougher specs. The extra precision [XP] line has an initial accuracy of $\pm 0.1^\circ\text{C}$ throughout the commercial temperature range of 0 to 70 $^\circ\text{C}$. 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 $^\circ\text{C}$. At the heart of all BAPI thermistor products is a sensor with a 2.7 mW/ $^\circ\text{C}$ 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 $^\circ\text{C}$.

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: $\pm 0.2^\circ\text{C}$ (0 to 70 $^\circ\text{C}$)

High Accuracy [XP] Sensor: $\pm 0.1^\circ\text{C}$ (0 to 70 $^\circ\text{C}$)

Dissipation Constant: 2.7 mW/ $^\circ\text{C}$

Stability (drift): Less than 0.02 $^\circ\text{C}$ / year

Thermal Time Constant: 5 seconds (bead in still air) .5 seconds (stirred liquid)

| Sensor Type | Reference Resistance | Operating Range |
|--------------|--------------------------------------|-----------------------------|
| 1.8K | 1.8 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 2.2K | 2.2 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 3K** | 3 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 3.3K | 3.3 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 10K-2** | 10 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 10K-3** | 10 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 10K-3(11K)** | 5.2 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 20K** | 20 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 47K | 47 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |
| 50K | 50 K Ω @ 25 $^\circ\text{C}$ | -80 to 150 $^\circ\text{C}$ |
| 100K** | 100 K Ω @ 25 $^\circ\text{C}$ | -55 to 150 $^\circ\text{C}$ |

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



Rev. 10/16/12

1.8K Thermistor Output Table

*BAPI Sensor Specifications***H3**

1.8K Thermistor Output Table

| °F | °C | Ohms |
|-----|--------|-------|
| -39 | -39.44 | 34389 |
| -37 | -38.33 | 32336 |
| -35 | -37.22 | 30419 |
| -33 | -36.11 | 28628 |
| -31 | -35.00 | 26955 |
| -29 | -33.89 | 25390 |
| -27 | -32.78 | 23927 |
| -25 | -31.67 | 22557 |
| -23 | -30.56 | 21275 |
| -21 | -29.44 | 20064 |
| -19 | -28.33 | 18939 |
| -17 | -27.22 | 17885 |
| -15 | -26.11 | 16896 |
| -13 | -25.00 | 15969 |
| -11 | -23.89 | 15098 |
| -9 | -22.78 | 14281 |
| -7 | -21.67 | 13512 |
| -5 | -20.56 | 12791 |
| -3 | -19.44 | 12106 |
| -1 | -18.33 | 11468 |
| 1 | -17.22 | 10868 |
| 3 | -16.11 | 10303 |
| 5 | -15.00 | 9771 |
| 7 | -13.89 | 9270 |
| 9 | -12.78 | 8798 |
| 11 | -11.67 | 8352 |
| 13 | -10.56 | 7933 |
| 15 | -9.44 | 7533 |
| 17 | -8.33 | 7159 |
| 19 | -7.22 | 6807 |
| 21 | -6.11 | 6473 |
| 23 | -5.00 | 6159 |
| 25 | -3.89 | 5861 |
| 27 | -2.78 | 5580 |
| 29 | -1.67 | 5314 |
| 31 | -0.56 | 5062 |
| 33 | 0.56 | 4822 |
| 35 | 1.67 | 4596 |

| °F | °C | Ohms |
|-----|-------|------|
| 37 | 2.78 | 4383 |
| 39 | 3.89 | 4180 |
| 41 | 5.00 | 3989 |
| 43 | 6.11 | 3807 |
| 45 | 7.22 | 3635 |
| 47 | 8.33 | 3471 |
| 49 | 9.44 | 3316 |
| 51 | 10.56 | 3167 |
| 53 | 11.67 | 3028 |
| 55 | 12.78 | 2895 |
| 57 | 13.89 | 2769 |
| 59 | 15.00 | 2649 |
| 61 | 16.11 | 2535 |
| 63 | 17.22 | 2426 |
| 65 | 18.33 | 2323 |
| 67 | 19.44 | 2225 |
| 69 | 20.56 | 2131 |
| 71 | 21.67 | 2042 |
| 73 | 22.78 | 1957 |
| 75 | 23.89 | 1877 |
| 77 | 25.00 | 1800 |
| 79 | 26.11 | 1727 |
| 81 | 27.22 | 1657 |
| 83 | 28.33 | 1590 |
| 85 | 29.44 | 1527 |
| 87 | 30.56 | 1466 |
| 89 | 31.67 | 1408 |
| 91 | 32.78 | 1353 |
| 93 | 33.89 | 1300 |
| 95 | 35.00 | 1250 |
| 97 | 36.11 | 1201 |
| 99 | 37.22 | 1155 |
| 101 | 38.33 | 1111 |
| 103 | 39.44 | 1069 |
| 105 | 40.56 | 1029 |
| 107 | 41.67 | 990 |
| 109 | 42.78 | 954 |
| 111 | 43.89 | 918 |

| °F | °C | Ohms |
|-----|-------|------|
| 113 | 45.00 | 885 |
| 115 | 46.11 | 852 |
| 117 | 47.22 | 822 |
| 119 | 48.33 | 792 |
| 121 | 49.44 | 763 |
| 123 | 50.56 | 736 |
| 125 | 51.67 | 710 |
| 127 | 52.78 | 685 |
| 129 | 53.89 | 661 |
| 131 | 55.00 | 638 |
| 133 | 56.11 | 616 |
| 135 | 57.22 | 595 |
| 137 | 58.33 | 574 |
| 139 | 59.44 | 555 |
| 141 | 60.56 | 536 |
| 143 | 61.67 | 518 |
| 145 | 62.78 | 500 |
| 147 | 63.89 | 484 |
| 149 | 65.00 | 468 |
| 151 | 66.11 | 452 |
| 153 | 67.22 | 438 |
| 155 | 68.33 | 423 |
| 157 | 69.44 | 410 |
| 159 | 70.56 | 396 |
| 161 | 71.67 | 384 |
| 163 | 72.78 | 372 |
| 165 | 73.89 | 360 |
| 167 | 75.00 | 349 |
| 169 | 76.11 | 338 |
| 171 | 77.22 | 327 |
| 173 | 78.33 | 317 |
| 175 | 79.44 | 307 |
| 177 | 80.56 | 298 |
| 179 | 81.67 | 289 |
| 181 | 82.78 | 280 |
| 183 | 83.89 | 272 |
| 185 | 85.00 | 264 |
| 187 | 86.11 | 256 |

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

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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 |

| °F | °C | Ohms |
|-----|-------|------|
| 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 |

| °F | °C | Ohms |
|-----|-------|------|
| 113 | 45.00 | 1310 |
| 115 | 46.11 | 1255 |
| 117 | 47.22 | 1202 |
| 119 | 48.33 | 1151 |
| 121 | 49.44 | 1104 |
| 123 | 50.56 | 1058 |
| 125 | 51.67 | 1014 |
| 127 | 52.78 | 973 |
| 129 | 53.89 | 933 |
| 131 | 55.00 | 895 |
| 133 | 56.11 | 860 |
| 135 | 57.22 | 825 |
| 137 | 58.33 | 793 |
| 139 | 59.44 | 761 |
| 141 | 60.56 | 731 |
| 143 | 61.67 | 703 |
| 145 | 62.78 | 676 |
| 147 | 63.89 | 650 |
| 149 | 65.00 | 625 |
| 151 | 66.11 | 601 |
| 153 | 67.22 | 578 |
| 155 | 68.33 | 556 |
| 157 | 69.44 | 536 |
| 159 | 70.56 | 516 |
| 161 | 71.67 | 496 |
| 163 | 72.78 | 478 |
| 165 | 73.89 | 461 |
| 167 | 75.00 | 444 |
| 169 | 76.11 | 428 |
| 171 | 77.22 | 413 |
| 173 | 78.33 | 398 |
| 175 | 79.44 | 384 |
| 177 | 80.56 | 370 |
| 179 | 81.67 | 357 |
| 181 | 82.78 | 345 |
| 183 | 83.89 | 333 |
| 185 | 85.00 | 321 |
| 187 | 86.11 | 310 |

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



Rev. 10/16/12

10K-2 Thermistor Output Table

BAPI Sensor Specifications

H5

10K-2 Thermistor Output Table

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

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

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

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

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10K-3 Thermistor Output Table

| °F | °C | Ohms | °F | °C | Ohms | °F | °C | Ohms |
|-----|--------|--------|-----|-------|-------|-----|-------|------|
| -39 | -39.44 | 232032 | 37 | 2.78 | 25948 | 113 | 45.00 | 4656 |
| -37 | -38.33 | 217394 | 39 | 3.89 | 24670 | 115 | 46.11 | 4473 |
| -35 | -37.22 | 203774 | 41 | 5.00 | 23462 | 117 | 47.22 | 4298 |
| -33 | -36.11 | 191093 | 43 | 6.11 | 22320 | 119 | 48.33 | 4131 |
| -31 | -35.00 | 179281 | 45 | 7.22 | 21241 | 121 | 49.44 | 3971 |
| -29 | -33.89 | 168275 | 47 | 8.33 | 20220 | 123 | 50.56 | 3817 |
| -27 | -32.78 | 158013 | 49 | 9.44 | 19254 | 125 | 51.67 | 3671 |
| -25 | -31.67 | 148442 | 51 | 10.56 | 18332 | 127 | 52.78 | 3532 |
| -23 | -30.56 | 139511 | 53 | 11.67 | 17467 | 129 | 53.89 | 3398 |
| -21 | -29.44 | 131100 | 55 | 12.78 | 16648 | 131 | 55.00 | 3271 |
| -19 | -28.33 | 123317 | 57 | 13.89 | 15872 | 133 | 56.11 | 3149 |
| -17 | -27.22 | 116045 | 59 | 15.00 | 15136 | 135 | 57.22 | 3032 |
| -15 | -26.11 | 109247 | 61 | 16.11 | 14439 | 137 | 58.33 | 2920 |
| -13 | -25.00 | 102889 | 63 | 17.22 | 13778 | 139 | 59.44 | 2812 |
| -11 | -23.89 | 96941 | 65 | 18.33 | 13151 | 141 | 60.56 | 2709 |
| -9 | -22.78 | 91374 | 67 | 19.44 | 12556 | 143 | 61.67 | 2610 |
| -7 | -21.67 | 86160 | 69 | 20.56 | 11987 | 145 | 62.78 | 2516 |
| -5 | -20.56 | 81276 | 71 | 21.67 | 11451 | 147 | 63.89 | 2425 |
| -3 | -19.44 | 76659 | 73 | 22.78 | 10942 | 149 | 65.00 | 2339 |
| -1 | -18.33 | 72371 | 75 | 23.89 | 10459 | 151 | 66.11 | 2256 |
| 1 | -17.22 | 68348 | 77 | 25.00 | 10000 | 153 | 67.22 | 2176 |
| 3 | -16.11 | 64574 | 79 | 26.11 | 9564 | 155 | 68.33 | 2099 |
| 5 | -15.00 | 61031 | 81 | 27.22 | 9149 | 157 | 69.44 | 2026 |
| 7 | -13.89 | 57703 | 83 | 28.33 | 8754 | 159 | 70.56 | 1955 |
| 9 | -12.78 | 54578 | 85 | 29.44 | 8379 | 161 | 71.67 | 1887 |
| 11 | -11.67 | 51641 | 87 | 30.56 | 8019 | 163 | 72.78 | 1822 |
| 13 | -10.56 | 48879 | 89 | 31.67 | 7679 | 165 | 73.89 | 1760 |
| 15 | -9.44 | 46259 | 91 | 32.78 | 7355 | 167 | 75.00 | 1700 |
| 17 | -8.33 | 43817 | 93 | 33.89 | 7047 | 169 | 76.11 | 1642 |
| 19 | -7.22 | 41519 | 95 | 35.00 | 6754 | 171 | 77.22 | 1587 |
| 21 | -6.11 | 39354 | 97 | 36.11 | 6474 | 173 | 78.33 | 1534 |
| 23 | -5.00 | 37316 | 99 | 37.22 | 6208 | 175 | 79.44 | 1483 |
| 25 | -3.89 | 35395 | 101 | 38.33 | 5954 | 177 | 80.56 | 1433 |
| 27 | -2.78 | 33585 | 103 | 39.44 | 5712 | 179 | 81.67 | 1386 |
| 29 | -1.67 | 31878 | 105 | 40.56 | 5479 | 181 | 82.78 | 1341 |
| 31 | -0.56 | 30267 | 107 | 41.67 | 5258 | 183 | 83.89 | 1297 |
| 33 | 0.56 | 28735 | 109 | 42.78 | 5048 | 185 | 85.00 | 1255 |
| 35 | 1.67 | 27302 | 111 | 43.89 | 4847 | 187 | 86.11 | 1214 |

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





Rev. 10/16/12

10K-3 (11K) Thermistor Output Table

BAPI Sensor Specifications

H7

10K-3 (11K) Thermistor Output Table

| °F | °C | Ohms |
|-----|--------|-------|
| -39 | -39.44 | 10502 |
| -37 | -38.33 | 10470 |
| -35 | -37.22 | 10437 |
| -33 | -36.11 | 10401 |
| -31 | -35.00 | 10364 |
| -29 | -33.89 | 10325 |
| -27 | -32.78 | 10284 |
| -25 | -31.67 | 10241 |
| -23 | -30.56 | 10196 |
| -21 | -29.44 | 10148 |
| -19 | -28.33 | 10099 |
| -17 | -27.22 | 10048 |
| -15 | -26.11 | 9994 |
| -13 | -25.00 | 9938 |
| -11 | -23.89 | 9879 |
| -9 | -22.78 | 9818 |
| -7 | -21.67 | 9755 |
| -5 | -20.56 | 9689 |
| -3 | -19.44 | 9620 |
| -1 | -18.33 | 9549 |
| 1 | -17.22 | 9475 |
| 3 | -16.11 | 9399 |
| 5 | -15.00 | 9320 |
| 7 | -13.89 | 9239 |
| 9 | -12.78 | 9155 |
| 11 | -11.67 | 9068 |
| 13 | -10.56 | 8979 |
| 15 | -9.44 | 8887 |
| 17 | -8.33 | 8793 |
| 19 | -7.22 | 8696 |
| 21 | -6.11 | 8597 |
| 23 | -5.00 | 8496 |
| 25 | -3.89 | 8392 |
| 27 | -2.78 | 8286 |
| 29 | -1.67 | 8178 |
| 31 | -0.56 | 8068 |
| 33 | 0.56 | 7955 |
| 35 | 1.67 | 7841 |

| °F | °C | Ohms |
|-----|-------|------|
| 37 | 2.78 | 7725 |
| 39 | 3.89 | 7608 |
| 41 | 5.00 | 7489 |
| 43 | 6.11 | 7369 |
| 45 | 7.22 | 7247 |
| 47 | 8.33 | 7124 |
| 49 | 9.44 | 7001 |
| 51 | 10.56 | 6875 |
| 53 | 11.67 | 6749 |
| 55 | 12.78 | 6623 |
| 57 | 13.89 | 6497 |
| 59 | 15.00 | 6370 |
| 61 | 16.11 | 6244 |
| 63 | 17.22 | 6117 |
| 65 | 18.33 | 5990 |
| 67 | 19.44 | 5863 |
| 69 | 20.56 | 5736 |
| 71 | 21.67 | 5611 |
| 73 | 22.78 | 5486 |
| 75 | 23.89 | 5361 |
| 77 | 25.00 | 5238 |
| 79 | 26.11 | 5116 |
| 81 | 27.22 | 4995 |
| 83 | 28.33 | 4875 |
| 85 | 29.44 | 4756 |
| 87 | 30.56 | 4638 |
| 89 | 31.67 | 4522 |
| 91 | 32.78 | 4408 |
| 93 | 33.89 | 4295 |
| 95 | 35.00 | 4185 |
| 97 | 36.11 | 4076 |
| 99 | 37.22 | 3968 |
| 101 | 38.33 | 3863 |
| 103 | 39.44 | 3760 |
| 105 | 40.56 | 3657 |
| 107 | 41.67 | 3558 |
| 109 | 42.78 | 3460 |
| 111 | 43.89 | 3365 |

| °F | °C | Ohms |
|-----|-------|------|
| 113 | 45.00 | 3271 |
| 115 | 46.11 | 3180 |
| 117 | 47.22 | 3090 |
| 119 | 48.33 | 3003 |
| 121 | 49.44 | 2918 |
| 123 | 50.56 | 2834 |
| 125 | 51.67 | 2753 |
| 127 | 52.78 | 2673 |
| 129 | 53.89 | 2596 |
| 131 | 55.00 | 2521 |
| 133 | 56.11 | 2448 |
| 135 | 57.22 | 2377 |
| 137 | 58.33 | 2307 |
| 139 | 59.44 | 2240 |
| 141 | 60.56 | 2173 |
| 143 | 61.67 | 2110 |
| 145 | 62.78 | 2048 |
| 147 | 63.89 | 1987 |
| 149 | 65.00 | 1929 |
| 151 | 66.11 | 1872 |
| 153 | 67.22 | 1817 |
| 155 | 68.33 | 1763 |
| 157 | 69.44 | 1711 |
| 159 | 70.56 | 1660 |
| 161 | 71.67 | 1611 |
| 163 | 72.78 | 1563 |
| 165 | 73.89 | 1517 |
| 167 | 75.00 | 1472 |
| 169 | 76.11 | 1429 |
| 171 | 77.22 | 1387 |
| 173 | 78.33 | 1346 |
| 175 | 79.44 | 1307 |
| 177 | 80.56 | 1268 |
| 179 | 81.67 | 1231 |
| 181 | 82.78 | 1195 |
| 183 | 83.89 | 1160 |
| 185 | 85.00 | 1126 |
| 187 | 86.11 | 1094 |

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

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20K Thermistor Output Table

| °F | °C | Ohms | °F | °C | Ohms | °F | °C | Ohms |
|-----|--------|--------|-----|-------|-------|-----|-------|------|
| -39 | -39.44 | 776470 | 37 | 2.78 | 60451 | 113 | 45.00 | 8260 |
| -37 | -38.33 | 719538 | 39 | 3.89 | 57005 | 115 | 46.11 | 7886 |
| -35 | -37.22 | 667144 | 41 | 5.00 | 53777 | 117 | 47.22 | 7531 |
| -33 | -36.11 | 618900 | 43 | 6.11 | 50750 | 119 | 48.33 | 7194 |
| -31 | -35.00 | 574453 | 45 | 7.22 | 47912 | 121 | 49.44 | 6874 |
| -29 | -33.89 | 533481 | 47 | 8.33 | 45249 | 123 | 50.56 | 6567 |
| -27 | -32.78 | 495691 | 49 | 9.44 | 42750 | 125 | 51.67 | 6278 |
| -25 | -31.67 | 460818 | 51 | 10.56 | 40383 | 127 | 52.78 | 6004 |
| -23 | -30.56 | 428619 | 53 | 11.67 | 38180 | 129 | 53.89 | 5742 |
| -21 | -29.44 | 398615 | 55 | 12.78 | 36111 | 131 | 55.00 | 5494 |
| -19 | -28.33 | 371140 | 57 | 13.89 | 34165 | 133 | 56.11 | 5258 |
| -17 | -27.22 | 345732 | 59 | 15.00 | 32336 | 135 | 57.22 | 5033 |
| -15 | -26.11 | 322223 | 61 | 16.11 | 30615 | 137 | 58.33 | 4819 |
| -13 | -25.00 | 300459 | 63 | 17.22 | 28996 | 139 | 59.44 | 4616 |
| -11 | -23.89 | 280301 | 65 | 18.33 | 27472 | 141 | 60.56 | 4420 |
| -9 | -22.78 | 261622 | 67 | 19.44 | 26037 | 143 | 61.67 | 4235 |
| -7 | -21.67 | 244304 | 69 | 20.56 | 24674 | 145 | 62.78 | 4059 |
| -5 | -20.56 | 228239 | 71 | 21.67 | 23400 | 147 | 63.89 | 3892 |
| -3 | -19.44 | 213201 | 73 | 22.78 | 22200 | 149 | 65.00 | 3732 |
| -1 | -18.33 | 199368 | 75 | 23.89 | 21068 | 151 | 66.11 | 3579 |
| 1 | -17.22 | 186518 | 77 | 25.00 | 20001 | 153 | 67.22 | 3434 |
| 3 | -16.11 | 174575 | 79 | 26.11 | 18994 | 155 | 68.33 | 3295 |
| 5 | -15.00 | 163471 | 81 | 27.22 | 18043 | 157 | 69.44 | 3163 |
| 7 | -13.89 | 153140 | 83 | 28.33 | 17145 | 159 | 70.56 | 3035 |
| 9 | -12.78 | 143526 | 85 | 29.44 | 16297 | 161 | 71.67 | 2914 |
| 11 | -11.67 | 134575 | 87 | 30.56 | 15488 | 163 | 72.78 | 2799 |
| 13 | -10.56 | 126236 | 89 | 31.67 | 14731 | 165 | 73.89 | 2689 |
| 15 | -9.44 | 118397 | 91 | 32.78 | 14016 | 167 | 75.00 | 2584 |
| 17 | -8.33 | 111156 | 93 | 33.89 | 13339 | 169 | 76.11 | 2484 |
| 19 | -7.22 | 104402 | 95 | 35.00 | 12699 | 171 | 77.22 | 2388 |
| 21 | -6.11 | 98099 | 97 | 36.11 | 12092 | 173 | 78.33 | 2296 |
| 23 | -5.00 | 92214 | 99 | 37.22 | 11519 | 175 | 79.44 | 2208 |
| 25 | -3.89 | 86719 | 101 | 38.33 | 10975 | 177 | 80.56 | 2123 |
| 27 | -2.78 | 81583 | 103 | 39.44 | 10461 | 179 | 81.67 | 2043 |
| 29 | -1.67 | 76783 | 105 | 40.56 | 9969 | 181 | 82.78 | 1966 |
| 31 | -0.56 | 72294 | 107 | 41.67 | 9507 | 183 | 83.89 | 1892 |
| 33 | 0.56 | 68057 | 109 | 42.78 | 9069 | 185 | 85.00 | 1822 |
| 35 | 1.67 | 64129 | 111 | 43.89 | 8654 | 187 | 86.11 | 1754 |

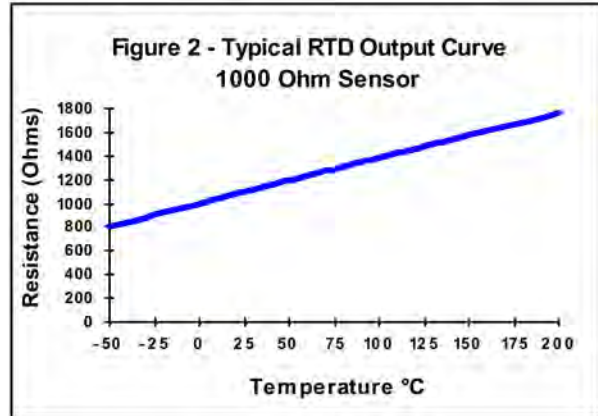


RTD Description

BAPI RTDs (Resistance Temperature Detectors) are thermally sensitive resistive elements that exhibit a small change in resistance per degree of temperature change. RTDs are especially recognized for excellent linearity throughout their temperature range with a high degree of accuracy and repeatability. An example of an RTD output curve can be seen in **Figure 2**.

RTDs supplied in BAPI products feature a standard interchangeability tolerance of $\pm 0.3^\circ\text{C}$ measured at 0°C . Higher accuracy sensors are also available. The Class A line [A] has an interchangeability tolerance of $\pm 0.15^\circ\text{C}$ 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 $1\text{ k}\Omega$ Platinum RTDs with the ranges shown in the table at right.



Standard & Extreme Temperature Ranges for the $1\text{ k}\Omega$ Platinum RTD

| Range | $^\circ\text{C}$ | $^\circ\text{F}$ |
|--------------------|------------------|------------------|
| 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 $1\text{ k}\Omega$ RTD with an operating range of 100 to 210°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 $^\circ\text{C}$:

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

Stability (drift):

0.14°C with 6,000 continuous hours at 400°C

Sensitivity:

$1\text{ k}\Omega$: $3.85\Omega/^\circ\text{C}$ ($2.14\Omega/^\circ\text{F}$)

Self Heating ($1\text{ k}\Omega$ 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]* | $1\text{ k}\Omega$ @ 0°C | $3.75\Omega/^\circ\text{C}$ | -60 to 150°C |
| BA/1K[Ni] | $1\text{ k}\Omega$ @ 21°C | $5.68\Omega/^\circ\text{C}$ | -60 to 200°C |
| BA/1K* | $1\text{ k}\Omega$ @ 0°C | $3.85\Omega/^\circ\text{C}$ | -60 to 150°C |
| BA/2K | $2\text{ k}\Omega$ @ 20°C | $8\Omega/^\circ\text{C}$ | -60 to 150°C |

*Available as an [A] high accuracy sensor.

Example: **BA/1K[A]-I-2"** (high accuracy immersion sensor)



1K (375) Platinum RTD Output Table

| °F | °C | Ohms |
|-----|--------|----------|
| -40 | -40.00 | 846.64 |
| -38 | -38.89 | 850.92 |
| -36 | -37.78 | 855.20 |
| -34 | -36.67 | 859.48 |
| -32 | -35.56 | 863.76 |
| -30 | -34.44 | 868.07 |
| -28 | -33.33 | 872.34 |
| -26 | -32.22 | 876.62 |
| -24 | -31.11 | 880.89 |
| -22 | -30.00 | 885.16 |
| -20 | -28.89 | 889.43 |
| -18 | -27.78 | 893.69 |
| -16 | -26.67 | 897.96 |
| -14 | -25.56 | 902.22 |
| -12 | -24.44 | 906.52 |
| -10 | -23.33 | 910.79 |
| -8 | -22.22 | 915.04 |
| -6 | -21.11 | 919.30 |
| -4 | -20.00 | 923.56 |
| -2 | -18.89 | 927.81 |
| 0 | -17.78 | 932.07 |
| 2 | -16.67 | 936.32 |
| 4 | -15.56 | 940.57 |
| 6 | -14.44 | 944.86 |
| 8 | -13.33 | 949.11 |
| 10 | -12.22 | 953.35 |
| 12 | -11.11 | 957.60 |
| 14 | -10.00 | 961.84 |
| 16 | -8.89 | 966.08 |
| 18 | -7.78 | 970.32 |
| 20 | -6.67 | 974.56 |
| 22 | -5.56 | 978.80 |
| 24 | -4.44 | 983.07 |
| 26 | -3.33 | 987.31 |
| 28 | -2.22 | 991.54 |
| 30 | -1.11 | 995.77 |
| 32 | 0.00 | 1,000.00 |
| 34 | 1.11 | 1,004.23 |

| °F | °C | Ohms |
|-----|-------|----------|
| 36 | 2.22 | 1,008.46 |
| 38 | 3.33 | 1,012.68 |
| 40 | 4.44 | 1,016.90 |
| 42 | 5.56 | 1,021.16 |
| 44 | 6.67 | 1,025.39 |
| 46 | 7.78 | 1,029.61 |
| 48 | 8.89 | 1,033.82 |
| 50 | 10.00 | 1,038.04 |
| 52 | 11.11 | 1,042.25 |
| 54 | 12.22 | 1,046.47 |
| 56 | 13.33 | 1,050.68 |
| 58 | 14.44 | 1,054.89 |
| 60 | 15.56 | 1,059.14 |
| 62 | 16.67 | 1,063.35 |
| 64 | 17.78 | 1,067.55 |
| 66 | 18.89 | 1,071.76 |
| 68 | 20.00 | 1,075.96 |
| 70 | 21.11 | 1,080.16 |
| 72 | 22.22 | 1,084.36 |
| 74 | 23.33 | 1,088.56 |
| 76 | 24.44 | 1,092.76 |
| 78 | 25.56 | 1,096.99 |
| 80 | 26.67 | 1,101.18 |
| 82 | 27.78 | 1,105.38 |
| 84 | 28.89 | 1,109.57 |
| 86 | 30.00 | 1,113.76 |
| 88 | 31.11 | 1,117.95 |
| 90 | 32.22 | 1,122.13 |
| 92 | 33.33 | 1,126.32 |
| 94 | 34.44 | 1,130.50 |
| 96 | 35.56 | 1,134.72 |
| 98 | 36.67 | 1,138.90 |
| 100 | 37.78 | 1,143.08 |
| 102 | 38.89 | 1,147.26 |
| 104 | 40.00 | 1,151.44 |
| 106 | 41.11 | 1,155.61 |
| 108 | 42.22 | 1,159.79 |
| 110 | 43.33 | 1,163.96 |

| °F | °C | Ohms |
|-----|-------|----------|
| 112 | 44.44 | 1,168.13 |
| 114 | 45.56 | 1,172.33 |
| 116 | 46.67 | 1,176.50 |
| 118 | 47.78 | 1,180.67 |
| 120 | 48.89 | 1,184.83 |
| 122 | 50.00 | 1,189.00 |
| 124 | 51.11 | 1,193.16 |
| 126 | 52.22 | 1,197.32 |
| 128 | 53.33 | 1,201.48 |
| 130 | 54.44 | 1,205.63 |
| 132 | 55.56 | 1,209.83 |
| 134 | 56.67 | 1,213.98 |
| 136 | 57.78 | 1,218.13 |
| 138 | 58.89 | 1,222.28 |
| 140 | 60.00 | 1,226.43 |
| 142 | 61.11 | 1,230.58 |
| 144 | 62.22 | 1,234.73 |
| 146 | 63.33 | 1,238.87 |
| 148 | 64.44 | 1,243.02 |
| 150 | 65.56 | 1,247.20 |
| 152 | 66.67 | 1,251.34 |
| 154 | 67.78 | 1,255.48 |
| 156 | 68.89 | 1,259.61 |
| 158 | 70.00 | 1,263.75 |
| 160 | 71.11 | 1,267.89 |
| 162 | 72.22 | 1,272.02 |
| 164 | 73.33 | 1,276.15 |
| 166 | 74.44 | 1,280.28 |
| 168 | 75.56 | 1,284.45 |
| 170 | 76.67 | 1,288.57 |
| 172 | 77.78 | 1,292.70 |
| 174 | 78.89 | 1,296.82 |
| 176 | 80.00 | 1,300.95 |
| 178 | 81.11 | 1,305.07 |
| 180 | 82.22 | 1,309.19 |
| 182 | 83.33 | 1,313.31 |
| 184 | 84.44 | 1,317.42 |
| 186 | 85.56 | 1,321.58 |



Rev. 10/16/12

1K (Ni) Nickel RTD Output Table

*BAPI Sensor Specifications***H11**

1K (Ni) Nickel RTD Output Table

| °F | °C | Ohms |
|-----|--------|--------|
| -40 | -40.00 | 699.28 |
| -38 | -38.89 | 704.37 |
| -36 | -37.78 | 709.47 |
| -34 | -36.67 | 714.58 |
| -32 | -35.56 | 719.70 |
| -30 | -34.44 | 724.84 |
| -28 | -33.33 | 729.98 |
| -26 | -32.22 | 735.14 |
| -24 | -31.11 | 740.31 |
| -22 | -30.00 | 745.49 |
| -20 | -28.89 | 750.68 |
| -18 | -27.78 | 755.89 |
| -16 | -26.67 | 761.11 |
| -14 | -25.56 | 766.35 |
| -12 | -24.44 | 771.60 |
| -10 | -23.33 | 776.86 |
| -8 | -22.22 | 782.14 |
| -6 | -21.11 | 787.44 |
| -4 | -20.00 | 792.75 |
| -2 | -18.89 | 798.07 |
| 0 | -17.78 | 803.41 |
| 2 | -16.67 | 808.76 |
| 4 | -15.56 | 814.13 |
| 6 | -14.44 | 819.52 |
| 8 | -13.33 | 824.92 |
| 10 | -12.22 | 830.34 |
| 12 | -11.11 | 835.77 |
| 14 | -10.00 | 841.22 |
| 16 | -8.89 | 846.69 |
| 18 | -7.78 | 852.17 |
| 20 | -6.67 | 857.66 |
| 22 | -5.56 | 863.18 |
| 24 | -4.44 | 868.71 |
| 26 | -3.33 | 874.25 |
| 28 | -2.22 | 879.81 |
| 30 | -1.11 | 885.39 |
| 32 | 0.00 | 890.98 |
| 34 | 1.11 | 896.59 |

| °F | °C | Ohms |
|-----|-------|---------|
| 36 | 2.22 | 902.21 |
| 38 | 3.33 | 907.85 |
| 40 | 4.44 | 913.51 |
| 42 | 5.56 | 919.18 |
| 44 | 6.67 | 924.87 |
| 46 | 7.78 | 930.57 |
| 48 | 8.89 | 936.29 |
| 50 | 10.00 | 942.02 |
| 52 | 11.11 | 947.77 |
| 54 | 12.22 | 953.53 |
| 56 | 13.33 | 959.31 |
| 58 | 14.44 | 965.11 |
| 60 | 15.56 | 970.92 |
| 62 | 16.67 | 976.74 |
| 64 | 17.78 | 982.59 |
| 66 | 18.89 | 988.44 |
| 68 | 20.00 | 994.31 |
| 70 | 21.11 | 1000.20 |
| 72 | 22.22 | 1006.10 |
| 74 | 23.33 | 1012.02 |
| 76 | 24.44 | 1017.95 |
| 78 | 25.56 | 1023.89 |
| 80 | 26.67 | 1029.86 |
| 82 | 27.78 | 1035.83 |
| 84 | 28.89 | 1041.82 |
| 86 | 30.00 | 1047.83 |
| 88 | 31.11 | 1053.85 |
| 90 | 32.22 | 1059.89 |
| 92 | 33.33 | 1065.94 |
| 94 | 34.44 | 1072.00 |
| 96 | 35.56 | 1078.08 |
| 98 | 36.67 | 1084.18 |
| 100 | 37.78 | 1090.29 |
| 102 | 38.89 | 1096.42 |
| 104 | 40.00 | 1102.56 |
| 106 | 41.11 | 1108.71 |
| 108 | 42.22 | 1114.89 |
| 110 | 43.33 | 1121.07 |

| °F | °C | Ohms |
|-----|-------|---------|
| 112 | 44.44 | 1127.27 |
| 114 | 45.56 | 1133.49 |
| 116 | 46.67 | 1139.72 |
| 118 | 47.78 | 1145.97 |
| 120 | 48.89 | 1152.24 |
| 122 | 50.00 | 1158.52 |
| 124 | 51.11 | 1164.81 |
| 126 | 52.22 | 1171.12 |
| 128 | 53.33 | 1177.45 |
| 130 | 54.44 | 1183.79 |
| 132 | 55.56 | 1190.15 |
| 134 | 56.67 | 1196.53 |
| 136 | 57.78 | 1202.92 |
| 138 | 58.89 | 1209.33 |
| 140 | 60.00 | 1215.75 |
| 142 | 61.11 | 1222.19 |
| 144 | 62.22 | 1228.65 |
| 146 | 63.33 | 1235.12 |
| 148 | 64.44 | 1241.62 |
| 150 | 65.56 | 1248.13 |
| 152 | 66.67 | 1254.65 |
| 154 | 67.78 | 1261.20 |
| 156 | 68.89 | 1267.76 |
| 158 | 70.00 | 1274.34 |
| 160 | 71.11 | 1280.93 |
| 162 | 72.22 | 1287.55 |
| 164 | 73.33 | 1294.18 |
| 166 | 74.44 | 1300.83 |
| 168 | 75.56 | 1307.50 |
| 170 | 76.67 | 1314.19 |
| 172 | 77.78 | 1320.89 |
| 174 | 78.89 | 1327.62 |
| 176 | 80.00 | 1334.36 |
| 178 | 81.11 | 1341.12 |
| 180 | 82.22 | 1347.90 |
| 182 | 83.33 | 1354.70 |
| 184 | 84.44 | 1361.52 |
| 186 | 85.56 | 1368.36 |





1K Ω Platinum RTD Output Table

| °F | °C | Ohms |
|--------|--------|---------|
| -40.00 | -40.00 | 842.75 |
| -38.00 | -38.89 | 847.14 |
| -36.00 | -37.78 | 851.53 |
| -34.00 | -36.67 | 855.91 |
| -32.00 | -35.56 | 860.30 |
| -30.00 | -34.44 | 864.72 |
| -28.00 | -33.33 | 869.10 |
| -26.00 | -32.22 | 873.48 |
| -24.00 | -31.11 | 877.86 |
| -22.00 | -30.00 | 882.24 |
| -20.00 | -28.89 | 886.61 |
| -18.00 | -27.78 | 890.99 |
| -16.00 | -26.67 | 895.36 |
| -14.00 | -25.56 | 899.73 |
| -12.00 | -24.44 | 904.14 |
| -10.00 | -23.33 | 908.51 |
| -8.00 | -22.22 | 912.88 |
| -6.00 | -21.11 | 917.24 |
| -4.00 | -20.00 | 921.61 |
| -2.00 | -18.89 | 925.97 |
| 0.00 | -17.78 | 930.33 |
| 2.00 | -16.67 | 934.69 |
| 4.00 | -15.56 | 939.05 |
| 6.00 | -14.44 | 943.45 |
| 8.00 | -13.33 | 947.80 |
| 10.00 | -12.22 | 952.16 |
| 12.00 | -11.11 | 956.51 |
| 14.00 | -10.00 | 960.86 |
| 16.00 | -8.89 | 965.21 |
| 18.00 | -7.78 | 969.56 |
| 20.00 | -6.67 | 973.91 |
| 22.00 | -5.56 | 978.25 |
| 24.00 | -4.44 | 982.64 |
| 26.00 | -3.33 | 986.98 |
| 28.00 | -2.22 | 991.32 |
| 30.00 | -1.11 | 995.66 |
| 32.00 | 0.00 | 1000.00 |
| 34.00 | 1.11 | 1004.34 |

| °F | °C | Ohms |
|--------|-------|---------|
| 36.00 | 2.22 | 1008.67 |
| 38.00 | 3.33 | 1013.01 |
| 40.00 | 4.44 | 1017.34 |
| 42.00 | 5.56 | 1021.71 |
| 44.00 | 6.67 | 1026.04 |
| 46.00 | 7.78 | 1030.37 |
| 48.00 | 8.89 | 1034.70 |
| 50.00 | 10.00 | 1039.02 |
| 52.00 | 11.11 | 1043.35 |
| 54.00 | 12.22 | 1047.67 |
| 56.00 | 13.33 | 1051.99 |
| 58.00 | 14.44 | 1056.31 |
| 60.00 | 15.56 | 1060.67 |
| 62.00 | 16.67 | 1064.99 |
| 64.00 | 17.78 | 1069.30 |
| 66.00 | 18.89 | 1073.62 |
| 68.00 | 20.00 | 1077.93 |
| 70.00 | 21.11 | 1082.24 |
| 72.00 | 22.22 | 1086.55 |
| 74.00 | 23.33 | 1090.86 |
| 76.00 | 24.44 | 1095.17 |
| 78.00 | 25.56 | 1099.51 |
| 80.00 | 26.67 | 1103.81 |
| 82.00 | 27.78 | 1108.12 |
| 84.00 | 28.89 | 1112.42 |
| 86.00 | 30.00 | 1116.72 |
| 88.00 | 31.11 | 1121.02 |
| 90.00 | 32.22 | 1125.31 |
| 92.00 | 33.33 | 1129.61 |
| 94.00 | 34.44 | 1133.90 |
| 96.00 | 35.56 | 1138.24 |
| 98.00 | 36.67 | 1142.53 |
| 100.00 | 37.78 | 1146.82 |
| 102.00 | 38.89 | 1151.11 |
| 104.00 | 40.00 | 1155.39 |
| 106.00 | 41.11 | 1159.68 |
| 108.00 | 42.22 | 1163.96 |
| 110.00 | 43.33 | 1168.25 |

| °F | °C | Ohms |
|--------|-------|---------|
| 112.00 | 44.44 | 1172.53 |
| 114.00 | 45.56 | 1176.85 |
| 116.00 | 46.67 | 1181.12 |
| 118.00 | 47.78 | 1185.40 |
| 120.00 | 48.89 | 1189.68 |
| 122.00 | 50.00 | 1193.95 |
| 124.00 | 51.11 | 1198.22 |
| 126.00 | 52.22 | 1202.49 |
| 128.00 | 53.33 | 1206.76 |
| 130.00 | 54.44 | 1211.03 |
| 132.00 | 55.56 | 1215.34 |
| 134.00 | 56.67 | 1219.60 |
| 136.00 | 57.78 | 1223.87 |
| 138.00 | 58.89 | 1228.13 |
| 140.00 | 60.00 | 1232.39 |
| 142.00 | 61.11 | 1236.65 |
| 144.00 | 62.22 | 1240.91 |
| 146.00 | 63.33 | 1245.17 |
| 148.00 | 64.44 | 1249.42 |
| 150.00 | 65.56 | 1253.72 |
| 152.00 | 66.67 | 1257.97 |
| 154.00 | 67.78 | 1262.22 |
| 156.00 | 68.89 | 1266.47 |
| 158.00 | 70.00 | 1270.72 |
| 160.00 | 71.11 | 1274.97 |
| 162.00 | 72.22 | 1279.21 |
| 164.00 | 73.33 | 1283.46 |
| 166.00 | 74.44 | 1287.70 |
| 168.00 | 75.56 | 1291.98 |
| 170.00 | 76.67 | 1296.22 |
| 172.00 | 77.78 | 1300.46 |
| 174.00 | 78.89 | 1304.69 |
| 176.00 | 80.00 | 1308.93 |
| 178.00 | 81.11 | 1313.16 |
| 180.00 | 82.22 | 1317.40 |
| 182.00 | 83.33 | 1321.63 |
| 184.00 | 84.44 | 1325.86 |
| 186.00 | 85.56 | 1330.12 |



Temperature Transmitter Description

BAPI temperature transmitters incorporate a 10K Ω thermistor or a 1K Ω RTD 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 also comes in a 0 to 5 VDC or 0 to 10 VDC output.

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 a NIST traceable reference thermometer. Each matched pair is provided with a "Certificate of Calibration" which lists the tested and calculated offset values, and identifies the equipment, products and people involved in the calibration process. The overall accuracy of the matched pair now becomes a function of the transmitter linearity, RTD linearity and reference thermometer uncertainty.

Matched errors are

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

Where Linearity Error =

$$\text{Square Root}((\text{Transmitter Linearity})^2 + (\text{RTD Linearity})^2) = \text{Square Root}((0.125\%)^2 + (0.2\%)^2) = 0.234\%$$

Examples:

BA/T1K(-30 to 130F)

Span = 130 - (-30) = 160

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

BA/T1K(45 to 95F)

Span = 95 - 45 = 50

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

These accuracies are for the entire range of the sensor, although the accuracies in the midband of the sensor will be tighter than those near the endpoints of the specified range. Other matching and/or certification options may be available, please contact your BAPI representative for details.

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

Specifications

T10K Transmitter

Sensor: 10K Ω Thermistor

Output: 4 to 20 mA, 0 to 5 V, or 0 to 10 V

Supply Voltage:

10 to 35 VDC (0-5 VDC or 4-20 mA Outputs)

15 to 35 VDC (0-10 VDC Output)

12 to 24 VAC (0-5 VDC Outputs)

15 to 24 VAC (0-10 VDC Output)

Maximum Loop Resistance:

700 Ω at 24 VDC (4 to 20 mA Output)

Impedance: >10K ohms (Voltage Output)

Calibration Range: -40 to 85 $^\circ\text{C}$ (-40 to 185 $^\circ\text{F}$)

Accuracy: $\pm 1.015^\circ\text{C}$ (0 to 65 $^\circ\text{C}$)

Linearity: $\pm 0.065^\circ\text{C}$ (0 to 65 $^\circ\text{C}$)

Temperature Resolution: Span/1024

Operating Temperature:

Transmitter: 0 to 70 $^\circ\text{C}$

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

-40 to 155 $^\circ\text{C}$ (available)

T1K Transmitters

Sensor: 1K Ω Platinum RTD

Supply Voltage: 7 to 40 VDC

Output: 4 to 20 mA

Max. Loop Resistance: 850 Ω at 24VDC

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

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

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

Zero: $\pm 10\%$ • Span: $\pm 10\%$

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

Linearity: $\pm 0.125\%$ of Span

Operational Humidity:

0 to 95%, non-condensing

0 to 100%, condensing for short intervals

Output Current limits:

Less than 1mA and 22.35 ± 0.15 mA

Power Output Shift:

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

Connections: Four 22-gauge etched Teflon leads or terminal blocks

Operating Temperature:

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

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

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





0-100 °F Temp. Transmitter Output Table

| °F | °C | mA | 5V | 10V | °F | °C | mA | 5V | 10V |
|----|--------|--------|------|------|-----|-------|--------|------|-------|
| 0 | -17.78 | 4.000 | 1.00 | 2.00 | 50 | 10.00 | 12.000 | 3.00 | 6.00 |
| 1 | -17.22 | 4.160 | 1.04 | 2.08 | 51 | 10.56 | 12.160 | 3.04 | 6.08 |
| 2 | -16.67 | 4.320 | 1.08 | 2.16 | 52 | 11.11 | 12.320 | 3.08 | 6.16 |
| 3 | -16.11 | 4.480 | 1.12 | 2.24 | 53 | 11.67 | 12.480 | 3.12 | 6.24 |
| 4 | -15.56 | 4.640 | 1.16 | 2.32 | 54 | 12.22 | 12.640 | 3.16 | 6.32 |
| 5 | -15.00 | 4.800 | 1.20 | 2.40 | 55 | 12.78 | 12.800 | 3.20 | 6.40 |
| 6 | -14.44 | 4.960 | 1.24 | 2.48 | 56 | 13.33 | 12.960 | 3.24 | 6.48 |
| 7 | -13.89 | 5.120 | 1.28 | 2.56 | 57 | 13.89 | 13.120 | 3.28 | 6.56 |
| 8 | -13.33 | 5.280 | 1.32 | 2.64 | 58 | 14.44 | 13.280 | 3.32 | 6.64 |
| 9 | -12.78 | 5.440 | 1.36 | 2.72 | 59 | 15.00 | 13.440 | 3.36 | 6.72 |
| 10 | -12.22 | 5.600 | 1.40 | 2.80 | 60 | 15.56 | 13.600 | 3.40 | 6.80 |
| 11 | -11.67 | 5.760 | 1.44 | 2.88 | 61 | 16.11 | 13.760 | 3.44 | 6.88 |
| 12 | -11.11 | 5.920 | 1.48 | 2.96 | 62 | 16.67 | 13.920 | 3.48 | 6.96 |
| 13 | -10.56 | 6.080 | 1.52 | 3.04 | 63 | 17.22 | 14.080 | 3.52 | 7.04 |
| 14 | -10.00 | 6.240 | 1.56 | 3.12 | 64 | 17.78 | 14.240 | 3.56 | 7.12 |
| 15 | -9.44 | 6.400 | 1.60 | 3.20 | 65 | 18.33 | 14.400 | 3.60 | 7.20 |
| 16 | -8.89 | 6.560 | 1.64 | 3.28 | 66 | 18.89 | 14.560 | 3.64 | 7.28 |
| 17 | -8.33 | 6.720 | 1.68 | 3.36 | 67 | 19.44 | 14.720 | 3.68 | 7.36 |
| 18 | -7.78 | 6.880 | 1.72 | 3.44 | 68 | 20.00 | 14.880 | 3.72 | 7.44 |
| 19 | -7.22 | 7.040 | 1.76 | 3.52 | 69 | 20.56 | 15.040 | 3.76 | 7.52 |
| 20 | -6.67 | 7.200 | 1.80 | 3.60 | 70 | 21.11 | 15.200 | 3.80 | 7.60 |
| 21 | -6.11 | 7.360 | 1.84 | 3.68 | 71 | 21.67 | 15.360 | 3.84 | 7.68 |
| 22 | -5.56 | 7.520 | 1.88 | 3.76 | 72 | 22.22 | 15.520 | 3.88 | 7.76 |
| 23 | -5.00 | 7.680 | 1.92 | 3.84 | 73 | 22.78 | 15.680 | 3.92 | 7.84 |
| 24 | -4.44 | 7.840 | 1.96 | 3.92 | 74 | 23.33 | 15.840 | 3.96 | 7.92 |
| 25 | -3.89 | 8.000 | 2.00 | 4.00 | 75 | 23.89 | 16.000 | 4.00 | 8.00 |
| 26 | -3.33 | 8.160 | 2.04 | 4.08 | 76 | 24.44 | 16.160 | 4.04 | 8.08 |
| 27 | -2.78 | 8.320 | 2.08 | 4.16 | 77 | 25.00 | 16.320 | 4.08 | 8.16 |
| 28 | -2.22 | 8.480 | 2.12 | 4.24 | 78 | 25.56 | 16.480 | 4.12 | 8.24 |
| 29 | -1.67 | 8.640 | 2.16 | 4.32 | 79 | 26.11 | 16.640 | 4.16 | 8.32 |
| 30 | -1.11 | 8.800 | 2.20 | 4.40 | 80 | 26.67 | 16.800 | 4.20 | 8.40 |
| 31 | -0.56 | 8.960 | 2.24 | 4.48 | 81 | 27.22 | 16.960 | 4.24 | 8.48 |
| 32 | 0.00 | 9.120 | 2.28 | 4.56 | 82 | 27.78 | 17.120 | 4.28 | 8.56 |
| 33 | 0.56 | 9.280 | 2.32 | 4.64 | 83 | 28.33 | 17.280 | 4.32 | 8.64 |
| 34 | 1.11 | 9.440 | 2.36 | 4.72 | 84 | 28.89 | 17.440 | 4.36 | 8.72 |
| 35 | 1.67 | 9.600 | 2.40 | 4.80 | 85 | 29.44 | 17.600 | 4.40 | 8.80 |
| 36 | 2.22 | 9.760 | 2.44 | 4.88 | 86 | 30.00 | 17.760 | 4.44 | 8.88 |
| 37 | 2.78 | 9.920 | 2.48 | 4.96 | 87 | 30.56 | 17.920 | 4.48 | 8.96 |
| 38 | 3.33 | 10.080 | 2.52 | 5.04 | 88 | 31.11 | 18.080 | 4.52 | 9.04 |
| 39 | 3.89 | 10.240 | 2.56 | 5.12 | 89 | 31.67 | 18.240 | 4.56 | 9.12 |
| 40 | 4.44 | 10.400 | 2.60 | 5.20 | 90 | 32.22 | 18.400 | 4.60 | 9.20 |
| 41 | 5.00 | 10.560 | 2.64 | 5.28 | 91 | 32.78 | 18.560 | 4.64 | 9.28 |
| 42 | 5.56 | 10.720 | 2.68 | 5.36 | 92 | 33.33 | 18.720 | 4.68 | 9.36 |
| 43 | 6.11 | 10.880 | 2.72 | 5.44 | 93 | 33.89 | 18.880 | 4.72 | 9.44 |
| 44 | 6.67 | 11.040 | 2.76 | 5.52 | 94 | 34.44 | 19.040 | 4.76 | 9.52 |
| 45 | 7.22 | 11.200 | 2.80 | 5.60 | 95 | 35.00 | 19.200 | 4.80 | 9.60 |
| 46 | 7.78 | 11.360 | 2.84 | 5.68 | 96 | 35.56 | 19.360 | 4.84 | 9.68 |
| 47 | 8.33 | 11.520 | 2.88 | 5.76 | 97 | 36.11 | 19.520 | 4.88 | 9.76 |
| 48 | 8.89 | 11.680 | 2.92 | 5.84 | 98 | 36.67 | 19.680 | 4.92 | 9.84 |
| 49 | 9.44 | 11.840 | 2.96 | 5.92 | 99 | 37.22 | 19.840 | 4.96 | 9.92 |
| | | | | | 100 | 37.78 | 20.000 | 5.00 | 10.00 |



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 | BAP1-Stat 4 without Display | RuP | RuPS | Decora | "Quantum" Pushbutton Setpoint & BAP1-Stat 4M | "Quantum" Slider Setpoint & BAP1-Stat 4S | X-Combo** | T1K Room Trans | "Quantum Prime" and BAP1-Stat 3* Temp or Humidity Units | BAP1-Stat 4* with Humidity or Dew Point | "Quantum Prime" and BAP1-Stat 3* VOC or CO2 Units | BAP1-Com | |
| Volts | 00 | 0 to 5 V | 5 Volts | 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 | X | X | X | |
| | 02 | 3.7 to 0.85 V | 2.85 Volts | X | | X | X | X | X | X | | | X | X | X | X | |
| | 03 | 5 to 0 V | 5 Volts | X | | X | X | X | X | X | Ch 3 | | | | X | X | |
| | 04 | 4.2 to 1.2 V | 3 Volts | X | | X | X | X | X | X | | | X | | X | X | |
| | 07 | 2.773 to 0.43 V | 2.343 Volts | X | | X | X | X | X | X | | | | X | X | X | |
| | 10 | 0 to 10 V | 10 Volts | X | | X | X | X | X | X | | | X | X | X | X | |
| | 11 | 2 to 10 V | 8 Volts | X | | X | X | X | X | X | | | | X | X | X | |
| | Current | 16 | 4.20 mA | 16 mA | | | | | | | | Ch 1,2 | X | X | | | |
| | <1kQ Span | 20 | 889 to 111 Ω | 778 Ω | | | X | | X | X | | | | X | X | | X ² |
| | | 21 | 792 to 208 Ω | 584 Ω | | | X | | X | X | | | | X | X | | X ² |
| 22 | | 695 to 305 Ω | 390 Ω | | | X | | X | X | | | | X | | X | X ² | |
| 23 | | 674 to 274 Ω | 400 Ω | X | | X | | X | X | X | | | | X | | X ² | |
| 24 | | 597 to 305 Ω | 292 Ω | | | X | | X | X | X | | | X | X | X | X ² | |
| 25 | | 800 to 1200 | 400 Ω | X | | X | | X | X | X | | | X | X | X | X ² | |
| 26 | | 909 to 1309 | 400 Ω | 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 ² | |
| 28 | | 865 to 1286 | 400 Ω | 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 ² | |
| 40 | | 0 to 1 kΩ | 1 kΩ | X | | X | | X | X | X | | | X | X | X | X ² | |
| 1kQ Span | 41 | 500 to 1500 Ω | 1 kΩ | X | | X | | X | X | X | | | X | X | X | X ² | |
| | 42 | 2 to 3 kΩ | 1 kΩ | X | | X | | X | X | X | | | X | X | X | X ² | |
| | 43 | 249 to 1249 Ω | 1 kΩ | X | | X | | X | X | X | | | X | X | X | X ² | |
| | 44 | 10 to 11 kΩ | 1 kΩ | X | | X | | X | X | X | | | X | X | X | X ² | |
| | 45 | 12.5K-11.5K Ω | 1 kΩ | X | | X | | X | X | X | | | X | X | X | X ² | |
| | 46 | 1K to 0 Ω | 1 kΩ | X | | X | | X | X | X | | | X | X | X | X ² | |
| | 47 | 182 to 1182 Ω | 1 kΩ | X | | X | | X | X | X | | | X | X | X | X ² | |
| | 2kQ Span | 48 | 0 to 2 kΩ | 2 kΩ | | | | | | X | | | | | | | X |
| | 55 | 0 to 1.5 kΩ | 2 kΩ | | | | | | | | X | | | | | X | |
| | 5kQ Span | 50 | 0 to 5 kΩ | 5 kΩ | | | X | | X | | | | | X | | | X |
| | | 51 | 7.87k to 2.87kΩ | 5 kΩ | X | | X | | X | X | | | | X | | | X |
| 52 | | 10.0k to 15.0kΩ | 5 kΩ | X | | X | | X | X | | | | X | | | X | |
| 53 | | 2.5k to 7.5kΩ | 5 kΩ | X | | X | | X | X | | | | X | | | X | |
| 54 | | 1k to 6kΩ | 5 kΩ | X | | X | | X | X | | | | X | | | X | |
| 60 | | 0 to 10 kΩ | 10 kΩ | 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 | |
| 62 | | 9577 to 1422 Ω | 8.16k | | | X | | X | X | | X | | | | | X | |
| 63 | | 1 to 11 kΩ | 10 kΩ | X | | X | | X | X | X | X | | | X | | X | |
| 64 | | 200 to 10.2 kΩ | 10 kΩ | X | | X | | X | X | X | X | | | X | | X | |
| 10kQ Span | | 65 | 10.4k to 400Ω | 10 kΩ | X | | X | | X | X | X | X | | | X | | X |
| | 66 | 10 kΩ to 0 | 10 kΩ | X | | X | | X | X | X | X | | | X | | X | |
| | 67 | 5k to 15 kΩ | 10 kΩ | X | | X | | X | X | X | X | | | X | | X | |
| | 68 | 9629 to 806 Ω | 10 kΩ ¹ | | | X | | X | X | X | X | | | X | | X | |
| | [XL]** | 10.6K to 600Ω | 9.62 kΩ | X | | X | | X | X | X | X | | | X | | X | |
| | 80 | 0 to 20 kΩ | 20 kΩ | 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 | |
| | 82 | 6.19 to 26.19 kΩ | 20 kΩ | 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 | |
| | 84 | 10 to 30 kΩ | 20 kΩ | X | | X | | X | X | X | X | | | X | | X | |
| | 100kQ | 85 | 24.75 to 4.75 kΩ | 20 kΩ | X | | X | | X | X | X | X | | | X | | X |
| 90 | | 0 to 100 kΩ | 100 kΩ | X | | X | | X | X | X | X | | | X | | X | |
| 50kQ | 91 | 25K to 75 kΩ | 50 kΩ | | | X | | X | | | | | X | | | | |

*Setpoint range must be within displayed temperature range

**XL 10 Option

***The X-Combo unit uses a unique set of designators for the ranges, not the designators listed on this page. See the X-Combo ordering grid for the designators.

†Only available with pushbutton style setpoint sensors.

‡The resolution is 40µ 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.



Setpoint Display Ranges for BAPI Room Sensors

| Designator | Setpoint Display Range** | | | | BAPI Room Sensors With Display | | | | | | T1K Room Trans | "Quantum Prime" or BAPI- Stat 3" Temp & Humidity | "Quantum Prime" or BAPI- Stat 3" VOC & CO2 | BAPI-Com** |
|------------|--------------------------|-------------|-------------|------------|--------------------------------|--------------------------|------------------------------------|--------------------------|-------------------------------|---|-------------------|---|---|-----------------------------|
| | °F | °C | Humidity | Generic | RuP | RuPS | "Quantum", Decora & BAPI-Stat 4 | X-Combo* | T1K Room Trans | "Quantum Prime" or BAPI- Stat 3" Temp & Humidity | | | | |
| A | | | | -3 to +3 | X | | X | X | X | X | | X | | X |
| B | | | | -5 to +5 | X | | X | X | X | X | | X | | X |
| C | | | | | X | | X | X | X | X | | X | | X |
| D | 50 to 90°F | 10 to 32°C | | | X | | X | X | X | X | | X | | X |
| E | 55 to 85°F | 13 to 30°C | | | X | | X | X | X | X | | X | | X |
| F | 60 to 80°F | 15 to 27°C | | | X | | X | X | X | X | | X | | X |
| G | 65 to 80°F | 18 to 27°C | | | X | | X | X | X | X | | X | | X |
| H | 45 to 96°F | 7 to 35°C | | | X | | X | X | X | X | | X | | X |
| I | -20 to 120°F | -29 to 48°C | | | X | | X | X | X | X | | X | | X |
| J | 68 to 78°F | 20 to 26°C | | | 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 |
| M | | | 0 to 100%RH | | | | | X | X | X | | X | | X |
| N | | | 35 to 70%RH | | | | | X | X | X | | X | | X |
| P | | | | -2 to +2 | X | | X | X | X | X | | X | | X |
| X | 40 to 80°F | 4 to 27°C | | | X | | X | X | X | X | | X | | X |
| AA | 60 to 85°F | 15 to 30°C | | | X | | X | X | X | X | | X | | X |
| BB | 54 to 90°F | 12 to 32°C | | | X | | X | X | X | X | | X | | X |
| CC | 41 to 85°F | 5 to 30°C | | | X | | X | X | X | X | | X | | X |
| DD | 32 to 100°F | 0 to 38°C | | | X | | X | X | X | X | | X | | X |
| EE | 67 to 77°F | 19 to 25°C | | | X | | X | X | X | X | | X | | X |
| FF | | | | -10 to +10 | X | | X | X | X | X | | X | | X |
| GG | 0 to 100°F | -18 to 38°C | | | X | | X | X | X | 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 | 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 | X | | X | | X |
| SS | 25 to 50°F | -4 to 10°C | | | | | | | X | X | | X | | X |
| | | | | | 32 to 110°F 0 to 43°C | 32 to 110°F 0 to 43°C | 32 to 99°F 0 to 60°C | 32 to 158°F 0 to 70°C | -147 to 999°F -99 to 999°C | -40 to 185°F -40 to 85°C | X | -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 and 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 | 12.886k | 11.86k | | | 13.86k | | RuPM, BAPIStat 2 & 4 |

Resistance Output Values for Units with Heat/Off/Cool Mode and On/Auto Fan Control

| Designator | Mode Control Selection and Resistance Output Value | | | | | | Room Sensor Models |
|------------|--|----------|-----------|---------|--------|---------|----------------------|
| | Heat/Auto | Off/Auto | Cool/Auto | Heat/On | Off/On | Cool/On | |
| H0F | 5k | 10k | 15k | 20k | 25k | 30k | RuPM, BAPIStat 2 & 4 |
| H01 | 0k | 2k | 4k | 6k | 8k | 10k | RuPM, BAPIStat 2 & 4 |

Resistance Output Values for BAPI-Stat 2 & 4 Units with Heat/Cool and Off/Auto Control

| Designator | Mode Control Selection and Resistance Output Value | | | | | | Room Sensor Models |
|------------|--|------|------|-----|--|--|---------------------|
| | Heat | Cool | Auto | Off | | | |
| H02 | 5k | 10k | 15k | 20k | | | BAPIStat 2 & 4 Only |



Below is a complete list of the "Optional Selections" available for the BAPI-Stat "Quantum" and "Quantum Prime" room units.

| BAPI-Stat "Quantum" Available Options | | | | | | | | |
|---------------------------------------|------------------------|-----------------------------------|--|--|--|-------------------------------------|----------------------|--|
| Designator | Option Description | Temperature Only, No Display Unit | Temperature Only, Pushbutton Setpoint and Display Unit | Temperature Only, Slider Setpoint and Display Unit | Temp/Humidity, Wipedown, Keypad and Display Unit | Temp/Humidity, Slider Setpoint Unit | CO2 or VOC Only Unit | Temp/Humidity, CO2 or VOC "Quantum Prime" Unit |
| 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 | | | | | | |

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 enclosure include the BAPI-Box Crossover, Junction Box, the Weatherproof Enclosure (or “Bell Box”), and the BAPI-Box, BAPI-Box 2 and BAPI-Box 4.

BAPI-Box Crossover

The BAPI-Box Crossover is made of UV-resistant polycarbonate 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.

NEMA 1: Constructed for indoor use to provide a degree of protection against falling dirt.

IP20: Protected against solid objects greater than 12.5mm diameter

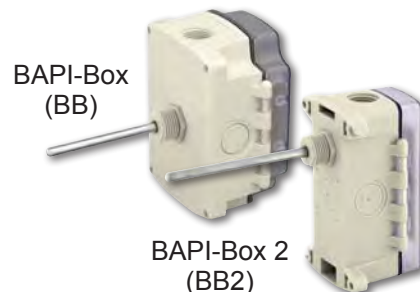
Junction
Box (JB)

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)

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)

Weatherproof Enclosure (“Bell Box”)

The Weatherproof Enclosure is made of cast aluminum and carries a NEMA 3R rating.

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.

IP24: Protected against solid foreign objects greater than 12.5mm diameter, and protected against splashing water.



Weatherproof (WP)

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.

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



The IEC (International Electrotechnical Commission) is an international committee that develops and publishes its recommendations for standardising 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 tilted up 15° |
| 3 | Protected against spraying water |
| 4 | Protected against splashing water |
| 5 | Protected against water jets |
| 6 | Protected against powerful jets from any direction |
| 7 | Protected against the effects of total water immersion up to 1M |
| 8 | Protected against the effects of total water immersion beyond 1M |

Therefore an IP66 rated enclosure is “dust tight and protected against powerful jets of water from any direction.”

If you have any questions about BAPI enclosures please call your BAPI representative.

Reference: IEC Publication 60529 - Classification of Degrees of Protection Provided by Enclosures



The **National Electrical Manufacturers Association (NEMA)** Standards Publication No. 250 defines 13 different enclosure “types” for non-hazardous locations. These NEMA types define the applications and the environmental conditions that enclosures are designed to protect against when properly installed.

Type 1: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment, and to provide a degree of protection against falling dirt.

Type 2: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment, to provide a degree of protection against falling dirt, and to provide a degree of protection against dripping and light splashing of liquids.

Type 3: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and that will be undamaged by the external formation of ice on the enclosure.

Type 3R: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow; and that will be undamaged by the external formation of ice on the enclosure.

Type 3S: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and in which the external mechanism(s) remain operable when ice laden.

Type 4: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.

Type 4X: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water; and corrosion; and that will be undamaged by the external formation of ice on the enclosure.

Type 5: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against settling airborne dust, lint and fiber flyings; and to provide a degree of protection against dripping and light splashing of liquids.

Type 6: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose directed water and the entry of water during occasional temporary submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.

Type 6P: Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose directed water and the entry of water during prolonged submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.

Type 12: Enclosures constructed (without knockouts) for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint and fiber flyings; and against dripping and light splashing of liquids.

Type 12K: Enclosures constructed (with knockouts) for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint, fiber flyings; and against dripping and light splashing of liquids.

Type 13: Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint and fiber flyings; and against spraying splashing, and seepage of water, oil and noncorrosive coolants. If you have any questions about BAPI enclosures or NEMA ratings, please call your BAPI representative.

Reference: NEMA Standard 250-1997, “Enclosures for Electrical Equipment (1000 Volts Maximum)”

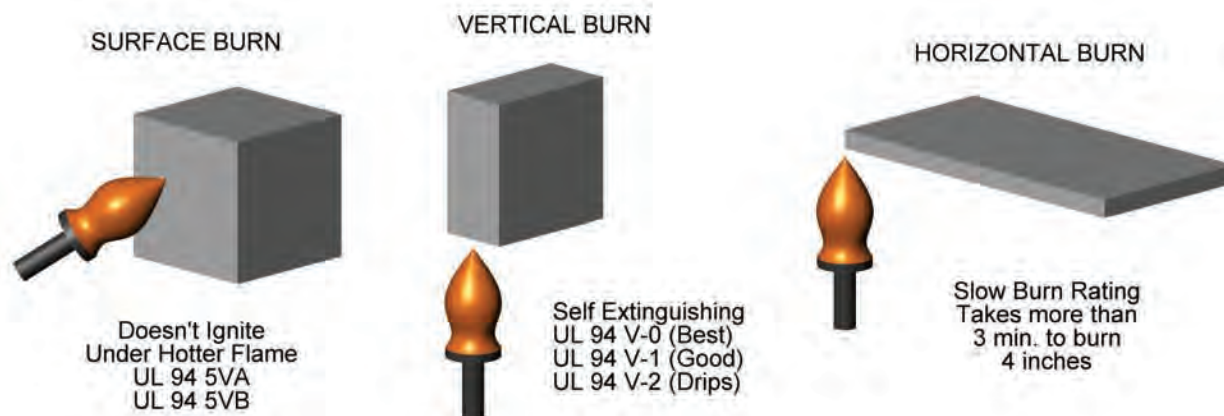




All of BAPI's indoor sensor bodies and transmitter enclosures are made from UL94, V-0 rated plastics.

UL94 serves as a preliminary indication of a plastic's acceptability for use as part of a device or appliance with respect to its flammability. It is not intended to reflect the hazards of a material under actual fire conditions.

The 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.





Recently BAPI changed its certification form to match the requirements of the National Institute of Standards and Technology data reporting standard.

| Customer | | Your Company Name | | Order # | Your Order # | CalDate | 2/17/2006 |
|---------------|----------|---------------------------|--------------------|---------|---------------|----------------|-----------|
| Serial # | BCC146 | BA/T1KM[-40 TO 120F]-O-WP | | | CalDue | 5/18/2006 | |
| Certificate # | BCEC1226 | Cal. Procedure | T1KCalibration.pdf | | Calibrated By | Tim VanBlarcom | |

The first section (shown above) indicates the product being certified, the customer and the order number.

| Environmental Conditions | | |
|--------------------------|------|----------------|
| Humidity %RH | 38 | Temperature °F |
| | | 71.6 |
| Pressure | 1016 | Pascals |

The second section (shown above) records the relative humidity, temperature and atmospheric pressure of the test laboratory.

| Calibration Standards | | |
|-----------------------|---------------------|-------------|
| BAPI ID# | Description | Uncertainty |
| BAPI0016 | SPRT | .02°C |
| BAPI0015 | Digital Thermometer | .02°C |
| BAPI0116 | Digital Multimeter | .001% |
| | | |
| | | |

The third section (shown above) is an inventory of the equipment used to perform the certification. Uncertainty is the tolerance of the instrument's measurement as determined during its last calibration at a NIST certified calibration center.

| Results | | | | | | | |
|---------|-------|-----------|-------------|----------|------------|---------|------------|
| Test | Units | Reference | Uncertainty | As Found | Difference | As Left | Difference |
| 00.0 | °F | -0.2 | .04°C | 00.0 | .2 | -0.2 | 0 |
| 40.0 | °F | 40.0 | .04°C | 40.3 | .3 | 40.1 | .1 |
| 80.0 | °F | 80.6 | .04°C | 80.8 | .2 | 80.6 | 0 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Notes | | | | | | | |

The fourth section (shown above) details the certification results. The column labeled Test defines the test procedure or procedures that were used to certify the product. The column labeled Units defines the units of measure used for the test. The three test conditions for this certification were 0°F, 40°F and 80°F.





The column labeled Reference is the actual test condition as measured by the Calibration Standards referenced in the inventory described above. For the test shown, the test condition at 0°F was actually -0.2°F, we achieved 40°F and 80°F was actually 80.6°F. The next column labeled Uncertainty is the tolerance of Calibration standards used to measure the test condition temperature.

The column labeled As Found is the transmitters output before any corrections are made to the transmitter. If the output is a 4 to 20mA current loop, the output is changed to the units of the parameter being measured, in this case Fahrenheit temperature. The next column labeled Difference is the difference or offset of the As Found to the Reference.

The column labeled As Left is the transmitters output after any corrections are made to the transmitter. This is how the equipment is sent to you. If the output is a 4 to 20mA current loop, the output is changed to the units of the parameter being measured, in this case Fahrenheit temperature. The next column labeled Difference is the difference or offset of the As Left to the Reference. This last Difference column is the offset you should use in your controller to correct the temperature.

This notification serves to certify that the unit described above has been inspected and tested in accordance with specifications published by Building Automation Products Inc.

The accuracy and calibration of this instrument are traceable through reference standards that are compared, at planned intervals, to national standards maintained by the National Institute of Standards and Technology (NIST), by comparison to natural physical constants.

The measurement standards which support this calibration are calibrated on a schedule to maintain the required accuracy level.

For recalibration and recertification of this unit or for other testing or calibration services contact:



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

**Phone (608) 735-4800
Fax (608) 735-4804**

The last section (shown above) notifies you that all instruments used to certify the equipment are properly calibrated and traceable to NIST.

Additional information on specific Temperature, Pressure and Humidity Certification documents is found on the following three pages.

If you have any questions about the certification documents, please contact your BAPI representative.





Shown below is an NIST Traceable Certificate of Calibration for a recent T1K order.

Each transmitter is calibrated for its range using precision resistors. A Class A RTD is given a unique serial number and attached to the transmitter. The RTD is subjected to each temperature certification point and the temperature transmitter's output is recorded at each point. BAPI normally tests at 25%, 50% and 75% of temperature span. BAPI will test at any temperature that you specify. BAPI can generate and certify temperatures between -50°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.

| Customer | | Order # | | Your Order # | | CalDate | |
|---------------|----------|---------------------------|--|--------------------|--|----------------|--|
| Serial # | BCC146 | BA/T1KM[-40 TO 120F]-O-WP | | | | 2/17/2006 | |
| Certificate # | BCEC1226 | Cal. Procedure | | T1KCalibration.pdf | | CalDue | |
| | | | | | | 5/18/2006 | |
| | | | | 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.

| 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 |
| -.10 to 0.10 | in W.C. | .070 | .001% | .0698 | -.0002 | .0698 | -.0002 |
| -.025 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 |
| -.100 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 |
|---|--|--|



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. In fact, the majority of BAPI products were RoHS compliant as of March 2006.

European Union's RoHS Directive

RoHS is the shorthand for the European Union's legislation, Reduction of Hazardous Substances in Electronics Manufacturing. The RoHS directive places restrictions on the use of six hazardous substances in electrical and electronic equipment. These substances are lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers.

The intent of RoHS is to reduce the amount of these hazardous substances which enter the waste stream where they can impact soils and groundwater. In general, the RoHS directive is aimed at consumer-level finished electronic products that have relatively short life spans and enter the waste stream at high rates. The directive does not target electrical and electronic equipment that is permanently mounted in a fixed installation inside a building, such as HVAC/R control system equipment. Such items have very long lives and are not disposed of in quantities that significantly impact the concentration of hazardous substances in the community waste stream. Therefore, many manufacturers of such equipment have claimed exemption from the RoHS directive. BAPI, however, has chosen to comply with the RoHS directive because of our commitment to environmentally responsible manufacturing practices.





Below is a list of Pressure Sensor Terms and their definitions:

1. **Burst pressure**
Maximum pressure that may be applied to the sensor without rupture. No physical damage is allowed to the sensor, but it may need factory recalibration as it may strain the sensors internal mounting. BAPI's ZPS burst pressure is 10psi. To date, no ZPS unit has required factory recalibration when subjected to these pressures.
2. **Proof pressure**
Maximum pressure that may be applied without changing the transducer performance beyond specified tolerances. BAPI's ZPS proof pressure is 5psi.
3. **Bidirectional**
Takes the specified range and turns it into plus or minus of that range. The output signal is at the center of the range at zero pressure. The procedure used to turn the ZPS into a bidirectional unit is in the ZPS Installation and Operation document 13086_ins_zps_display.pdf available through your friendly BAPI representative.
4. **Auto Zero**
Field calibration of the zero pressure output. The procedure used to auto zero the ZPS is in the ZPS Installation and Operation document 13086_ins_zps_display.pdf available through your friendly BAPI representative.
5. **Range**
Specified endpoint pressures
6. **Span**
Arithmetic difference between two pressure endpoints
7. **Sensitivity**
Ratio of output signal change to a corresponding input pressure change
8. **Pressure**
Force per unit area
9. **Velocity**
Displacement per unit time
10. **Absolute Pressure**
Pressure measured relative to a perfect vacuum
11. **Differential Pressure**
Pressure difference measured between two pressure sources
12. **Gauge Pressure**
Differential pressure between the local ambient pressure and another pressure source
13. **Static pressure**
Pressure on the walls of a vessel at right angle to any flow. Static pressure is usually measured with a static pressure probe. ZPS/ACC07 or ZPS/ACC08
14. **Velocity pressure**
Pressure caused by the momentum of moving air Velocity pressure is usually measured with a pitot tube assembly. ZPS/ACC11 or ZPS/ACC12
15. **Total pressure**
Arithmetic sum of static pressure and velocity pressure. Total pressure is usually measured with a total pressure tube.

If you have any additional questions, please contact your BAPI representative.





Recommended wire lengths for various power loads

When an electric current flows through a wire there is a drop in voltage due to the resistance of the wire. The voltage drop is found from Ohm's Law: **$E=IR$** , or **Voltage Drop = Wire Resistance x Amps of Current**.

The wire length recommendations below represent a 10% voltage drop in a 24 VAC or VDC circuit for various wire gauges and maximum currents. The voltage drop is linear, therefore cutting the wire length in half would result in a 5% voltage drop rather than a 10% voltage drop. The currents in the two tables represent the various models of power supplies and voltage converters available from BAPI.

Wire length recommendations in Table 1 are based on a wire temperature of 70 °F. If the wire is run in a portion of the building where temperatures can increase to 140 °F, such as an unventilated attic, then decrease the recommended wire length by 5%, as shown in Table 2.

The minimum wire gauge is determined by the maximum worst-case load. When in doubt, use the next larger size wire. All wiring must comply with the National Electric Code (NEC) and local codes.

Table 1: Recommended wire lengths at 70 °F and below (10% maximum drop in voltage)

| Wire gauge | Ω/1000 ft (305 M) @ 70°F | Distance @ 75 mA | Distance @ 100 mA | Distance @ 350 mA | Distance @ 1.5 Amp | Distance @ 3 Amps |
|------------|-----------------------------|---------------------|----------------------|----------------------|-----------------------|----------------------|
| 22 | 16.8 | 1905 ft (581 M) | 1429 ft (435 M) | 408 ft (124 M) | 95 ft (29 M) | 48 ft (15 M) |
| 20 | 10.5 | 3048 ft (929 M) | 2286 ft (697 M) | 653 ft (199 M) | 152 ft (46 M) | 76 ft (23 M) |
| 18 | 6.6 | 4848 ft (1478 M) | 3636 ft (1109 M) | 1039 ft (317 M) | 242 ft (74 M) | 121 ft (37 M) |
| 16 | 4.2 | 7619 ft (2322 M) | 5714 ft (1742 M) | 1633 ft (498 M) | 381 ft (116 M) | 190 ft (58 M) |

Table 2: Recommended wire lengths above 70 °F (10% maximum drop in voltage)

| Wire gauge | Ω/1000 ft (305 M) @ 70°F | Distance @ 75 mA | Distance @ 100 mA | Distance @ 350 mA | Distance @ 1.5 Amp | Distance @ 3 Amps |
|------------|-----------------------------|---------------------|----------------------|----------------------|-----------------------|----------------------|
| 22 | 16.8 | 1810 ft (522 M) | 1357 ft (414 M) | 388 ft (118 M) | 90 ft (27 M) | 45 ft (14 M) |
| 20 | 10.5 | 2895 ft (882 M) | 2171 ft (662 M) | 620 ft (189 M) | 145 ft (44 M) | 72 ft (22 M) |
| 18 | 6.6 | 4606 ft (1404 M) | 3455 ft (1053 M) | 987 ft (301 M) | 230 ft (70 M) | 115 ft (35 M) |
| 16 | 4.2 | 7238 ft (2206 M) | 5429 ft (1655 M) | 1551 ft (473 M) | 362 ft (110 M) | 181 ft (55 M) |

If you have any additional questions, please contact your BAPI representative.

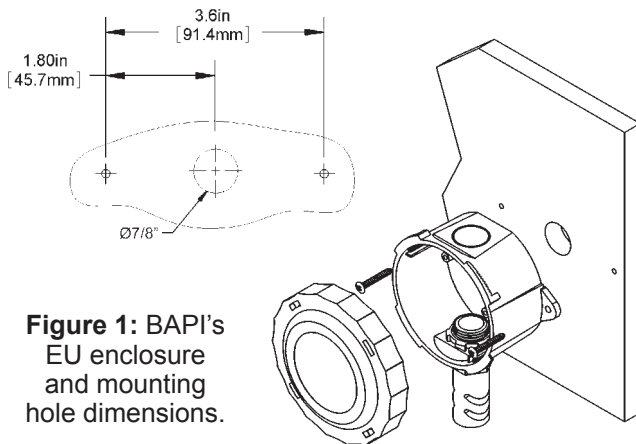


Figure 1: BAPI's EU enclosure and mounting hole dimensions.

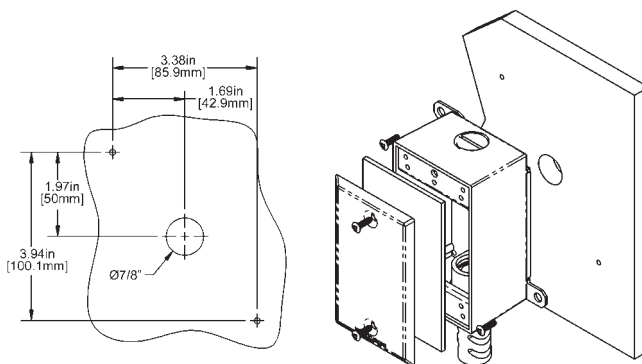


Figure 2: BAPI's WP enclosure and mounting hole dimensions.

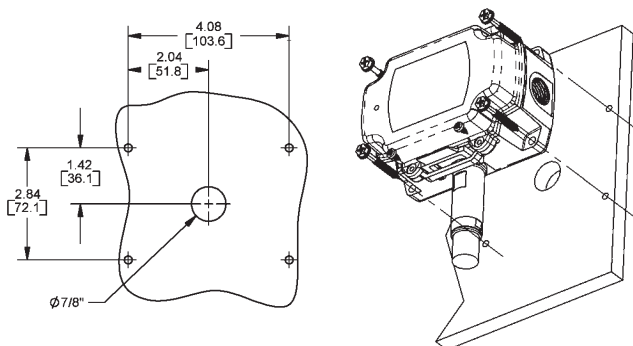


Figure 3: The BAPI-Box enclosure and mounting hole dimensions.

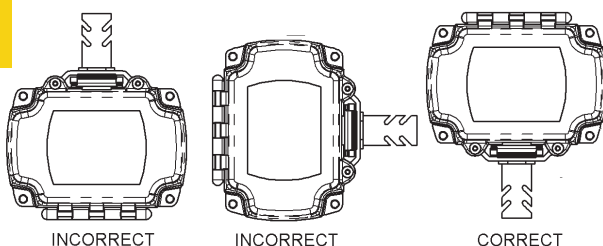


Figure 4: Proper orientation of the BAPI-Box enclosure.

Proper Procedure for Mounting BAPI Outdoor Sensors

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 affect humidity readings. BAPI's tests show that humidity readings can be affected by as much as 30% RH when the sensor is in direct sunlight. In far northern or southern latitudes, be aware that at sunrise or sunset the sun can illuminate all sides of a building.

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 (BA/SFC1000 - Crimp-On Style or BA/SFC2000 - Twist-On Style) 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.

References

<http://weather.gov/om/coop/standards.htm>

The State Climatologist (1985) Publication of the American Association of State Climatologists: Heights and Exposure Standards for Sensors on Automated Weather Stations, v. 9, No. 4 October, 1985.

EPA (1987). On-Site Meteorological Program Guidance for Regulatory Modeling Applications, EPA-450/4-87-013. Office of Air Quality Planning and Standards, Research Triangle Parks, North Carolina 27711.

WMO (1983). Guide to Meteorological Instruments and Methods of Observation. World Meteorological Organization No. 8, 5th edition, Geneva Switzerland.



When thermowells are too big to fit into small pipes, you can still measure water temperature by strapping a small, wired temperature probe to the pipe. BAPI recommends using the remote probe with FEP jacketed cable because of its moisture resistance and because of the higher temperatures encountered in this application.

There are two ways to mount the sensor to the pipe.

Figure 1 shows the probe strapped to the pipe with cable ties. Hose clamps may be used too.

Make sure the probe is securely touching the pipe before clipping the ends off the cable ties. Secure the sensor lead to the pipe for strain relief. Wrap insulation a minimum of 1/2 inch thick around the probe and 4 inches to either side of it. Polyester quilt batting, purchased at a craft store, makes a good insulation that won't make your skin itch. Preformed, molded rubber or fiberglass pipe insulation works well too. Spray foam insulation is another alternative. Any standard insulation material may be used. If necessary, protect the insulation with an over-wrap of tape.

Using BAPI's Foamback Insulator (as shown in Figure 2 below) is another easy way to mount and insulate the probe. The Foamback Insulator is made from medical grade, closed cell foam, insuring that the probe is reading the pipe temperature, not the room temperature.

Clean and dry the pipe. Peel off the protective cover from the foamback's adhesive side and stick the probe to the adhesive. Stick the foamback/probe assembly to the pipe. Add cable ties or hose clamps to ensure that the sensor always stays attached to the pipe, avoiding costly callbacks.

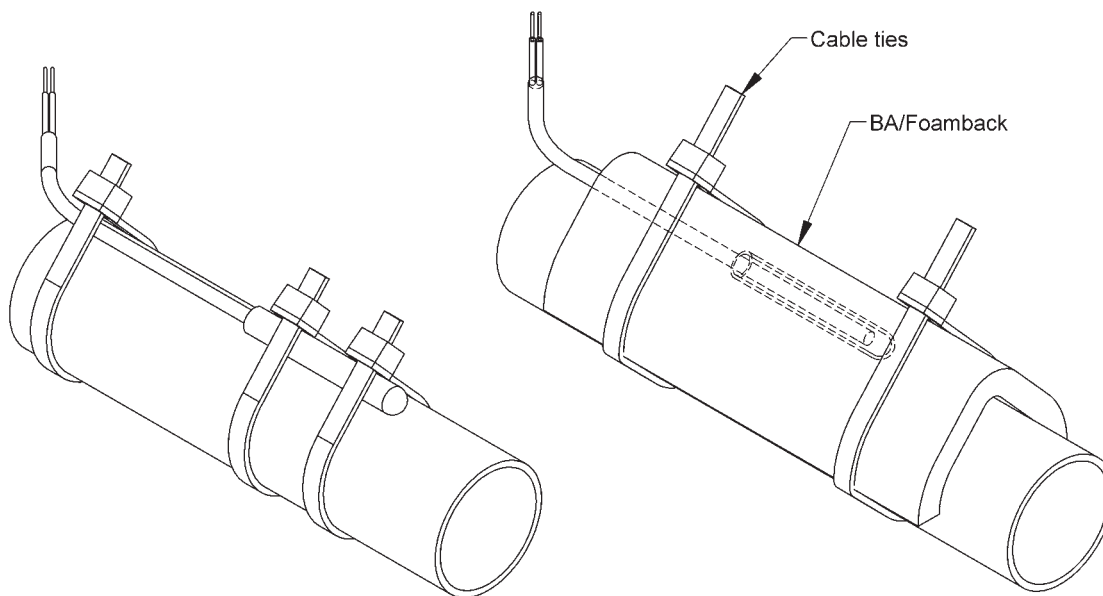


Figure 1: Remote probe with FEP jacketed cable strapped directly to pipe.

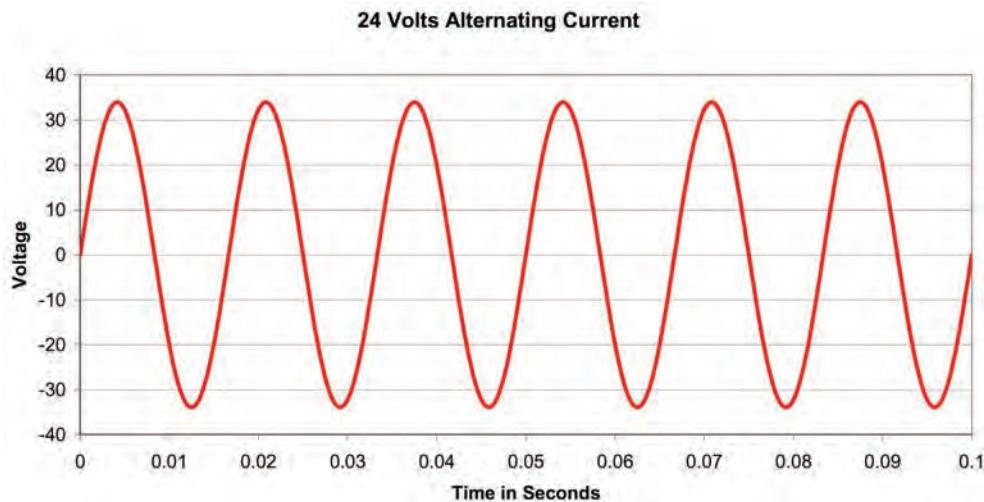
Figure 2: Remote probe with FEP jacketed cable applied beneath a FOAMBACK insulator.

Note: 1.25 inch diameter pipe shown, this technique may be used for any diameter pipe.



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) 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 contact person noted on the order or to a 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.

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***Ordering continued...*****BACK ORDERS**

BAPI ships complete orders whenever possible to keep freight charges to a minimum. In the event that an order cannot be completely filled as scheduled, BAPI will contact the customer with information regarding the delay and advise a new ship date whenever possible. At that time a customer may elect to accept a partial shipment. Back orders will be shipped as soon as possible.

FREIGHT

Customer is responsible for all shipping charges billed on each invoice. Any discrepancies in shipments must be brought to the attention of our Sales Department within ten (10) working days of receipt of shipment. Deductions from remittances will not be allowed unless authorized by BAPI in writing. Please notify BAPI of Goods Damaged in Transit within 5 business days of receipt. Also, take photos upon receipt for proper case documentation.. DO NOT return the shipment to BAPI.

Free Ground Shipping Terms & Conditions

BAPI offers free ground shipping on orders being shipped within the contiguous United States. Orders requiring expedition – as well as orders to Hawaii, Alaska, Guam and Puerto Rico – will have shipping added to the invoice. BAPI will not third party bill or bill recipient bill a customer's shipping account for a domestic shipment. International customers shipping to a freight forwarder within the contiguous United States will receive free ground shipping and have any expedited costs added to their invoice. Residential customers qualify for BAPI's free shipping program. Customers may request one of three preferred carriers, including UPS, Fed Ex and Speedee. Customers who provide invalid addresses will have charges added to their invoice. Expedited shipping charges will coincide with the UPS world ship rate, which is less than published rate. International customers whose product ships directly to their location may request to have shipping costs billed to their respective shipping account. BAPI's free shipping program is subject to change without notice.

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 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 issue a labor credit* for the time required to repair or replace them with BAPI products; provided that:

1. 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;
2. The product has not been repaired or altered by anyone except BAPI or its authorized service agencies;
3. The serial number or date code has not been removed, defaced, or otherwise changed;
4. Examination discloses, in the judgment of BAPI, the defect in materials or workmanship which developed under normal installation, use and service;
5. 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.

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Warranty continued...

BAPI will pay the freight for all units being returned to the customer where a defect was found. In the case that no defect was found with the units received, or the defect was determined to be caused by customer error or abuse, the customer will be responsible for the payment of the shipping charge to return the units. The customer will need to supply a FED-Ex or UPS account number for shipping charges if units are to be returned. Purchase orders will not be accepted for return shipping. In cases where units are repairable but not covered under BAPI's warranty, customers may elect to have BAPI repair the unit at a rate of \$60 per hour.

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 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 pay for labor or other related expenses associated with the troubleshooting and/or repair of 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.

***Labor Credit**

Warranty labor credits are issued in the form of a product credit and cover the direct hard labor costs to repair or replace the product only. Requests for labor credits must include a written invoice describing the labor performed and the billed labor rate. Under no circumstances does BAPI agree to pay for labor associated with the repair or replacement of our products without prior specific written authorization. BAPI reserves the right to refute or refuse labor credit warranty claims that do not meet the specified terms and conditions.

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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