



**Building
Automation
Products, Inc.**

Sensors for HVAC/R



***2011 Catalog
of BAPI sensors
made exclusively for***

AUTOMATEDLOGIC®
CORPORATION

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Wireless Temperature and/or Humidity Sensors - pgs 2-3

Wireless
Temperature and/
or Humidity
Sensor

LS3-WTH



Wireless
Temperature and/
or Humidity
Sensor with
Setpoint and
Occupant
Override

LS3-WTH-SO

***LSBASE2 or LSPLUS2 - pgs 4-5***

Temperature Sensor
with Optional Setpoint
Adjustment and
Occupant Override

LSBASE2



LSPLUS2

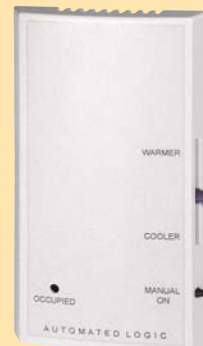
***LSBASE2H or LSPLUS2H - pgs 6-7***

Combination
Temperature/Humidity
Sensor with Optional
Setpoint Adjustment
and Occupant Override

LSBASE2



LSPLUS2



Wireless Sensing

Temperature & Humidity Sensing

Manufactured by BAPI exclusively for Automated Logic Corporation



LS3-WT or
LS3-WTH



LS3-WT-SO or
LS3-WTH-SO

The BAPI Wireless Transmitter measures the room Temperature and/or Humidity and transmits the data through 418MHz RF to a Receiver or Wireless Point Manager. The wireless transmitter has a minimum in-building range of 100 feet. The transmit rate is approximately once every 10 seconds with an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries.

The information from the transmitter is received by a Wireless Point Manager and converted to ethernet (TCP/IP) or serial protocol for the network. Instructions for using the Wireless Point Manager/ Receiver, please see the ALC document "Point Six Integration Guide".

Key Features and Benefits

- 8 Year Battery Life
- Built In Error Detection
- 100 feet range, extendable to 1,000 feet with Repeater
- Optional Temp. Setpoint & Override



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1150 Roberts Boulevard Kennesaw, Georgia 30144

Wireless Repeater

Extends the range of the
Wireless Transmitters up
to 1,000 feet.

Wireless
Repeater



Wireless Point Manager/Receiver

Receives the RF signal from up to 100 wireless transmitters and converts the data to ethernet (TCP/IP) or serial protocol for the network. The data can then be viewed and accessed by any standard internet browser.

For instructions on using the Wireless Point Manager/Receiver, please see the ALC document "Point Six Integration Guide".

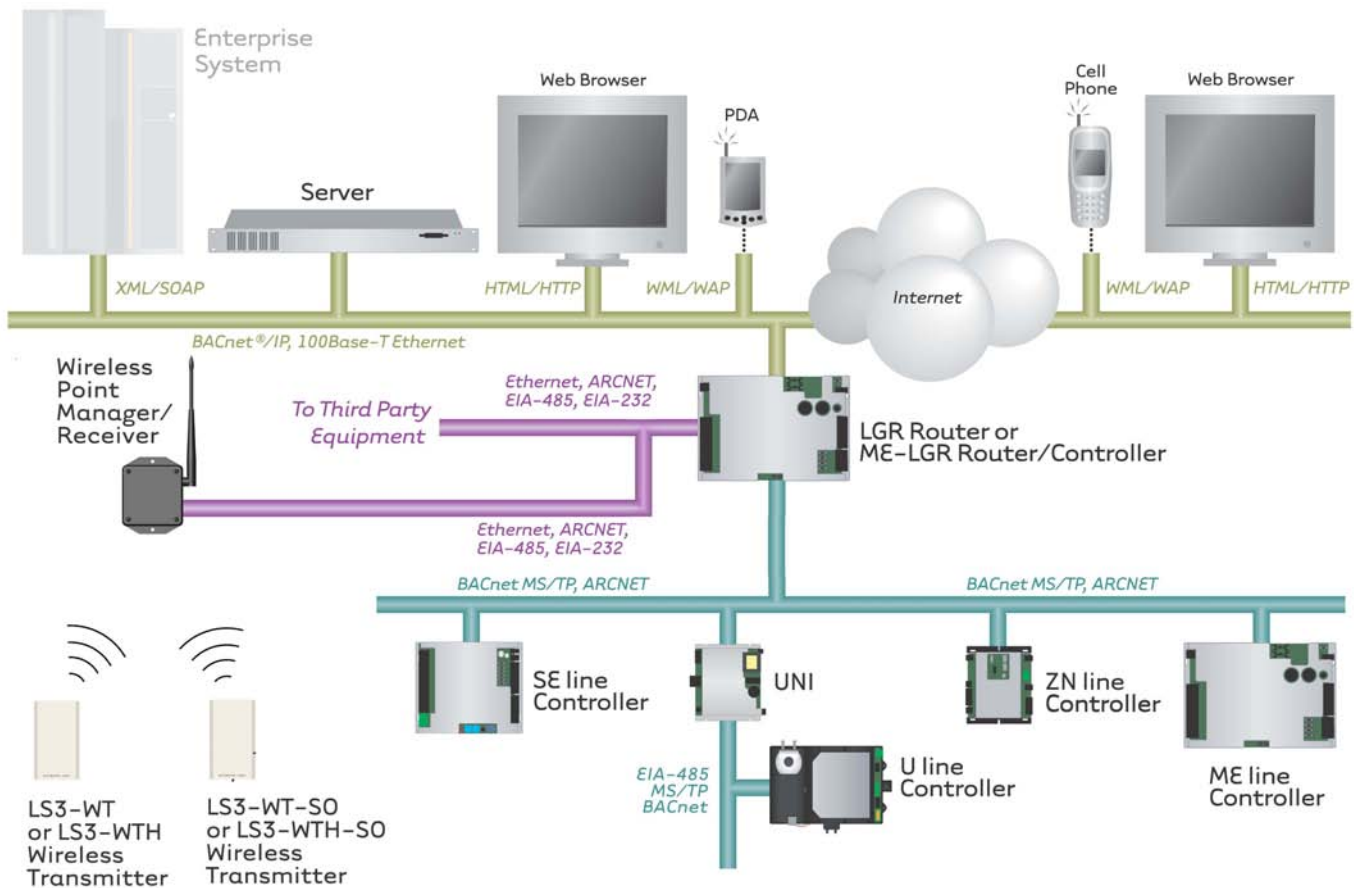
Wireless
Point Manager/
Receiver



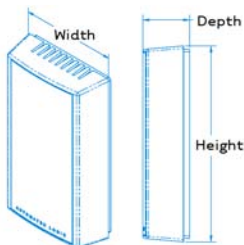
Wireless Sensing Specifications

A3

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Power:	Two 3.6V Lithium batteries, 8 year battery life at 10 second transmit rate
Sensor Specs:	Temperature Only: Built in thermistor, ± 0.2 °C accuracy Temp./Humidity Unit: Replaceable Temp/RH Sensor, ± 0.3 °C / $\pm 2\%$ RH Accuracy
Transmitted Range:	Temperature Only: -40 to 185°F (-40 to 85°C) Temp./Humidity Unit: -40 to 185°F (-40 to 85°C)/ 0 to 100% RH.
Material:	ABS plastic, Material Rating - UL94 V-0
Radio Frequency:	418 MHz, Antenna is built inside the enclosure
Transmitter Interval:	Approximately once every 10 seconds
Mounting:	Standard 2" by 4" electrical box using 6-32 by 1/2" mounting screws provided.
FCC Approval:	FCC ID# T4F16963N16946
Overall Dimensions:	2.75" (width) by 4.75" (height) by 1.14" (depth) 69.9mm (width) by 120.7mm (height) by 28.9mm (depth)



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LSBASE2H / LSPLUS2H

Room Temperature with Humidity Sensors

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LSBASE2H



LSPLUS2H

BAPI's line of sensors includes the LSBASE2H and LSPLUS2H and are designed for use with Automated Logic's S, U, ZN and SE line controllers. Both sensors provide precision temperature and humidity measurement in an attractive low profile enclosure.

In addition, the LSPLUS2H offers a local setpoint adjustment, override to an occupied mode and LED indication of current status—all within boundaries established by the Building Automation System (BAS) operator. When the override button is pressed during an unoccupied mode, the zone reverts to an occupied setpoint for a predetermined period of time. Local setpoint override enables an occupant to increase or decrease the zone setpoint by a preset amount. If the sliding setpoint adjustment is positioned in the center, the setpoint override is defeated.

Key Features and Benefits

- Attractive, low profile enclosure in a neutral color complements any room.
- Precise 10K ohm thermistor with $\pm 0.36^{\circ}\text{F}$ (0.2°C) standard accuracy and less than 0.18°F (0.1°C) drift over a ten year span – requires no maintenance or recalibration.
- $\pm 2\%$ RH accuracy humidity sensor – 0 to 5 VDC output from 0 to 100% RH.
- LSPLUS2H features a convenient local setpoint adjustment through an easy-to-use slide potentiometer.
- Occupancy override is simple using the momentary pushbutton on the LSPLUS2 with a bright LED for immediate indication of status.
- Mounts on a standard 2" by 4" electrical box for easy installation.

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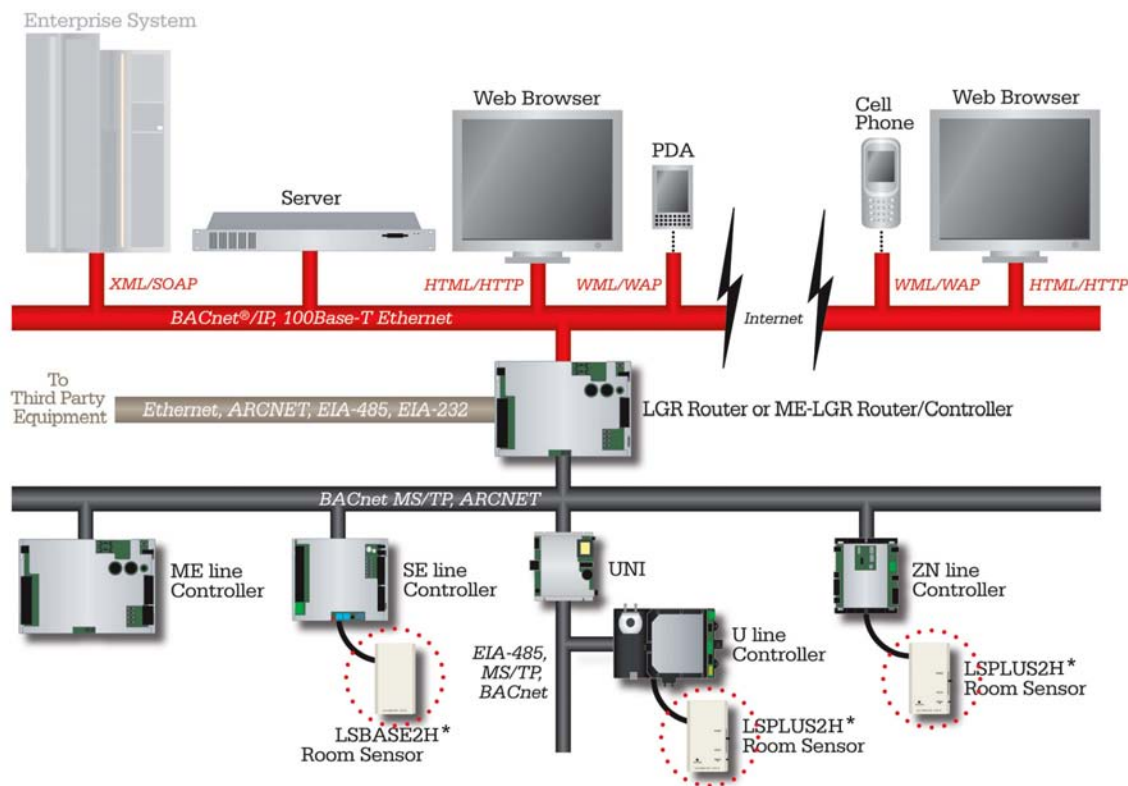
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LSBASE2H / LSPLUS2H

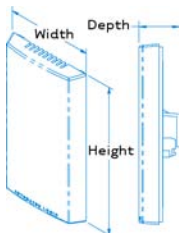
A5

Specifications

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Power:	S, U, ZN, or SE Controllers, 7-12 VDC from the RS port or a ALC/VC75-12
Temperature Sensor:	Precision 10K-2 Thermistor. Standard accuracy $\pm 0.36^{\circ}\text{F}$ (0.2°C). Less than $\pm 0.18^{\circ}\text{F}$ (0.1°C) drift over a 10 year period.
Humidity Sensor:	$\pm 2\%$ from 10% to 90% RH. Output: 0 to 5 VDC from 0 to 100% RH. Temperature Compensation Range: -40 to 185°F (-40 to 85°C) Power Consumption: less than .5 mA.
Wiring:	Four connector shielded or unshielded cable - 18 to 24 AWG recommended. Connects to LS2 connectors on ZN or SE controller and uses two of the controller's available Universal Inputs.
Communications:	LS2 sensors do not support pass-through communications to the building automation system. Use RS sensors if this feature is required.
Mounting:	Standard 2" by 4" electrical box using 6-32 by 1/2" mounting screws provided.
Overall Dimensions:	2.75" (width) by 4.75" (height) by 1.08" (depth) 69.9mm (width) by 120.7mm (height) by 27.4mm (depth)



* LSGR2H and LSPLUS2H are not available with Communications Port

LSBASE2 / LSPLUS2

Room Temperature Sensors

Manufactured by BAPI exclusively for Automated Logic Corporation



LSBASE2



LSPLUS2

BAPI's line of sensors includes the LSBASE2 and LSPLUS2 and are designed for use with Automated Logic's S, U, ZN and SE line controllers. Both sensors provide precision temperature measurement in an attractive low profile enclosure.

In addition, the LSPLUS2 offers a local setpoint adjustment, override to an occupied mode and LED indication of current status—all within boundaries established by the Building Automation System (BAS) operator. When the override button is pressed during an unoccupied mode, the zone reverts to an occupied setpoint for a predetermined period of time. Local setpoint override enables an occupant to increase or decrease the zone setpoint by a preset amount. If the sliding setpoint adjustment is positioned in the center, the setpoint override is defeated.

Key Features and Benefits

- Attractive, low profile enclosure in a neutral color complements any room.
- Precise 10K ohm thermistor with $\pm 0.36^{\circ}\text{F}$ (0.2°C) standard accuracy and less than 0.18°F (0.1°C) drift over a ten year span – requires no maintenance or recalibration.
- LSPLUS2 features a convenient local setpoint adjustment through an easy-to-use slide potentiometer.
- Occupancy override is simple using the momentary pushbutton on the LSPLUS2 with a bright LED for immediate indication of status.
- LSBASE2 and LSPLUS2 sensors can be interchanged without calibration.
- Mounts on a standard 2" by 4" electrical box for easy installation.

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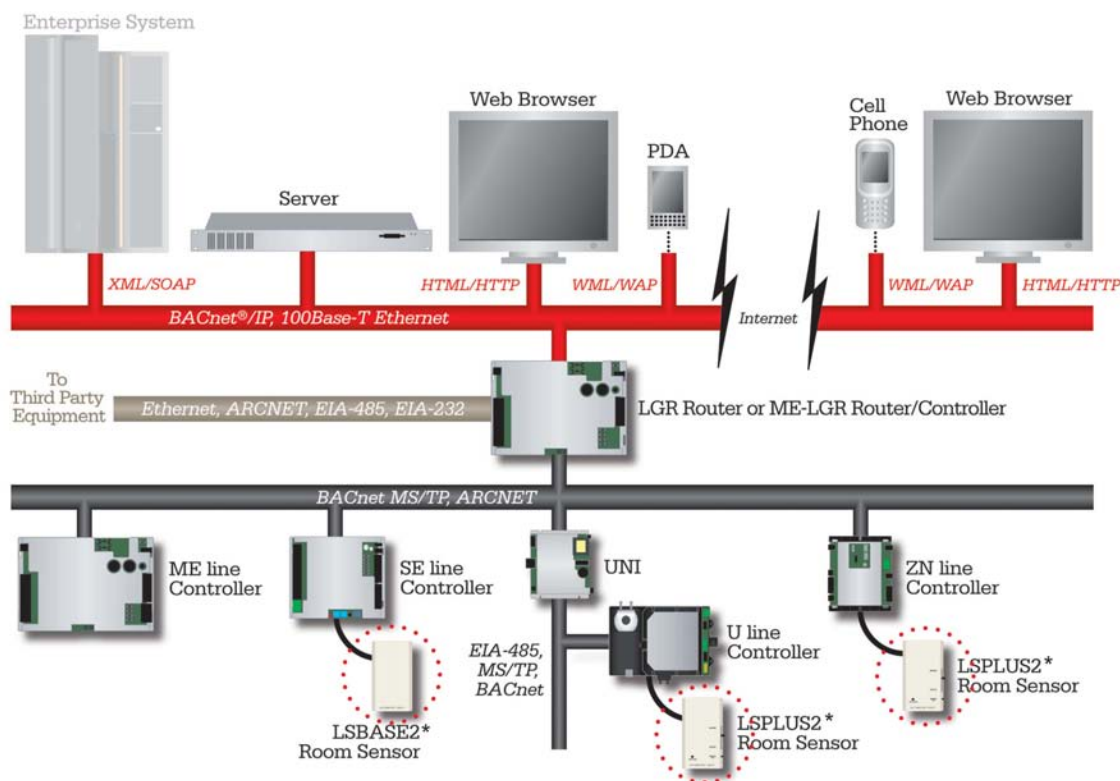
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LSBASE2 / LSPLUS2

A7

Specifications

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Power: S, U, ZN, or SE Controllers.

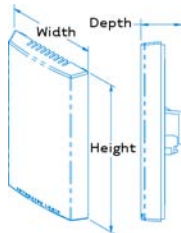
Temperature Sensor: Precision 10K-2 Thermistor. Standard accuracy $\pm 0.36^{\circ}\text{F}$ (0.2°C). Less than $\pm 0.18^{\circ}\text{F}$ (0.1°C) drift over a 10 year period.

Wiring: Four connector shielded or unshielded cable - 18 to 24 AWG recommended. Connects to LS2 connectors on ZN or SE controller and uses two of the controller's available Universal Inputs.

Communications: LS2 sensors do not support pass-through communications to the building automation system. Use RS sensors if this feature is required.

Mounting: Standard 2" by 4" electrical box using 6-32 by 1/2" mounting screws provided.

Overall Dimensions: 2.75" (width) by 4.75" (height) by 1.08" (depth)
69.9mm (width) by 120.7mm (height) by 27.4mm (depth)



* LSBATCH2 and LSPLUS2 are not available with Communications Port

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Temperature Sensors

Room Sensors - pgs 2-5



RuP Units,
pg. 2



BAPI-Stat Units,
pg. 3



BAPI-Stat 3 Units,
pg. 4



BAPI-Stat 2 Units,
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BAPI-Stat 4 Units,
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Decora & Button - pgs 7-8



Decora
Style
Units,
pg. 7

Low Profile
"Button"
Sensors,
pg. 8



BAPI-Com - pg 9



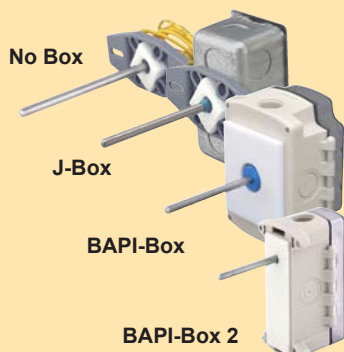
BAPI-Com 2-Wire
Communicating Sensor

Wall Plate Sensors - pg 10

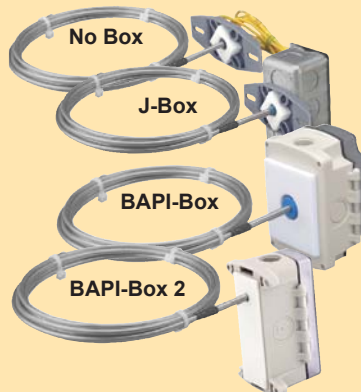


Wall Plate Sensors,
pg. 10

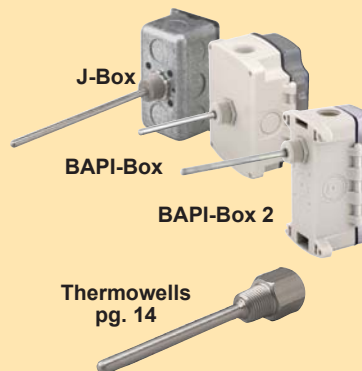
Duct Sensors - pg 11



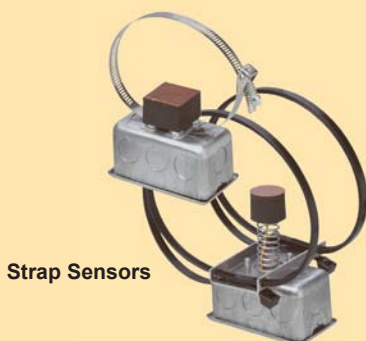
Duct Avging - pg 12



Immersion Units - pg 13



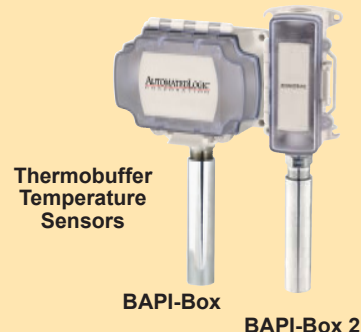
Strap Sensors - pg 15



Outside Air Sensors - pg 16



Thermobuffer - pg 17



Rev. 03/09/11

Features & Options

- Robust Tactile Pushbuttons
- Digital Display and Setpoint Adjustment
- Occupancy Override with LED
- Precision 10K-2 Thermistor
- Two Year Warranty

The R_μP room sensor provides local indication of Temperature and Setpoint with Setpoint Adjustment and Occupant Override. The Setpoint is displayed for a short time after an adjustment and can be programmed to display as an offset (i.e. -2 to 2) or as a value within a specified temperature range (i.e. 65 to 80 °F). The Occupant Override is a momentary signal that is configured in parallel with the Setpoint.



RuP Unit with °F Indication

Ordering Information/Part Numbers

ALC/RUPF-A81-P-24-102-NL-CG - °F Indication and Setpoint Display Range of -3 to +3

ALC/RUPF-B81-P-24-102-NL-CG - °F Indication and Setpoint Display Range of -5 to +5

ALC/RUPF-C81-P-24-102-NL-CG - °F Indication and Setpoint Display Range of 50 to 90 °F (10 to 32 °C)

ALC/RUPF-D81-P-24-102-NL-CG - °F Indication and Setpoint Display Range of 55 to 85 °F (13 to 30 °C)

ALC/RUPF-E81-P-24-102-NL-CG - °F Indication and Setpoint Display Range of 60 to 80 °F (15 to 27 °C)

ALC/RUPF-F81-P-24-102-NL-CG - °F Indication and Setpoint Display Range of 65 to 80 °F (18 to 27 °C)

For °C indication, change the **RUPF-** in the part number to a **RUPC-**

All units have the override in parallel with the setpoint, a setpoint output range of 4.75 to 24.75 Ohms, require 7 to 35 VDC or 12 to 30 VAC power, have a 10K-2 Thermistor direct sensor, no setpoint lockout and common ground configuration.

Specifications

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

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

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

Environmental Operation Range:

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

Humidity: 0 to 95%, non-condensing

Enclosure Material: ABS Plastic

Enclosure Material Rating: UL 94, V-0

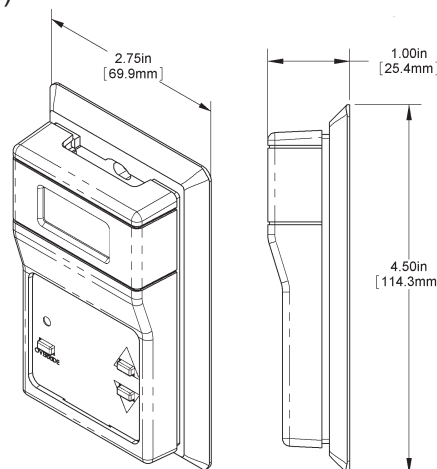
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.

**VC75 - AC to DC Voltage Converter**

BAPI recommends using DC power on room units for a more stable reading. With its compact size, BAPI's VC75 is the perfect AC to DC converter. For more info, see the Accessories section.



** **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, the R_μP is not designed for line voltage applications. The circuits are intended to be connected to analog inputs (AI's) set in the "resistive" mode.



Manufactured by Building Automation Products, Inc., 750 N. Royal Ave., Gays Mills, WI 54631 USA
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Rev. 01/07/11

Easy-to-Read Display & Membrane Pushbuttons for Wipedown Cleaning

Features & Options

- Larger Enclosure with Larger LCD Display
- Temperature Alone or Combination Temp./Humidity
- Membrane Pushbuttons for Wipedown Applications
- Adjustable Temperature and Humidity Setpoints
- 2% RH Accuracy
- Two Year Warranty



BAPI-Stat Combo Unit

The BAPI-Stat features an easy-to-read LCD display and membrane pushbuttons for wipedown cleaning. It is available as a temperature sensor alone or as a combination temperature/humidity sensor. Depending upon the options selected, the BAPI-Stat can display room temperature, room humidity, temperature setpoint, humidity setpoint and override status. The unit includes a number of field adjustments including °F or °C display, temperature offset (± 5 °F or °C in increments of 0.1°), RH offset ($\pm 5\%$ in increments of 0.1%), or setpoint lockout (which disables the setpoint pushbuttons). The display can also be set to show a large temperature and small %RH, a large %RH and a small temperature, or to alternate between these two settings every five seconds.

Perfect for Operating Rooms and Clean Rooms

Ordering Information/Part Numbers

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power: 10 to 35 VDC (15 to 24 VDC recommended) for 4 to 20 mA or 0 to 5 VDC Outputs
 15 to 35 VDC (15 to 24 VDC recommended) for 0 to 10 VDC Output
 12 to 28 VAC (Requires a separate pair of shielded wires) for 4 to 20 mA or 0 to 5 VDC Outputs
 15 VAC to 28 VAC (Requires a separate pair of shielded wires) 0 to 10 VDC Output

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

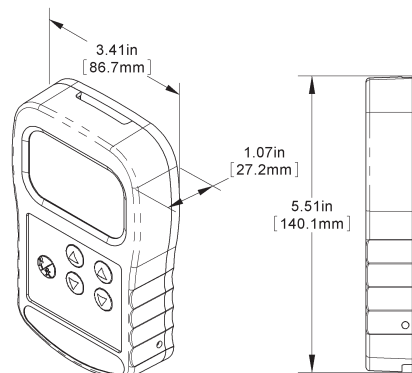
Sensing Elements:

Temp. - Semiconductor Band Gap,
 Proportional to Absolute Temperature, $\pm 0.3^\circ\text{C}$
 Humidity - Capacitive Polymer, $\pm 1.8\%$ RH Accuracy
 Optional Direct Temp. Sensor - Therm., RTD or Semicond.

Mounting: 2" by 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 4 pair of 16 to 22 AWG*

Material: ABS Plastic - UL 94, V-0

* 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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Rev. 08/09/10

*Easy-to-Read Display & Membrane Pushbuttons for Wipedown Cleaning***Features & Options**

- Larger Enclosure with Larger LCD Display
- Temperature Alone or Combination Temp./Humidity
- Membrane Pushbuttons for Wipedown Applications
- Adjustable Temperature and Humidity Setpoints
- 2% RH Accuracy
- Two Year Warranty

The BAPI-Stat 3 features an easy-to-read LCD display and membrane pushbuttons for wipedown cleaning. It is available as a temperature sensor alone or as a combination temperature/humidity sensor.

Depending upon the options selected, the BAPI-Stat 3 can display room temperature, room humidity, temperature setpoint, humidity setpoint and override status. The unit includes a number of field adjustments including °F or °C display, temperature offset (± 5 °F or °C in increments of 0.1°), RH offset ($\pm 5\%$ in increments of 0.1%), or setpoint lockout (which disables the setpoint pushbuttons).

The display can also be set to show a large temperature and small %RH, a large %RH and a small temperature, or to alternate between these two settings every five seconds.

**BAPI-Stat 3 Combo Units***Perfect for Operating Rooms and Clean Rooms***Ordering Information/Part Numbers**

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power: 10 to 35 VDC (15 to 24 VDC recommended) for 4 to 20 mA or 0 to 5 VDC Outputs
 15 to 35 VDC (15 to 24 VDC recommended) for 0 to 10 VDC Output
 12 to 28 VAC (Requires a separate pair of shielded wires) for 4 to 20 mA or 0 to 5 VDC Outputs
 15 VAC to 28 VAC (Requires a separate pair of shielded wires) 0 to 10 VDC Output

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

Sensing Elements:

Temp. - Semiconductor Band Gap,
 Proportional to Absolute Temperature, $\pm 0.3^\circ\text{C}$
 Humidity - Capacitive Polymer, $\pm 1.8\%$ RH Accuracy
 Optional Direct Temp. Sensor - Therm., RTD or Semicond.

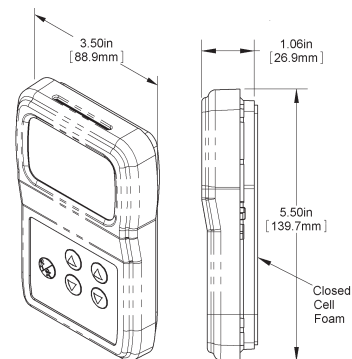
Mounting: 2" by 4" J-box or drywall mount - screws provided

Environmental Specifications:

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

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

Material: ABS Plastic - UL 94, V-0



* 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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Rev. 03/09/11

Features & Options

- Aesthetically Pleasing Enclosure with Large LCD
- Occupancy Override
- Slider or Pushbutton Setpoint Adjustment
- Precision 10K-2 Thermistor
- Two Year Warranty

The BAPI-Stat 2 enclosure is similar in size to the Delta Style enclosure but with a larger LCD display and greater functionality. The unit provides local indication of Temperature and Setpoint with Setpoint Adjust and Occupant Override. The Setpoint Adjust is available as a slidepot or as pushbuttons and is displayed on the LCD for a short time after an adjustment. The Setpoint can be displayed as an offset (i.e. -2, -1, 0, 1, 2) or as a value within a specified temperature range (i.e. 65 to 80 °F). The Override is a momentary signal that is configured in parallel with the setpoint.



BAPI-Stat 2M

BAPI-Stat 2S

Ordering Information/Part Numbers

- ALC/BS2MF-A81-P-24-102-CG** - °F Indication, Pushbutton Setpoint with Display Range of -3 to +3
ALC/BS2MF-B81-P-24-102-CG - °F Indication, Pushbutton Setpoint with Display Range of -5 to +5
ALC/BS2MF-C81-P-24-102-CG - °F Indication, Pushbutton Setpoint with Display Range of 50 - 90 °F (10 - 32 °C)
ALC/BS2MF-D81-P-24-102-CG - °F Indication, Pushbutton Setpoint with Display Range of 55 - 85 °F (13 - 30 °C)
ALC/BS2MF-E81-P-24-102-CG - °F Indication, Pushbutton Setpoint with Display Range of 60 - 80 °F (15 - 27 °C)
ALC/BS2MF-F81-P-24-102-CG - °F Indication, Pushbutton Setpoint with Display Range of 65 - 80 °F (18 - 27 °C)

For Slider Setpoint Adjustment, change the **BS2MF-** to **BS2SF-** in the part number.

For °C indication, change the **BS2MF-** to **BS2MC-** in the part number.

All units have the override in parallel with the setpoint, a setpoint output range of 4.75 to 24.75 Ohms, require 7 to 35 VDC or 12 to 30 VAC power, have a 10K-2 Thermistor direct sensor, and common ground configuration.

Specifications

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

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

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

Environmental Operation Range:

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

Humidity: 0 to 95%, non-condensing

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

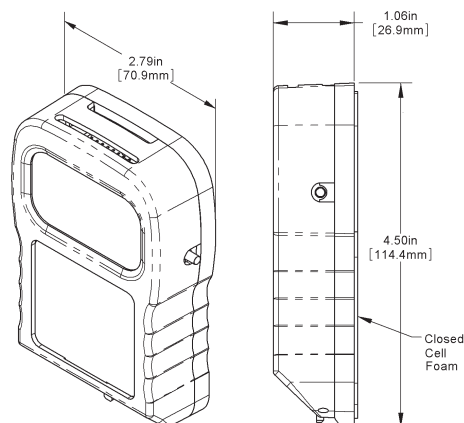
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.



VC75 - AC to DC Voltage Converter

BAPI recommends using DC power on room units for a more stable reading. With its compact size, BAPI's VC75 is the perfect AC to DC converter. For more info, see the Accessories section.



** 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, the RμP is not designed for line voltage applications. The circuits are intended to be connected to analog inputs (AI's) set in the "resistive" mode.



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Rev. 03/09/11

Features & Options

- Modern Enclosure Style with Large Display
- Occupancy Override
- Slider or Pushbutton Setpoint Adjustment
- Precision 10K-2 Thermistor
- Two Year Warranty

The BAPI-Stat 4 enclosure is similar in size to the Delta Style enclosure but with a larger LCD and greater functionality. The unit provides local indication of Temperature and Setpoint with Setpoint Adjust and Occupant Override. The Setpoint Adjust is available as a slidepot or as pushbuttons and is displayed on the LCD for a short time after an adjustment. The Setpoint can be displayed as an offset (i.e. -2, -1, 0, 1, 2) or as a value within a specified temperature range (i.e. 65 to 80 °F). The Override is a momentary signal that is configured in parallel with the setpoint.

**BAPI-Stat 4M****BAPI-Stat 4S****Ordering Information/Part Numbers**

ALC/BS4MF-A81-P-24-102-CG-WMW - °F Indication, Pushbutton Setpoint w/ Display Range of -3 to +3
ALC/BS4MF-B81-P-24-102-CG-WMW - °F Indication, Pushbutton Setpoint w/ Display Range of -5 to +5
ALC/BS4MF-C81-P-24-102-CG-WMW - °F Indication, Pushbutton Setpoint w/ Display Range of 50 - 90 °F (10 - 32 °C)
ALC/BS4MF-D81-P-24-102-CG-WMW - °F Indication, Pushbutton Setpoint w/ Display Range of 55 - 85 °F (13 - 30 °C)
ALC/BS4MF-E81-P-24-102-CG-WMW - °F Indication, Pushbutton Setpoint w/ Display Range of 60 - 80 °F (15 - 27 °C)
ALC/BS4MF-F81-P-24-102-CG-WMW - °F Indication, Pushbutton Setpoint w/ Display Range of 65 - 80 °F (18 - 27 °C)

For Slider Setpoint Adjustment, change the **BS4MF-** to **BS4SF-** in the part number.

For °C indication, change the **BS4MF-** to **BS4MC-** in the part number.

All units have the override in parallel with the setpoint, a setpoint output range of 4.75 to 24.75 Ohms, require 7 to 35 VDC or 12 to 30 VAC power, have a 10K-2 Thermistor direct sensor, and common ground configuration.

Specifications

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

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

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

Environmental Operation Range:

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

Humidity: 0 to 95%, non-condensing

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

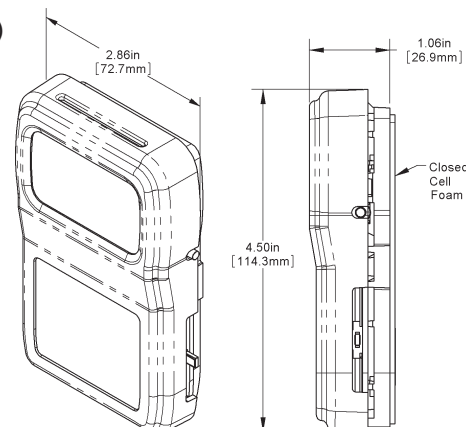
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.

**VC75 - AC to DC Voltage Converter**

BAPI recommends using DC power on room units for a more stable reading. With its compact size, BAPI's VC75 is the perfect AC to DC converter. For more info, see the Accessories section.



** 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, the RuP is not designed for line voltage applications. The circuits are intended to be connected to analog inputs (AI's) set in the "resistive" mode.



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Rev. 03/09/11

Features & Options

- Low Profile Decora Style Enclosure
- LCD Readout of Local Temperature, °F or °C Indication
- Optional Setpoint Adjustment

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

Besides the standard wall plate cover, the unit is also available with two styles of decorative wall plate covers: the "Curved" style or "Dentil" style.

Decora Style Units with Dentil and Curved Wall Plate Covers (above) and units with Standard Wall Plate Covers with and without Setpoint Adjustment



Ordering Information/Part Numbers

ALC/RUPDF-A81-102-CG - °F Indication and Setpoint Display Range of -3 to +3

ALC/RUPDF-B81-102-CG - °F Indication and Setpoint Display Range of -5 to +5

ALC/RUPDF-C81-102-CG - °F Indication and Setpoint Display Range of 50 to 90 °F (10 to 32 °C)

ALC/RUPDF-D81-102-CG - °F Indication and Setpoint Display Range of 55 to 85 °F (13 to 30 °C)

ALC/RUPDF-E81-102-CG - °F Indication and Setpoint Display Range of 60 to 80 °F (15 to 27 °C)

ALC/RUPDF-F81-102-CG - °F Indication and Setpoint Display Range of 65 to 80 °F (18 to 27 °C)

For °C indication, change the **RUPDF-** to **RUPDC-** in the part number.

For No Setpoint units, eliminate the **A81-**, **B81-**, **C81-**, **D81-**, **E81-** or **F81-** from the part number.

Wall Plate Covers: Add **-NC** to the end of the part # for No Wall Plate Cover; Add **-SWC** to the end for the Standard Wall Plate Cover; Add **-DWCC** to the end for the White Curved Wall Plate Cover; Add **-DWDC** to the end for the White Dentil Wall Plate Cover.

All units have a precision 10K-2 Thermistor and a common ground configuration. Units with setpoint have a setpoint output range of 4.75 to 24.75 Ohms.

Specifications

Power: 5 VDC ±5%

Power Consumption: .5 mA

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

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

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

Enclosure Material: ABS Plastic

Enclosure Material Rating: UL 94, V-0

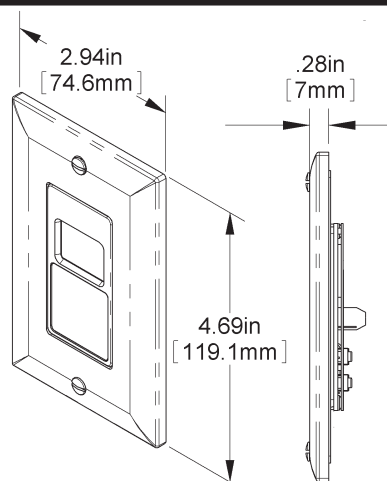
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.



** **BAP** 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, the Decora Style Unit is not designed for line voltage applications. The circuits are intended to be connected to analog inputs (AI's) set in the "resistive" mode.



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Rev. 08/09/10

Features & Options

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

**The Button
Sensor**

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 3/8" 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 multiple thermistor or RTD sensors as shown in the specifications. Other sensor types are available on request.

Ordering Information/Part Numbers

ALC/10K-2-LP-5 - Button Sensor with 5 feet of Plenum Rated Cable

ALC/10K-2-LP-10 - Button Sensor with 10 feet of Plenum Rated Cable

ALC/10K-2-LP-15 - Button Sensor with 15 feet of Plenum Rated Cable

Specifications

Lead wire: 2 or 3 conductor, 22 AWG stranded wire

Wire Insulation: Etched Teflon, Plenum rated

Wiring: Two 22 AWG wires (non-polar)

Mounting: 3/8" hole, push in plastic sheath with peel off tape strip.

Dimensions: Plastic Sheath
 Insertion..... 1.0" depth, into a 0.375" hole
 Sleeve..... 0.375" Diameter
 Bezel..... 0.875" Diameter

Enclosure Type: Round Flush Sensor Sheath

Enclosure ratings: NEMA 1

Encl. Material: White Delrin, UL94V-HB

Ambient (Encl.)

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

Agency

RoHS, CE* (Thermistor's <10KΩ)
 PT= DIN43760, IEC Pub 751-1983,
 JIS C1604-1989

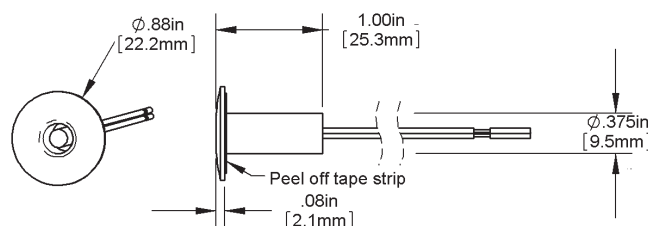
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.



Rev. 08/09/10

Features & Options

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

Many existing buildings have two wire sensors but do not have the other sensor features that customers expect in today's sophisticated systems. The BAPI-Com Sensor uses those existing two wires and offers the owner a full function temperature 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 installation labor. The sensors are powered and communicate over two wires to a Communication 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 Module which itself is supplied by any 24VDC/VAC source.



BAPI-Stat 4M Unit
(includes Room Sensor & Comm. Module)



BAPI-Stat 4S Unit
(includes Room Sensor & Comm. Module)

Ordering Information/Part Numbers

This unit has dozens of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

ROOM SENSOR

Power: Supplied by the Communication Module

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

AWG gauge 26-16AWG

Twist per foot 5 per ft preferred

Shielding Preferred (not required)

Wire spec typical Belden 9841

Sensor: Thermistor

Accuracy (std) $\pm 0.36^{\circ}\text{F}$, ($\pm 0.2^{\circ}\text{C}$)

Pole Rate: 400 ms

Options:

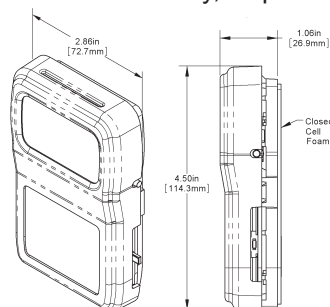
Setpoint Slide or Pushbutton

Display LCD

Override Pushbutton

Test & Balance Switch

Humidity 2% Accuracy, Capacitive



COMMUNICATION MODULE

Power in: 24VDC/AC, 30mA

Terminations:

Comm. & PWR 2 wires to the sensor

Power in 2 wires, 12-24 AWG

Output 2 wires per output, 16-28 AWG

Override Input 2 wires, 14-28 AWG

Outputs: Three Maximum

Volts 0-5VDC or 0-10VDC,

10k Ω minimum load

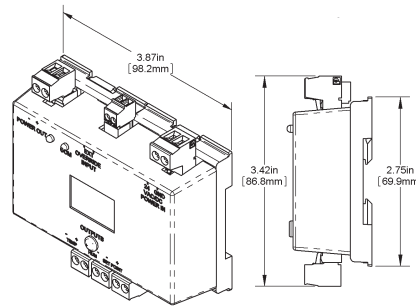
Resistance 20K span

Thermistor 10K-2

Input (DI): External Override, Closed = Occupied

Mounting: 35mm DIN Rail. 2.75" Snap Track or Surface

Material: ABS Plastic, UL94V-0



Rev. 07/13/10

Features & Options

- Low Profile Stainless Steel Wall Plate
- Etched Teflon Leadwires and Plate-Sized Foam Insulator
- Standard, Durable and Water-Resistant Low-Profile (with and without LED) Override Buttons



All Stainless Steel Wall Plates feature ¼" closed cell, medical-grade 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 under real world conditions.

A momentary Override is available in three styles of Pushbutton — Standard (-O), Durable (-O1) & water-resistant Low Profile (-O2) with a red or green LED indicator.

*Some items may not be CE compliant, call BAPI for additional information.

Ordering Information/Part Numbers

ALC/10K-2-SP: Plain Wall Plate

ALC/10K-2-SP-O: Wall Plate with Standard Override

ALC/10K-2-SP-O1: Wall Plate with Durable Override

ALC/10K-2-SP-O2: Wall Plate with Low Profile Override

ALC/10K-2-SP-O2G5: Wall Plate with Low Profile Override with Green LED

ALC/10K-2-SP-O2R5: Wall Plate with Low Profile Override with Red LED

**Specifications****10K-2 Thermistor Sensor Specifications**

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.

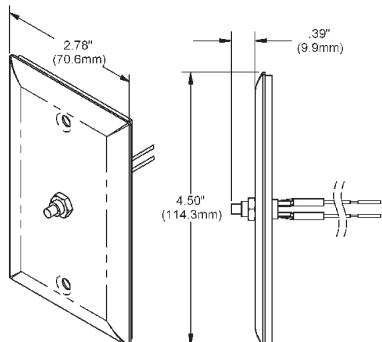
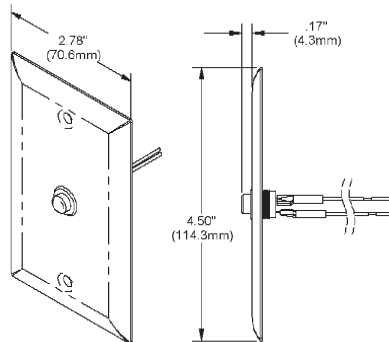
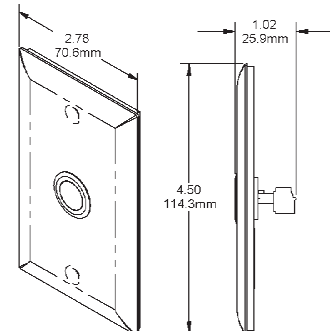
Environmental Operation Range:

Temperature: -40 °C to 100 °C

Humidity: 0 to 95%, non-condensing

Plate Material: Stainless Steel

Enclosure Material Rating: UL 94, V-0

Standard Override**Durable Override****Low Profile Override**

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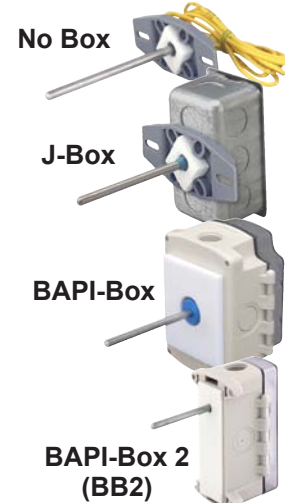
Features & Options

- Probe Lengths: 2", 4", 8", 12" and 18"
- Series 304 Stainless Steel Probes & Double Encapsulated Sensors
- Medical-Grade Foam Padding and Etched Teflon Leadwires
- Optional BAPI-Box or BAPI-Box 2 Enclosures

Single Point Duct Units feature medical-grade 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 perform under real world conditions. Duct Units have probe lengths from 2" to 18". Custom probe lengths are also available, call for details.

Duct Units come standard with a 2"x4" steel J-Box but are also available with no box, or a watertight BAPI-Box or BAPI-Box 2 enclosure.

*Some items may not be CE compliant, call BAPI for additional info.



Ordering Information/Part Numbers

ALC/10K-2-D-2": Duct Unit with 2" Probe

ALC/10K-2-D-4": Duct Unit with 4" Probe

ALC/10K-2-D-8": Duct Unit with 8" Probe

ALC/10K-2-D-12": Duct Unit with 12" Probe

ALC/10K-2-D-18": Duct Unit with 18" Probe

Duct Units come standard with a 2"x4" steel J-Box Enclosure.

Add **-BB** to the end of the part # for a BAPI-Box enclosure or **-BB2** for a BAPI-Box 2 enclosure

Add **-NB** to the end of the part # for No Box. Please also specify a lead length for the plenum-rated cable of **-18"**, **-5'**, **-10'** or **-15'**. Example **-NB-18"** for No Box with 18" lead length

Specifications

Enclosure Material:

BB or BB2 Models: Polycarbonate

J-Box Model: Galv. Steel

Environmental Operation Range:

Temperature: -40 °C to 100 °C

Humidity: 0 to 100%, non-condensing

Enclosure Material Rating:

BB or BB2 Models: UL94, V-0

Encl. Rating: BB or BB2 Models: IP66

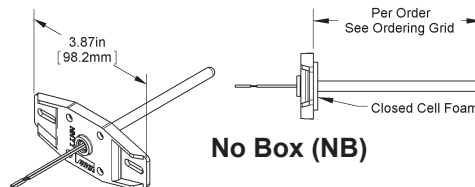
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

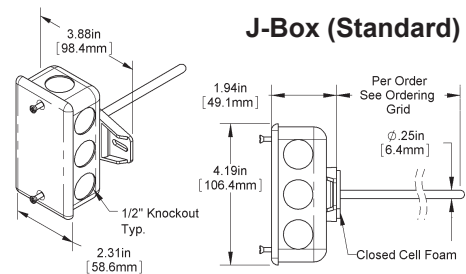
Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

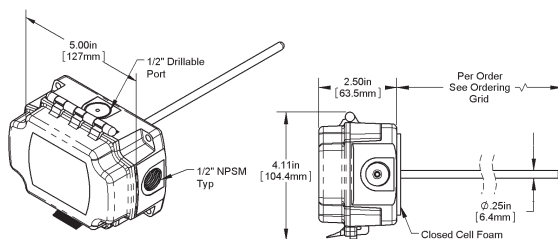
Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.



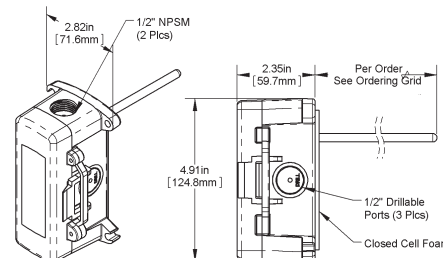
No Box (NB)



J-Box (Standard)



BAPI-Box (BB)



BAPI-Box 2 (BB2)



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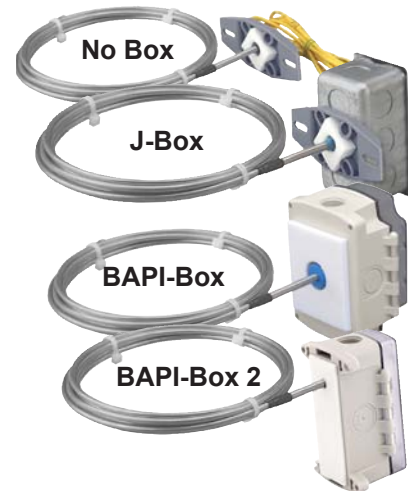
Features & Options

- Averaging Lengths: 8', 12' and 24'
- Optional BAPI-Box or BAPI-Box 2 Enclosure

Duct Averaging Units feature medical-grade 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 units have etched Teflon leadwires and encapsulated sensors to create a watertight package that can perform under real world conditions.

The units come standard with a 2"x4" steel J-Box but are also available with no box or a watertight BAPI-Box or BAPI-Box 2.

*Some items may not be CE compliant, call BAPI for additional information.

**Ordering Information/Part Numbers**

ALC/10K-2-A-8' - 8' Duct Averaging Unit with a precision 10K-2 Thermistor Sensor

ALC/10K-2-A-12' - 12' Duct Averaging Unit with a precision 10K-2 Thermistor Sensor

ALC/10K-2-A-24' - 24' Duct Averaging Unit with a precision 10K-2 Thermistor Sensor

Duct Averaging Units come standard with a 2"x4" steel J-Box Enclosure. Add **-BB** or **-BB2** to the end of the part # for a watertight BAPI-Box or BAPI-Box 2 enclosure. Add **-NB** to the end of the part # for No Box (6" etched teflon leadwires).

Specifications for Duct Averaging Units**Enclosure Material:**

BB or BB2: Polycarbonate, UL94, V-0

J-Box Model: Galv. Steel

Environmental Operation Range:

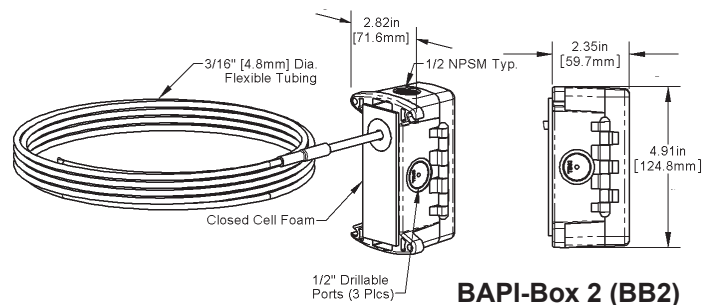
Temperature:

BB or BB2 Encl.: -40 °C to 85 °C

J-Box & NB: -40 °C to 100 °C

Humidity: 0 to 100%, non-condensing

Encl. Rating: BB or BB2 Models: IP66

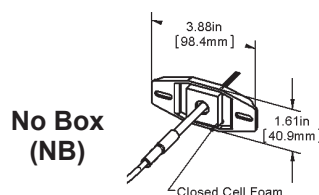
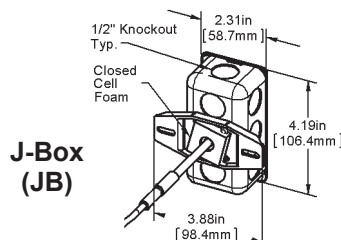
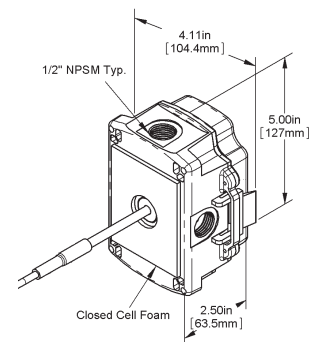
**BAPI-Box 2 (BB2)****10K-2 Thermistor Sensor Specifications**

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.

**No Box (NB)****J-Box (JB)****BAPI-Box (BB)**

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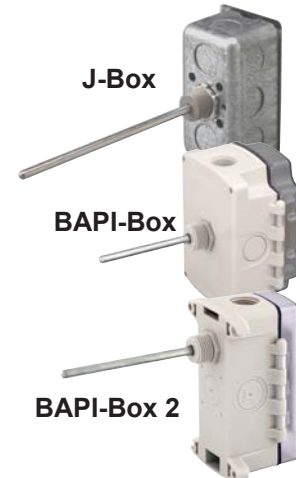
Features & Options

- Probe Lengths: 2", 4" and 8" (fit standard BAPI Thermowell lengths)
- Series 304 Stainless Steel Probes & Double Encapsulated Sensors
- Optional BAPI-Box or BAPI-Box 2 Enclosure

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 epoxy. 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 a watertight BAPI-Box or BAPI-Box 2 enclosure.

*Some items may not be CE compliant, call BAPI for additional information.



BAPI Thermowells

Immersion Unit Probes are designed to be inserted into a Thermowell. BAPI Thermowells are available in lengths to match our Immersion Probe Lengths. For more info, see the next page.

Ordering Information/Part Numbers

ALC/10K-2-I-2" - 2" Immersion Unit

ALC/10K-2-I-8" - 8" Immersion Unit

ALC/10K-2-I-4" - 4" Immersion Unit

Immersion Units come standard with a 2"x4" steel J-Box Enclosure. Add **-BB** or **-BB2** to the end of the part # for a watertight BAPI-Box or BAPI-Box 2 enclosure.

Specifications

Encl. Material: J-Box Model: Galvanized Steel
BB or BB2: UV-resistant polycarbonate, UL94, V-0

Encl. Rating: BB or BB2 Models: IP66

Environmental Operation Range:

Temperature: J-Box: -40 °C to 100 °C

BB or BB2 Encl.: -40 °C to 85 °C

Humidity: 0 to 100%, non-condensing

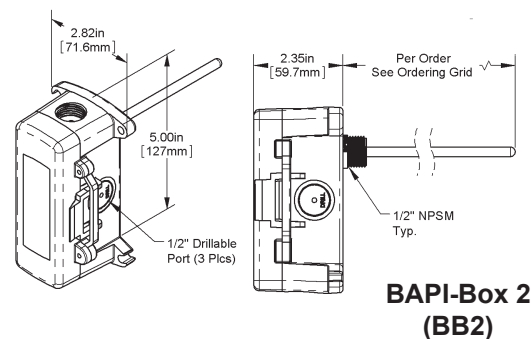
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

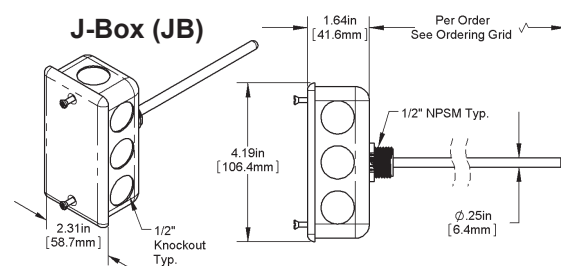
Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

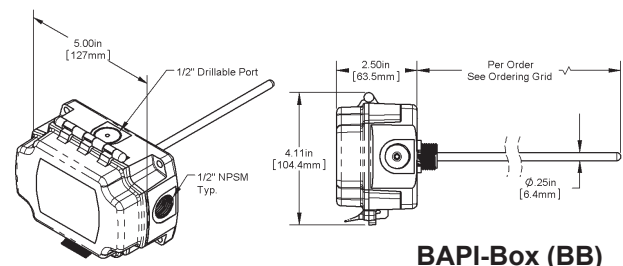
Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.



**BAPI-Box 2
(BB2)**



J-Box (JB)



BAPI-Box (BB)



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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 include 304 stainless steel (machined), 316 stainless steel (machined), brass (machined), and two part* (welded) stainless steel. These wells are offered in 2", 4" and 8" lengths with 1/2" NPT external and 1/2" NPSM. Other lengths and thread diameters are available upon request.

The Thermowell chosen for the 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.

*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**

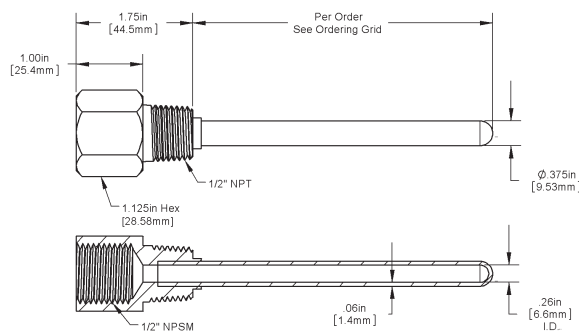


**Two Part (welded)
Thermowell***

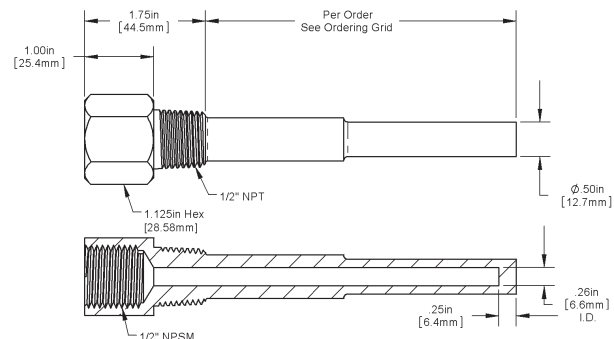
Ordering Information/Part Numbers

ALC/2" - Two Part (Welded) Stainless Steel - 2"
ALC/4" - Two Part (Welded) Stainless Steel - 4"
ALC/8" - Two Part (Welded) Stainless Steel - 8"
ALC/2" M304 - Machined 304 Stainless Steel - 2"
ALC/4" M304 - Machined 304 Stainless Steel - 4"
ALC/8" M304 - Machined 304 Stainless Steel - 8"

ALC/2" M316 - Machined 316 Stainless Steel - 2"
ALC/4" M316 - Machined 316 Stainless Steel - 4"
ALC/8" M316 - Machined 316 Stainless Steel - 8"
ALC/2" MB - Machined Brass - 2"
ALC/4" MB - Machined Brass - 4"
ALC/8" MB - Machined Brass - 8"

Specifications

Two Part (Welded) Thermowell



Machined Thermowell



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Features & Options

Clamp-On Strap and Spring-Loaded Strap Units are designed to monitor water temperature in retrofit or filled pipe applications. These units fit around the outside of a pipe and measure the water temperature by sensing the surface temperature of the pipe. Both units come standard with a Junction Box enclosure. The Clamp-On Unit is also available with a watertight BAPI-Box or BAPI-Box 2 enclosure. The Spring Loaded Unit is only available with a BAPI-Box 2 enclosure.

Clamp-On Strap – This unit has a bendable copper sensing plate which forms to the curvature of the pipe. An adjustable hose clamp is used to firmly hold the unit in place around the pipe.

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 pipes having up to 2" of insulation.



Clamp-On Strap Unit with J-Box

Spring Loaded Strap Unit with J-Box

*Some items may not be CE compliant, call BAPI for additional information.

Ordering Information/Part Numbers

ALC/10K-2-S - Clamp-On Strap - Fits 2" to 5" (5.08 to 12.7 cm) pipe (both BB & BB2)

ALC/10K-2-STP - Spring-Loaded Strap - Fits 5" to 14.5" (12.7 to 36.8 cm) pipe (only BB2)

Add **-BB** or **-BB2** to the end of the Clamp-On Unit part # for a watertight BAPI-Box or BAPI-Box 2 enclosure. Add **-BB2** to the end of the Spring-Loaded unit for a watertight BAPI-Box 2 enclosure.

Specifications

10K-2 Thermistor Sensor Specifications

Resistance: 10 k Ω @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C ($\pm 0.36^\circ\text{F}$) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than $\pm 0.1^\circ\text{C}$ (0.18°F) drift over 10 years.

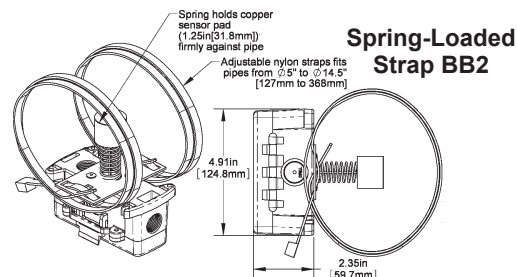
Enclosure Material:

Polycarbonate (BB or BB2) or Galv. Steel (J-Box)

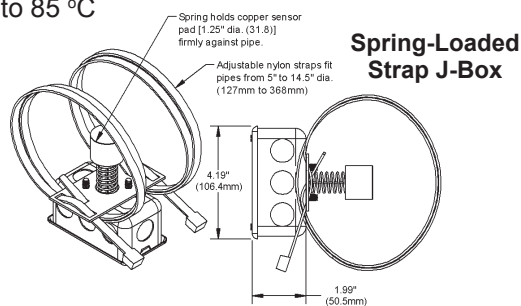
Environmental Operation Range:

Temp: Clamp On: -65 °C to 100 °C, Spring Loaded: -40 °C to 85 °C

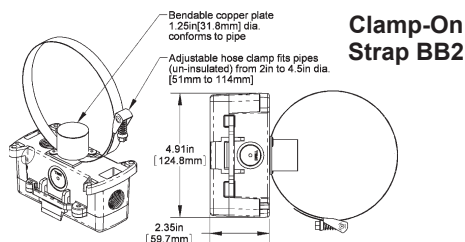
Humidity: 0 to 95%, non-condensing



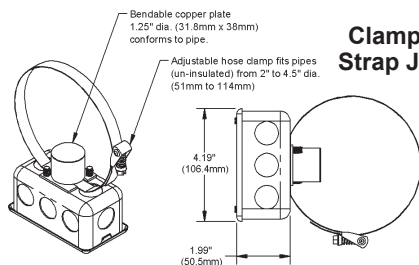
Spring-Loaded Strap BB2



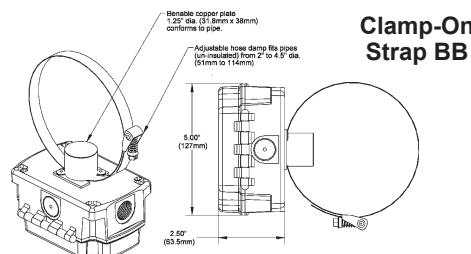
Spring-Loaded Strap J-Box



Clamp-On Strap BB2



Clamp-On Strap J-Box



Clamp-On Strap BB



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Features & Options

- Watertight BAPI-Box or BAPI-Box 2 Enclosure
- Etched Teflon Leadwires
- Well-Vented, Light-Colored Sensor Guard

Outside Air Units are designed to be mounted outdoors. The 5¼" UV-resistant plastic shield keeps the sensor out of the sunlight and allows for excellent air circulation. The Outside Air Unit is available in a watertight BAPI-Box (**BB**) or BAPI-Box 2 (**BB2**) Enclosure.

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.



BAPI-Box

BAPI-Box 2

*Some items may not be CE compliant, call BAPI for additional information.

Ordering Information/Part Numbers

ALC/10K-2-O-BB - Outside Air Temperature Sensor in a BAPI-Box Enclosure

ALC/10K-2-O-BB2 - Outside Air Temperature Sensor in a BAPI-Box 2 Enclosure

Specifications

Enclosure Material:

UV-resistant polycarbonate, UL94, V-0

Enclosure Rating: IP66

Environmental Operation Range:

Temperature: -40 °C to 85 °C

Humidity: 0 to 100%, non-condensing

10K-2 Thermistor Sensor Specifications

Resistance:

10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy:

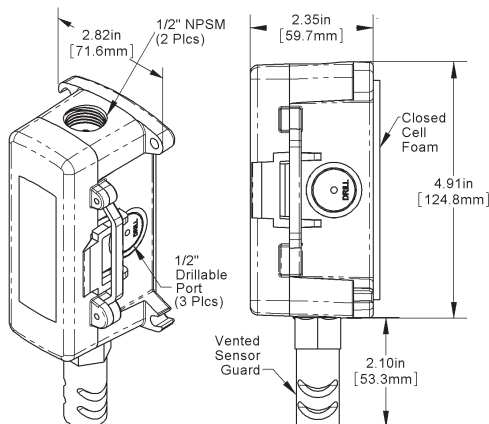
0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant:

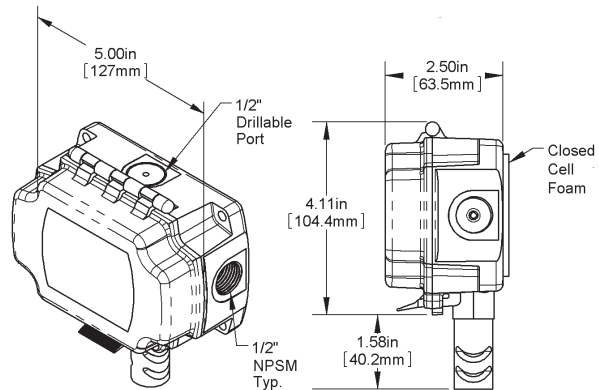
2.7 mW/°C

Stability(drift):

Less than ±0.1°C (0.18°F)
drift over 10 years.



BAPI-Box 2 (BB2)



BAPI-Box (BB)

Rev. 07/13/10

Features & Options

- Slows/Buffers Temperature Changes in Coolers & Freezers (Caused by Opening and Closing of Cooler/Freezer Door)
- Available in 304 Stainless Steel or Aluminum

The 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.



Ordering Information/Part Numbers

ALC/10K-2-TB-M304-1"-HB - 1" Sensor, Hanging Bracket Mount, Overall Buffer Length, 1.99"

ALC/10K-2-TB-M304-2"-BB - 2" Sensor, 304 Stainless Steel Cylinder Buffer, Overall Buffer Length, 4.33"

ALC/10K-2-TB-M304-4"-BB - 4" Sensor, 304 Stainless Steel Cylinder Buffer, Overall Buffer Length, 6.3"

ALC/10K-2-TB-MAL-2"-BB - 2" Sensor & Aluminum Cylinder Buffer, Overall Buffer Length, 4.33"

ALC/10K-2-TB-MAL-4"-BB - 4" Sensor & Aluminum Cylinder Buffer, Overall Buffer Length, 6.3"

Replace **-BB** with **-BB2** at the end of the 2" and 4" part # for a watertight BAPI-Box 2 enclosure.

Many more options are available. Call BAPI at the number below for more information.

Specifications

Enclosure Material:

UV-resistant polycarbonate, UL94, V-0

Enclosure Rating: IP66

Environmental Operation Range:

Temperature: -40 °C to 85 °C

Humidity: 0 to 100%, condensing

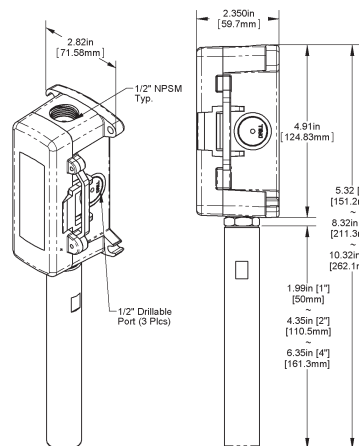
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

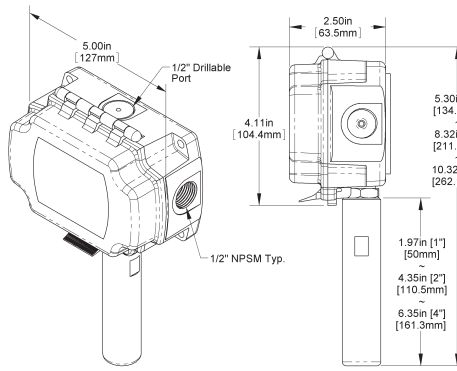
Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.

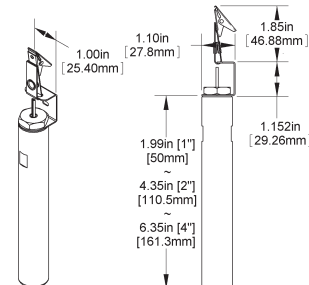


BAPI-Box 2



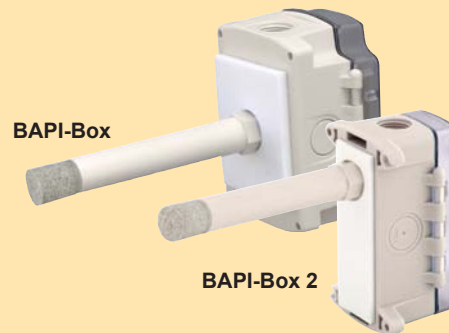
BAPI-Box

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



Hanging Bracket

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BAPI-Stat 2 Sensors - pg 2**BAPI-Stat 2 Units*****BAPI-Stat 4 Sensors - pg 3*****BAPI-Stat 4 Units*****BAPI-Stat & BAPI-Stat 3 - pgs 4-5*****BAPI-Stat****BAPI-Stat 3*****Delta & X-Combo - pgs 6-7*****Delta Style Units****X-Combo Unit*****BAPI-Com - pg 8*****BAPI-Com 2-Wire
Communicating Sensor*****Duct Sensors - pg 9*****BAPI-Box****BAPI-Box 2*****Outside Air Sensors - pg 10***

- Etched Teflon Leadwires & Double Encapsulated Sensors
- Watertight BAPI-Box or BAPI-Box 2 Enclosure
- Humidity Only or Temp./Humidity Combination
- Replaceable Filter & Humidity Probe
- 2% and 3% RH Accuracies

**BAPI-Box****BAPI-Box 2**

Rev. 06/03/11

Features & Options

- Modern, Aesthetically Pleasing Enclosure
- Humidity Only or Temp./Humidity Combo
- LCD Display (optional)
- 2% RH Accuracy
- Temp. Setpoint and Override (optional)
- °F or °C Indication
- Full-range Temperature Compensation of RH Signal
- Two Year Warranty



The BAPI-Stat 2 room sensor is similar in size to the Delta Style Enclosure but with a larger LCD display and greater functionality. The BAPI-Stat 2 unit is available as a humidity only sensor or as a combination temperature and humidity sensor with optional LCD display, temperature setpoint adjustment and occupant override. The unit is available with °F or °C indication and features a user-adjustable toggle rate between the temperature and humidity display.

BAPI-Stat 2 Style Units (with and without Display)



Ordering Information/Part Numbers

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power: 10 to 35 VDC for 4 to 20 mA and 0 to 5 VDC Output Units
12 to 24 VAC for 0 to 5 VDC Output (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 Output • 0.1 VA max. for 0 to 5 VDC Output

Humidity Sensor: Capacitive Polymer, ±1.8% RH Accuracy

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: ABS Plastic

Material Rating: UL 94, V-0

10K-2 Thermistor Sensor Specifications

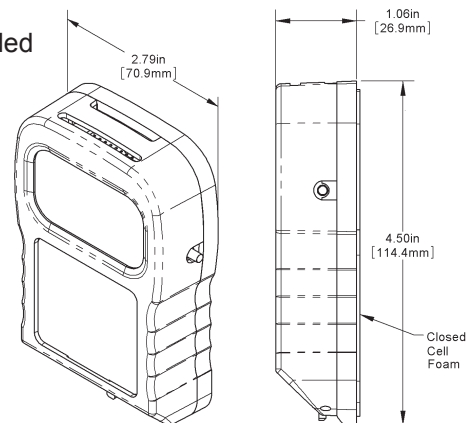
Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.

BAPI-Stat 2 Enclosure



* 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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Rev. 06/03/11

Features & Options

- Modern, Aesthetically Pleasing Enclosure
- Humidity Only or Temp./Humidity Combo
- LCD Display (optional)
- 2% RH Accuracy
- Temp. Setpoint and Override (optional)
- °F or °C Indication
- Full-range Temperature Compensation of RH Signal
- Two Year Warranty



**BAPI-Stat 4
without Display**

**BAPI-Stat 4
with Display**

The BAPI-Stat 4 room sensor is similar in size to the Delta Style Enclosure but with a larger LCD display and greater functionality. The BAPI-Stat 2 unit is available as a humidity only sensor or as a combination temperature and humidity sensor with optional LCD display, temperature setpoint adjustment and occupant override. The unit is available with °F or °C indication and features a user-adjustable toggle rate between the temperature and humidity display.

Ordering Information/Part Numbers

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power: 10 to 35 VDC for 4 to 20 mA and 0 to 5 VDC Output Units
12 to 24 VAC for 0 to 5 VDC Output (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 Output • 0.1 VA max. for 0 to 5 VDC Output

Humidity Sensor: Capacitive Polymer, ±1.8% RH Accuracy

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: ABS Plastic

Material Rating: UL 94, V-0

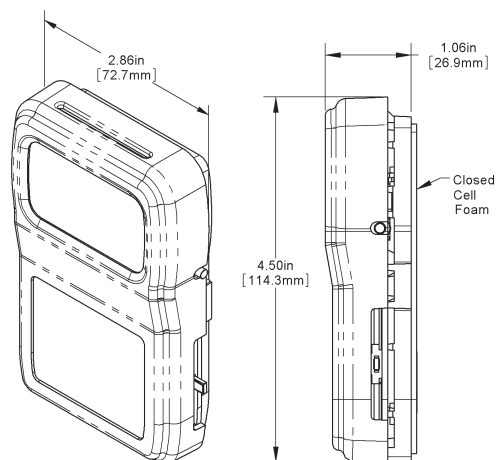
10K-2 Thermistor Sensor Specifications

Resistance: 10 kΩ @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C (±0.36°F) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than ±0.1°C (0.18°F) drift over 10 years.



** 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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Rev. 07/14/10

*Easy-to-Read Display & Membrane Pushbuttons for Wipedown Cleaning***Features & Options**

- Larger Enclosure with Larger LCD Display
- Temperature Alone or Combination Temp./Humidity
- Membrane Pushbuttons for Wipedown Applications
- Adjustable Temperature and Humidity Setpoints
- 2% RH Accuracy
- Two Year Warranty

**BAPI-Stat Combo Unit**

The BAPI-Stat features an easy-to-read LCD display and membrane pushbuttons for wipedown cleaning. It is available as a temperature sensor alone or as a combination temperature/humidity sensor. Depending upon the options selected, the BAPI-Stat can display room temperature, room humidity, temperature setpoint, humidity setpoint and override status. The unit includes a number of field adjustments including °F or °C display, temperature offset (± 5 °F or °C in 0.1° increments), RH offset ($\pm 5\%$ in increments of 0.1%), or setpoint lockout (which disables the setpoint pushbuttons). The display can also be set to show a large temperature and small %RH, a large %RH and a small temperature, or to alternate between these two settings every five seconds.

*Perfect for Operating Rooms and Clean Rooms***Ordering Information/Part Numbers**

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power: 10 to 35 VDC (15 to 24 VDC recommended) for 4 to 20 mA or 0 to 5 VDC Outputs
 15 to 35 VDC (15 to 24 VDC recommended) for 0 to 10 VDC Output
 12 to 28 VAC (Requires a separate pair of shielded wires) for 4 to 20 mA or 0 to 5 VDC Outputs
 15 VAC to 28 VAC (Requires a separate pair of shielded wires) 0 to 10 VDC Output

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

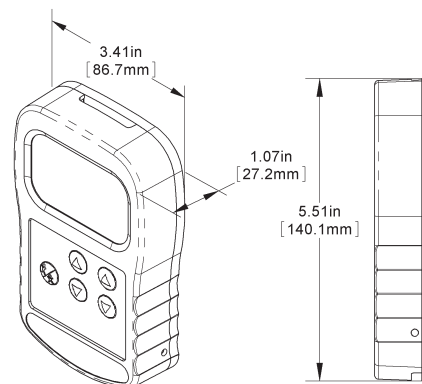
Sensing Elements:

Temp. - Semiconductor Band Gap,
 Proportional to Absolute Temperature, $\pm 0.3^\circ\text{C}$
 Humidity - Capacitive Polymer, $\pm 1.8\%$ RH Accuracy
 Optional Direct Temp. Sensor - Therm., RTD or Semicond.

Mounting: 2" by 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 4 pair of 16 to 22 AWG*

Material: ABS Plastic - UL 94, V-0

* 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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Rev. 08/09/10

Easy-to-Read Display & Membrane Pushbuttons for Wipedown Cleaning

Features & Options

- Larger Enclosure with Larger LCD Display
- Temperature Alone or Combination Temp./Humidity
- Membrane Pushbuttons for Wipedown Applications
- Adjustable Temperature and Humidity Setpoints
- 2% RH Accuracy
- Two Year Warranty



BAPI-Stat 3 Combo Units

The BAPI-Stat 3 features an easy-to-read LCD display and membrane pushbuttons for wipedown cleaning. It is available as a temperature sensor alone or as a combination temperature/humidity sensor. Depending upon the options selected, the BAPI-Stat 3 can display room temperature, room humidity, temperature setpoint, humidity setpoint and override status. The unit includes a number of field adjustments including °F or °C display, temperature offset (± 5 °F or °C in increments of 0.1°), RH offset ($\pm 5\%$ in increments of 0.1%), or setpoint lockout (which disables the setpoint pushbuttons). The display can also be set to show a large temperature and small %RH, a large %RH and a small temperature, or to alternate between these two settings every five seconds.

Perfect for Operating Rooms and Clean Rooms

Ordering Information/Part Numbers

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power: 10 to 35 VDC (15 to 24 VDC recommended) for 4 to 20 mA or 0 to 5 VDC Outputs
 15 to 35 VDC (15 to 24 VDC recommended) for 0 to 10 VDC Output
 12 to 28 VAC (Requires a separate pair of shielded wires) for 4 to 20 mA or 0 to 5 VDC Outputs
 15 VAC to 28 VAC (Requires a separate pair of shielded wires) 0 to 10 VDC Output

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

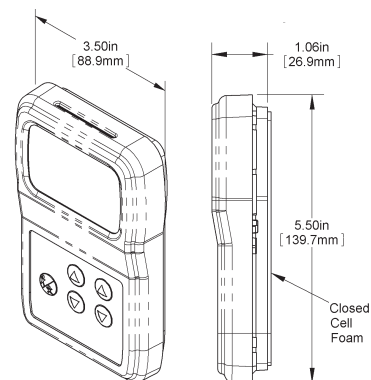
Sensing Elements:

Temp. - Semiconductor Band Gap,
 Proportional to Absolute Temperature, $\pm 0.3^\circ\text{C}$
 Humidity - Capacitive Polymer, $\pm 1.8\%$ RH Accuracy
 Optional Direct Temp. Sensor - Therm., RTD or Semicond.

Mounting: 2" by 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 4 pair of 16 to 22 AWG*

Material: ABS Plastic - UL 94, V-0

* 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
- Humidity Only or Temp./Humidity Combo
- LCD Readout (optional)
- 2% and 3% RH Accuracies
- User Adjustable Toggle Rate Between Temperature and Humidity
- Full-range Temperature Compensation of RH Signal
- Two Year Warranty



**Delta Style
Enclosures with and
without LCD Display**

The Delta Style room units are available as humidity only sensors or as combination temperature and humidity sensors. The Delta Style enclosure features an optional LCD display with a user adjustable toggle rate between humidity and temperature and can display in either °C or °F. These units save time and money by allowing for field replacement of humidity elements without recalibration.

*Some items may not be CE compliant, call BAPI for additional information.

Ordering Information/Part Numbers**2% RH Humidity Only Units**

ALC/H200-R: 2%RH Sensor

ALC/H200-RD: 2%RH Sensor with Display

2% RH Combo Temp./Humidity Units

ALC/10K-2-H200-R: 2%RH Combo Sensor Only

ALC/10K-2-H200-RD: 2%RH Combo Sensor w/ LCD

3% RH Humidity Only Units

ALC/H300-R: 3%RH Sensor

ALC/H300-RD: 3%RH Sensor with Display

3% RH Combo Temp./Humidity Units

ALC/10K-2-H300-R: 3%RH Combo Sensor Only

ALC/10K-2-H300-RD: 3%RH Combo Sensor w/ LCD

Specifications

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

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

Humidity Sensor: Impedance Type, $\pm 2\%$ or $\pm 3\%$ RH

Wiring: 2 to 3 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: ABS Plastic

Material Rating: UL 94, V-0

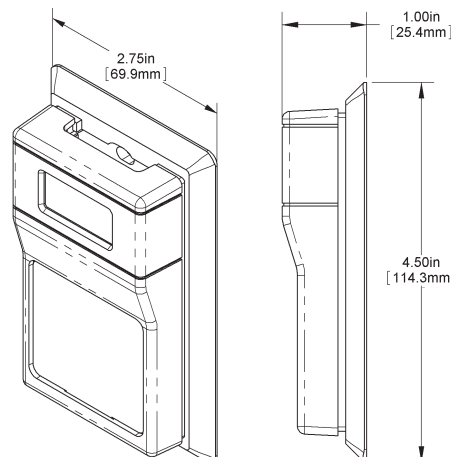
10K-2 Thermistor Sensor Specifications

Resistance: 10 k Ω @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C ($\pm 0.36^\circ\text{F}$) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than $\pm 0.1^\circ\text{C}$ (0.18°F) drift over 10 years.



* **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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Rev. 07/14/10

Combination Temp. & Humidity Unit

Features & Options

- LCD Readout
- 2% and 3% RH Accuracies
- °C or °F Operation
- Full-range Temperature Compensation of RH Signal
- Setpoint Adjust and Occupancy Override (optional)
- User Adjustable Toggle Rate Between Temperature and Humidity
- Two Year Warranty



**X-Combo Unit with
Setpoint & Override**

The “X-Combo” Room Unit features local indication of both temperature and humidity in ONE aesthetically-pleasing enclosure. Additional options include Temperature Setpoint, Humidity Setpoint and Local Override. The LCD can toggle between temperature and humidity at a user adjustable rate, with °C or °F temperature indication. In addition, the BAPI “X-Combo” saves time and money by allowing for field replacement of humidity elements without the need for ANY recalibration.

Ordering Information/Part Numbers

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power:

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

Power Consumption: 50 mA maximum DC
1.2 VA maximum AC

Humidity Sensor: Impedance Type, $\pm 2\%$ or $\pm 3\%$ RH

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

Mounting:

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

10K-2 Thermistor Sensor Specifications

Resistance: 10 k Ω @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C ($\pm 0.36^\circ\text{F}$) at 0 to 70°C

Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than $\pm 0.1^\circ\text{C}$ (0.18°F) drift over 10 years.

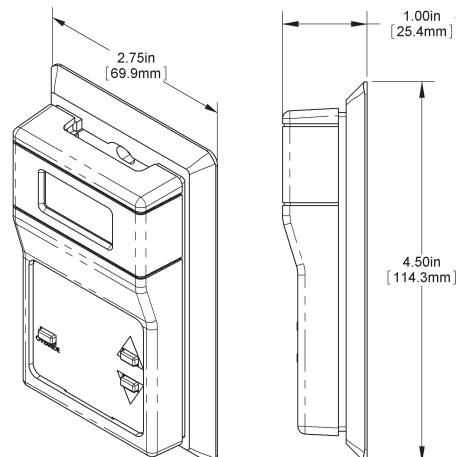
Environmental Operation Range:

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

Humidity: 0 to 95%, non-condensing

Material: ABS Plastic

Material Rating: UL 94, 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.



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Rev. 08/09/10

Features & Options

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

Many existing buildings have two wire sensors but do not have the other sensor features that customers expect in today's sophisticated systems. The BAPI-Com Sensor uses those existing two wires and offers the owner a full function temperature 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 installation labor. The sensors are powered and communicate over two wires to a Communication 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 Module which itself is supplied by any 24VDC/VAC source.



BAPI-Stat 4M Unit
(includes Room Sensor
& Comm. Module)



BAPI-Stat 4S Unit
(includes Room Sensor
& Comm. Module)

Ordering Information/Part Numbers

This unit has dozens of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications**ROOM SENSOR**

Power: Supplied by the Communication Module

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

AWG gauge 26-16AWG

Twist per foot 5 per ft preferred

Shielding Preferred (not required)

Wire spec typical Belden 9841

Sensor: Thermistor

Accuracy (std) $\pm 0.36^{\circ}\text{F}$, ($\pm 0.2^{\circ}\text{C}$)

Pole Rate: 400 ms

Options:

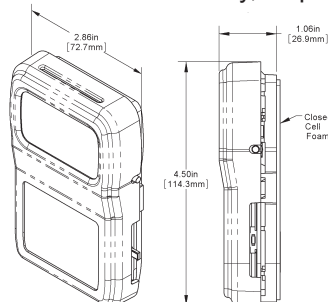
Setpoint Slide or Pushbutton

Display LCD

Override Pushbutton

Test & Balance Switch

Humidity 2% Accuracy, Capacitive

**COMMUNICATION MODULE**

Power in: 24VDC/AC, 30mA

Terminations:

Comm. & PWR 2 wires to the sensor

Power in 2 wires, 12-24 AWG

Output 2 wires per output, 16-28 AWG

Override Input 2 wires, 14-28 AWG

Outputs: Three Maximum

Volts 0-5VDC or 0-10VDC,

10k Ω minimum load

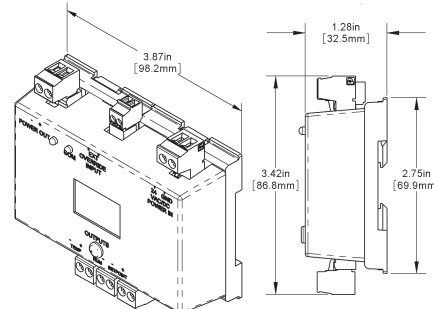
Resistance 20K span

Thermistor 10K-2

Input (DI): External Override, Closed = Occupied

Mounting: 35mm DIN Rail. 2.75" Snap Track or Surface

Material: ABS Plastic, UL94V-0



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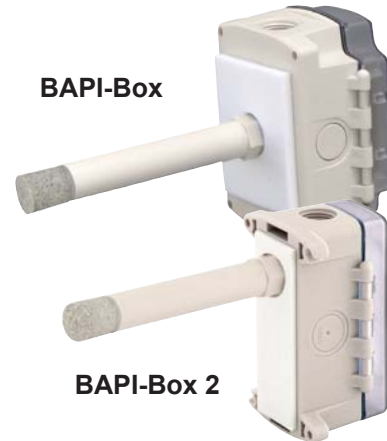
Rev. 03/25/11

Features & Options

- Humidity Only or Temp./Humidity Combination
- Etched Teflon Leadwires & Foamback Insulator
- Watertight BAPI-Box Enclosure
- Replaceable Filter
- 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 sensors are prescreened for accuracy, eliminating the need for field calibration. The Duct Units are also extremely dependable, with a watertight BAPI-Box or BAPI-Box 2 enclosure.

All Duct Units feature medical-grade 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 are built to withstand high humidity and condensation and perform under real world conditions.



Ordering Information/Part Numbers

Humidity Only Units

ALC/H200-D-BB: 2%RH Duct Humidity Sensor

ALC/H300-D-BB: 3%RH Duct Humidity Sensor

Combination Temperature and Humidity Duct Sensor

ALC/10K-2-H200-D-BB: 2%RH Duct Temperature and Humidity Sensor

ALC/10K-2-H300-D-BB: 3%RH Duct Temperature and Humidity Sensor

Replace **-BB** with **-BB2** at the end of the part # for a watertight BAPI-Box 2 enclosure

Specifications

Power:

10 to 35 VDC (0 - 5 VDC or 4 - 20 mA outputs)

12 to 24 VAC (0 - 5 VDC Output)

Encl. Material:

UV-resistant polycarbonate, UL 94, V-0

Enclosure Rating: IP 66

Environmental Operation Range:

Temp: -30 °C to 70 °C

Humidity: 0% to 100% RH

Humidity Sensor:

Impedance Type, $\pm 2\%$ or $\pm 3\%$ RH

10K-2 Thermistor Sensor Specifications

Resistance: 10 k Ω @ 25°C, -55°C to 150°C range

Standard Accuracy: 0.2°C ($\pm 0.36^\circ\text{F}$) at 0 to 70°C

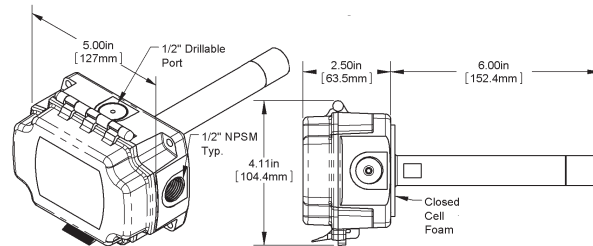
Dissipation Constant: 2.7 mW/°C

Stability(drift): Less than $\pm 0.1^\circ\text{C}$ (0.18°F) drift over 10 years.

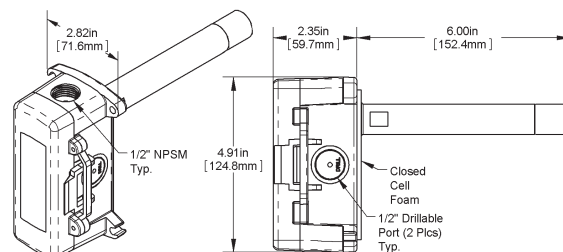
Power Consumption:

22 mA max. DC (0 - 5 VDC or 4 - 20 mA Outputs)

0.53 VA max. AC (0 - 5 VDC Output)



BAPI-Box (BB)



BAPI-Box 2 (BB2)

Rev. 07/14/10

Features & Options

- Etched Teflon Leadwires & Double Encapsulated Sensors
- Watertight BAPI-Box or BAPI-Box 2 Enclosure
- Humidity Only or Temp./Humidity Combination
- Replaceable Filter
- 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 sensors are prescreened for accuracy, eliminating the need for field calibration. The Outside Air Units are also extremely dependable with a watertight BAPI-Box or BAPI-Box 2 enclosure which is made of UV-resistant polycarbonate and carries an IP66 rating.

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



BAPI-Box

BAPI-Box 2

Ordering Information/Part Numbers

Humidity Only Units

ALC/H200-O-BB: 2%RH Outside Air Humidity Sensor

ALC/H300-O-BB: 3%RH Outside Air Humidity Sensor

Combination Temperature and Humidity Duct Sensor

ALC/10K-2-H200-O-BB: 2%RH Outside Air Temperature and Humidity Sensor

ALC/10K-2-H300-O-BB: 3%RH Outside Air Temperature and Humidity Sensor

Replace **-BB** with **-BB2** at the end of the part # for a watertight BAPI-Box 2 enclosure

Specifications

Power:

10 to 35 VDC (0 - 5 VDC or 4-20 mA outputs)

12 to 24 VAC (0 - 5 VDC Output)

Power Consumption:

22 mA max. DC (0 - 5 VDC or 4-20 mA Outputs)

0.53 VA max. AC (0 - 5 VDC Output)

Humidity Sensor: Impedance Type, $\pm 2\%$ or $\pm 3\%$ RH

Enclosure Material:

UV-resistant polycarbonate, UL 94, V-0

Enclosure Rating: IP 66

Environmental Operation Range:

Temp: -30°C to 70°C

Humidity: 0% to 100% RH

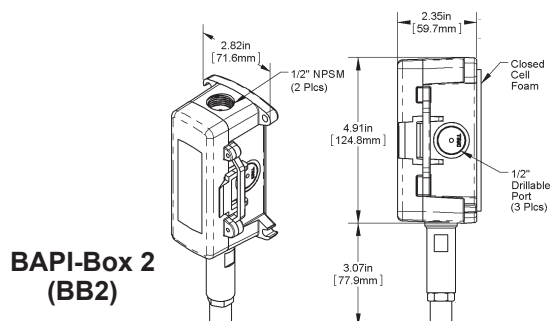
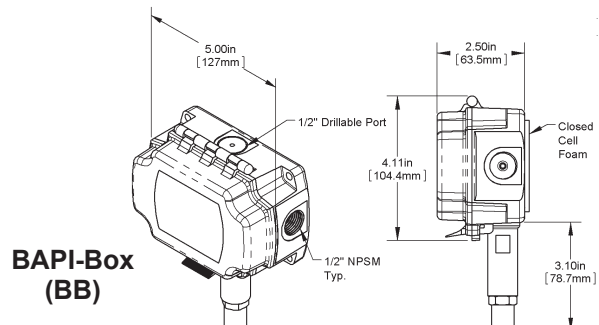
10K-2 Thermistor Sensor Specifications

Resistance: $10\text{ k}\Omega$ @ 25°C , -55°C to 150°C range

Standard Accuracy: 0.2°C ($\pm 0.36^{\circ}\text{F}$) at 0 to 70°C

Dissipation Constant: $2.7\text{ mW}/^{\circ}\text{C}$

Stability(drift): Less than $\pm 0.1^{\circ}\text{C}$ (0.18°F) drift over 10 years.

BAPI-Box 2
(BB2)BAPI-Box
(BB)

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Zone Pressure Sensors

D1



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Rev. 05/25/11

EZ Pressure Sensors - pgs 2-5

- 10 Field Selectable Pressure Ranges
- 3 Field Selectable Outputs, 4-20 mA, 0-5 or 0-10 VDC
- LCD Displays Pressure Over the Entire Operational Range Regardless of Which Individual Pressure Range is Selected
- Inches of Water Column (W.C.) or Pascal Operation
- Simple Auto-Zero and One Touch Set Up
- Snaptrack, DIN Rail or Surface Mounting

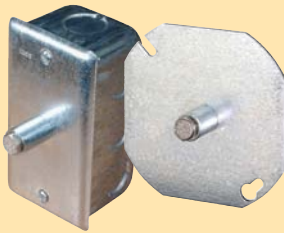


BAPI-Box Pressure Sensors - pgs 6-11

- Field Selectable Pressure and Output Ranges
- Optional Display
- Low, Medium or High Pressure Ranges
- Inches of Water Column (W.C.) or Pascal Operation
- Simple Auto-Zero Process



Pressure Pickup Ports - page 12



Ceiling Mount

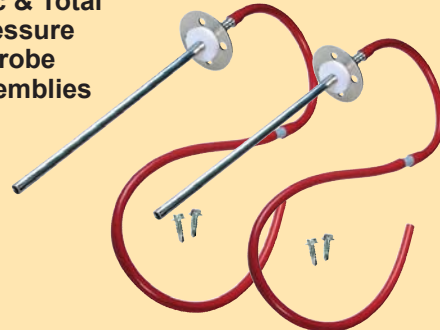


Wall and Room

- Economical & Easy to Install
- 100 Micron Filter

Probes and Accessories - page 13

Static & Total Pressure Probe Assemblies



Low Profile & Outside Air Ports - pgs 14-15



Low Profile
Page 14

- Flush Pressure Port Mounting
- Paintable with Latex or Oil Base



Outside Air
pgs 15

Pressure Switch - page 16



Differential Pressure
Switch

Rev. 05/24/11

Features & Options

- 10 Field Selectable Pressure Ranges
- 3 Field Selectable Outputs, 4-20 mA, 0-5 or 0-10 VDC
- LCD Displays Pressure Over the Entire Operational Range Regardless of Which Individual Pressure Range is Selected
- Inches of Water Column (W.C.) or Pascal Operation
- Simple Auto-Zero and One Touch Set Up
- Snaptrack, DIN Rail or Surface Mounting
- Three Year Warranty



**EZ Pressure
Sensor**

Measuring building pressure and air velocities or 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. The auto-zeroing process is also very easy — simply turn the rotary switch to zero, push the button for five seconds, turn the rotary switch back to your pressure range and walk away.

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 piezoresistive pressure sensor that provides excellent accuracy, repeatability and stability.

The unit features a rugged NEMA 1 rated enclosure with 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 (-5 to +5 inches W.C. or -1,000 to 1,000 Pascals) regardless of which individual pressure range is selected for output to the system controller.

Specifications

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

Load Resistance:

- 0-5 VDC or 0-10 VDC Output - 1 k Ω minimum
- 4-20 mA Output - 850 Ω max @ 24 VDC

Accuracy: $\pm 0.25\%$ Full Scale

Stability: $\pm 0.25\%$ Full Scale per year

Temperature Error: $\pm 2\%$ of Span max (0 to 60°C)

Overpressure: Proof - 1 PSI, Burst - 1.5 PSI

Mounting:

35mm DIN Rail, 2.75" Snaptrack or Surface

Wiring: 2 wires (4-20 mA Current Loop)

3 wires (AC or DC Powered, Voltage Out)

Environmental Operation Range:

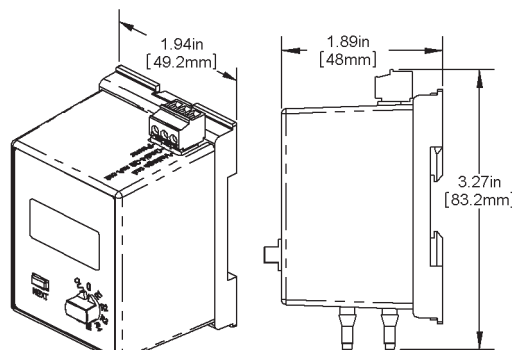
Temperature:

- 13 to 176°F (-25 to 80°C)
- 32 to 140°F (0 to 60°C) compensated range

Humidity:

0 to 95% RH, non-condensing

Display: 4 digit LCD, 1/2" tall



EZ Pressure Sensor



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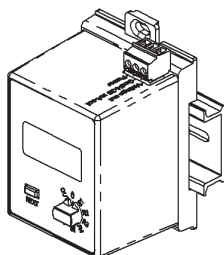
EZ Pressure Sensor

Zone Pressure Sensors (ZPS)

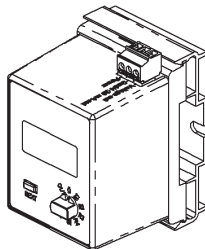
D3

Rev. 05/24/11

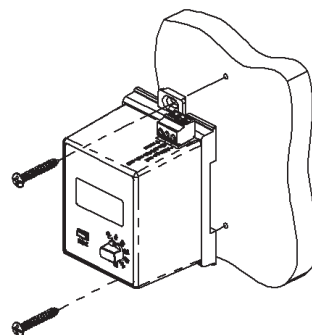
Mounting Options



DIN Rail Mount



Snaptrack Mount



Screw Mount

Ordering Information						EZ Zone Pressure Sensor with Display	
ALC/ZPS							
		Output Range					
-20		4 to 20 mA		(7 to 45 VDC Supply ONLY)			
-05		0 to 5 V		(7 to 45 VDC Supply or 7 to 32 VAC Supply)			
-10		0 to 10 V		(13 to 45 VDC Supply or 13 to 32 VAC Supply)			
		Pressure Range					
		-SR(range)		Standard Pressure Ranges - <i>replace (range) with option # shown below</i>			
		Option	Range (inches W.C.)	Option	Range (Pascals)		
		71	0 to 1.00	81	0 to 250		
		72	0 to 2.00	82	0 to 300		
		73	0 to 2.50	83	0 to 500		
		74	0 to 3.00	84	0 to 1,000		
		75	0 to 5.00	85	0 to 1,250		
		76	-1.00 to 1.00	86	-250 to 250		
		77	-2.00 to 2.00	87	-300 to 300		
		78	-2.50 to 2.50	88	-500 to 500		
		79	-3.00 to 3.00	89	-1,000 to 1,000		
		80	-5.00 to 5.00	90	-1,250 to 1,250		
		Custom Range (W.C.)***		Custom Range (Pascals)***			
		CI	[0 to y.yy]*	CP	[0 to yyyy]**		
		Enclosure Style					
		-EZ	NEMA 1 rated enclosure				
				Optional Static Pressure Probe			
				-NT	No Tube or Probe Included		
				-ST	Static Pressure Measurement Probe Included (not attached)		
				LCD Display (See note **** below)			
				-D	LCD Display****		
EXAMPLE							
ALC/ZPS	-20	-SR71	-EZ	-NT	-D		
Example Part Number: ALC/ZPS-20-SR71-EZ-NT-D							
Your Part Number:							

*Custom W.C. ranges must start at zero and y.yy can be any pressure between .10 and 5.00 inches W.C. Placing the unit into +/- places the custom range in bi-directional mode (Example Part # ALC/ZPS-20-SRCI[0.00 to 3.00]-EZ-NT-D)

**Custom W.C. ranges must start at zero and yyyy can be any pressure between 25 and 1250 Pascals. Placing the unit into +/- places the custom range in bi-directional mode (Example Part #: ALC/ZPS-20-SRCP[0 to 100]-EZ-NT-D)

***There is a net add of \$100 for custom ranges. Multipliers do not apply to net adds. Custom Ranges include a certification of 3 points within the custom pressure range.

****If you do not wish to view the current pressure on the display, simply leave off the "-D" in the part number. Instead of showing the current pressure, the display will show the word "on".



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Rev. 05/24/11

Features & Options

- 10 Field Selectable Pressure Ranges
- 3 Field Selectable Outputs, 4-20 mA, 0-5 or 0-10 VDC
- LCD Displays Pressure Over the Entire Operational Range Regardless of Which Individual Pressure Range is Selected
- Inches of Water Column (W.C.) or Pascal Operation
- Optimized for Pressures Below 1" W.C. or 250 Pascals
- Simple Auto-Zero and One Touch Set Up
- Snaptrack, DIN Rail or Surface Mounting
- Three Year Warranty



**EZ Pressure
Sensor**

Measuring building pressure and air velocities or 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. The auto-zeroing process is also very easy — simply turn the rotary switch to zero, push the button for five seconds, turn the rotary switch back to your pressure range and walk away.

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 piezoresistive pressure sensor specifically developed for low pressure. The capacitive sensor design inherently provides excellent accuracy, repeatability and stability — even at low pressures.

The unit features a rugged NEMA 1 rated enclosure with 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 (-5 to +5 inches W.C. or -1,000 to 1,000 Pascals) regardless of which individual pressure range is selected for output to the system controller.

Specifications

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

Load Resistance:

0-5 VDC or 0-10 VDC Output - 1 k Ω minimum
4-20 mA Output - 850 Ω max @ 24 VDC

Accuracy:

$\pm 0.5\%$ on 0 to 0.25" and $\pm 0.25\%$ W.C. ranges,
 $\pm 0.25\%$ on other ranges

Stability: $\pm 0.25\%$ Full Scale per year

Temperature Error: $\pm 2\%$ of Span max (0 to 60°C)

Overpressure: Proof - 1 PSI, Burst - 1.5 PSI

Mounting:

35mm DIN Rail, 2.75" Snaptrack or Surface

Wiring: 2 wires (4-20 mA Current Loop)

3 wires (AC or DC Powered, Voltage Out)

Environmental Operation Range:

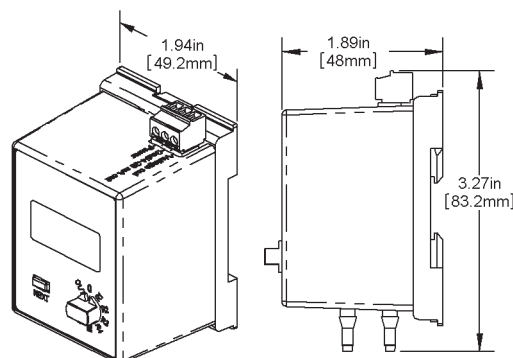
Temperature:

-13 to 176°F (-25 to 80°C)
32 to 140°F (0 to 60°C) compensated range

Humidity:

0 to 95% RH, non-condensing

Display: 4 digit LCD, 1/2" tall



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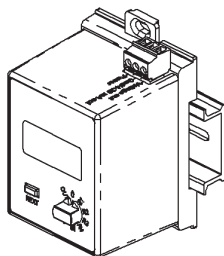
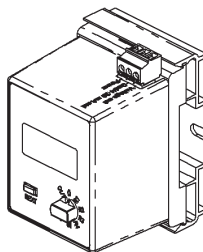
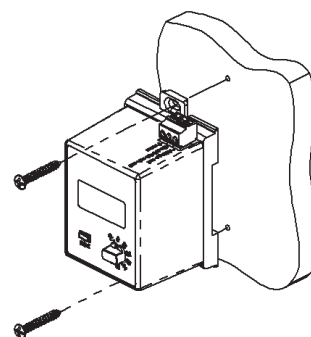
EZ Low Pressure Sensor

Zone Pressure Sensors (ZPS)

D5

Rev. 05/24/11

Mounting Options

**DIN Rail Mount****Snaptrack Mount****Screw Mount**

Ordering Information		EZ Zone Low Pressure Sensor with Display			
ALC/ZPS					
	Output Range				
	-20	4 to 20 mA	(7 to 45 VDC Supply ONLY)		
	-05	0 to 5 V	(7 to 45 VDC Supply or 7 to 32 VAC Supply)		
	-10	0 to 10 V	(13 to 45 VDC Supply or 13 to 32 VAC Supply)		
	Pressure Range				
	-SR(range)	Standard Pressure Ranges - <i>replace (range) with option # shown below</i>			
	Option	Range (inches W.C.)		Option	Range (Pascals)
	51	0 to 0.10		61	0 to 30
	52	0 to 0.25		62	0 to 50
	53	0 to 0.50		63	0 to 100
	54	0 to 0.75		64	0 to 175
	55	0 to 1.00		65	0 to 250
	56	-0.10 to 0.10		66	-30 to 30
	57	-0.25 to 0.25		67	-50 to 50
	58	-0.50 to 0.50		68	-100 to 100
59	-0.75 to 0.75		69	-175 to 175	
60	-1.00 to 1.00		70	-250 to 250	
Enclosure Style					
-EZ	NEMA 1 rated enclosure				
	Optional Static Pressure Probe				
	-NT	No Tube or Probe Included			
	-ST	Static Pressure Measurement Probe Included (not attached)			
		LCD Display (See note * below)			
	-D	LCD Display*			
EXAMPLE					
ALC/ZPS	-20	-SR51	-EZ	-NT	-D
Example Part Number: ALC/ZPS-20-SR51-EZ-NT-D					
Your Part Number:					

*If you do not wish to view the current pressure on the display, simply leave off the "-D" in the part number. Instead of showing the current pressure, the display will show the word "on".



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Features & Options

- 10 Field Selectable Pressure Ranges
- 3 Field Selectable Outputs, 4-20 mA, 0-5 or 0-10 VDC
- Optional LCD Displays Pressure Over the Entire Operational Range Regardless of Which Individual Pressure Range is Selected
- Inches of Water Column (W.C.) or Pascal Operation
- Available with Attached Static Tube
- Simple Auto-Zero Process
- Mounting Tabs for Easy Installation
- Three Year Warranty



**BAPI-Box Enclosure
with Display**



**BAPI-Box Enclosure
without Display**

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

The LCD model offers an additional level of troubleshooting and monitoring capability over the standard model by displaying the actual differential pressure over the entire operational range (-5 to +5 inches W.C. or -1,000 to 1,000 Pascals) regardless of which individual pressure range is selected for output to the system controller.

The unit comes with an IP66-rated BAPI-Box enclosure with short circuit proof outputs and reverse polarity protected inputs to perform under real world conditions.

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).

Pressure Sensor with Attached Static Tube

The unit is available in a BAPI-Box with an Attached Static Tube (-AT), therefore it doesn't require two trades to install the unit.



Specifications

Accuracy:

$\pm 0.25\%$ Full Scale

Stability:

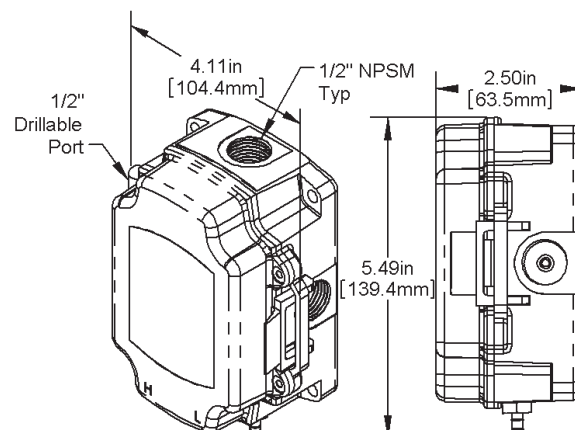
$\pm 0.25\%$ Full Scale per year

Temperature Error:

Zero - $\pm 0.025\%$ F.S. per $^{\circ}\text{C}$,
Span - max $\pm 0.03\%$ F.S. per $^{\circ}\text{C}$

Overpressure:

Proof - 1 PSI,
Burst - 1.5 PSI



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Pressure Transmitter

Zone Pressure Sensors (ZPS)

D7

Rev. 05/25/11

Additional Specifications

Enclosure Material: Polycarbonate**Enclosure Rating:** IP66, NEMA 4**Environmental Operation Range:**

Temp.: -13 to 176 °F (-25 to 80 °C)
32 to 140 °F (0 to 60 °C)
compensated range

Humidity: 0 to 95% RH, non-condensing

Wiring:

2 (loop powered) or 3 (voltage output) wires¹

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)

Load Resistance:

0-5 VDC or 0-10 VDC Output - 1 k Ω minimum
4-20 mA Output - 850 Ω max @ 24 VDC

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 on 4-20 mA Output

¹ 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.

Note: Mount unit with the pressure fittings on the bottom to prevent condensation from entering the sensor.

Ordering Information		Zone Pressure Sensor in a BAPI-Box					
ALC/ZPS							
	Output Range						
	-20	4 to 20 mA (7 to 45 VDC Supply ONLY)					
	-05	0 to 5 V (7 to 45 VDC Supply or 7 to 32 VAC Supply)					
	-10	0 to 10 V (13 to 45 VDC Supply or 13 to 32 VAC Supply)					
	Pressure Range						
	-SR(range)	Standard Pressure Ranges - replace (range) with option # shown below					
		Option	Range (inches W.C.)	Option	Range (Pascals)		
		71	0 to 1.00	81	0 to 250		
		72	0 to 2.00	82	0 to 300		
		73	0 to 2.50	83	0 to 500		
		74	0 to 3.00	84	0 to 1,000		
		75	0 to 5.00	85	0 to 1,250		
		76	-1.00 to 1.00	86	-250 to 250		
		77	-2.00 to 2.00	87	-300 to 300		
		78	-2.50 to 2.50	88	-500 to 500		
		79	-3.00 to 3.00	89	-1,000 to 1,000		
		80	-5.00 to 5.00	90	-1,250 to 1,250		
		Custom Range (W.C.) ***			Custom Range (Pascals) ***		
		CI	[x.xx to y.yy]*		CP	[xxxx to yyyy]**	
Enclosure Style (Must Select One)							
	-BB	BAPI-Box Enclosure - IP66 rated, UV-resistant polycarbonate					
	Static Pressure Probe (Must Select One)						
	-NT	No Tube or Probe Included					
	-ST	Static Pressure Probe Included (not attached)					
	-AT	Attached Static Pressure Probe (not available with Back Mount option [-BM])					
	LCD Display (Omit if not required)						
	-D	LCD Display					
	Back Mount Option (Omit if not required)						
	-BM	Back Mount (wires and pressure ports run out the back, not available with Attached Tube option [-AT])					
EXAMPLE							
ALC/ZPS	-20	-SR71	-BB	-NT	-D	-BM	
Example Part Number: ALC/ZPS-20-SR71-BB-NT-D-BM							
Your Part Number:							

*For custom W.C. ranges, x.xx and y.yy can be any pressure from -5.00 to +5.00 inches W.C. However, x.xx must be less than y.yy and y.yy - x.xx must be at least .4 inches. (Example Part #: ALC/ZPS-20-SRCI[0.00 to 3.50]-BB-NT-D-BM)

**For custom Pascal ranges, xxxx and yyyy can be any pressure from -1250 to +1250 Pascals. However, xxxx must be less than yyyy and yyyy - xxxx must be at least 100 Pascals. (Example Part #: ALC/ZPS-20-SRCP[0 to 100]-BB-NT-D-BM)

***There is a net add of \$100 for custom ranges. Multipliers do not apply to net adds. Custom Ranges include a certification of 3 points within the custom pressure range.



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Features & Options

- 10 Field Selectable Pressure Ranges
- 3 Field Selectable Outputs, 4-20 mA, 0-5 or 0-10 VDC
- Optional LCD Displays Pressure Over the Entire Operational Range Regardless of Which Individual Pressure Range is Selected
- Inches of Water Column (W.C.) or Pascal Operation
- Available with Attached Static Tube
- Simple Auto-Zero Process
- Optimized for Pressures Below 1" W.C. or 250 Pascals
- Mounting Tabs for Easy Installation
- Three Year Warranty

**BAPI-Box Enclosure with Display****BAPI-Box Enclosure without Display**

BAPI's Low Pressure Sensor with Display is an accurate, rugged and economical solution for measuring and reporting duct/building static pressure, room-to-room differential pressure or air velocities/volumes. The heart of the unit is a micro-machined silicon pressure sensor specifically developed for low pressures. The capacitive sensor design inherently provides excellent accuracy, repeatability and stability. The unit has been optimized for pressures below 1" W.C. or 250 Pascals.

The LCD model offers an additional level of troubleshooting and monitoring capability over the standard model by displaying the actual differential pressure over the entire operational range (-5 to +5 inches W.C. or -1,000 to 1,000 Pascals) regardless of which individual pressure range is selected for output to the system controller.

The unit comes with an IP66-rated BAPI-Box enclosure with short circuit proof outputs and reverse polarity protected inputs to perform under real world conditions.

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).

Pressure Sensor with Attached Static Tube

The unit is available in a BAPI-Box with an Attached Static Tube (-AT), therefore it doesn't require two trades to install the unit.

**Specifications****Accuracy:**

$\pm 0.5\%$ on 0 to 0.25" and $\pm 0.25\%$ W.C. ranges,
 $\pm 0.25\%$ on other ranges

Stability:

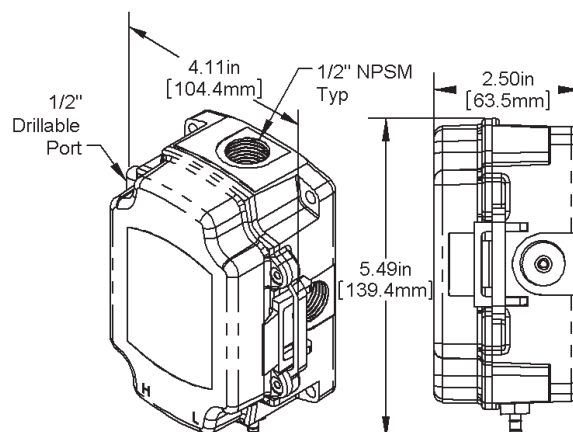
$\pm 0.25\%$ Full Scale per year

Temperature Error:

Zero - $\pm 0.025\%$ F.S. per $^{\circ}\text{C}$,
 Span - max $\pm 0.03\%$ F.S. per $^{\circ}\text{C}$

Overpressure:

Proof - 1 PSI,
 Burst - 1.5 PSI



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Low Pressure Transmitter

Zone Pressure Sensors (ZPS)

D9

Rev. 05/25/11

Additional Specifications

Enclosure Material: Polycarbonate**Enclosure Rating:** IP66, NEMA 4**Environmental Operation Range:**

Temp.: -13 to 176 °F (-25 to 80 °C)

32 to 140 °F (0 to 60 °C)
compensated range

Humidity: 0 to 95% RH, non-condensing

Wiring:2 (loop powered) or 3 (voltage output) wires¹**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)

Load Resistance:0-5 VDC or 0-10 VDC Output - 1 k Ω minimum4-20 mA Output - 850 Ω max @ 24 VDC**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 on 4-20 mA Output

¹ 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.

Note: Mount unit with the pressure fittings on the bottom to prevent condensation from entering the sensor.

Ordering Information		Zone Low Pressure Sensor in a BAPI-Box			
ALC/ZPS					
	Output Range				
	-20	4 to 20 mA	(7 to 45 VDC Supply ONLY)		
	-05	0 to 5 V	(7 to 45 VDC Supply or 7 to 32 VAC Supply)		
	-10	0 to 10 V	(13 to 45 VDC Supply or 13 to 32 VAC Supply)		
	Pressure Range				
	-SR(range)	Standard Pressure Ranges - replace (range) with option # shown below			
		<u>Option</u>	<u>Range (inches W.C.)</u>	<u>Option</u>	<u>Range (Pascals)</u>
		51	0 to 0.10	61	0 to 30
		52	0 to 0.25	62	0 to 50
		53	0 to 0.50	63	0 to 100
	54	0 to 0.75	64	0 to 175	
	55	0 to 1.00	65	0 to 250	
	56	-0.10 to 0.10	66	-30 to 30	
	57	-0.25 to 0.25	67	-50 to 50	
	58	-0.50 to 0.50	68	-100 to 100	
	59	-0.75 to 0.75	69	-175 to 175	
	60	-1.00 to 1.00	70	-250 to 250	
		Enclosure Style (Must Select One)			
	-BB	BAPI-Box Enclosure - IP66 rated, UV-resistant polycarbonate			
		Static Pressure Probe (Must Select One)			
		-NT	No Tube or Probe Included		
		-ST	Static Pressure Probe Included (not attached)		
		-AT	Attached Static Pressure Probe (not available with Back Mount option [-BM])		
			LCD Display (Omit if not required)		
		-D	LCD Display		
			Back Mount Option (Omit if not required)		
		-BM	Back Mount (wires and pressure ports run out the back, not available with Attached Tube option [-AT])		
EXAMPLE					
ALC/ZPS	-20	-SR51	-BB	-NT	-D -BM
Example Part Number: ALC/ZPS-20-SR51-BB-NT-D-BM					
Your Part Number:					



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Features & Options

- 5 Field Selectable Pressure Ranges (from 0-5 to 0-30 W.C. or 0-1,250 to 0-7,400 Pascals)
- 3 Field Selectable Outputs, 4-20 mA, 0-5 or 0-10 VDC
- Optional LCD Displays Pressure Over the Entire Operational Range Regardless of Which Individual Pressure Range is Selected
- Inches of Water Column (W.C.) or Pascal Operation
- Available with Attached Static Tube
- Simple Auto-Zero Process
- Three Year Warranty



**BAPI-Box
Enclosure with
Display**



**BAPI-Box
Enclosure
without Display**

BAPI's High Pressure Sensor is an accurate, rugged and economical solution for measuring and reporting duct/building static pressure, room-to-room differential pressure or air velocities/volumes. It features 5 pressure ranges from 0-5 to 0-30 W.C. (0-1,250 to 0-7,400 Pascals).

The heart of the unit is a micro-machined silicon piezoresistive pressure sensor with excellent accuracy, repeatability and stability.

The LCD model offers an additional level of troubleshooting and monitoring capability over the standard model by displaying the actual differential pressure over the entire operational range (0 to 30 inches W.C. or 0 to 7,400 Pascals) regardless of which individual pressure range is selected for output to the system controller.

The unit comes with an IP66-rated BAPI-Box enclosure with short circuit proof outputs and reverse polarity protected inputs to perform under real world conditions.

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).

**Pressure Sensor with
Attached Static Tube**

The unit is available in a BAPI-Box with an Attached Static Tube (-AT), therefore it doesn't require two trades to install the unit.

**Specifications****Accuracy:**

$\pm 0.25\%$ on all ranges

Stability:

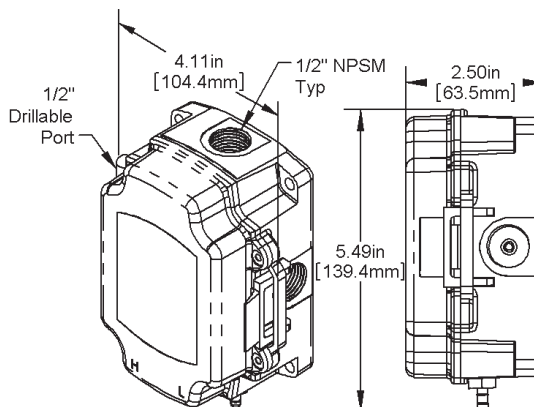
$\pm 0.25\%$ F.S. (full scale) per year

Temperature Error:

Zero - $\pm 0.025\%$ F.S. per $^{\circ}\text{C}$,
Span - max $\pm 0.03\%$ F.S. per $^{\circ}\text{C}$

Overpressure:

Proof - 2 PSI, Burst - 3 PSI



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Additional Specifications

Enclosure Material:

Polycarbonate

Enclosure. Rating: IP66

Environmental Operation Range:

Temp.: -13 to 176 °F (-25 to 80 °C)

32 to 140 °F (0 to 60 °C)

compensated range

Humidity: 0 to 95% RH, non-condensing

Wiring:

2 (loop powered) or 3 (voltage output) wires¹

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)

Load Resistance:

0-5 VDC or 0-10 VDC Output - 1 kΩ minimum

4-20 mA Output - 850 Ω max @ 24 VDC

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 on 4-20 mA Output

¹ **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.

Note: Mount unit with the pressure fittings on the bottom to prevent condensation from entering the sensor.

Ordering Information		High Pressure Zone Pressure Sensor					
ALC/ZPS							
	Output Range						
	-20	4 to 20 mA	(7 to 45 VDC Supply ONLY)				
	-05	0 to 5 V	(7 to 45 VDC Supply or 7 to 32 VAC Supply)				
	-10	0 to 10 V	(13 to 45 VDC Supply or 13 to 32 VAC Supply)				
	Pressure Range						
	-SR(range)	Standard Pressure Ranges - replace (range) with option # shown below					
		Option	Range (inches W.C.)		Option	Range (Pascals)	
		31	0 to 5		41	0 to 1,250	
		32	0 to 10		42	0 to 2,500	
		33	0 to 15		43	0 to 4,000	
		34	0 to 25		44	0 to 6,000	
		35	0 to 30		45	0 to 7,400	
	Enclosure Style						
	-BB	BAPI-Box Enclosure - IP66 rated, UV-resistant polycarbonate					
		Optional Static Pressure Probe					
		-NT	No Tube or Probe Included				
		-ST	Static Pressure Probe Included (not attached)				
		-AT	Attached Static Pressure Probe (not available with Back Mount option [-BM])				
		LCD Display					
		-D	LCD Display				
		Back Mounting Options (Omit if not required)					
		-BM	Back Mount (wires and pressure ports run out the back, not available with Attached Tube option [-AT])				
EXAMPLE							
ZPS	-20	-SR31	-BB	-NT	-D	-BM	
Example Part Number: ALC/ZPS-20-SR31-BB-NT-D-BM							
Your Part Number:							



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Rev. 05/25/11

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

Features & Options

- Economical & Easy to Install
- Delta Enclosure or Stainless Steel Plate for Wall Mount
- Ceiling Mount with or without J-Box
- 100 Micron Filter
- Accommodates 1/8" I.D. to 5/32" I.D. Tubing

The Wall Pressure Pickup Port comes standard on a brushed stainless steel plate or in a Delta Style enclosure, both sized to fit a common 2" x 4" electrical box. A foam gasket seals the plate or enclosure to the wall to insure the integrity of the measured space. The Wall Plate and Delta Style Enclosure can be used for pressure alone or as a combination temperature sensor and pressure pickup port. BAPI also offers a Ceiling Mount Cover designed to fit a standard 3/4" thick suspended ceiling tile. If additional protection is required in the ceiling, a second ceiling cover fits on a common 2" x 4" electrical box. The brass fitting on the back of all Pickup Ports accommodates standard 1/8" to 5/32" I.D. tubing.



**Delta Style
Enclosure**



Wall Plate



**Ceiling Mount
Square Cover
(ALC/ZPS-ACC05)**



**Ceiling Mount
Cover & J-Box
(ALC/ZPS-ACC06)**

Specifications

Environmental Operation Range:

Temp. - 32 to 122 °F (0 to 50 °C)

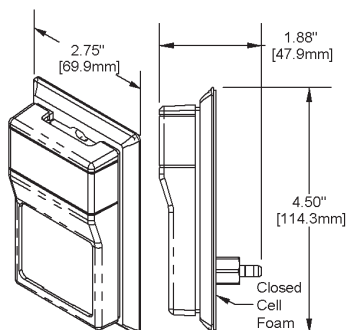
Humidity 0% to 95% RH, non-condensing

Material:

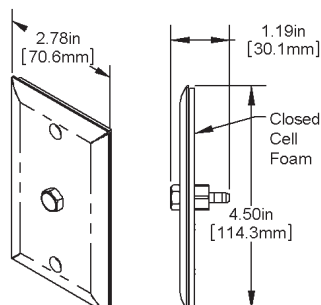
Delta Style Enclosure:

ABS Plastic, UL 94, V-0

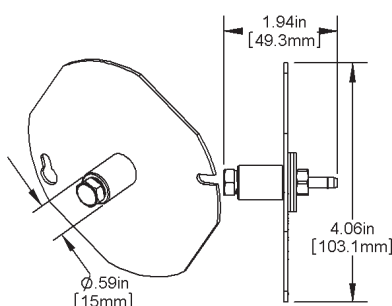
Wall Plate: Stainless Steel



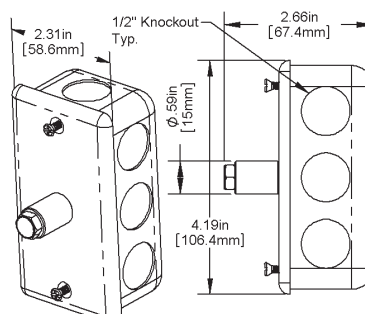
Delta Enclosure (ZPS-ACC03)



Wall Plate (ZPS-ACC01)



**Ceiling Mount Cover
(ZPS-ACC05)**



**Ceiling Mount Cover & J-Box
(ZPS-ACC06)**



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ORDERING INFORMATION

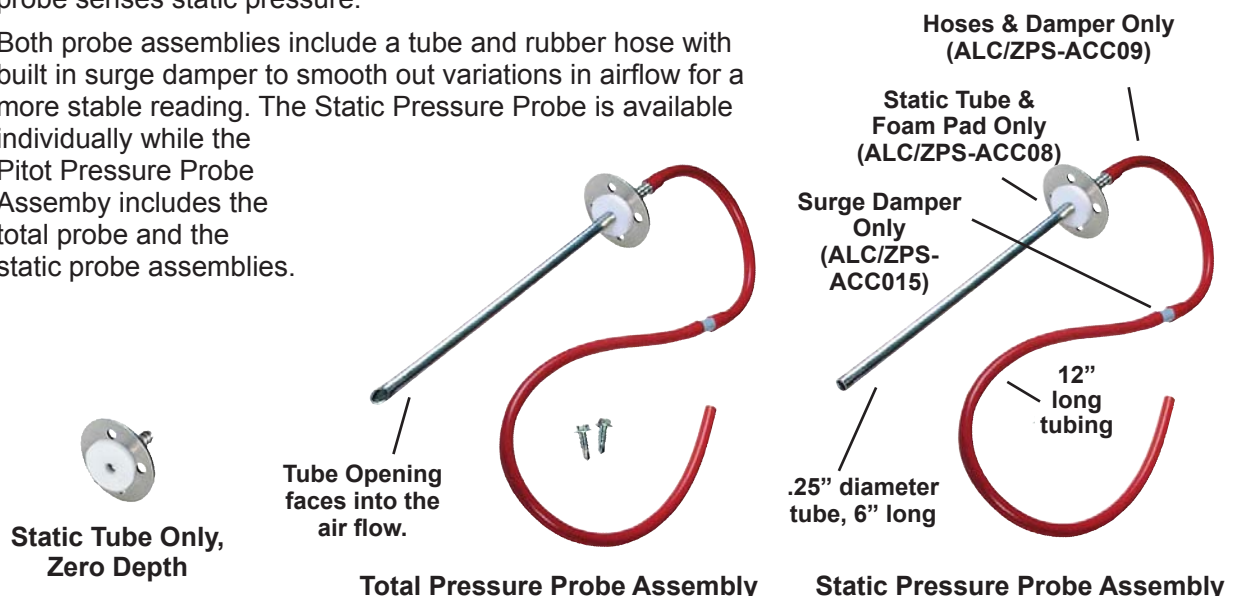
ALC/ZPS-ACC01	 2" X 4" Stainless Steel Wall Plate with Static Pickup
ALC/ZPS-ACC01-102	.. 2" X 4" Stainless Steel Wall Plate with Static Pickup & 10K-2 Temp. Sensor
ALC/ZPS-ACC03	 Room Mount Delta Style Enclosure with Static Pickup
ALC/ZPS-ACC03-102	.. Room Mount Delta Style Encl. with Static Pickup & 10K-2 Temp. Sensor
ALC/ZPS-ACC05	 Ceiling Mount Square Cover with Static Pickup
ALC/ZPS-ACC06	 Ceiling Mount Rectangular 2" X 4" Cover and Box with Static Pickup
ALC/ZPS-ACC07	 Static Pressure Probe Assembly, 6" long
ALC/ZPS-ACC08	 Static Tube Only (6") with Circular Foam
ALC/ZPS-ACC09	 Rubber Hoses with Surge Damper
ALC/ZPS-ACC11	 Pitot Pressure Probe Assy, 3.5" long (includes the Static & Total Probe Assy)
ALC/ZPS-ACC12	 Pitot Pressure Probe Assy, 6" long (includes Static & Total Probe Assy)
ALC/ZPS-ACC13	 Total Tube Only (3.5") w/ Circular Foam (doesn't include hoses & damper)
ALC/ZPS-ACC14	 Total Tube Only (6") with Circular Foam (doesn't include hoses & damper)
ALC/ZPS-ACC15	 Surge Damper Only, 5 micron
ALC/ZPS-ACC17	 Static Tube Only (0.5") with Circular Foam (doesn't include hoses & damper)
ALC/ZPS-ACC18	 2 Static Pressure Tube Assemblies, 6" Long
ALC/ZPS-ACC21	 Static Tube Only (6") with Circular Foam and Mounting Screws (doesn't include hoses & damper)
ALC/ZPS-ACC22	 Static Tube Only, Zero Length, with Circular Foam and Mounting Screws

Static & Total Pressure Probe Assemblies

Features & Options

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.



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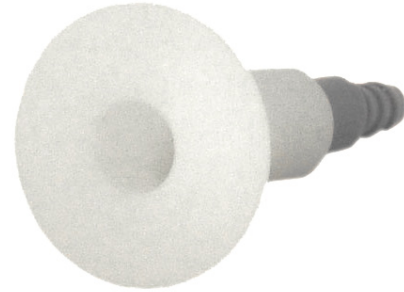
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Rev. 05/25/11

Features & Options

- Small Flush Pressure Port Mounting
- Accurate Air Pressure Measurement
- Paintable with Latex or Oil Base
- Five-Micron Filter
- Built in Surge Damper

The Low Profile Pressure Port is ideal for locations where aesthetics are as important as the pressure measurement. The inconspicuous sensor mounts easily by pushing through a 3/8" hole and secured with an adhesive ring. The only visible portion is a flush 7/8" dot on the wall. The built in surge damper provides five-micron filtering and smoothes out rapid variations in air pressure for a more stable reading.



**Low Profile Pressure
Pickup Port**

ORDERING INFORMATION

Part Number: ALC/ZPS-ACC20

Specifications

Mounting: 3/8" hole, push in plastic sheath with an adhesive ring

Configuration: Round Flush Sensor Sheath

Dimensions:

Insertion 1.74" depth (44.2mm), into a 0.375" hole

Sleeve 0.375" (9.52mm) Diameter

Bezel 0.88" (22.2mm) Diameter

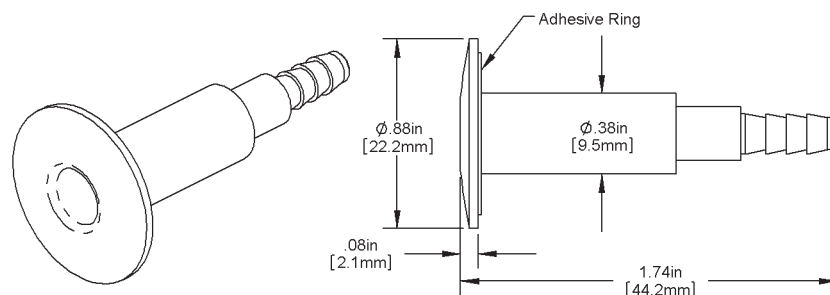
Material: White Delrin, UL94V-HB

Filter: 5 Micron

Ambient:

0 to 100% RH, Non-condensing

-40°F to 185°F, (-40° to 85°C)



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Features & Options

- Economical & Easy to Install
- Rugged Housing
- Rooftop, Wall or Vertical Mount

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 pressure 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.

Rooftop Mount or Wall Mount
(Conduit and tubing not included)



ORDERING INFORMATION

Part #: ALC/ZPS-ACC10

Rooftop or Wall Mount Unit

Part #: ALC/ZPS-ACC10-V

Vertical Mount Unit

Specifications

Environmental Operation

Range:

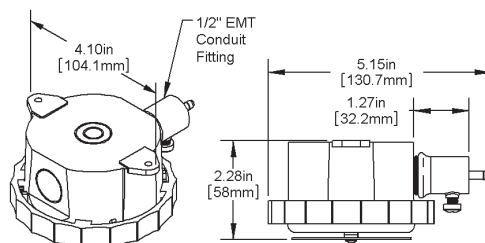
Temperature:
-40 to 212 °F
(-40 to 100 °C)

Humidity:
0% to 100% RH,
condensing

Material:

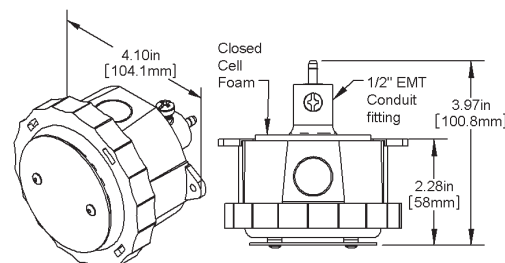
UV-resistant plastic

Rooftop or Wall Mount



Patent Pending

Vertical Mount



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Rev. 07/19/10

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 (ALC/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
ALC/ZPS-SW1:	Differential Pressure Switch, 0.12" to 0.52" W.C. (30 Pa to 130 Pa)
ALC/ZPS-SW2:	Differential Pressure Switch, 0.40" to 1.40" W.C. (100 Pa to 350 Pa)
ALC/ZPS-SW3:	Differential Pressure Switch, 1.20" to 2.40" W.C. (300 Pa to 600 Pa)
ALC/ZPS-SW4:	Differential Pressure Switch, 2.40" to 6.42" W.C. (600 Pa to 1,600 Pa)
ALC/ZPS-SW5:	Differential Pressure Switch, 5.22" to 12.84" W.C. (1,300 Pa to 3,200 Pa)
ALC/ZPS-SW6:	Differential Pressure Switch, 11.64" to 23.68" W.C. (2,900 Pa to 5,900 Pa)
ALC/ZPS-SW7:	Differential Pressure Switch, 21.68" to 35.32" W.C. (5,400 Pa to 8,800 Pa)
ALC/SQ1BIT:	Square Screwdriver Bit to turn the Pressure Adjustment Screw

**Specifications**

Measurement Media: Air, Combustion Gases

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

Operating Humidity: 5 to 95% RH non-condensing

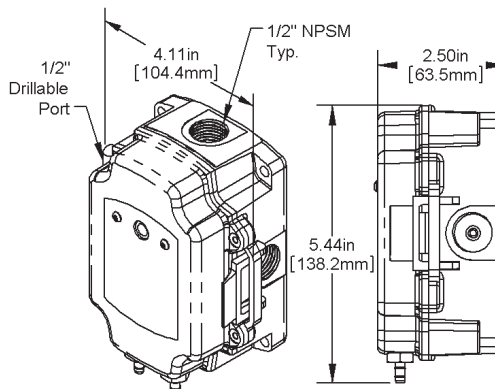
Contact Ratings: 28 VA pilot duty, 24 VAC
1/10 HP, 120-277 VAC
125 VA Pilot Duty, 125 VAC
2.5 A Inductive, 125 VAC
5 A Resistive, 125 VAC

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

Pressure Ports: 1/4" Barbed Fittings

Switch Type: SPDT (Silver Contacts)

UL Limit Control Listing: 353



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Air Quality Sensors

VOC Sensors - pages 2-3

- VOC Alone or Temperature and Humidity Combination
- Indicates Space Occupancy by Detecting Human-Generated VOCs
- Output is Correlated to a CO₂ Value Allowing You to Ventilate Using ASHRAE's Occupancy-Based VRP Algorithm

Humans respire Volatile Organic Compounds (VOCs) as well as CO₂. The BAPI sensor is able to measure these VOCs, therefore it is as good an indicator of space occupancy as a CO₂ sensor.

The BAPI Sensor is different from other VOC sensors because it has been optimized for Demand Controlled Ventilation (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 occupancy-based VRP schedule to ventilate.



Duct Mounted VOC Sensor

Room Mount VOC Sensors

CO₂ Sensors - pages 4-5

- Altitude and Temperature Compensation
- Optional Temperature, Temperature Setpoint, Override and Humidity
- Two Units -- One for Areas that Are Periodically Unoccupied and One for Areas that are Continuously Occupied

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 0-5 or 0-10 VDC.

The unit can be ordered as CO₂ alone, or with optional temperature sensing, temperature setpoint, occupant override and humidity sensing. The large format display is easy to read and alternates between the measured values (CO₂, Temperature or Humidity). The display is also field adjustable between °F or °C and all the displayed values may be turned on or off by an HVAC technician.



CO₂ Sensors with Temp. Setpoint and Override.

Refrigerant Leak Detector - pg 6

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



Carbon Monoxide Sensors - pg 7

- Long Life Electrochemical Sensor
- High Accuracy at Low Concentrations
- Optional LCD Display



VOC and CO₂ Sensor White Papers and App. Notes - pages 8-18

- BAPI VOC Sensor Offers an Alternative to CO₂ for Demand Controlled Ventilation, pg 8
- Using the BAPI VOC Sensor for Demand Controlled Ventilation - White Paper, pgs 9-13
- Common Volatile Organic Compounds Detected by BAPI's VOC Sensor - App. Note, pgs 14-15
- The Effects of Temperature and Altitude on CO₂ Measurement - App. Note, pgs 16-17
- Calibration Methods for Single and Dual Beam CO₂ Sensors - App. Note, pg 18

Rev. 04/11/11

Features & Options

- VOC Alone or Temperature and Humidity Combination
- Indicates Space Occupancy by Detecting Human-Generated VOCs
- Output is Correlated to a CO₂ Value Allowing You to Ventilate Using ASHRAE's Occupancy-Based VRP Algorithm

Humans respire Volatile Organic Compounds (VOCs) as well as CO₂. The BAPI sensor is able to measure these VOCs, therefore it is as good an indicator of space occupancy as a CO₂ sensor.

The BAPI Sensor is different from other VOC sensors because it has been optimized for Demand Controlled Ventilation (DCV). Using a calibration algorithm, the sensor value is converted to an output with a high correlation to a CO₂ level¹. This lets you use ASHRAE's occupancy-based VRP schedule to ventilate. (¹More info on this correlated output is available on our website at www.bapihvac.com)

Besides from respiration, the sensor picks up VOCs from other sources such as building materials, perfumes, colognes and furniture off gassing. Using this sensor to ventilate is a way of achieving true indoor air quality and not just CO₂ dilution.

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. An optional three color LED indicates "VOC Level" of Good, Fair or Poor.

Demand Controlled Ventilation with Confidence!**Ordering Information/Part Numbers**

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications**Power:** (No AC Power)

9-35 VDC @ 50 mA Max
(9-24VDC recommended) for 0-5 VDC Outputs
15-35 VDC @ 50mA Max
(15-24VDC recommended) for 0-10 VDC Output

Sensing Elements:

Humidity – Capacitive Polymer, ±1.8% RH Accuracy
VOCs – Micro-machined Metal Oxide

Temp. Sensor: Thermistor, RTD or Semiconductor**Mounting:** 2"x4" J-Box or drywall mount – screws provided**VOC Detection Range:** 0 – 2,000 CO₂ PPM equivalent**Response Time:** Less Than 60 Sec. (after Start-Up Time)**Start-Up Time:** 15 minutes**Operating Environment:**

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

LCD Display:

Main Display: 0.76" 4-digit Numeric (Numeric Values)
Minor Display: 0.34" 3-digit Alpha-Numeric (PPM, %RH, °F, °C)
Occ/Un-occ BAPI Man Icon: (Blk=Occupied)

Measurement Offsets (field adjustable)

±5° (F or C) in 0.1° increments
±5% RH in 0.1% RH increments
±5% Contaminants in 0.1% increments
±100 ppp CO₂ Equivalent Contaminants in 2 ppm increments

Analog Outputs (0-5, 0-10 or 2-10VDC [%RH only], >10KΩ impedance)

VOC Contaminants: 0-100%
%RH: 0-100% or 35-70% RH

Override Output:

Contact: SPST
Sensor: Shorts out direct Temperature sensor (Temp)
Setpoint: Contact in parallel, resistive setpoint only

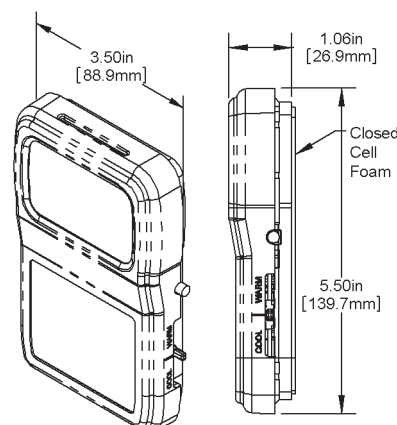
LED CO₂ Equivalent Level Indicator:

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:** Two years from manufacture date

VOC Sensors with Temp. Setpoint and Override.

The top unit has the VOC Level of "Good, Fair or Poor" shown by an arrow on the display. The bottom unit has the VOC level shown by a 3-color LED.



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Rev. 04/04/11

Features & Options

- Corresponds to ASHRAE's Occupancy-Based DCV Algorithm
- Quick Response Sensor Through Aspiration Tube
- Indicates Space Occupancy by Detecting Human-Generated VOCs
- 0-5 VDC or 0-10 VDC Output

Humans respire Volatile Organic Compounds (VOCs) as well as CO₂. The BAPI Duct Sensor is able to measure these VOCs, therefore it is as good an indicator of space occupancy as a CO₂ sensor.

The BAPI Sensor is different from other VOC sensors because it has been optimized for Demand Controlled Ventilation (DCV). Using a calibration algorithm, the sensor value is converted to an output with a high correlation to a CO₂ level¹. This lets you use Ashrae's occupancy-based VRP schedule to ventilate. (¹More info on this correlated output is available on our website at www.bapihvac.com)

Besides from respiration, the sensor picks up VOCs from other sources such as building materials, perfumes, colognes and furniture off gassing. Using this sensor to ventilate is a way of achieving true indoor air quality and not just CO₂ dilution.

BAPI's VOC Duct Sensor samples duct air using an aspiration tube. Moving air from the duct enters the tube, is forced into the BAPI-Box enclosure and exits through the other half of the tube. As long as there is air movement in the duct, air is continuously exchanged.



**Duct Mounted
VOC Sensor**

Demand Controlled Ventilation with Confidence!

Ordering Information/Part Numbers

Part Number:

- ALC/VOC05-D-BB** VOC Sensor, 0-5 Volt DC Output, BAPI-Box Enclosure
ALCVOC10-D-BB VOC Sensor, 0-10 Volt DC Output, BAPI-Box Enclosure

Specifications

Power:

- 9 - 35 VDC @ 50 mA Max
 (9 - 24VDC recommended) for 0 - 5 VDC Outputs
 15 - 35 VDC @ 50mA Max
 (15 - 24VDC recommended) for 0 - 10 VDC Outputs

Sensing Element:

Air Quality – Micro-machined Metal Oxide

VOC Detection Range: 0 – 100%

Response Time: Less Than 60 Seconds

Warm-up Time: 15 minutes

Operating Environment:

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

Analog Outputs

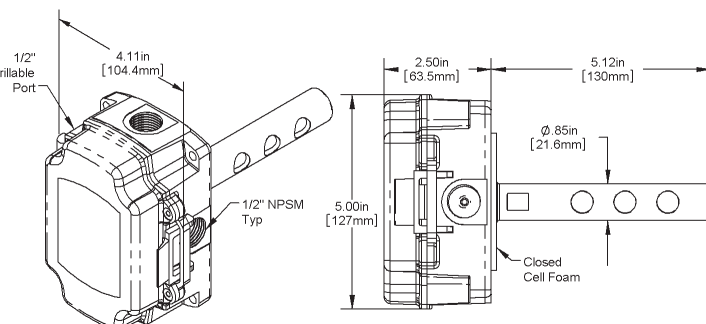
- (0-5VDC or 0-10VDC, >10KΩ impedance)
 VOC Contaminants 0 - 100%

Calibration: Internal & continuous,
 (No field calibration)

Material: ABS Plastic, Material Rated UL94V-0

Certifications: RoHs

Warranty: 2 years from manufacture date



Rev. 04/11/11

Features & Options

- Altitude and Temperature Compensation
- Optional Temperature, Temperature Setpoint, Override and Humidity
- Optimized for Areas that Are Periodically Unoccupied

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 0-5 or 0-10 VDC.

The non-dispersive infrared (NDIR) technology has been optimized for areas that are periodically unoccupied and features automatic background calibration over a long time period to reduce drift. The sensor is also altitude compensated for long-term accuracy and stability. Changing air pressure, due to altitude or weather patterns, can change the output of most CO₂ sensors by as much as 17%. The BAPI unit has a built-in barometric sensor that continuously compensates the output for accurate readings despite inclement weather or the altitude of the installation.

The unit can be ordered as CO₂ alone, or with optional temperature sensing, temperature setpoint, occupant override and humidity sensing. The large format display is easy to read and alternates between the measured values (CO₂, Temperature or Humidity). The display is also field adjustable between °F or °C and all the displayed values may be turned on or off by an HVAC technician.

Optional indication of the CO₂ level as "Good, Fair or Poor" is available as a three-color LED on the unit or as an arrow on the display.

Ordering Information/Part Numbers

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power for 0-5 VDC Outputs:

9-35 VDC @ 150mA max (9-24 VDC recommended)

Power for 0-10 VDC Outputs:

15-35 VDC @ 150mA max (15-24 VDC recommended)

Sensing Elements:

CO₂ – Single Beam Non-Dispersive Infrared (NDIR)
Humidity – Capacitive Polymer ±1.8% RH Accuracy

Temperature Sensor:

Thermistor, RTD or Semiconductor

Operating Environment:

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

Material ABS Plastic, Material Rated UL94V-0

CO₂ Detection Range: 0 – 2000 ppm

Start-Up Time: 10 Minutes

Response Time: Less Than 2 Minutes (after Start-Up Time)

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

Override Output:

Contact SPST, 24V AC/DC, 0.5A max
Sensor Shorts Out direct temperature sensor
Setpoint ... Contact in parallel, resistive setpoint only

LCD Display:

Main Display: 0.76" 4-digit Numeric (Numeric Values)
Minor Display: 0.34" 3-digit Alpha-Numeric (PPM, %RH, °F, °C)
Occ/Un-occ BAPI Man Icon: (Blk=Occupied)

Measurement Offsets: (Field Adjustable)

±5° (F or C) in 0.1° increments
±5% RH in 0.1% RH increments

CO₂ Accuracy: (Automatic Background Calibration)

500ppm ±35ppm • 800ppm ±60ppm
1000ppm ±75ppm • 1200ppm ±90ppm

LED CO₂ Level Indicator:

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

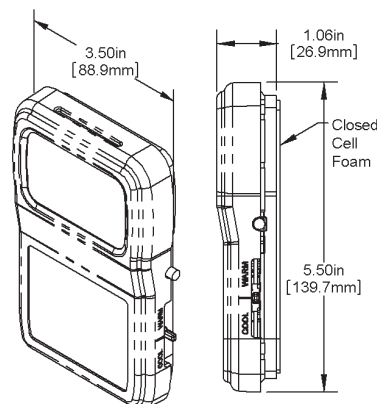
Certifications: RoHS

Warranty Period: 2 Years from manufacture date



CO₂ Sensors with Temp. Setpoint and Override.

The top unit has the CO₂ Level of "Good, Fair or Poor" shown by an arrow on the display. The bottom unit has the CO₂ level shown by a 3-color LED.



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Features & Options

- Altitude and Temperature Compensation
- Optional Temperature, Temperature Setpoint, Override and Humidity
- Optimized for Areas that Are Continuously Occupied

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 0-5 or 0-10 VDC.

The non-dispersive infrared (NDIR) technology of the "24/7" unit has been optimized for areas that are continuously occupied. It features a dual-channel optical system and three-point calibration process for enhanced stability, accuracy and reliability. The sensor is also altitude compensated for long-term accuracy and stability. Changing air pressure, due to altitude or weather patterns, can change the output of most CO₂ sensors by as much as 17%. The BAPI unit has a built-in barometric sensor that continuously compensates the CO₂ output for accurate readings despite inclement weather or the altitude of the installation.

The unit can be ordered as CO₂ alone, or with optional temperature sensing, temperature setpoint, occupant override and humidity sensing. The large format display is easy to read and alternates between the measured values (CO₂, Temperature or Humidity). The display is also field adjustable between °F or °C and all the displayed values may be turned on or off by an HVAC technician.

Optional indication of the CO₂ level as "Good, Fair or Poor" is available as a three-color LED on the unit or as an arrow on the display.

Ordering Information/Part Numbers

This unit has hundreds of factory-configurable options, so please contact your BAPI representative at +1-608-735-4800 to build a part number for this unit.

Specifications

Power for 0-5 VDC Outputs:

9-35 VDC @ 150mA max (9-24 VDC recommended)

Power for 0-10 VDC Outputs:

15-35 VDC @ 150mA max (15-24 VDC recommended)

Sensing Elements:

CO₂ – Dual Channel Non-Dispersive Infrared (NDIR)

Humidity – Capacitive Polymer ±1.8% RH Accuracy

Temperature Sensor:

Thermistor, RTD or Semiconductor

Operating Environment:

32-122°F (0-50°C)

0-95%, RH non-condensing

Material ABS Plastic, Material Rated UL94V-O

CO₂ Detection Range: 0 – 2000 ppm

Start-Up Time: 10 Minutes

Response Time: Less Than 2 Minutes (after Start-Up Time)

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

Override Output:

Contact SPST, 24V AC/DC, 0.5A max

Sensor Shorts out direct temperature sensor

Setpoint ... Contact in parallel, resistive setpoint only

LCD Display:

Main Display: 0.76" 4-digit Numeric (Numeric Values)

Minor Display: 0.34" 3-digit Alpha-Numeric (PPM, %RH, °F, °C)

Occ/Un-occ BAPI Man Icon: (Blk=Occupied)

Measurement Offsets: (Field Adjustable)

±5° (F or C) in 0.1° increments

±5% RH in 0.1% RH increments

CO₂ Accuracy: ±75ppm

LED Air Quality Indicator:

Good, Green < 1,000 PPM

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

Poor, Red > 1,500 PPM

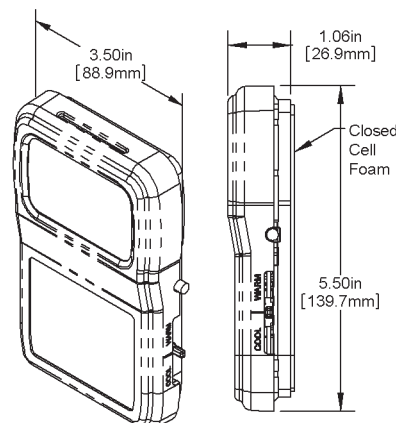
Certifications: RoHS

Warranty Period: 2 Years from manufacture date



CO₂ Sensors with Temp. Setpoint and Override.

The top unit has the CO₂ Level of "Good, Fair or Poor" shown by an arrow on the display. The bottom unit has the CO₂ level shown by a 3-color LED.



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Rev. 01/12/11

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:**

ALC/RLD.. Refrigerant Leak Detector in a BAPI-Box Enclosure

Specifications**Power:**

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

Output Impedance:

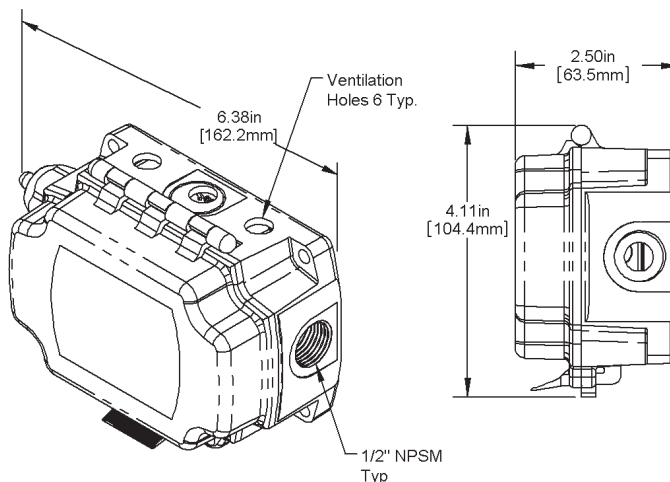
680 Ohms

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



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Rev. 04/04/06

Features & Options

- Long Life Electrochemical Sensor
- High Accuracy at Low Concentrations
- Optional LCD Display
- Rugged Housing with Mounting Tabs for Easy Installation
- Two Year Warranty

BAPI's Carbon Monoxide Sensor offers enhanced, long life electrochemical sensing with outstanding accuracy at low concentrations. The sensor has a range of 1-100 PPM or 1-300 PPM of Carbon Monoxide with a resolution of 1 PPM and a linear output of 4-20 mA. The unit also features a robust enclosure and is available with or without LCD display.



**Carbon Monoxide
Sensor with Display**



**Carbon Monoxide Sensor
without Display**

Ordering Information: Carbon Monoxide Sensor/Transmitter					
ALC/420CO	4 - 20mA output Carbon Monoxide Sensor/Transmitter				
	Carbon Monoxide Concentration				
	-1	1 - 100 ppm Carbon Monoxide			
	-3	1 - 300 ppm Carbon Monoxide			
	LCD Display				
	-ND	No Display			
	-D	LCD Display			
	Case Style				
	-EUO	UV-Resistant Plastic			
	Mounting Kits (Optional)				
		-FM	3/4" Conduit Adapter only		
	-PM	Panel Mount			
EXAMPLE					
ALC/420CO	-1	-D	-EU	-FM	
Example Part Number: ALC/420CO-1-D-EU-FM					
Your Part Number:					

Specifications

Range: 1-100 PPM CO (normal range) or 1-300 PPM CO (optional)

Voltage requirement: 12-27 VDC (non-display) or 14-27 VDC (with display)

Signal output: 4-20 mA, 2-wire, loop powered

Sensor type: Electrochemical cell

Enclosure Material: UV-resistant plastic

Resolution: 1 PPM on display,
Infinite on 4-20 mA loop

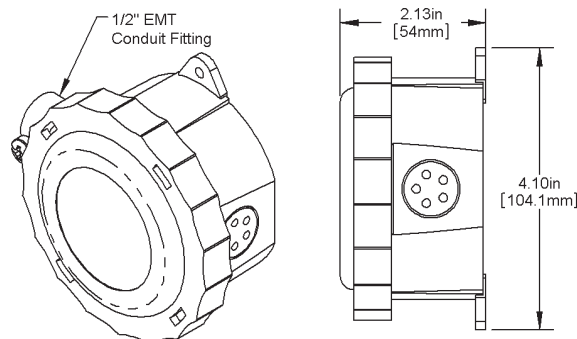
Accuracy: ±5 PPM (combination of linearity,
temperature, drift and repeatability)

Response time:
90%: Less than 40 seconds @ 25°C

Environmental Operating Range:

Temperature: -20°C to 40°C (non-display)
-10°C to 40°C (with display)

Humidity: 15-90% RH (constant)
0-98% RH (intermittent)



Carbon Monoxide Sensor

Sensor life expectancy: More than four years

Load Resistance: 500 Ohms max at 24 VDC

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



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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.



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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

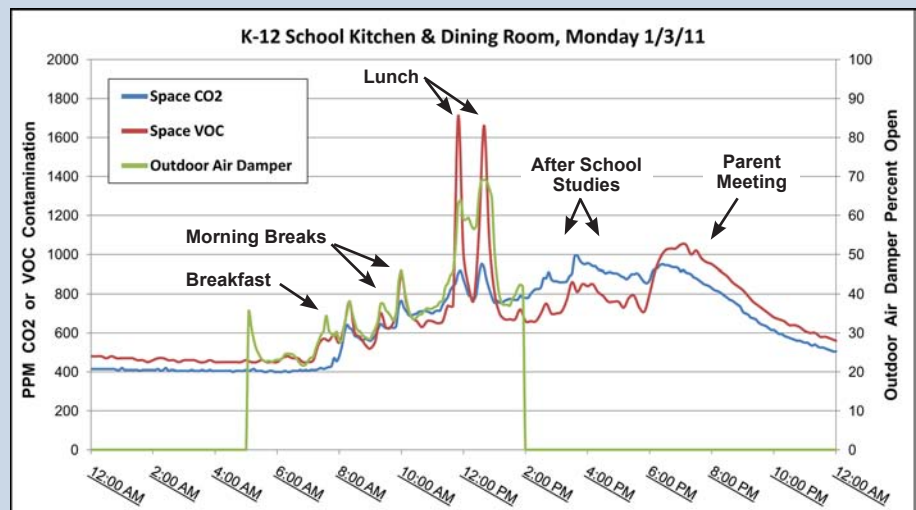
This chart was taken in a kitchen and dining area of a public school in Wisconsin. This is a true multi-purpose area with breakfast, snacks, lunch, and after school studies in the day, and athletic practices, exercise classes and meetings in the evenings.

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



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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.

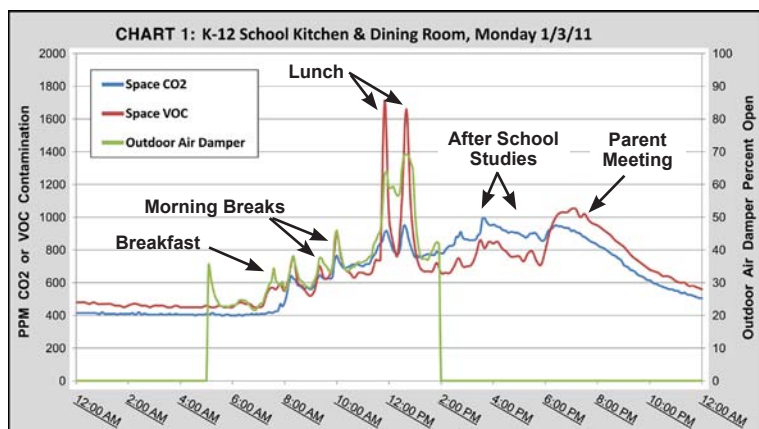
Chart 1. Monday:

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.



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Using the VOC Sensor for Demand Controlled Ventilation

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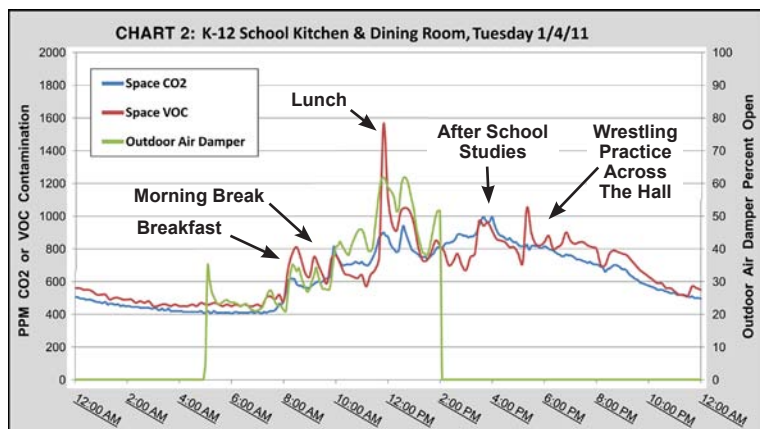


Chart 2, Tuesday:

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.

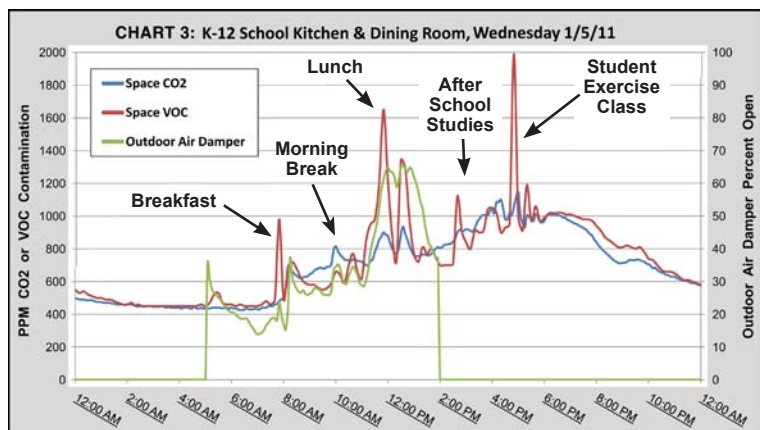


Chart 3, Wednesday:

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.

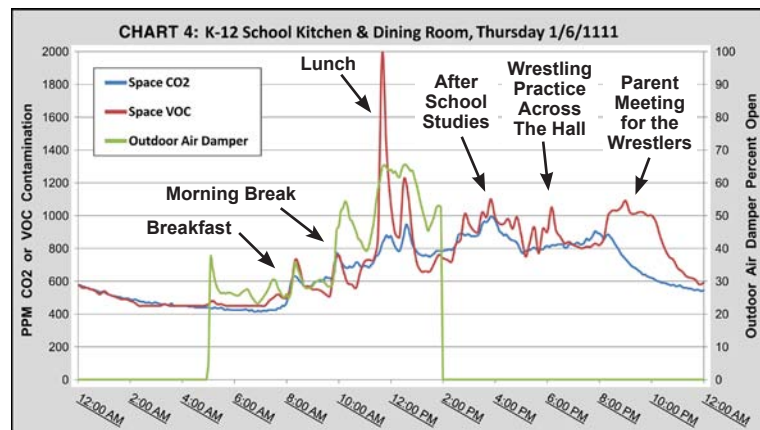


Chart 4, Thursday:

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.

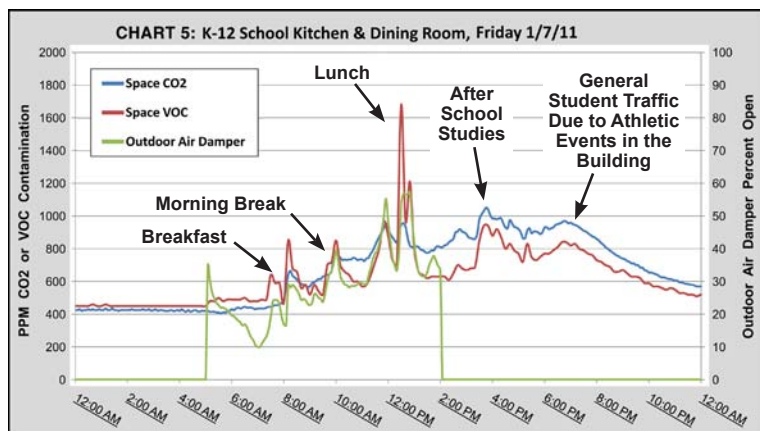


Chart 5, Friday:

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.



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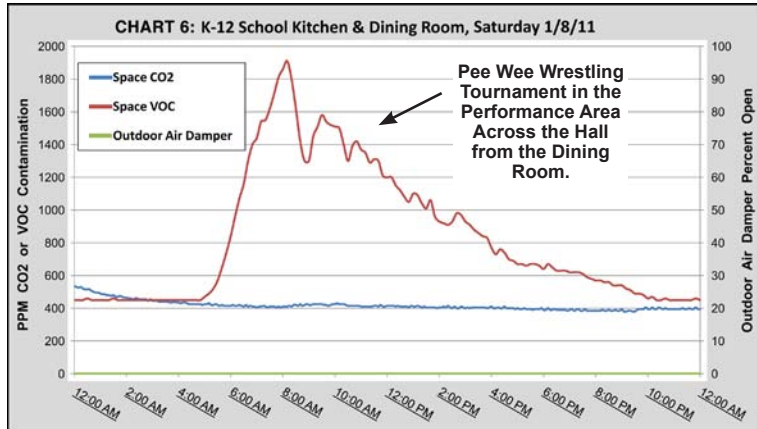


Chart 6, Saturday:

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.

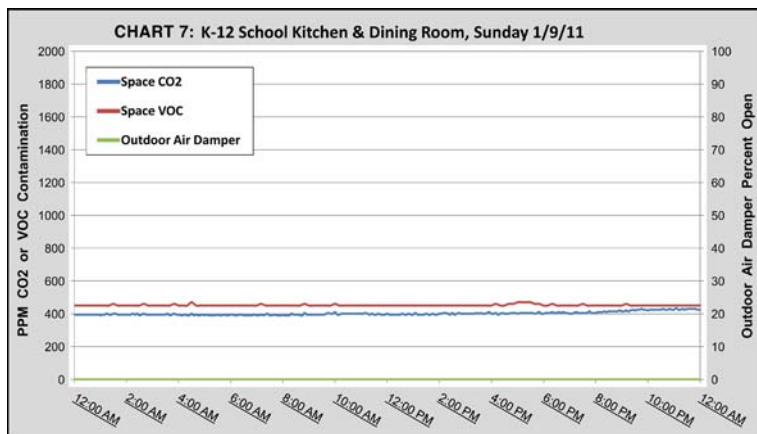


Chart 7, Sunday:

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.



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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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Rev. 03/17/11

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



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Common VOCs Detected by the BAPI VOC Sensor

Rev. 03/17/11

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
Pentane	Polystyrene foam, Refrigerants
Phenol	Platics, Cosmetics, Disinfectants
Pinene	Perfume, Human metabolism
Propane	Fuel based heating, Cooking appliances, Cleaners
Siloxanes.....	Waxes, Polishes
Tetrachloroethene.....	Dry cleaning
Tetrachloroethylene	Spot cleaners
Toluene	Paints, Coatings, Cleaners, Detergents, Smoking, Polyurethane lacquers
Trichloromethane.....	Human metabolism
r (1-methylethyl)cyclopropane	Adhesives, Coatings, Plastics, Lubricants
Xylene.....	Plastics, Synthetic Rubber, Polyester clothing



Rev. 05/25/11

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 pressure and air temperature. 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 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 pressure.

Calculating Temperature and 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 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 and the 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 pressure. As seen in Table 1, the CO₂ concentration varies by 150 ppm.

Air pressure or barometric pressure is directly affected by altitude, and **Table 2** uses the Ideal Gas Law and formula to show how the uncompensated CO₂ measurement would change with altitudes of -1,000 to 10,000 feet. Initial conditions are 77°F and 1,000 ppm CO₂ at sea level. As seen in Table 2, the CO₂ concentration varies by 349 ppm.

Table 1: CO₂ Measurement Change With Temperature

Temp. in °F	CO ₂ Measured in PPM	Temp. in °F	CO ₂ Measured in PPM	Temp. in °F	CO ₂ Measured in PPM
32	1092	60	1033	85	985
35	1085	65	1023	90	976
40	1074	70	1013	95	968
45	1063	75	1004	100	959
50	1053	77	1000	105	950
55	1043	80	994	110	942

Table 2: CO₂ Measurement Change with Altitude and Pressure

Altitude in Feet	Barometric Pressure in inches Hg	CO ₂ Measured in PPM
-1000	31.02	1037
0	29.92	1000
1000	28.85	964
2000	27.82	930
3000	26.82	896
4000	25.84	864
5000	24.9	832
6000	23.98	801
7000	23.09	772
8000	22.23	743
9000	21.39	715
10000	20.58	688



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The Effects of Temperature and Altitude on CO₂ Measurement

Rev. 05/25/11

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. These systems influence air volumes exactly like changes in altitude, thus creating an “effective altitude” for the location. 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.

Due to barometric pressure changes from weather patterns, DeSoto's “effective altitude” changed by 2,096 feet between January 15, 2005, and October 26, 2010. The “effective altitude” changed by 983 feet in one day on January 18, 2005.

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	Effective Altitude in Feet	Measured CO ₂ in PPM
1/18/2005	30.71	-723	1026
1/18/2005	29.64	260	991
1/15/2005	30.78	-786	1029
10/26/2010	28.53	1310	954

The Combined Effect of Temperature and Pressure on CO₂ Measurement

Temperature and 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 were 1,000 ppm at 77°F and sea level, the measured CO₂ concentration would vary by 161 ppm across the various temperature and pressure ranges. That variance is more than the specified accuracy of the NDIR CO₂ sensor.

Table 4: CO₂ Measurement Change with Temperature and 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 sensor provides the most accurate CO₂ measurement in the industry. There is also no need for an HVAC technician to spend valuable time entering altitude compensation values into the sensor when it is received from the factory. The technician just screws the sensor to the wall and walks away. The sensor takes care of itself!



Rev. 04/15/11

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.

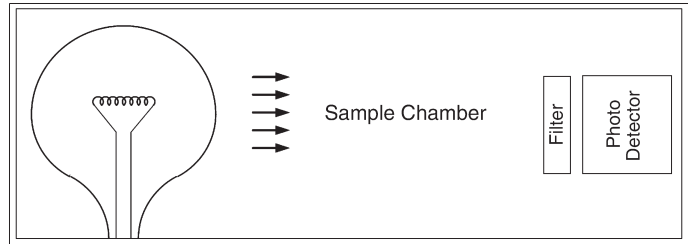


Figure 1: Single Channel CO₂ Sensor

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 using nitrogen gas will immediately restore the highest level of accuracy. BAPI recommends a 5-year calibration interval for the average office environment.

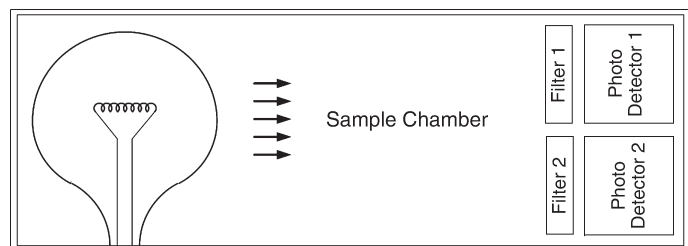


Figure 2: Dual Channel CO₂ Sensor

Accessories for HVAC/R

F1



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Rev. 08/09/10

VC75 & VC100 - pg 2



**75mA & 100mA
Snaptrack
Mountable
Voltage
Converters**

VC350A-EZ & VC350A - pg 3-4



**350 mA "EZ"
Voltage Converter,
Surface, Snaptrack
or Din Rail
Mountable - pg. 3**



**350 mA
Snaptrack
Mountable
Voltage
Converter - pg. 4**

BAPI-Guard - pg 5

Prevents
Tampering,
Physical
Damage and
Unauthorized
Adjustment



**BAPI-Guard 2
Thermostat Protector**

Voltage Converters - pgs 6-7



**VC2700-STM, 2.7 Amp Voltage
Converter (below)**

SFC, Screwdrivers & Insulators - pg 8



**Sealant Filled
Connectors (SFC)**



**Screwdriver & Allen
Wrench Combo**



**Foamback
Insulator**

ZN551 Relay Pack - pg 9

The Relay Pack plugs directly into your ALC ZN551 controller and provides a total of six relays. Five relays are directly controlled by the five Digital Outputs (DO) on the controller. The sixth relay can be operated by the controller's Analog Output if it is not being used.



Adaptor Plates - pgs 10-11

BAPI Adaptor Plates are designed to cover wall imperfections when installing wall sensors or thermostats. They are made in three different sizes and three different colors to match the sensor. The Adaptor Plates can be painted or wall papered in place if required.



FPB & BAPI Clean Cut - pg 12-13



**FPB - Flexible
Probe Bracket for
Easy Mounting of
Averaging Sensors**



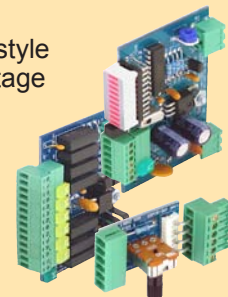
**The BAPI Clean Cut
for Cutting Out the
Plugs in the
BAPI-Box Enclosures**

DS6R, EA2 & OAM Modules - pgs 14-16

The EA2 simplifies wiring & troubleshooting of "Belimo®" style modulating actuators with voltage feedback.

The OAM allows stroking of the actuator without additional equipment.

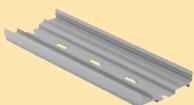
The DS6R monitors 6 dry switch closure devices and provides one resistive output.



Backplanes, Snaptrack & Filter - pg 17-18

The Snaptrack and Backplanes provide a convenient way to mount and power the DS6R & EA2 Modules.

**BP8 Backplane
(right) and 4"
Snaptrack (left)**



**Replacement
Humidity Sensor Filter**



Output Termination Boards - pg 19

The Output Termination Boards are designed to assist the ALC network by providing all necessary field wiring terminations, which reduces costs related to installation, panel building, project materials and engineering. No additional termination strips are required.



Rev. 07/13/10

Features & Options

- Compact & Cost Effective
- 75 mA and 100mA models
- Self-resetting Thermal Fuse
- Operation & Fault LED Indicators
- Ruggedized Circuitry
- Fixed or Adjustable Outputs
- Output Protected Against Overload and Accidental Short Circuit

**Snaptrack
Mountable!**



**VC100 with
optional Snaptrack**

BAPI VC75 and VC100 voltage converters are a cost effective way of converting 24 VAC to 5, 12, 15 or 24 VDC for use on peripheral devices that require DC voltage. The converters are available with outputs of 75 mA or 100 mA and fit into standard 2.75" 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 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 three models are available with fixed outputs of 5, 12 or 15 VDC, or an adjustable output of 5-24 VDC.

As a reference, the VC75 has the capability to power the following BAPI sensors: one X-Combo Temperature/Humidity Combination Room Unit; two Room, Duct or Outside Air Humidity Sensors; three R_μP Temperature Sensor Room Units.

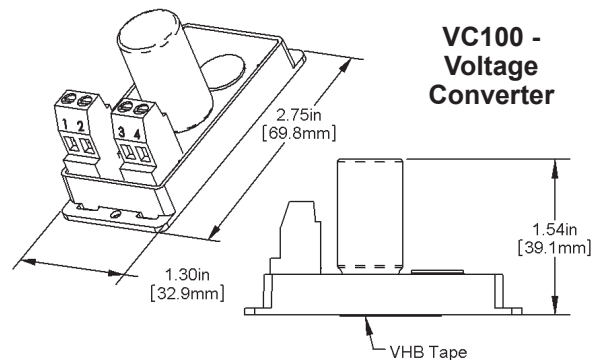
Ordering Information

Part Number	Description
ALC/VC75-5	5 VDC at 75 mA
ALC/VC75-10	10 VDC at 75 mA
ALC/VC75-12	12 VDC at 75 mA
ALC/VC75-15	15 VDC at 75 mA
ALC/VC75-ADJ	5-24 VDC (adj.) at 75 mA
ALC/VC100-5	5 VDC at 100 mA
ALC/VC100-10	10 VDC at 100 mA
ALC/VC100-12	12 VDC at 100 mA
ALC/VC100-15	15 VDC at 100 mA
ALC/VC100-ADJ	5-24 VDC (adj.) at 100 mA

Add **-TRK** to the end of the part number (**ALC/VC75-5-TRK**) to include a 1.25" wide piece of 2.75" snaptrack.



Specifications



Input Voltage:
18-30 VAC, 24 VDC

Input Current Max:
240 mA (5.8 VA)

Environmental Operation Range:
32°F to 158°F

Wiring:
Two pair 16 to 22 AWG

Rectification:
Half-Wave Rectified

Grounding:
AC & DC Ground are Common

Min. Input Voltage:
5, 10, 12 or 15VDC Output: 18 VAC
24VDC Output: 19 VAC

Mounting: Standard 2-3/4" snaptrack or double-sided foam tape (supplied)



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Rev. 07/13/10

Features & Options

- EZ Mount Enclosure
- Compact & Cost-Effective 350 mA Unit
- Self-resetting Thermal Fuse
- Operation & Fault LED Indicators
- Fixed or Adjustable Outputs
- Output Protected Against Overload and Accidental Short Circuit

BAPI's EZ Voltage Converter 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 5-24 VDC.

Ordering Information

Part Number	Description
ALC/VC350A-EZ-5.....	5 VDC at 350 mA
ALC/VC350A-EZ-10.....	10 VDC at 350 mA
ALC/VC350A-EZ-12.....	12 VDC at 350 mA
ALC/VC350A-EZ-15.....	15 VDC at 350 mA
ALC/VC350A-EZ-ADJ .	5-24 VDC (adj.) at 350 mA

Specifications

Output Voltage: 5 to 24 VDC @ 350 mA

Recommended Input Voltage: 18-28 VAC, 24 VDC

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°F to 149°F (-40°C to 65°C) 350 mA @ any output voltage
 -40°F to 158°F (-40°C 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°F to 176°F (-40°C to 80°C)

Wiring: 4 wires, 16 to 22 gauge

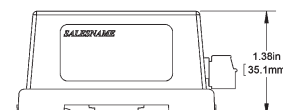
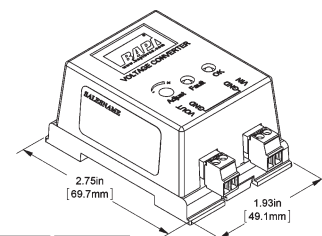
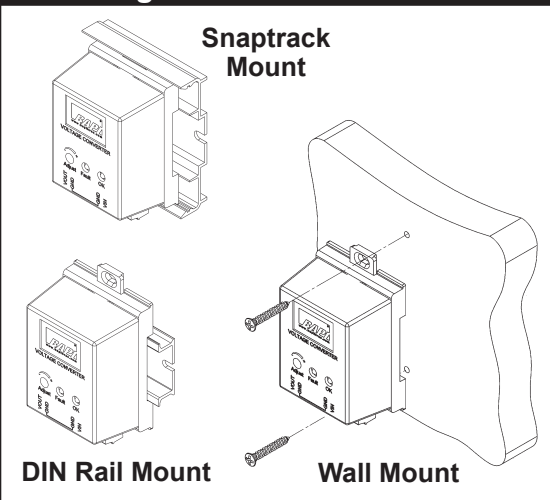
Rectification: Half-Wave Rectified

Grounding:
 AC & DC Ground are Common



**VC350A EZ
mounted on DIN Rail**

Mounting Methods



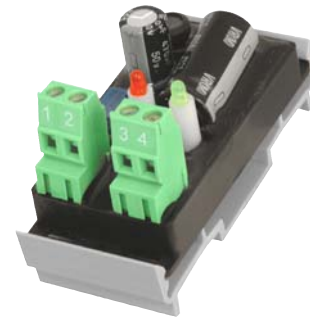
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Rev. 08/31/11

Features & Options

- Compact & Cost-Effective 350 mA Unit
- Self-resetting Thermal Fuse
- Operation & Fault LED Indicators
- Ruggedized Circuitry
- Fixed or Adjustable Outputs
- Output Protected Against Overload and Accidental Short Circuit



**VC350A mounted
in optional snaptrack**

BAPI's voltage converter 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.

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 5-24 VDC.

<u>Part Number</u>	<u>Description</u>
ALC/VC350A-5	5 VDC at 350 mA
ALC/VC350A-10	10 VDC at 350 mA
ALC/VC350A-12	12 VDC at 350 mA
ALC/VC350A-15	15 VDC at 350 mA
ALC/VC350A-ADJ ..	5-24 VDC (adj.) at 350 mA

Note: Add **-TRK** to the end of the part number (**ALC/VC350A-5-TRK**) to include a 1.25" length of 2.75" snaptrack

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 F3.)



Specifications

Output Voltage: 5 to 24 VDC @ 350 mA

Recommended Input Voltage: 18-28 VAC, 24 VDC

Input Voltage Limits:

<u>Model of Unit</u>	<u>Minimum (VAC/VDC)</u>	<u>Maximum (VAC/VDC)</u>	<u>Input Current@ Min Input Volts (AC/DC)</u>
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°F to 149°F (-40°C to 65°C) 350 mA @ any output voltage

-40°F to 158°F (-40°C to 70°C) 350 mA @ 5 VDC,
330 mA @ 10 VDC,
280 mA @ 12 VDC,
224 mA @ 15 VDC,
140 mA @ 24 VDC

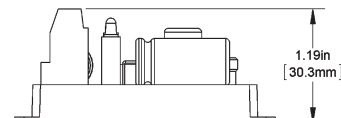
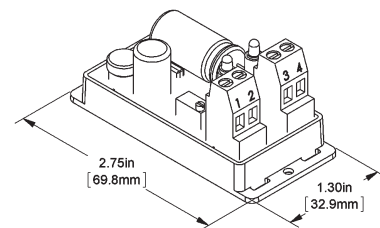
Environmental Storage Range:
-40°F to 176°F (-40°C to 80°C)

Wiring: 4 wires, 16 to 22 gauge

Rectification: Half-Wave Rectified

Grounding:

AC & DC Ground are Common



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Rev. 01/12/11

Features & Options

- Prevents Tampering, Damage and Unauthorized Adjustment
- Exceptional Airflow for Proper Thermostat Operation
- Made from Thick, Durable Polycarbonate
- Key Lock Protected
- Low Profile, Compact Design
- 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, low-profile 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

- ALC/BG**.....Larger BAPI-Guard Thermostat Protector
ALC/BG2.....Smaller BAPI-Guard 2 Thermostat Protector
ALC/KEY16187...Replacement Key for BAPI-Guard and BAPI-Guard 2



**BAPI-Guard 2 Mounted
Over an LSPLUS2H
Room Sensor**

Specifications

Material: Polycarbonate

Material Rating: UL 94, V-0

The BAPI-Guard fits these common thermostats

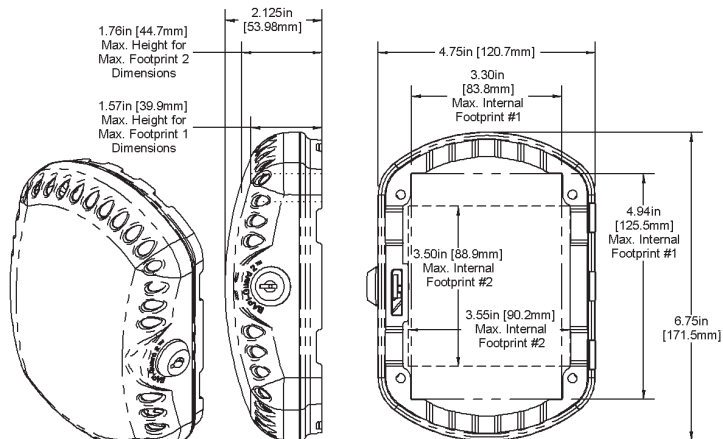
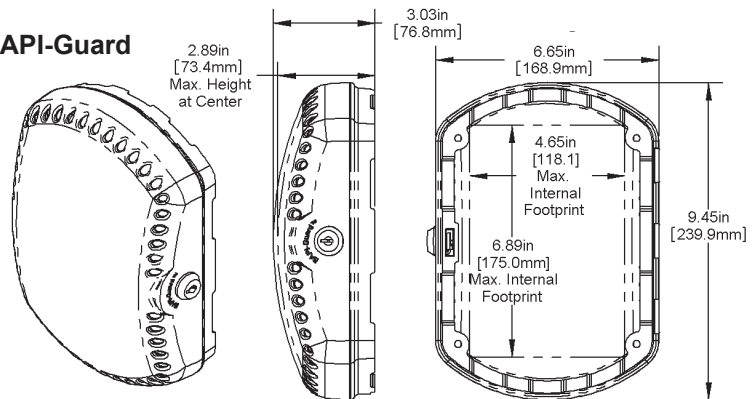
BAPI-Stat
 BAPI-Stat 3
 Honeywell T7300, T7350, T7560,
 T7770 and T7790 Series
 Johnson Controls Metastat

The BAPI-Guard 2 fits these common thermostats

Delta Style Enclosure
 BAPI-Stat 2
 BAPI-Stat 4
 Powers & PreCon Style
 Automated Logic RS Series
 and LS Series Sensors
 York Zone Sensor

*If you have a question about
whether the BAPI-Guard or
BAPI-Guard 2 will fit a specific
thermostat, please call BAPI.*

BAPI-Guard



BAPI-Guard 2

Rev. 07/13/10

Overview

The VC2700-STM is a 2.75" snaptrack-mountable 2.7 amp voltage converter. The unit takes a 24 VAC input and converts it to a regulated and adjustable output of 3-26 VDC.

The unit also has a filtered, unregulated 24 VAC output tap drawn from the 24 VAC input. Both the 24 VAC and the VDC outputs are routed through independent ON-OFF rocker switches. The switches allow you to remove power from the AC or DC loads without disturbing the other circuit.

There are status LEDs for 24 VAC IN, 24 VAC OUT, VDC OUT and VDC FAULT (indicating that the resettable circuit breaker has tripped). The user can determine at a glance whether there is a problem with the HVAC system power and where the problem exists. The resettable circuit breaker eliminates the need to carry fuses.

This unit has removable terminal block plugs at all inputs and outputs to simplify wiring. The unit can also be plugged directly into the BP2, BP4 or BP8 Backplanes of the ETA line to provide power to a variety of ETA modules or other peripherals, and features a user-selectable full wave or half wave rectification.



**VC2700-STM - Voltage Converter
mounted in the snaptrack**

Part Number	Description
ALC/VC2700-HW-STM ..	2.7 Amp Voltage Converter, Half-Wave, Snaptrack Mountable
ALC/VC2700-FW-STM...	2.7 Amp Voltage Converter, Full-Wave, Snaptrack Mountable

VC2700 Accessories

BAPI makes three accessories for the VC2700 which are shown on the opposite page. The LVTM simplifies connecting an external transformer to the VC2700-STM, while the TB4 and TB4-VC100 provide additional depluggable terminals for the VC2700 output voltage or an additional system voltage.

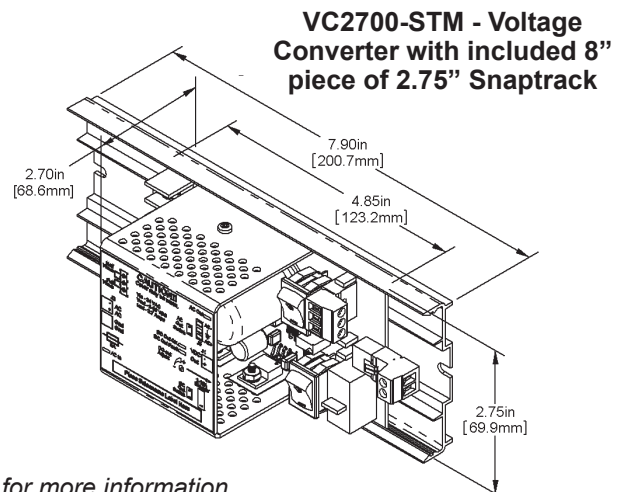


**VC2700-STM with LVTM
and TB4-VC100 Module
and Power Cord**

Specifications

Voltage Input	18 - 30 VAC
Current Output	2.7Amp DC (100 VA Input)
Current Input	4 Amp AC (100VA)
Output Ripple	50mV p-p, Full Wave 100mV p-p, Half Wave
AC Voltage Output	Same as Input
Min DC Output Voltage	3 VDC
Max Output voltage	26 VDC, Full Wave 25.5 VDC Half Wave
Max Output Current	2.7 Amps* DC
Min Input Voltage	5 or 15 VDC Output: 18 VAC 24 VDC Output: 23 VAC

*Other current output ranges are available, contact BAPI for more information



**VC2700-STM - Voltage
Converter with included 8"
piece of 2.75" Snaptrack**

Rev. 07/13/10

Overview

BAPI offers two styles of Line Voltage Transformer Module (LVTM) to simplify connecting an external transformer to the VC2700-STM Voltage Converter. The LVTM can sit side-by-side with the VC2700-STM in an 8" long piece of industry standard 2.75" snaptrack (TRK08).

The LVTM takes 120/240 VAC power and protects the input with a 3.15 amp resettable circuit breaker. Pluggable terminals provide a convenient way to terminate the primary and secondary windings of the transformer. Connectors on the end of the LVTM plug directly into the VC2700's inputs for a clean connection without interconnecting wires.

Part Numbers

ALC/LVTM..... Line Voltage Transf. Module with power cord connector
ALC/LVTM-TB.. Line Voltage Transf. Module with Terminal Block

ALC/PWR-CORD-18" .. 18" Power Cord
ALC/PWR-CORD-36" .. 36" Power Cord

LVTM Specifications

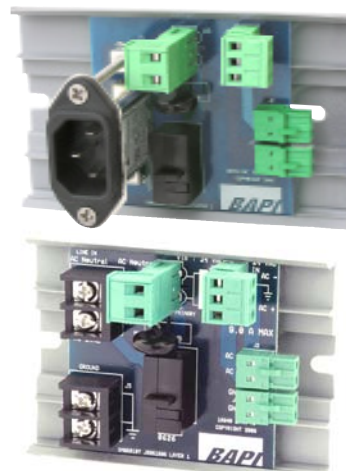
Input: 120/240 VAC at 3.15 Amps Max.
24 VAC input: 9 Amps Max.

Power Cord Specifications

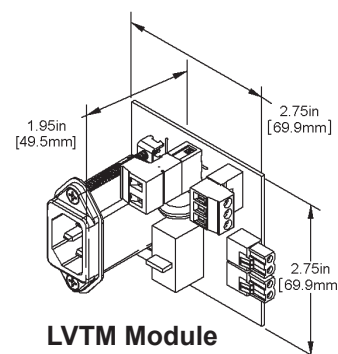
Input: 125 VAC at 10 Amps Max.
Wire: 3 Wire, 18 AWG
Ratings: NEMA 5-15P, UL817, CSA22.2



**18" Power Cord
shown above**



LVTM (top) and LVTM-TB (below) in optional snaptrack



LVTM Module

TB4 & TB4-VC100

Overview

Power supplies and voltage converters in large HVAC/R systems sometimes do not have enough output terminals. Also some systems need a small amount of power at a 2nd voltage. BAPI'S TB4 and TB4-VC100 are accessories for the VC2700 that answer these problems.

The TB4 plugs directly into the VC2700 and provides four sets of depluggable terminals for the VC2700's output voltage. These additional outputs can be used to power BP8, BP4 and BP2 ETA backplanes.

The TB4-VC100 plugs directly into the VC2700 and adds a 100 mA adjustable voltage converter for a second system voltage of 5-20 VDC. Additional TB4-VC100's may be plugged in for 3rd and 4th system voltages. The adjustable voltage must be 6 VDC or more below the VC2700 voltage.

Part Number Description

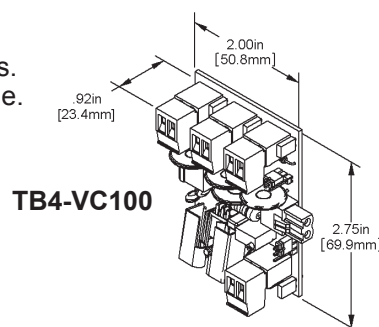
ALC/TB4 Four Terminal Output Board
ALC/TB4-VC100 .. TB4 w/ adjustable 100 mA Voltage Converter

Specifications

Input: BA/VC2700
Output: 3-26 VDC Adjustable (from the VC2700), 2.7 Amps DC Max (all terminals combined)
VC100 section: 5-20 VDC adjustable, 100 mA Max.



TB4-VC100 Module



TB4-VC100



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Features & Options

- Creates a Weatherproof Wire Connection
- Accommodates 18 to 26 AWG Wire
- Crimp-On & Twist-On Styles Available
- Quick & Easy Installation

Sealant Filled Connectors contain a moisture-excluding sealant which encapsulates the electrical connection protecting it from moisture and oxidation. The Crimp-On Style is used for factory terminations, while the Twist-On Style is used for quick and safe field terminations. The Crimp-On accepts up to two 22 AWG wires or one 22 AWG and one 16 or 18 AWG wire. The Twist-On has a voltage rating of 300 volts and a temperature rating of 105 °C, and it is not UL listed.

ORDERING INFORMATION

Part Number: ALC/SFC1000 - Crimp-On Style
ALC/SFC2000 - Twist-On Style



Crimp-On Sealant Filled Connectors



Twist-On Sealant Filled Connectors

BAPI Screwdriver & Allen Wrench

Features & Options

- Small Flathead Screwdriver for Terminal Block Screws
- 1/16" Allen Wrench for Cover Locking Screws
- Works on Delta Style, BAPI-Stat and BAPI-Stat 2 Room Units

The BAPI Screwdriver & Allen Wrench Combinations are especially useful for installing 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. One 6" screwdriver (ALC/116) is included with every 25 room units ordered. This model is not designed for prolonged use. The 6.75" model (ALC/116W) is designed for prolonged use.



BAPI 6.75" Screwdriver & Allen Wrench (top) and the 6" Screwdriver & Allen Wrench (bottom)

ORDERING INFORMATION

Part Number: ALC/116W - BAPI 6.75" Screwdriver & Allen Wrench Combination
Part Number: ALC/116 - BAPI 6" Screwdriver & Allen Wrench Combination

Foamback Insulator

Description

Made of medical grade, closed cell foam, the Foamback Insulator insures 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 white or gray.

PART NUMBERS

ALC/Foamback - White Foamback Insulator (2.6" wide, 4.4" high, .25" thick)
ALC/Foamback-Room - White Foamback (2.6" wide, 4.4" high, .125" thick)
ALC/Foamback-Grey - Grey Foamback (2.8" wide, 4.6" high, .25" thick)



Foamback Insulator

Note: Several BAPI products come standard with foambacks including wall plates and duct units.



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Features & Options

- Adds High Voltage / High Current Switching for an ALC, ZN Controller.
- Simplifies Wiring by Plugging Directly into the ZN Controller.
- No Need for an Additional Transformer or Actuator Power Supply.
- 5 Relay Outputs with a Selectable Sixth Output.
- LED Indication of Digital Output Status
- Analog Feed Through to Actuator

The ALC/RP-ZN551 Relay Pack saves time and money by allowing you to switch line voltage without having to mount and wire additional external relays.

The Relay Pack plugs directly into your ALC, ZN551 controller and provides a total of six relays. Five relays are directly controlled by the five Digital Outputs (DO) on the controller. The sixth relay can be operated by the controller's Analog Output if it is not being used. LED's on the Relay Pack show when each relay is energized for a visual indication of which DOs are closed.

Terminal block covers on the Relay Pack prevent access to the high voltage terminals and eliminate the need for any additional enclosure.

The Relay Pack runs off the same transformer as the controller so there is no need for an additional transformer. If you choose to use a separate actuator transformer, then the Relay Pack simplifies the wiring by providing a terminal block for the second actuator power supply leads.



**ALC/RP-ZN551
Relay Pack**

Part Number Description

ALC/RP-ZN551 Relay Pack for the ALC, ZN551 Controller

Specifications

Power: 24 VAC @3.5 VA (without ZN controller or actuator), All grounds are common

Actuator Power Termination Limit: 24 VAC @60 VA

Output Relays: 5-SPDT Relays
1 optional SPDT Relay (analog controlled)

Relay Switching Load:

Resistive: 10 A @250 VAC or 30 VDC
Inductive: 7.5 A @250 VAC or 5A @30 VDC

Digital Input (from ZN551):

Terminal to ground
22mA @ 24 VDC for each relay

Optional Relay Six (Analog Signal):

Option Jumper Digital (Control relay 6, SPDT)
Energize: Analog Output >1.4 VDC
De-energize: Analog Output <0.8 VDC

Analog Output from ZN551 to Actuator:

Option Jumper Analog
(AO feed through to terminal A1)
0-10VDC signal



**ALC/RP-ZN551 Relay
Pack plugged into an
ALC, ZN551 Controller**



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Rev. 08/31/11

Features & Options

- Covers Wall Imperfections during Retrofits
- Different Colors and Sizes, Horizontal or Vertical Mounting
- Made of ABS Flame-Retardant Plastic

BAPI Adaptor Plates are designed to cover wall imperfections when installing wall sensors or thermostats. They are made in three different sizes and four different colors to match the sensor. The Adaptor Plates can be painted or wall papered in place if architecturally required.

PART NUMBERS

ALC/ADP-525-7-WMW Adaptor Plate, 5.25 x 7" Warm White

ALC/ADP-525-7-OFW Adaptor Plate, 5.25 x 7" Off White

ALC/ADP-525-7-CPW Adaptor Plate, 5.25 x 7" Copla White

ALC/ADP-525-7-CDW Adaptor Plate, 5.25 x 7" Cloud White

ALC/ADP-53-53-WMW Adaptor Plate, 5.3 x 5.3" Warm White

ALC/ADP-53-53-OFW Adaptor Plate, 5.3 x 5.3" Off White

ALC/ADP-53-53-CPW Adaptor Plate, 5.3 x 5.3" Copla White

ALC/ADP-53-53-CDW Adaptor Plate, 5.3 x 5.3" Cloud White

ALC/ADP-37-55-WMW Adaptor Plate, 3.75 x 5.5" Warm White

ALC/ADP-37-55-OFW Adaptor Plate, 3.75 x 5.5" Off White

ALC/ADP-37-55-CPW Adaptor Plate, 3.75 x 5.5" Copla White

ALC/ADP-37-55-CDW Adaptor Plate, 3.75 x 5.5" Cloud White

ALC/ADP-37-55-WMW-UK Adaptor Plate (Europe), 3.75 x 5.5" Warm White

ALC/ADP-37-55-OFW-UK Adaptor Plate (Europe), 3.75 x 5.5" Off White

ALC/ADP-37-55-CPW-UK Adaptor Plate (Europe) , 3.75 x 5.5" Copla White

ALC/ADP-37-55-CDW-UK Adaptor Plate (Europe) , 3.75 x 5.5" Cloud White

Color Reference

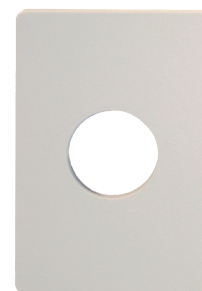
Sensor	Adaptor Plate Color	Approx. Pantone Color
Delta Style	Warm White or Beige	Warm Gray 2 C
BAPI-Stat 2.....	Warm White or Beige	Warm Gray 2 C
BAPI-Stat 3.....	Warm White or Beige	Warm Gray 2 C
LSBASE.....	Warm White or Beige	Warm Gray 2 C
LSPLUS.....	Warm White or Beige	Warm Gray 2 C
LSPRO	Warm White or Beige	Warm Gray 2 C
BAPI-Stat.....	Off White	Warm Gray 1C
LSBASE2.....	Off White	Warm Gray 1C
LSPLUS2.....	Off White	Warm Gray 1C
LSBASE3.....	Off White	Warm Gray 1C
LSPLUS3.....	Off White	Warm Gray 1C
LS3	Off White	Warm Gray 1C
RS.....	Off White	Warm Gray 1C
RS PLUS	Off White	Warm Gray 1C
RS Pro	Off White	Warm Gray 1C
RS Pro F	Off White	Warm Gray 1C



ALC/ADP-525-7-WMW



ALC/ADP-53-53-WMW



ALC/ADP-37-55-WMW



ALC/ADP-37-55-WMW-UK



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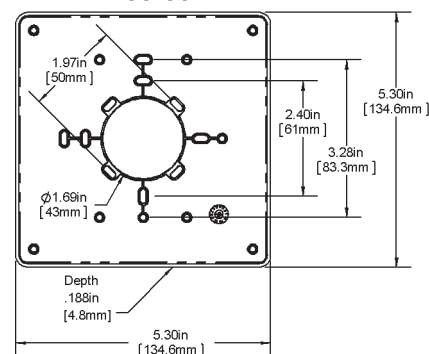
Specifications

Material	ABS plastic, Flame-retardant, UL 94, V-0
Application	Horizontal or Vertical
Mounting	Dry wall, US back box or European back box
Dimensions	W x H x D
ADP-525-7	5.25" x 7" x 0.188", (133.4 x 177.8 x 4.8 mm)
ADP-37-55	3.75" x 5.5" x 0.188", (95.3 x 139.7 x 4.8 mm)
ADP-53-53	5.3" x 5.3" x 0.188", (134.6 x 134.6 x 4.8 mm)

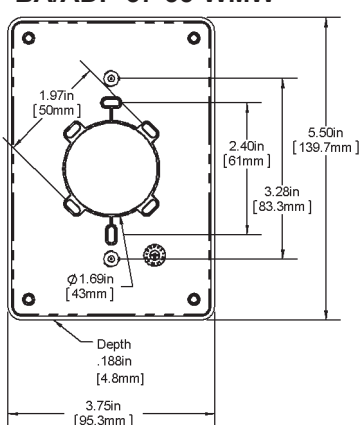
Color Match

WMW	Delta, BAPI-Stat 2, EU, BAPI-Box (Approx. Pantone Warm Gray 2)
OFW	BAPI-Stat (Approx. Pantone Warm Gray 1)
CPW	Copla White – Delta, BAPI-Stat 2 (Appr. Pantone Cool Gray 2)
CDW	Cloud White – Delta, BAPI-Stat 2 (Appr. Pantone Cool Gray 1)

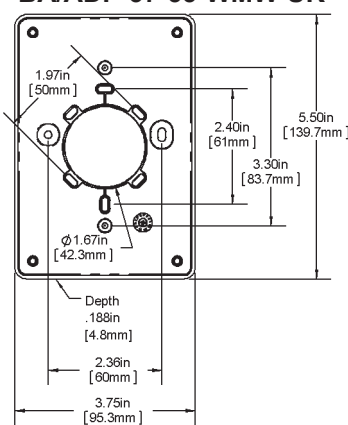
BA/ADP-53-53-WMW



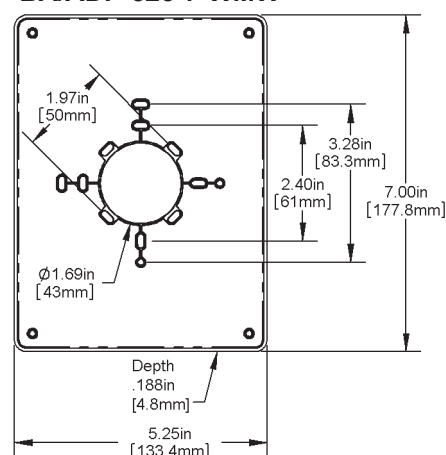
BA/ADP-37-55-WMW



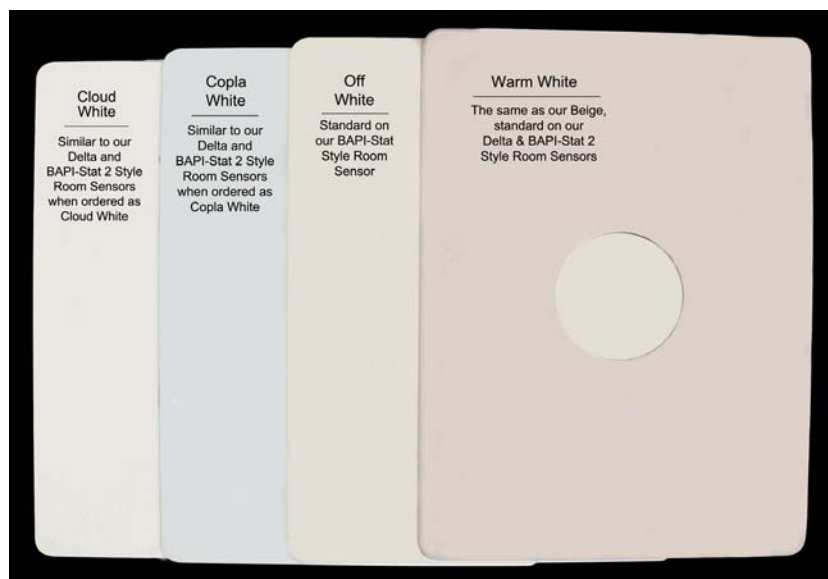
BA/ADP-37-55-WMW-UK



BA/ADP-525-7-WMW



Adaptor Plate Color Comparison



The image at left is meant as a comparison of the four Adaptor Plate colors. It is not meant as an indicator of the exact color of any of the Adaptor Plates because the printed colors will vary somewhat from the actual color.

Rev. 03/11/11

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.

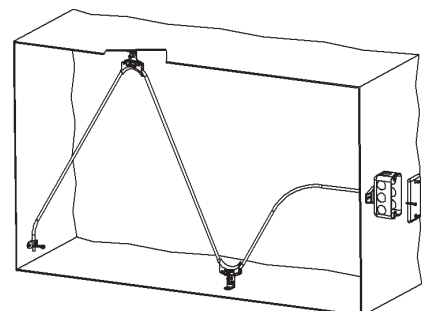
A fixed 1/4" probe may also be mounted as part of the bracket design using the scored break-off. The FPB is made out of tough UL94V Nylon and limits heat/cold conduction to the probe and has multiple mounting holes to make mounting quick and easy.



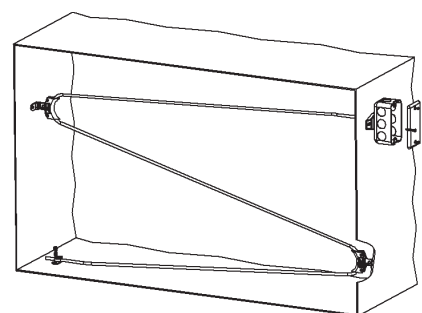
FPB - Flexible Probe Bracket

ORDERING INFORMATION

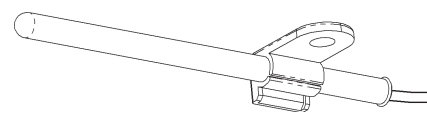
Part Number	Description
BA/FPB-50	50 Flexible Probe Brackets
BA/FPB-100	100 Flexible Probe Brackets



Vertical Mounting of the Averaging Sensor



Horizontal Mounting of the Averaging Sensor



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

Specifications

Material: Nylon

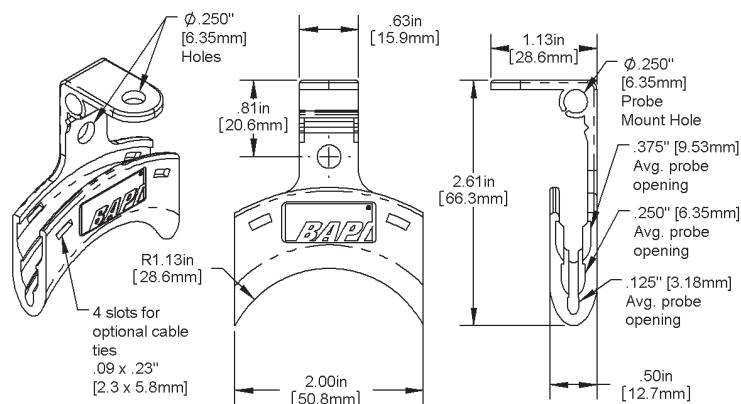
Rating: UL94V-2 (plenum rated), RoHS Compliant

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)



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Features & Options

- BAPI-Box (BB, BB2) Knockout Cutter
- Perfect knockouts every time!
- One Step Cutting Bit
- Standard Hex Drill Bit Shaft
- Quick Disconnect Shaft
- Built in Rim Stop (No push through)
- Stainless Steel Construction
- Blade sheath



The BAPI Clean Cut Tool

The Clean-Cut hole cutter is made to cut out the plastic plug in the 1/2" NPSM threaded ports of the BAPI-Box and BAPI-Box 2 polycarbonate enclosures. It has a hex shaft for use with any drill and a notch for a quick disconnect shaft. The Clean-Cut makes removing the plastic plug easy, fast and produces a professional-looking hole. The hole produced is 0.65" with a built in stop to prevent the tool from pushing through and possibly damaging sensitive electronics within the box. No more need to remove sensitive electronics to drill out the knockout. 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 when the time comes and comes with a protective sheath to protect the blades and user.

ORDERING INFORMATION

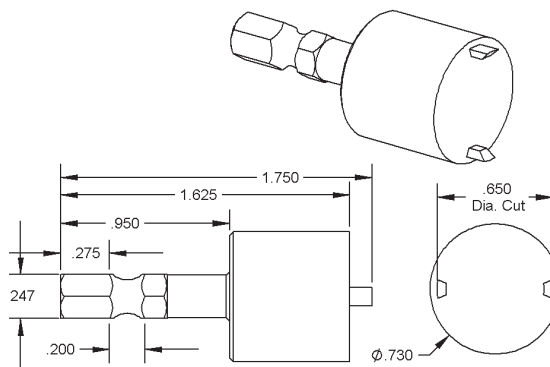
Part Number: BA/CLN-CUT-50

Operation Instructions (Read all instructions before using the Clean Cut tool)

- 1 Put on eye protection.
 - 2 Insert the cutting tool into your drill and then remove the protective sheath.
 - 3 Clear any loose wires away from the port hole to be cut.
 - 4 Place the bit into the 1/2" port of either the BAPI-Box or BAPI-Box 2 just short of making contact with the cutting blades.
 - 5 Start the drill at medium speed and then slowly engage the blades to the plastic plug.
 - 6 Keep even pressure on the bit until the plug is cut through.
- Note: The built in stop will prevent the blades from going completely into the box causing internal component damage.*
- 7 Stop the drill so as not to damage the 1/2" NPSM threads and remove the bit.
 - 8 Clean out the plastic shavings and plug from the box.
 - 9 Place the protective sheath back on the cutter for future use.

Specifications

Material:	316 Stainless Steel
Outer Diameter:	Smooth 0.73" (18.5mm)
Cutting Blades:	1/8" (3.175mm) long 0.05" (1.27mm) wide
Hole Cut:	0.65" (16.51mm)
Rim Stop:	0.04" (1mm), in from edge
Shaft Stem:	0.95" (24.1mm) long w/quick disconnect shaft
Drill Chuck:	Quarter inch Hex
Flats:	0.247" (6.27mm)
Sharpening:	Hand grinder or file
Weight:	0.11lb (50.0g)



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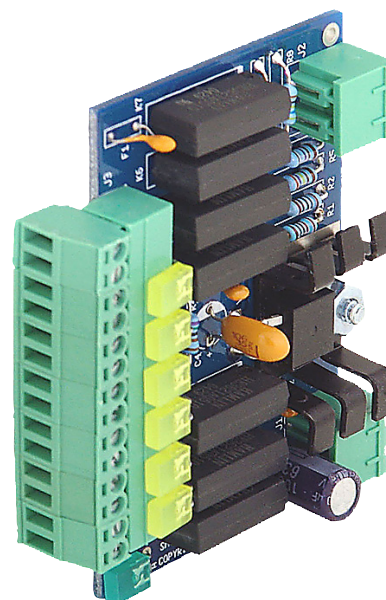
Rev. 07/13/10

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.

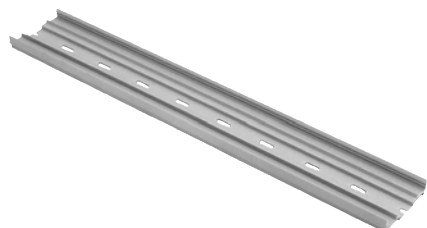
The DS6R plugs into the BP2, BP4 or BP8 backplane.



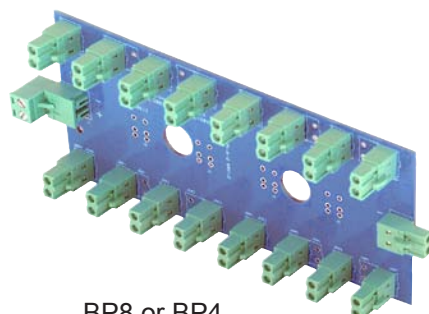
DS6R - Dry Switch Monitor

Part Number	Description
ALC/DS6R.....	Dry Switch Monitor, 30K Output
ALC/DS6R-10K.....	Dry Switch Monitor, 10K Output

Associated Products

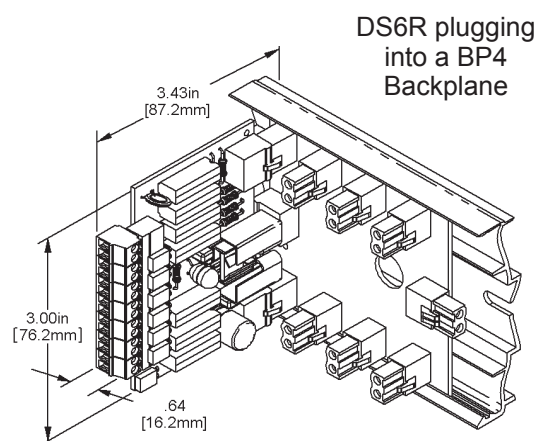


**TRK18
Snaptrack
(p. F18)**



**BP8 or BP4
Interface
Backplane (p. F17)**

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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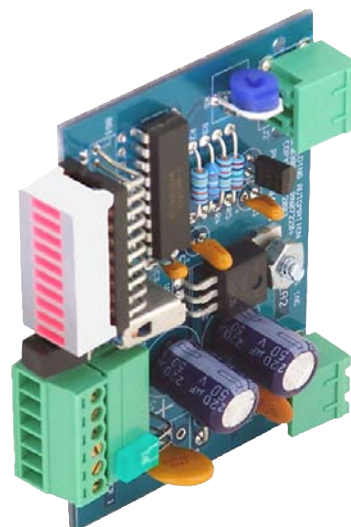
Rev. 07/13/10

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.

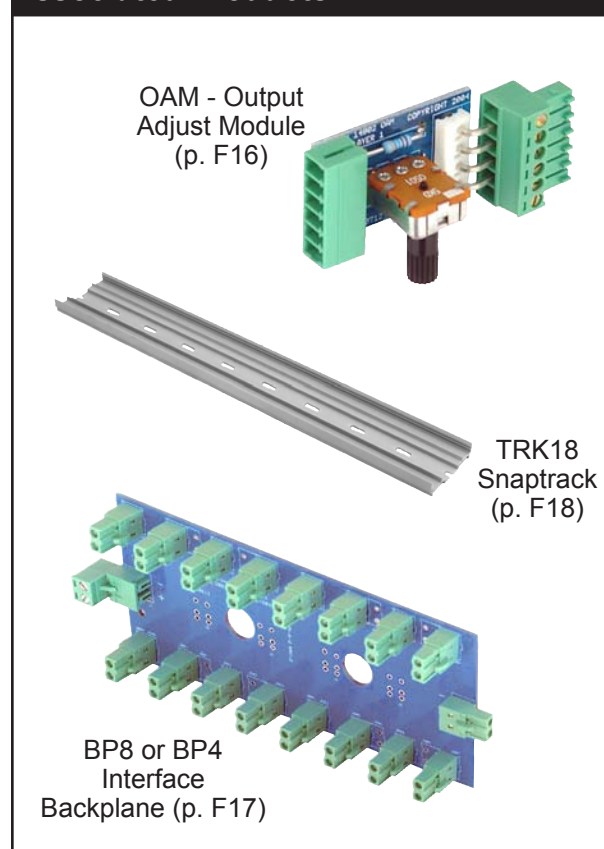


**EA2 - Modulating
Actuator Interface**

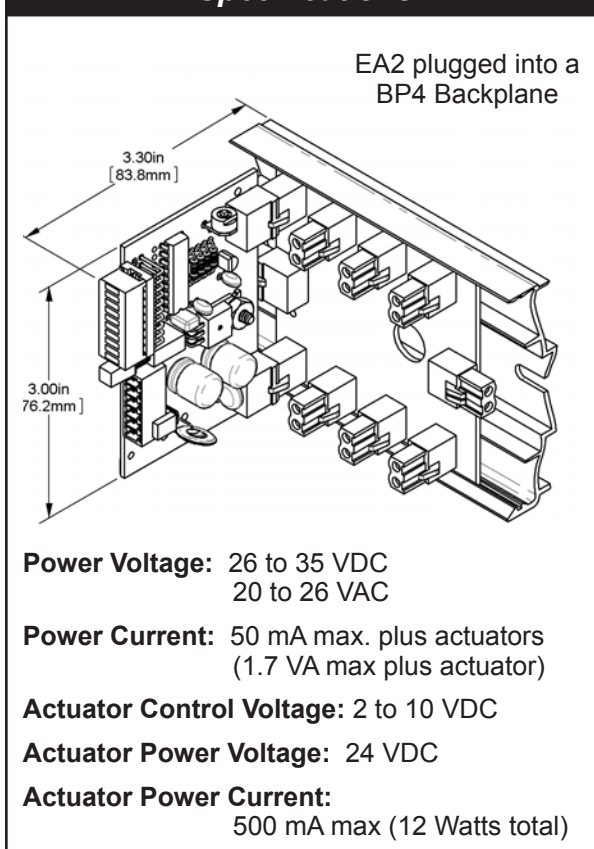
Belimo® is a trademark of Belimo Aircontrols (USA) Inc. registered in the United States and other countries.

Part Number	Description
ALC/EA2	Modulating Actuator Interface

Associated Products



Specifications

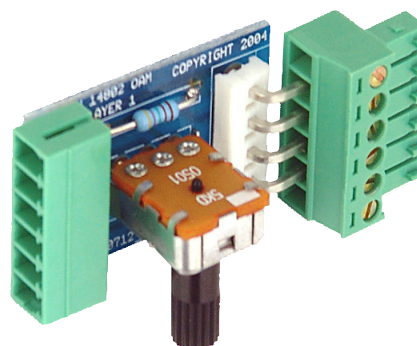


Rev. 07/13/10

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.

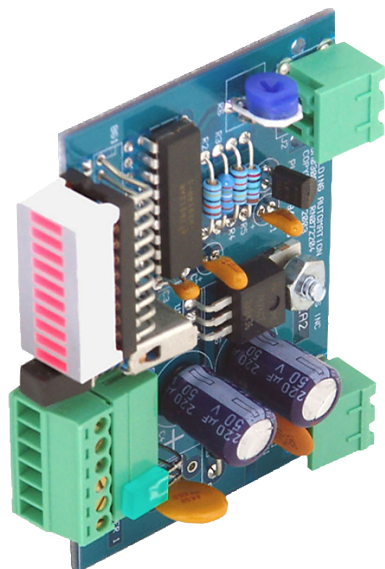
There is a better way. If you use the EA2 module (p.E10) to drive your modulating actuators, the OAM (Output Adjust Module) accessory allows you to stroke your actuator to any position without any additional equipment. Simply plug the actuator cable into the OAM and then plug the OAM into the EA2. Turning 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

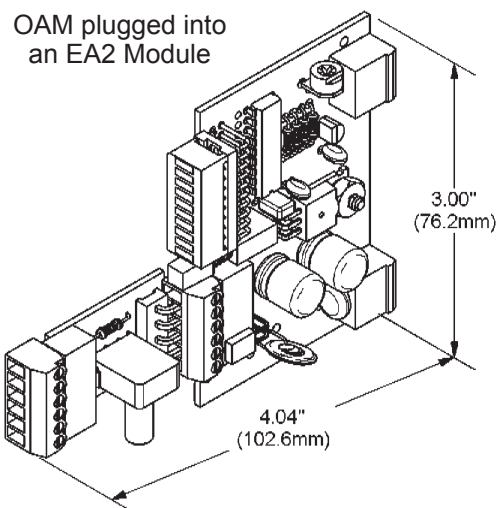
Part Number	Description
ALC/OAM.....	Output Adjust Module

Associated Products



EA2 - Modulating Actuator Interface
(p. F15)

Specifications



Input Voltage: 24VDC
Output Power Voltage: 0-10 VDC nominal
Output Power Current: 2 mA

Rev. 07/13/10

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 accommodates eight ETA modules while the BP4 accommodates four and the BP2 accommodates two.

For large control systems, the Backplanes receive power from a PS17 or PS17CB Power Supply or a VC2700-STM voltage converter. 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 VC350A voltage converters.

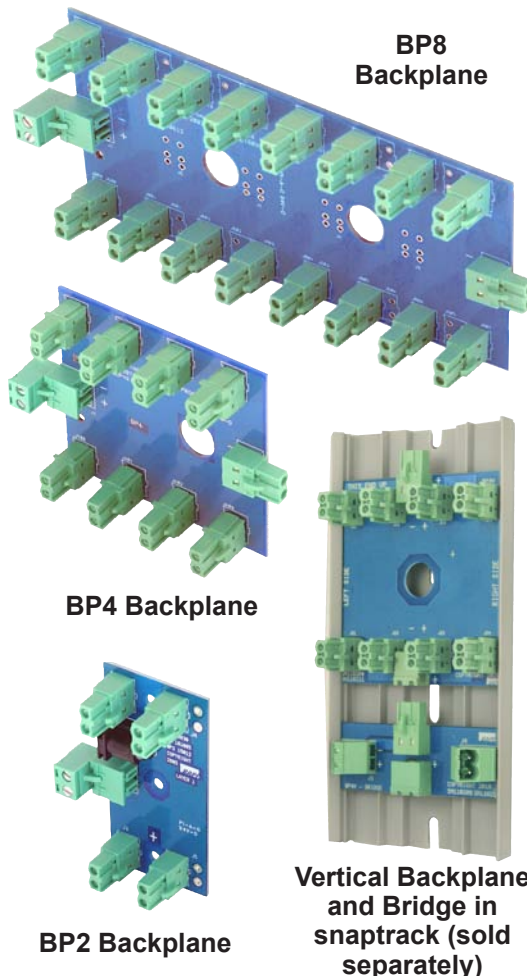
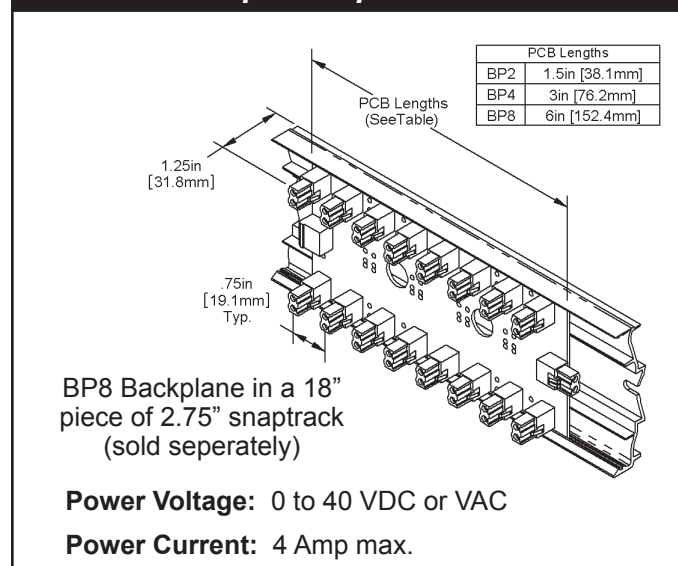
The BP4-V Vertical Backplane was designed to add additional ETA boards into a congested panel by allowing the use of small vertical spaces that may go unused. Each BP4-V accommodates four ETA modules.

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.

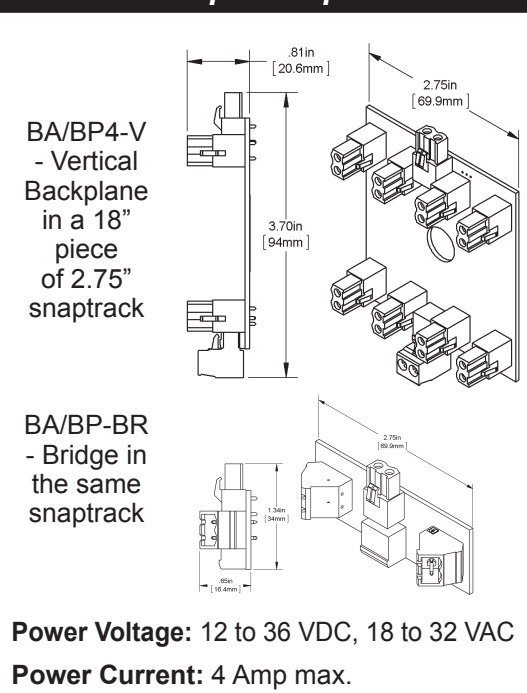
Part Number Description

ALC/BP2	2-Position Interface Backplane
ALC/BP4	4-Position Interface Backplane
ALC/BP8	8-Position Interface Backplane
ALC/BP4-V	Vertical Backplane
ALC/BP-BR ...	Bridge (to connect Vertical Backplanes)

Standard Backplane Specifications



Vertical Backplane Specifications



Rev. 03/25/11

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**

Part Number Description

ALC/TRK01..... TR2 Snaptrack, 1.27" length

ALC/TRK02..... TR2 Snaptrack, 2" length

ALC/TRK04..... TR2 Snaptrack, 4" length

ALC/TRK08..... TR2 Snaptrack, 8" length

Part Number Description

ALC/TRK12..... TR2 Snaptrack, 12" length

ALC/TRK18..... TR2 Snaptrack, 18" length

ALC/TRK48..... TR2 Snaptrack, 48" length

Duct and Outside Air Humidity Filter

Overview

- 100 Micron Sintered Stainless Steel or Porous Plastic
- Protects Sensor from Contamination while Allowing Airflow
- Can be Removed and Cleaned with Distilled Water



**Stainless Steel
Humidity Filter**

ORDERING INFORMATION

<u>Part Number</u>	<u>Description</u>
ALC/HDOFS	Stainless Steel Humidity Filter for Duct and Outside Air Units
ALC/HDOFP	Porous Plastic Humidity Filter for Duct Units



**Porous Plastic
Humidity Filter**



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Rev. 08/31/10

Features & Options

- Plugs Directly into ALC Module Terminal Strip
- Field Configurable Via Shunt Jumpers
- Compression Clamp Type Terminal Strips
- Multiple Models to Match ALC Module I/O Configurations
- 24VAC, 4A NEC Class II Rating

The BAPI series of Output Termination Boards — the **OUT80B**, **OUT66**, **OUT64A** and **OUT40** — are designed to assist the Automated Logic network by providing all necessary field wiring terminations, which reduces costs related to installation, panel building, project materials and engineering. No additional termination strips are required.

All four of these modules are field configurable via shunt jumpers. The digital outputs can be configured for dry contact or 24V switched output (default). Each module includes terminals for 24V power for devices such as valve and damper actuators.

Ordering Information

OUT80B - M8102, M8102NX, M880NX, MX880, M16160 or MX16160 Controllers

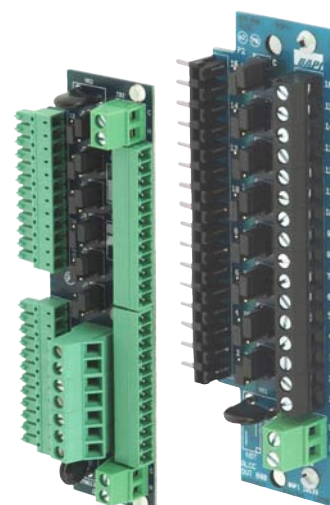
OUT66 - SE6166 Controller

OUT64A - SE6104A Controller

OUT40 - M4106P, MX4106P, M4106NX, M4106, MX4106, or MX440 Controllers

UIUO4 - ME812U, MEX816U, MEX88U, MEX016U, ME812U-LGR

The **UIUO4 Module** plugs into the inputs and outputs on the ME(X) line of control/expander modules. They include a top row of free bussed terminal blocks for 24Vac or 24Vdc powered actuators or two-wire and three-wire 4-20mA transmitters. No additional terminal strips are required.



OUT 66

OUT 80B



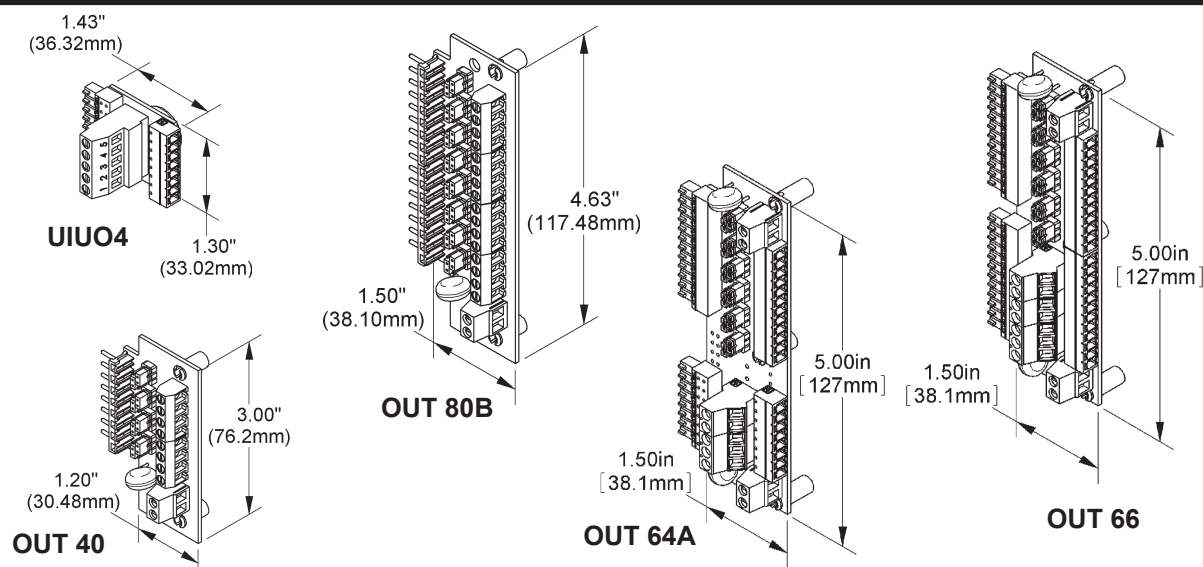
OUT 40



OUT 64A

UIUO4

Specifications



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Wireless Overview

- 8 Year Battery Life
- Temperature Only or Temperature/Humidity Combination
- 100 ft range, extendable to 1,000 feet with Repeater*

The BAPI Wireless Temperature or Temperature/Humidity Combination system incorporates a 418 MHz transmitter along with Wireless Point Manager to send zone temperature, and humidity to the ALC controller.

The wireless transmitter has a minimum in-building range of 100 feet, extendable to the 1,000 feet with a Repeater. The transmitter uses two high-capacity 3.6 volt lithium batteries and has an estimated battery life of 8 years with a transmit rate of approximately once every 10 seconds.

*Actual in-building transmission distances will vary depending upon building construction and other factors.



Room Transmitters - pgs 4-5

- 8 Year Battery Life
- Temp Only or Temp/Humidity
- Transmitted signals can be converted to Voltage, Current or Resistive Outputs for the Controller



Duct & Immersion Transmitters - pgs 6-8

- 8 Year Battery Life
- Temp Only or Temp/Humidity Combo
- Watertight BAPI-Box Enclosure



Remote & Outside Air Transmitters - pgs 9-11

- 8 Year Battery Life
- Temp Only or Temp/Humidity Combo
- Watertight BAPI-Box Enclosure



Thermobuffer Sensor - pg 12

- Special Sensor for Walk-in Coolers and Freezers

The Thermobuffer wirelessly transmits the temperature of walk-in freezers or coolers to a receiver within 100 feet.



Universal Input Transmitter - pg 13

- Two Year Battery Life
- 0-5, 0-10 and 4-20mA Analog Input Models
- Digital Input (dry contact) Model
- Thermistor Temperature Input
- 100' open air range, 1,000' range with a Repeater
- Transmission Interval from 10-17 seconds
- Easy Two-Wire Termination and Easy Setup Mode



418 to 900 MHz Repeater - pg 14

- Extends the Transmitter Range to 1,000 Ft.
- The Repeater receives the 418 MHz RF signal from one or more wireless temperature or humidity transmitters which have a range of 100 feet. The Repeater re-transmits the signal at 900 MHz to a distance of 1,000 feet to a Point Manager.



Wireless Field Verifier - pg 15

- Validates RF operation with a simple site visit
- Identifies radio positions before installation
- Loaner verifiers available



Wireless Point Manager - pgs 16-17

Receives the RF signal from up to 100 wireless transmitters and converts the data to ethernet (TCP/IP) or serial protocol for the network. The data can then be viewed and accessed by any standard internet browser.



Rev. 07/16/10

Features & Options

- 8 Year Battery Life (with two 3.6 volt lithium batteries, full AA size)
- Optional Setpoint and Occupant Override
- 100 foot range, extendable to 1,000 feet with Repeater*
- Transmitted signals can be converted to Voltage, Current or Resistive Outputs for the Controller

The Wireless Transmitter measures the room temperature and transmits the data through 418MHz RF to a receiver. The transmitter is mounted in a BAPI-Stat 2 style enclosure and has a minimum in-building range of 100 feet. It is available with optional Setpoint and Override.

The unit has an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries with a transmit rate of about once every 10 seconds. Each transmitter has a unique address with built in error detection. Each variable sent by the transmitter is picked up by the receiver and converted by an Analog Output Module to a voltage, current or resistance signal which is sent to the controller. The unit can be set up to trigger an alarm on the controller when the batteries need replacing.

PART NUMBER: ALC/BS2-WT - Wireless Temperature Transmitter

PART NUMBER: ALC/BS2-WT-O - Wireless Temperature Transmitter with Occupant Override

PART NUMBER: ALC/BS2-WT-S - Wireless Temperature Transmitter with Setpoint Adjustment

PART NUMBER: ALC/BS2-WT-SO - Wireless Temperature Transmitter with Setpoint & Override

PART NUMBER: ALC/LI3620 - Lithium Battery 3.6V



**Transmitter with
optional Setpoint &
Override**

Associated Products

- **418 or 900 MHz Receivers** — Receives the RF signal from one or more transmitters or repeaters and outputs the values to up to 127 Analog Output Modules.
- **Wireless Point Manager** – Receives the RF signal from up to 100 wireless transmitters and converts the data to ethernet (TCP/IP) or serial protocol for the network.
- **Repeater** – Extends the range of the Transmitter up to 1,000 feet.

**Wireless
Point
Manager**

**Specifications for the Wireless Temperature Transmitters**

Supply Power: Two 3.6V Lithium batteries, 8 year battery life at 10 second transmit rate

Inputs: Built in thermistor

Accuracy: $\pm 0.36^{\circ}\text{F}$ ($\pm 0.2^{\circ}\text{C}$)

Transmitted Range: -40°F to 185°F (-40°C to 85°C)

Environmental Operation Range:

Temp: 32°F to 140°F (0°C to 60°C)

Humidity: 5% to 95% RH non-condensing

Material: ABS Plastic

Material Rating: UL94 V-0

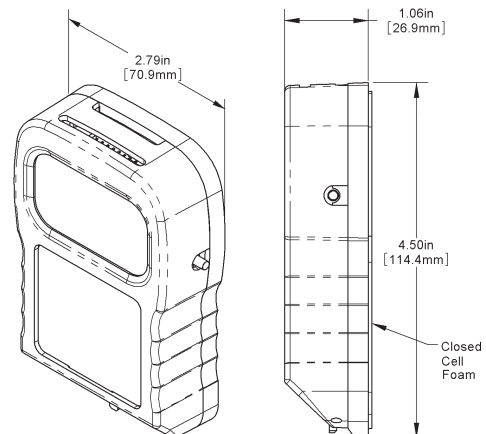
Radio Frequency: 418 MHz

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

FCC Approval: FCC ID# T4F061213RSO

**BAPI-Stat 2
Enclosure**



*Actual in-building transmission distances will vary depending upon building construction and other factors.



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Temp. & Humidity Transmitter

**Wireless Temp.
and/or Humidity**

G3

Rev. 01/13/11

Features & Options

- 8 Year Battery Life (with two 3.6 volt lithium batteries, full AA size)
- Optional Temperature Setpoint and Occupant Override
- 100 ft range, extendable to 1,000 feet with Repeater*
- Transmitted signals can be converted to Voltage, Current or Resistive Outputs for the Controller

The Wireless Transmitter measures the room temperature and Humidity and transmits the data through 418MHz RF to a receiver. The transmitter is mounted in a BAPI-Stat 2 style enclosure and has a minimum in-building range of 100 feet. It is available with optional Temperature Setpoint and Occupant Override.

The unit has an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries with a transmit rate of once every 10 seconds. Each transmitter has a unique address with built in error detection. Each variable sent by the transmitter is picked up by the receiver and converted by an Analog Output Module to a voltage, current or resistance signal for the controller. The unit can be set up to trigger an alarm on the controller when the batteries need replacing.

PART #: ALC/BS2-WTH - Wireless Temp. and Humidity Transmitter

PART #: ALC/BS2-WTH-O - Wireless Temp. and Humidity Transmitter with Override

PART #: ALC/BS2-WTH-S - Wireless Temp. & Humidity Transmitter with Temp. Setpoint Adjustment

PART #: ALC/BS2-WTH-SO - Wireless Temp & Humidity Transmitter w/ Temp. Setpoint & Override

PART #: ALC/LI3620 - Lithium Battery 3.6V



**Transmitter with
optional Temperature
Setpoint & Override**

Associated Products

- **418 or 900 MHz Receivers** — Receives the RF signal from one or more transmitters or repeaters and outputs the values to up to 127 Analog Output Modules.
- **Wireless Point Manager** – Receives the RF signal from up to 100 wireless transmitters and converts the data to ethernet (TCP/IP) or serial protocol for the network.
- **Repeater** – Extends the range of the Transmitter up to 1,000 feet.

**Wireless
Point
Manager**



Specifications for the Wireless Temperature & Humidity Transmitters

Supply Power: Two 3.6V Lithium batteries, 8 year battery life at 10 second transmit rate

Sensing Elements:

Temp. - Semiconductor Band Gap, Proportional to Absolute Temperature, $\pm 0.54^{\circ}\text{F}$ ($\pm 0.3^{\circ}\text{C}$)

Humidity - Capacitive Polymer, $\pm 1.8\%$ RH Accuracy

Transmitted Range: -40°F to 185°F (-40°C to 85°C)
0-100% RH

Environmental Operation Range:

Temp: 32°F to 140°F (0°C to 60°C)

Humidity: 5% to 95% RH non-condensing

Material & Rating: ABS Plastic, UL94 V-0

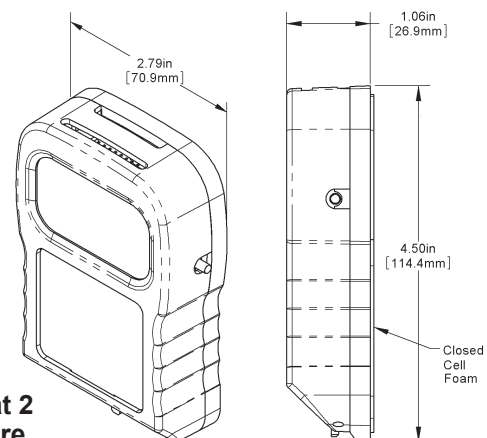
Radio Frequency: 418 MHz

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

FCC Approval: FCC ID# T4F061213RSO

**BAPI-Stat 2
Enclosure**



*Actual in-building transmission distances will vary depending upon building construction and other factors.



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Rev. 02/03/11

Features & Options

- 8 Year Battery Life (with two 3.6 volt lithium batteries, full AA size)
- 100 foot range, extendable to 1,000 feet with Repeater*
- Transmitted signals can be converted to Voltage, Current or Resistive Outputs for the Controller
- Probe Lengths: 4", 8", 12" and 18"
- Watertight BAPI-Box Enclosure and Stainless Steel Probes
- Medical-Grade Foam Padding, Etched Teflon Leadwires & Double Encapsulated Sensors
- 2 Year Warranty

**Wireless Duct Temperature Transmitter**

Wireless Duct Temperature Transmitters feature medical-grade closed cell foam to seal the probe insertion hole and to absorb vibration. Mounting feet allow for easy installation directly to the wall of the duct. The Duct Units come with etched teflon leadwires, double encapsulated sensors and a watertight BAPI-Box enclosure to withstand high humidity and condensation and perform under real world conditions. The units are available with probe lengths from 4" to 18" to accommodate most duct shapes and sizes. Custom probe lengths are also available.

The Wireless Duct Temperature Transmitter measures the duct temperature and transmits the data through 418MHz RF to a receiver. It has a minimum in-building range of 100 feet and an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries with a transmit rate of about once every 10 seconds. Each transmitter has a unique address with built in error detection. Each variable sent by the transmitter is picked up by the receiver and converted by an Analog Output Module to a voltage, current or resistance signal which is sent to the controller. The unit can be set up to trigger an alarm on the controller when the batteries need replacing.

PART NUMBER: ALC/WT-D-4" - Wireless Duct Temperature Transmitter, 4" Probe Length

PART NUMBER: ALC/WT-D-8" - Wireless Duct Temperature Transmitter, 8" Probe Length

PART NUMBER: ALC/WT-D-12" - Wireless Duct Temperature Transmitter, 12" Probe Length

PART NUMBER: ALC/WT-D-18" - Wireless Duct Temperature Transmitter, 18" Probe Length

PART NUMBER: ALC/WT-D-XX* - Wireless Duct Temperature Transmitter, Custom Probe Length

PART NUMBER: ALC/LI3620 - Lithium Battery 3.6V

**Custom Lengths of 1/4" Diameter Stainless Steel Probe are Available. Call BAPI for more information.*

Specifications

Supply Power: Two 3.6V Lithium batteries, 8 year battery life at 10 second transmit rate

Inputs: Built in thermistor

Accuracy: $\pm 0.36^{\circ}\text{F}$ ($\pm 0.2^{\circ}\text{C}$)

Transmitted Range: -40°F to 185°F (-40°C to 85°C)

Environmental Operation Range:

Temp: -40°F to 185°F (-40°C to 85°C)

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

Enclosure Rating: IP66

Enclosure Material: UV-Resistant Polycarbonate

Material Rating: UL94 V-0

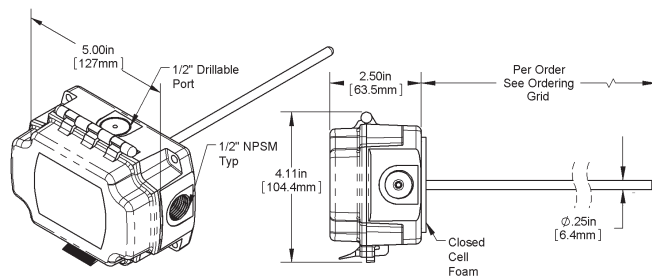
Radio Frequency: 418 MHz

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

FCC Approval: FCC ID# T4F060811TEMP

**Actual in-building transmission distances will vary depending upon building construction and other factors.*

**Wireless Duct Temperature unit in a BAPI-Box (BB) Enclosure**

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Duct Temp./Humidity Transmitter

**Wireless Temp.
and/or Humidity**

G5

Rev. 03/25/11

Features & Options

- 8 Year Battery Life
(with two 3.6 volt lithium batteries, full AA size)
- 100 foot range, extendable to 1,000 feet with Repeater*
- Temperature and Humidity signals can be converted to Voltage, Current or Resistive Outputs for the Controller
- Watertight BAPI-Box Enclosure
- Medical-Grade Foam Padding
- 2 Year Warranty



**Wireless Duct Temperature
and Humidity Transmitter**

The Wireless Duct Temperature and Humidity Transmitters feature medical-grade closed cell foam to seal the probe insertion hole and to absorb vibration. Mounting feet allow for easy installation directly to the wall of the duct. The wireless Duct Units come with a watertight BAPI-Box enclosure to withstand high humidity and condensation and perform under real world conditions.

The Wireless Duct unit measures the duct temperature and humidity and transmits the data through 418MHz RF to a receiver. It has a minimum in-building range of 100 feet and an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries with a transmit rate of about once every 10 seconds. Each transmitter has a unique address with built in error detection. Each variable sent by the transmitter is picked up by the receiver and converted by an Analog Output Module to a voltage, current or resistance signal which is sent to the controller. The unit can be set up to trigger an alarm on the controller when the batteries need replacing.

PART #: ALC/WTH-D - Wireless Duct Temperature & Humidity Transmitter, 5" Probe Length

PART #: ALC/LI3620 - Lithium Battery 3.6V

Specifications

Supply Power: Two 3.6V Lithium batteries, 8 year battery life at 10 second transmit rate

Sensing Elements:

- Temp. - Semiconductor Band Gap,
Proportional to Absolute Temperature, $\pm 0.54^{\circ}\text{F}$ ($\pm 0.3^{\circ}\text{C}$)
- Humidity - Capacitive Polymer, $\pm 1.8\%$ RH Accuracy

Transmitted Range: -40°F to 185°F (-40°C to 85°C)

Environmental Operation Range:

- Temp: -40°F to 185°F (-40°C to 85°C)
- Humidity: 0% to 100% RH, non-condensing

Enclosure Rating: IP66

Enclosure Material:

- UV-Resistant Polycarbonate

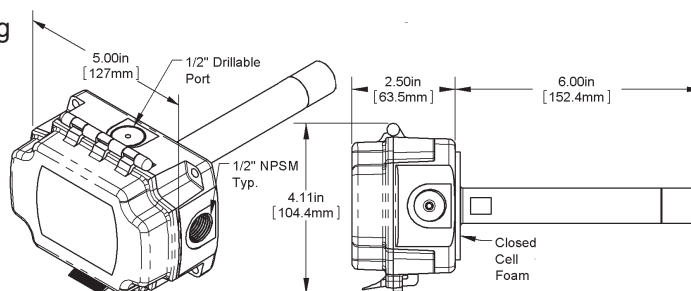
Material Rating: UL94 V-0

Radio Frequency: 418 MHz

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

FCC Approval: FCC ID# T4F060811TEMP
& FCC ID# T4F060811RH



**Wireless Duct Temperature and Humidity
unit in a BAPI-Box (BB) Enclosure**

*Actual in-building transmission distances will vary depending upon building construction and other factors.



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Rev. 02/03/11

Features & Options

- 8 Year Battery Life (with two 3.6V lithium batteries, full AA size)
- 100 foot range, extendable to 1,000 feet with Repeater*
- Transmitted signals can be converted to Voltage, Current or Resistive Outputs for the Controller
- Probe Lengths: 2", 4" and 8" (fit standard BAPI Thermowells)
- Watertight BAPI-Box Enclosure and Stainless Steel Probes
- Etched Teflon Leadwires & Double Encapsulated Sensors
- 2 Year Warranty

**Wireless Immersion Temperature Transmitter**

The Wireless 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 epoxy. The Immersion Units come with etched teflon leadwires, double encapsulated sensors and a BAPI-Box enclosure to withstand high humidity and condensation and perform under real world conditions.

The Wireless Immersion Temperature Transmitter measures the temperature and transmits the data through 418MHz RF to a receiver. It has a minimum in-building range of 100 feet and an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries with a transmit rate of about once every 10 seconds. Each transmitter has a unique address with built in error detection. Each variable sent by the transmitter is picked up by the receiver and converted by an Analog Output Module to a voltage, current or resistance signal which is sent to the controller. The unit can be set up to trigger an alarm on the controller when the batteries need replacing.

BAPI Thermowells

Immersion Unit Probes are designed to be inserted into a Thermowell. BAPI Thermowells are available in machined stainless steel or brass, or welded stainless steel, in lengths to match our Immersion Unit Probe Lengths. For more info, see page B14.



PART NUMBER: ALC/WT-I-2" - Wireless Immersion Temperature Transmitter, 2" Probe Length

PART NUMBER: ALC/WT-I-4" - Wireless Immersion Temperature Transmitter, 4" Probe Length

PART NUMBER: ALC/WT-I-8" - Wireless Immersion Temperature Transmitter, 8" Probe Length

PART NUMBER: ALC/LI3620 - Lithium Battery 3.6V

**Custom Lengths of 1/4" Diameter Stainless Steel Probe are Available. Call BAPI for more information.*

Specifications

Supply Power: Two 3.6V Lithium batteries, 8 year battery life at 10 second transmit rate

Inputs: Built in thermistor

Accuracy: $\pm 0.36^{\circ}\text{F}$ ($\pm 0.2^{\circ}\text{C}$)

Transmitted Range: -40° to 85°C

Environmental Operation Range:

Temp: -40°C to 85°C

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

Enclosure Rating: IP66

Enclosure Material: UV-Resistant Polycarbonate

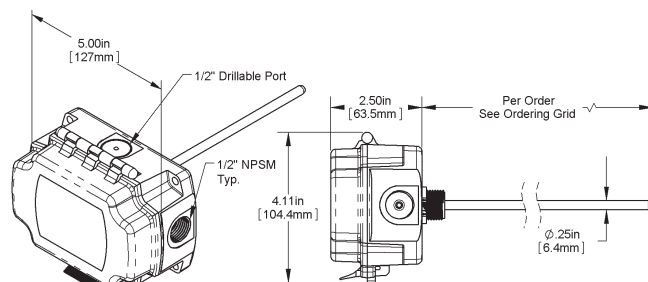
Material Rating: UL94 V-0

Radio Frequency: 418 MHz

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

FCC Approval: FCC ID# T4F060811TEMP

**Wireless Immersion Temperature unit in a BAPI-Box (BB) Enclosure**

**Actual in-building transmission distances will vary depending upon building construction and other factors.*



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Remote Probe Transmitter

**Wireless Temp.
and/or Humidity**

G7

Rev. 01/13/11

Features & Options

- 8 Year Battery Life (with two 3.6V lithium batteries, full AA size)
- 100 foot range, extendable to 1,000 feet with Repeater*
- Transmitted signals can be converted to Voltage, Current or Resistive Outputs for the Controller
- Plenum Rated Cable or FEP Jacketed Cable
- Double Encapsulated Probe Sensor
- 2 Year Warranty

The Wireless Remote Probes feature a 1.75" long stainless steel probe with either Plenum-Rated Cable or FEP-Jacketed Cable and a watertight BAPI-Box Enclosure. Standard 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 for applications where the usual Immersion or Duct Sensors do not fit well. Additional cable options, lead lengths and probe styles are available upon request.



**Wireless Remote
Probe Transmitter**

The Wireless Remote Probe Transmitter measures the temperature and transmits the data through 418MHz RF to a receiver. It has a minimum in-building range of 100 feet and an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries with a transmit rate of about once every 10 seconds. Each transmitter has a unique address with built in error detection. Each variable sent by the transmitter is picked up by the receiver and converted by an Analog Output Module to a voltage, current or resistance signal which is sent to the controller. The unit can be set up to trigger an alarm on the controller when the batteries need replacing.

ALC/WT-RPP-5'	Remote Probe, Plenum Rated Cable - 5' Leads
ALC/WT-RPP-10'	Remote Probe, Plenum Rated Cable - 10' Leads
ALC/WT-RPP-15'	Remote Probe, Plenum Rated Cable - 15' Leads
ALC/WT-RPP-20'	Remote Probe, Plenum Rated Cable - 20' Leads
ALC/WT-RPP-25'	Remote Probe, Plenum Rated Cable - 25' Leads
ALC/WT-RPFEP-5'	Remote Probe with FEP Jacketed Cable - 5' Leads
ALC/WT-RPFEP-10'	Remote Probe with FEP Jacketed Cable - 10' Leads
ALC/WT-RPFEP-15'	Remote Probe with FEP Jacketed Cable - 15' Leads
ALC/WT-RPFEP-20'	Remote Probe with FEP Jacketed Cable - 20' Leads
ALC/WT-RPFEP-25'	Remote Probe with FEP Jacketed Cable - 25' Leads

ALC/LI3620 Lithium Battery, 3.6 Volt (for Wireless Transmitters)

Specifications

Supply Power: Two 3.6V Lithium batteries, 8 year battery life at 10 second transmit rate

Inputs: Built in thermistor

Accuracy: $\pm 0.36^{\circ}\text{F}$ ($\pm 0.2^{\circ}\text{C}$)

Transmitted Range: -40°F to 185°F (-40°C to 85°C)

Environmental Operation Range:

Temp: -40°F to 185°F (-40°C to 85°C)

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

Enclosure Rating: IP66

Enclosure Material: UV-Resistant Polycarbonate

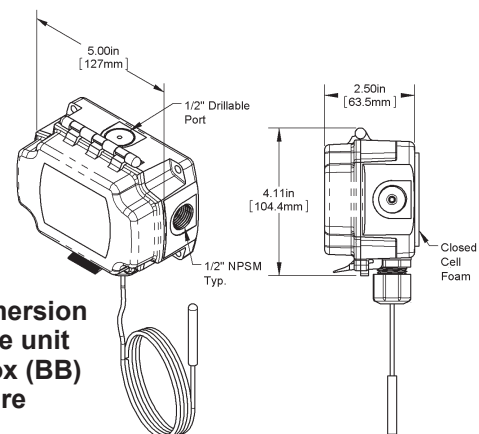
Material Rating: UL94 V-0

Radio Frequency: 418 MHz

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

FCC Approval: FCC ID# T4F060811TEMP



**Wireless Immersion
Temperature unit
in a BAPI-Box (BB)
Enclosure**

*Actual in-building transmission distances will vary depending upon building construction and other factors.



Manufactured by Building Automation Products, Inc., 750 N. Royal Ave., Gays Mills, WI 54631 USA
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Features & Options

- 8 Year Battery Life (with two 3.6 volt lithium batteries, full AA size)
- 100 foot range, extendable to 1,000 feet with Repeater*
- Transmitted signals can be converted to Voltage, Current or Resistive Outputs for the Controller
- Watertight BAPI-Box Enclosure
- Quick Response Sensor
- Light-Colored Sensor Guard
- Etched Teflon Leadwires
- 2 Year Warranty



**Wireless Outside
Air Temperature
Transmitter**

The Wireless Outside Air Temperature Transmitters 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 Outside Air Units come with a watertight BAPI-Box enclosure which is made of UV-resistant polycarbonate and carries an IP66 rating.

The Wireless Outside Air Temperature Transmitter measures the temperature and transmits the data through 418MHz RF to a receiver. It has a minimum range of 100 feet and an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries with a transmit rate of about once every 10 seconds. Each transmitter has a unique address with built in error detection. Each variable sent by the transmitter is picked up by the receiver and converted by an Analog Output Module to a voltage, current or resistance signal which is sent to the controller. The unit can be set up to trigger an alarm on the controller when the batteries need replacing.

Ordering Information/Part Numbers

PART NUMBER: ALC/WT-O-BB - Wireless Outside Air Temperature Transmitter

PART NUMBER: ALC/LI3620 - Lithium Battery 3.6V

Specifications

Supply Power: Two 3.6V Lithium batteries
8 year battery life at 10 second transmit rate

Inputs: Built in thermistor

Accuracy: $\pm 0.36^{\circ}\text{F}$ ($\pm 0.2^{\circ}\text{C}$)

Transmitted Range: -40°F to 185°F (-40°C to 85°C)

Enclosure Rating: IP66

Enclosure Material:
UV-Resistant Polycarbonate

Material Rating: UL94 V-0

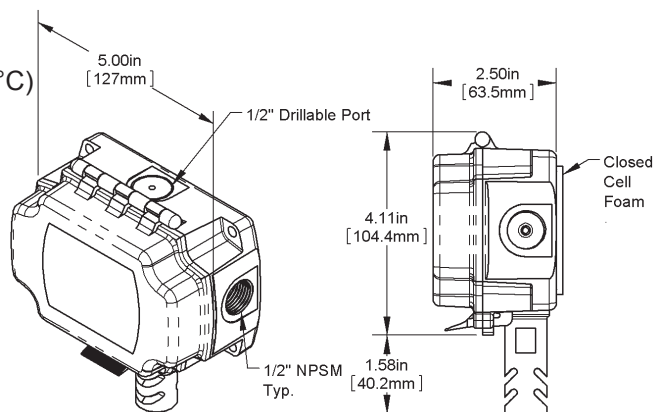
Environmental Operation Range:
Temp: -40°F to 185°F (-40°C to 85°C)
Humidity: 0 to 100% RH

Radio Frequency: 418 MHz

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

FCC Approval: FCC ID# T4F060811TEMP



**Wireless Outside Air Temperature unit
in a BAPI-Box (BB) Enclosure**

*Actual in-building transmission distances will vary depending upon building construction and other factors.



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Features & Options

- 8 Year Battery Life (with two 3.6 volt lithium batteries, full AA size)
- 100 feet range, extendable to 1,000 feet with Repeater*
- Temperature and Humidity signals can be converted to Voltage, Current or Resistive Outputs for the Controller
- Watertight BAPI-Box Enclosure
- Quick Response Sensor
- 2% RH Accuracy
- 2 Year Warranty



**Wireless Outside Air
Temperature and Hu-
midity Transmitter**

The Wireless Outside Air Temperature and Humidity Transmitters 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 Outside Air Units come with a watertight BAPI-Box enclosure which is made of UV-resistant polycarbonate and carries an IP66 rating.

The Wireless Outside Air Temperature and Humidity Transmitter measures the temperature and humidity and transmits the data through 418MHz RF to a receiver. It has a minimum in-building range of 100 feet and an estimated battery life of 8 years using two high-capacity 3.6V lithium batteries with a transmit rate of about once every 10 seconds. Each transmitter has a unique address with built in error detection. Each variable sent by the transmitter is picked up by the receiver and converted by an Analog Output Module to a voltage, current or resistance signal which is sent to the controller. The unit can be set up to trigger an alarm on the controller when the batteries need replacing.

Ordering Information/Part Numbers

PART NUMBER: ALC/WTH-O-BB - Wireless Outside Air Temperature and Humidity Transmitter

PART NUMBER: ALC/LI3620 - Lithium Battery 3.6V

Specifications

Supply Power: Two 3.6V Lithium batteries, 8 year battery life at 10 second transmit rate

Sensing Elements:

Temp. - Semiconductor Band Gap,
Proportional to Absolute Temperature, $\pm 0.54^{\circ}\text{F}$ ($\pm 0.3^{\circ}\text{C}$)

Humidity - Capacitive Polymer, $\pm 1.8\%$ RH Accuracy

Transmitted Range: -40°F to 185°F (-40°C to 85°C)

Enclosure Rating: IP66

Enclosure Material:

UV-Resistant Polycarbonate

Material Rating: UL94 V-0

Environmental Operation Range:

Temp: -22°F to 158°F (-30°C to 70°C)

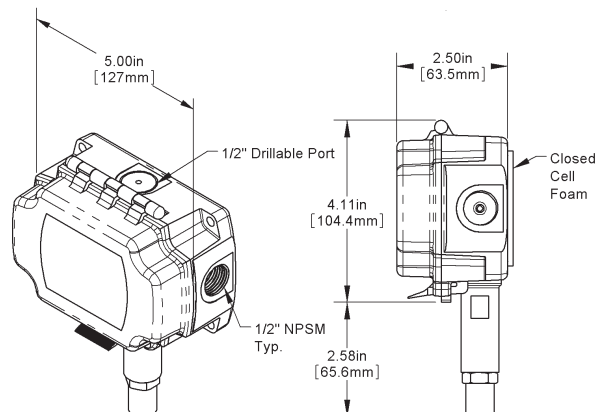
Humidity: 0 to 100% RH

Radio Frequency: 418 MHz

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

FCC Approval: FCC ID# T4F060811TEMP
& FCC ID# T4F060811RH



**Wireless Outside Air Temperature and
Humidity unit in a BAPI-Box (BB) Enclosure**

*Actual in-building transmission distances will vary depending upon building construction and other factors.



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Features & Options

- Reduces Temperature Reading “Spikes” Caused By Opening and Closing the Cooler or Freezer Door
- 100 Foot Range, Extendable to 1,000 Feet with a Repeater*
- Buffer Chamber is 304 Stainless or Aluminum
- 8 Year Battery Life

The BAPI Wireless Thermobuffer wirelessly transmits the temperature of walk-in freezers or coolers to a receiver within 100 feet. The Thermobuffer slows the temperature reaction of a freezer door opening to prevent false alarms or short cycling the compressor.

The Thermobuffer features a watertight BAPI-Box enclosure and is designed to be mounted to the wall of the cooler or freezer saving valuable shelf space. It is available with a two-inch or four-inch stainless steel buffer chamber (optional aluminum) which is sealed with customer provided oil, or a 50/50 glycol solution to approximate the temperature reaction of the refrigerated contents in the freezer or cooler.



**Thermobuffer
temperature
sensor (2"
length shown)**

Ordering Information/Part Numbers

ALC/WT-TB-M304-2-BB: 304 Stainless Steel Chamber, 2 inch probe, BAPI-Box Enclosure

ALC/WT-TB-M304-4-BB: 304 Stainless Steel Chamber, 4 inch probe, BAPI-Box Enclosure

ALC/WT-TB-MAL-2-BB: Machined Aluminum Chamber, 2 inch probe, BAPI-Box Enclosure

ALC/WT-TB-MAL-4-BB: Machined Aluminum Chamber, 4 inch probe, BAPI-Box Enclosure

ALC/LI3620: Replacement Battery, Lithium 3.6V

Specifications

Supply Power: Two 3.6V Lithium batteries,

Battery Life: 8 years at 10 second transmit rate

Battery capacity: 2.25 AH

Sensor: Built in thermistor

Accuracy: $\pm 0.36^{\circ}\text{F}$ ($\pm 0.2^{\circ}\text{C}$)

Temp. Range: -40°F to 185°F , (-40°C to 85°C)

Radio Frequency: 418 MHz

Transmit Power: 1.5mW

Transmit Time: 20ms

Modulation: Amplitude Modulation (AM)

A/D Resolution: 12 Bit

Transmitter Interval: ~10 seconds

Antenna: Built inside the enclosure

Weight: 2 lb (0.9kg)

Error checking: CRC 16, Cyclic Redundancy Check 16 bit

Agency: FCC ID#T4F061213RSO (US)

Probe: 2 or 4 inch, $\frac{1}{4}$ " 304 Stainless Steel

Buffer chamber: 2 or 4" 304 Stainless Steel
(Optional machined aluminum)

Environmental Operation Range:

Temp: -22°F to 158°F (-30°C to 70°C)

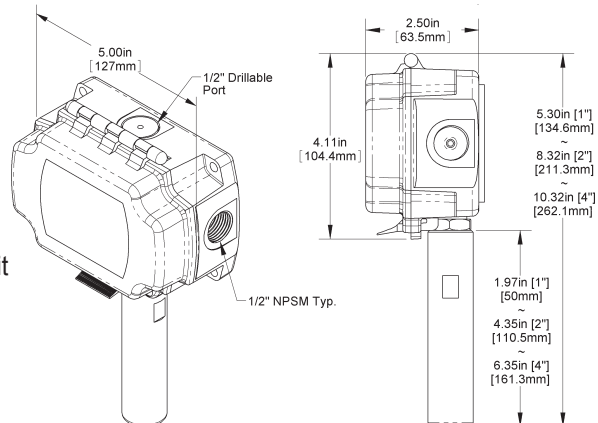
Humidity: 0% to 100% RH, Non-condensing

Enclosure Rating: NEMA 4, IP66

Encl. Material: UV-Resistant Polycarbonate

Material Rating: UL94 V-0

Warranty: 2 Years



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

*Actual in-building transmission distances will vary depending upon building construction and other factors.



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Features & Options

- Two Year Battery Powered with Replaceable Battery
- 0-5, 0-10 and 4-20mA Analog Input Models
- Digital Input (dry contact) Model
- Thermistor Temperature Input
- 100' open air range, 1,000' range with a Repeater*
- Transmission Interval from 10-17 seconds
- Easy Two-Wire Termination and Easy Setup Mode

The Wireless Universal Input Transmitter is designed to monitor 0-5VDC, 0-10VDC or 4-20mA signals and transmit that analog value to the receiver. The Digital Input version monitors any dry contact status input and transmits that On/Off status to the receiver. The Thermistor Temperature Input version takes any 10K-2 thermistor sensor and transmits it to any BAPI receiver. All models transmit their data every 10-17 seconds. The units are battery operated and only require wiring from the remote input sensor.



Wireless Analog or Digital Input Transmitter shown with the BAPI-Box open and closed



Ordering Information

ALC/WAI-05

0-5VDC Analog Input Transmitter, 418MHz

ALC/WAI-10

0-10VDC Analog Input Transmitter, 418MHz

ALC/WAI-420

4-20mA Analog Input Transmitter, 418MHz

ALC/WDI

Digital Input Transmitter, 418MHz

ALC/WTS

Thermistor Sensor Transmitter, 418MHz

Related Products

ALC/VOM-05-AO-EZ:

0-5V Output Full Scale

ALC/VOM-10-AO-EZ:

0-10V Output Full Scale

ALC/COM-AO-EZ:

4-20 mA Output Full Scale

ALC/RVOL-NO-EZ:

Relay Output Latching, Normally Open

Also, any ROM, VOM or COM Temperature Output Module

Specifications

Supply Power: 3.6 Lithium,
..... 2-AA Batteries (included)

Battery life: 2 years @ 10 sec. intervals

Analog Input: 2-terminals

BA/WAI-05 0-5VDC, Imp. > 30K Ω

BA/WAI-10 0-10VDC, Imp. > 50K Ω

BA/WAI-420 4-20mA, Imp. = 100 Ω

Digital Input: 2-terminals

BA/WDI Dry contact, >20 seconds

Contact Status < 10 Ω closed, >250 Ω open

Thermistor Input: 2-terminals

BA/WTS Any 10K-2 Thermistor

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

Mounting: Four corner tabs

Radio Frequency: 418 MHz @ 1mW

Transmitter Interval: ~10-17 sec.

Antenna: Built into case

Transmission Range: Up to 100 feet direct
(Up to 1,000 feet with a repeater)

Enclosure: NEMA-4 w/ cover screw

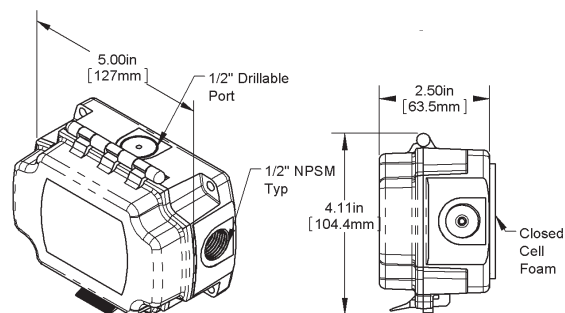
Environmental Operating Range:

Temperature .. 32°F to 140°F (0°C to 60°C)

Humidity 5 to 95% RH, Non-condensing

Case Material: . ABS Plastic, UL94V-0

FCC ID: T4F061213RSO



*Actual in-building transmission distances will vary depending upon building construction and other factors.



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Features & Options

- Extends Transmitter Range to 1,000 Feet

The BAPI Repeater receives the 418 MHz RF signal from one or more wireless temperature or humidity transmitters which have a range of 100 feet. The Repeater re-transmits the signal at 900 Mhz to a distance of 1,000 feet to a BAPI 900 MHz Receiver.

The 900 MHz Receiver then outputs the values to any Analog Output Module through a four-wire bus. The Analog Output Module converts the signal to an analog voltage, current or resistance for the controller. The 900 MHz Receiver can accommodate up to 127 different Analog Output Modules. The Repeater is surface, snaptrack or din rail mountable with an attached 900 MHz antenna and a 79" 418 MHz extendable antenna.



PART NUMBERS: ALC/RPT49 - 418 to 900 MHz Repeater
ALC/RPT49-35DIN - 418 to 900 MHz Repeater, 35mm Din Rail Mounting

Associated Products

• Wireless Temperature or Temp./Humidity Transmitter

Measures the room temperature and/or humidity and transmits the data through 418MHz RF to a receiver. The 1 mW transmitter is mounted in a BAPI-Stat 2 style enclosure and has an open-air range of 100 feet.

• Wireless Point Manager

Receives the RF signal from up to 100 wireless transmitters and converts the data to ethernet (TCP/IP) or serial protocol for the network.



Specifications for the Wireless Repeater

Supply Power: 9 to 15 VDC

Power Consumption: 150 mA max. DC

Inputs: 418MHz

Output: 900MHz at 100mW

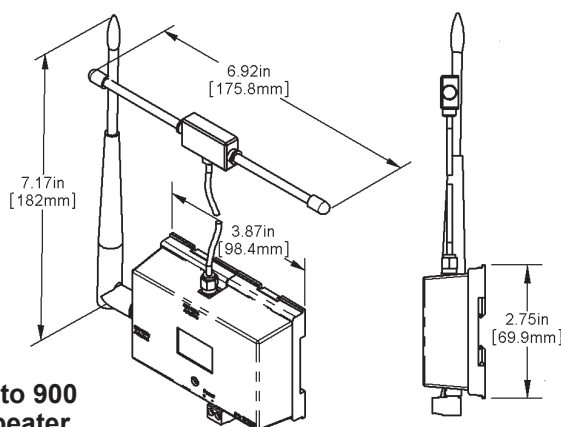
Environmental Operation Range:

Temp: 32°F to 140°F (0°C to 60°C)

Humidity: 5% to 95% RH non-condensing

Material: ABS Plastic

Material Rating: UL94, V-0



418 MHz to 900
MHz Repeater



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Features & Options

- Validates RF operation with a simple site visit
- Identifies radio positions before installation
- Battery operated for easy survey mobility
- Loaner verifiers available
- Automatic battery power management
- LED and beeper indication of performance

The 418 MHz Field Verifier is designed to measure how far the BAPI Wireless Transmitter signal will go in a specific installation. The verifier is equipped with an LED bar graph indicating signal strength and sounder from a single BAPI 418MHz transmitter or from all the BAPI 418MHz transmitters on the job.

The 900 MHz Field Verifier is an RF transceiver field tool designed to verify how far the BAPI Repeater will go in a specific installation. Each verifier is equipped with an LED and sounder indicating packet reception from the other verifier. Units are used in pairs with one unit set-up as the transmitter and the other unit set-up as the receiver.



Ordering Information

ALC/FV-KIT - Combined Field Verifier Kit (BA/FV418K & BA/FV900K)

ALC/FV-KIT-LOAN - Loaner Combined Field Verifier Kit (BA/FV418K & BA/FV900K)*

ALC/FV418K - Field Verifier Kit, 418 MHz, (1 transmitter & 1 verifier included)

ALC/FV900K - Field Verifier Kit, 900 MHz, (2 transmitter/verifiers per kit)

ALC/FV418 - Field Verifier 418 MHz, (1 verifier only)

ALC/FV900 - Field Verifier 900 MHz, (1 verifier only)

***Note:** You will receive 100% credit less shipping and handling charges if unit is returned in working order within 30 Days from product ship date

Specifications

Battery Power: BA/FV418, (2) 3.6 volt Lithium
BA/FV900, 9VDC

Auto Off: BA/FV418, 17 minutes
BA/FV900, 1 hour

Storage/Operating: 32° to 158°F (0 to 70°C)

Frequency/RF-Power/Transmission time

BA/FV418K: 418MHz/ 1mW / ~every 10S

BA/FV900K: 900MHz/100mW / ~ every 1S

Receiver Sensitivity: 418MHz - 112dBm
900MHz - 110dBm

Typical open air range: 418MHz - 100 feet
900MHz - 1,000 feet

Sound Indication: 50db@5ft beeper (Off selectable)

BA/FV418 Indication: 10 element LED, ~6db per element

BA/FV900 Indication: 2 LED's, 1-transmit and 1-recieve

Antenna: Detachable whip (must be installed to operate)

Weight: 0.5 lb (.23kg) per unit

Indoor Range Est. "Rules of Thumb"

Xmtr = Transmitter Rptr = Repeater

A) Xmtr, 0-100ft

Will work in open office instances.

B) Xmtr, 100-150ft

May work but verify.

C) Xmtr, >150 ft

Needs a repeater.

D) Rptr, 0-1,000ft

Will work in most instances.

E) Rptr, 1,000ft -2,000ft

May work but verify.

F) Rptr, >2,000ft

Needs another repeater.

G) Xmtr possible line of site range
900ft but verify.

H) Rptr, possible line of site range
2500ft but verify.



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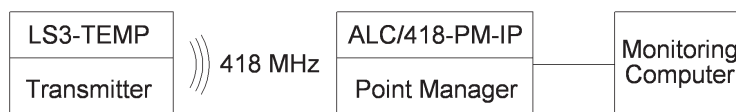
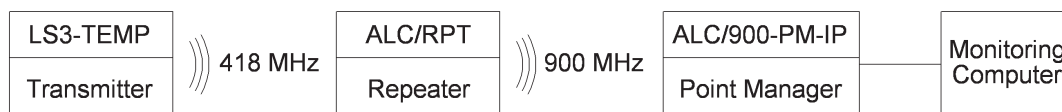
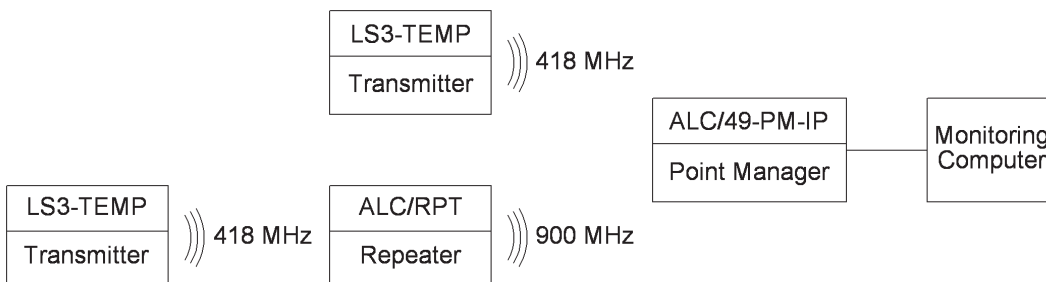
Features & Options

- Interfaces Directly with Specified ALC, LGR controllers
LGR25, LGR250, LGR-1000, ME-LGR25, ME-LGR200, ME812u-LGR
- Multiple Communication Options, Including Ethernet (TCP/IP) and RS232 Serial
- Ethernet Communication Uses Dynamic HTML for Direct LGR Interface
- Serial Communication Uses Simple ASCII Command/Response Protocol
- Each Point Manager Supports Up To 100 Input Sensors

The Point Manager receives RF signals from the wireless sensors and communicates with LGR controllers via Ethernet TCP/IP. The communication between the LGR and the Point manager is through an ALC written software driver available as a download from ALC. The TCP/IP has a built in HTML web page server and can output point status using XML over an Ethernet LAN or the Internet using either DHCP or fixed IP addresses.

**418 MHz or 900 MHz Point Manager****Ordering Information****PART NUMBERS:**

- ALC/418-PM-IP:** RF Point Manager Rx-418 MHz only, North America, with 6' dipole antenna
ALC/900-PM-IP-EA: RF Point Manager Rx & Tx-900MHz, N. America, with 6' dipole antenna
ALC/49-PM-IP: RF Point Manager Rx-418 & 900 MHz, & Tx-900 MHz, North America

Wireless System Block Diagrams**System 1
418 MHz
Receiver****System 2
900 MHz
Receiver****System 3
418 MHz
& 900 MHz
Receiver**

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Point Manger Specifications

Power:..... 6 to 12 VDC, 600mA @9VDC, 5mm plug

Transformer:.... Plug-in 120VAC-9VDC (included), 1.87"W x 2.87"L x 1.6"H

Battery: CRC2032, 3VDC Lithium (included)

Memory:..... Backed up 6 years via battery

Indicators: Red LED - Power & reception activity / Green LED - Ethernet link

Cable:..... Cross over 6' Ethernet w/RJ45 at each end (included)

Communication Ports:

RJ45 Ethernet:..... TCP/IP used for WEB Browser interface, Built in HTML web page server, DHCP or static IP addressing

Terminals: RS485, not used

9 pin male D-plug: RS232 used for serial comm. to computer

Communication Connections:

RJ45: Standard 4 pair color code

RS485:..... 4 connections, not used

9 pin D-plug: 3 Pins used- 2 Tx, 3 Rx, 5 GND

Reset Button: Restarts reception/transmission

Error Correction: CRC 16

Capacity/Unit: 100 Input sensors

Frequency: ALC/49 418MHz and 900MHz, North America

ALC/418 418MHz, North America

ALC/900 900MHz, North America

Antenna: Thread-on connection

ALC/418 6.5" dipole with 6' cable

ALC/900 3.9" dipole with 6' cable

ALC/49 7" whip and 6.5" dipole

Note: Mount Antennas 2 feet apart

Ambient: 32° to 150°F (0° to 70°C), 0% to 95% RH non-condensing

Typical Line of Site Tx to Rx Reception:

418MHz 900ft

900MHz 2500ft

Typical Indoor Tx to Rx Reception (no obstructions):

418MHz 100ft

900MHz 300ft

Transmitter (Tx) Power:

900MHz 100 mW

Receiver (Rx) Sensitivity:

418MHz 112dBm

900MHz 110dBm

Compatible Controllers:

LGR25, LGR250, LGR-1000, ME-LGR25, ME-LGR200, ME812u-LGR

ALC SW Driver: Download from ALC website, drv_melgr_pointsix_<Latest Version>.driver

ALC Communication: Ethernet, RJ45

Direct to computer Crossover cable

LAN/HUB/Switcher Straight through cable

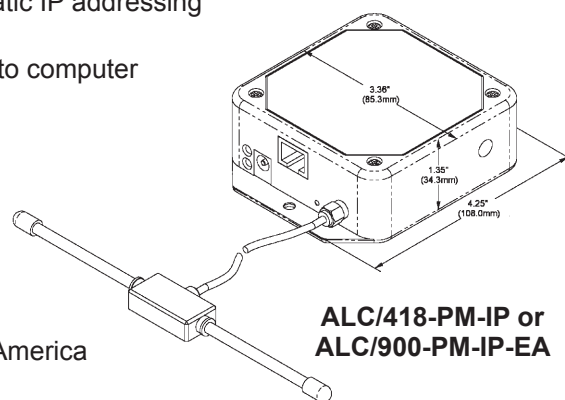
ALC Device Limit: Up to 10 Point Managers

Interface literature: ALC – Point Six Integration Guide; Point Six – Point Manager Manual

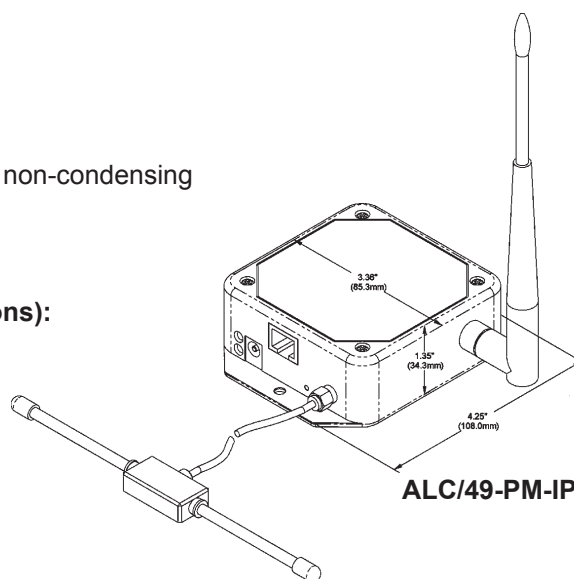
Default IP Address:

IP 192.168.1.55 Net Mask... 255.255.255.0

Gateway ...None Port 1000



**ALC/418-PM-IP or
ALC/900-PM-IP-EA**



ALC/49-PM-IP

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Page	Part Number	Description	List Price
WIRELESS TRANSMITTERS			
A2-3	LS3-WT	Wireless Temperature Transmitter.....	\$215
	LS3-WT-S	Wireless Temperature Transmitter with Setpoint	\$221
	LS3-WT-O	Wireless Temperature Transmitter with Override	\$220
	LS3-WT-SO	Wireless Temperature Transmitter with Setpoint & Override	\$226
	LS3-WTH	Wireless Temperature and Humidity Transmitter.....	\$265
	LS3-WTH-S	Wireless Temp. and Humidity Transmitter with Setpoint	\$271
	LS3-WTH-O	Wireless Temp. and Humidity Transmitter with Override	\$270
	LS3-WTH-SO	Wireless Temp. and Humidity Transmitter with Setpoint & Override	\$276
	ALC/LI3620	Lithium Battery, 3.6 Volt (for Wireless Transmitters).....	\$30
ROOM SENSORS			
A4-5	LSBASE2H	Room Temperature and Humidity Sensor	\$190
	LSPLUS2H	Room Temperature and Humidity Sensor with Setpoint and Override	\$200
A6-7	LSBASE2	Room Temperature Sensor	\$29
	LSPLUS2	Room Temperature Sensor with Setpoint and Override	\$36
RpP STYLE ROOM TEMPERATURE SENSORS			
B2	ALC/RUPF-A81-P-24-102-NL-CG	RpP Sensor, °F Indication and Setpoint Display Range of -3 to +3	\$125
	ALC/RUPF-B81-P-24-102-NL-CG	RpP Sensor, °F Indication and Setpoint Display Range of -5 to +5	\$125
	ALC/RUPF-C81-P-24-102-NL-CG	RpP Sensor, °F Indication and Setpoint Display Range of 50 to 90 °F	\$125
	ALC/RUPF-D81-P-24-102-NL-CG	RpP Sensor, °F Indication and Setpoint Display Range of 55 to 85 °F	\$125
	ALC/RUPF-E81-P-24-102-NL-CG	RpP Sensor, °F Indication and Setpoint Display Range of 60 to 80 °F	\$125
	ALC/RUPF-F81-P-24-102-NL-CG	RpP Sensor, °F Indication and Setpoint Display Range of 65 to 80 °F	\$125
B2	ALC/RUPC-A81-P-24-102-NL-CG	RpP Sensor, °C Indication and Setpoint Display Range of -3 to +3	\$125
	ALC/RUPC-B81-P-24-102-NL-CG	RpP Sensor, °C Indication and Setpoint Display Range of -5 to +5	\$125
	ALC/RUPC-C81-P-24-102-NL-CG	RpP Sensor, °C Indication and Setpoint Display Range of 10 to 32 °C	\$125
	ALC/RUPC-D81-P-24-102-NL-CG	RpP Sensor, °C Indication and Setpoint Display Range of 13 to 30 °C	\$125
	ALC/RUPC-E81-P-24-102-NL-CG	RpP Sensor, °C Indication and Setpoint Display Range of 15 to 27 °C	\$125
	ALC/RUPC-F81-P-24-102-NL-CG	RpP Sensor, °C Indication and Setpoint Display Range of 18 to 27 °C	\$125
BAPI-Stat STYLE ROOM TEMPERATURE SENSORS			
B3		BAPI-Stat Style Room Temperature Sensors.....	Call BAPI
BAPI-Stat 3 STYLE ROOM TEMPERATURE SENSORS			
B4		BAPI-Stat 3 Style Room Temperature Sensors.....	Call BAPI
BAPI-Stat 2 STYLE ROOM TEMPERATURE SENSORS			
B5	ALC/BS2MF-A81-P-24-102-CG...	Unit with Buttons, °F Indication and Setpoint Display Range of -3 to +3.....	\$125
	ALC/BS2MF-B81-P-24-102-CG...	Unit with Buttons, °F Indication and Setpoint Display Range of -5 to +5.....	\$125
	ALC/BS2MF-C81-P-24-102-CG...	Unit with Buttons, °F Indication and Setpoint Display Range of 50 to 90 °F	\$125
	ALC/BS2MF-D81-P-24-102-CG...	Unit with Buttons, °F Indication and Setpoint Display Range of 55 to 85 °F	\$125
	ALC/BS2MF-E81-P-24-102-CG...	Unit with Buttons, °F Indication and Setpoint Display Range of 60 to 80 °F	\$125
	ALC/BS2MF-F81-P-24-102-CG...	Unit with Buttons, °F Indication and Setpoint Display Range of 65 to 80 °F	\$125
	ALC/BS2MC-A81-P-24-102-CG ..	Unit with Buttons, °C Indication and Setpoint Display Range of -3 to +3	\$125
	ALC/BS2MC-B81-P-24-102-CG ..	Unit with Buttons, °C Indication and Setpoint Display Range of -5 to +5	\$125
	ALC/BS2MC-C81-P-24-102-CG ..	Unit with Buttons, °C Indication and Setpoint Display Range of 10 to 32 °C	\$125
	ALC/BS2MC-D81-P-24-102-CG ..	Unit with Buttons, °C Indication and Setpoint Display Range of 13 to 30 °C	\$125



Page	Part Number	Description	List Price
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BAPI-Stat 2 STYLE ROOM TEMPERATURE SENSORS Continued...

B5	ALC/BS2MC-E81-P-24-102-CG..	Unit with Buttons, °C Indication and Setpoint Display Range of 15 to 27 °C...	\$125
	ALC/BS2MC-F81-P-24-102-CG..	Unit with Buttons, °C Indication and Setpoint Display Range of 18 to 27 °C...	\$125
B5	ALC/BS2SF-A81-P-24-102-CG ..	Unit with Slider, °F Indication and Setpoint Display Range of -3 to +3	\$125
	ALC/BS2SF-B81-P-24-102-CG ..	Unit with Slider, °F Indication and Setpoint Display Range of -5 to +5	\$125
	ALC/BS2SF-C81-P-24-102-CG ..	Unit with Slider, °F Indication and Setpoint Display Range of 50 to 90 °F	\$125
	ALC/BS2SF-D81-P-24-102-CG ..	Unit with Slider, °F Indication and Setpoint Display Range of 55 to 85 °F	\$125
	ALC/BS2SF-E81-P-24-102-CG...	Unit with Slider, °F Indication and Setpoint Display Range of 60 to 80 °F	\$125
	ALC/BS2SF-F81-P-24-102-CG...	Unit with Slider, °F Indication and Setpoint Display Range of 65 to 80 °F	\$125
	ALC/BS2SC-A81-P-24-102-CG ..	Unit with Slider, °C Indication and Setpoint Display Range of -3 to +3.....	\$125
	ALC/BS2SC-B81-P-24-102-CG ..	Unit with Slider, °C Indication and Setpoint Display Range of -5 to +5.....	\$125
	ALC/BS2SC-C81-P-24-102-CG ..	Unit with Slider, °C Indication and Setpoint Display Range of 10 to 32 °C	\$125
	ALC/BS2SC-D81-P-24-102-CG ..	Unit with Slider, °C Indication and Setpoint Display Range of 13 to 30 °C	\$125
	ALC/BS2SC-E81-P-24-102-CG ..	Unit with Slider, °C Indication and Setpoint Display Range of 15 to 27 °C	\$125
	ALC/BS2SC-F81-P-24-102-CG ..	Unit with Slider, °C Indication and Setpoint Display Range of 18 to 27 °C	\$125

BAPI-Stat 4 STYLE ROOM TEMPERATURE SENSORS

B6	ALC/BS4MF-A81-P-24-102-CG-WMW ..	Unit with Buttons, °F Indication and Setpoint Display Range of -3 to +3.....	\$125
	ALC/BS4MF-B81-P-24-102-CG-WMW ..	Unit with Buttons, °F Indication and Setpoint Display Range of -5 to +5.....	\$125
	ALC/BS4MF-C81-P-24-102-CG-WMW ..	Unit with Buttons, °F Indication and Setpoint Display Range of 50 to 90 °F ..	\$125
	ALC/BS4MF-D81-P-24-102-CG-WMW ..	Unit with Buttons, °F Indication and Setpoint Display Range of 55 to 85 °F ..	\$125
	ALC/BS4MF-E81-P-24-102-CG-WMW ..	Unit with Buttons, °F Indication and Setpoint Display Range of 60 to 80 °F ..	\$125
	ALC/BS4MF-F81-P-24-102-CG-WMW...	Unit with Buttons, °F Indication and Setpoint Display Range of 65 to 80 °F ..	\$125
B6	ALC/BS4MC-A81-P-24-102-CG-WMW ..	Unit with Buttons, °C Indication and Setpoint Display Range of -3 to +3	\$125
	ALC/BS4MC-B81-P-24-102-CG-WMW ..	Unit with Buttons, °C Indication and Setpoint Display Range of -5 to +5	\$125
	ALC/BS4MC-C81-P-24-102-CG-WMW ..	Unit with Buttons, °C Indication and Setpoint Display Range of 10 to 32 °C .	\$125
	ALC/BS4MC-D81-P-24-102-CG-WMW ..	Unit with Buttons, °C Indication and Setpoint Display Range of 13 to 30 °C .	\$125
	ALC/BS4MC-E81-P-24-102-CG-WMW ..	Unit with Buttons, °C Indication and Setpoint Display Range of 15 to 27 °C .	\$125
	ALC/BS4MC-F81-P-24-102-CG-WMW ..	Unit with Buttons, °C Indication and Setpoint Display Range of 18 to 27 °C .	\$125
B6	ALC/BS4SF-A81-P-24-102-CG-WMW...	Unit with Slider, °F Indication and Setpoint Display Range of -3 to +3.....	\$125
	ALC/BS4SF-B81-P-24-102-CG-WMW...	Unit with Slider, °F Indication and Setpoint Display Range of -5 to +5.....	\$125
	ALC/BS4SF-C81-P-24-102-CG-WMW...	Unit with Slider, °F Indication and Setpoint Display Range of 50 to 90 °F	\$125
	ALC/BS4SF-D81-P-24-102-CG-WMW...	Unit with Slider, °F Indication and Setpoint Display Range of 55 to 85 °F	\$125
	ALC/BS4SF-E81-P-24-102-CG-WMW...	Unit with Slider, °F Indication and Setpoint Display Range of 60 to 80 °F	\$125
	ALC/BS4SF-F81-P-24-102-CG-WMW...	Unit with Slider, °F Indication and Setpoint Display Range of 65 to 80 °F	\$125
B6	ALC/BS4SC-A81-P-24-102-CG-WMW ..	Unit with Slider, °C Indication and Setpoint Display Range of -3 to +3	\$125
	ALC/BS4SC-B81-P-24-102-CG-WMW ..	Unit with Slider, °C Indication and Setpoint Display Range of -5 to +5	\$125
	ALC/BS4SC-C81-P-24-102-CG-WMW ..	Unit with Slider, °C Indication and Setpoint Display Range of 10 to 32 °C.....	\$125
	ALC/BS4SC-D81-P-24-102-CG-WMW ..	Unit with Slider, °C Indication and Setpoint Display Range of 13 to 30 °C.....	\$125
	ALC/BS4SC-E81-P-24-102-CG-WMW...	Unit with Slider, °C Indication and Setpoint Display Range of 15 to 27 °C.....	\$125
	ALC/BS4SC-F81-P-24-102-CG-WMW...	Unit with Slider, °C Indication and Setpoint Display Range of 18 to 27 °C.....	\$125

DECORA STYLE ROOM TEMPERATURE SENSORS

B7	ALC/RUPDF-A81-102-CG-NC	°F Indication and Setpoint Display Range of -3 to +3, No Wall Plate Cover.....	\$115
	ALC/RUPDF-B81-102-CG-NC	°F Indication and Setpoint Display Range of -5 to +5, No Wall Plate Cover.....	\$115
	ALC/RUPDF-C81-102-CG-NC	°F Indication and Setpoint Display Range of 50 to 90 °F, No Wall Plate Cover.....	\$115



Page	Part Number	Description	List Price
	ALC/RUPDF-D81-102-CG-NC	°F Indication and Setpoint Display Range of 55 to 85 °F, No Wall Plate Cover.....	\$115
	ALC/RUPDF-E81-102-CG-NC	°F Indication and Setpoint Display Range of 60 to 80 °F, No Wall Plate Cover.....	\$115
	ALC/RUPDF-F81-102-CG-NC	°F Indication and Setpoint Display Range of 65 to 80 °F, No Wall Plate Cover.....	\$115
B7	ALC/RUPDF-A81-102-CG-SWC	°F Indication and Setpoint Display Range of -3 to +3, Standard Wall Plate Cover.....	\$125
	ALC/RUPDF-B81-102-CG-SWC	°F Indication and Setpoint Display Range of -5 to +5, Standard Wall Plate Cover.....	\$125
	ALC/RUPDF-C81-102-CG-SWC	°F Indication and Setpoint Display Range of 50 to 90 °F, Standard Wall Plate Cover..	\$125
	ALC/RUPDF-D81-102-CG-SWC	°F Indication and Setpoint Display Range of 55 to 85 °F, Standard Wall Plate Cover..	\$125
	ALC/RUPDF-E81-102-CG-SWC	°F Indication and Setpoint Display Range of 60 to 80 °F, Standard Wall Plate Cover..	\$125
	ALC/RUPDF-F81-102-CG-SWC	°F Indication and Setpoint Display Range of 65 to 80 °F, Standard Wall Plate Cover..	\$125
B7	ALC/RUPDF-A81-102-CG-DWCC	°F Indication, Setpoint Display Range of -3 to +3, Curved White Wall Plate Cover	\$148
	ALC/RUPDF-B81-102-CG-DWCC	°F Indication, Setpoint Display Range of -5 to +5, Curved White Wall Plate Cover	\$148
	ALC/RUPDF-C81-102-CG-DWCC	°F Indication, Setpoint Display Range of 50 to 90 °F, Curved White Wall Plate Cover..	\$148
	ALC/RUPDF-D81-102-CG-DWCC	°F Indication, Setpoint Display Range of 55 to 85 °F, Curved White Wall Plate Cover..	\$148
	ALC/RUPDF-E81-102-CG-DWCC	°F Indication, Setpoint Display Range of 60 to 80 °F, Curved White Wall Plate Cover..	\$148
	ALC/RUPDF-F81-102-CG-DWCC	°F Indication, Setpoint Display Range of 65 to 80 °F, Curved White Wall Plate Cover..	\$148
B7	ALC/RUPDF-A81-102-CG-DWDC	°F Indication, Setpoint Display Range of -3 to +3, Dentil White Wall Plate Cover	\$156
	ALC/RUPDF-B81-102-CG-DWDC	°F Indication, Setpoint Display Range of -5 to +5, Dentil White Wall Plate Cover	\$156
	ALC/RUPDF-C81-102-CG-DWDC	°F Indication, Setpoint Display Range of 50 to 90 °F, Dentil White Wall Plate Cover	\$156
	ALC/RUPDF-D81-102-CG-DWDC	°F Indication, Setpoint Display Range of 55 to 85 °F, Dentil White Wall Plate Cover	\$156
	ALC/RUPDF-E81-102-CG-DWDC	°F Indication, Setpoint Display Range of 60 to 80 °F, Dentil White Wall Plate Cover	\$156
	ALC/RUPDF-F81-102-CG-DWDC	°F Indication, Setpoint Display Range of 65 to 80 °F, Dentil White Wall Plate Cover	\$156
LOW PROFILE "BUTTON" SENSOR			
B8	ALC/10K-2-LP-5.....	Button Sensor with 5 feet of Plenum Rated Cable.....	\$31
	ALC/10K-2-LP-10.....	Button Sensor with 10 feet of Plenum Rated Cable.....	\$33
	ALC/10K-2-LP-15.....	Button Sensor with 15 feet of Plenum Rated Cable.....	\$35.50
BAPI-COM, 2-WIRE SENSOR			
B9		BAPI-Com, 2-Wire Sensor.....	Call BAPI
WALL PLATE TEMPERATURE SENSORS			
B10	ALC/10K-2-SP.....	Stainless Steel Wall Plate	\$18
	ALC/10K-2-SP-O.....	Stainless Steel Wall Plate with Standard Override	\$28
	ALC/10K-2-SP-O1.....	Stainless Steel Wall Plate with Durable Override	\$42
	ALC/10K-2-SP-O2.....	Stainless Steel Wall Plate with Low Profile Override	\$75
	ALC/10K-2-SP-O2G5.....	Stainless Steel Wall Plate with Low Profile Override with Green LED.....	\$118
	ALC/10K-2-SP-O2R5.....	Stainless Steel Wall Plate with Low Profile Override with Red LED	\$118
DUCT TEMPERATURE SENSORS			
B11	ALC/10K-2-D-2".....	Duct Unit with 2" Probe and J-Box Enclosure.....	\$25
	ALC/10K-2-D-4".....	Duct Unit with 4" Probe and J-Box Enclosure.....	\$25
	ALC/10K-2-D-8".....	Duct Unit with 8" Probe and J-Box Enclosure.....	\$25
	ALC/10K-2-D-12".....	Duct Unit with 12" Probe and J-Box Enclosure.....	\$25
	ALC/10K-2-D-18".....	Duct Unit with 18" Probe and J-Box Enclosure.....	\$25
	ALC/10K-2-D-2"-BB	Duct Unit with 2" Probe and BAPI-Box Enclosure	\$37
	ALC/10K-2-D-4"-BB	Duct Unit with 4" Probe and BAPI-Box Enclosure	\$37
	ALC/10K-2-D-8"-BB	Duct Unit with 8" Probe and BAPI-Box Enclosure	\$37
	ALC/10K-2-D-12"-BB	Duct Unit with 12" Probe and BAPI-Box Enclosure	\$37



Page	Part Number	Description	List Price
	ALC/10K-2-D-18"-BB	Duct Unit with 18" Probe and BAPI-Box Enclosure	\$37
B11	ALC/10K-2-D-2"-BB2	Duct Unit with 2" Probe and BAPI-Box 2 Enclosure	\$37
	ALC/10K-2-D-4"-BB2	Duct Unit with 4" Probe and BAPI-Box 2 Enclosure	\$37
	ALC/10K-2-D-8"-BB2	Duct Unit with 8" Probe and BAPI-Box 2 Enclosure	\$37
	ALC/10K-2-D-12"-BB2	Duct Unit with 12" Probe and BAPI-Box 2 Enclosure	\$37
	ALC/10K-2-D-18"-BB2	Duct Unit with 18" Probe and BAPI-Box 2 Enclosure	\$37
B11	ALC/10K-2-D-2"-NB-18" ..	Duct Unit with 2" Probe, No Box with 18" Leads	\$25
	ALC/10K-2-D-2"-NB-5'	Duct Unit with 2" Probe, No Box with 5' Leads	\$27
	ALC/10K-2-D-2"-NB-10' ..	Duct Unit with 2" Probe, No Box with 10' Leads	\$29
	ALC/10K-2-D-2"-NB-15' ..	Duct Unit with 2" Probe, No Box with 15' Leads	\$31
B11	ALC/10K-2-D-4"-NB-18" ..	Duct Unit with 4" Probe, No Box with 18" Leads	\$25
	ALC/10K-2-D-4"-NB-5'	Duct Unit with 4" Probe, No Box with 5' Leads	\$27
	ALC/10K-2-D-4"-NB-10' ..	Duct Unit with 4" Probe, No Box with 10' Leads	\$29
	ALC/10K-2-D-4"-NB-15' ..	Duct Unit with 4" Probe, No Box with 15' Leads	\$31
B11	ALC/10K-2-D-8"-NB-18" ..	Duct Unit with 8" Probe, No Box with 18" Leads	\$25
	ALC/10K-2-D-8"-NB-5'	Duct Unit with 8" Probe, No Box with 5' Leads	\$27
	ALC/10K-2-D-8"-NB-10' ..	Duct Unit with 8" Probe, No Box with 10' Leads	\$29
	ALC/10K-2-D-8"-NB-15' ..	Duct Unit with 8" Probe, No Box with 15' Leads	\$31
B11	ALC/10K-2-D-12"-NB-18" ..	Duct Unit with 12" Probe, No Box with 18" Leads	\$25
	ALC/10K-2-D-12"-NB-5' ..	Duct Unit with 12" Probe, No Box with 5' Leads	\$27
	ALC/10K-2-D-12"-NB-10' ..	Duct Unit with 12" Probe, No Box with 10' Leads	\$29
	ALC/10K-2-D-12"-NB-15' ..	Duct Unit with 12" Probe, No Box with 15' Leads	\$31
B11	ALC/10K-2-D-18"-NB-18" ..	Duct Unit with 18" Probe, No Box with 18" Leads	\$25
	ALC/10K-2-D-18"-NB-5' ..	Duct Unit with 18" Probe, No Box with 5' Leads	\$27
	ALC/10K-2-D-18"-NB-10' ..	Duct Unit with 18" Probe, No Box with 10' Leads	\$29
	ALC/10K-2-D-18"-NB-15' ..	Duct Unit with 18" Probe, No Box with 15' Leads	\$31
DUCT AVERAGING TEMPERATURE SENSORS			
B12	ALC/10K-2-A-8'	8' Duct Averaging Unit with J-Box Enclosure	\$105
	ALC/10K-2-A-12'	12' Duct Averaging Unit with J-Box Enclosure	\$110
	ALC/10K-2-A-24'	24' Duct Averaging Unit with J-Box Enclosure	\$134
	ALC/10K-2-A-8'-BB	8' Duct Averaging Unit with BAPI-Box Enclosure	\$117
	ALC/10K-2-A-12'-BB	12' Duct Averaging Unit with BAPI-Box Enclosure	\$122
	ALC/10K-2-A-24'-BB	24' Duct Averaging Unit with BAPI-Box Enclosure	\$146
	ALC/10K-2-A-8'-BB2	8' Duct Averaging Unit with BAPI-Box 2 Enclosure	\$117
	ALC/10K-2-A-12'-BB2	12' Duct Averaging Unit with BAPI-Box 2 Enclosure	\$122
	ALC/10K-2-A-24'-BB2	24' Duct Averaging Unit with BAPI-Box 2 Enclosure	\$146
	ALC/10K-2-A-8'-NB	8' Duct Averaging Unit, No Box with 18" Leads, Plenum-Rated Cable	\$103
	ALC/10K-2-A-12'-NB	12' Duct Averaging Unit, No Box with 18" Leads, Plenum-Rated Cable	\$108
	ALC/10K-2-A-24'-NB	24' Duct Averaging Unit, No Box with 18" Leads, Plenum-Rated Cable	\$132

Gray shaded items follow the Buy and Resale Multiplier.



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Page	Part Number	Description	List Price
IMMERSION TEMPERATURE SENSORS			
B13	ALC/10K-2-I-2"	2" Immersion Unit with J-Box Enclosure.....	\$25
	ALC/10K-2-I-4"	4" Immersion Unit with J-Box Enclosure.....	\$25
	ALC/10K-2-I-8"	8" Immersion Unit with J-Box Enclosure.....	\$25
	ALC/10K-2-I-2"-BB	2" Immersion Unit with BAPI-Box Enclosure	\$37
	ALC/10K-2-I-4"-BB	4" Immersion Unit with BAPI-Box Enclosure	\$37
	ALC/10K-2-I-8"-BB	8" Immersion Unit with BAPI-Box Enclosure	\$37
	ALC/10K-2-I-2"-BB2	2" Immersion Unit with BAPI-Box 2 Enclosure	\$37
	ALC/10K-2-I-4"-BB2	4" Immersion Unit with BAPI-Box 2 Enclosure	\$37
	ALC/10K-2-I-8"-BB2	8" Immersion Unit with BAPI-Box 2 Enclosure	\$37
THERMOWELLS			
B14	ALC/2"	Two Part (Welded) Stainless Steel - 2".....	\$22
	ALC/4"	Two Part (Welded) Stainless Steel - 4".....	\$24
	ALC/8"	Two Part (Welded) Stainless Steel - 8".....	\$28
	ALC/2"M304	Machined 304 Stainless Steel - 2".....	\$32
	ALC/4"M304	Machined 304 Stainless Steel - 4".....	\$44
	ALC/8"M304	Machined 304 Stainless Steel - 8".....	\$65
	ALC/2"M316	Machined 316 Stainless Steel - 2".....	\$44
	ALC/4"M316	Machined 316 Stainless Steel - 4".....	\$50
	ALC/8"M316	Machined 316 Stainless Steel - 8".....	\$80
	ALC/2"MB	Machined Brass - 2".....	\$23
	ALC/4"MB	Machined Brass - 4".....	\$26
	ALC/8"MB	Machined Brass - 8".....	\$45
STRAP UNIT TEMPERATURE SENSORS			
B15	ALC/10K-2-S	Clamp-On Strap Unit with J-Box.....	\$28
	ALC/10K-2-S-BB	Clamp-On Strap Unit with BAPI-Box Enclosure	\$40
	ALC/10K-2-S-BB2	Clamp-On Strap Unit with BAPI-Box 2 Enclosure	\$40
B15	ALC/10K-2-STP	Spring-Loaded Strap Unit with J-Box	\$43
	ALC/10K-2-STP-BB2	Spring-Loaded Strap Unit with BAPI-Box 2 Enclosure	\$55
OUTSIDE AIR TEMPERATURE SENSORS			
B16	ALC/10K-2-O-BB	Outside Air Temperature Sensor with a BAPI-Box Enclosure.....	\$30
	ALC/10K-2-O-BB2	Outside Air Temperature Sensor with a BAPI-Box 2 Enclosure.....	\$30
THERMOBUFFER TEMPERATURE SENSORS			
B17	ALC/10K-2-TB-M304-1"-HB	1" Sensor, Hanging Bracket Mount.....	\$105
	ALC/10K-2-TB-M304-2"-BB	2" Sensor, 304 Stainless Steel 4.33" Cylinder Buffer, BAPI-Box Enclosure	\$222
	ALC/10K-2-TB-M304-2"-BB2	2" Sensor, 304 Stainless Steel 4.33" Cylinder Buffer, BAPI-Box 2 Enclosure	\$222
	ALC/10K-2-TB-M304-4"-BB	4" Sensor, 304 Stainless Steel 6.3" Cylinder Buffer, BAPI-Box Enclosure	\$222
	ALC/10K-2-TB-M304-4"-BB2	4" Sensor, 304 Stainless Steel 6.3" Cylinder Buffer, BAPI-Box 2 Enclosure	\$222
	ALC/10K-2-TB-MAL-2"-BB	2" Sensor & Aluminum 4.33" Cylinder Buffer, BAPI-Box Enclosure	\$162
	ALC/10K-2-TB-MAL-2"-BB2	2" Sensor & Aluminum 4.33" Cylinder Buffer, BAPI-Box 2 Enclosure	\$162
	ALC/10K-2-TB-MAL-4"-BB	4" Sensor & Aluminum 6.3" Cylinder Buffer, BAPI-Box Enclosure	\$162
	ALC/10K-2-TB-MAL-4"-BB2	4" Sensor & Aluminum 6.3" Cylinder Buffer, BAPI-Box 2 Enclosure	\$162



Page	Part Number	Description	List Price
BAPI-STAT 2, BAPI-STAT 4, BAPI-STAT & BAPI-STAT 3 STYLE UNITS			
C2	ALC/xxx	BAPI-Stat 2 Units.....	Call BAPI
C3	ALC/xxx	BAPI-Stat 4 Units.....	Call BAPI
C4	ALC/xxx	BAPI-Stat Units.....	Call BAPI
C5	ALC/xxx	BAPI-Stat 3 Units.....	Call BAPI
DELTA STYLE ROOM HUMIDITY OR COMBO SENSORS			
C6	ALC/H200-R	Delta Style, 2%RH Sensor	\$260
	ALC/H200-RD	Delta Style, 2%RH Sensor with Display	\$295
	ALC/H300-R	Delta Style, 3%RH Sensor	\$240
	ALC/H300-RD	Delta Style, 3%RH Sensor with Display	\$275
	ALC/10K-2-H200-R	Delta Style, 2%RH Combo Sensor Only	\$278
	ALC/10K-2-H200-RD	Delta Style, 2%RH Combo Sensor with Display.....	\$313
	ALC/10K-2-H300-R	Delta Style, 3%RH Combo Sensor Only	\$258
	ALC/10K-2-H300-RD	Delta Style, 3%RH Combo Sensor with Display.....	\$293
X-COMBO & BAPI-COM UNITS			
C7	ALC/xxx	X-Combo Units	Call BAPI
C8	ALC/xxx	BAPI-Com, 2-Wire Sensor.....	Call BAPI
DUCT HUMIDITY OR COMBO SENSORS			
C9	ALC/H200-D-BB	2%RH Duct Humidity Sensor in a BAPI-Box Enclosure	\$272
	ALC/H200-D-BB2	2%RH Duct Humidity Sensor in a BAPI-Box Enclosure	\$272
	ALC/H300-D-BB	3%RH Duct Humidity Sensor in a BAPI-Box Enclosure	\$252
	ALC/H300-D-BB2	3%RH Duct Humidity Sensor in a BAPI-Box 2 Enclosure	\$252
	ALC/10K-2-H200-D-BB	2%RH Duct Temperature and Humidity Sensor in a BAPI-Box Enclosure	\$290
	ALC/10K-2-H200-D-BB2	2%RH Duct Temperature and Humidity Sensor in a BAPI-Box 2 Enclosure	\$290
C9	ALC/10K-2-H300-D-BB	3%RH Duct Temperature and Humidity Sensor in a BAPI-Box Enclosure	\$270
	ALC/10K-2-H300-D-BB2	3%RH Duct Temperature and Humidity Sensor in a BAPI-Box 2 Enclosure	\$270
OUTSIDE AIR HUMIDITY OR COMBO SENSORS			
C10	ALC/H200-O-BB	2%RH Outside Air Humidity Sensor in a BAPI-Box Enclosure	\$272
	ALC/H200-O-BB2	2%RH Outside Air Humidity Sensor in a BAPI-Box 2 Enclosure	\$272
	ALC/H300-O-BB	3%RH Outside Air Humidity Sensor in a BAPI-Box Enclosure	\$252
	ALC/H300-O-BB2	3%RH Outside Air Humidity Sensor in a BAPI-Box 2 Enclosure	\$252
	ALC/10K-2-H200-O-BB	2%RH Outside Air Temperature and Humidity Sensor in a BAPI-Box Enclosure...	\$290
	ALC/10K-2-H200-O-BB2	2%RH Outside Air Temperature and Humidity Sensor in a BAPI-Box 2 Enclosure	\$290
	ALC/10K-2-H300-O-BB	3%RH Outside Air Temperature and Humidity Sensor in a BAPI-Box Enclosure...	\$270
	ALC/10K-2-H300-O-BB2	3%RH Outside Air Temperature and Humidity Sensor in a BAPI-Box 2 Enclosure	\$270
ZONE PRESSURE SENSORS			
D2-11	ALC/ZPS-xxx-EZ	All Zone Pressure Sensor EZ Units.....	\$320
	ALC/ZPS-xxx	All Zone Pressure Sensors with BAPI-Box.....	\$340
	Custom Ranges	All Custom Range Zone Pressure Sensors.....	Call BAPI



Page	Part Number	Description	List Price
ZONE PRESSURE SENSORS PICKUP PORTS & PROBES			
D12-13	ALC/ZPS-ACC01	2" X 4" Stainless Steel Wall Plate with Static Pickup	\$18
	ALC/ZPS-ACC01-102	2" X 4" Stainless Steel Wall Plate with Static Pickup & 10K-2 Temp. Sensor	\$36
	ALC/ZPS-ACC03	Room Mount Delta Style Enclosure with Static Pickup	\$15
	ALC/ZPS-ACC03-102	Room Mount Delta Style Encl. with Static Pickup & 10K-2 Temp. Sensor	\$33
	ALC/ZPS-ACC05	Ceiling Mount Square Cover with Static Pickup	\$15
	ALC/ZPS-ACC06	Ceiling Mount Rectangular 2" X 4" Cover and Box with Static Pickup	\$17
	ALC/ZPS-ACC07	Static Pressure Probe Assembly, 6" long	\$25.50
	ALC/ZPS-ACC08	Static Tube Only (6") with Circular Foam	\$12
	ALC/ZPS-ACC09	Rubber Hoses with Surge Dampener	\$13
	ALC/ZPS-ACC11	Pitot Pressure Probe Assy, 3.5" long (includes the Static & Total Probe Assy)	\$72
	ALC/ZPS-ACC12	Pitot Pressure Probe Assy, 6" long (includes Static & Total Probe Assy)	\$72
	ALC/ZPS-ACC13	Total Tube Only (3.5") w/ Circular Foam (doesn't include hoses & dampener)	\$13
	ALC/ZPS-ACC14	Total Tube Only (6") with Circular Foam (doesn't include hoses & dampener)	\$13
	ALC/ZPS-ACC15	Surge Dampener Only, 5 micron	\$7.50
	ALC/ZPS-ACC17	Static Tube Only (0.5") with Circular Foam (doesn't include hoses & damper)	\$10.50
	ALC/ZPS-ACC18	2 Static Pressure Tube Assemblies, 6" Long	\$51
	ALC/ZPS-ACC21	Static Tube Only (6") with Circular Foam and Mounting Screws (doesn't include hoses & damper)	\$20
	ALC/ZPS-ACC22	Static Tube Only, Zero Length, with Circular Foam and Mounting Screws	\$7.50
LOW PROFILE PRESSURE PICKUP PORT			
D14	ALC/ZPS-ACC20	Low Profile Pressure Pickup Port	\$30
OUTSIDE AIR PRESSURE PICKUP PORT			
D15	ALC/ZPS-ACC10	Outside Air Pressure Pickup Port	\$40
	ALC/ZPS-ACC10-V	Vertical Mount Outside Air Pressure Pickup Port	\$40
PRESSURE SWITCH			
D16	ALC/ZPS-SW1:	Differential Pressure Switch, 0.12" to 0.52" W.C. (30 Pa to 130 Pa)	\$79
	ALC/ZPS-SW2:	Differential Pressure Switch, 0.40" to 1.40" W.C. (100 Pa to 350 Pa)	\$79
	ALC/ZPS-SW3:	Differential Pressure Switch, 1.20" to 2.40" W.C. (300 Pa to 600 Pa)	\$79
	ALC/ZPS-SW4:	Differential Pressure Switch, 2.40" to 6.42" W.C. (600 Pa to 1,600 Pa)	\$79
	ALC/ZPS-SW5:	Differential Pressure Switch, 5.22" to 12.84" W.C. (1,300 Pa to 3,200 Pa)	\$79
	ALC/ZPS-SW6:	Differential Pressure Switch, 11.64" to 23.68" W.C. (2,900 Pa to 5,900 Pa)	\$79
	ALC/ZPS-SW7:	Differential Pressure Switch, 21.68" to 35.32" W.C. (5,400 Pa to 8,800 Pa)	\$79
	ALC/SQ1BIT:	Square Screwdriver Bit to turn the Pressure Adjustment Screw	\$1 (net)
VOC ROOM SENSOR			
E2	ALC/xxx	VOC Room Sensor	Call BAPI
VOC DUCT SENSOR			
E3	ALC/VOC05-D-BB	VOC Sensor, 0-5 Volt DC Output, BAPI-Box Enclosure	\$568
	ALC/VOC10-D-BB	VOC Sensor, 0-10 Volt DC Output, BAPI-Box Enclosure	\$568
CO₂ ROOM SENSOR			
E4	ALC/xxx	CO ₂ Sensor for Periodically Occupied Rooms	Call BAPI



Page	Part Number	Description	List Price
E5	ALC/xxx	CO ₂ Sensor for Continuously Occupied Rooms	Call BAPI
REFRIGERANT LEAK DETECTOR			
E6	ALC/RLD	Refrigerant Leak Detector in a BAPI-Box Enclosure	\$465
CARBON MONOXIDE SENSOR			
E7	ALC/xxx	Carbon Monoxide Sensor	Call BAPI
75 mA VOLTAGE CONVERTERS			
F2	ALC/VC75-5	5 VDC at 75 mA	\$23
	ALC/VC75-10	10 VDC at 75 mA	\$23
	ALC/VC75-12	12 VDC at 75 mA	\$23
	ALC/VC75-15	15 VDC at 75 mA	\$23
	ALC/VC75-ADJ	5-24 VDC (adj.) at 75 mA	\$25
	ALC/VC75-5-TRK	5 VDC at 75 mA with a 1.25" wide piece of 2.75" snaptrack	\$28
	ALC/VC75-10-TRK	10 VDC at 75 mA with a 1.25" wide piece of 2.75" snaptrack	\$28
	ALC/VC75-12-TRK	12 VDC at 75 mA with a 1.25" wide piece of 2.75" snaptrack	\$28
	ALC/VC75-15-TRK	15 VDC at 75 mA with a 1.25" wide piece of 2.75" snaptrack	\$28
	ALC/VC75-ADJ-TRK	5-24 VDC (adj.) at 75 mA with a 1.25" wide piece of 2.75" snaptrack	\$30
100 mA VOLTAGE CONVERTERS			
F2	ALC/VC100-5	5 VDC at 100 mA	\$23
	ALC/VC100-10	10 VDC at 100 mA	\$23
	ALC/VC100-12	12 VDC at 100 mA	\$23
	ALC/VC100-15	15 VDC at 100 mA	\$23
	ALC/VC100-ADJ	5-24 VDC (adj.) at 100 mA	\$25
	ALC/VC100-5-TRK	5 VDC at 100 mA with a 1.25" wide piece of 2.75" snaptrack	\$28
	ALC/VC100-10-TRK	10 VDC at 100 mA with a 1.25" wide piece of 2.75" snaptrack	\$28
	ALC/VC100-12-TRK	12 VDC at 100 mA with a 1.25" wide piece of 2.75" snaptrack	\$28
	ALC/VC100-15-TRK	15 VDC at 100 mA with a 1.25" wide piece of 2.75" snaptrack	\$28
	ALC/VC100-ADJ-TRK	5-24 VDC (adj.) at 100 mA with a 1.25" wide piece of 2.75" snaptrack	\$30
350mA "EZ" VOLTAGE CONVERTERS			
F3	ALC/VC350A-EZ-5	5 VDC at 350 mA EZ Voltage Converter	\$43
	ALC/VC350A-EZ-10	10 VDC at 350 mA EZ Voltage Converter	\$43
	ALC/VC350A-EZ-12	12 VDC at 350 mA EZ Voltage Converter	\$43
	ALC/VC350A-EZ-15	15 VDC at 350 mA EZ Voltage Converter	\$43
	ALC/VC350A-EZ-ADJ	5-24 VDC (adj.) at 350 mA EZ Voltage Converter	\$43
350mA SNAPTRACK MOUNTABLE VOLTAGE CONVERTERS			
F4	ALC/VC350A-5	5 VDC at 350 mA EZ Voltage Converter	\$35
	ALC/VC350A-10	10 VDC at 350 mA EZ Voltage Converter	\$35
	ALC/VC350A-12	12 VDC at 350 mA EZ Voltage Converter	\$35
	ALC/VC350A-15	15 VDC at 350 mA EZ Voltage Converter	\$35
	ALC/VC350A-ADJ	5-24 VDC (adj.) at 350 mA EZ Voltage Converter	\$35
	ALC/VC350A-5-TRK	5 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	\$40
	ALC/VC350A-10-TRK	10 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	\$40
	ALC/VC350A-12-TRK	12 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	\$40
	ALC/VC350A-15-TRK	15 VDC at 350 mA with a 1.25" wide piece of 2.75" snaptrack	\$40
	ALC/VC350A-ADJ-TRK	5-24 VDC (adj.) at 350 mA with a 1.25" wide piece of 2.75" snaptrack	\$40



Page	Part Number	Description	List Price
BAPI-GUARD THERMOSTAT PROTECTOR			
F5	ALC/BG	Larger BAPI-Guard Thermostat Protector	\$45
	ALC/BG2	Smaller BAPI-Guard 2 Thermostat Protector	\$35
	ALC/KEY16187	Replacement Key for BAPI-Guard and BAPI-Guard 2 (*Net Price, no multiplier)	\$2*
2.7 AMP VOLTAGE CONVERTER			
F6	ALC/VC2700-HW-STM	2.7 Amp Voltage Converter, Half-Wave, Snaptrack Mountable	\$220
	ALC/VC2700-FW-STM	2.7 Amp Voltage Converter, Full-Wave, Snaptrack Mountable	\$220
LINE VOLTAGE TRANSFORMER MODULE & POWER CORDS			
F7	ALC/LVTM	Line Voltage Transformer Module with Power Cord Connector	\$110
	ALC/LVTM-TB	Line Voltage Transformer Module with Terminal Block	\$90
	ALC/PWR-CORD-18"	18" Power Cord	\$5.25
	ALC/PWR-CORD-36"	36" Power Cord	\$5.25
TB4 & TB4-VC100 MODULES			
F7	ALC/TB4	Four Terminal Output Board	\$40
	ALC/TB4-VC100	Four Terminal Output Board with adjustable 100 mA Voltage Converter	\$65
SEALANT FILLED CONNECTORS			
F8	ALC/SFC1000-100	100 Crimp-On Style SFCs	\$10
	ALC/SFC1000-500	500 Crimp-On Style SFCs	\$50
	ALC/SFC1000-1000	1,000 Crimp-On Style SFCs	\$100
	ALC/SFC2000-100	100 Twist-On Style SFCs	\$120
	ALC/FCC2000-500	500 Twist-On Style SFCs	\$600
	ALC/SFC2000-1000	1,000 Twist-On Style SFCs	\$1,200
FOAMBACK INSULATOR			
F8	ALC/Foamback	White Foamback Insulator (2.6" wide, 4.4" high, .25" thick)	\$1
	ALC/Foamback-Room	White Foamback (2.6" wide, 4.4" high, .125" thick)	\$1
	ALC/Foamback-Grey	Grey Foamback Insulator (2.8" wide, 4.6" high, .25" thick)	\$1
SCREWDRIVER AND ALLEN WRENCH COMBINATION			
F8	ALC/116W	BAPI 6.75" Screwdriver & Allen Wrench Combination	\$20
	ALC/116	BAPI 6" Screwdriver & Allen Wrench Combination	\$5
ZN551 RELAY PACK			
F9	ALC/RP-ZN551	Relay Pack for the ALC ZN551 Controller	\$240
ADAPTOR PLATES			
F10-11	ALC/ADP-525-7-WMW	Adaptor Plate, 5.25 x 7" Warm White	\$18
	ALC/ADP-525-7-OFW	Adaptor Plate, 5.25 x 7" Off White	\$18
	ALC/ADP-525-7-CPW	Adaptor Plate, 5.25 x 7" Copla White	\$21
	ALC/ADP-525-7-CDW	Adaptor Plate, 5.25 x 7" Cloud White	\$21
	ALC/ADP-53-53-WMW	Adaptor Plate, 5.3 x 5.3" Warm White	\$18
	ALC/ADP-53-53-OFW	Adaptor Plate, 5.3 x 5.3" Off White	\$18
	ALC/ADP-53-53-CPW	Adaptor Plate, 5.3 x 5.3" Copla White	\$21
	ALC/ADP-53-53-CDW	Adaptor Plate, 5.3 x 5.3" Cloud White	\$21

Gray shaded items follow the Buy and Resale Multiplier.



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Page	Part Number	Description	List Price
F10-11	ALC/ADP-37-55-WMW	Adaptor Plate, 3.75 x 5.5" Warm White	\$18
	ALC/ADP-37-55-OFW	Adaptor Plate, 3.75 x 5.5" Off White	\$18
	ALC/ADP-37-55-CPW	Adaptor Plate, 3.75 x 5.5" Copla White	\$21
	ALC/ADP-37-55-CDW	Adaptor Plate, 3.75 x 5.5" Cloud White	\$21
	ALC/ADP-37-55-WMW-UK ..	Adaptor Plate (Europe), 3.75 x 5.5" Warm White	\$18
	ALC/ADP-37-55-OFW-UK ..	Adaptor Plate (Europe), 3.75 x 5.5" Off White	\$18
	ALC/ADP-37-55-CPW-UK ..	Adaptor Plate (Europe) , 3.75 x 5.5" Copla White	\$21
	ALC/ADP-37-55-CDW-UK ..	Adaptor Plate (Europe) , 3.75 x 5.5" Cloud White	\$21
FLEXIBLE PROBE BRACKET			
F12	ALC/FPB-50	50 Flexible Probe Brackets.....	\$157
	ALC/FPB-100	100 Flexible Probe Brackets.....	\$314
BAPI CLEAN CUT			
F13	ALC/CLN-CUT-50	The BAPI Clean Cut	\$50
DS6R - DRY SWITCH MONITOR			
F14	ALC/DS6R	Dry Switch Monitor, 30K Output	\$95
	ALC/DS6R-10K	Dry Switch Monitor, 10K Output	\$95
EA2 - MODULATING ACTUATOR INTERFACE			
F15	ALC/EA2	Modulating Acuator Interface	\$87
OAM - OUTPUT ADJUST MODULE			
F16	ALC/OAM	Output Adjust Module	\$23
BP2, BP4 & BP8 BACKPLANES and Vertical Backplane			
F17	ALC/BP2	2-Position Interface Backplane.....	\$30
	ALC/BP4	4-Position Interface Backplane.....	\$40
	ALC/BP8	8-Position Interface Backplane.....	\$65
	BA/BP4-V	Vertical Backplane	\$40
	BA/BP-BR	Bridge (to connect Vertical Backplanes).....	\$22
TRK - SNAPTRACK			
F18	ALC/TRK01	TR2 Snaptrack, 1.27" length.....	\$5
	ALC/TRK02	TR2 Snaptrack, 2" length.....	\$6
	ALC/TRK04	TR2 Snaptrack, 4" length.....	\$8
	ALC/TRK08	TR2 Snaptrack, 8" length.....	\$10
	ALC/TRK12	TR2 Snaptrack, 12" length.....	\$12
	ALC/TRK18	TR2 Snaptrack, 18" length.....	\$14
	ALC/TRK48	TR2 Snaptrack, 48" length.....	\$40
DUCT & OUTSIDE AIR REPLACEMENT HUMIDITY SENSOR FILTER			
F18	ALC/HDOFS	Stainless Steel 100 Micron Humidity Sensor Filter.....	\$30
	ALC/HDOFP	Porous Plastic 100 Micron Humidity Sensor Filter	\$10
OUTPUT TERMINAL BOARDS			
F19	OUT80B	Designed for M8102, M8102NX, M880NX, MX880, M16160 or MX16160 Controllers.....	\$85
	OUT66	Designed for SE6166 Controller	\$120
	OUT64A	Designed for SE6104A Controller.....	\$100
	OUT40	Designed for M4106P, MX4106P, M4106NX, M4106, MX4106, or MX440 Controllers ...	\$55
	UIUO4	Designed for ME812U, MEX816U, MEX88U, MEX016U, ME812U-LGR	\$36



Page	Part Number	Description	List Price
WIRELESS ROOM TRANSMITTERS			
G2	ALC/BS2-WT.....	Wireless Room Temperature Transmitter	\$215
	ALC/BS2-WT-O	Wireless Room Temperature Transmitter with Override.....	\$220
	ALC/BS2-WT-S	Wireless Room Temperature Transmitter with Setpoint Adjustment	\$221
	ALC/BS2-WT-SO	Wireless Room Temperature Transmitter with Override & Setpoint Adj.	\$226
G3	ALC/BS2-WTH	Wireless Room Temperature & Humidity Transmitter	\$265
	ALC/BS2-WT-O	Wireless Room Temperature Transmitter with Override.....	\$270
	ALC/BS2-WT-S	Wireless Room Temperature Transmitter with Setpoint Adjustment	\$271
	ALC/BS2-WT-SO	Wireless Room Temperature Transmitter with Override & Setpoint Adj.	\$276
G2-3	ALC/LI3620	Lithium Battery, 3.6 Volt (for Wireless Transmitters)	\$30
WIRELESS DUCT TRANSMITTERS			
G4	ALC/WT-D-4"	Wireless Duct Temperature Transmitter, 4" Probe Length	\$335
	ALC/WT-D-8"	Wireless Duct Temperature Transmitter, 8" Probe Length	\$335
	ALC/WT-D-12"	Wireless Duct Temperature Transmitter, 12" Probe Length	\$335
	ALC/WT-D-18"	Wireless Duct Temperature Transmitter, 18" Probe Length	\$335
	ALC/WT-D-xx	Wireless Duct Temp. Transmitter, Custom Probe Length.....	Call BAPI
G5	ALC/WTH-D	Wireless Duct Temperature and Humidity Transmitter	\$535
G4-5	ALC/LI3620	Lithium Battery, 3.6 Volt (for Wireless Transmitters)	\$30
WIRELESS IMMERSION TRANSMITTERS			
G6	ALC/WT-I-2"	Wireless Immersion Temp. Transmitter, 2" Probe Length	\$335
	ALC/WT-I-4"	Wireless Immersion Temp. Transmitter, 4" Probe Length	\$335
	ALC/WT-I-8"	Wireless Immersion Temp. Transmitter, 8" Probe Length	\$335
	ALC/LI3620	Lithium Battery, 3.6 Volt (for Wireless Transmitters)	\$30
WIRELESS REMOTE PROBE TRANSMITTERS			
G7	ALC/WT-RPP-5'	Remote Probe with Plenum Rated Cable - 5' Leads	\$347
	ALC/WT-RPP-10'	Remote Probe with Plenum Rated Cable - 10' Leads	\$349
	ALC/WT-RPP-15'	Remote Probe with Plenum Rated Cable - 15' Leads	\$351
	ALC/WT-RPP-20'	Remote Probe with Plenum Rated Cable - 20' Leads	\$353
	ALC/WT-RPP-25'	Remote Probe with Plenum Rated Cable - 25' Leads	\$355
	ALC/WT-RPFEP-5'	Remote Probe with FEP Jacketed Cable - 5' Leads	\$350
	ALC/WT-RPFEP-10'	Remote Probe with FEP Jacketed Cable - 10' Leads	\$355
	ALC/WT-RPFEP-15'	Remote Probe with FEP Jacketed Cable - 15' Leads	\$360
	ALC/WT-RPFEP-20'	Remote Probe with FEP Jacketed Cable - 20' Leads	\$365
	ALC/WT-RPFEP-25'	Remote Probe with FEP Jacketed Cable - 25' Leads	\$370
	ALC/LI3620	Lithium Battery, 3.6 Volt (for Wireless Transmitters)	\$30
WIRELESS OUTSIDE AIR TRANSMITTERS			
G8	ALC/WT-O-BB	Wireless Outside Air Temperature Transmitter	\$335
G9	ALC/WTH-O-BB	Wireless Outside Air Temperature & Humidity Transmitter	\$530
G8-9	ALC/LI3620	Lithium Battery, 3.6 Volt (for Wireless Transmitters)	\$30



Page	Part Number	Description	List Price
WIRELESS THERMOBUFFER			
G10	ALC/WT-TB-M304-2-BB	Wireless Thermobuffer, 304 SS Chamber, 2 inch probe, BAPI-Box Enclosure.....	\$532
	ALC/WT-TB-M304-4-BB	Wireless Thermobuffer, 304 SSI Chamber, 4 inch probe, BAPI-Box Enclosure.....	\$532
	ALC/WT-TB-MAL-2-BB	Wireless Thermobuffer, Machined Alum. Chamber, 2 inch probe, BAPI-Box Encl...	\$472
	ALC/WT-TB-MAL-4-BB	Wireless Thermobuffer, Machined Alum. Chamber, 4 inch probe, BAPI-Box Encl...	\$472
	ALC/LI3620	Lithium Battery, 3.6 Volt (for Wireless Transmitters)	\$30
WIRELESS UNIVERSAL INPUT TRANSMITTER			
G11	ALC/WAI-05	0-5VDC Analog Input Transmitter, 418MHz	\$315
	ALC/WAI-10	0-10VDC Analog Input Transmitter, 418MHz	\$315
	ALC/WAI-420	4-20mA Analog Input Transmitter, 418MHz	\$315
	ALC/WDI	Digital Input Transmitter, 418MHz	\$315
	ALC/WTS	Thermistor Sensor Transmitter, 418MHz.....	\$315
REPEATERS			
G12	ALC/RPT49	418 MHz to 900 MHz Repeater.....	\$735
	ALC/RPT49-35DIN	418 MHz to 900 MHz Repeater, 35mm Din Rail Mounting.....	\$745
WIRELESS FIELD VERIFIERS			
G13	ALC/FV-KIT	Combined Field Verifier Kit (ALC/FV418K & ALC/FV900K)	\$2,608
	ALC/FV-KIT-LOAN	Loaner Combined Field Verifier Kit (ALC/FV418K & ALC/FV900K)*	\$2,608*
	ALC/FV418K	Field Verifier Kit, 418 MHz, (1 transmitter & 1 verifier)	\$1,172
	ALC/FV900K	Field Verifier Kit, 900 MHz, (2 transmitter/verifiers).....	\$1,543
	ALC/FV418	Field Verifier 418 MHz, (1 verifier only)	\$716
	ALC/FV900	Field Verifier 900 MHz, (1 verifier only)	\$716
WIRELESS POINT MANAGER			
G14-15	ALC/418-PM-IP	RF Point Manager Rx-418 MHz only, North America, with 6' dipole antenna	1,160
	ALC/900-PM-IP-EA	RF Point Manager Rx & Tx-900MHz, N. America, with 6' dipole antenna.....	\$1,400
	ALC/49-PM-IP	RF Point Manager Rx-418 & 900 MHz, & Tx-900 MHz, North America	\$1,700

***Note:** A separate PO is required for the LOANer unit. Only loaner parts may appear on the PO. After one month you will be expected to pay the invoice for the LOANer parts that are not returned. An RMA will be issued at the time of the loan so that the LOANer unit can be returned expeditiously. The LOANer unit is identical to a new unit except that it has been used and inspected between every loan. You will receive 100% credit less shipping and handling charges if 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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Sensors for HVAC/R



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