



CO Sensor in a BAPI-Stat “Quantum” Enclosure

Installation and Operating Instructions

48665_ins_quantum_CO

rev. 10/31/23

Identification and Overview

The BAPI-Stat “Quantum” Carbon Monoxide Sensor features a modern enclosure style with green/red status LED. It has a 0 to 40 ppm CO measurement range with a 30 ppm relay/audible alarm trip level. The relay is field selectable for normally closed or normally open, and the CO output level is field selectable for 0 to 5V, 0 to 10V or 4 to 20mA.

The green/red LED indicates unit status of normal, alarm, trouble/service or test. The side pushbutton places the unit into test status to verify audible alarm and LED operation. The sensing element has a typical life of 7 years.

Note: Sensors must be installed and powered within 4 months of purchase to prevent loss of accuracy.

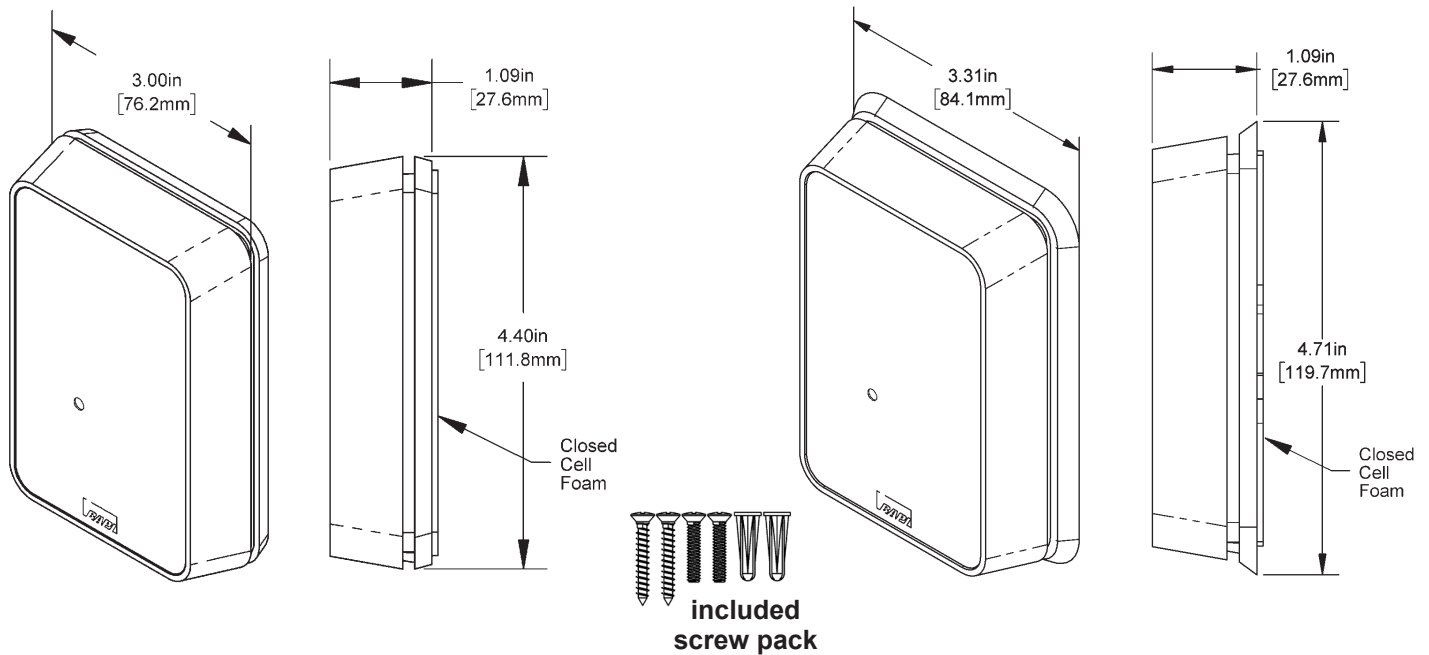


Fig. 1: BAPI-Stat “Quantum” CO Sensor

(standard mounting base at left and 60mm mounting base for European wall boxes with 60mm mounting centers at right)

Specifications

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

CO Sensor Technology: Electrochemical

CO Detection Range: 0 to 40 ppm

CO Accuracy: $\pm 3\%$ of Full Scale

Jumper Selectable Analog Output:
or 4 to 20mA, 0 to 5VDC or 0 to 10VDC

Relay Trip Point: 30 ppm

Relay Output: Form “C”, 0.1A-30VDC, Normally Closed (NC) and Normally Open (NO) contacts

Audible Alarm: 75 dB at 10 feet

Start-Up Time: <10 Minutes

Response Time: < 5 Min (after Start-Up Time)

Termination: 6 Terminals, 16 to 22 AWG

Environmental Operating Range:

40 to 100°F (4.4 to 37.8°C)

0 to 95%RH non-condensing

Altimeter: Mechanical

LED Behavior:

Red/Green LED indicates the unit status of Normal, Alarm, Trouble/Service or Test.

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

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

Sensing Element Life: 7 years typical

Certifications: RoHS

Warranty Period: 5 years

Specifications subject to change without notice.



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Mounting

The sensor should be mounted in accordance with local code. If local code does not dictate mounting location, BAPI recommends mounting the CO Room Sensor on a solid, non-vibrating surface at a height of 3 to 5 feet above floor level in a vertical fashion to take advantage of the enclosure venting, similar to Figure 2. Mounting hardware is provided for both junction box and drywall installation (junction box installation shown).

Note: Screw the 1/16” Allen lock-down screw into the base to open the case. Back out the lock-down screw to secure the cover.

Junction Box

1. Pull the wire through the wall and out of the junction box, leaving about six inches free.
2. Pull the wire through the hole in the base plate.
3. Secure the plate to the box using the #6-32 x 5/8” mounting screws provided.
4. Terminate the unit according to the guidelines in the Termination section. (page 3)
5. Mold the foam on the unit’s base to the wire bundle to prevent drafts. (see note below)
6. Attach Cover by latching it to the top of the base, rotating the cover down and snapping it into place.
7. Secure the cover by backing out the lock-down screw using a 1/16” Allen wrench until it is flush with the bottom of the cover.

Drywall Mounting

1. Place the base plate against the wall where you want to mount the sensor. Mark the two mounting holes and the area where the wires will come through the wall.
2. Drill two 3/16” holes in the center of each marked mounting hole. DO NOT punch the holes or the drywall anchors will not hold. Insert a drywall anchor into each hole.
3. Drill one 1/2” hole in the middle of the marked wiring area. Pull the wire through the wall and out of the 1/2” hole, leaving about 6” free. Pull the wire through the hole in the base plate.
4. Secure the base to the drywall anchors using the #6x1” screws provided.
5. Terminate the unit according to the guidelines in the Termination section. (page 3)
6. Mold the foam on the unit’s base to the wire bundle to prevent drafts. (see note below)
7. Attach cover by latching it to the top of the base, rotating the cover down and snapping it into place.
8. Secure the cover by backing out the lock-down screw using a 1/16” Allen wrench until it is flush with the bottom of the cover.

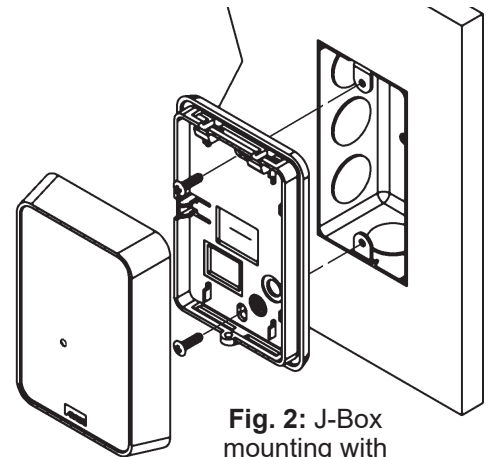


Fig. 2: J-Box mounting with standard base

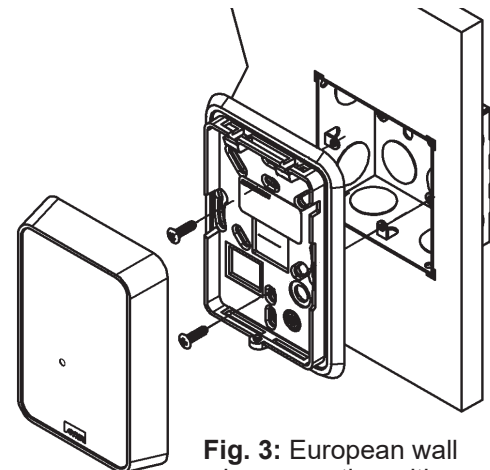


Fig. 3: European wall box mounting with 60mm base

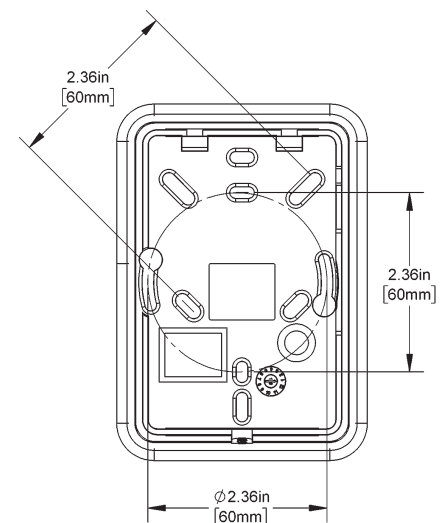


Fig. 4: 60mm mounting base dimensions



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Termination

BAPI recommends using twisted pair of at least 22AWG and sealant filled connectors for all wire connections. Larger gauge wire may be required for long runs. All wiring must comply with the National Electric Code (NEC) and local codes.

Do NOT run this device’s wiring in the same conduit as AC power wiring of NEC class 1, NEC class 2, NEC class 3 or with wiring used to supply highly inductive loads such as motors, contactors and relays. BAPI’s tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your BAPI representative.



BAPI recommends wiring the product with power disconnected. Proper supply voltage, polarity, and wiring connections are important to a successful installation. Not observing these recommendations may damage the product and will void the warranty.

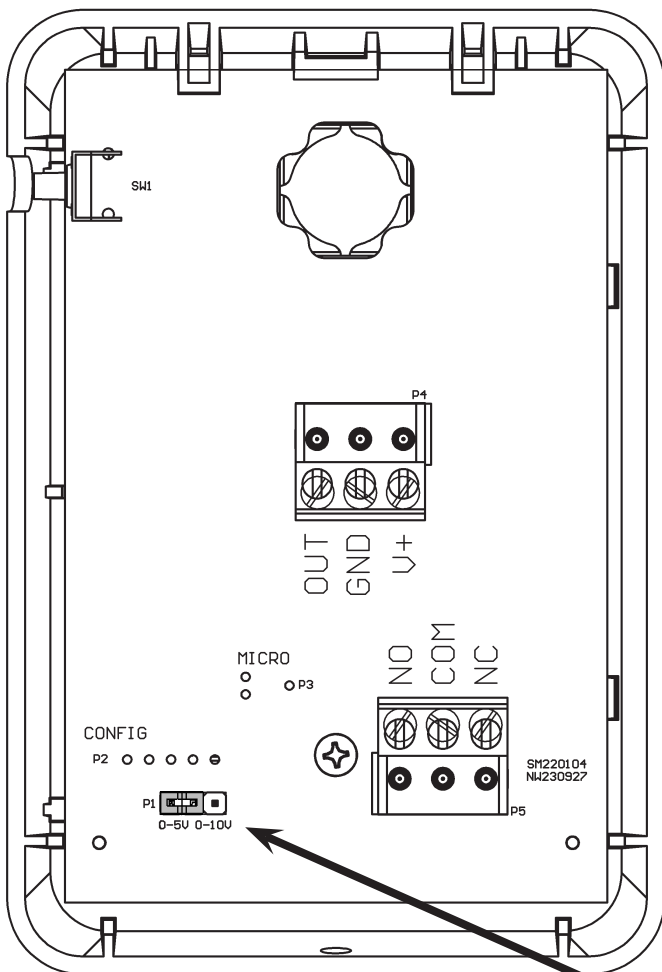
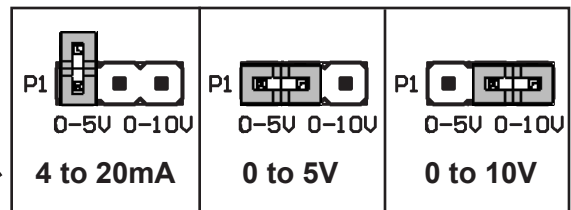


Fig. 5: Circuit Board

Terminal Function

- V+** 24 VAC/VDC ±10%
- GND**..... To controller Ground [GND or Common]
- OUT** Output, CO Signal
4 to 20 mA, 0 to 5 or 0 to 10 VDC,
Referenced to GND
- NO** Relay Contact, Normally Open
Referenced to COM
- COM** Relay Contact Common
- NC** Relay Contact, Normally Closed
Referenced to COM



Note: The CO Output may be field configured for 4 to 20 mA, 0 to 5 or 0 to 10 VDC outputs at any time. Set the Jumper on P1 as shown above.



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Red/Green LED Operation:

NORMAL STATUS:

Green illuminated, Red LED flashes every 30 seconds indicating that the alarm is powered

ALARM STATUS:

Green light extinguished, Red LED flashes and pulsating horn

LED TROUBLE/SERVICE STATUS:

Green illuminated, Red LED flashes twice and alarm buzzer “beeps” once every 30 seconds

Note: Unit is not ready for operation until the ten-minute start-up time has elapsed.

Test Button Operation

A recessed Test button on the side of unit can be used to test the alarm buzzer and LEDs. When the recessed Test button is pressed, the Green LED is lit, the alarm buzzer “beeps” once and the Red LED flashes 4 to 5 times. Then the Green LED goes off, the Red LED flashes and the alarm buzzer “beeps” twice. The relay is not activated by pressing the Test button.

Note: Unit is not ready for operation until the ten-minute start-up time has elapsed.

Diagnosics

Possible Problems:

General troubleshooting

Possible Solutions:

Determine that the input is set up correctly in the controller's and building automation software.

Check wiring at the sensor and controller for proper connections.

Check for corrosion at either the controller or the sensor. Clean off the corrosion, re-strip the interconnecting wire and reapply the connection. In extreme cases, replace the controller, interconnecting wire and/or sensor.

Check the wiring between the sensor and controller. Label the terminals at the sensor end and the controller end. Disconnect the interconnecting wires from the controller and the sensor. With the wires disconnected, measure the resistance from wire-to-wire with a multimeter. The meter should read greater than 10 Meg-ohms, open or OL depending on the meter. Short the interconnecting wires together at one end. Go to the other end and measure the resistance from wire-to-wire with a multimeter. The meter should read less than 10 ohms (22 gauge or larger, 250 feet or less). If either test fails, replace the wire.

Check power supply/controller voltage supply

Disconnect sensor and check power wires for proper voltage (see specifications on page 1)

Incorrect CO

Wait 10 minutes after a power interruption.

Check all BAS controller software parameters.

Determine if the sensor is exposed to an external environment different from the room environment (conduit draft).