

Overview

The BAPI-Stat 2 Style room 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. It is available with the entire line of BAPI temperature sensors.

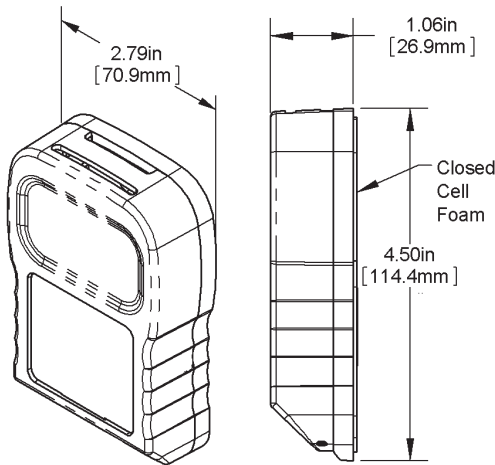


Figure 1: BAPI-Stat 2 Room Humidity

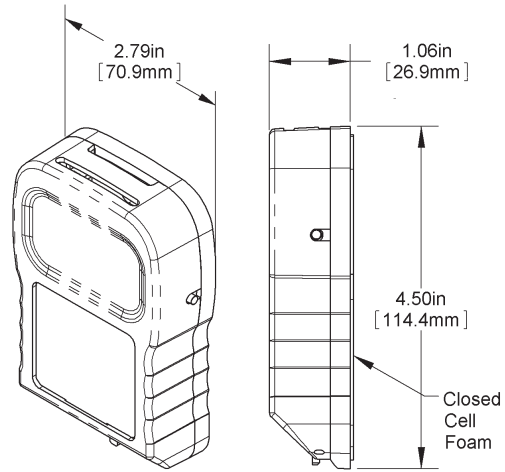


Figure 2: BAPI-Stat 2 with Override and Setpoint

Mounting

Mounting hardware is provided for both junction box and drywall installation (junction box installation shown).

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 1/2 inch mounting screws provided.
4. Terminate the unit according to the guidelines in the **Termination** section.
5. Attach Cover by latching it to the top of the base, rotating the cover down and snapping it into place.
6. Secure the cover by backing out the lock-down screws using a 1/16" Allen wrench until they are flush with the bottom of the cover.

Drywall Mounting

1. Place the base plate against the wall where you want to mount the sensor.
2. Using a pencil mark out the two mounting holes and the area where the wires will come through the wall.
3. Drill two 3/16" holes in the center of each marked mounting hole. Insert a drywall anchor into each hole.
4. Drill one 1/2" hole in the middle of the marked wiring area.
5. Pull the wire through the wall and out of the 1/2" hole, leaving about six inches free.
6. Pull the wire through the hole in the base plate.
7. Secure the base to the drywall anchors using the #6 x 1 inch mounting screws provided.
8. Terminate the unit according to the guidelines in the **Termination** section.
9. Attach cover by latching it to the top of the base, rotating the cover down and snapping it into place.
10. Secure the cover by backing out the lock-down screws using a 1/16" Allen wrench until they are flush with the bottom of the cover.

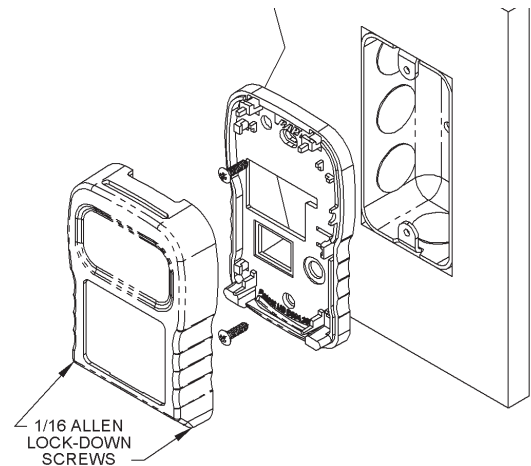


Fig 3: Mounting to a Junction Box

NOTE: In any wall-mount application, the wall temperature and the temperature of the air within the wall cavity can lead to condensation, erroneous readings and premature failure of the sensor. To prevent these conditions, seal the conduit leading to the junction box or fill the box with insulation.

Specifications subject to change without notice.

Terminations

BAPI recommends using twisted pair of at least 22AWG and sealant filled connectors for all wire connections. 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.

Note 1: The termination screws should be turned fully Counter Clockwise (CCW) to open the jaws fully. Then insert the field wire and turn the screws Clock Wise (CW) to pinch the wire fully closed. If the jaws are left partially open, the inserted wire may be on bottom of, instead of inside, the jaws causing a poor connection.



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.

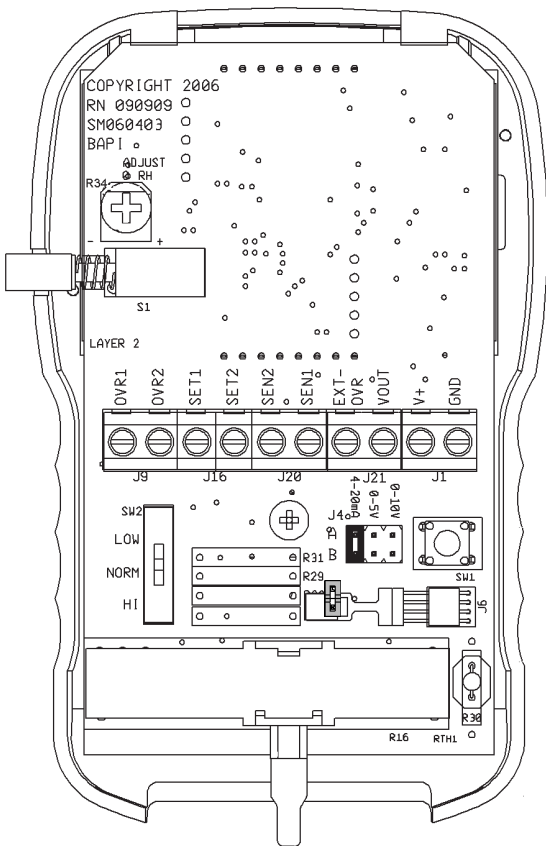


Fig 4: Circuit Board

4 to 20 mA Unit Termination

Terminal Function

- OVR1 & OVR2.....Override Output – Dry Contact Switch
 If unit is a common (-CG) model, see Note below.
- SET1 & SET2Setpoint Output
 If unit is a common (-CG) model, see Note below.
- SEN1 & SEN2Sensor Output – Resistive Output.
 (Semiconductor: SEN1=+, SEN2=-)
 If unit is a common (-CG) model, see Note below.
- EXT-OVR.....Allows remote control of the LCD indicator for occupancy, and is activated by logic LOW or power supply ground at this terminal.
- VOUT.....Not Used
- V+Power, see specifications section for details
- GND.....4 to 20 mA Humidity Signal [to analog input of controller]

0 to 5 VDC, 0 to 10 VDC and 2 to 10 VDC Unit Termination

Terminal Function

- OVR1 & OVR2.....Override Output – Dry Contact Switch
 If unit is a common (-CG) model, see Note below.
- SET1 & SET2Setpoint output.
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- SEN1 & SEN2Sensor Output – Resistive Output.
 (Semiconductor: SEN1=+, SEN2=-)
 If unit is a common (-CG) model, see Note below.
- EXT-OVR.....Allows remote control of the LCD indicaor for occupancy, and is activated by logic LOW or power supply ground at this terminal.
- VOUT.....Voltage Humidity Signal [to analog input of controller]
- V+Power, see specifications section for details
- GND.....To controller power supply ground

NOTE on Common (-CG) Models: On the common (-CG) models, terminals “OVR2”, “SEN2”, and “SET2” are connected together internally but they are not connected to Ground “GND”. If you intend to use “GND” as common, then a jumper must be added from terminal “GND” to “SEN2”. This is only allowed on Voltage Output models. Do not install this jumper on 4 to 20 mA Output models.

NOTE On Differential (-DF) Models: All terminals are independent.

Optional Test Balance Switch (SW2)

The “NORM” position allows the real sensor to be monitored. The “HI” position forces the output to a very hot reading and the “LOW” position forces the output to a very cold output. See Table 1 below for the most common sensor output readings.

Optional Test and Balance Switch (SW2)

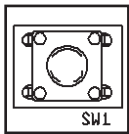
- LOW:** Will set the sensor value low
- NORM:** Thermistor/RTD will operate normally
- HI:** Will set the sensor value high

Table 1: Test and Balance Resistance Values

Sensor Type	Low Temp (40° F) Resistance Value	High Temp (105° F) Resistance Value
1000Ω RTD	1.02KΩ (41.2° F)	1.15KΩ (101.5° F)
3000Ω Thermistor	7.87KΩ (39.8° F)	1.5KΩ (106.8° F)
10K-2 Thermistor	30.1KΩ (34.9° F)	4.75Ω (109.1° F)
10K-3 Thermistor	26.7KΩ (35.9° F)	5.11KΩ (108.4° F)
10K-3(11K) Thermistor	7.32KΩ (43.7° F)	3.65Ω (105.2° F)

Optional Technician Adjustments

Adjustments for Units with a Display



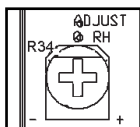
The optional technician adjustment procedure allows a technician to set temperature and humidity offsets, °F or °C display indication and which parameters are shown on the display. When the unit is powered up, pressing Switch SW1 will enter the user calibration adjustment mode (See Fig 5). When pressed, the LCD will show page zero, P0.

Fig 5:
Calibration
Switch

The page numbers auto-scroll to P5 and then the unit returns to the normal run mode. Pressing SW1 when any page number is displayed will show the calibration value that is associated with that page. The variable will auto-scroll and will show all the allowed values for the selected page. Pressing SW1 when the variable value you need is shown will record that value and return to showing page numbers.

Parameter	Page Designator	Adjustment
Temperature Offset	P0	±5° in 0.1° increments. A high accuracy reference is recommended.
Humidity Offset	P1	±5% in 0.1% increments or R34 When R34 is selected, humidity offset is set by turning potentiometer R34 situated just above the override switch. See Figure 6. A high accuracy reference is recommended.
Display Units	P2	°F or °C
Display RH to Temp Toggle Time	P3	3 to 11 seconds
Display Resolution	P4	0 = 0.5
Display Section	P5	1 = 0.1
		0 = Temperature, Humidity and Temperature Setpoint when active*
		1 = Temperature and Temperature Setpoint when active*
		2 = Humidity and Temperature Setpoint when active*
		3 = Temperature, Humidity and Temperature Setpoint**
		4 = Temperature and Temperature Setpoint**
		5 = Humidity and Temperature Setpoint**
		6 = Temperature Setpoint
		7 = Temperature and Humidity**
8 = Temperature		
9 = Humidity		

* When active means when moving the setpoint slider.
** Display toggles through selections.



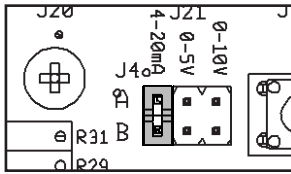
Units without a Display

Potentiometer R34 (Fig 5) can be used to adjust the humidity output by ±5%. A high accuracy humidity reference is recommended.

Fig 6: R34 %RH Adjustment Potentiometer

Specifications subject to change without notice.

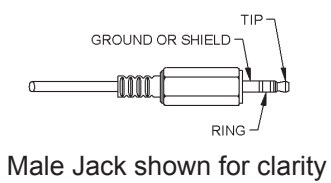
Humidity Output Selection



Moving the jumper on connector J4 will change the humidity output from 4 to 20mA, 0 to 5VDC or 0 to 10VDC. Fig 7 shows the jumper in the 4 to 20mA position. The 0 to 10 VDC jumper is used for the 2 to 10 VDC signal if an H212 or H312 was ordered.

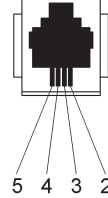
Fig 7: Humidity Output Jumpers

Optional Communications Jack Wiring



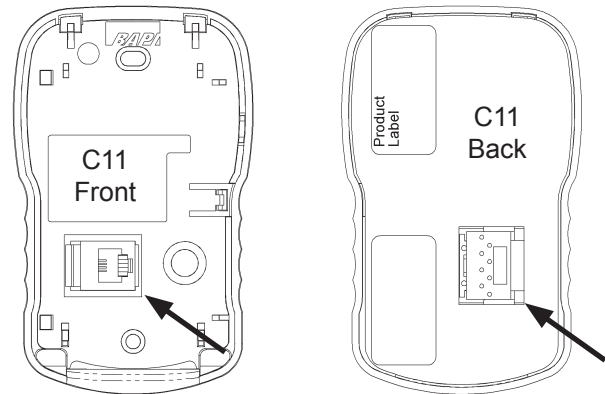
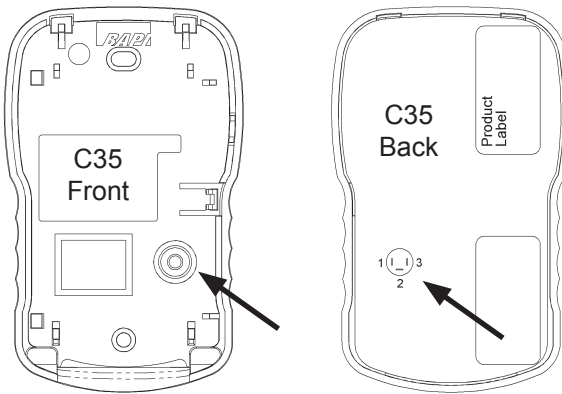
C35 Wiring	
	Wire Color
Ground	Black
Tip	White
Ring	Red

Fig 8: C35 Communications Jack



C11 Wiring	
Comm Jack Pin	Wire Color
1	Not Connected
2	Black
3	Red
4	Yellow
5	White or Green
6	Not Connected

Fig 9: C11 Communications Jack




User Operation

The display indicates temperature in degrees Fahrenheit or Celsius, relative humidity in %RH, temperature setpoint in degrees Fahrenheit or Celsius. Temperatures and relative humidity can be displayed in a rotating manner, see the Optional Technician Adjustments section. The BAPI Man icon indicates that the override button has been pushed.

Temperature: When temperature is displayed, the INSIDE icon as well as the appropriate units icon are illuminated.

Relative Humidity: When relative humidity is displayed, the INSIDE icon as well as %RH are illuminated.

Setpoint Slidepot: When the temperature setpoint is active (see technician adjustments), moving the slidepot enough to change the setpoint by one degree will display the setpoint on display units.

Override Button: When the override button is pressed, the Override or BAPI-Man Icon  will display on display units. A dry resistance of less than 15 ohms appears across the override output (OVR1 to OVR2). Latching the Icon (to make it remain lit on the display when the unit is in override) requires that a digital output on your controller be used to connect terminal EXT-OVR to power supply ground.

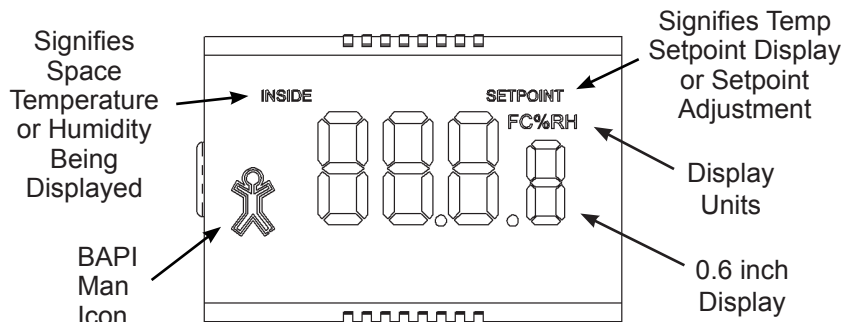


Fig 10: Optional Display

Specifications subject to change without notice.

**Specifications****Power:**

- 15 to 35 VDC for 4 to 20 mA Output
- 10 to 40 VDC for 0 to 5 VDC Output
- 15 to 40 VDC for 0 to 10 or 2 to 10 VDC Output
- 12 to 24 VAC for 0 to 5 VDC Output (requires a separate pair of shielded wires)
- 15 to 28 VAC for 0 to 10 or 2 to 10 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, 0 to 10 and 2 to 10 VDC Output
- 0.1 VA max. for 0 to 5, 0 to 10 and 2 to 10 VDC Output

- RH Signal Output:** 0 to 100%, User selectable
- 4 to 20mA 450Ω impedance max @ 24VDC
 - 0 to 10 or 2 to 10VDC 10KΩ impedance minimum
 - 0 to 5VDC 10KΩ impedance minimum

- Display Option:** Overall, 2"W x 1.1"H
- LCD 3.5 Digits @0.6"H
 - Occ/Unocc Indication BAPI-Man Icon
 - Display limits 999.9 maximum display digits, Setpoints in 0.5° steps
 - Display Set-up °F or °C, Temp. & Setpoint & RH, Temp. only, Setpoint only, RH only

- Options:** Factory setup only per order
- Setpoint (SP) Slidepot, Resistive or Voltage Output
DA or RA, Board supports a fixed offset resistor
 - Override Pushbutton on side
-J, Independent closure, Contact rating = 300mA @30VDC, Silver plated
-P, Resistive SP shunt
-N, Temperature sensor shunt
 - Comm. Jack Jack wired to the base, -C11, RJ11(4 pin), -C35, 3.5mm (3 pin)
 - Grounding type -CG, Common connection for SP, Override and Sensor
-DF, Independent connections for SP, Override and Sensors
 - Test & Balance -TB, Three position switch, Hi temp/Norm/Lo Temp

- Accuracy:** 2% RH, Capacitive Polymer

Optional Passive Temperature Sensors:

- Thermistor** Thermal resistor
- Temp. Output Resistance, NTC
 - Accuracy (std) ±0.36°F, (±0.2°C), (Hi) ±0.18°F, (±0.1°C), [XP] option

- RTD** Resistance Temperature Device
- Temp. Output Resistance, PTC
 - PT Accuracy (std) 0.12% @Ref, or ±0.55°F, (±0.3°C), (Hi) 0.06% @Ref, or ±0.277°F, (±0.15°C), [A]option

- Semiconductor** Solid State (AD592)
- Temp. Output 2 wire, 1uA/°C (0.556uA/°F), 3 wire, 10mV/°C, (5.556mV/°F)
 - Accuracy Factory offset to 0.1°C (0.18°F), Raw AD592, ±3.3°F (1.8°C)

Field Calibration:

- Potentiometer (R34), ±5% in 0.1% increments. **Note:** Units are factory calibrated.

Terminals: Cage clamp, 16 to 22 AWG

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

Specifications subject to change without notice.

**Diagnostics****Possible Problems:****Possible Solutions:**

General troubleshooting

- Determine that the input is set up correctly in the controller's and BAS 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.
- Label the terminals that the interconnecting wires are connected to at the sensor end and the controller end. Disconnect the interconnecting wires from the controller and the sensor. With the interconnecting wires separated at both ends 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 you have. 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.

Incorrect Humidity

- Check power supply/controller voltage supply
- Disconnect sensor and check power wires for proper voltage (see specifications page)
- Check all software parameters
- If available, check the sensor against a calibrated instrument such as a hygrometer
- Determine if the sensor is exposed to an external environment different from the room (conduit draft)

Incorrect Temperature

- Determine that the temperature sensor's wires are connected to the correct controller input terminals and are not loose.
- Check the wires at the sensor and controller for proper connections.
- Determine if the sensor is exposed to an external environment different from the room (conduit draft)
- Measure the physical temperature at the temperature sensor's location using an accurate temperature standard. Disconnect the temperature sensor's wire (Terminals SEN1 & SEN2) and measure the temperature sensor's resistance across the sensor output pins with an ohmmeter. Put the ohmmeter's black lead on Terminal SEN2 and the red lead on Terminal SEN1. Compare the temperature sensor's resistance to the appropriate Temperature Sensor Resistance Table on the BAPI website (See below). If the measured resistance is different from the temperature table by more than 5%, call BAPI technical support. Don't forget to reconnect the wires.

How to Find The Temperature Sensor Resistance Table

Find BAPI's website at www.bapihvac.com; click on "Resource Library" and "Sensor Specs" and then click on the sensor type you have.