

The 2410 consists of a humidity sensor, a controller and a 10A outlet to plug in a fogger for small room humidification. Its principal components are also used in the Sentinel 5850-H.

The controller monitors the signal from the sensor and displays the percent relative humidity (RH). It also holds two user-adjustable parameters in its memory – the RH “set point”; and the “deadband” (the humidity spread between the “on” and “off” triggers). When the humidity is below the setpoint, the unit turns on. When the humidity reaches the top of the deadband, the unit turns off.

The setpoint is adjustable from 20% to 95%. The deadband is adjustable from 1.0 to 3.0 RH points.

The sensor is factory calibrated to a precision of  $\pm 1$  RH percentage point. If you replace either the sensor or the controller, you should recalibrate (see “Sensor Calibration”).

### The Display

The digital display shows the relative humidity *at the sensor*. The display is steady when the unit is standing by, and flashing when calling for additional water vapor.

### The Controls

The controller has two switches and a rotary knob.

The AUTO/MANUAL switch determines when the unit operates:

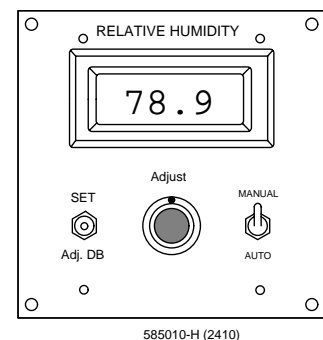
MANUAL: unit operates continuously (the sensor is ignored).

AUTO: operation is controlled by sensor.

The SET/ADJ DB switch has two positions:

SET: Depress switch to display RH setpoint. Turn knob to change.

ADJ DB: Depress switch to display deadband. Turn knob to change.



### Sensor Calibration

The circuit board of the controller has a small adjustment pot to change the display output. To calibrate, put the sensor in a known humidity environment (see below), allow it to stabilize and adjust the display reading to the proper (known humidity) value.

A small adjustment pot is located on the underside of the circuit board. (On some models, it is upright and accessible from the edge of the circuit board.) Turn the adjustment pot with a jeweler's screwdriver (it turns only one revolution; do not overturn).

### Accessing the circuit board

On the 2410 RH controller, **turn the power switch off and unplug from outlet** to avoid risk of electrical shock. Loosen the enclosure screws and lift the cover to expose the circuit board and adjustment pot. Reconnect the power cord (**CAUTION: do not touch high voltage terminals**), turn unit on and adjust pot. **Disconnect power cord** again before reassembling unit.

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On the Sentinel 5850, remove the four machine screws holding the control module to the panel. Gently lift the control module out a few inches.

### Known Humidity Environments

Room humidity, measured with a sling psychrometer, can be used for calibration. However, air currents or temperature changes can influence the reading.

A more precise technique is to use a **saturated** salt solution; it has a constant relative humidity at a fixed temperature. Choose a salt with a humidity close to your desired operating condition.

	<u>Temperature and Relative Humidity</u>			
<u>Saturated solution of</u>	<u>10°C</u>	<u>15°C</u>	<u>20°C</u>	<u>25°C</u>
Potassium Chloride	86.8% RH	85.9% RH	85.1% RH	84.3% RH
Sodium Chloride	75.7	75.6	75.5	75.3
Sodium Bromide	62.2	60.7	59.1	57.6
Potassium Carbonate	43.1	43.2	43.2	43.2
Magnesium Chloride	33.5	33.3	33.1	32.8
Lithium Chloride	11.3	11.3	11.3	11.3

You can fabricate a calibration apparatus using a wide mouth jar and lid, the chosen salt and distilled water. For best accuracy, use only *distilled* water and reagent grade chemicals. Impurities in either the water or the chemical will affect the results. Non-iodized Kosher salt sometimes is used in place of sodium chloride.

Cut a hole in the lid just large enough for the end of the sensor cable. Disconnect cable from sensor, feed it through the lid and reconnect sensor. Seal the opening around the cable with cotton and tape to prevent air exchange. Put a little salt in the jar and add enough water to thoroughly wet, but not completely dissolve, the salt. The jar must contain both salt crystals and free liquid at equilibrium.

Screw on the lid to suspend sensor above the liquid (do not let it get wet!) and allow the environment to stabilize. This may take 6-12 hours. Adjust the display to the appropriate value.

### Troubleshooting

If the display shows no reading, make sure the power is on and the sensor is properly connected.

The display will read zero in a condensing environment or if the sensing element gets wet. The sensor recovers from wetting but recalibration may be needed.