

43347 & 43502

RTD Temperature Probe & Aspirated Radiation Shield



RM Young's 43347 RTD Temperature Probe is typically housed in a 43502 Aspirated Radiation Shield to provide "delta temperature" measurements for air quality applications. To determine delta temperature, a 43347 probe mounted in a 43502 shield is attached to the mast of a UT20 or UT30 tower, while another 43347 probe mounted in a 43502 shield is attached to the tower at a 2 m height. The temperature difference of the two measurement heights is calculated and used to determine atmospheric stability as required by the EPA. The 43347 may also be housed in a 41003-5 Naturally Aspirated Shield if fan-driven aspiration is not required.

43347 RTD Temperature Probe

The 43347 probe has a 1000 ohm RTD that accurately measures ambient air temperature. The standard 43347 probe has an RTD uncertainty of $\pm 0.3^{\circ}\text{C}$. If increased accuracy is required, a three point calibration can be ordered that allows the RTD to have an uncertainty of only $\pm 0.1^{\circ}\text{C}$.

43502 Aspirated Radiation Shield

The 43502 employs concentric downward facing intake tubes and a small canopy shade to isolate the temperature probe from direct and indirect radiation. The 43347 probe mounts vertically in the center of the intake tubes. A brushless 12 Vdc blower motor pulls ambient air into the shield and across the probe to reduce radiation errors. This allows temperature to be measured with an RMS error of less than $\pm 0.2^{\circ}\text{C}$. The blower operates off a 115 Vac to 12 Vdc transformer that is included with the shield.

Mounting

Mounting is similar for both the the 43502 and 41003-5 radiation shields. A u-bolt is used to attach the shield to a mast, tower leg, or vertical pipe with up to 2" OD. By moving the u-bolt to the other set of holes, the 43502 or 41003-5 can be attached to a CM202, CM204, or CM206 crossarm. Each of these crossarms includes a CM210 Mounting Kit that mounts the crossarm to the mast or one tower leg. Another CM210 Crossarm Mounting Kit can be ordered to attach the crossarm to two tower legs—providing additional stability.



The 43347 probe connects to two differential channels and an excitation channel on the datalogger.



For the upper measurement, attach the 43502 to the top most mast of a UT20 or UT30 tower (20 ft and 30 ft measurement heights, respectively).



For the 2 m measurement, the 43502 attaches to the legs of a UT20 or UT30 tower via a CM202, CM204, or CM206 crossarm. Two CM210s can be used to attach the crossarm to two tower legs.

Ordering Information

Temperature Probe (wiring configuration option required)

43347-L R.M. Young RTD Temperature Probe with user-supplied cable length. Enter the cable length (in feet) after the -L. Order an 11 ft (43347-L11) lead length for the 2 m measurement height; a 24 ft (43347-L24) lead length for mounting to the mast of a UT20 tower, and a 34 ft (43347-L34) lead length for mounting to the mast of a UT30 tower.

Wiring Configuration Options (one required)

- VX** 4-Wire Half Bridge/VX. Choose this option to connect the 43347 RTD to the datalogger's voltage switched excitation ports. Compatible dataloggers are the CR510, CR800, CR850, CR10X, CR1000, CR3000, CR5000, CR7, and CR9000X.
- IX** Resistance/IX. Choose this option to connect the 43347 RTD to the datalogger's switched current outputs. Option is only compatible with the CR3000 and CR5000 dataloggers.

Calibration Option

- CC** Optional 3-point calibration for the 43347 that provides $\pm 0.1^\circ\text{C}$ uncertainty (-50° to $+50^\circ\text{C}$).

Aspirated Shield

43502-L R.M. Young Compact Aspirated Radiation Shield with user-specified power lead length; enter the lead length (in feet) after the -L. Order an 11 ft (43502-L11) lead length for the 2 m measurement height; a 24 ft (43502-L24) lead length for mounting to the mast of a UT20 tower, and a 34 ft (43502-L34) lead length for mounting to the mast of a UT30 tower.

Accessories

- 41003-5** 10-plate Gill Naturally Aspirated Radiation Shield for applications that do not require fan-aspiration
- CM210** Crossarm mounting kit for attaching the 43502 onto two tower legs via a crossarm (one of the CM210s is included with the crossarm).

Specifications

43347 RTD Temperature Probe

Sensing Element:	HY-CAL 1000 ohm Platinum RTD
Temperature Range:	$\pm 50^\circ\text{C}$
Accuracy:	$\pm 0.3^\circ\text{C}$ at 0°C ; $\pm 0.1^\circ\text{C}$ with NIST calibration
Temperature Coefficient:	0.00375 ohm/ $^\circ\text{C}$
Weight:	1.2 lbs (0.54 kg)
Dimensions:	7" (17.8 cm) overall length, 0.125" (0.318 cm) probe tip diameter, 2.25" (5.72 cm) probe tip length

43502 Aspirated Radiation Shield

Aspiration Rate:	5 to 11 m s^{-1} (16 to 36 fps) depending on sensor size
Ambient Temperature:	$< 0.2^\circ\text{C}$ (0.4°F) RMS at 1000 W/m^2 intensity)
Delta T:	$< 0.05^\circ\text{C}$ (0.1°F) RMS with like shields equally exposed
Power Required:	12 to 14 Vdc @ 500 mA for blower
Dimensions:	13" (33 cm) overall length, 8" (20 cm) overall diameter
Mounting:	V-Block and U-Bolt for vertical pipe with 1.0" to 2.0" (2.5 to 5.0 cm) diameter

