

# 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 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-in. outer diameter. 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-specified cable length. Enter the cable length (in feet) after the -L. Order an 11 ft (43347-L11) cable length for the 2 m measurement height; a 24 ft (43347-L24) cable length for mounting to the mast of a UT20 tower, and a 34 ft (43347-L34) cable 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. With this option, the sensor can connect directly to a CR800, CR850, CR1000, CR3000, CR5000, CR9000X, CR7, CR510, or CR10X.
- IX** Resistance/IX. Choose this option to connect the 43347 RTD to the switched current outputs of a CR3000 or CR5000 datalogger.

### Calibration Option

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

### Aspirated Shield

**43502-L** R. M. Young Compact Aspirated Radiation Shield with user-specified power cable length; enter the cable length (in feet) after the -L. Order an 11 ft (43502-L11) cable length for the 2 m measurement height; a 24 ft (43502-L24) cable length for mounting to the mast of a UT20 tower, and a 34 ft (43502-L34) cable 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. It requires the 27251 split nut (see below).
- 27251** Split nut plug that is required to mount the 43347 in the 41003-5 radiation shield.
- 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

<b>Sensing Element:</b>	HY-CAL 1000 ohm Platinum RTD
<b>Temperature Range:</b>	$\pm 50^\circ\text{C}$
<b>Accuracy</b>	
<b>At <math>0^\circ\text{C}</math>:</b>	$\pm 0.3^\circ\text{C}$
<b>With NIST Calibration:</b>	$\pm 0.1^\circ\text{C}$
<b>Temperature Coefficient:</b>	0.00375 ohm/ $^\circ\text{C}$
<b>Weight:</b>	1.2 lbs (0.54 kg)
<b>Dimensions</b>	
<b>Overall Length:</b>	7 in. (17.8 cm)
<b>Probe Tip Diameter:</b>	0.125 in. (0.318 cm)
<b>Probe Tip Length:</b>	2.25 in. (5.72 cm)

### 43502 Aspirated Radiation Shield

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

