



## 43347 and 43502

RTD Temperature Probe and Aspirated Radiation Shield



# Very High Accuracy

Good for air-quality applications

## Overview

The 43347\* is a highly-accurate RTD that often provides delta temperature measurements for air quality applications. Typically, it is housed in the 43502\* fan-aspirated radiation shield, which greatly

reduces radiation errors. The 43347 may also be housed in a 41003-5 Naturally Aspirated Shield if fan-driven aspiration is not required.

## Benefits and Features

- › Uses 1000  $\Omega$  RTD for highly accurate air temperature measurements
- › Well-suited for air quality applications
- › 43502 fan-aspirated radiation shield reduces radiation errors for more accurate measurements
- › Ideal for delta temperature measurements used in calculating atmospheric stability class
- › Standard RTD uncertainty is  $\pm 0.3^\circ\text{C}$ . With optional three point calibration, uncertainty is only  $\pm 0.1^\circ\text{C}$ .

## Technical Description

### Delta Temperature Measurements

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 at-

tached 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.

### 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.

\*The 43347 and 43502 are manufactured by R. M. Young.

questions & quotes: 435.227.9120

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## 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.
- IX** Resistance/IX. Choose this option to connect the 43347 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-to-Pole Bracket 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: 1000  $\Omega$  Platinum RTD
- › Temperature Range:  $\pm 50^\circ\text{C}$
- › Accuracy:  $\pm 0.3^\circ\text{C}$  at  $0^\circ\text{C}$ ;  $\pm 0.1^\circ\text{C}$  with NIST calibration
- › Temperature Coefficient: 0.00375  $\Omega/\Omega/^\circ\text{C}$
- › Radiation Error/Ambient Temperature (when housed in the 43502 shield):  $< 0.2^\circ\text{C}$  RMS at 1000  $\text{W}/\text{m}^2$  intensity
- › Radiation Error/ Delta T (when housed in the 43502 shield):  $< 0.05^\circ\text{C}$  RMS with 43502 shields equally exposed
- › Overall Length: 17.8 cm (7 in)
- › Stainless-Steel Sheath Diameter: 0.478 cm (0.188 in)
- › Stainless-Steel Sheath Length: 6.12 cm (2.41 in)
- › Total Probe Tip Length (stainless-steel sheath and molded plastic): 10.08 cm (3.97 in)
- › Weight: 0.54 kg (1.2 lb)



For the 2 m measurement, the 43502 attaches to the legs of a UT20 or UT30 tower via a CM202, CM203, CM204, or CM206 crossarm. Two CM210s can be used to attach the crossarm to two tower legs.

### 43502 Aspirated Radiation Shield

- › Aspiration Rate: 5 to 11  $\text{m s}^{-1}$  (16 to 36 fps) depending on sensor size
- › Radiation Error  
Ambient Temperature:  $< 0.2^\circ\text{C}$  ( $0.4^\circ\text{F}$ ) RMS at 1000  $\text{W}/\text{m}^2$  intensity  
Delta T:  $< 0.05^\circ\text{C}$  ( $0.1^\circ\text{F}$ ) RMS with like shields equally exposed
- › Power Required: 12 to 14 Vdc at 500 mA for blower
- › Mounting: V-block and U-bolt for vertical pipe with 2.5 cm to 5.0 cm (1.0 in to 2.0 in) diameter
- › Length: 33 cm (13 in)
- › Diameter: 20 cm (8 in)
- › Weight: 1.1 kg (2.5 lb)



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).



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