



# Rugged, Accurate, Versatile

Can be used in a  
variety of applications

## Overview

The 107 and 108 are rugged, accurate sensors that measure air, soil, and water temperature in a variety of applications. These sensors consist of a thermistor encapsulated in an epoxy-filled

aluminum housing. The housing protects the thermistor allowing the sensors to be buried or submerged. The 107 measures from -35° to +50°C, the 108 from -5° to +95°C.

## Benefits and Features

- › Versatile product—measures air, soil, or water temperature
- › Compatible with AM16/32-series multiplexers allowing measurement of multiple sensors
- › Easy to install or remove
- › Durable
- › Compatible with most dataloggers\*

## Installation

### Air Temperature

When exposed to sunlight, the 107 and 108 sensors should be housed in a 41303-5A or 41303-5B 6-plate radiation shield. The louvered construction of these radiation shields allows air to pass freely through the shield thereby keeping the sensor at or near ambient temperature. The shields' white color reflects solar radiation.

The 41303-5A attaches to a crossarm, mast, or user-supplied pipe with a 2.5 to 5.3 cm (1.0 in. to 2.1 in.) outer diameter. The 41303-5B attaches to a CM500-series pole or a user-supplied pole with a 5.1 cm (2.4 in.) outer diameter.

### Water Temperature

The sensors can be submerged to 15 m (50 ft) or 21 psi. Please note that neither the 107 nor 108 is weighted. Therefore, the installer should either add a weighting system or secure the sensor to a fixed, submerged object, such as a piling.

### Soil Temperature

The 107 and 108 are suitable for shallow burial only. Placement of the sensor's cable inside a rugged conduit may be advisable for long cable runs—especially in locations subject to digging, mowing, traffic, use of power tools, or lightning strikes.

*\*The 107 and 108 are not compatible with the CR200(X)-series dataloggers. However, a similar sensor, the 109, has been developed specifically for our CR200(X)-series dataloggers.*



## Ordering Information

### Temperature Sensors

- 107-L** Temperature Sensor (-35° to +50°C) with a user-specified cable length; enter the cable length (in feet) after the -L. Recommended cable length is shown below. Must choose a cable termination option (see below).
- 108-L** Temperature Sensor (-5° to +95°C) with a user-specified cable length; enter the cable length (in feet) after the -L. Recommended cable length is shown below. Must choose a cable termination option (see below).

### Cable Termination Options (choose one)

- PT** Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.
- PW** Cable terminates in connector for attachment to a prewired enclosure.

### Solar Radiation Shield for Air Temperature Measurements

- 41303-5A** 6-Plate Gill Radiation Shield with U bolts for attachment to a Campbell Scientific crossarm or mast.
- 41303-5B** 6-Plate Gill Radiation Shield with Band Clamp for attachment to a CM500-series or similar pole.

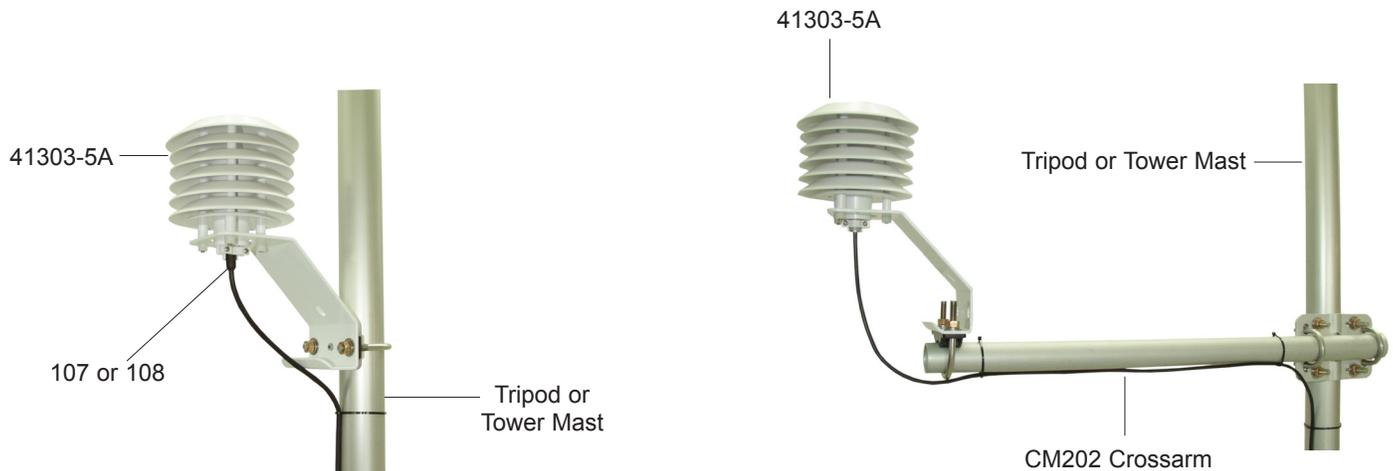
## Specifications

- › Sensor: BetaTherm 100K6A11A Thermistor
- › Tolerance:
  - 107:  $\pm 0.2^{\circ}\text{C}$  over  $0^{\circ}$  to  $50^{\circ}\text{C}$  range
  - 108:  $\pm 0.2^{\circ}\text{C}$  over  $0^{\circ}$  to  $70^{\circ}\text{C}$  range
- › Temperature Measurement Range
  - 107:  $-35^{\circ}$  to  $+50^{\circ}\text{C}$
  - 108:  $-5^{\circ}$  to  $+95^{\circ}\text{C}$
- › Steinhart-Hart Equation Error (CRBasic loggers only):  $\leq \pm 0.01^{\circ}\text{C}$  over measurement range
- › Polynomial Linearization Error (Edlog loggers only)
  - 107: Typically  $< \pm 0.5^{\circ}\text{C}$  over measurement range
  - 108: Typically  $< \pm 0.5^{\circ}\text{C}$  over  $-5^{\circ}$  to  $+90^{\circ}\text{C}$  range
- › Time Constant in Air: 30 to 60 s in a wind speed of  $5\text{ m s}^{-1}$
- › Maximum Cable Length: 305 m (1000 ft)
- › Maximum Submersion Depth: 15 m (50 ft)
- › Sensor Length: 10.4 cm (4.1 in.)
- › Sensor Diameter: 0.76 cm (0.3 in.)
- › Weight with 10 ft cable: 136 g (5 oz)

## Recommended Cable Lengths for Air Temperature Measurements

2 m Height		Atop a tripod or tower via a 0.6 m (2 ft) crossarm such as the CM202						
Mast/Leg	CM202	CM106	CM110	CM115	CM120	UT10	UT20	UT30
2.7 m (9 ft)	3.4 m (11 ft)	4.3 m (14 ft)	4.3 m (14 ft)	5.8 m (19 ft)	7.3 m (24 ft)	4.3 m (14 ft)	7.3 m (24 ft)	11.3 m (37 ft)

*Note: Add 0.6 m (2 ft) to the cable length if mounting the enclosure to the leg base of a CM106, CM110, CM115, or CM120 tripod.*



Above is a sensor housed in the 41303-5A radiation shield. The U-bolt is placed in the holes on the side of the bracket to allow the 41303-5A to be attached to a mast or vertical pole.

To attach the 41303-5A to a CM202, CM202SS, CM204, CM204SS, or CM206 crossarm, place the 41303-5A's U bolt in the bottom holes.