CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

107 and 108

Temperature Sensors

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, 41303-5B, or RAD06 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 RAD06 uses a double-louvered design that offers improved sensor protection from driving rain, snow, insect intrusion and has lower self-heating in bright sunlight combined with higher temperatures (> 24°C (~75°F)) and low wind speeds (< 2 m s^{-1} (~4.5 mph)) giving a better measurement.

The 41303-5A and RAD06 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

When ordering the temperature sensor, you must choose a cable length option and cable termination option.

107 Temperature Sensor (-35° to +50°C).

108 Temperature Sensor (-5° to +95°C).

Cable Length Options (choose one)

-10 10 ft (3 m) cable length recommended for mounting sensor directly to the mast or leg at a 2 m height.

-17 17 ft (5 m) cable length recommended for mounting sensor on a 2 ft crossarm at a 2 m height or atop a CM106B, CM110, or UT10.

-33 33 ft (10 m) cable length recommended for mounting sensor on a 2 ft crossarm atop a CM115, CM120, or UT20.

-50 50 ft (15 m) cable length recommended for mounting sensor on a 2 ft crossarm atop a UT30 tower.

-U-L User-defined cable length. Enter length, in feet, after the -L. See Cable Length Recommendation Table 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 that attaches to a prewired enclosure.

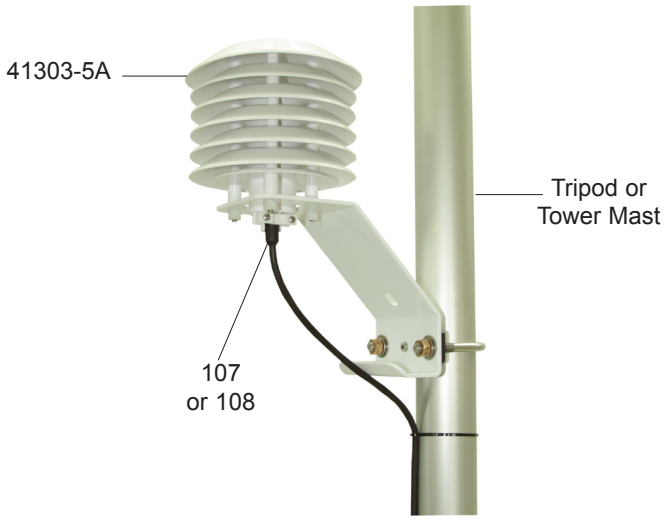
-C Cable terminates in a connector for attachment to a CS110 Electric Field Meter or ET107 weather station

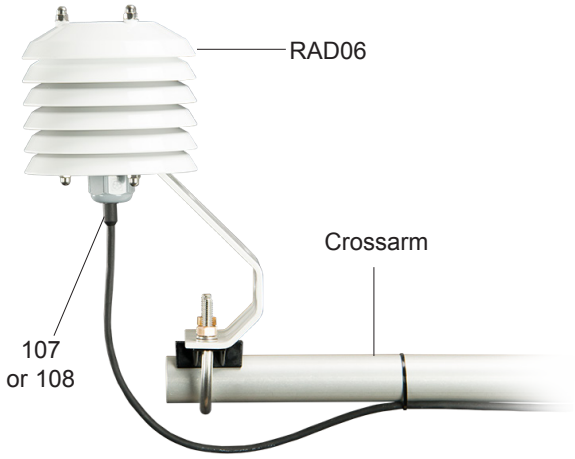
Solar Radiation Shield for Air Temperature Measurements

41303-5A R. M. Young 6-Plate shield with U-bolts for attachment to a crossarm, mast, or pipe with 2.5 to 5.3 cm (1.0 to 2.1 in) outer diameter

41303-5B R. M. Young 6-Plate shield with Band Clamp for attachment to a CM500-series or similar pole (5.1 cm (2.4 in) outer diameter).

RAD06 6-Plate MetSpec Radiation Shield with U-bolts for attachment to a Campbell Scientific crossarm or mast.





Cable Length Recommendations for Air Temperature Measurement[1]

2 m Height	CM106B[2]	CM110[2]	CM115[2]	CM120[2]	UT10	UT20	UT30
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)

Notes:
1. The lengths assume the sensor is mounted at the end of a 2 ft crossarm.
2 The lengths assume the enclosure is mounted to the tripod mast. If it is mounted to the leg base, add 0.6 m (2 ft) to the cable length.

Specifications

- Sensor: BetaTherm 100K6A1IA Thermistor
- Tolerance:
  107: ±0.2°C over 0° to 50°C range
  108: ±0.2°C over 0° to 70°C range
- Temperature Measurement Range
  107: -35° to +50°C
  108: -5° to +95°C
- Steinhart-Hart Equation Error: ≤±0.01°C over measurement range
- Time Constant in Air: 30 to 60 s in a wind speed of 5 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)
- View EU Declaration of Conformity Documentation at:
  www.campbellsci.com/107 or www.campbellsci.com/108