

The 109 is a rugged, accurate probe that measures air, soil, and water temperature for a variety of applications. It consists of a thermistor encapsulated in an epoxy-filled aluminum housing. The housing protects the thermistor allowing the 109 to be buried or submerged. The 109 measures from -50° to $+70^{\circ}\text{C}$.

Installation

Air Temperature

When exposed to sunlight, the 109 probe should be housed in a 41303-5A 6-plate Gill Radiation Shield. The 41303-5A's louvered construction allows air to pass freely through the shield thereby keeping the probe at or near ambient temperature. The shield's white color reflects solar radiation. The 41303-5A attaches to a crossarm, mast, or user-supplied pipe with a 1.0-inch to 2.1-inch outer diameter.

Water Temperature

The 109 probe can be submerged to 50 feet (21 psi). Please note that 109 is not weighted. Therefore, the installer should either add a weighting system or secure the probe to a fixed, submerged object, such as a piling.

Soil Temperature

The 109 is suitable for shallow burial only. Placement of the probe'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.

Ordering Information

Temperature Probe

109-L Temperature Probe for CR200(X)-Series Dataloggers (-50° to $+70^{\circ}\text{C}$). Enter cable length, in feet, after the -L. Recommended cable lengths are provided on page 2. Must choose a cable termination option (see below).

Cable Termination Options (choose one)

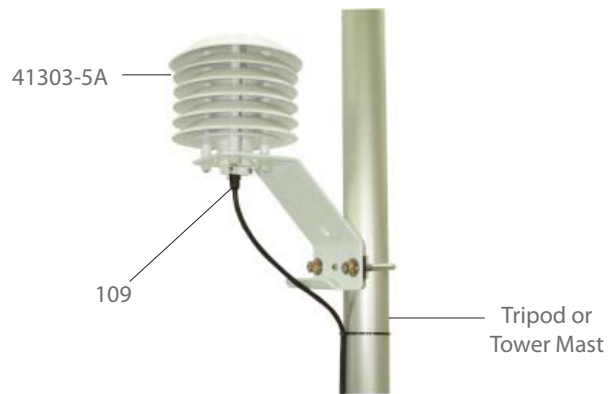
- PT** Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.
- PW** Cable terminates in connector for attachment to a prewired enclosure.

Solar Radiation Shield for Air Temperature Measurements

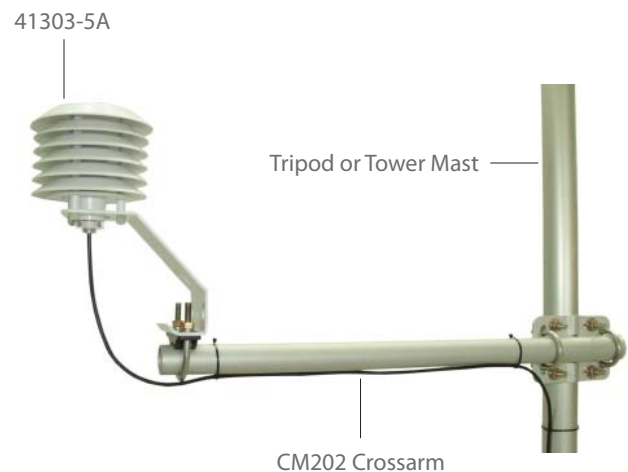
41303-5A 6-Plate Gill Radiation Shield that houses a 109 for air temperature measurements.



The 109 was developed specifically for the CR200(X)-series dataloggers. This probe outputs a signal of 0 to 2.2 volts.



Above is a probe 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, CM204, or CM206 crossarm, place the 41303-5A's U-bolt in the bottom holes.

Recommended Cable Lengths for Air Temperature Measurements

2 m Height		Atop a tripod or tower via a 2 ft crossarm such as the CM202							
Mast/Leg	CM202	CM6	CM10	CM110	CM115	CM120	UT10	UT20	UT30
9 ft	11 ft	11 ft	14 ft	14 ft	19 ft	24 ft	14 ft	24 ft	37 ft

Note: Add two feet to the cable length if you are mounting the enclosure on the leg base of a light-weight tripod.

Specifications

Sensor:	BetaTherm 10K3A11B Thermistor	Time Constant in Air:	30 to 60 seconds in a wind speed of 5 m sec ⁻¹
Tolerance:	±0.2°C over 0° to 70°C range	Maximum Cable Length:	1000 ft (305 m)
Measurement Range:	-50° to +70°C	Probe Length:	4.1 in. (10.4 cm)
Steinhart-Hart Equation Error (maximum):	0.03°C at -50°C	Probe Diameter:	0.3 in. (0.762 cm)
Interchangeability Error:	<±0.2°C over 0° to 70°C range; increasing to ±0.5°C at -50°C	Weight:	5 oz (136 g) with a 10-ft (3 m) cable

