



Highly Accurate Air Temperature

Fine-wire thermocouple in aspirated radiation shield

Overview

The ASPTC-L consists of a type-E fine-wire thermocouple mounted in a fan-aspirated radiation shield to provide highly accurate air temperature measurements. One ASPTC can measure absolute air temperature, or two ASPTCs can make

delta temperature measurements. Often, the ASPTC replaces, or is measured in addition to, the TCBR thermocouples in a Bowen ratio system.

Benefits and Features

- › Uses fine-wire thermocouple for accurate air temperature measurements
- › Includes aspirated radiation shield
- › High-powered fan reduces solar loading

Technical Description

The ASPTC's radiation shield is an elongated tube constructed from white UV-stabilized polyethylene that provides low thermal conductivity and heat retention. A fan draws air across the measurement junction, which reduces solar loading on the thermocouple. The radiation shield also protects the thermocouple, increasing the thermocouple's durability.

The ASPTC's fine-wire thermocouple consists of a chromel wire and a constantan wire joined at a measurement junction. A voltage potential is generated when the

measurement end of the thermocouple is at a different temperature than the reference end of the thermocouple. The magnitude of the voltage potential is related to the temperature difference. Therefore, temperature can be determined by measuring the differences in potential created at the junction of the two wires.

A reference temperature measurement is required for thermocouple measurements. The temperature sensor built into many of our dataloggers' wiring panel typically provides this measurement.

Specifications

Shield Material	UV-stabilized polyethylene
Large Diameter	5.8 cm (2.3 in.)
Small Diameter	4.6 cm (1.8 in.)
Power Cable Diameter	0.5 cm (0.2 in.)

Signal Cable Diameter	0.3 cm (0.1 in.)
Length	53.3 cm (21 in.)
Height	14.7 cm (5.8 in.)
Weight	0.86 kg (1.9 lb)

Fan

Air Velocity at Thermocouple	5.5 m/s (@ 12 Vdc)
Life Expectancy	65,000 h (@ 30°C)
Current Drain	260 mA (@ 12 Vdc)
Operating Voltage	9 to 13 Vdc
Operating Temperature Range	-10° to +70°C

Polarity Protection Reverse polarity protected

Thermocouple

Type	Chromel-Constantan
Typical Output	60 $\mu\text{V}/^\circ\text{C}$
Accuracy	Refer to the <i>Thermocouple Measurement</i> section in the data logger manual.
Diameter	0.0762 mm (0.003 in.)

For comprehensive details, visit: www.campbellsci.eu/asptc 



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