



## Fast Response

Ideal for monitoring solar panel temperatures

### Overview

The CS220 is a thermocouple that measures the temperature of a surface by direct contact. It typically monitors the temperature of a solar panel, but it can also monitor the

temperature of other devices. This thermocouple easily interfaces with our dataloggers, and it is ideal for solar energy applications.

### Benefits and Features

- › Well-suited for solar energy applications
- › Thermocouple tolerance meets ASTM E230-ANSI MC 96.1 (reference junction at 0°C)
- › Easy to install
- › Compatible with most Campbell Scientific data loggers

### Technical Description

The CS220 uses a 24-AWG, twisted pair, shielded, fast response type E thermocouple. Type E thermocouples consist 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.

The CS220 consists of a stainless-steel overbraided cable and a thermocouple extension cable. Adhesive on one end of the overbraided cable secures the sensor to the solar panel. The mini connectors of the thermocouple extension and overbraided cables attach to each other. The pigtails of the extension cable connect to the datalogger.

The CS220 can provide the temperature on the back of a solar panel, which is an important measurement in solar energy applications. The output of a solar panel is affected by its temperature. As the temperature of the solar panel increases, its output decreases.

### Specifications

Sensor	Type E thermocouple	Measurement Description	Back-of-module temperature
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Operating Temperature Range	Up to 260°C
Thermocouple Type	Chromel-Constantan
Typical Output	60 $\mu\text{V}/^\circ\text{C}$
Thermocouple Tolerances	Meets ASTM E230-ANSI MC 96.1 Special Limits of 1.0°C or 0.4% (0° to 900°C).  Reference junction at 0°C.
Maximum Temperature of Adhesive	Adheres up to 260°C.

Accuracy	Refer to the <i>Thermocouple Measurement</i> section in the data logger manual.
Response Time	0.15 s
Sensitivity	+1°C
Length of Stainless-Steel Braided Cable	1.0 m (3.3 ft)
Thermocouple Length	2.54 cm (1.00 in.)
Thermocouple Width	1.91 cm (0.75 in.)
Weight	238 g (8.4 oz) with 15.24-m (50-ft) cable

For comprehensive details, visit: [www.campbellsci.eu/cs220](http://www.campbellsci.eu/cs220) 



80 Hathern Road, Shepshed, LE12 9GX UK | +(0)1509 828888 | [sale@campbellsci.co.uk](mailto:sale@campbellsci.co.uk) | [www.campbellsci.eu](http://www.campbellsci.eu)  
 AUSTRALIA | BRAZIL | CANADA | CHINA | COSTA RICA | FRANCE | GERMANY | INDIA | SOUTH AFRICA | SPAIN | THAILAND | UK | USA

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