

Type E, Fine Wire Thermocouples

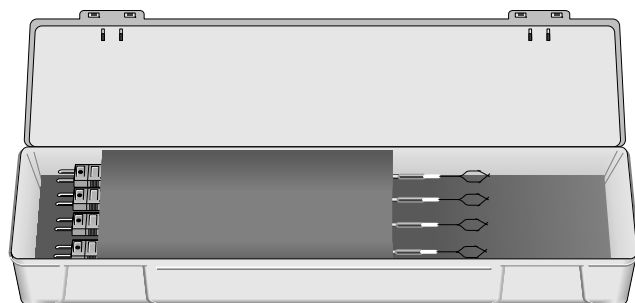
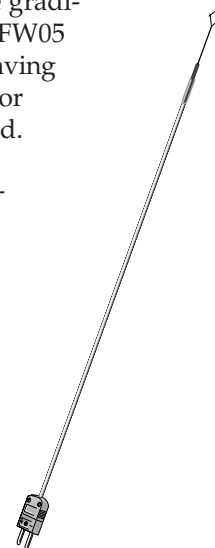
Models FW05, FW1, and FW3

Campbell Scientific's FW05, FW1, and FW3 thermocouples measure atmospheric temperature gradients or fluctuations with research-grade accuracy. The models differ in their diameters—the FW05 has a 0.0005" diameter, the FW1 a 0.001" diameter, and the FW3 a 0.003" diameter. The FW05, having the smallest diameter, experiences the least amount of solar loading but is the most fragile. For all of these thermocouples, solar loading is small enough that a radiation shield is not required.

Type E thermocouples are comprised 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 (typically measured at the datalogger wiring panel) is required. Options for measuring the reference temperature include:

- CR10XTCR thermistor that connects to the CR10X wiring panel
- Thermistor built into the CR800, CR1000, CR3000, or CR5000 wiring panel
- PRT built into the wiring panel of the CR9050 or CR9051E input module for the CR9000X Measurement and Control System
- PRT built into the wiring panel of the CR723T input card for the CR7 Measurement and Control System

Please note that our CR200-series and CR510 dataloggers are not compatible with thermocouples. The thermocouples connect to the datalogger via the FWC-L cable.



The FW/ENC Carrying Case is required to ship our FW05, FW1, and FW3 thermocouples. It holds up to four thermocouples. Thermocouples returned to Campbell Scientific for repair without this case will be shipped to the customer in a new case and the account charged accordingly.

Ordering Information

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| FW05 | Type E Fine Wire Thermocouple with a 0.0005" Diameter; requires the FWC-L. |
| FW1 | Type E Fine Wire Thermocouple with a 0.001" Diameter; requires the FWC-L. |
| FW3 | Type E Fine Wire Thermocouple with a 0.003" Diameter; requires the FWC-L. |
| FWC-L | Connector Cable with user-specified lead length that connects the thermocouple to the datalogger. Enter the lead length, in feet, after the L. A 20 ft length (FWC-L20) is recommended. |
| FW/ENC | Carrying Case for shipping fine-wire thermocouples. |

Specifications

Weight:	2 oz (45 g)
Diameter	
FW05:	0.0005" (0.0127 mm)
FW1:	0.001" (0.0254 mm)
FW3:	0.003" (0.0762 mm)
Total length:	14.5" (36.8 cm)
Plug Dimensions:	0.7" x 1.3" x 0.4" (1.8 x 3.3 x 1.0 cm)
Type:	Chromel-Constantan
Typical Output:	60 $\mu\text{V}/^{\circ}\text{C}$
Accuracy:	temp. error = reference temp. error + TC output error + TC voltage error + linearization error Where: TC output error = deviation from standards published in NIST Monograph 175 linearization error = difference between the NIST standard and the datalogger's polynomial approximation <i>Refer to the "Thermocouple Measurement" section in your datalogger manual for more information.</i>

FW/ENC

Weight:	0.8 lbs (0.36 kg)
Capacity:	up to 4 thermocouples