

105E

Type E Thermocouple Burial Probe

The 105E consists of a 24-gage, shielded, type E thermocouple wire that typically measures soil temperature. The thermocouple junction is electrically isolated from the media being measured, thereby avoiding measurement errors due to differences in ground potential.

Thermocouple Description¹

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.

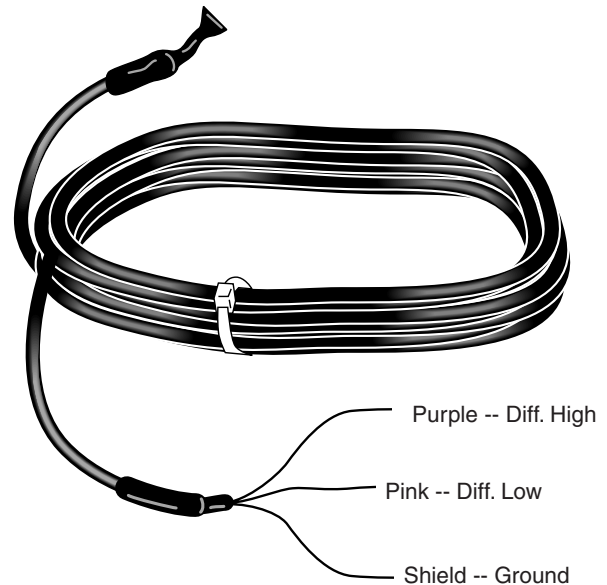
A reference temperature measurement (typically measured at the datalogger wiring panel) is required. Options for measuring the reference temperature include:

- Thermistor built into the wiring panel of a CR800, CR850, CR1000, CR3000, or CR5000 datalogger
- PRT built into the wiring panel of the CR9050 or CR9051E input module for the CR9000X datalogger
- PRT built into the wiring panel of the CR723T input card for the CR7 datalogger

Please note that our CR200-series dataloggers are not compatible with thermocouples.

Installation

The 105E is typically buried in the soil or other media. At the desired depth, the sensor should be placed horizontally to avoid thermal conduction between the surface and measurement junction. Emplacement of the sensor cable inside a rugged conduit may be advisable for long cable runs in locations subject to digging/mowing or lightning strikes.



Ordering Information

Temperature Probe

105E-L Type E Thermocouple Burial Probe with user-specified cable length. Enter the cable length, in feet, after the -L.

Specifications

Weight:	3 oz (90 g) with 10-ft cable
Diameter:	0.3 inch (0.8 cm)
Type:	Chromel-Constantan
Typical Output:	60 $\mu\text{V}/^\circ\text{C}$
Temperature Error:	$T_r + TC_o + TC_v + L$

Where:

T_r = reference temperature error
 TC_o = TC output error, which is the deviation from standards published in NIST Monograph 175.
 TC_v = TC voltage error
 L = linearization error, which is the difference between the NIST standard and the datalogger's polynomial approximation

¹Refer to the “Thermocouple Measurement” section in your datalogger manual for more information.

