CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

229-L

Heat Dissipation Matric Potential Sensor

Reliable Water Measurements

No maintenance required

Overview

The 229 is a sensor that measures soil water potential from -10 to -2500 kPa. It requires that you connect it to either the CE4 or CE8 current excitation module. A Campbell Scientific data logger controls the current excitation module, measures the sensor, and calculates soil water matric potential.

Benefits and Features

- Compatible with most Campbell Scientific data loggers
- Measures a wide range of matric potential
- Measurements not affected by salts in the soil
- Long lasting, with no maintenance required
- Compatible with AM16/32-series multiplexers, allowing measurement of multiple sensors

Detailed Description

The 229 Water Matric Potential Sensor consists of a heating element and thermocouple placed in epoxy in a hypodermic needle, which is encased in a porous ceramic matrix.

To calculate soil water matric potential, a CE4 or CE8 current excitation module applies a 50 mA current to the 229's heating element, and the 229's thermocouple measures the temperature rise. The magnitude of the temperature rise varies according to the amount of water in the porous ceramic matrix, which changes as the surrounding soil wets and dries. Soil water matric potential is determined by applying a second-order polynomial equation to the temperature rise.

Users must individually calibrate each of their 229 sensors in the soil type in which the sensors will reside.

A reference temperature measurement is required for the 229's thermocouple measurement. Options for measuring the reference temperature include:

- Thermistor built into the CR6, CR800, CR850, 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

Specifications

Operating Temperature Range	-5° to +30°C
Normal Environmental Temperature Range	-40° to +70°C
Measurement Range	-10 to -2500 kPa
Measurement Time	30 s (typical)
Thermocouple Type	Copper/constantan (type T)
Heater Resistance	~34 Ω
Resolution	~1 kPa (at matric potentials < -100 kPa)
Diameter	1.5 cm (0.6 in.)
Length	6.0 cm (2.4 in.)
Cable Weight	~23 g/m (0.25 oz/ft)
Sensor Weight	10 g (0.35 oz)