Overview

The new TEROS 12 sensor is a complete soil moisture system that treats problems that cause uncertainty in the data. The TEROS 12 sensor tackles problems like sensor-to-sensor variability, air gaps, or preferential flow and delivers and is the only soil moisture system on the market that addresses these issues.

The TEROS 12 uses a new calibration procedure that maximizes accuracy and minimizes sensor-to-sensor variability (less than 1%), while keeping the TEROS 12 cost reasonable. So you can be confident that every sensor you install is going to read exactly like the next one.

The TEROS 12 delivers the best volume of influence to sensor size on the market. With an optimized circuitry, this 9.4-cm sensor delivers one-liter volume of influence while most sensors only deliver 200 mL. Most soil sensors that measure this much volume are larger in size (20 cm or longer) which make them difficult to install. The New TEROS 12 has temperature sensor perfectly positioned inside the middle needle so the needles are robust, yet extremely sensitive to soil temperature change. These high-quality stainless steel needles slip easily into even hardened soils, and a durable epoxy fill means the sensor lasts up to 10 years in the field.

The new TEROS 12 is the perfect solution to optimize the accuracy of the whole data set. It combines consistent, flawless installation, minimal sensor-to-sensor variability, and a large volume of influence to deliver performance, accuracy and reliability.

The TEROS 12 uses a completely new calibration procedure that maximizes accuracy and minimizes sensor-to-sensor variability (less than 1%), while keeping the TEROS 12 cost reasonable. So you can be confident that every sensor you install is going to read exactly like the next one. Problems that cause uncertainty in the data—things like sensor-to-sensor variability, air gaps, or preferential flow. No other soil moisture system on the market addresses these issues.

The new TEROS 12 sensor is more than just a sensor. It’s a complete soil moisture system that treats the whole accuracy problem, rather than just one part of it, by eliminating common problems that cause uncertainty in the data—things like sensor-to-sensor variability, air gaps, or preferential flow.

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### Specifications

#### Volumetric Water Content (VWC)

<table>
<thead>
<tr>
<th>Calibration Type</th>
<th>Volumetric Water Content (m³/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral soil</td>
<td>0.00–0.70</td>
</tr>
<tr>
<td>Soilless media</td>
<td>0.0–1.0</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.001 m³/m³</td>
</tr>
<tr>
<td>Generic calibration</td>
<td>±0.03 m³/m³ typical in mineral soils that have solution EC &lt; 8 dS/m</td>
</tr>
<tr>
<td>Medium specific calibration</td>
<td>±0.01–0.02 m³/m³ in any porous medium</td>
</tr>
</tbody>
</table>

#### Apparent dielectric permittivity (ε_a)

- 1–40 (soil range), ±1 ε_a (unitless)
- 40–80, 15% of measurement
- 1 (air) to 80 (water)

#### Temperature

- **Range**: −40 to 60 °C
- **Resolution**: 0.1 °C
- **Accuracy**: ±1 °C

#### Bulk Electrical Conductivity (EC_b)

- **Range**: 0–10 dS/m (bulk)
- **Resolution**: 0.001 dS/m
- **Accuracy**: ±5% of measurement

#### Data Logger Compatibility

- *Campbell Scientific*: CR10X, CR850, 1000, 3000, etc.

#### Dimensions

- **Length**: 9.4 cm (3.70 in)
- **Width**: 2.4 cm (0.95 in)
- **Height**: 7.5 cm (2.95 in)

#### Cable Length

- **Cable Length**: 5 m (standard), 75 m (maximum custom cable length)
- Nonstandard cable length can also be provide.

#### Connector Types

- **Connector Types**: Stripped and tinned wires

#### Supply Voltage (VCC to GND)

- **Minimum**: 4.0 VDC
- **Typical**: NA

#### Digital Input Voltage (logic high)

- **Minimum**: 2.8 V
- **Typical**: 3.6 V
- **Maximum**: 3.9 V

#### Digital Input Voltage (logic low)

- **Minimum**: −0.3 V
- **Typical**: 0.0 V
- **Maximum**: 0.8 V

#### Power Line Slew Rate

- **Minimum**: 1.0 V/ms
- **Typical**: NA
- **Maximum**: NA

#### Current Drain (during 25-ms measurement)

- **Minimum**: 3.0 mA
- **Typical**: 3.6 mA
- **Maximum**: 16.0 mA

#### Current Drain (while asleep)

- **Minimum**: NA
- **Typical**: 0.03 mA
- **Maximum**: NA

#### Operating Temperature Range

- **Minimum**: −40 °C
- **Typical**: NA
- **Maximum**: 60 °C

#### Power-Up Time (SDI-12)

- **Minimum**: NA
- **Typical**: 245 ms
- **Maximum**: NA

#### Measurement Duration

- **Minimum**: 25 ms
- **Typical**: NA
- **Maximum**: 50 ms

For comprehensive details, visit: [www.campbellsci.ca/teros-12-](http://www.campbellsci.ca/teros-12-)

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