

Soil moisture temperature sensor

Description:

1. Low power consumption, average current <math><10\text{mA}</math>
2. High measurement accuracy, fast response speed, stable output signal, no random jump, no drift.
3. Vacuum potting, excellent airtightness, completely preventing water intrusion from any direction, and long-term soaking in water.
4. The steel needle is made of high-quality stainless steel, which can withstand long-term electrolysis and is more resistant to corrosion by acid, alkali and salt in the soil.
5. High measurement accuracy, reliable performance, less affected by soil salt content, and suitable for various soil qualities.
6. Concave-convex structure on the side, easy to hold, beautiful and durable, with antistatic pearl cotton packaging, safer transportation and storage;
7. It has multi-directional protection against misconnection of power lines, ground lines and signal lines.

Datasheet:

Sensor output type: 0-2V output

Load capacity: load resistance > 30K, output impedance $\approx 0\Omega$

Rated power supply voltage: 5-24V

No-load current: peak value <math><30\text{mA}</math>, average <math><10\text{mA}</math>, ultra-low power consumption

Response time: Power on <math><0.1</math> second, refresh cycle 0.5 second

Measurement stabilization time: 0.5 seconds

Moisture measurement area: centered on the central probe, inside a cylinder with a diameter of 7 cm and a height of 10 cm

Moisture measurement range: volumetric water content: 0-50%, 0-100%, customized

Moisture measurement error: <math><3\%</math> (0-53%), <math><5\%</math> (>53%)

Temperature measurement range: $-30^{\circ}\text{C} \sim 70^{\circ}\text{C}$, $-40^{\circ}\text{C} \sim 90^{\circ}\text{C}$ (485 type)

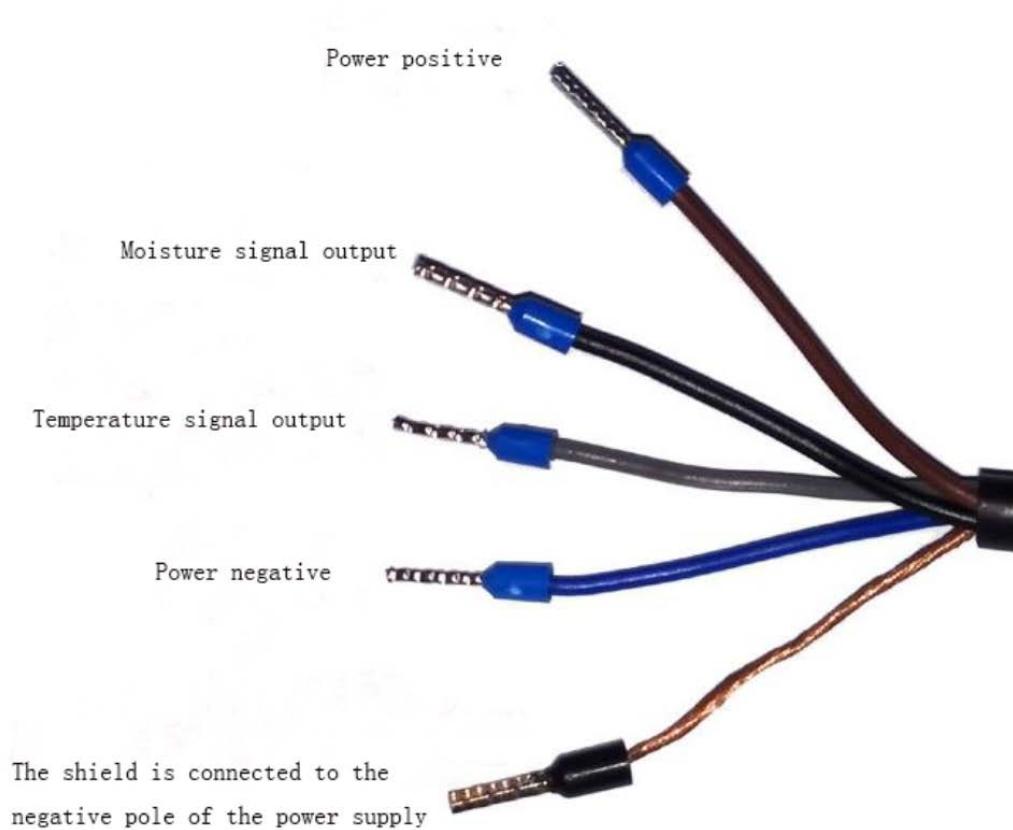
Temperature measurement error: <math><0.4^{\circ}\text{C}</math> (-10~70), <math><0.6^{\circ}\text{C}</math> (other ranges)

Operating temperature range: $-40^{\circ}\text{C} \sim 80^{\circ}\text{C}$

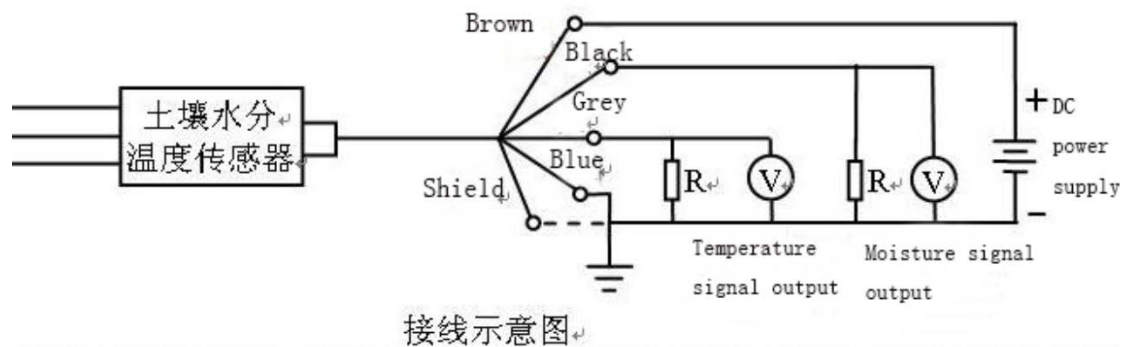
Size:



Lead description:



Wiring diagram:



Principle explanation:

The volumetric water content in the soil has a fixed function relationship with the dielectric constant exhibited by the soil, and is almost independent of the soil quality and the salt content in the water. Then, use the frequency domain measurement method to measure the capacitance between the middle probe and the probes on both sides. The capacitance is proportional to the dielectric constant. After AD conversion, single-chip calculation processing, nonlinear correction and DA conversion output, you can Obtain a linear

voltage (current or 485 signal) output proportional to the soil volumetric water content. The sensor adopts imported high-quality industrial-grade single-chip microcomputers and components inside, with high precision, good reliability, durability, good repeatability and high cost performance.

Installation Notes:

1. Quick measurement method, set a suitable measurement location, avoid stones, ensure that the steel needle does not touch hard objects such as stones, plan the surface soil according to the required measurement depth, and maintain the original tightness of the soil below, Hold the sensor body and insert it vertically into the soil. Do not shake back and forth while inserting it. It is recommended to measure multiple times for an average within a small range of a measuring point.
2. Buried measurement method: Vertically dig a pit with a diameter > 20cm, and the depth is as required for measurement. Then insert the sensor needle horizontally into the pit wall at a predetermined depth, fill the pit and compact it. After a period of stability, continuous counting Measurement and recording of days, months or even longer

Output signal conversion calculation instructions:

Moisture 0-2V output (50% range): Moisture% = output voltage (V)*25 (%)

Moisture 0-2V output (100% range): Moisture% = output voltage (V)*50 (%)

Temperature 0-2V output: temperature °C = output voltage (V)*50-30

Moisture 4-20mA output (50% range): Moisture% = output current (mA)*3.125-12.5 (%)

Moisture 4-20mA output (100% range): Moisture% = (output current (mA)*6.25-25 (%)

Temperature 4-20mA output: temperature °C = output current (mA)*6.25-55

Scope of application:

It is suitable for scientific experiments, water-saving irrigation, greenhouses, flowers and vegetables, grassland pastures, rapid soil testing, plant cultivation, sewage treatment and measurement of various particulate water content.