



HygroVUE10

Temperature and Relative Humidity Probe



Rugged, reliable and flexible

Overview

The HygroVUE™10 utilises a latest generation, Swiss-made, combined relative humidity and temperature element based on CMOSens® technology that offers good measurement accuracy and stability in a wide range of monitoring applications.

The element is a new, more accurate version of that used in the popular Campbell Scientific CS215 probe of which 20,000 have been sold over a period of 14 years.

The HygroVUE™10 is specifically designed for field use with dimensions to suit common radiation shields (the RAD10E is recommended).

It features a digital SDI-12 output allowing simple connection and measurement by many datalogging systems. The digital output avoids the extra errors associated with measuring analogue probes, especially with long cables.

Benefits and Features

- › Uses a combined, pre-calibrated digital humidity and temperature element
- › The field changeable element allows fast on site recalibration
- › Digital SDI-12 output allows long cables with no added errors
- › Simple datalogger programming
- › Low power consumption
- › Wide operating voltage
- › Rugged design with potted electronics
- › Standard M12 connector with IP67 sealing rating
- › Suitable for wide range of monitoring applications

Typical Applications

- › Automatic Weather Station
- › Environmental monitoring and control
- › Moisture monitoring in building materials



HygroVUE™10 fitted in a RAD10E shield

Mounting

When the sensor is used outdoors it is standard practice to install the sensor within a housing, known as a shield, to prevent solar radiation heating the sensor and thereby creating errors in the measurements. The shield also gives a degree of protection from adverse weather, e.g. hail, driving rain. The most common type of shield is a relatively small, naturally ventilated screen that is low maintenance and requires no power.

Campbell Scientific offers and recommends the RAD10E shield for this probe as it performs better than most other

shields of a similar design. It can be mounted on vertical or horizontal poles. Please request a brochure for further details. For continuity with long term measurements some meteorological services sometimes require use of larger, more expensive, Stevenson screens.

Alternatively, for best accuracy a ventilated shield can be used, such as the 43502, although these require significant power. These are attached either to a crossarm or a tripod or tower mast using a U bolt.

Field Calibration

Calibration is easy to carry out by simply changing the sensor element. Each sensor element is individually calibrated so no further adjustments of the probe are required. This means that changing the element

returns the probe to the factory calibration state for both temperature and humidity without interrupting the measurements for long periods.

Specifications

- › Sensing Element: Sensirion SHT35
- › Communication Standard: SDI-12 V1.4 (responds to a subset of commands)
- › Supply voltage: 7-28V DC
- › Current drain (maximum):
Quiescent: 50 µA quiescent,
During measurement: 0.6 mA (takes 0.5 sec)
- › EMC Compliance: Tested and conforms to IEC61326:2013
- › Standard Operating Temperature Range: -40° to +70°C
- › Main housing material: UV stable, white PET-P
Electronics sealing classification: IP67
- › Sensor Protection: Outer glass-filled polypropylene cap fitted with a stainless steel mesh dust filter with nominal pore size of <30 µm. The sensor element has a PTFE protective film with a filtration efficiency of >99.99% for particles of 200 nm or larger size.
- › Length without cable fitted: 180 mm (7.1 in)
- › Diameter of the sensor cap: 12.5 mm (0.5 in)
- › Diameter of body at connector: 18 mm (0.7 in)
- › Weight of probe body: 50 g (1.8 oz)
- › Weight with 5 m cable: 250 g (8.8 oz)
- › Sensor connector: M12, male, 4-pole, A-coded
- › Cable: Polyurethane sheathed, screened cable, nominal diameter 4.8 mm
- › Cable lengths available: 3, 5 and 10 metres as standard fitted with moulded connectors. User specified cable lengths are available at extra cost, fitted with a rewirable connector.

Relative Humidity Measurement

- › Measurement Range: 0 to 100% RH
- › Accuracy (at 25°C)*:
Over the range 0-80% RH: ±1.5%
Over the range 80-100% RH: ±2%
- › Short term hysteresis: <±1% RH
- › Additional errors at other temperatures: less than ±1% RH over -40° to 60°C
- › Long-term stability (maximum drift in clean air conditions): ±0.5% per year
- › Reported resolution: 0.001% RH
- › Repeatability (3σ noise level): 0.05% RH
- › Response time with filter: 8 s (63% response time in air moving at 1 m/s)

Temperature Measurement

- › Standard measurement range: -40°C to +70°C
- › Accuracy*:
Over the range -40 to +70°C: ±0.2°C
Over the range +20 to +60°C: ±0.1°C
- › Long term drift <0.03°C/yr.
- › Reported resolution: 0.001°C
- › Repeatability (3σ noise level): 0.04°C
- › Response time with filter: <130 s (63% response time in air moving at 1 m/s⁻¹)
- › Calibration traceability: NIST and NPL standards

*The accuracy figures quoted are the 95% confidence limits relative to factory standards.

