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WHEN MEASUREMENTS MATTER

HygroVUE5

Digital Temperature and Relative Humidity Sensor



Designed for General Meteorological and Other Data Logging Applications

Overview

The HygroVUE™5 Temperature and Relative Humidity Sensor is designed for general meteorological and environmental monitoring applications. It utilizes the SDI-12 communications protocol to communicate with any SDI-12 recorder, simplifying installation and programming. The sensing element is easily changed in the field, reducing downtime and calibration costs. It is the entry-level sensor in the HygroVUE™ line of relative humidity and temperature sensors.

Benefits and Features

- Uses a combined, pre-calibrated digital humidity and temperature element
- Field-changeable element for fast, on-site recalibration
- Digital SDI-12 output, allowing long cables with no added errors
- Simple data logger programming
- Low power consumption
- Wide operating voltage
- Rugged design with potted electronics
- Compact size for smaller radiation shields

Detailed Description

The HygroVUE™5 sensor has a user-replaceable chip element that incorporates both a temperature sensor and an RH sensor. Each element is individually calibrated with the calibration corrections stored on the chip.

Electronics within the HygroVUE™5 control the measurement made by the sensor element, apply temperature and linearization corrections to the readings, and present the data via SDI-12 to a data logger.

A stainless-steel mesh filter minimizes the effects of dust and dirt on the sensor, while allowing air exchange around the sensor element and reducing the chance that condensation remains inside the filter cap. A small PTFE membrane filter is bonded to the surface of the element, which prevents any finer dust or mold from directly influencing the measurement.

The sensor housing is designed to withstand permanent exposure to all weather. It fits into a range of radiation shields, including compact shields such as the RAD06 6-Plate Solar Radiation Shield.

For improved reliability, the sensor is factory fitted with a fixed length of cable, and the sensor body is then potted to completely seal the electronics and cable joint. A range of cable lengths is available.

Specifications

Sensor Element	SHT35 derivative (specially coated for reliability)
Calibration Traceability	NIST and NPL standards
Supply Voltage	7 to 28 Vdc
Warm-up Time	Sensor is normally powered all the time. If power is switched off, allow 1.8 s for sensor to power up.
Main Housing Material	White PET-P
Housing Classification	IP67 (electronics housing)
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 is fitted with a PTFE protective film with a filtration efficiency of > 99.99% for particles of 200 nm or larger size.
EMC Compliance	Tested and conforms to IEC61326:2013
Calibration	The sensor element is individually calibrated during manufacture.
Diameter	12.5 mm (0.49 in) at sensor tip, maximum 16 mm (0.63 in) at the cable end
Length	115 mm (4.52 in) sensor only, without cable

Maximum Current Drain

Quiescent	50 µA typical
During Measurement	0.6 mA (takes 0.5 s) typical

Temperature Measurement

Operating Range	-40 to +70°C
Accuracy	⟩ ±0.4°C (over the range -40 to +70°C) ⟩ ±0.3°C (over the range -20 to +60°C)
Long-Term Drift	< ±0.03°C per year
Reported Resolution	0.001°C
Repeatability	0.04°C Values are 3 standard deviations of 25 measurements at constant temperature.
Response Time	130 s (63% response time in air moving at 1 m/s)
Units	Degrees Celsius

Relative Humidity Measurement

Measurement Range	0 to 100% RH
Accuracy (at 25°C)	⟩ ±3% (over the range 80 to 100% RH) ⟩ ±1.8% (over the range 0 to 80% RH)
Additional Errors at Other Temperatures	< ±1% RH (over -40 to +60°C)
Short-Term Hysteresis	< ±1% RH
Long-Term Stability	±0.5% per year (maximum drift in clean air conditions)
Reported Resolution	0.001% RH
Repeatibility	0.05% RH Values are 3 standard deviations of 25 measurements at constant humidity.
Response Time with Filter	8 s (63% response time in air moving at 1 m/s at 25°C)

For comprehensive details, visit: www.campbellsci.com/hygrovue5

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