



NIST-Traceable Sensors

Davis weather stations and sensors are carefully manufactured in our California factory in accordance with a quality management system certified by DNV to be compliant to ISO 9001:2000. Each is tested for accuracy. However, additional testing and verification of specific sensors, called NIST-Traceable Certification, may be required for some users.

What is NIST?

In the USA, the National Institute of Standards and Technology (NIST) develops and maintain the standards of measurement to which all others are ultimately traced. Numerous calibrations, tests, and measurement assurance programs are delivered directly to approximately 10,000 companies. From these companies, NIST-traceable intermediate service providers are the next link in a network that joins together the makers and users of precision instruments.

A NIST-traceable certificate verifies that the unit has been compared to a NIST-traceable reference standard, and that it is accurate within stated specifications. It also shows the range of conditions under which the instrument was tested, the date the test was performed, and the expiration date of the certification, which is one year from the date of the test.

Which Davis sensors are NIST-traceable and how are they tested?*

Each NIST-traceable sensor is individually tested and compared to a calibrated standard.

- **Relative Humidity**

The inside and outside humidity sensors are tested in a humidity and temperature-controlled chamber and verified in comparison with a General Eastern M4-RH Dew Point Monitor. Temperature is maintained at 72°F/22°C, and the humidity is varied to several check points.

- **Temperature**

Inside and outside temperature sensors are tested in a temperature-controlled chamber at several different temperatures and verified against a Vaisala HMP-233 Temperature Sensor.

- **Barometric Pressure**

Barometric pressure is tested at several different pressures and verified in comparison to a Vaisala PTB-220A Digital Barometer.

- **Wind Speed**

Wind cups are tested in a subsonic wind tunnel operating at up to approximately 33.5 m/s (75 mph/121 kph), and verified at various speeds in comparison to a MKS Baratron 223B Pressure Transducer (Electronic Pitot Tube).

- **Rainfall**

The rain sensor is tested and verified in comparison to a CAVRO XL 3000 Modular Digital Pump.

* *NIST-traceable certification is available for the following Vantage Vue sensors only: inside humidity, inside temperature, and barometric pressure.*

NIST– Traceable Methodology & Standard Accuracy

SENSOR	STANDARD'S CALIBRATED ACCURACY	SENSOR'S CHECKED & VERIFIED ACCURACY	CHECK POINTS
Inside Humidity	± 0.1% RH at 33% RH, ± 0.3% between 80% RH and 90% RH	± 5% RH between 33% RH and 90% RH	33% RH, 80% RH and 90% RH
Outside Humidity		± 3% RH between 33% RH and 90% RH	
Inside Temperature	±0.4°F (0.2°C)	± 1°F (0.5°C) between 40°F and 110°F (4°C and 43°C) ± 2°F (1°C) between 95°F and 140°F (35°C and 60°C)	40°F, 60°F, 80°F, 100°F, and 140°F (4°C, 15°C, 27°C, 38°C, and 60°C)
Outside Temperature		± 2°F (1°C) between -40°F and +15°F (-40°C and -9°C) ± 1°F (0.5°C) between +15°F and 95°F (-9°C and 35°C) ± 2°F (1°C) between 95°F and 140°F (35°C and 60°C)	-40°F, -15°F, 0°F, 40°F, 60°F, 80°F, 100°F, and 140°F (-40°C, -26°C, 18°C, 4°C, 15°C, 27°C, 38°C, and 60°C)
Barometric Pressure, Perception II	±0.003" Hg	± 0.05" Hg (1.7 hPa) between 20" Hg and 30" Hg (677 hPa and 1016 hPa)	20.00" Hg, 22.25" Hg, 25.00" Hg, 27.75" Hg, and 30.00" Hg (677 hPa, 753 hPa, 847 hPa, 940 hPa, and 1016 hPa)
Barometric Pressure, Vantage Pro2 & Vantage Vue		± 0.03" Hg (1.0 hPa) between 20" Hg and 30" Hg (677 hPa and 1016 hPa)	
Wind Speed	± 2 mph	± 2 mph (0.9 m/s) below 40 mph (18.0 m/s) ± 5% above 40 mph (18.0 m/s)	6, 12, 25, 40, and 75 mph (2.7, 5.4, 11.2, 18.0, and 33.8 m/s)
Rain, 0.01"	± .07 ml = ±0.0001" (0.003 mm) rain = 1/100 tip	± 4% + 1 tip at a rain rate of up to 2"/hr	1.00" total at a rain rate of 0.39"/hr
Rain, 0.2 mm		± 4% + 1 tip at a rain rate of up to 50 mm/hr	25.4 mm total at a rain rate of 10 mm/hr

Need more information?

More information on the National Institute of Standards and Technology can be found on its website at www.nist.gov/index.html

A chart showing complete sensor accuracy, resolution and range of all Davis weather sensors can be found on the Davis website at www.davisnet.com/weather/choose_stations_detail.pdf