

# HygroVue<sup>TM</sup>5

Digital Temperature and Relative Humidity Sensor

**Designed for General Meteorological  
and Other Data Logging Applications**



## Overview

The HygroVue<sup>TM</sup>5 Temperature and Relative Humidity Sensor is designed for general meteorological and environmental monitoring applications. It uses 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

<b>Sensor Element</b>	SHT35 derivative (specially coated for reliability)
<b>Calibration Traceability</b>	NIST and NPL standards
<b>Supply Voltage</b>	7 to 28 Vdc
<b>Warm-up Time</b>	Sensor is normally powered all the time. If power is switched off, allow 1.8 s for sensor to power up.
<b>Main Housing Material</b>	White PET-P
<b>Housing Classification</b>	IP67 (electronics housing)
<b>Sensor Protection</b>	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.
<b>EMC Compliance</b>	Tested and conforms to IEC 61326:2013
<b>Calibration</b>	The sensor element is individually calibrated during manufacture.

<b>Field-Replaceable Chip or Recalibrate</b>	Field-replaceable chip
<b>Diameter</b>	12.5 mm (0.49 in.) at sensor tip, maximum 16 mm (0.63 in.) at the cable end
<b>Length</b>	115 mm (4.52 in.) sensor only, without cable

**Maximum Current Drain**

<b>Quiescent</b>	50 µA typical
<b>During Measurement</b>	0.6 mA (takes 0.5 s) typical



## Air Temperature

Measurement Range	-40° to +70°C
Accuracy	<ul style="list-style-type: none"><li>■ <math>\pm 0.4^{\circ}\text{C}</math> (over the range -40° to +70°C)</li><li>■ <math>\pm 0.3^{\circ}\text{C}</math> (over the range 20° to 60°C)</li></ul>
Long-Term Drift	$< \pm 0.03^{\circ}\text{C}$ 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 Range	0 to 100% RH
Accuracy	<ul style="list-style-type: none"><li>■ <math>\pm 1.8\%</math> (at 25°C, over the range 0 to 80% RH)</li><li>■ <math>\pm 3\%</math> (at 25°C, over the range 80 to 100% RH)</li></ul>
Additional Errors at Other Temperatures	$< \pm 1\%$ RH (over -40° to +60°C)
Short-Term Hysteresis	$< \pm 1\%$ RH
Long-Term Stability	$\pm 0.5\%$ per year (maximum drift in clear air conditions)
Reported Resolution	0.001% RH
Repeatability	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)

