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CS215 Temperature and Relative Humidity Probe

A cost effective probe suitable for a wide range of monitoring applications

Introduction

The CS215 utilises a novel, Swiss-made, combined relative humidity and temperature element based on CMOSens® technology that offers good measurement accuracy and stability.

These elements have been tested in Switzerland over a period of years in Alpine conditions and shown to work within their specifications through extreme weather.

The CS215 probe is specifically designed for field use with dimensions to suit common radiation shields (see over).

It features a digital SDI-12 output allowing simple connection and measurement by many datalogging systems.

Field Calibration

Calibration is easy to carry out by simply changing the sensor element. As each sensor element is individually calibrated no further adjustments of the probe are required, i.e. changing the element returns the probe to the factory calibration state for both temperature and humidity.

This feature means the probe can be recalibrated in the field for a reasonable cost without interrupting the measurements for long periods.

Key Features

Uses a novel, combined digital humidity and temperature element

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

Typical Applications

Automatic Weather Stations

Environmental monitoring and control

Moisture monitoring in building materials

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CS215 Specifications

Sensing Element: Sensirion SHT75

Relative Humidity Measurement:

MEASUREMENT RANGE: 0 to 100% RH

ACCURACY (AT 25°C): ±2% over 10-90% RH, ±4% over 0–100% RH

SHORT TERM HYSTERESIS: <1% RH

TEMPERATURE DEPENDENCE: better than ±2% over -20° to 60°C

LONG-TERM STABILITY (TYPICAL): ±1.0% per year

RESPONSE TIME WITH FILTER: <20s (63% response time in still air)

CALIBRATION TRACEABILITY: NIST and NPL standards

Temperature Measurement:

MEASUREMENT RANGE: -40°C to +70°C

ACCURACY: ±0.3°C at 25°C, ±0.4°C over +5° to +40°C, ±0.9°C over -40° to +70°C

RESPONSE TIME WITH FILTER: <120 s (63% response time in air moving at 1 m/s^{-1})

Electrical:

SUPPLY VOLTAGE: 6-16V DC

CURRENT DRAIN (TYPICAL): Quiescent: 120µA quiescent, During measurement: 1.7mA (takes 0.7 sec)

EMC COMPLIANCE: Tested and conforms to IEC61326:2002

Sensor output:

COMMUNICATION STANDARD: SDI-12 V1.3 (responds to a subset of commands)

Output resolution: 0.03% RH, 0.01°C

Physical:

OPERATING TEMPERATURE RANGE: -40°C to +70°C

WEIGHT: 150g (incl. 3m of cable)

STANDARD CABLE LENGTH: 3m

CABLE TYPE: Low-temperature cable with Santoprene outer jacket

HOUSING MATERIAL: Anodised aluminium

HOUSING CLASSIFICATION: IP65 (NEMA 4)

SENSOR PROTECTION: Outer glass-filled polypropylene cap. Inner expanded PTFE filter. Filter material has a porosity of 64% and a pore size <3 µm

DIMENSIONS:
Diameter 12mm at sensor tip
18mm at cable end
Length 180mm including cable strain relief

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 MET20 shield for this probe as it performs better than most other shields of a similar design. The MET21 shield can also be used for slightly improved accuracy for a small increase in price. Please request a leaflet on those products 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, although these require significant power. Please contact Campbell Scientific for further details of these options.