SOLIDRH SHR – PRECISE MEASUREMENTS TO INDICATE WHEN A CONCRETE SURFACE CAN BE COVERED, AND ELECTRONIC REPORTING

SolidRH SHR is a wireless sensor developed by Wiiste Oy for the measurement of relative humidity and temperature in air and structures. This sensor has been designed especially for precise measurements to indicate when a concrete surface can be covered, and its structure is optimised for measurements completed with the bore-hole method.

SolidRH system

SolidRH is a system for the measurement of a structure's relative humidity and temperature. The system is especially designed for measurements related to the detection of whether a covering material can be applied on top of a concrete surface, and for the long-term monitoring of structural humidity.

The system includes various types of sensors which can be read using the same reader. The sensors do not include an energy source; the required energy is transferred wirelessly, using the reader when performing the measurement.

From the reader, the measurement data can be transferred to the Relia cloud service in order to enable easy data management and reporting.

Use of the SolidRH SHR sensor

In a bore-hole measurement, the sensor is installed in the measurement sleeve such that the measurement head reaches the bottom of the hole and, at the same time, the sealing rubber closes the upper part of the sleeve tightly. The correct depth and upper part sealing of the sleeve is reached easily by using a measurement sleeve with a length of 120 mm and an inner diameter of 12.5–13.0 mm. If necessary, sealing is ensured using non-hygroscopic sealing putty.

When measuring humidity in concrete, the equilibrium time depends on the quality, humidity and temperature of the concrete. Typically, a measurement tube equilibrium is reached by using a one-hour equilibrating time.

When installing the sensor in concrete, the drilling of the installation hole, and the installation and measurement are performed by applying the instructions of the building information file card RT 14-10984 on the measurement of relative humidity in concrete, utilising the bore hole method.

For more detailed instructions, refer to the SolidRH system user instructions.

Serial numbering

Each sensor has a unique serial number. The serial number is programmed into the sensor memory and it is always read during the measuring.

Calibration

The SolidRH SHR sensor is delivered factory-calibrated. Operating conditions and frequency of use affect the calibration interval. The sensor must be re-calibrated, if there is reason to suspect that the specified measurement accuracy is no longer obtained. It is recommended that the sensor is calibrated at least once a year.

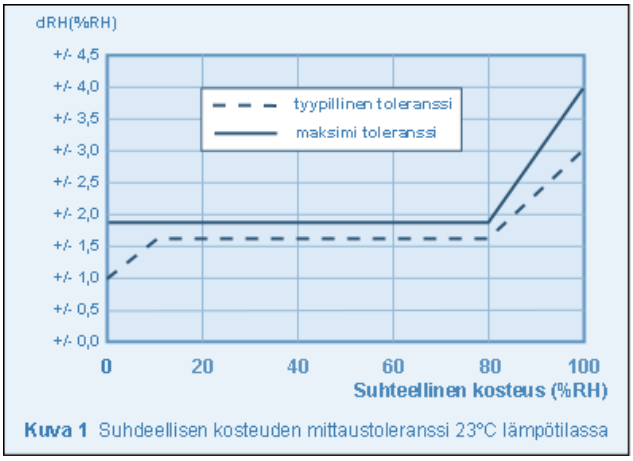
Characteristics

- Measurement range 0…100 %RH, -40…125 ºC
- Accuracy ±1.8 %RH, ±0.2 ºC
- Good long-term stability
- High measurement reproducibility
- Stable in high humidity conditions
- Temperature-compensated
- Electronic reporting

TECHNICAL DATA

HUMIDITY MEASUREMENT

Measurement range[1]	0 … 100 % RH
Measurement accuracy[2]	±1.8 % RH (0 … 80 % RH), see Figure 1
Reproducibility[3]	±0.2 % RH
Hysteresis	< ±1 % RH
Resolution	0.1 % RH
Linearity error	< ±1 % RH
Response time t_{63}	< 4 s
Tk residual error	0.05 % RH / K (0 … 60°)
Long-term stability	< 0.5 % RH / a
Sensor type	capacitive polymer

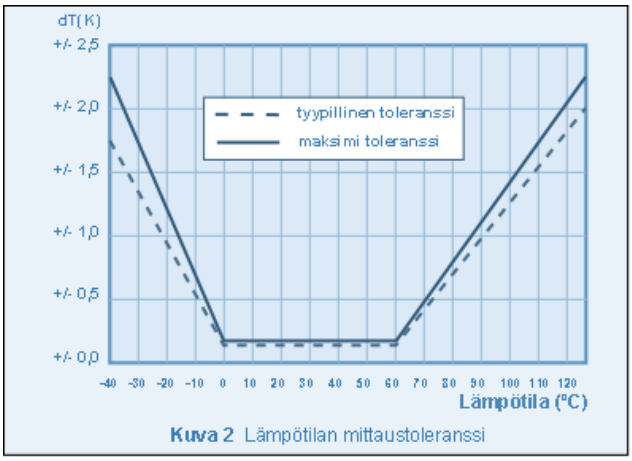


Kuva 1 Suhdeellisen kosteuden mittaustoleranssi 23°C lämpötilassa

(1) The maximum condensation point is limited to 80 °C.
(2) Accuracy has been tested at 23 °C in the direction of rising relative humidity. The Tk residual error, linearity error or hysteresis have not been considered in the accuracy.
(3) Reproducibility has been measured in the same direction, and it does not consider hysteresis.

TEMPERATURE MEASUREMENT

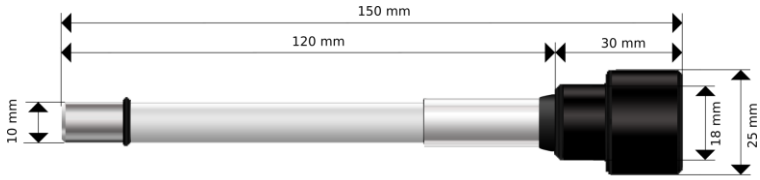
Measurement range	- 40 … 125 ºC
Measurement accuracy	±0.2 K (0 … 60 ºC), see Figure 2
Reproducibility	±0.1 K
Resolution	0.1 ºC
Response time t_{63}	< 5 s
Long-term stability	< 0.05 K / a
Sensor type	PTAT



Kuva 2 Lämpötilan mittaustoleranssi

MECHANICS

Dimensions	see Figure 3
Weight	33 g
IP protection class	IP65



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