



# HYT 939P P14 Assembly

## RH/T Module

### For continuous humidity and temperature monitoring

#### Benefits & characteristics

- Ready-to-use, factory calibrated sensor for continuous humidity temperature measurement
- Assembled into compact screw-in housing for an air-tight installation with minimal insertion depth
- Resistant to condensation and temperature changes
- Stable at high humidity
- For a long lifespan in industrial applications

#### Applications

- Industrial drying
- Air supply and gas filtration systems
- Storage and indoor climate control
- Process control, incl. monitoring of optical equipment sensitive to humidity and condensation



156389 RH/T module

A compact and **ready-to-use** sensor for continuous and highly accurate measurement of relative humidity and temperature. System integration is made easy by a digital interface and small screw-in housing. Custom calibration and assembly options upon request



156390 RH/T module with PTFE filter

**Optional:** PTFE filter for particle and VOC retention when required for extended exposure under harsh industrial conditions:



## Technical Data



|                                | Humidity                                                                                                                                                    | Temperature              |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Accuracy:                      | ±1.8 % RH at +23 °C (0 % RH to 90 % RH)<br>See figure 1 for typical accuracies in the measuring temperature range. Custom specific alternatives available.  | ±0.2 °C (0 °C to +60 °C) |
| Reproducibility:               | ±0.2 % RH                                                                                                                                                   | ±0.1 °C                  |
| Resolution:                    | 0.03 % RH                                                                                                                                                   | 0.015 °C                 |
| Response time $t_{63}^1$ :     | < 10 s                                                                                                                                                      | < 10 s                   |
| Long-term drift:               | < 0.5 %RH/a (at 23 °C 0 %RH to 10 %RH in synthetic air)<br>Exposure to VOCs can lead to higher values.<br>Please find more details in HYT application note. | < 0.05 °C/a              |
| Measurement principle:         | Capacitive polymer humidity sensor                                                                                                                          |                          |
| Measuring range <sup>2</sup>   | 0 - 90 %RH (For usage in condensing environment please refer to HYT application note)                                                                       | 0 °C to +60 °C           |
| Hysteresis:                    | < ±1 % RH at 25 °C                                                                                                                                          |                          |
| Operating voltage:             | 2.7 V to 5.5 V                                                                                                                                              |                          |
| Current consumption (nominal): | < 22 µA at 1 Hz measuring rate; 850 µA max.                                                                                                                 |                          |
| Current consumption (sleep):   | < 1 µA                                                                                                                                                      |                          |
| Digital interface:             | I <sup>2</sup> C, address 0x28 or alternative address                                                                                                       |                          |
| Operating voltage (limits):    | -0.3 V to 6 V                                                                                                                                               |                          |
| Operating range <sup>3</sup> : | -40 °C to +80 °C, 0-100 %RH                                                                                                                                 |                          |
| Housing material               | Stainless steel 1.4571                                                                                                                                      |                          |
| Process connector              | M14 x 1.5                                                                                                                                                   |                          |
| Cable <sup>4</sup>             | 4x AWG 26, 500 mm                                                                                                                                           |                          |
| Storage conditions:            | +5 °C to 30 °C, < 30 % RH.                                                                                                                                  |                          |

<sup>1</sup>) The response time is often measured for increasing humidity steps, whereas physics predicts that decreasing humidity leads to generally far longer response times for capacitive humidity sensors. IST always measures response times for decreasing humidity values, since this is the worst case.

<sup>2</sup>) In the specified range the modules measure according to typical accuracies demonstrated in figure 1. At T > 60 °C and/or high humidity over a long period of time, an offset in the %RH signal can occur

<sup>3</sup>) Specifies the temperature range the modules work without permanent damage. Operation/storage above +60 °C can lead to an offset of the %RH signal

<sup>4</sup>) The maximum bending radius of the cable is for single bending 5 x outer diameter (4.1 mm) and for repeated bending 20x outer diameter (4.1 mm). Bending closer than 50 mm to the housing is discouraged and might harm the cable or potting material. The cable must not be stretched or pulled.



# Accuracies

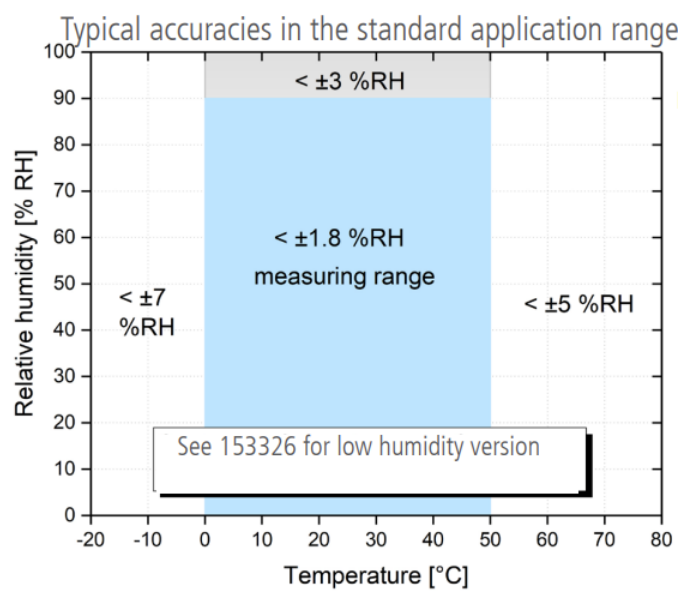
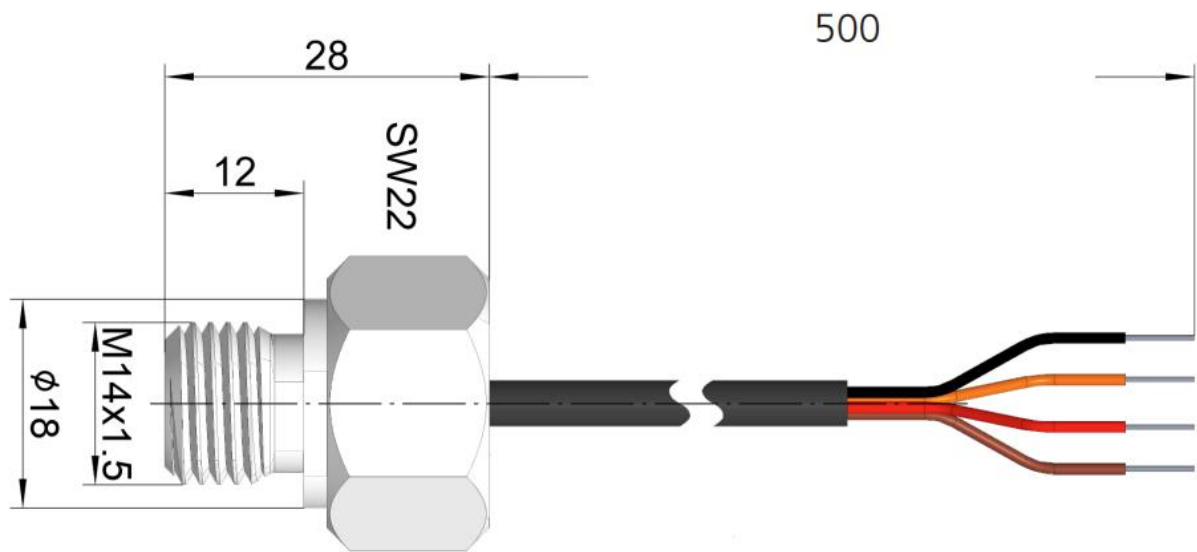


Fig. 1: Typical tolerance of the % RH measurement

# Mechanical Dimensions



# Pin Assignment

|                  |       |        |       |     |
|------------------|-------|--------|-------|-----|
| Insulation color | Black | Orange | Brown | Red |
| Assignment       | SDA   | SCL    | GND   | VCC |



## Order Information

| Description  | RH/T Module              | RH/T module with PTFE filter |
|--------------|--------------------------|------------------------------|
| Product name | HPM.HYT.939p.P.0.SK.SA.S | HPM.HYT.939p.P.0.SK.SA.S     |
| Order code   | 156389                   | 156390                       |

## Additional Documents

|                   |                |
|-------------------|----------------|
|                   | Document name: |
| Application Note: | AHHYTM_E       |

Please find software code examples on [www.ist-ag.com](http://www.ist-ag.com).



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