HYT 271/939P/221

Digital Humidity and Temperature Module

Optimal for general purpose humidity applications with best accuracy at 0 - 50 °C and 0 - 90 % RH

Benefits & Characteristics

- Fast response time (HYT 271)
- Low hysteresis
- Low drift
- Stable at high humidity
- Custom specific versions

- Humidity and temperature sensor with excellent accuracy
- Easy integration, interchangeable without adjustments
- I²C protocol
- Fully calibrated and temperature compensated

The HYT humidity module family

HYT 271
The fastest and smallest of the HYT family is the 271. The digital module with only 10.2 x 5.1 x 1.8 mm size offers a wide application window and an optimal price-performance-ratio. It is only the best solution for fast measurements or sophisticated mass applications.
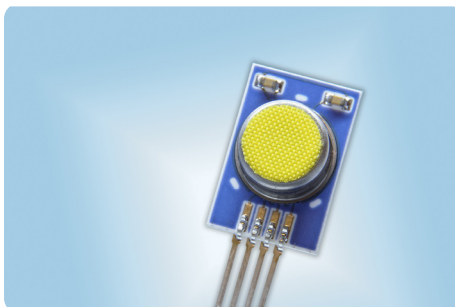

HYT 221
The round stainless-steel casing can be easily fitted into housing openings and sealed against a wall with the use of an O-Ring. A textile membrane filter with hydrophobic coating protects the sensor from dust while enabling a compact assembly with high dynamic responsiveness.

HYT 939P
The strongest of the HYT modules in TO39 packaging particularly features mechanical robustness. Through glass to metal seals and welding of the stainless-steel cap onto the metal header, it is pressure tight up to 16 bar.
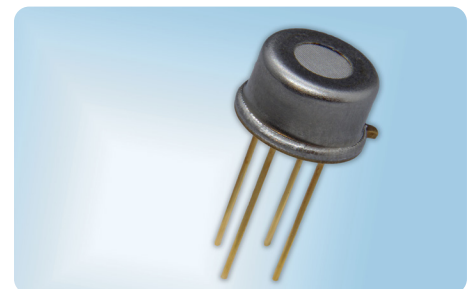
Custom specific versions:

If a higher accuracy or different sensor design is needed, the modular design of HYT allows for high flexibility – the sensor, its calibration and assembly can easily be adapted to develop tailor-made modules fulfilling individual demands. Customized IST AG humidity modules feature extraordinary response times, high accuracies in condensing environment or low humidity conditions. Please contact us for custom specific versions.

Technical Data

	Humidity			Temperature		
Accuracy:	±1.8 % RH at +23 °C (0 % RH to 90 % RH)			±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]:	271	221	939P	271	221	939P
	< 4 s	< 10 s	< 10 s	< 5 s	< 10 s	< 10 s
Long-term drift:	< 0.5 % RH/a (at 23 °C and 30 % RH to 70 % RH in synthetic air) Exposure to VOCs can lead to higher values. Please find more details in HYT application note.			< 0.05 °C/a		
Measurement principle:	Capacitive polymer humidity sensor			PTAT (integrated)		

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:	I²C, address 0x28 or alternative address
Operating voltage (limits):	-0.3 V to 6 V
Measuring range[2]:	0 °C to 50 °C, 0 % RH to 90 % RH For usage in condensing environment please refer to HYT application note.
Operating range[3]:	-40 to 125 °C, 0 to 100 % RH Non-condensing. For usage in condensing environment please refer to HYT application note.
Storage conditions:	-5 to 30 °C, < 30 % RH Please refer to HYT application note for packaging recommendations.

[1] 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.

²⁾ In the specified range the modules measure within typical tolerance ±1.8 % RH, see Fig. 1. At T > 50 °C and/or high humidity over a long period of time, an offset in the % RH signal can occur. Please refer to HYT application note for reconditioning procedure.

³⁾ Specifies the range the modules work without permanent damage. % RH/T tolerances etc. cannot be guaranteed in these conditions.
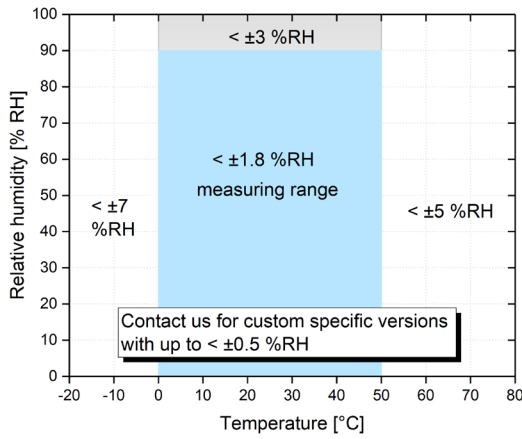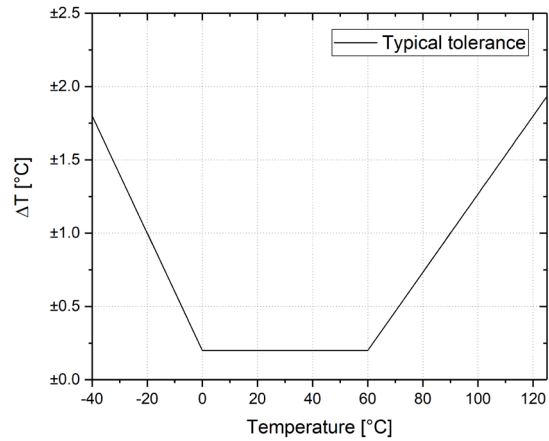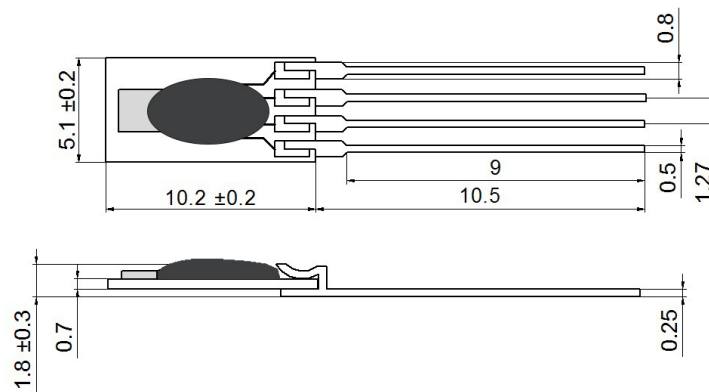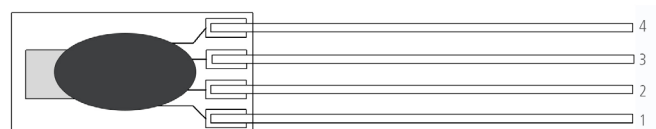
Fig. 1: Typical tolerance of the % RH measurement

Fig. 2: Typical tolerance of the temperature measurement

HYT 271

Mechanical Dimensions

Pin Assignment

1	2	3	4
SDA	GND	VDD	SCL

HYT 221

Mechanical Dimensions
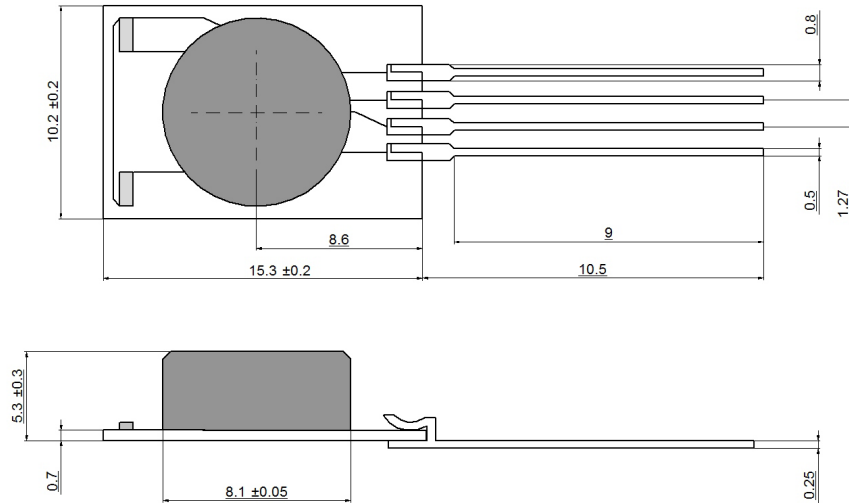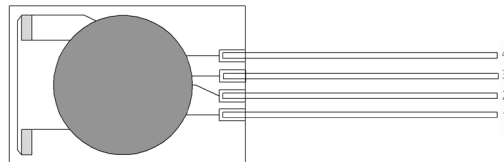
Pin Assignment

1	2	3	4
SDA	GND	VCC	SCL

HYT 939P

Mechanical Dimensions

5.08 mm ±0.35

0.8 ±0.1

Ø9 ±0.1

9.8 ±0.1

4.2 ±0.1

Ø8.1 ±0.1

3.59 ±0.25

0.45

5.2 ±0.2

13.5 ±0.1

Pin Assignment

bottom view
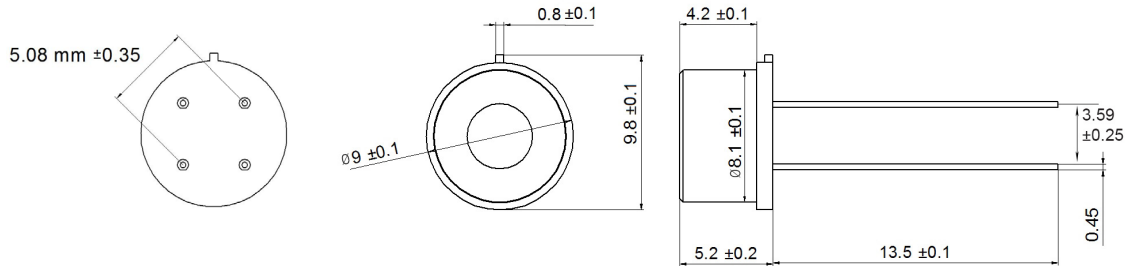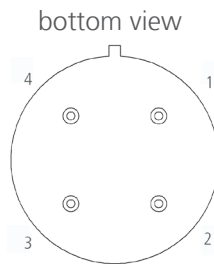
1	2	3	4
SCL	VCC	GND	SDA

Order information

Version	HYT 271	HYT 221	HYT 939P
Order code	153349	153680	153658

Additional Documents

	Document name
Application Note	AHHYTM_E

Please find software code examples on www.ist-ag.com.