



HYT 939P with PTFE filter

Digital Humidity and Temperature Module

Optimal for industrial drying applications

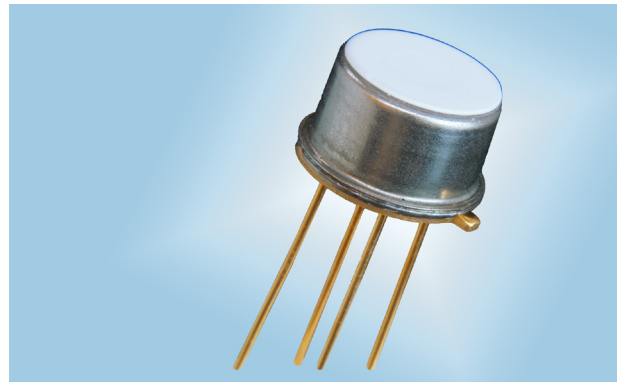
Benefits & Characteristics

- Fast response time
- Low drift and hysteresis
- Stable at high humidity
- Standard I²C protocol digital output
- Humidity and temperature sensor with excellent accuracy
- Easy integration, interchangeable without adjustments
- Fully calibrated and temperature compensated
- Application specific calibration and housing design possible

Product description

HYT 939P

The compact TO39 housing with a PTFE filter allows for optimal positioning in the monitored process. The welded filter cap protects the sensor in industrial settings while maintaining a fast response time.



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 :	< 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 lower influence on measured results. 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 μ A
Digital interface:	I ² C, 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.

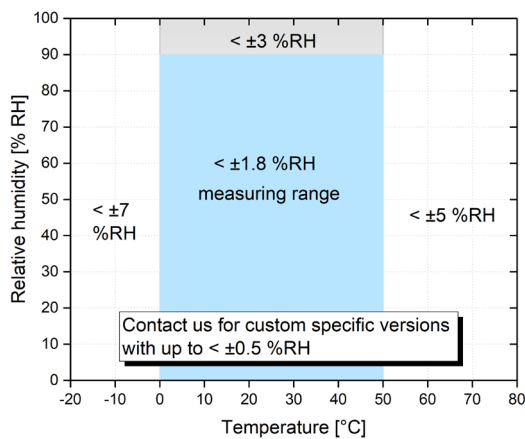


Fig. 1: Typical tolerance of the % RH measurement

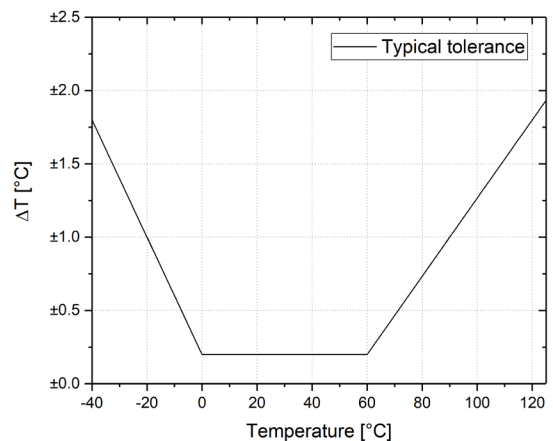


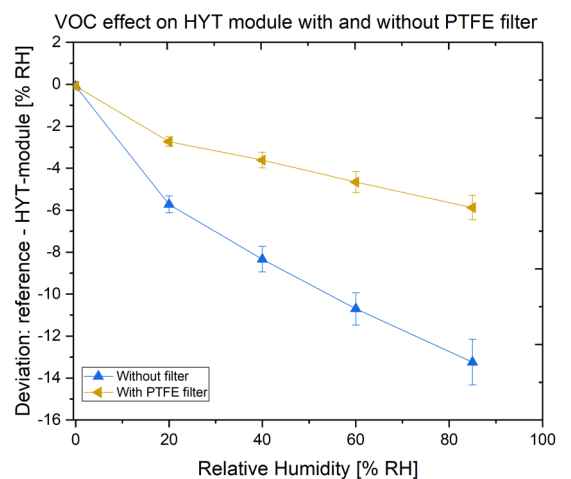
Fig. 2: Typical tolerance of the temperature measurement

Performance test of HYT modules with PTFE filter

HYT modules with and without PTFE filter were exposed to an atmosphere with high concentration of VOC (Volatile Organic Compounds) generated by strongly outgassing potting materials.

During the 4 weeks long exposure in a closed and sealed environment, contact with VOC led to a negative drift in the relative humidity signal of the tested sensors. The presence of a PTFE filter cap has considerably limited the contact with VOC molecules and thereby minimized the drift effect on the HYT module.

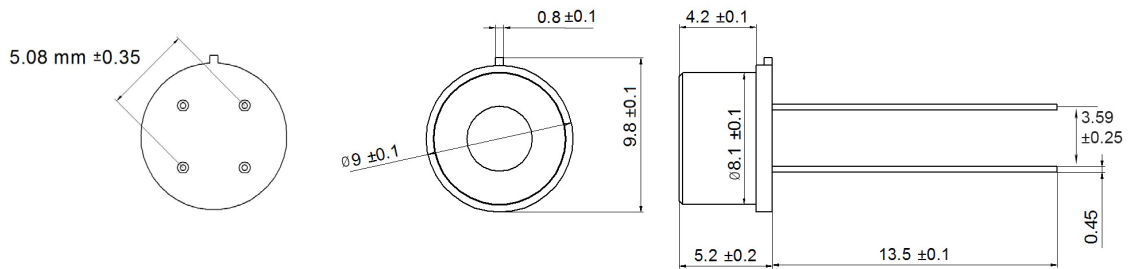
The measurement graph shows the deviation of the %RH signal of the modules compared to a dew-point mirror. As can be seen in the graph, the PTFE filter limits the drift even under this extremely unfavorable environmental conditions by a factor of more than 2 compared to modules without filter.



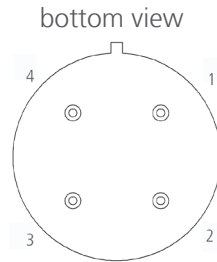


HYT 939 with PTFE filter

Mechanical Dimensions



Pin Assignment



1	2	3	4
SCL	VCC	GND	SDA

Order information

Version	HYT 939P with PTFE filter
Order code	154417

Additional Documents

	Document name
Application Note	AHHYTM_E

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



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