HYGROCHIP
DIGITAL HUMIDITY SENSOR HYT-939

HUMIDITY
TEMPERATURE
FLOW
CONDUCTIVITY

RoHS

Characteristic Features

- **Measuring range 0 .. 100% rH, -40 … 125°C**
- **Resistant to pressure up to 16 bar**
  (Proposals for pressure-tight fitting see application note)
- **I²C protocol for humidity and temperature**
  (address 0x28 or alternative address)
- **Accuracy ±1.8% rH, ±0.2°C**
- **Temperature compensated**

Typical Areas of Application

- **Medical systems**
- **Autoclaves**
- **Pressure dew point measurement**
- **Drying systems**
- **Laboratories**

Features

HYT 939 – the specialist for compressed air

The welded, hermetically sealed TO 39 housing with glass grommet and metal filter is designed for compressed air systems up to 16 bar.

Precisely calibrated, the HYT 939 delivers an accuracy of ±1.8% rH and ±0.2°C. Further features are the integrated signal processing for measuring the physical parameters of relative humidity and temperature, the I²C compatible interface, easy interchangeability without adjustment as well as mechanical robustness, chemical resistance, dew formation resistance and long-term stability.

Both the linearity error and temperature drift are corrected “OnChip” through computation.

Because of the special robust construction, the sensor also withstands peak loading at high temperatures. Therefore, this special model is also ideal for extremely sophisticated industrial applications in drying systems and suitable for medical systems.

Further variants and the full spectrum of the HYGROCHIP product series can be found at:

http://www.hygrochip.com

IST
INNOVATIVE SENSOR TECHNOLOGY

IST AG, Industriestrasse 2, CH-9630 Wattwil, Switzerland, Phone (+)41 71 987 73 73, Fax (+)41 71 987 73 77
e-mail info@ist-ag.com, www.ist-ag.com

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Technical Data

Humidity Measurement	
Humidity measuring range (1)	0 ... 100% rH see Figure 3
Humidity accuracy (2) (Maximum tolerance)	±1.8% rH (10 ... 80% rH) see Figure 1
Accuracy humidity 0 .. 10% RH (0 ... 50 ° C) (Typical tolerance)	±(1% rF + 8% a_w) a_w = rF / 100%
Hysterisis (50% rH)	< ±1% rH
Humidity resolution	0.02% rH
Linearity error	< ±1% rH
Response time t_{63}	< 10 sec with Sinter filter
Tk Residual error (50% rH)	0.05% rH / K (0 ... 60°C)
Long term drift	< 0.5% rH / a
Measuring principle	Capacitive polymer humidity sensor

Temperature Measurement	
Temperature measuring range	- 40 ... +125°C
Temperature accuracy	±0.2°C (0 ... 60°C) see Figure 2
Reproducibility	±0.1K
Response time t_{63}	< 10 sec with membrane filter
Temperature resolution	0.015°C
Long term drift	< 0.05K / a
Measuring principle	PTAT (integrated)

Relative Humidity Accuracy

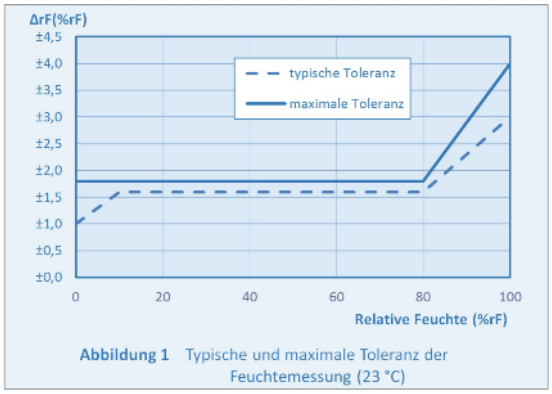

Abbildung 1 Typische und maximale Toleranz der Feuchtemessung (23 °C)

(1) The maximum dew point is limited to 80°C.

(2) The accuracy is tested at 23°C and 3.3V operating voltage in the direction of rising humidity. The accuracy does not include Tk-Residual error, residual linearity error or hysterisis effect.

(3) The repeatability is measured in the same direction and does not consider the hysterisis effect

Temperature Measurement Accuracy

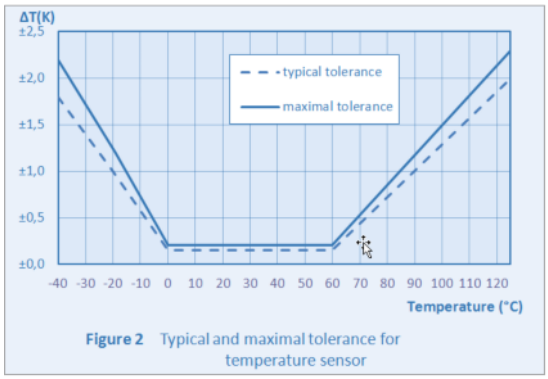

Figure 2 Typical and maximal tolerance for temperature sensor

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Humidity Application Range

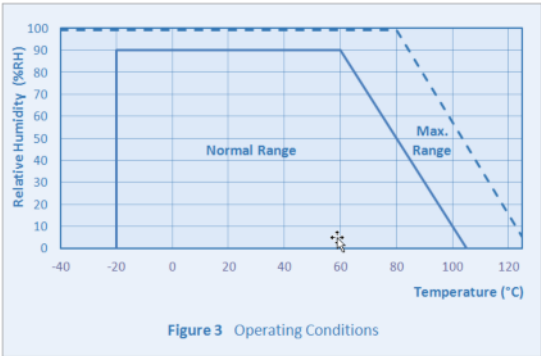
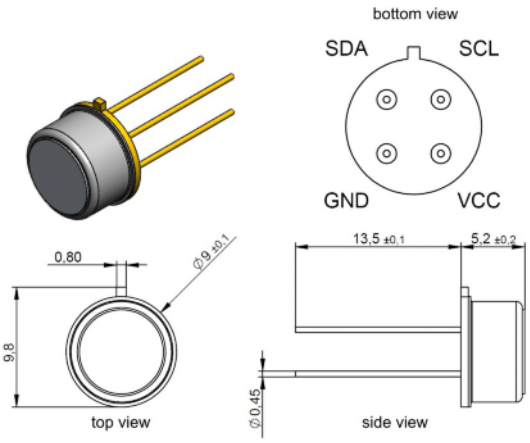


Figure 3 Operating Conditions

Mechanical Dimensions



Operating Data	
Operating voltage	2.7 … 5.5V
Current consumption (Nominal)	< 22µA at 1Hz measuring rate 850µA maximum
Current consumption (Sleep)	< 1µA
Application temperature	-40°C ... 125°C
Humidity application range	0 ... 100% rH
Digital interface	I^2C, address 0x28 or alternative address

Limits	
Operating voltage	-0.3 … 6.0V
Storage temperature	-20°C ... 80°C

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