HUMIDITY

TEMPERATURE

FLOW

CONDUCTIVITY

P14-W

Capacitive Humidity Sensor

For various humidity applications

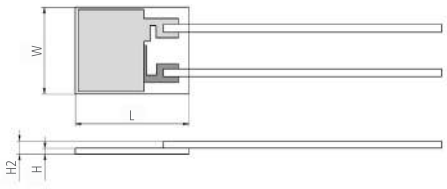
INNOVATIVE SENSOR TECHNOLOGY

Benefits & Characteristics

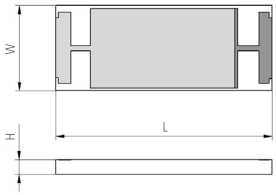
- High chemical resistance
- Wide temperature range
- Resistance to condensation
- Fast recovery time
- Very low drift
- High humidity stability
- Customer specific sensor available upon request

Illustration[1)]

Wired



SMD



1) For actual size, see dimensions

Technical Data

	Wired	SMD
Dimensions (L x W x H / H2 in mm):	5 x 3.81 x 0.4 / 0.8	6.35 x 2.54 x 0.4
Capacitance at 30 % RH and +23 °C (C_{30}):*	150 pF ±50 pF	180 pF ±50 pF
Sensitivity at C_{30} = 150 pF/ 180 pF (15 % RH to 90 % RH):	0.25 pF/% RH	0.3 pF/% RH

Operating humidity range:	0 % RH to 100 % RH (maximal dew point +85 °C)	
Operating temperature range:	-50 °C to +150 °C	
Loss factor:	< 0.01 (at +23 °C, at 10 kHz, at 90 % RH)	
Linearity error:	< 1.5 % RH (15 % RH to 90 % RH at +23 °C after one point calibration)	
Hysteresis:	< 1.5 % RH	
Response time t_{63}:	< 5 s (50 % RH to 0 % RH at +23 °C)	
Temperature dependence (nominal):	Δ % RH = (B1 x % RH + B2) x T [°C] + (B3 x % RH + B4)	
	B1 = 0.0014 [1/ °C]	B2 = 0.1325 [% RH/ °C]
	B3 = -0.0317	B4 = -3.0876 [% RH]
Measurement frequency:	1 kHz to 100 kHz (recommended 10 kHz)	
Maximal supply voltage:	< 12 V_{pp} AC	
Signal form:	alternating signal without DC bias	
Connections:*	CuP-SIL-wire post-plated with Sn, 10 mm or Au/Cu-wire, Ø 0.4 mm, 10 mm, or SMD, automatic assembly compatible	

* Customer specific alternatives available

The calibration of the sensor must be done 5 days after soldering at the earliest.

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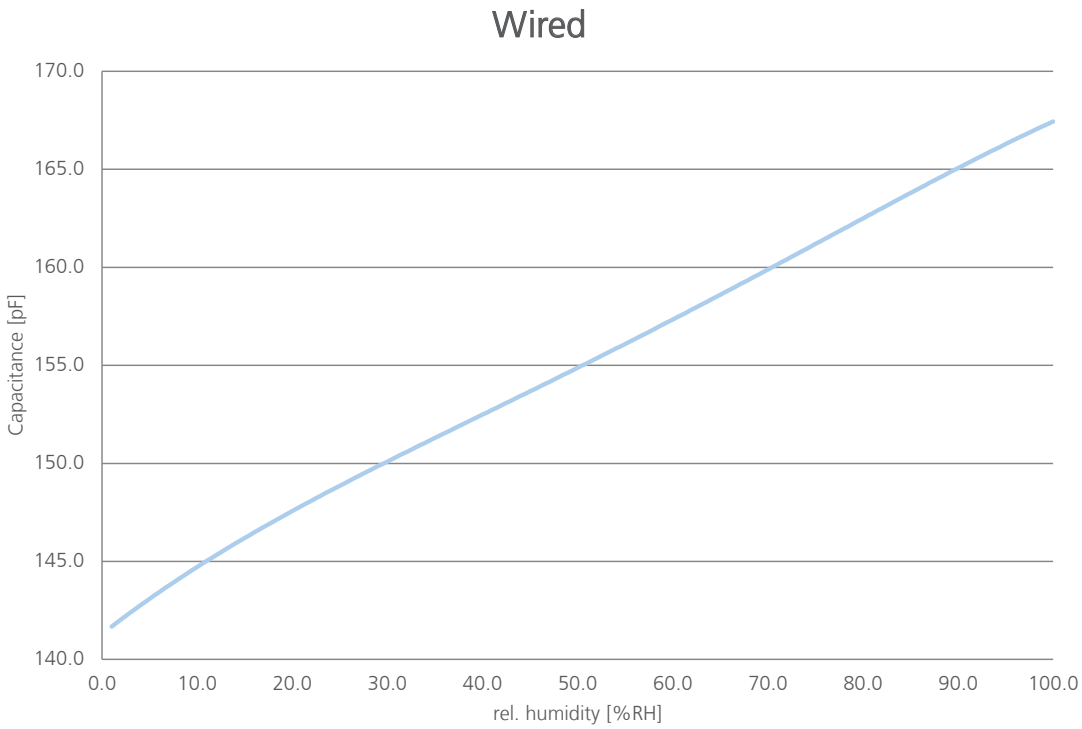
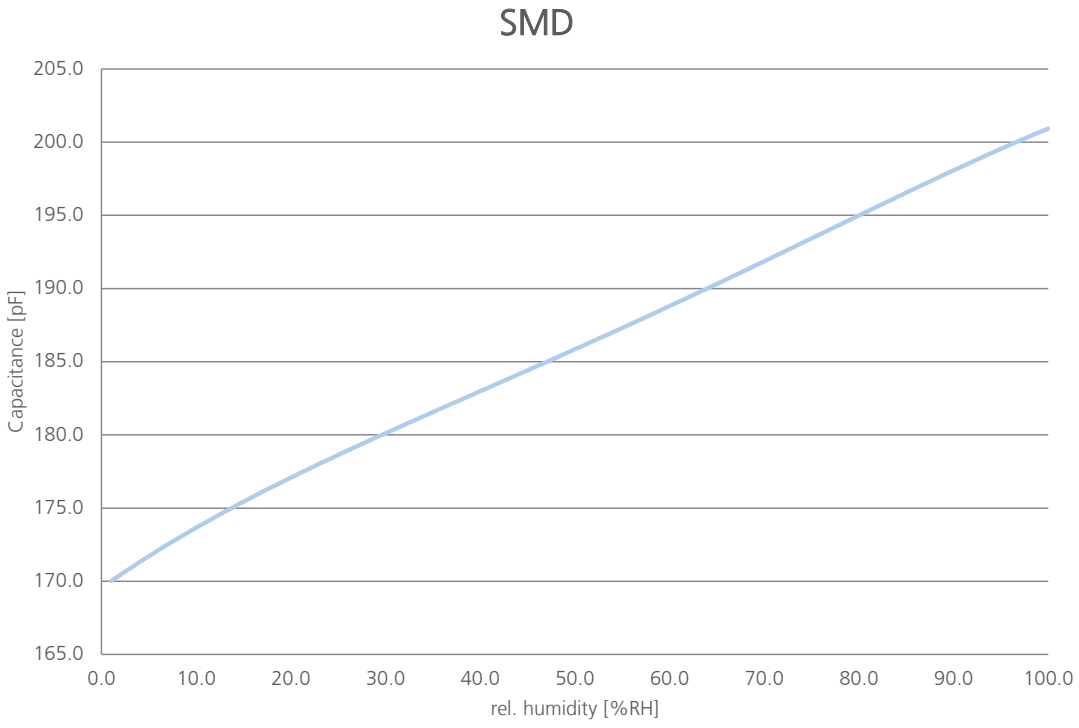
Characteristic Curve





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Order Information - SIL (CuP-SIL-wire post-plated with Sn, 10 mm)

	P14 (150pF ±50pF)
Order code	040.00191

Order Information - SMD

	P14 SMD-G (180pF ±50pF)
Order code	040.00109

Order Information - Au/Cu-wire, Ø 0.4 mm, 10 mm

	P14-W (150pF ±50pF)
Order code	040.00174

Order Information - Cu/Ag-wire, 18 mm, AWG26, PTFE, insulated 8 mm

	P14.S-W (150pF ±50pF)
Order code	040.00184

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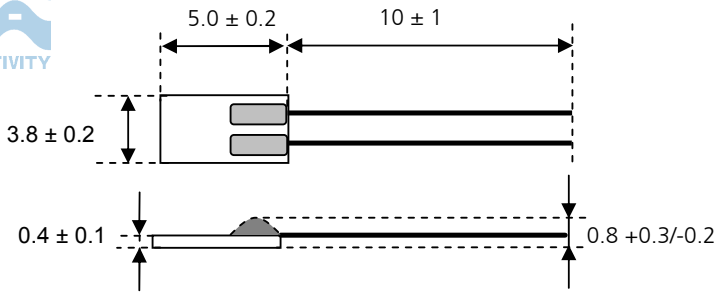
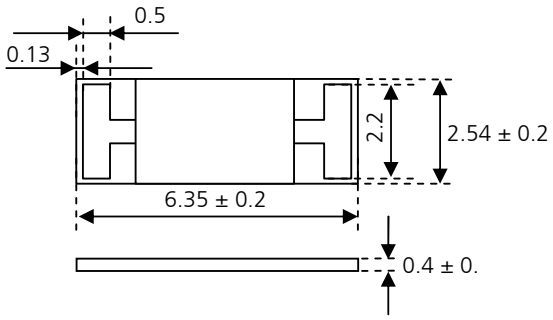
Construction Sizes

Wired (in mm)

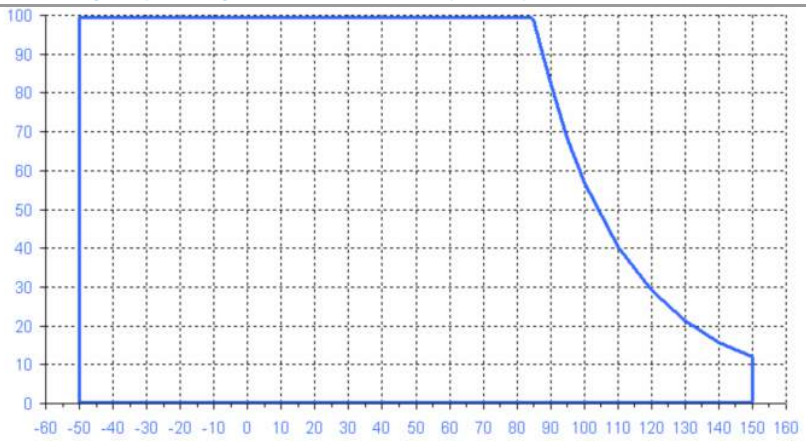


SMD (in mm)



Allowed Humidity-Temperature Range, operating conditions at atmospheric pressure (1 bar)

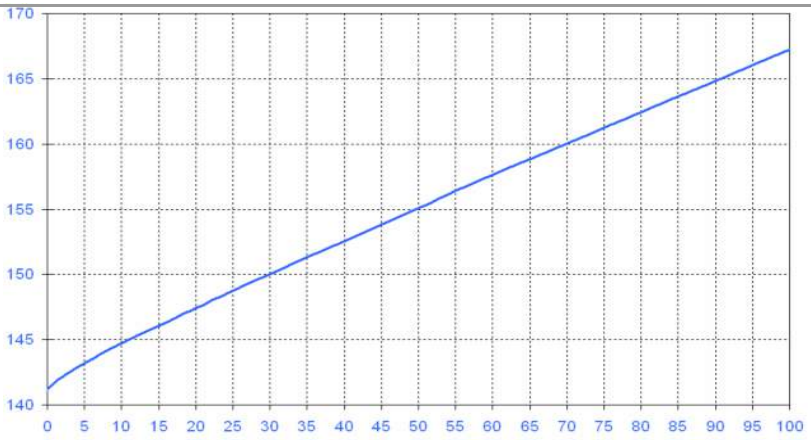
Relative Humidity [%]



Temperature [°C]

Sensor Characteristic

Capacitance [pF]



Relative Humidity [%]

ISO 9001

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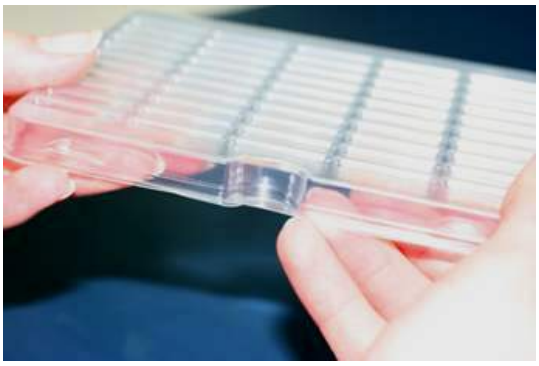
Capacitive Humidity Sensor
Handling guideline

Packaging

The wired humidity sensors are packaged in blisters. Please be careful when opening the blisters to avoid any damages to the sensors.

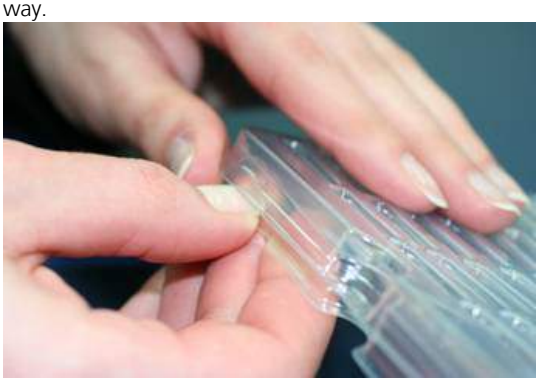
To avoid damages please handle as follows:

1. Side with curve has to face you.



2. Push your thumb beneath cover and press carefully lock system until cover removes smoothly.

3. Press lock system on second side on the same way.



4. Remove cover slowly.

Storage

Sensors have to be stored only in the original blisters.

Storage environment	-20°C...+50°C /-4...122°F (temperature range of blister)

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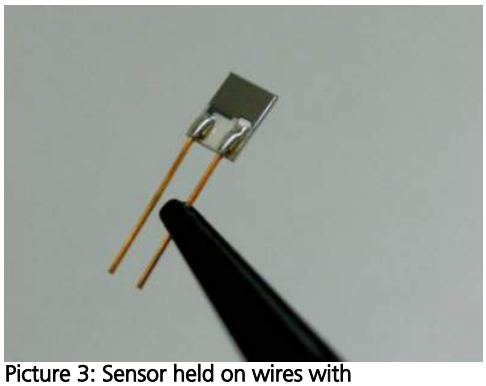
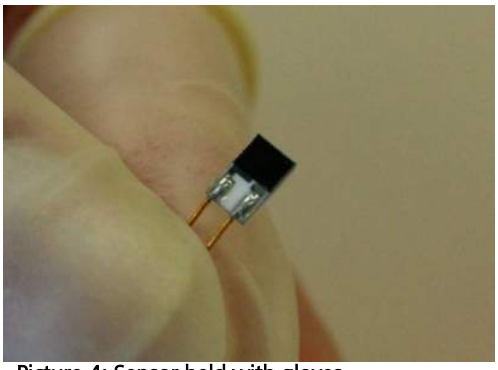
Handling guideline

Sensor handling

Hold the sensor with **plastic tweezers** or with **gloves** on the **wires** only.



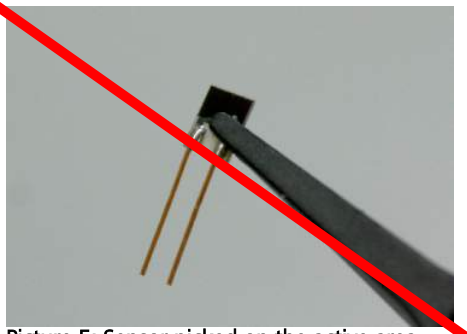
Picture 3: Sensor held on wires with plastic tweezers



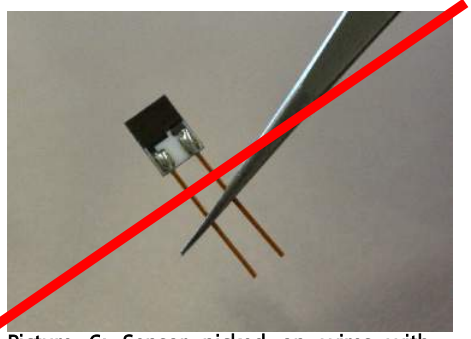
Picture 4: Sensor held with gloves

- **Do not touch the active area** of the sensor.
- **Do not use metal tweezers** to handle the sensors.
- **Never** handle the sensor by hand **without gloves**.

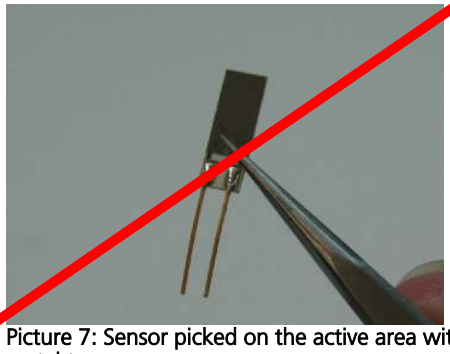
Pictures 5-8 are examples for forbidden handlings.



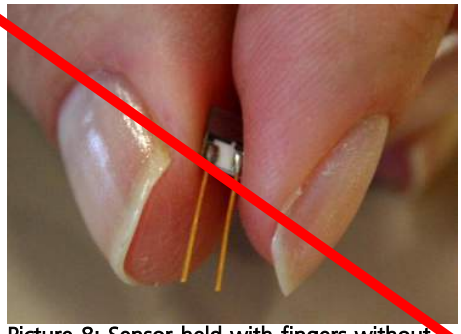
Picture 5: Sensor picked on the active area



Picture 6: Sensor picked on wires with metal tweezers



Picture 7: Sensor picked on the active area with metal tweezers



Picture 8: Sensor held with fingers without gloves on the active area

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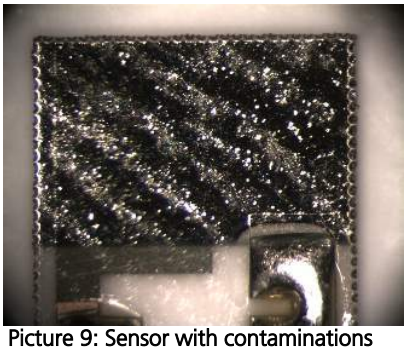
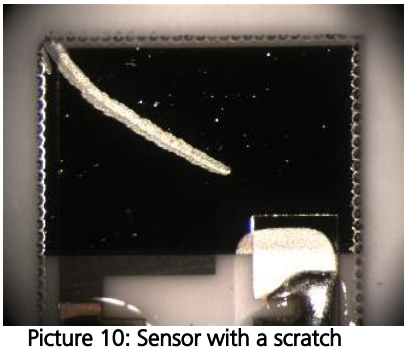
Handling guideline

Do not touch or scratch the active area of the sensors. Scratches and contaminations can degrade the sensor characteristic (see bad samples in pictures 9 and 10 below).



Picture 9: Sensor with contaminations



Picture 10: Sensor with a scratch

- **Avoid mechanical stress** to the sensors, e.g. bending or touching with sharp objects.
- Hold the sensors with **plastic tweezers** on the side edges only.

Soldering of the sensor

- The maximum temperature of the soldering iron of **320°C** may not be exceeded. Maximum heat apply with the iron must be below 10 seconds **at the very end** of the connecting wires.
- The calibration of the sensors has to been done **5 days after soldering at earliest**. This time is needed to provide a relaxation after the heat induces during the soldering process.
- **Avoid soldering flux residues**, caused by the soldering process, or any other contaminations inside the active area of the sensor.
- Soldering flux residues on the outside of the sensor's active area are not critical.
- If the sensor is mounted with glue we recommend baking the sensor at 80 °C for 1 hour after the gluing process.

Cleaning of the sensor

- Any residues can be easily removed with isopropanol at room temperature. Apply of low ultrasonic energy might improve the cleaning process. The sensor has to be dried after the cleaning process.
- The sensor cannot be cleaned mechanically with cotton swabs for instance.
- It is possible to clean the sensor with oil free and filtered clean air, e.g. for removing dust particles.

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