HUMIDITY

TEMPERATURE

FLOW

CONDUCTIVITY

P14-W

Capacitive Humidity Sensor

Optimal for various humidity applications

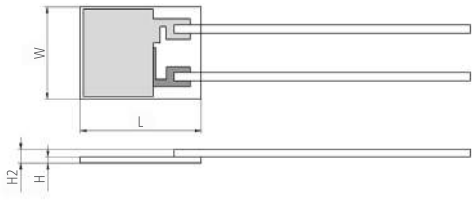
INNOVATIVE SENSOR TECHNOLOGY

Benefits & Characteristics

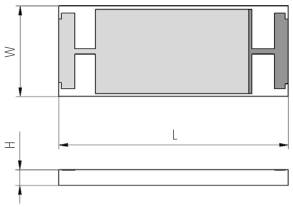
- High chemical resistance
- Wide temperature range
- Resistance to condensation
- Fast recovery time
- Very low drift
- High humidity stability
- Customer specific sensor available upon request

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.

HUMIDITY

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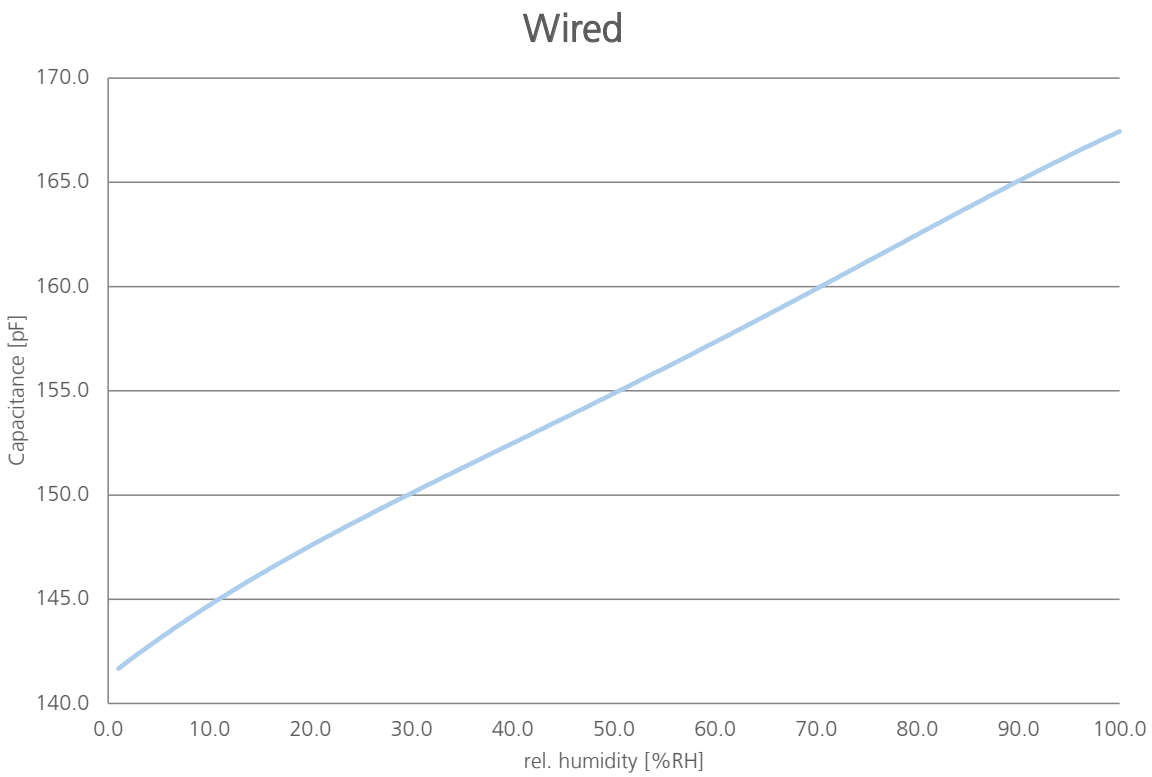
P14-W

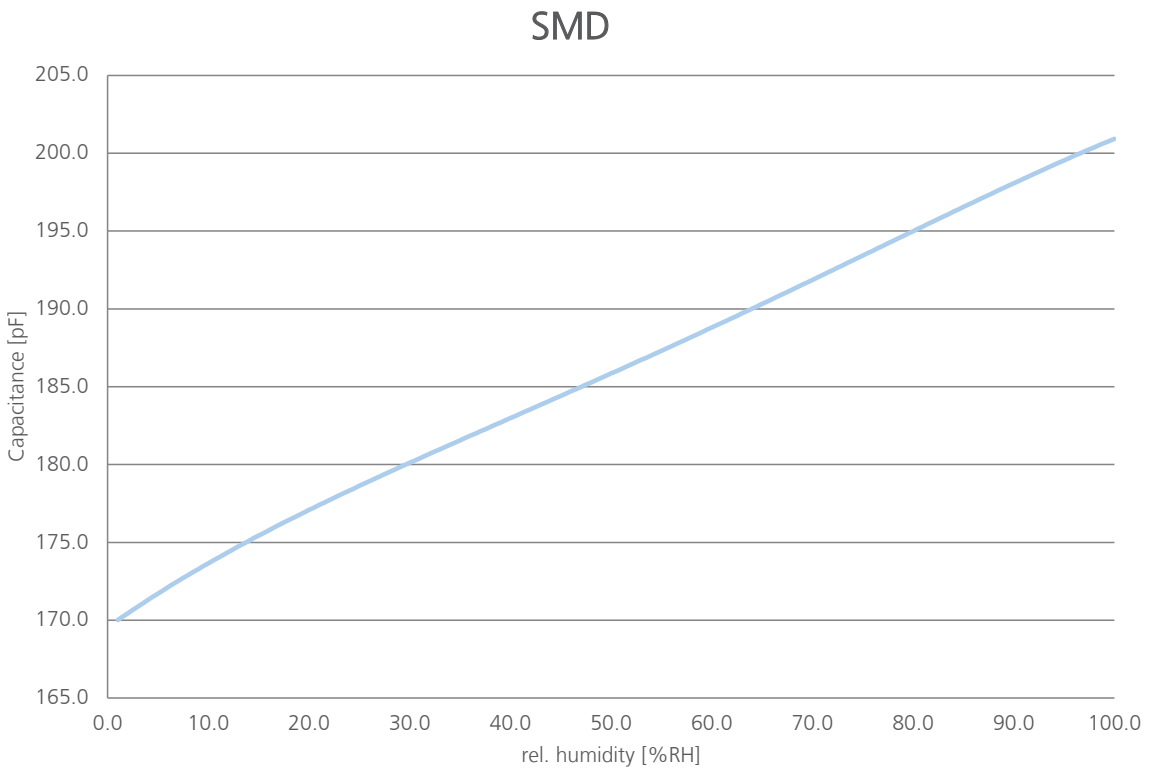
Capacitive Humidity Sensor

Optimal for various humidity applications

INNOVATIVE SENSOR TECHNOLOGY

Characteristic Curve





HUMIDITY

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P14-W

Capacitive Humidity Sensor

Optimal for various humidity applications

INNOVATIVE SENSOR TECHNOLOGY

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

ISO 9001

RoHS

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Innovative Sensor Technology IST AG, Stegrütistrasse 14, CH-9642 Ebnat-Kappel, Switzerland,
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HUMIDITY

TEMPERATURE

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CONDUCTIVITY

P14 Rapid

Capacitive Humidity Sensor

Optimal for weather balloons and radio sondes

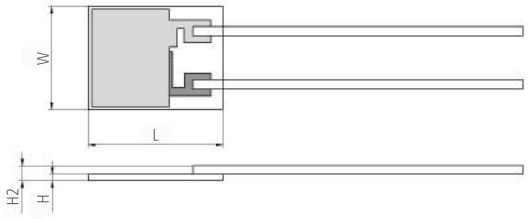
INNOVATIVE SENSOR TECHNOLOGY

Benefits & Characteristics

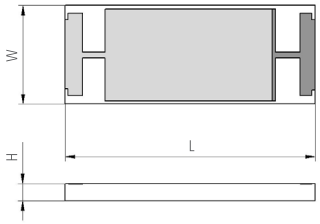
- Ultra fast response time
- Condensation resistant
- High humidity stability
- Wide temperature range
- Temperature shock resistant
- Fast recovery time
- Customer specific sensor available upon request

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}):*	140 pF ±40 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:	-80 °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}:[2)]	< 1.5 s (50 % RH to 0 % RH at +23 °C)	
2) 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 thus measures response times always for decreasing humidity values, since this is the worst case.		
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	

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P14 Rapid

Capacitive Humidity Sensor

Optimal for weather balloons and radio sondes

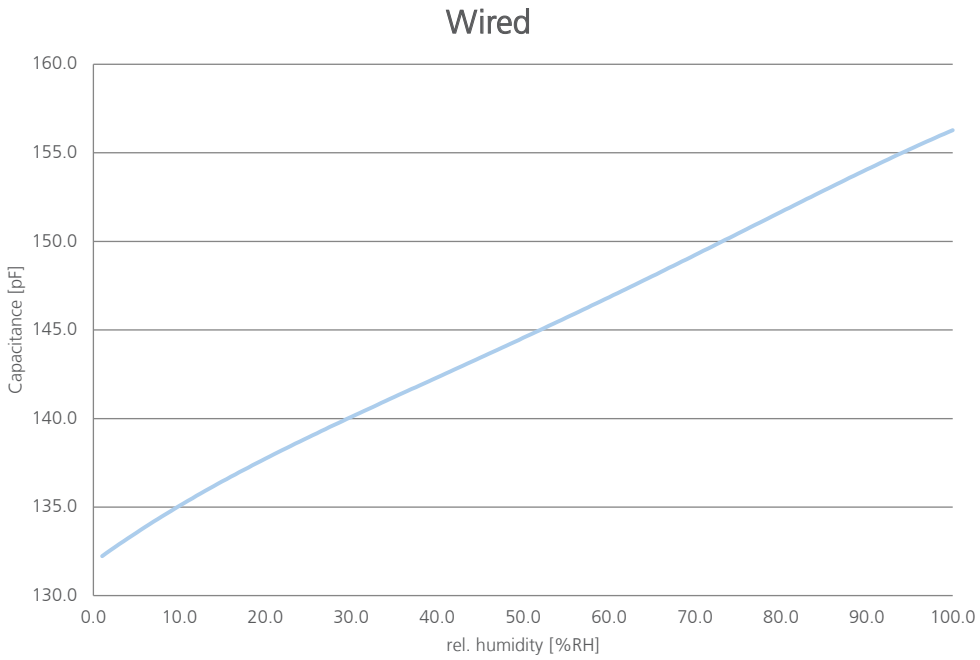
INNOVATIVE SENSOR TECHNOLOGY

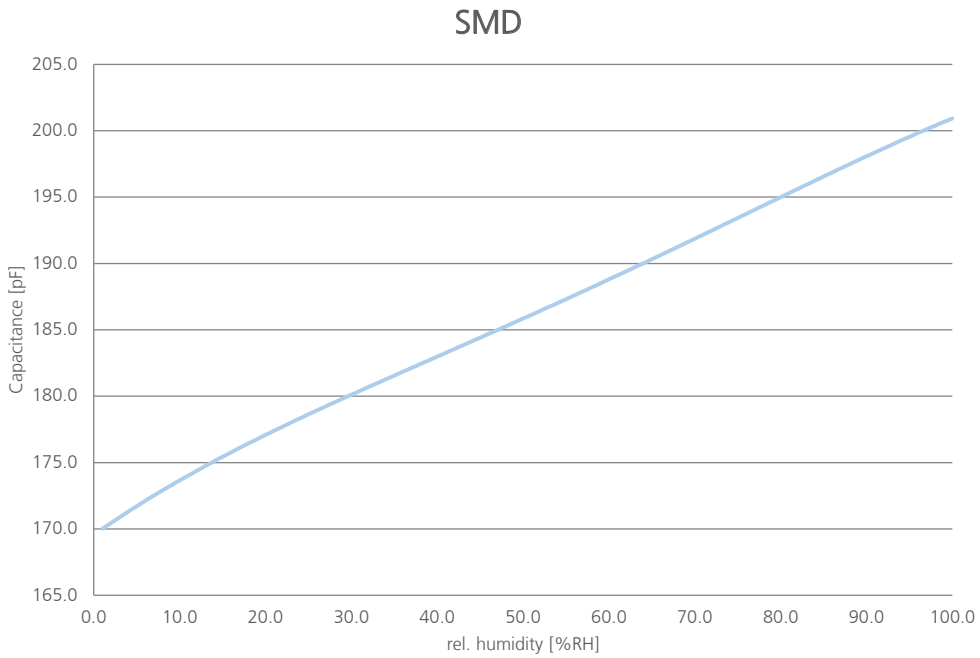
Signal form:	alternating signal without DC bias
Connection:*	CuP-SIL-wire post-plated with Sn, 10 mm or Au/Cu-wire, Ø 0.4 mm or SMD automatic assembly compatible

* Customer specific alternatives available

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

Characteristic Curve





HUMIDITY

TEMPERATURE

FLOW

CONDUCTIVITY

P14 Rapid

Capacitive Humidity Sensor

Optimal for weather balloons and radio sondes

INNOVATIVE SENSOR TECHNOLOGY

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

	P14 Rapid (140 ±40pF)
Order code	040.00119

Order Information - SMD

	P14 SMD Rapid-G (180 ±50pF)
Order code	040.00170

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

	P14 Rapid-W (140 ±40pF)
Order code	040.00177

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Innovative Sensor Technology IST AG, Stegrütistrasse 14, CH-9642 Ebnat-Kappel, Switzerland,
Phone: +41 (0) 71 992 01 00 | Fax: +41 (0) 71 992 01 99 | E-mail: info@ist-ag.com | Web: www.ist-ag.com

ISO 9001 RoHS

HUMIDITY

TEMPERATURE

FLOW

CONDUCTIVITY

P14 FemtoCap

Capacitive Humidity Sensor

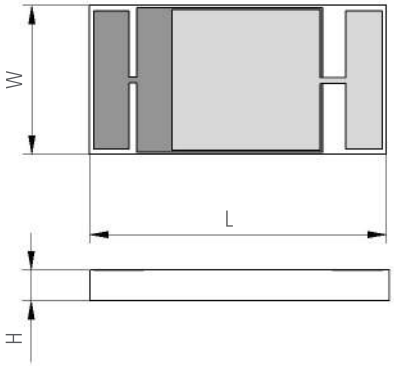
Optimal for automotive and white good applications

INNOVATIVE SENSOR TECHNOLOGY

Benefits & Characteristics

- High chemical resistance
- Wide temperature range
- Resistance to condensation
- Fast recovery time
- Very low drift
- Excellent price-performance ratio
- Solderable and bondable (fully automated assembly)
- Customer specific sensor available upon request

Illustration[1)]



1) For actual size, see dimensions

Technical Data

Dimensions (L x W x H in mm):	4 x 2 x 0.4
Operating humidity range:	0 % RH to 100 % RH (maximal dew point +85 °C)
Operating temperature range:	-50 °C to +150 °C
Capacitance (C_{30}):*	180 pF ±50 pF (at 30 % RH and +23 °C)
Sensitivity (at C_{30} = 180 pF):	0.3 pF/% RH (15 % RH to 90 % RH)
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}:	< 3 s (50 % RH to 0 % RH at +23 °C)
Temperature dependence (typical):	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:	SMD, automatic assembly compatible

* Customer specific alternatives available

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

HUMIDITY

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CONDUCTIVITY

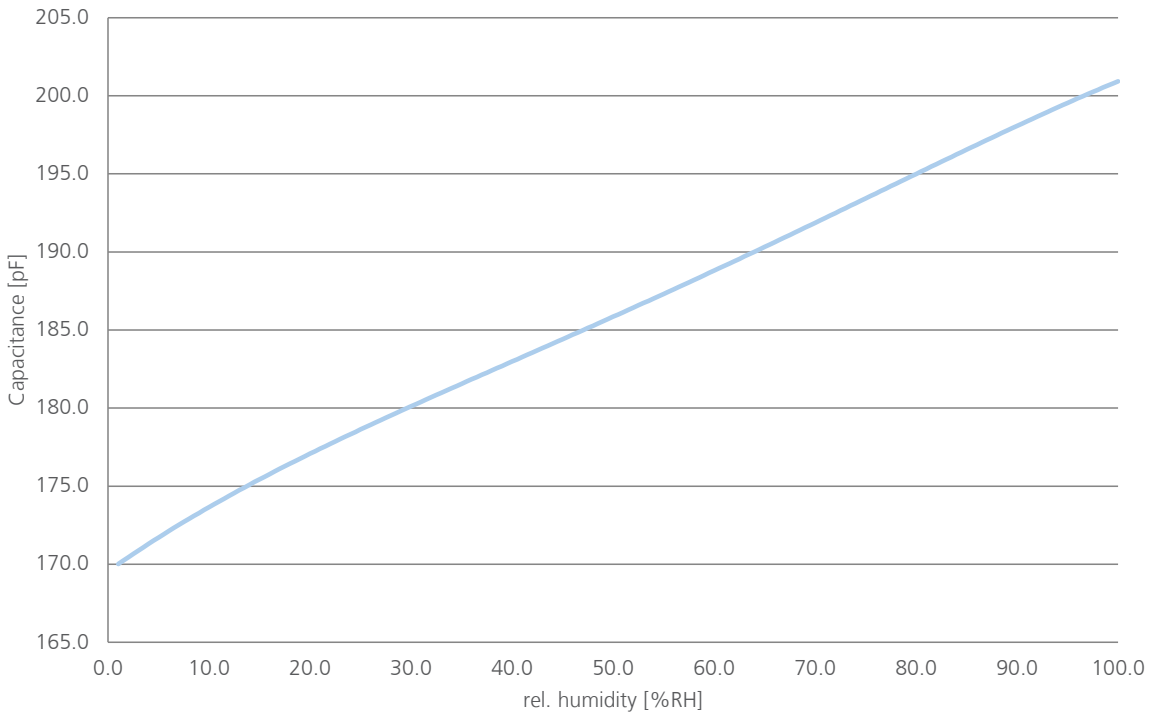
P14 FemtoCap

Capacitive Humidity Sensor

Optimal for automotive and white good applications

INNOVATIVE SENSOR TECHNOLOGY

Characteristic Curve



Order Information - SMD

	P14 FemtoCap-G (180pF ±50pF)
Order code	040.00111

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Innovative Sensor Technology IST AG, Stegrütistrasse 14, CH-9642 Ebnat-Kappel, Switzerland,
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HUMIDITY

TEMPERATURE

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CONDUCTIVITY

P14 2FW Thermo

Capacitive Humidity Sensor

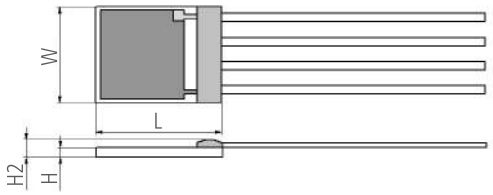
Optimal for dew point applications

INNOVATIVE SENSOR TECHNOLOGY

Benefits & Characteristics

- Fast recovery time
- Temperature measurement on-chip
- Wide temperature range
- Condensation resistance
- High chemical resistance
- Heating of humidity sensor (humidity sensor and heater on one chip)
- Very low drift
- High humidity stability
- Customer specific sensor available upon request

Illustration[1)]



1) For actual size, see dimensions

Technical Data

Dimensions (L x W x H / H2 in mm):	5.0 x 3.8 x 0.4 / 0.8
Operating humidity range:	0 % RH to 100 % RH (maximal dew point +85 °C)
Operating temperature range:	-50 °C to +150 °C
Heater/temperature sensor:*	Pt100
Heater/temperature sensor accuracy:	DIN EN 60751 F0.3 (class B)
Capacitance (C_{30}):*	150 pF ±50 pF (at 30 % RH and +23 °C)
Sensitivity (at C_{30} = 150 pF):	0.25 pF/% RH (15 % RH to 90 % RH)
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}:	< 6 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 range:	1 kHz to 100 kHz (recommended 10 kHz)
Maximal supply voltage:	< 12 V_{pp} AC
Signal form:	alternating signal without DC bias
Connection:*	Ni/Au-flat wire

* Customer specific alternatives available

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

HUMIDITY

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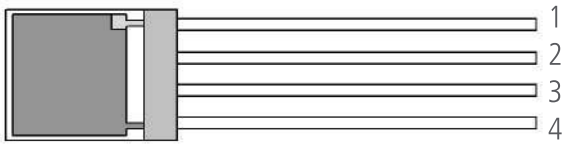
P14 2FW Thermo

Capacitive Humidity Sensor

Optimal for dew point applications

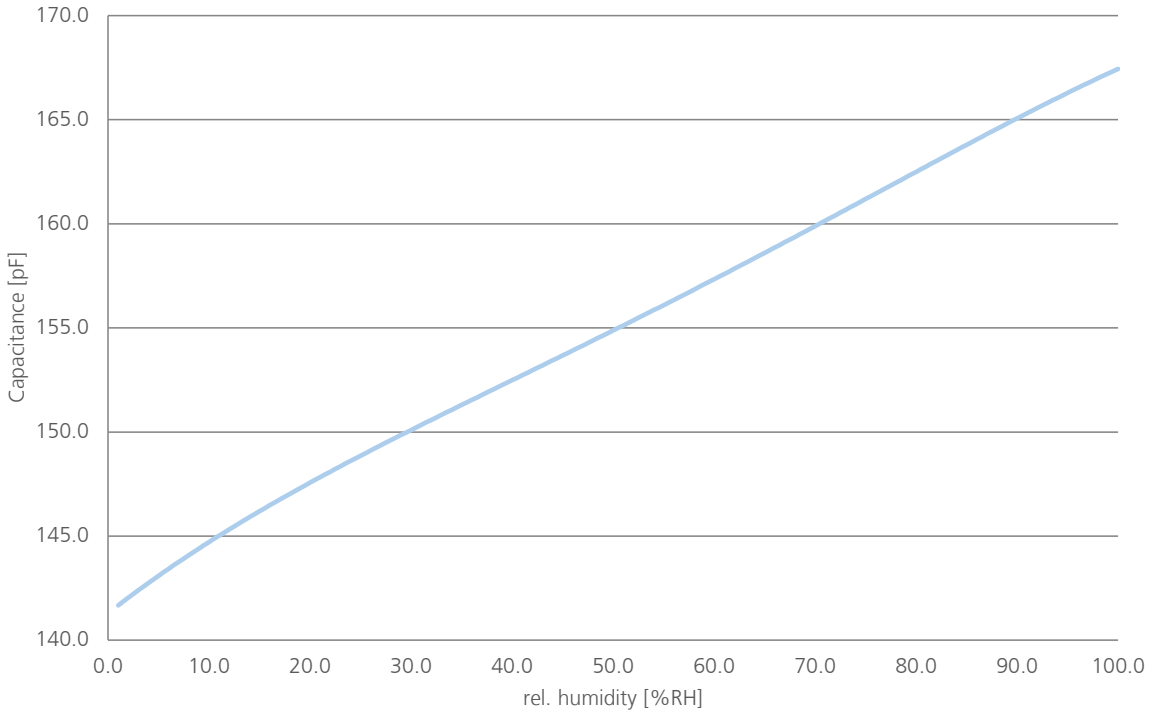
INNOVATIVE SENSOR TECHNOLOGY

Pin Assignment



1	2	3	4
humidity sensor	temperature sensor	temperature sensor	humidity sensor

Characteristic Curve



Order Information - Ni/Au-flat wire

Nominal resistance: 100 Ω at 0 °C

	P14 2FW Thermo (P0K1)
Order code	040.00229

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Innovative Sensor Technology IST AG, Stegrütistrasse 14, CH-9642 Ebnat-Kappel, Switzerland,
Phone: +41 (0) 71 992 01 00 | Fax: +41 (0) 71 992 01 99 | E-mail: info@ist-ag.com | Web: www.ist-ag.com

HUMIDITY

TEMPERATURE

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CONDUCTIVITY

MK33-W

Capacitive Humidity Sensor

Optimal for oil measurement applications

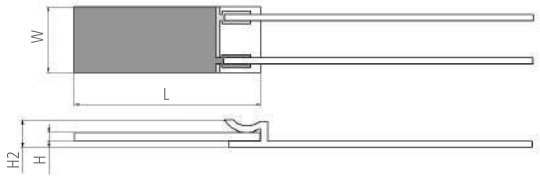
INNOVATIVE SENSOR TECHNOLOGY

Benefits & Characteristics

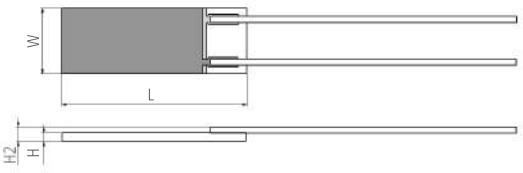
- High chemical resistance
- Wide temperature range
- Condensation resistant
- Fast recovery time
- Very low drift
- High humidity stability
- Suitable for extreme environments
- Customer specific sensor available upon request

Illustration[1)]

SIL



Au/Cu-wire



1) For actual size, see dimensions

Technical Data

Dimensions (L x W x H / H2 in mm):	SIL	10.8 x 3.81 x 0.4 / 1.2
	Au/Cu-wire	10.8 x 3.81 x 0.4 / 0.8
Operating humidity range:	0 % RH to 100 % RH (maximal dew point +95 °C)	
Operating temperature range:	-40 °C to +190 °C	
Capacitance (C_{30}):*	300 pF ±40 pF (at 30 % RH and +23 °C)	
Sensitivity (at C_{30} = 300 pF):	0.45 pF/% RH (15 % RH to 90 % RH)	
Loss factor:	< 0.01 (at 23 °C, at 10 kHz, at 90 % RH)	
Linearity error:	< 2 % RH (15 % RH to 90 % RH at +23 °C after one point calibration)	
Hysteresis:	< 2 % RH	
Response time t_{63}:	< 6 s (50 % RH to 0 % RH at +23 °C)	
Temperature dependence (typical):	Δ % RH = (B1 x % RH + B2) x T [°C] + (B3 x % RH + B4)	
	B1 = 0.0011 [1/ °C]	B2 = 0.0892 [% RH/ °C]
	B3 = -0.0268	B4 = -2.079 [% 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	
Connection:*	CuP-SIL-wire post-plated with Sn, 10 mm or Au/Cu-wire, Ø 0.4 mm	

* Customer specific alternatives available

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

HUMIDITY

TEMPERATURE

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CONDUCTIVITY

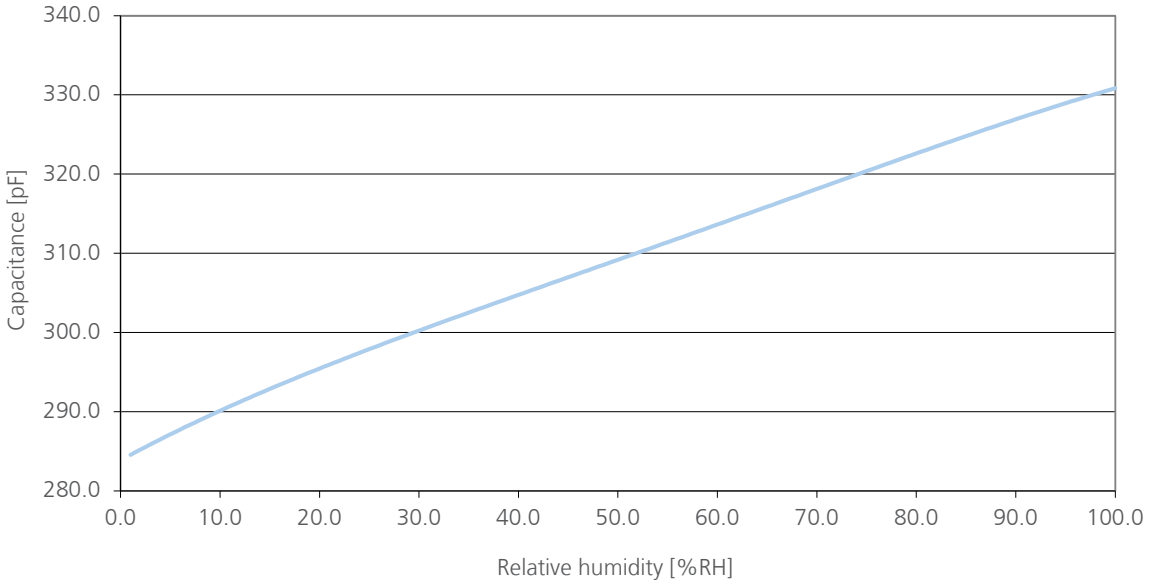
MK33-W

Capacitive Humidity Sensor

Optimal for oil measurement applications

INNOVATIVE SENSOR TECHNOLOGY

Characteristic Curve



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

	MK33 (300pF ±40pF)
Order code	040.00192

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

	MK33-W (300pF ±40pF)
Order code	040.00180

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Innovative Sensor Technology IST AG, Stegrütistrasse 14, CH-9642 Ebnat-Kappel, Switzerland,
Phone: +41 (0) 71 992 01 00 | Fax: +41 (0) 71 992 01 99 | E-mail: info@ist-ag.com | Web: www.ist-ag.com

HUMIDITY

TEMPERATURE

FLOW

CONDUCTIVITY

K5-W

Capacitive Humidity Sensor

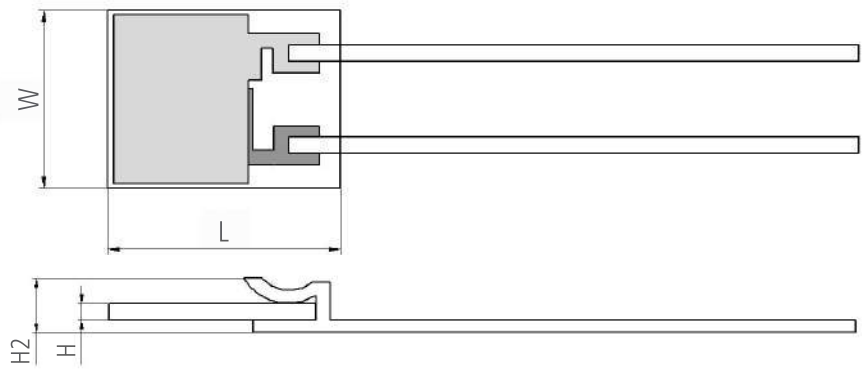
Optimal for low humidity measurement

INNOVATIVE SENSOR TECHNOLOGY

Benefits & Characteristics

- Very stable at low humidity
- High chemical resistance
- Wide temperature range
- Condensation resistant
- Very low drift
- Customer specific sensor available upon request

Illustration[1)]



1) For actual size, see dimensions

Technical Data

Dimensions (L x W x H / H2 in mm):	5 x 3.81 x 0.4 / 1.2
Operating humidity range:	0 % RH to 100 % RH
Operating temperature range:	-40 °C to +150 °C
Capacitance (C_{30}):*	200 pF ±50 pF (at 30 % RH and +23 °C)
Sensitivity (at C_{30} = 200 pF):	0.4 pF/% RH (15 % RH to 90 % RH)
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 = 0.00004 [1/°C] B2 = 0.1842 [% RH/°C]
	B3 = -0.0010 B4 = -4.2370 [% RH]
Measurement frequency range:	1 kHz to 100 kHz (recommended 10 kHz)
Maximal supply voltage:	< 12 V_{pp} AC
Signal form:	alternating signal without DC bias
Connection:*	CuP-SIL wire post-plated with Sn, 10 mm

* Customer specific alternatives available

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

HUMIDITY

TEMPERATURE

FLOW

CONDUCTIVITY

K5-W

Capacitive Humidity Sensor

Optimal for low humidity measurement

INNOVATIVE SENSOR TECHNOLOGY

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

	K5 (200pF ±50pF)
Order code	040.00146

INNOVATIVE SENSOR TECHNOLOGY
Innovative Sensor Technology IST AG, Stegrütistrasse 14, CH-9642 Ebnat-Kappel, Switzerland,
Phone: +41 (0) 71 992 01 00 | Fax: +41 (0) 71 992 01 99 | E-mail: info@ist-ag.com | Web: www.ist-ag.com

