



HUMIDITY



TEMPERATURE



FLOW



CONDUCTIVITY

# MK33-W

## Capacitive Humidity Sensor

### For oil measurement applications

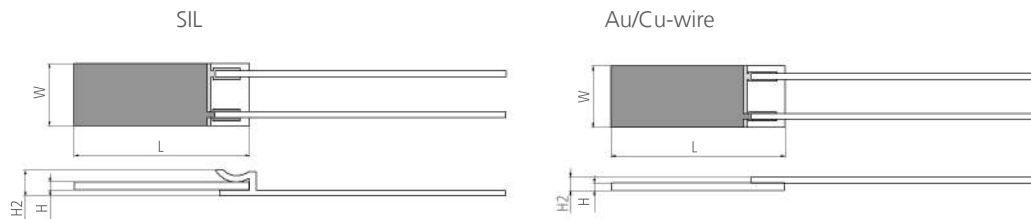


INNOVATIVE SENSOR TECHNOLOGY

#### 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<sup>1)</sup>



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 <sub>30</sub> ):*	300 pF ±40 pF (at 30 % RH and +23 °C)	
Sensitivity (at C <sub>30</sub> = 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 <sub>63</sub> :	< 6 s (50 % RH to 0 % RH at +23 °C)	
Temperature dependence (typical):	$\Delta \% RH = (B1 \times \% RH + B2) \times T [^{\circ}C] + (B3 \times \% RH + B4)$ 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 <sub>pp</sub> 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.



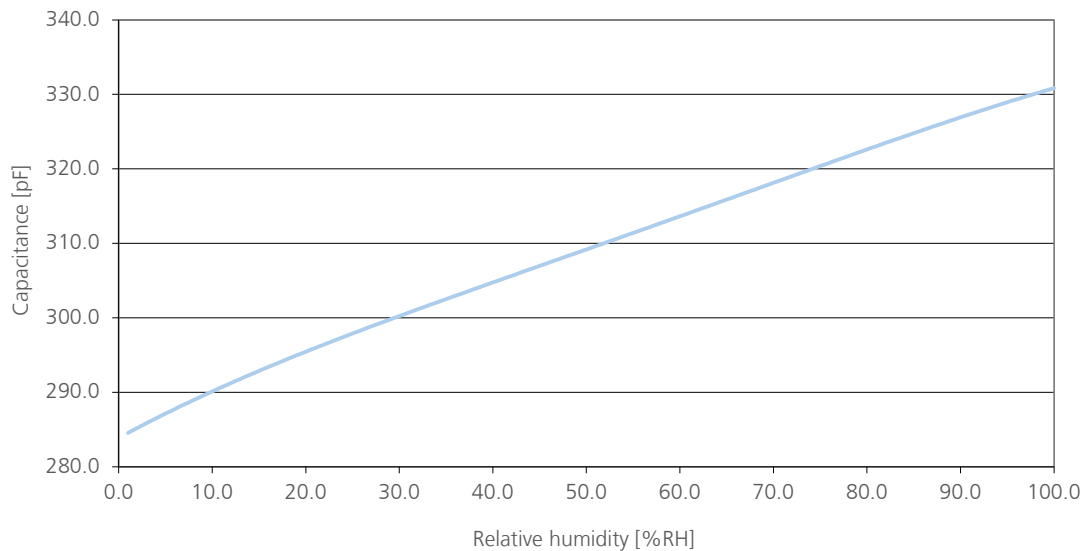
# MK33-W

## Capacitive Humidity Sensor

### For oil measurement applications



#### Characteristic Curve



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

Order code	MK33 (300pF $\pm$ 40pF) 040.00192
------------	--------------------------------------

#### Order Information - Au/Cu-wire, $\varnothing$ 0.4 mm

Order code	MK33-W (300pF $\pm$ 40pF) 040.00180
------------	--



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](mailto:info@ist-ag.com) | Web: [www.ist-ag.com](http://www.ist-ag.com)



All mechanical dimensions are valid at 25 °C ambient temperature, if not differently indicated • All data except the mechanical dimensions only have information purposes and are not to be understood as assured characteristics • Technical changes without previous announcement as well as mistakes reserved • The information on this data sheet was examined carefully and will be accepted as correct; No liability in case of mistakes • Load with extreme values during a longer period can affect the reliability • The material contained herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner • Typing errors and mistakes reserved • Product specifications are subject to change without notice • All rights reserved



HUMIDITY



TEMPERATURE



FLOW



CONDUCTIVITY

# MK33-W

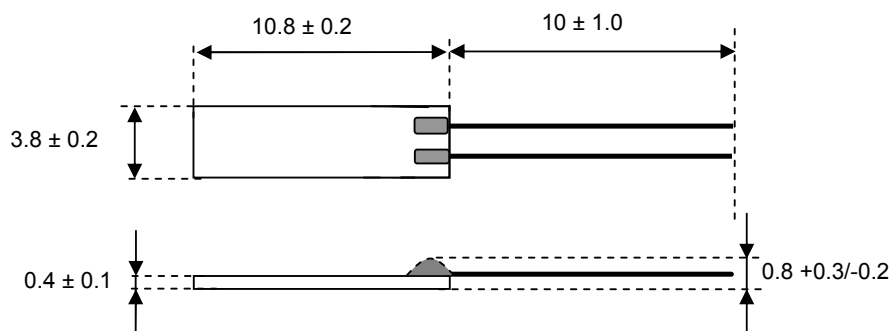
## Capacitive Humidity Sensor For oil measurement applications



INNOVATIVE SENSOR TECHNOLOGY

### Construction Sizes

Dimension in mm



INNOVATIVE SENSOR TECHNOLOGY

IST AG, Stegrütstrasse 14, CH-9642 Ebnet-Kappel, Switzerland, Phone +41 (0)71 992 01 00, Fax +41 (0)71 992 01 99,  
email [info@ist-ag.com](mailto:info@ist-ag.com), [www.ist-ag.com](http://www.ist-ag.com)



HUMIDITY



TEMPERATURE



FLOW



CONDUCTIVITY

# MK33-W

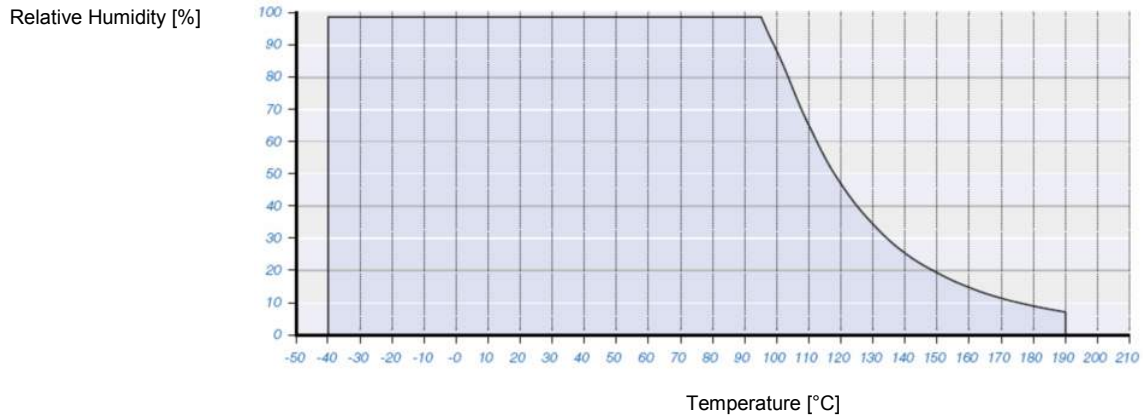
## Capacitive Humidity Sensor

### For oil measurement applications

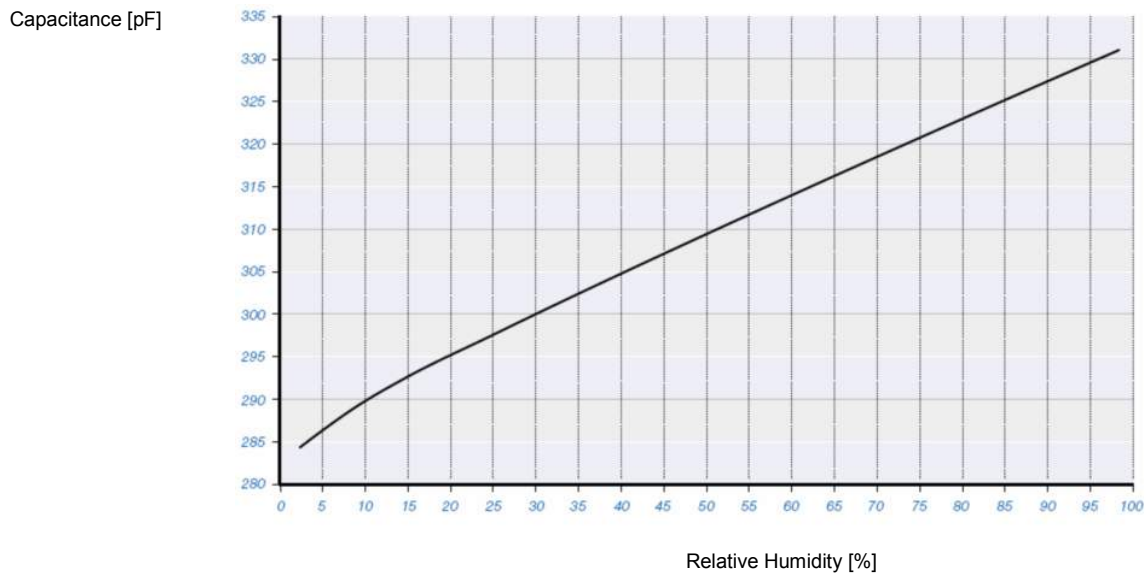


INNOVATIVE SENSOR TECHNOLOGY

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



#### Sensor Characteristic



All mechanical dimensions are valid at 25°C ambient temperature. If not differently indicated. ■ All data except the mechanical dimensions only have information purposes and are not to be understood as assured characteristics. ■ Technical changes without previous announcement as well as mistakes reserve. ■ The information on this data sheet was examined carefully and will be accepted as correct. No liability in case of mistakes. ■ Load with extreme values during a longer period can affect the reliability. All rights reserved. The material contained herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner. Typing errors and mistakes reserved. Product specifications are subject to change without notice. All rights reserved



INNOVATIVE SENSOR TECHNOLOGY

IST AG, Stegrütstrasse 14, CH-9642 Ebnet-Kappel, Switzerland, Phone +41 (0)71 992 01 00, Fax +41 (0)71 992 01 99,  
email [info@ist-ag.com](mailto:info@ist-ag.com), [www.ist-ag.com](http://www.ist-ag.com)



DMK33-W\_E1.1



HUMIDITY



TEMPERATURE



FLOW



CONDUCTIVITY

# MK33-W

## Capacitive Humidity Sensor

### Handling guideline



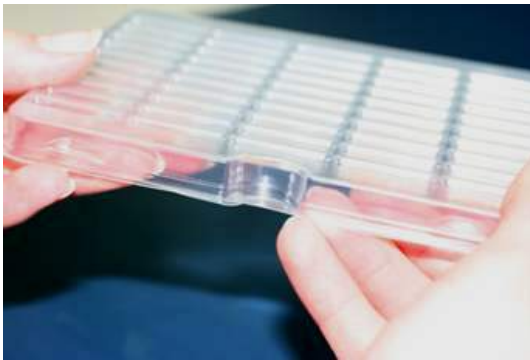
INNOVATIVE SENSOR TECHNOLOGY

#### 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:**

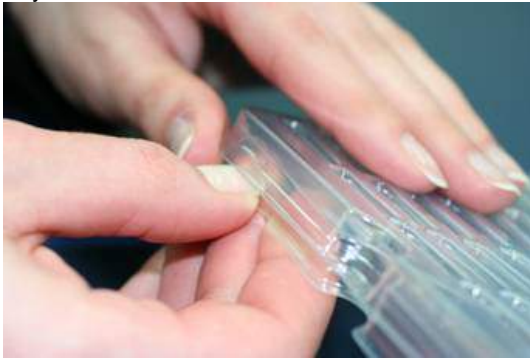
1. Side with curve has to face you.



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)



INNOVATIVE SENSOR TECHNOLOGY

IST AG, Stegrütistrasse 14, CH-9642 Ebnet-Kappel, Switzerland, Phone +41 (0)71 992 01 00, Fax +41 (0)71 992 01 99,  
email [info@ist-ag.com](mailto:info@ist-ag.com), [www.ist-ag.com](http://www.ist-ag.com)



HUMIDITY



TEMPERATURE



FLOW



CONDUCTIVITY

# MK33-W

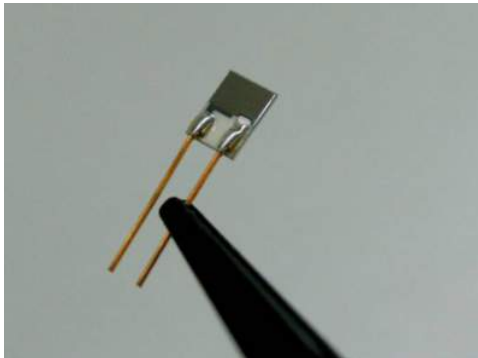
## Capacitive Humidity Sensor

### Handling guideline

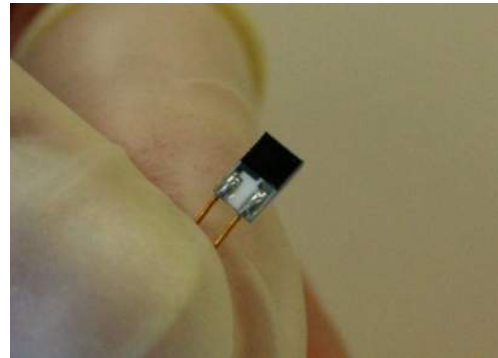


#### Sensor handling

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



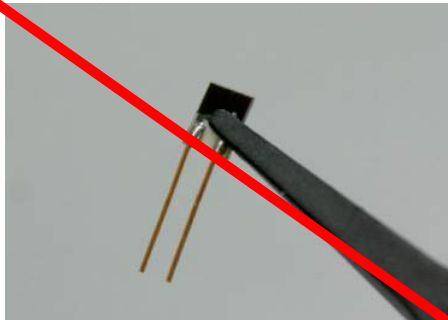
Picture 3: Sensor held on wires with plastic tweezers



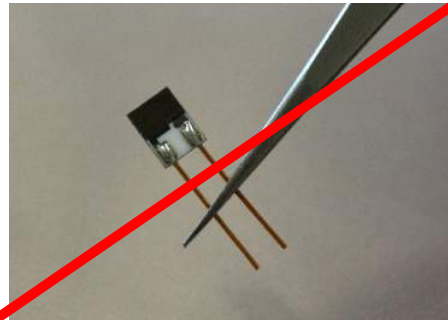
Picture 4: Sensor held with gloves

- 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**.

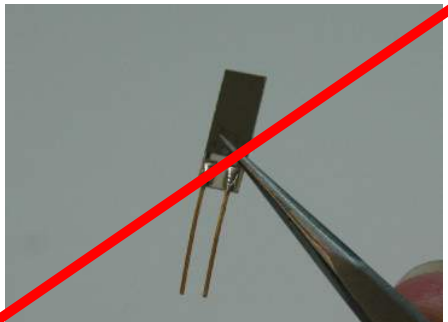
Pictures 5-8 are examples for forbidden handlings.



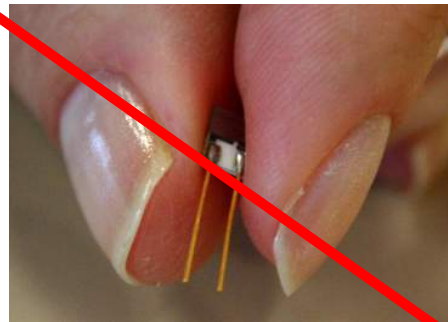
Picture 5: Sensor picked on the active area



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





HUMIDITY



TEMPERATURE



FLOW



CONDUCTIVITY

# MK33-W

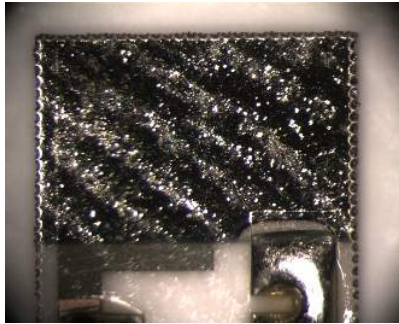
## Capacitive Humidity Sensor

### Handling guideline

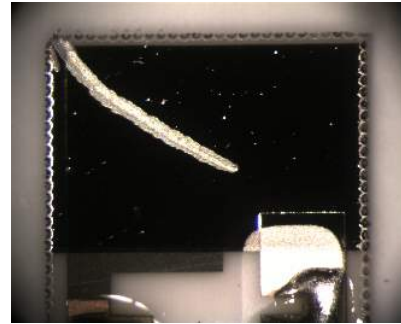


INNOVATIVE SENSOR TECHNOLOGY

**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.



INNOVATIVE SENSOR TECHNOLOGY

IST AG, Stegrütstrasse 14, CH-9642 Ebnet-Kappel, Switzerland, Phone +41 (0)71 992 01 00, Fax +41 (0)71 992 01 99,  
email [info@ist-ag.com](mailto:info@ist-ag.com), [www.ist-ag.com](http://www.ist-ag.com)



AW\_L1.1