

# HUMIDITY SENSOR PLUS

## Continuous Determination of Water Content in Oil

In order to ensure effective performance of the engine system, the degree of water concentration in lubricating and hydraulic oils can be measured permanently with the help of the HUMIDITY SENSOR PLUS - an upgraded version of the HUMIDITY SENSOR STANDARD. In addition to the standard measurement features (relative humidity value and the corresponding temperature), the improved product enables also accurate determination of relative permittivity and conductivity of the oil under inspection. Thereby, this provides possibility for more extensive assessment of the general quality of oil turning the HUMIDITY SENSOR PLUS into a semi-intelligent device of a new generation.



### Technical Features:

- Measuring range:
  - Relative Humidity: 0 - 100 %
  - Relative Permittivity (dielectric number): 1-7
  - Conductivity: 100 – 800000 pS/m
- Temperature range: -20°C to +85°C
- Voltage: 9 - 33 VDC
- Max. fluid pressure: 50 bar
- Protection class: IP 67
- Interface: RS 232/ CAN; 4- 20 mA
- Fluid compatibility: mineral and ester fluids, polyalphaolefins

After the HUMIDITY SENSOR PLUS is integrated into the engine system, three parameters (relative humidity, relative permittivity and conductivity of the oil) are measured on a continuous basis at current temperature and transferred to the special display unit DATALOGGER. During the learning phase the required database is created. The obtained data is stored for about half a year in an internal data storage unit of the sensor.

Once the learning phase is complete, the sensor also processes the measured values at reference temperature of 40 °C. Through assessment of three oil parameters the HUMIDITY SENSOR PLUS helps to efficiently track any occurring changes in the oil condition as well as to calculate the remaining useful lifetime of the oil. In this context, the ageing and aging rates of the oil can be specified with long-term gradients of the temperature and the acidification. Moreover, the sensor technology allows optimizing the intervals of oil change and maintenance of the engine system.

The practical usefulness of the HUMIDITY SENSOR PLUS can be especially observed with regard to unsaturated ester oils. As portable test devices for on-site water-in-oil analyses use reagents containing calcium hydride, they are not suitable for esters due to the occurring reaction between components of these oils and the employed reagent. Thus, the sensor technology can be regarded as an important technical solution for the real-time assessment of the oil condition.