Continuous
Oil Condition Monitoring

LubCos H_2O+ Lubrication Condition Sensor

Application area

Stationary screw-in sensor for the continuous determination of the oil condition in hydraulic and lubricating oils.

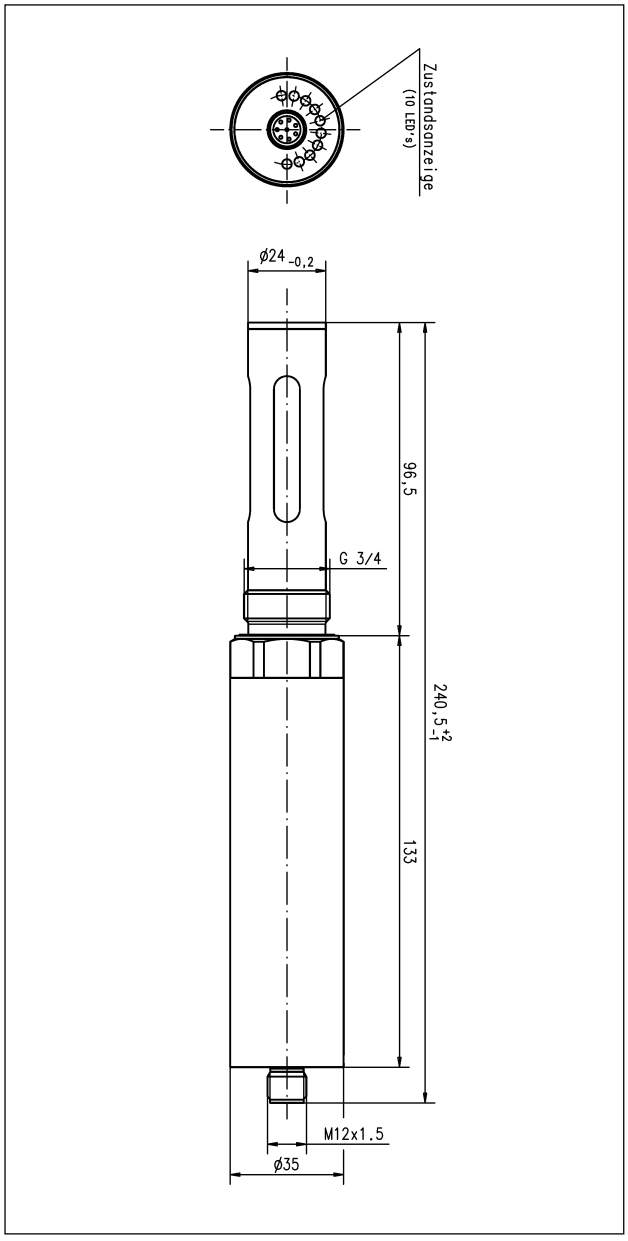
Performance features

Measurement and documentation of changes in hydraulic fluids and lubricants. Data is continuously documented and stored. In that way deterioration and changes in the oil (e.g. water inleakage, oil change,...) can be indicated. Through this, damage can be recognized or completely avoided at an early stage. This offers the opportunity to prevent machine failures as well as to prolong maintenance and oil change intervals by means of appropriate measures. Furthermore, by monitoring the lubricant, correctly performed maintenance work and the use of the required lubricant quality may be documented.

Design characteristics

The sensor is provided with a ¾" thread and can be e.g. integrated in a return line or the tank. Optionally, with an integrated LED status indicator with 10 segments on the back side of the sensor which visualizes the oil condition.

LubCos H_2O+



Sensor head

LED status indicator

The communication with the sensor takes place over a serial *RS232 interface*. Optionally, the signals are sent over two analog outputs (4...20 mA).
In order to also enable a long-term record of data up to half a year, the sensor has a data storage unit which can be read out over the serial interface.

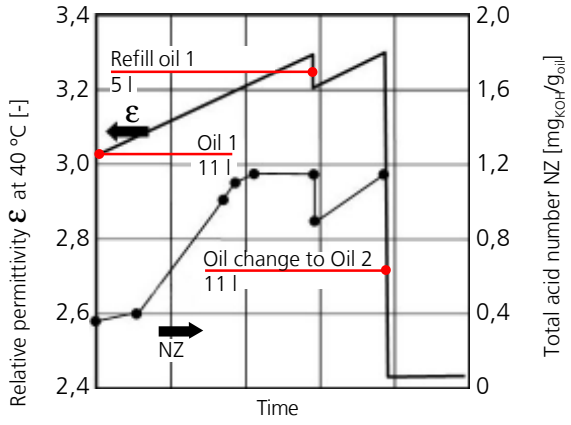
Measuring principle

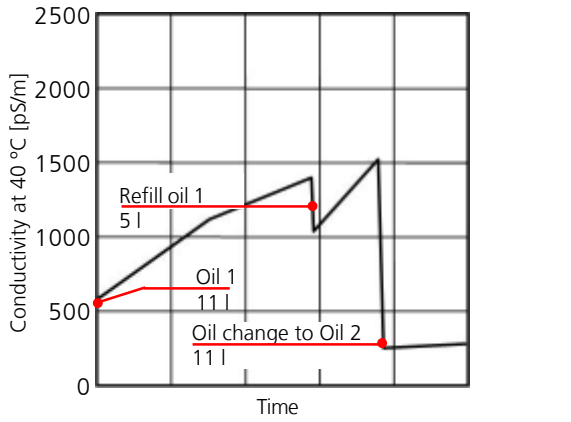
The sensor records four different physical oil characteristics as well as its **periodic change**: **Temperature**, **relative oil humidity** and water activity, **relative permittivity** and **conductivity** of the fluid respectively.
As especially the conductivity and the relative permittivity show a strong connection to the temperature, next to the characteristic values at current temperature the sensor also sends the data at reference temperature.

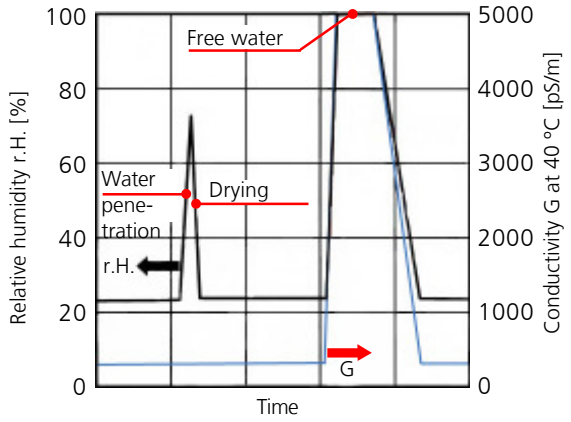
Technical data / Example of use

Example of use

By using the sensor different changes of the oil condition can be detected. The following example shows a typical course of relative permittivity, conductivity and relative humidity during various changes of the condition in the system. By means of the characteristics, different oil types may be differed, oil refreshing and oil change can be detected and the relative humidity, free water as well as the deterioration and deterioration rate can be defined respectively.







Sensor data	Size	Unit
Operating pressure	10	bar
Operating temperature	20-100	°C
Ambient conditions, operation: Temperature Humidity	 -20...80 0...95	 °C % r.H.
Ambient conditions, storing: Temperature Humidity	 -20...100 0...98	 °C % r.H.
Pressure fluids	Mineral and ester fluids (HLP, HEES)	
Wetted materials **Sealing material**	galvanized steel, FPM, poly-urethane resin, epoxy resin NBR	
Power supply	9...36	V
Power input	0,2 typ. 0,3 max.	A
Output Power output (2x) Interface Optical indicator, optional	 4...20 RS232 10 segment LED	mA
Measuring range[1)] rel. permittivity rel. humidity Conductivity Temperature	 1...5 0...100 0...90000 0...100	 - % r.H. pS/m °C
Measuring resolution rel. permittivity rel. humidity Conductivity Temperature	 $1*10^{-4}$ 0,1 0,1 0,3	 - % r. H. pS/m K
Measuring accuracy rel. permittivity[2)] rel. humidity Conductivity Temperature	 ± 0,015 ± 3 < 300 ± 0,3	 - % r. H. pS/m K

[1)] Additional display of temperature gradient and trend
[2)] Measured with n-Pentan at 25 °C

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