Continuous Oil Condition Monitoring

ARGO HYTOS

LubCos Vis*plus* Lubrication Condition Sensor

Application area

A service sensor for determination of the **viscosity,** relative **permittivity** and **temperature** in hydraulic and lubricating oils. The sensor is a screw-in sensor and immersion sensor respectively and is designed for continuous monitoring of the oil condition in service applications.

Performance features

Measurement and documentation of changes in hydraulic fluids and lubricants. The measured values are continuously documented, evaluated and stored. In that way deterioration and changes in the oil (e.g. viscosity and polarity) can be indicated. Through this, damage can be recognized or completely avoided at an early stage. This provides the opportunity to avoid machine malfunction by appropriate actions and to extend maintenance and oil change intervals. By monitoring of the lubricant, it is also possible to record service measures and the use of the prescribed lubricant quality.

Design characteristics

The sensor is provided with a G¾ thread and can be integrated in the tank. Optionally the sensor can be used as immersion sensor for analyzing of oil samples.
The communication with the sensor takes place optionally over a serial RS232 interface, CANopen or over two analogue outputs (4 ... 20 mA). In order to enable a long-term recording of data, the sensor is provided with an internal storage unit which can be read out over the serial interface.

Measuring principle

The sensor records the following physical oil characteristics as well as periodic changes: Temperature, SAW-dynamic viscosity, and the relative permittivity of the fluid. As the viscosity and the relative permittivity show a strong connection to the temperature, the sensor, after a learning phase, also sends the data at reference temperature, next to the characteristics values at current temperature.
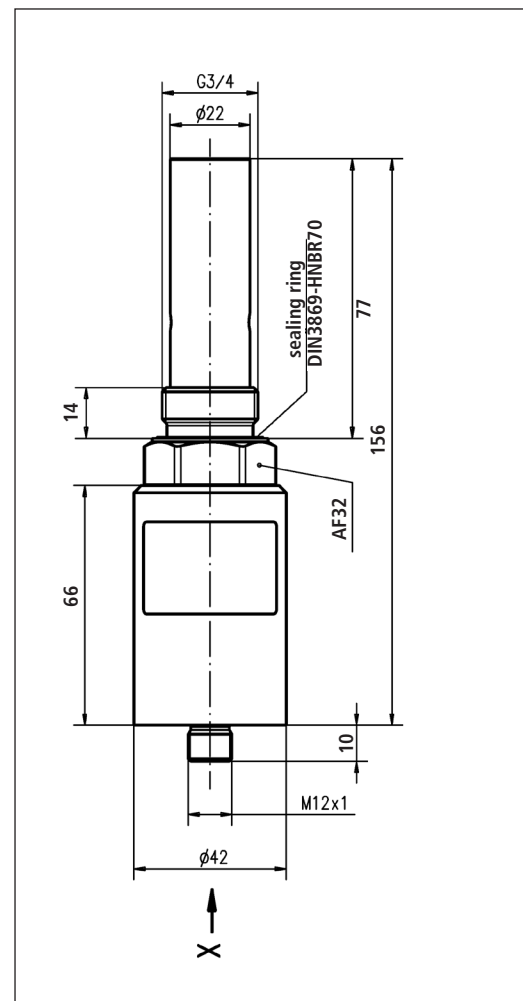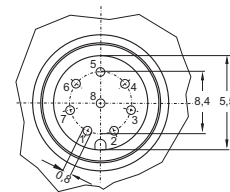The sensor is able to evaluate constitutional changes as well as its own functional condition automatically. Alarm messages, warnings and errors are displayed as error codes.

Software

A free PC-software for data recording and evaluation of the measured values can be downloaded from our website at www.argo-hytos.com within the download area.
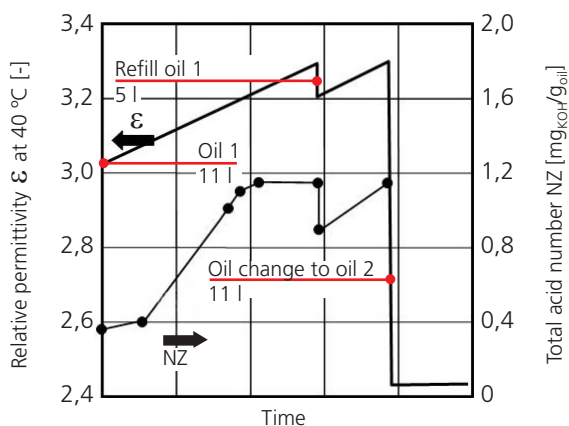
LubCos Vis*plus*

Technical data / Application example

Application example

For operation, the sensor can be integrated in the system for the time of measuring and there e.g. be operated as a data logger. Alternatively the sensor may be used as an immersion sensor. For this an oil sample will be taken into a sample glass and the sensor will be immersed into the glass for the time of measuring. For correct measurement, the sensor element must be completely immersed into the oil.

With both methods the sensor element has to be cleaned from dirt and sediments from time to time with the help of a cleaning wiper to guarantee reliable measurement.

Order code

LubCos Vis*plus*	SCSO 200-1000

Accessories

Screw-in block for mounting in a return line, connection G¾	SCSO 100-5070
Cleaning wiper to clean the sensor surface	SCSO 200-5050
Complete data cable set, 5 m length	SCSO 100-5030
Data cable with open ends	SCSO 100-5020
Contact box for connection of a data cable	SCSO 100-5010
USB adapter - RS232 serial	PPCO 100-5420
Power supply	SCSO 100-5080
Ethernet - RS232 gateway	SCSO 100-5100

Sensor data	Size	Unit
Max. operating pressure	10	bar
Operating temperature fluid[1]	0 ... + 100	°C
Ambient conditions, operation		
Temperature	0 ... + 80	°C
Humidity	0 ... 95	% r.H.
Ambient conditions, storing		
Temperature	- 20 ... + 80	°C
Humidity	0 ... 95	% r.H.
Protection class	IP 67	
Pressure fluids	Mineral and ester fluids, polyalphaolefins	
Wetted materials **Sealing materials**	Aluminium, HNBR, polyurethane, resin epoxy resin, SiO_2, SiC	
Power supply **Power input**	9 ... 33 0,1 typ. < 0,3 max.	VDC A
Output Interface	2 x 4 ... 20 RS 232, CAN / CANopen	mA
Connecting dimensions Threaded connection Electrical connection	G¾ M 12 x 1, 8-pole connector	
Measuring range[2] SAW-dynamic viscosity rel. permittivity Temperature	8 ... 400 1 ... 5 - 20 ... + 120	mm^2/s - °C
Measuring resolution rel. and abs. viscosity rel. permittivity Temperature	0,1 $1*10^{-3}$ 0,1	mm^2/s - °C
Measuring accuracy rel. viscosity[3] rel. permittivity[4] Temperature	± 5 ± 0,02 ± 0,5	mm^2/s - K

[1] Permanently
[2] Dynamic viscosity measured with a SAW sensor, calibrated with a Ubbelohde viscosimeter
[3] Measured in Panolin HLP Synth in a temperature range of 20°C to 80°C
[4] Measured with n-Pentan at 25°C