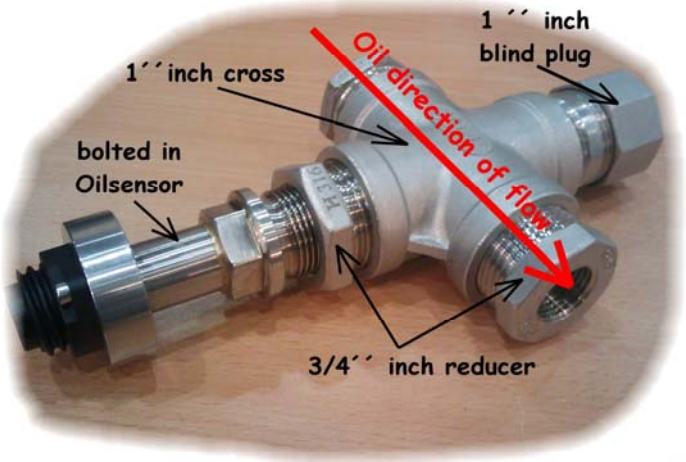
www.**Oelsensor**.de

Operating safety and reduction in running costs for block combination power plants

- **Monitors the quality of the engine oil (*oil ageing*) in real-time**
- **“4-in-1” sensors measures relative dielectric constant, viscosity, specific conductivity and temperature**
- **Measurement results output to a traffic light indicator or system controlle**

Fitting description:



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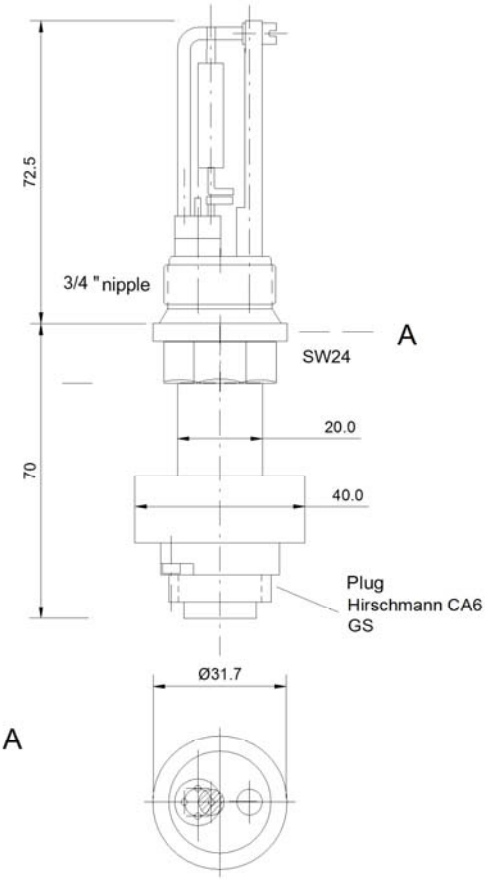
Changes to the viscosity of lubricant are particularly significant.
The simultaneous logging of other operating values also provides information on the chemical changes in the lubricant. However, it is only by combining these measurement results that it becomes possible to provide information about the performance reserve of the lubricant.

Important quantifiable features of lubricant ageing

1) Change in flow properties (viscosity)
2) Increase in insoluble solid impurities including metallic components
3) Change in neutralisation capacity
   (*Total base number TBN or total acid number TAN*)
4) Change in electrical and dielectric values
   (*Relative dielectric constant DC. electrical conductivity*)



Characterisation of "oil capacity"

Viscosity

Whilst lubricant is in use, three processes generally take place simultaneously to change its viscosity:

- Mechanical destruction
- Simultaneous superimposed thermal oxidation
- More or less particle addition

Relative dielectric constant (DC)

Even if there are no free charge carriers in the lubricant, the fluid will react to an electric field applied to it, in other words if a voltage is applied the charge of a capacitor filled with fluid is greater than that of a system filled with air by the value of the relative DC. The capacity will rise by the value of the relative DC due to the polarisation of the lubricant.

Specific conductivity

Free charge carriers in the lubricant can be found by measuring the specific electrical conductivity. Generally as the length of use of the oil increases, its increase in acid is particularly responsible for the increase in free charge carriers. Fresh oil containing additives will reduce its alkaline residual reserve as a result of acid insertion and become increasingly acidic.

Adapter	¾" thread (G3/4A)
Dimensions	Overall length approx. 142.5 mm, installation depth approx. 72.5 mm
Weight	Approx. 250 g
Connection	Plug-in system with screw lock RD24x1/8, 6-pole, Hirschmann plug CA6GS (IP67)
Sensor cable	Type LIYY-LIYCY 6 x 0.5, 6-pole, two individually shielded cables (max. length 20 m / typ. 5 m) with Hirschmann cable socket CA6LD (IP67)
Material	Base body in stainless steel
Protection type	IP 67
Operating temp.	-40°C to 130°C (fluid)
Operating pressure	Max. 25 bar
Ambient temp.	-40°C to 90°C
Bushing	4-way high-performance ceramic (brazed)
Fluid sensor	Torsion quartz (SiO_2), approx. 78 kHz, shearing rate approx. $4.9*10^5$/sec
Temperature sensor	Silicium planar sensor KTY

Sensormodul:
Sensor module

Viscosity sensor	Torsion quartz, 78 kHz L = 25 mm, D = 6 mm
Sensor-rel. DC	Integrated in the viscosity sensor
Design	¾" thread (G3/4A)
Installation length	L = 72.5 mm from sealing edge as shown in attached principle sketch
Material	Stainless steel
Temperature sensor	KTY, integrated
Sensor cable	L = 5 m
Temperature range	-30°C to 100°C
Pressure range	Max. 25 bar
Measuring medium	Engine oil

Electronics

Viscosity range	1 to 100 mPas
Rel. dielectric	1 to 10
Spec. elec. Cond.	1-100 [10^{-6} S/m]
Resolution	See data sheet
Temp. measurement	KTY
Measuring time	Approx. 30 s
Display	4 LEDs (red, yellow, green, red)
Control	1 button (concealed)
Sensor connection	7-pole housing plug (AMPH.)
Connection power	7-pole housing plug (AMPH.)
Digital interface	1 USB1.1 interface
Analogue output	4 x 4-20 mA signals (active, 16 bit, earth-free)
Error display	4 x 2 mA current signal at analogue output (see above)
Control cables	1 optocoupler output
Housing	Die-cast aluminium box approx. 115x85x35 (LxWxH), 300 g
Power supply	Direct voltage +/- 10% Version A12: 12 VDC or Version A24: 24 VDC
Power consumption	Approx. 200 mA at 13.5 V
Ambient temp.	-30°C to 70°C

Hint !
www.statuskop.de – preventative machine and engine maintenance using "ultrasound".
Provides evidence of wearing processes and quick, simple error analyses. No other method also allows a precise status check of an engine at the same time whilst also archiving the recorded data. The Statuskop is a portable monitoring system designed to record and save values of an ultrasonic spectrum.