

Water in Oil Sensor

FRG 00035

MPU 010



Application fields

- Power generation
- Marine engines
- Oil transformers
- Hydraulic aggregates
- Large gear units
- Heavy duty applications

Benefits

- Water in oil saturation monitoring
- System protection
- Service on request
- Precision engineered
- Harsh environment capability

Working principle

Oil has the ability to hold a certain amount of **dissolved water**. The maximum amount of water that oil can hold is characterized by the "saturation point". Above this point free water precipitates, which can lead to **corrosion inside an aggregate**. The "saturation point" is influenced by temperature and other various factors such as the composition of the oil (mineral or synthetic) and the formulation of additives. Moreover, it changes during lifetime.

Leaving behind basic measuring technology of free water in oil or emulsion, our **system senses the absolute content of absorbed water in oil**. Based on a capacitive measuring principle, the Water in Oil Sensor FRG00035 physically detects the 'water activity' characterized by value AW.

The system provides very precise measurement results, compensating temperature and aging effects. Basically it provides an **alert function** containing pre-alarm at 0.5AW (which correlates to 50% humidity) and main alarm at 0.9AW. These values can be set differently depending on the needs of the application.


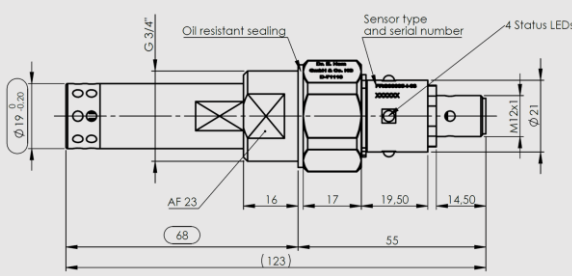

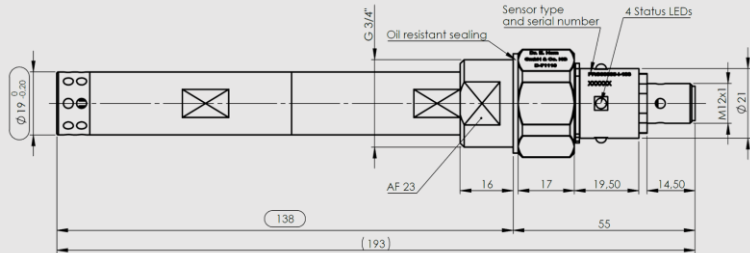
Installed in a robust **stainless steel housing**, our Water in Oil Sensor withstands the most demanding environmental conditions. In combination with the **MPU010 evaluation unit**, the customer receives a very flexible system offering simple integration with various output signal options.



Technical data sensor FRG00035


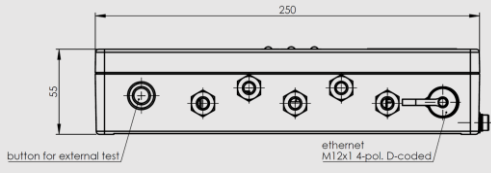
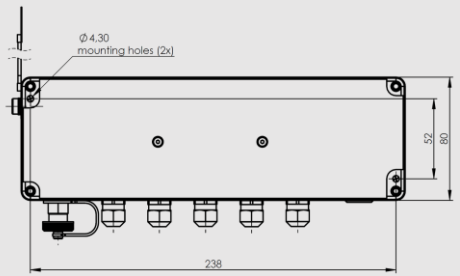

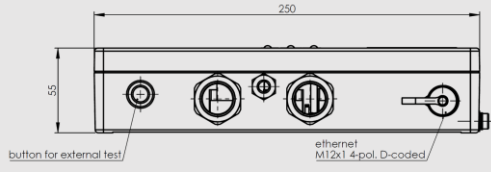
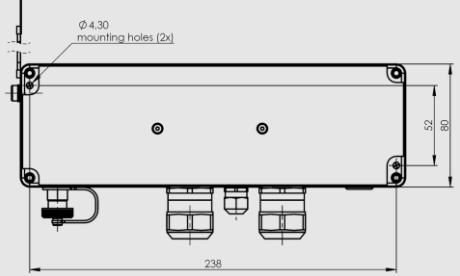
Version	R / N ¹⁾	I	C	AC
Output interface	RS232, SCP (R) RS232, non-SCP (N)	I ² C	2 relay outputs driving 2 alarm levels (0.5AW / 0.9AW), output max. 500mA	2 analog outputs 4...20mA load < 500Ω
Operating temperature	-25...+85 °C	-25...+125 °C	-25...+85 °C	-25...+85 °C
Accuracy of humidity measurement	±3% within -25...+85 °C			
Pressure resistance against medium	10 bar			
Protection degree	IP67			
Power supply	18...32 VDC, max. perm. ripple ≤ 5%	5 VDC	18...32 VDC, max. perm. ripple ≤ 5%	18...32 VDC, max. perm. ripple ≤ 5%
Current consumption	< 30mA	< 10mA	< 60mA	< 60mA
Polarity protection	yes			
Cable length	max. 25m	max. 50m	max. 50m	max. 50m
Dimensions	Standard shaft length: 68 mm / 138 mm (others on request), see drawing Nut size: inner or outer thread G ¾ (through adapter)			

¹⁾ Only for Bearing Distance Monitoring System BDMS

Picture	Drawing
<p>Sensor shaft length 68mm</p> 	
<p>Sensor shaft length 138mm</p> 	

Technical data monitoring box MPU010

Version	MPU010-I-K small cable glands, I ² C	MPU010-I-G large cable glands, I ² C
Power supply	18...32 VDC, max. permissible ripple ≤ 5 %, Protected by automatic fuse	
Power consumption	approx. 10 W	
Polarity protection	yes	
Operating temperature	-25...+85 °C	
Storage temperature	-25...+85 °C	
Relative humidity	< 90 %, non-condensing	
Weight	Monitoring box: approx. 700 g	
Protection degree	IP 67	
EMC-standard	DIN EN 55016 and DIN EN 55022, safety rules acc. EN 61000-4, -6 rules for type approval test accord. GL	
Connection to PE	Copper mesh band	
Cable glands	M12 for sensor, cable dia. 5..6.5mm M12 for relays, cable dia. 5..6.5mm M12 for analog out, cable dia. 5..6.5mm M12 for power supply, cable dia. 5..6.5mm	M12 for sensor, cable dia. 5..6.5mm M25 for power, cable dia. 12.5..20.5mm M25 for relays and analog out, cable dia. 12.5..20.5mm
Sensor interface	I ² C	
Alarm relays	PAV (pre-alarm-value), MAV (main-alarm-value), Ready	
Photo-MOS outputs	< 60 VDC, 500 mA (Short Circuit Protected, free configurable)	
User interface	3 LED, analog output, web page over ethernet, CAN	
Configuration	web page over ethernet	
Analogue output	current output or voltage output (details configurable: 4-20 mA or 0-10 VDC, others on request), galvanic isolated, user selectable, 12 bit (4096 steps)	
Current output burden	max. 1200 Ω	
Linearity	≤ ±0.15 % of final value	
Reaction time	> 300 ms, adjustable	
Ethernet	Transmission rate max. 100 Mbit/s for parameter settings and display, galvanic isolated, IP-Address adjustable	
CAN	Transmission rate 20 kBaud...1 MBaud; Node ID adjustable 1...127 CANopen-protocol for parameter settings and display, galvanic isolated	

Picture	Drawings	
<p>Cable glands small „K“</p> 		
<p>Cable glands large „G“</p> 		

Further details on request.

Ordering structures

FRG00035 - X - YY - ZZ

- Temp. range [85, 125] °C
- Sensor length [68, 138] mm
- Version/output interf. [R, N, I, C, AC]
- Basic type information

MPU010 - X - Y

- Cable gland [K, G]
- Version/output interf. [I]
- Basic type information

Options and related products

Optional display unit:

Analog indicator for indication of water activity AW.
EA 96x96.2 s l w DW (AW or temperature).
Further details on request.



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