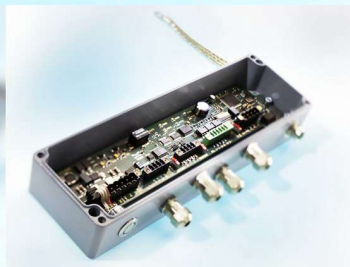


Water in Oil Sensor

FRG 00035

MPU 010

GHG 02088-5



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 (PAV) at 0.5AW (which correlates to 50% humidity) and main alarm (MAV) at 0.9AW. With version "I" these values can be set differently depending on the needs of the application. Four status LEDs indicate following information: RUN / PAV / MAV.

Installed in a robust **stainless steel housing**, our Water in Oil Sensor withstands the most demanding environmental conditions. In combination with the **Main Processing Unit MPU010**, the customer receives a very flexible system offering simple integration (Module Type Package ready "**MTP-Ready**"³⁾) with various output signal options and event memory functions.

With the "AC" version in conjunction with **GHG02088-5**, users can not only read out the analog signals of temperature and AW, but also the alarm signals supported by relay technology.


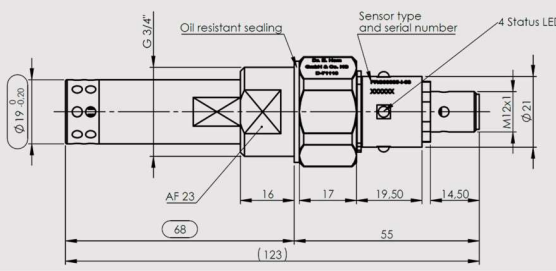

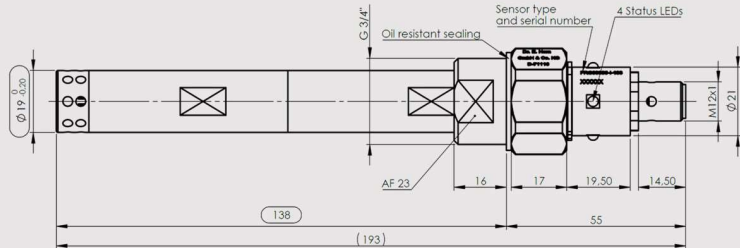


Technical data sensor FRG00035

Version	I	R / N ¹⁾	C	A	AC ²⁾
Output interface	I ² C	RS232	Relay (2x)	Analog (2x)	Analog (2x) / Relay (3x)
Output information	Humidity, Temp., PAV, MAV	Humidity, Temp., PAV, MAV	PAV, MAV	Humidity, Temp.	Humidity, Temp., PAV, MAV, STATUS
Output characteristics	Serial	Serial	Analog 4...20mA / load max. 500Ω Relay max. 500mA		
Operating temperature	-25...+125 °C		-25...+85 °C		
Accuracy of humidity measurement				±3%	
Pressure resistance against medium				10 bar	
Protection degree				IP67	
Power supply	5 VDC ±5%		18...32 VDC, max. perm. ripple ≤ 5%		
Current consumption				< 50mA	
Polarity protection				yes	
Cable length	max. 50m	max. 25m	max. 50m		
Certificates	Class approval DNV				
Dimensions	Standard shaft length: 68 mm / 138 mm (others on request), see drawing Connecting thread: outer thread G ¾ (inner thread G ¾ on demand)				

¹⁾ R = Short circuit protected (SCP) / N = Non-SCP; Only for HORN-Bearing Distance Monitoring System (BDMS)


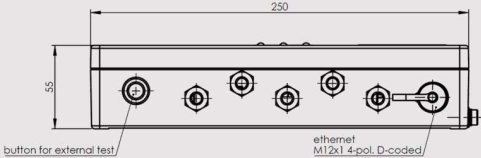
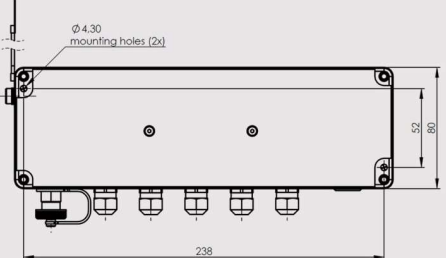

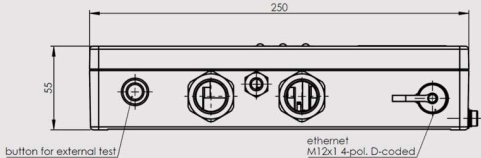
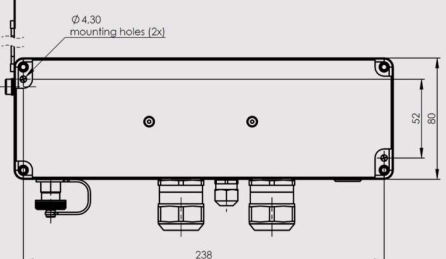

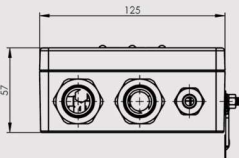
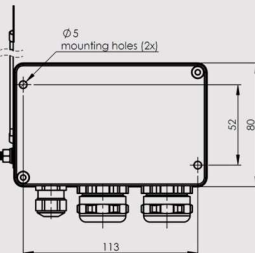
²⁾ Only in combination with GHG02088-5

Image	Drawing
<p>Sensor shaft length 68mm</p>  <p>Image: Outer thread G 3/4</p>	
<p>Sensor shaft length 138mm</p>  <p>Image: Inner thread G 3/4</p>	

Technical data Main Processing Unit MPU010 and GHG02088-5

Version	MPU010-I-K small cable glands, I ² C	MPU010-I-G large cable glands, I ² C	GHG02088-5 large cable glands
Power supply	18...32 VDC, max. permissible ripple ≤ 5 % (protected by automatic fuse) MPU010: 2 power supply inputs (redundancy)		
Power consumption	approx. 10 W		approx. 2 W
Polarity protection	yes		
Operating / storage temperature	-25...+85 °C		
Relative humidity	< 90 %, non-condensing		
Weight	approx. 1000 g		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 M12 for power supply M12 for relays M12 for analog out M12 for CAN bus Cable size M12: ø5...6.5mm	M12 for sensor M25 for power supply M25 for relays, analog out, CAN Cable size M12: ø5...6.5mm Cable size M25: ø12.5...20.5mm	M16 for sensor M25 for power supply M25 for relays, analog out Cable size M16: ø6...10.5mm Cable size M25: ø11...20mm
Sensor interface	I ² C		AC
Relays	PAV (pre-alarm-value), MAV (main-alarm-value), STATUS Photo-MOS output: < 60 VDC, 500 mA (Short Circuit Protected SCP)		
Analog output	current output or voltage output (details configurable: 4-20 mA or 0-10 VDC, others on request), galvanic isolated, user selectable		current output (4-20 mA), galvanic isolated
Current output load	max. 1200 Ω		max. 500 Ω
Ethernet	Transmission rate max. 100 Mbit/s, galvanic isolated, IP-Address adjustable		
CAN	Transmission rate 20 kBaud...1 Mbaud, galvanic isolated, Node ID adjustable 1...127		
Configuration / display	CANopen-protocol / Web page over ethernet		

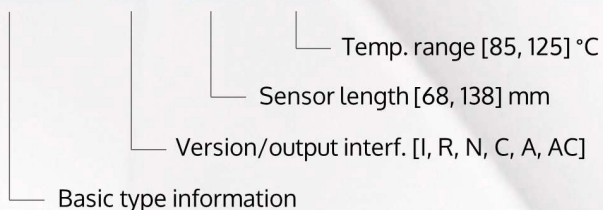
MTP-Ready³⁾

Image	Drawings	
	<p>Cable glands small „K“</p>  <p>button for external test</p> <p>ethernet M12x1 4-pol. D-coded</p>	 <p>Ø 4.30 mounting holes (2x)</p> <p>238</p> <p>52</p> <p>80</p>
	<p>Cable glands large „G“</p>  <p>button for external test</p> <p>ethernet M12x1 4-pol. D-coded</p>	 <p>Ø 4.30 mounting holes (2x)</p> <p>238</p> <p>52</p> <p>80</p>
	 <p>125</p> <p>57</p>	 <p>Ø 5 mounting holes (2x)</p> <p>113</p> <p>52</p> <p>80</p>

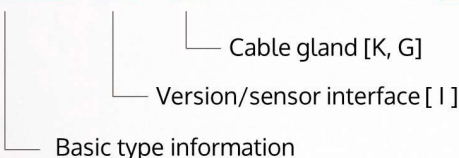
Further details on request.

Ordering structures

FRG00035 - X - YY - ZZ



MPU010 - X - Y



GHG02088-5



Options and related products

Display touch function EV 314xx (settings)

Analog indicator EA 96x96 (AW or temp.)

Switch and indication cabinet GHG 02088-50



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