WATER IN OIL SENSOR (WIO) Product Overview

The WIO-Sensor technology is a secure on-line system monitoring the water content in oil. Water or moisture is the second largest contamination (after particles) in oil systems with damaging effects on the life time of both the machinery and the oil. Moisture is damaging to engine parts, cylinders, bearings, etc. with resulting mechanical failures and therefore repairs and expensive downtime costs (often ranging between EUR 10,000 – 200,000).

WIO Sensor Integrated

The amount of water a specific oil type can dissolve varies significantly, depending on e.g. the base oil, additives, oxidation, temperature and other factors. The sensors thus require a comprehensive calibration to measure the water content correctly. PAJ sensors have the highest quality and accuracy levels in the industry through elaborate oil calibration & testing methods.

While conventional approaches require taking a small sample of the oil and then analysing it, the sensor provides continuous monitoring of the entire lubricant oil volume, providing early warning of high levels of water content that could damage the machine. As well as providing advance warnings of problems, it can also be used to ensure that separators, filters and driers are only running when actually needed. The sensor is available with an associated terminal box. The terminal box provides power to the sensor, links the sensor to any external condition monitoring system, gives alarms and provides a local visual indication of the water level in the oil.

Oil Types	Applications	Industries	Product Features
• Lube • Gear Box • Turbine • Diesel • Hydraulic • Transformer	• Oil systems • Gear boxes • Turbines • Transformers • Compressors • Hydraulics • Ventilation • Cooling systems • Pumps • Others	• Marine • Power • Processing • Offshore • Renewables • Steel • Food • Paper • Mining • Agriculture • Robotics • Others	• 24/7 monitoring • Highest measuring accuracy • Robustness (for heavy use) • GL approved • MAN Diesel Approved • Calibration certificate • Analogue output or MODBUS • Configuration to exact needs • Thread or ball valve installation • Galvanic isolated • High grade cables • Optional LED buttons & displays • Customised alarm settings • Easy installation

CUSTOMER BENEFITS

- **24/7 monitoring and early warnings (allowing preventive actions)**
- **Increased lifetime of engine parts, cylinders, bearings, etc.**
- **Saved damages and downtime costs**
- **Longer oil lifetime**
- **Saved oil sample costs (and administration)**
- **Potential savings on water filters, separators, etc. (only running when needed)**
- **Avoided commercial costs and negative customer impact (from downtime and delays)**
- **Higher accuracy than most oil sample tests and real time answers**

WATER IN OIL SENSOR PRODUCT RANGE

The sensor is simple to install and easy to connect. It provides a measurement range of 0.01-1.00aw, with accuracy of ±0.03aw and a resolution of better than 0.004aw. The relay alarm contacts are rated for 250V AC by installation with the Terminal connections, with the default alarm limits being 0.50aw and 0.90aw (both adjustable for WIO 300 to 500). The sensor works with oils at up to 10 bar pressure with the ball valve installation, and with thread installation up to 20bar and from 0°C to 90°C.

The Integrated WIO sensor can be quickly installed - either as retrofit or in new installations.

WIOI200B Integrated

- 24VDC±10% power supply
- 2 x NO relay outputs 250VAC/2A
- 1 x galvanic isolated analogue output 4 - 20mA
- 4 digit indication display for aw/ppm
- LED indication for High/HighHigh-alarm
- Push button function for H/HH alarm
- Acoustic indication for H/HH alarm
- Includes Ball Valve part adapter for sealing and retaining

WIOI300 Integrated

- 24VDC±10% power supply
- 2 x NO relay outputs 250VAC/2A
- 2 x galvanic isolated analogue output 4 - 20mA
- RS232 user interface
- adjustable alarm points for HA and HHA (aw/ppm) via com.
- 4 digit indication display for aW/ppm
- LED indication for High/HighHigh-alarm
- Push button function for H/HH alarm
- Acoustic indication for H/HH alarm
- USB Stick for WIO software
- Includes Ball Valve part adapter for sealing and retaining

WIOI400 Integrated

- 24VDC±10% power supply
- 2 x NO relay outputs 250VAC/2A
- 2 x galvanic isolated analogue output 4 - 20mA
- RS485 user interface
- adjustable alarm points for HA and HHA (aw/ppm) via com.-
- 4 digit indication display for aW/ppm
- LED indication for High/HighHigh-alarm
- Push button function for H/HH alarm
- Acoustic indication for H/HH alarm
- USB Stick for WIO software
- Includes Ball Valve part adapter for sealing and retaining

WIOI500 Integrated

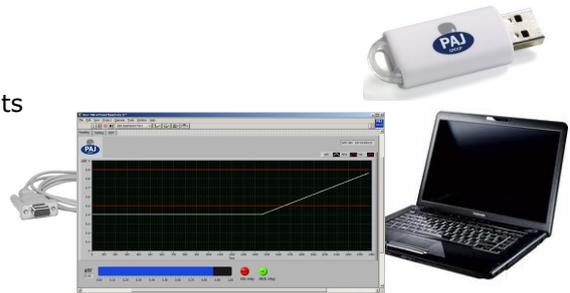
- 24VDC±10% power supply
- 2 x NO relay outputs 250VAC/2A
- 2 x galvanic isolated analogue output 4 - 20mA
- CANopen user interface
- adjustable alarm points for HA and HHA (aw/ppm) via com.-
- 4 digit indication display for aW/ppm
- LED indication for High/HighHigh-alarm
- Push button function for H/HH alarm
- Acoustic indication for H/HH alarm
- USB Stick for WIO software
- Includes Ball Valve part adapter for sealing and retaining

ISO 9001 - ISO 14001 - ISO 13485 - IRIS - IEC 61340-5-1 - IPC A-610 Class 3

WIO-Software

- settings of High-Alarm & HighHigh-Alarm alarm limits
- monitoring of aW and PPM
- monitoring of the temperature
- status indication of the service intervals
- logfile of the measured data
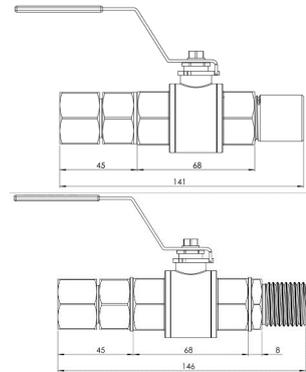- Easy to install from USB-Stick

DB9 Female
RS232/RS485/
CanOpen to
USB cable

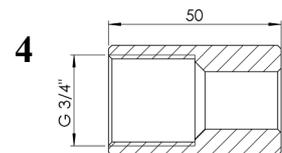8 pole Male
RS232/RS485/
CanOpen to USB
cable

Ball Valve 16mm

1. Complete solution for WIO-Sensor for welding
2. Complete solution for WIO-Sensor with external thread
3. Ball Valve part adapter for sealing and retaining
- Easy to install and to use
- Fixed mounting of WIO-Sensor
- Able to expand with ISO228/1 G3/4 adapter

Pipe unit

- Special adapter unit for WIO-Sensors
- Fix mounting and simple solution

Cable

- The cable is 5 meter

ISO 9001 - ISO 14001 - ISO 13485 - IRIS - IEC 61340-5-1 - IPC A-610 Class 3

Product list

WIOI	Water In Oil Integrated Sensor						
	L					Lubrication Oil	
	G					Gear Box Oil	
	D					Diesel Oil	
	H					Hydraulic Oil	
	T					Transformer Oil	
	U					Turbine Oil	
		1				Integreted Ball valve Long Pipe WIO sensor with **aW** display and LED buttons	
		2				Integreted Ball valve Long Pipe WIO sensor with **ppm** display and LED buttons	
		3				Integreted Ball valve Short Pipe WIO sensor with **aW** display and LED buttons	
		4				Integreted Ball valve Short Pipe WIO sensor with **ppm** display and LED buttons	
			A			No user interface (WIOI 200B)	
			B			RS232 Modbus user interface (WIOI 300)	
			C			RS485 Modbus user interface (WIOI 400)	
			D			CanOpen Modbus user interface (WIOI 500)	
				50		Standard High-Alarm 0,50 aW	
				xx		xx must be from 10 to 80 (0,10 – 0,80 aW)	
					90	Standard HighHigh-Alarm 0,90 aW	
					xx	xx must be from 20 to 90 (0,20 – 0,90 aW)	
WIOI	L	1	A	50	90	This is an order example of a WIOI200B sensor with aw display	
WIOI	L	2	C	50	90	This is an order example of a WIOI400 sensor with ppm display	

ACC	Accessory equipment			
	SW1	Additional USB sticks with SW for Communication with PC and sensor (per USB stick)		
	SW2	USB to DB9 Female cable (for RS232)		
	SW3	USB to DB9 Female cable (for RS485)		
	SW4	USB to DB9 Female cable (for CanOpen)		
	SW5	USB to 8 pole Male cable (for RS232)		
	SW6	USB to 8 pole Male cable (for RS485)		
	SW7	USB to 8 pole Male cable (for CanOpen)		
	PI-1	Complete Ball Valve adapter with no thread, for welding		
	PI-2	Complete Ball Valve adapter with external thread		
	PI-3	Ball Valve part adapter for sealing and retaining part		
	PI-4	Pipe unit 3/4" with internal thread, for welding		
ACC	PI-1	This is an order example of Accessory equipment		

RF	Refurbishment of sensor					
	L G D H T U	Lubrication Oil Gear Box Oil Diesel Oil Hydraulic Oil Transformer Oil Turbine Oil				
		1	Integrated Ball Valve sensor			
			50 xx	Standard High-Alarm 0,50 aW xx must be from 10 to 80 (0,10 – 0,80 aW)		
				90 xx	Standard HighHigh-Alarm 0,90 aW xx must be from 20 to 90 (0,20 – 0,90 aW)	
RF	L	1	50	90	Order example	

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