

Oil Debris Sensor

Real time condition monitoring for equipment using oil lubrication

The Oil Debris Sensor is designed for use in equipment that uses oil as a lubricant.

Once fitted as a 'smart' sump plug replacement, or within an oil bypass circuit, the sensor uses a powerful magnet to attract ferrous particles suspended within the oil as a result of wear to the internal components. Able to determine between fine and coarse debris, the sensor can also alert or continuously monitor either oil temperature or water presence*.

Installed into a wide variety of fittings and available with either an analogue 0–10 V or 4–20 mA, or a digital CANbus or Modbus RTU output.

Typical Applications

- Industrial processes
- Power sector
- Transportation
- Mining

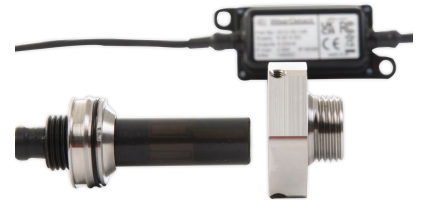
Key Features

- Measures quantity of captured fine and coarse ferrous debris
- Continuous or alert output for water presence* or oil temperature
- Wide operating temperature range
- Choice of 0–10 V, 4–20 mA, CANbus or Modbus RTU output models
- Suitable for use with oils, fuels and coolants
- Broad range of fittings available
- Calibration software available

Benefits

- Continuous real-time monitoring
- Cost effective high precision measurement sensor
- Separate electronics enclosure for mounting flexibility
- Easy installation in oil sump or bypass line
- Can be user calibrated for optimum performance
- Complements oil analysis and/or vibration monitoring
- Low cost of ownership

* minimum 10% free water presence



Sensor & electronics



Sensor with debris attached



Example installation

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ELECTRICAL — Analogue		
	Voltage	Current
Supply voltage	6–32 VDC	9–32 VDC
Over voltage protection	>32 VDC	>32 VDC
Power consumption	<0.7 W	<2.6 W
Reverse polarity protection	to -32 VDC	to -32 VDC
Analogue resolution	10 bit	10 bit
Report rate	10 Hz	10 Hz
Sensor configuration	USB	USB

ELECTRICAL — Digital		
	CAN	Modbus
Supply voltage	5–32 VDC	5–32 VDC
Over voltage protection	>32 VDC	>32 VDC
Power consumption	<0.7 W	<0.7 W
Reverse polarity protection	to -32 VDC	to -32 VDC
Measurement resolution	See connections table	
Report rate	1 Hz	1 Hz
Sensor configuration	USB	USB

MECHANICAL	
Sensor size	57 x Ø24.5mm
Enclosure	55 x 30 x 12mm
Enclosure mounting	2 off M44 clearance holes
Materials (sensor)	Stainless Steel, FEP, PEI
Materials (enclosure)	Aluminium alloy, st/steel, polyester
Sensor/Enclosure cable	26AWG PTFE with DR25 Jacket - 3m /1m
Weight	0.21kg (total)

ANALOGUE OUTPUT SPECIFICATIONS — Configurable		
	Voltage	Current
Fine, Coarse, Water/temp	0.25–10 VDC	4–20 mA
Error Indication	0.25–10 VDC	1–20 mA

ENVIRONMENTAL	
Sensor protection	IP66 / IP68
Enclosure protection	IP65
Differential pressure	10 Bar
Sensor operating temp (Enclosure)	-26°C to +150°C (+85°C)
Humidity	95% RH @ +55°C
This product is <u>not</u> designed or certified for use in ATEX environments. Please contact Gill Sensors & Controls for more details	

MODBUS OUTPUT SPECIFICATIONS	
Communication standard	Modbus RTU (RS-485) Half Duplex
Baud rates	4800, 9600, 19200, 38400, 57600
Transmission formats	8E1, 8O1, 8N2
Parameter Registers (Type) - resolution:	
Fine Debris (16-bit UNIT) - 1 %	40001
Coarse Debris (16-bit UINT) - 1 %	40002
Oil Status (16-bit UINT) - 1 count	40003
Oil Probe Temperature (32-bit Float) - 0.0625°C	40004-40005
For additional details on functions and parameters, see the WearDetect User Manual.	

LIQUIDS	
Fuels	Diesel, gasoline
Oils	Hydraulic, gear, mineral, vegetable, synthetic ester, semi-synthetic, polyalphaolefin, polyalkyleneglycol
Coolants / Other	Ethylene glycol, water, salt water

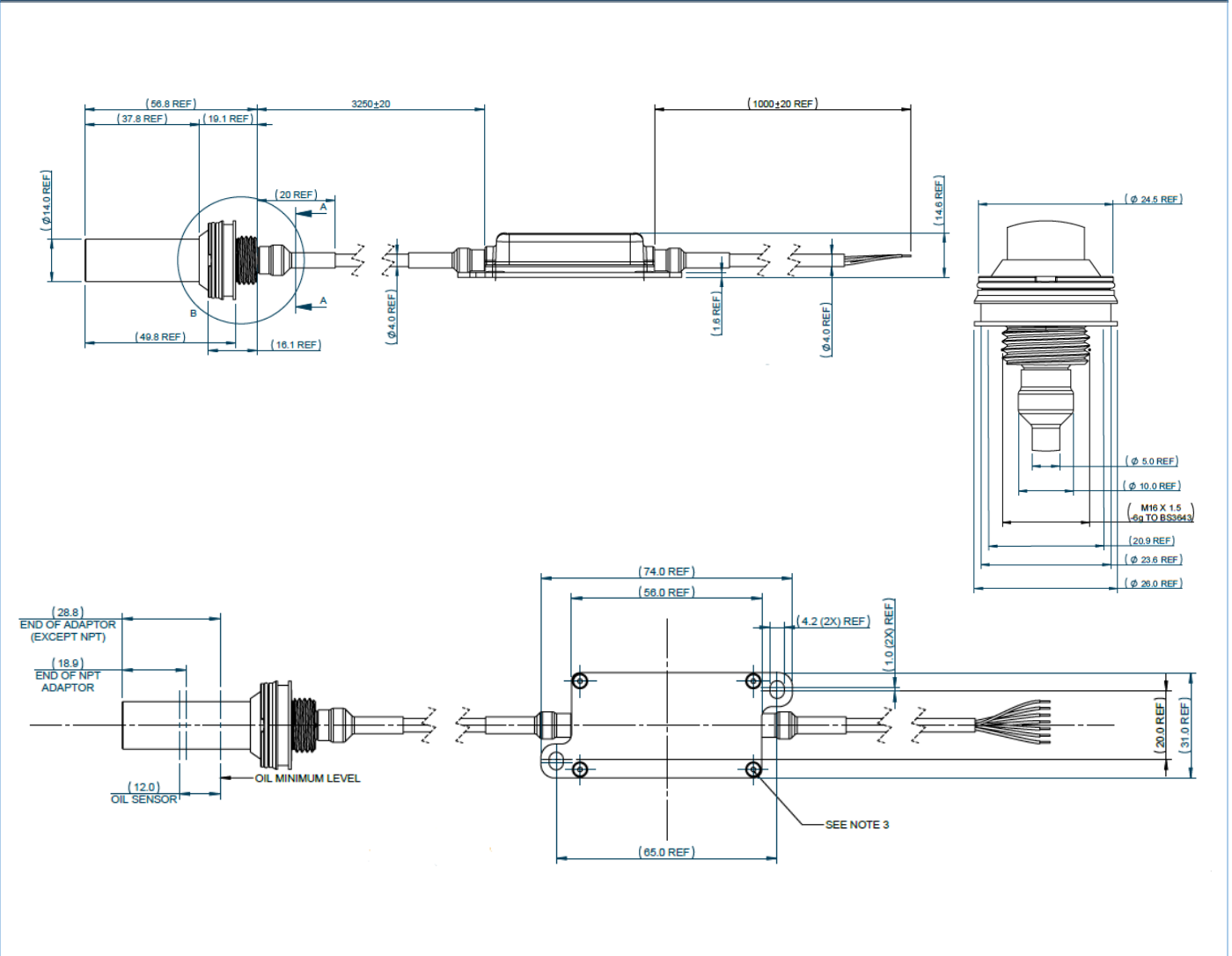
DIGITAL CANBUS SPECIFICATIONS	
J1939 data length	8 bytes
PGN	130816
Byte 0	Coarse measurement %, no scaling Value 255—optional output inhibited during calibration
Byte 1	Fine measurement %, no scaling Value 255—optional output inhibited during calibration
Byte 2	8 Status bits Bit 0—High/low temp exceeded Bit 1—Oil upper threshold exceeded Bit 2—Oil lower threshold exceeded Bit 3—Fine measurement error Bit 4—Coarse measurement error Bit 5—Oil measurement error Bit 6—Internal temp sensor error Bit 7—External temp sensor error
Byte 3-7	Manufacturer use

ORDERING	
Sensor:	Output:
4212—PK - [] [] []	148 = 4-20mA 150 = CAN 149 = 0-10V 151 = Modbus
Mounting Thread Code:	Thread:
4212—PK - [] [] []	504 = M22x1.5 507 = M24x2.0 552 = 3/4"x16UNF
Conduit Kit = 4212-10-051-X	

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DIMENSIONS



MOUNTING THREADS (4212-PK-...see below)

Thread Code	Thread Size	Insert Depth	Spanner A/F	Torque ± 10%
502	M20 x 1.5	37.05	36.0	50 Nm
504	M22 x 1.5	37.05		
507	M24 x 2.0	37.05		
533	1/2" BSPP	36.55		
552	3/4" x 16 UNF	36.55		

MOUNTING THREADS (4212-PK-...see below)

Thread Code	Thread Size	Insert Depth	Spanner A/F	Torque ± 10%
571	1/2" NPT	32.46	36.0	Refer ANSI / ASME B.20.1
573	3/4" NPT	32.76		
575	1" NPT	36.24		
576	1 1/4" NPT	36.85		
577	1 1/2" NPT	37.28		

For more information about WearDetect Oil Debris Sensors please contact Gill Sensors & Controls.

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