WearDetect

Datasheet

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.

Sensor & electronics

Typical Applications

- Industrial processes
- Power sector
- Transportation
- Mining

Sensor with debris attached

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

Example installation

* minimum 10% free water presence

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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

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)

ENVIRONMENTAL

Sensor protection	IP66 / IP68
Enclosure protection	IP65
Differential pressure	10 Bar
Sensor operating temp (Enclosure)	-26°C to +150°C (+85ºC)
Humidity	95% RH @ +55°C

This product is not designed or certified for use in ATEX environments.
Please contact Gill Sensors & Controls for more details

LIQUIDS

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

ORDERING

Sensor:

4212—PK - ☐ ☐ ☐ ..... **Output:**

148 = 4-20mA **150 = CAN**
149 = 0-10V **151 = Modbus**

Mounting Thread Code:

4212—PK - ☐ ☐ ☐ ..... **Thread:**

504 = M22x1.5
507 = M24x2.0
552 = 3/4"x16UNF

Conduit Kit = 4212-10-051-X

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

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

MODBUS OUTPUT SPECIFICATIONS

Communication standard	Modbus RTU (RS-485) Half Duplex
Baud rates	4800, 9600,19200, 38400, 57600
Transmission formats	8E1, 8O1, 8N2, 8N1
Parameter Registers (Type) - resolution: Fine Debris (16-bit UNIT) - 1 % Coarse Debris (16-bit UINT) - 1 % Oil Status (16-bit UINT) - 1 count Oil Probe Temperature (32-bit Float) - 0.0625°C	 40001 40002 40003 40004-40005
For additional details on functions and parameters, see the WearDetect User Manual.	

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

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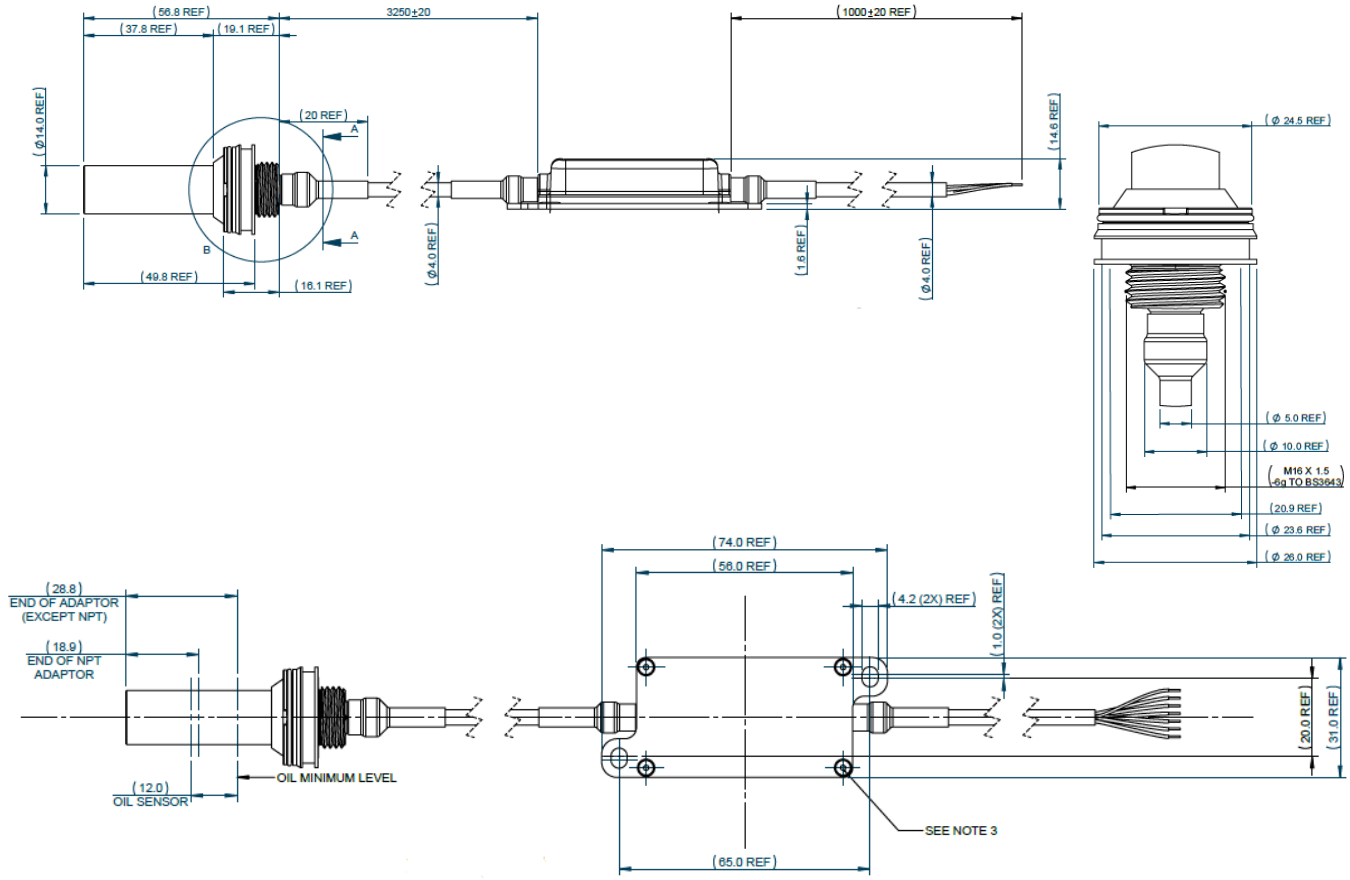
DIMENSIONS



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

Thread Code	Thread Size	Insert Depth (mm)	Spanner A/F (mm)	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 (mm)	Spanner A/F (mm)	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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Designed and manufactured in the UK by Gill Sensors & Controls Limited