

SPECIFICATION SHEET

MS3510 ONLINE OIL DEBRIS MONITOR

Real-time damage detection anytime, anywhere. MetalSCAN 3500 Series oil debris sensors monitor metal particles generated from rotating equipment due to bearing and gear damage. Oil debris monitoring enables early and simple assessment of how much time you have to schedule maintenance prior to potential equipment failure.

The MS3510 is part of the newest 5th generation MetalSCAN 3500 Series of sensors and is designed to be easily installed in line in the lubrication system of rotating equipment to detect the presence of metallic particles and provide early detection, identify severity, and provide remaining life indication of the bearings and gears located deep within your critical equipment.

The sensor detects metal particles above its minimum size threshold and provides particle data, equipment condition, and self-diagnostic information directly to a host monitoring or control system. The sensor communicates via standard Modbus TCP protocol over Ethernet and is fully backward compatible to previous MetalSCAN 3000 generations providing Particle Pulse and Built-in-Test outputs. Modbus RTU protocol over an RS-485 serial interface is also available.

The data collected by the sensor is compared to pre-established machinery condition indicators. These condition indicators are based upon simple criteria which establish whether or not the gearbox is healthy. When damage is detected, condition indicator models help determine how much damage there is and how much longer the equipment can be operated before a potential failure. All analysis is performed locally to the sensor and subsequently transmitted to a host monitoring system with no need for expensive expert-based analysis or consultations.



Features

- 100% detection of Fe and NFe metal particles
- Particle type and size discrimination (Fe / NFe)
- Particle mass classification
- Built-in equipment condition indication
- Temperature reporting
- Full function continuous Built-in-Test (BIT)
- Simple to install and easy to interpret
- Rugged, solid-state with no moving parts and proven reliability in harsh environments
- Low power consumption
- Wide operational temperature range
- Lightweight and compact in size
- Low cost

Benefits

- Prevent unplanned outages
- Prevent equipment secondary damage
- Real-time indication of equipment health and remaining life
- Earliest reliable detection of component damage
- Simple and intuitive data interpretation

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Performance

Sensor Bore	25mm (1 inch)
Minimum Detectable Particle (sphere)	260µm Fe / 600µm NFe
Minimum Detectable Particle (ESD) ¹	170µm Fe / 370µm NFe
Flow Rate	10 L/min - 300 L/min (2.6 USGPM to 79 USGPM)
Flow Direction	Bi-directional
Maximum Particle Detection Rate	Configurable up to 100 particles/sec

¹The Equivalent Spherical Diameter (ESD) of an irregular shaped object is the diameter of a sphere of equivalent volume.

Electrical Interface

Input Power Supply	18 to 30 VDC
Power Consumption	2.4W

Communication

Ethernet 10/100 Mbit/s Serial RS-485 (Optional)

Particle Type Discrimination	Ferromagnetic (Fe) / Non-Ferromagnetic (NFe)
Particle Size Reporting	Configurable Fe / NFe size bins and Fe / NFe Rate
Particle Mass Reporting	Fe Mass and Fe Mass Rate
Equipment Condition Indication	Configurable Alarm and Warning Limits (Fe, NFe & Temperature)

Modbus TCP Modbus RTU

Ferromagnetic (Fe) / Non-Ferromagnetic (NFe)
Configurable Fe / NFe size bins and Fe / NFe Rate
Fe Mass and Fe Mass Rate
Configurable Alarm and Warning Limits (Fe, NFe & Temperature)

MS3000 Digital Outputs

PULSE	5 ms Square Wave Pulse ± 2 ms
BIT State	Hi-LO Logic
Fault	Low Logic
No Fault	High Logic
Signal Amplitude	Power Supply Voltage +0/-2 VDC
Load Impedance Required	High (≥1 kΩ)

Particle Pulse and Built-in-Test (BIT)

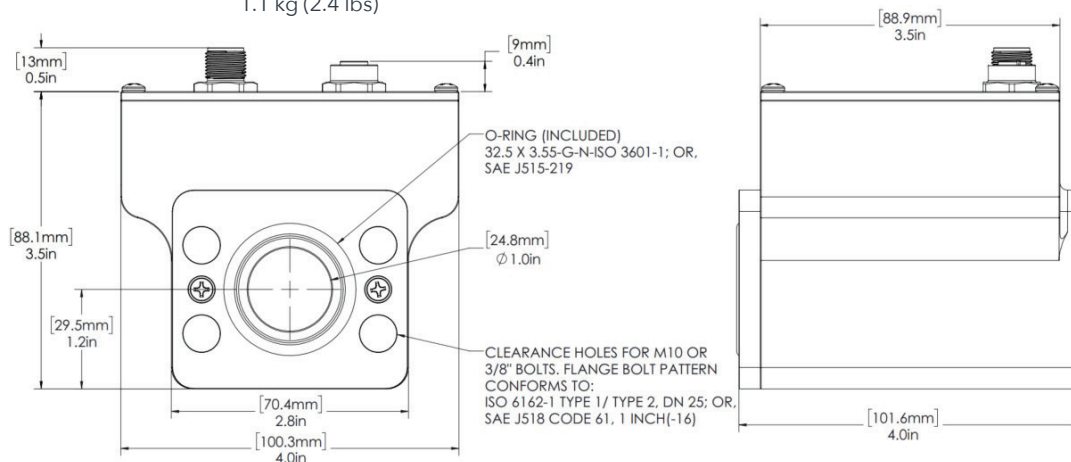
5 ms Square Wave Pulse ± 2 ms
Hi-LO Logic
Low Logic
High Logic
Power Supply Voltage +0/-2 VDC
High (≥1 kΩ)

Environment

Oil Pressure	Maximum 20 bar (300 psi)
Oil Temperature	-40°C to 85°C (-40°F to 185°F)
Ambient Temperature	-40°C to 70°C (-40°F to 158°F)
Vibration	10-50 Hz: 3mm (displacement) 50-300 Hz: 15g (acceleration)
Fluids Compatibility	Hydraulic & lubrication oils; synthetic & mineral based; solvents & cleaning agents

Mechanical Interface

Weight 1.1 kg (2.4 lbs)



Compliance

Conforms to ASTM D7917
IP66/67



Ordering Information

Sensors

MetalSCAN 3510 Sensor
(Order: MS3510)

MetalSCAN 3510-RTU Sensor
(Order: MS3510-RTU)

Accessories

M12, A-Coded, 8-PIN, Straight Backshell
Cable, 10m
(Order: Cable-3500-A-10-00)

M12, A-Coded, 8-PIN, 90deg Backshell
Cable, 10m
(Order: Cable-3500-A-10-90)

M12, D-Coded, 4-PIN to Ethernet RJ45
Straight Connector Cable, 10m
(Order: Cable-3500-D-10-00)

M12, D-Coded, 4-PIN to Ethernet RJ45
90deg Connector Cable, 10m
(Order: Cable-3500-D-10-90)

MetalSCAN Monitor Software
(Order: Software-3000)

Application Installation Kits
(Contact Gastops)

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