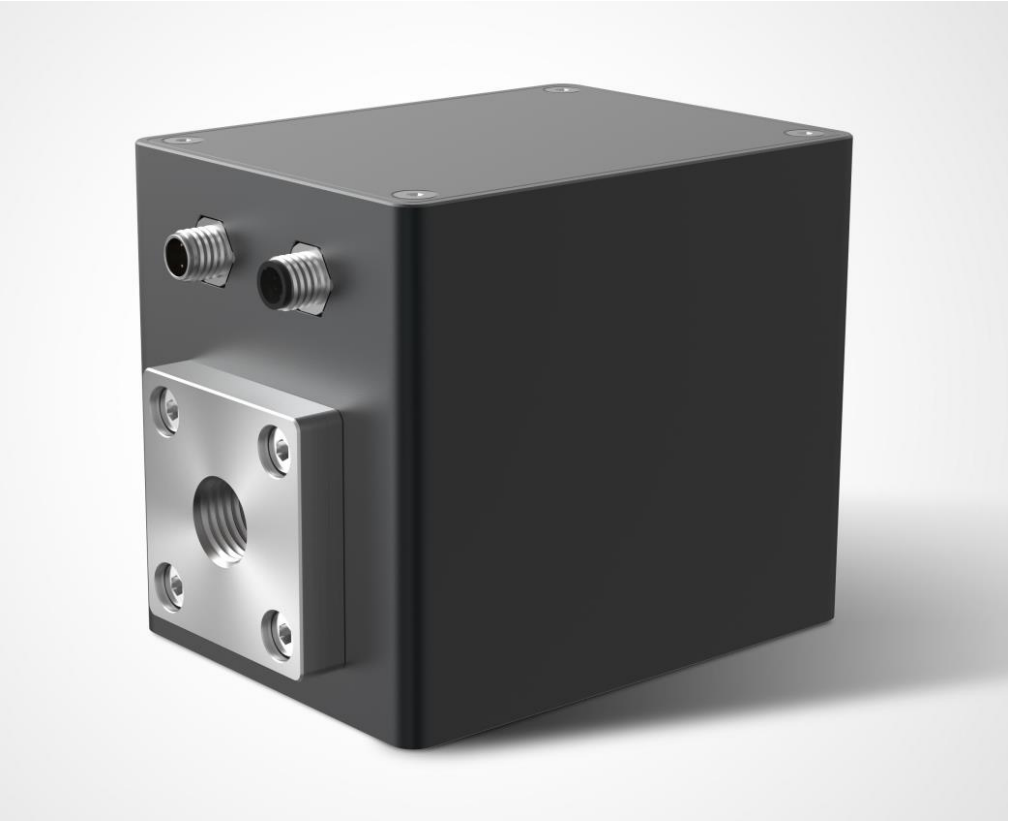
MPS-1000 Metal Particle Sensor



Fast, Accurate & Robust Sensor

The MPS-1000 is an intelligent sensor designed for real-time detection of wear particles in both ferromagnetic and non-ferromagnetic in lubricating oil. It employs state-of-the-art multi-coil electromagnetic induction principles. Based on a highly reliable, high-sensitivity data sampling module, it simultaneously monitors particle attributes, size, distribution, quantity, concentration, quality, flow rate, and temperature. It provides comprehensive real-time monitoring of the lubrication and wear status of large industrial equipment.

Function:

The MPS-1000 is exceptionally powerful, offering users the following data for assessment:

- Minimum detectable limit for ferromagnetic (Fe) particles: 40μm
- Minimum detectable limit for non-ferromagnetic (NFe) particles: 150μm
- Five to eight customizable size bands for both Fe and NFe particles
- Accumulating counts of particles in each size band for Fe and NFe
- Total accumulated counts of Fe and NFe particles
- Concentration of Fe and NFe particles in ppm (mg/L) per minute
- Mass of Fe and NFe particles in μg/h
- Lubricant flow rate (m/s)
- Internal sensor temperature (°C)
- Total operating time (seconds)

By continuously monitoring the generation of wear debris and accurately analyzing increases in particle numbers within each size band, along with changes in concentration and mass over time, the MPS-1000 enables a clear and accurate understanding of equipment wear conditions. It alerts users to early signs of equipment failure or malfunction, allowing for more cost-effective maintenance measures compared to traditional scheduled inspection routines.

Key Features

- Rugged and robust with state-of-the-art design
- Effective recognition of 40μm Fe and 150μm NFe particles
- Sixteen editable size bands
- Output of particle concentration in ppm/mass
- Data output for flow rate, temperature, and operational time
- Early detection of abnormal wear, safeguarding valuable assets
- Immunity to interference from external metals and magnetic fields
- Unaffected by bubbles or moisture in the oil
- Rapid response with continuous data accumulation
- Excellent chemical corrosion resistance and pressure tolerance
- No moving parts or consumables, designed for a 10-year lifespan
- 2.5kV isolated RS485 communication





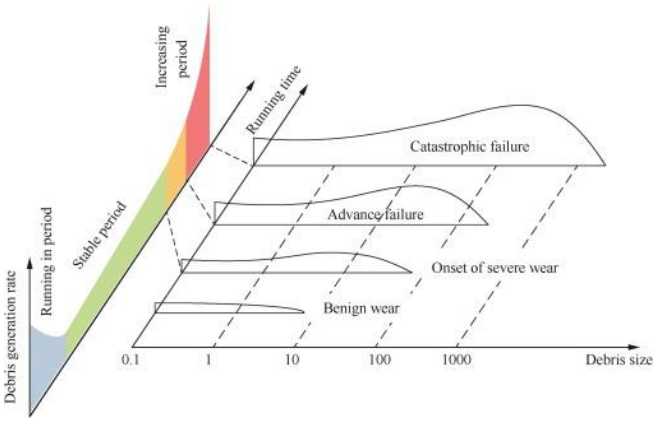
Applications

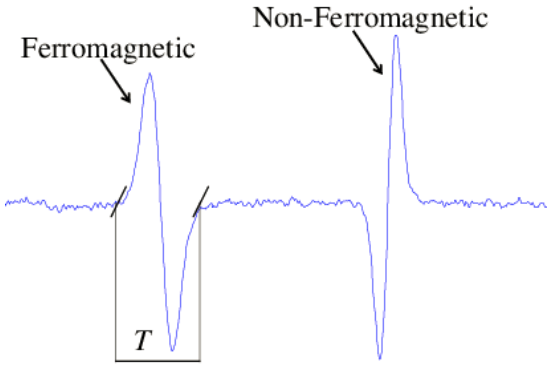
- Wind, thermal, and hydroelectric power generation industries
- Large-scale construction machinery
- Transportation vehicles
- Aviation, maritime, and railway transportation sectors
- Offshore drilling platforms
- Fuel storage and transportation
- Refining and petrochemical industry
- Seawater treatment and testing equipment
- Oil processing equipment
- Chemical laboratory analysis
- Production process quality management
- Oil treatment and filtration systems
- Paints, inks, and printing industries
- Medical equipment

Measurement Principle

The MPS-1000 incorporates two sets of high-performance, reverse-wound excitation coils and two sets of high-performance sensing coils. Both sets of coils operate at resonance. When metal particles pass through the pipeline, changes in magnetic flux from the excitation coil are detected by the sensing coil. This signal undergoes processing through high-sensitivity sampling units, band-pass filters, phase and amplitude comparison units, signal amplification, low-pass filters, and signal extraction units to capture and report metal particle signals in real-time.

It has achieved detection capabilities for 40μm iron particles (Fe) and 150μm non-iron particles (NFe).

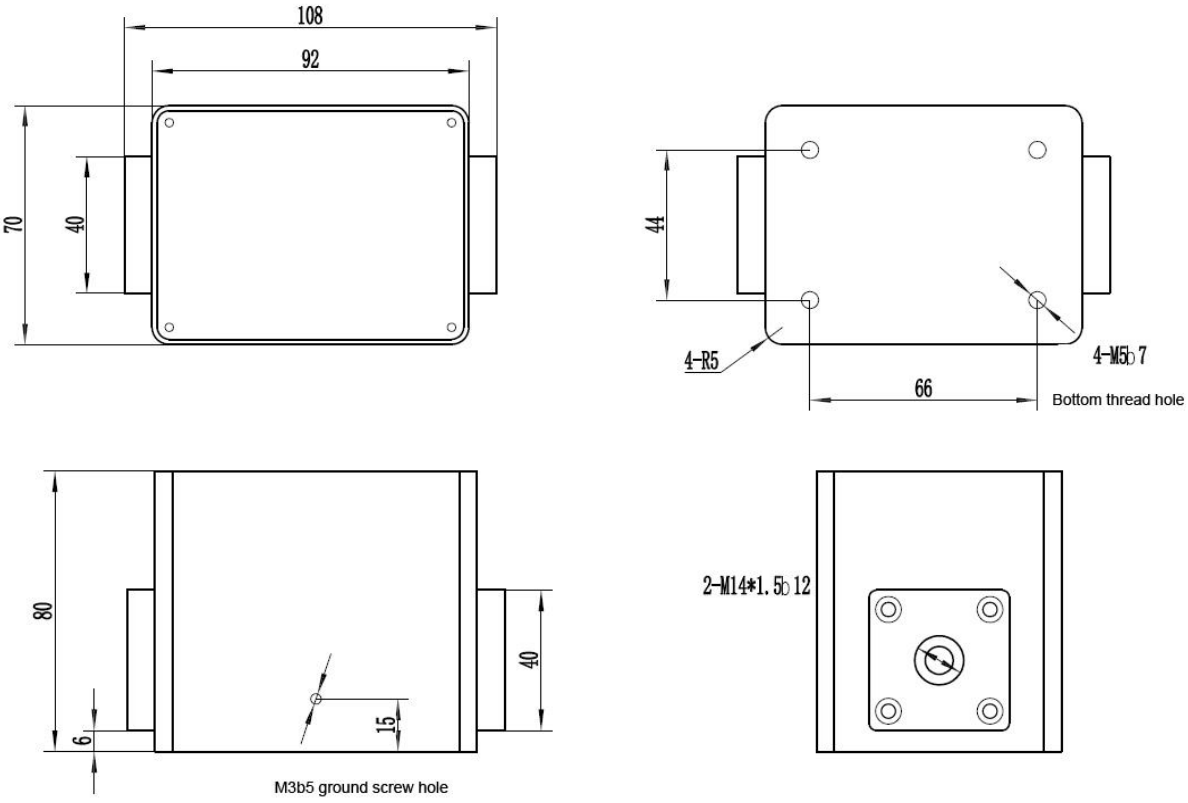




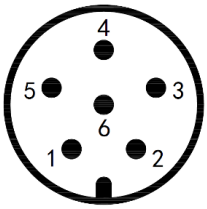
Technical Parameters

Detection capability	Ferromagnetic particles (Fe): > 40μm (ESD), customizable five to eight size bands
	Non-ferromagnetic particles (NFe): > 150μm (ESD), customizable five to eight size bands
Statistical period	Initial self-check cycle of 30 seconds, followed by continuous data accumulation
Particle count	Max100 particles/second
Permissible flow rate	0.2 … 8.9 L/m（0.15 … 2.9m/s）
Pipe specification	Φ8mm
Digital output	RS485 MODBUS RTU，isolation voltage 2.5kv
Operating voltage	DC 12~30V±10%，< 200mA
Probe pressure resistance	10bar Max
Suitable fluids	Lubricating and hydraulic oils (synthetic and mineral-based)
Fluid temperature	-20 … 80 ℃
Ambient temperature	-20 … 85 ℃
Housing material	316 stainless steel, T6061 anodized aluminum
Dimensions	108*70*80 mm (L*W*H)
Thread interface	M14*1.5 (customizable)
Weight	<1.0 kg
Protection class	IP65
Connection cable	2-meter M8-6 pin straight head
EMC compliance	EN 61326-1, EN 61326-2-3, ICES-003 Class B
Explosion-proof certification	Ex ib IIC T4 Gb (optional)

Structural dimensions (mm)



Connector definition (M8-6 pin male end)



2）	+24V DC	Red
4）	GND	Black
1）	RS485+/A	White
3）	RS485-/B	Green

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