The Steel Dust Meter (SDM) can diagnose the health of rotating machinery like no other tool available. The device provides a useful simplified diagnosis for inspecting the abrasion status of bearings and gears. It checks the wear conditions of bearings in ultra-low to high-speed rotating machinery.

The SDM employs a magnetic balance type electromagnet induction method to provide accurate and repeatable measurements. The SDM-72 is designed for equipment that uses grease as lubrication oil, while the SDM-73 is for equipment that uses oil as its lubricant.

ITEM # SDM | STEEL DUST METERS

PREVENTATIVE MAINTENANCE TOOL

LONG BATTERY LIFE

GREAT FOR WIND TURBINES

IDEAL FOR ROBOTICS

SDM-72: GREASE STEEL DUST METER

FEATURES

1) Enable the wear condition of bearings to be determined before vibration increases. Effective bearing diagnostics of low-speed and variable-speed rotating machinery.
2) The unit is powered by 4 x AA batteries
3) Simple operation – simply measured by a grease sample.
4) Equipped with auto-zero function, adjustment not required
5) Minimum resolution is 0.001% Wt. The unit can be detected by small amount of a grease sample.

USAGE INSTRUCTIONS
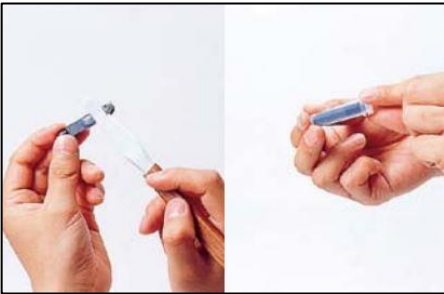
Take a grease sample with the spatula, wipe it in the sample case & wipe off the excess.

Insert grease sample into "SAMPLE" port.

The unit measures & displays the steel dust density.

Case Study: Heat Exchanger Fan Bearing

Detection of Flaking in Fan Bearing

In this case, vibration level of the entire heat exchanger fan frame had increased. Bearing flaking (on A side) was diagnosed by measuring the density of steel dust in the bearing grease. Generally, heat exchanger fans experience greater pressure pulsations on the fan blade side at low rotation speeds, making it difficult to diagnose bearing condition using the vibration meter. Testing for steel dust ensures performance and protects the asset over the long run.

Results of measuring density of steel dust in grease

Fan blade
Bearing A ← 0.23%Wt
Metal screen   Bearing B ← 0%
V belt
Rotation speed 200rpm
Motor
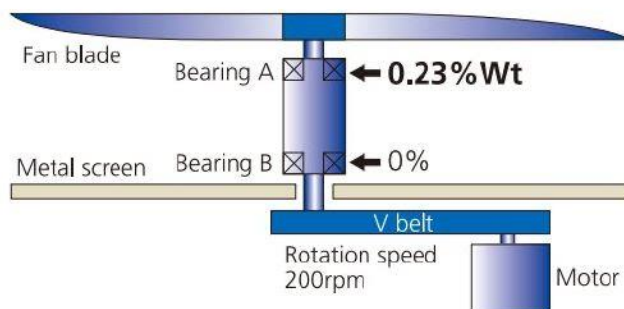
SDM-73: OIL STEEL DUST METER

FEATURES

1) Enable the wear condition of bearings to be determined before vibration increases. Effective bearing diagnostics of low-speed and variable-speed rotating machinery.
2) The unit is powered by 4 x AA batteries
3) Simple operation – simply measured by a grease sample.
4) Equipped with auto-zero function, adjustment not required
5) Minimum resolution is 1ppm (Wt). The unit can be detected by small amount of an oil sample.

USAGE INSTRUCTIONS

Collect oil sample into the sampling bottle & shake well. Collect oil sample in syringe with oil collection nozzle.

Shake the syringe well and attach syringe holder.

Insert the oil into the sample port. The unit measures & displays the steel dust density.

UNDERSTANDING THE MEASUREMENTS

SDM 72	Status	Reading	Recommended Action
	Normal	< 0.05%	No action; steel dust contents at normal levels
	Precaution	0.05 - 0.1%	Re-lube & measure steel dust again in 30 days
	Irregular	> 0.1%	Plan for lubrication improvement needed

| SDM 73	Status	Reading (ppm)		Recommended Action
		Large Machine	Small Machine	
	Normal	< 30	< 100	No action; steel dust contents at normal levels
	Precaution	30-100	100-300	Re-lube & measure steel dust again in 30 days
	Irregular	> 100	> 300	Plan for lubrication improvement needed

TECHNICAL SPECIFICATIONS

| MODEL	SDM-72	SDM-73
Applicable to	Steel dust concentration in grease	Steel dust concentration in oil
Meas. Range	0-5.000% Wt.	0-19999 Wt. ppm
Min. Solution	0.001% Wt.	1 Wt ppm
Amt. of Sample	Approximately 0.8 ml	1.5 ml
Meas. Principle	Magnetic balance type electromagnetic method	
Display	Back-lit LCD	
Zero Adjustment	Automatically adjusts	
Power	4 x AA batteries	
Battery Life	Approximately 30 hours	
Operating Temp.	32°F - 104°F | 0°C - 40°C	
Dimensions	7.5"H x 3.3"W x 1.6"D	
Weight	1 lbs.	

DETECTION PRINCIPLE

The measuring principle of the magnetic balance electromagnetic induction method is shown in the illustration below, the magnetic circuit sensor is composed of an exciter coil connected to the both sides of the detection coil, the magnetic field generated by both exciter coils are blanketed in the vicinity of the center detection coil.

Normally, the center detection coil does not generate an induction voltage, on the other hand when the sampled oil containing iron particles is inserted into the exciter coil, the magnetic field is offset by the magnetic permeability variation, and an induction voltage is generated in the detection coil. The induction voltage can measure the concentration of the iron particles in the sampled oil.
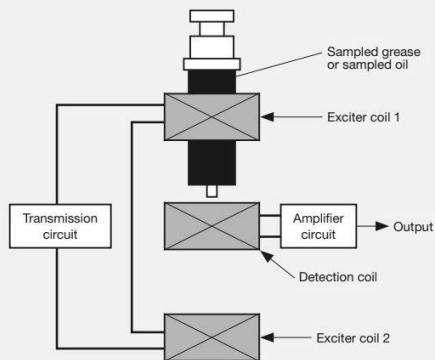
DIMENSIONS (IN MM)

(Unit: mm)
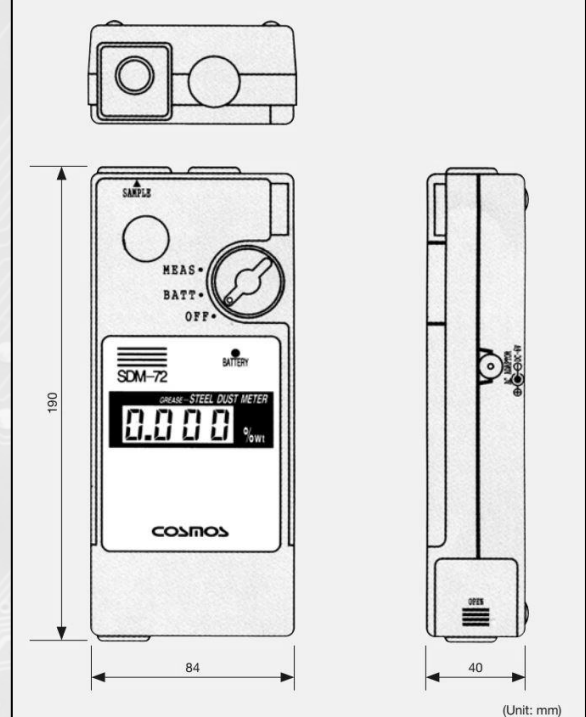
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