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COSMOS

Specifications

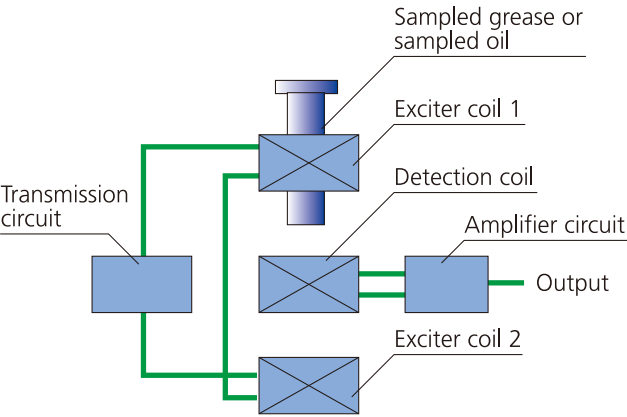
Model	SDM-72	SDM-73
Measurement principle	Magnetic balance type electromagnetic method	Magnetic balance type electromagnetic induction method
Applicable to	Steel dust concentration in grease	Steel dust concentration in lubricating oil
Measurement range	0 - 5.000%Wt	0 - 19999Wt ppm
Indicator	4-digit LCD display	4 1/2 digit LCD display
Minimum solution	0.001%Wt	1Wt ppm
Zero adjustment	Automatic adjustment	
Amount of sample	Approx. 0.8ml	1.5ml
Power source	4 x AA alkaline dry-cell batteries	
Battery life	Approx. 30 hours by alkaline dry-cell batteries	
Operating temperature	0 to 40 degrees C	
Dimensions	84 (W)×190 (H)×40 (D) mm	
Weight	Approx. 500g (including batteries)	
Standard accessories	Carrying case, grease sampling spatula, grease sample case (10pcs), 4 x AA alkaline dry-cell batteries	Carrying case, 2ml syringe (5pcs), oil sampling nozzle (2pcs), syringe holder, 4 x AA alkaline drycell batteries

STEEL DUST METERSDM-72 / SDM-73

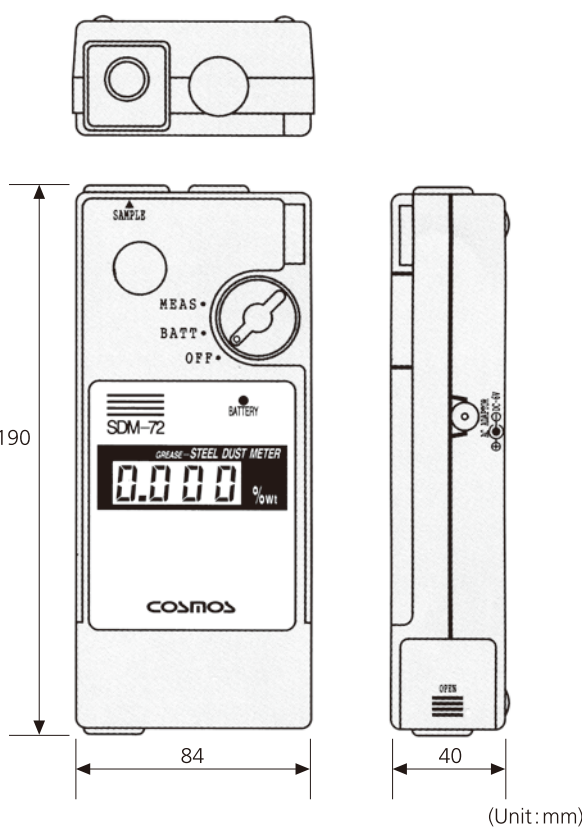
Portable steel dust meter
to check the wear condition of bearings
in ultra-low to high speed rotating machinery

Measuring 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.



External Dimensions



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SAFETY WARNING

Carefully read the instruction manual prior to use.
Select and use the device designed to detect the required type of gas. Use of a wrong sensor type may cause an accident.



SDM-72/SDM-73 units can diagnose the bearing condition, even long before wear-induced vibration becomes detectable, by measuring the amount of steel dust in the grease/oil around the bearing.

Features

- Best suited to diagnose low-speed rotation machinery and variable-speed rotating machinery which are hard to be diagnosed by vibration indicators
- Battery-operated and convenient to carry or use on-site
- Simple operation without requiring special knowledge
- Equipped with auto-zero function
- Able to diagnose with only a small amount of grease/oil sample

Applications

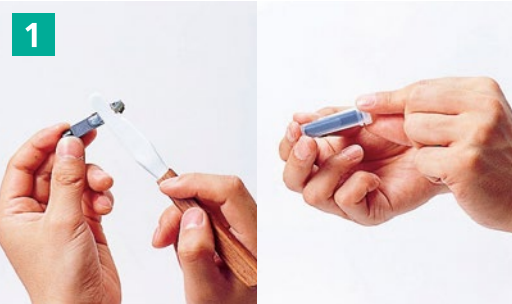
- Pump/Motor
 - Mixer
 - Fan/Blower/Compressor
 - Cooling tower/Air fin cooler
 - Rotary Drying Oven
- Paper-making machine
 - Mill/Crasher
 - Rolling Machine
 - Conveyor
 - Crane/Lift
- Earth-moving machine
 - Transporting machine
 - Elevator
 - Escalator/Moving walk
 - Multistory parking lot



SDM-73

Usage Instructions

For maintenance of rotating machinery using grease as a lubrication oil
Grease Steel Dust Meter SDM-72



Take a grease sample with the spatula, wipe it in the sample case, and wipe off the excess.



Insert the grease sample into the "SAMPLE" port.



The unit measures and displays the steel dust density automatically.

For maintenance of rotating machinery using oil as a lubrication oil
Oil Steel Dust Checker SDM-73



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



Shake the syringe well and attach syringe holder.



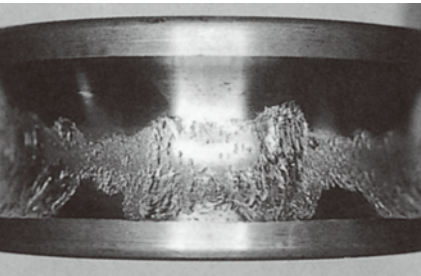
Insert the sampling oil into the sample port immediately. The unit measures and displays the steel dust density automatically.

Case Study

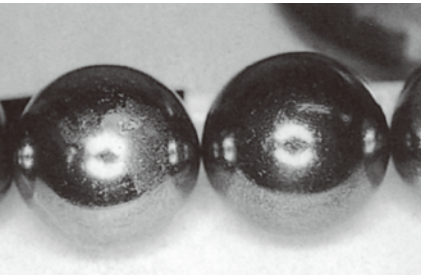
Detection of flaking in a heat exchanger fan bearing

In this case, vibration level of the entire heat exchanger fan frame had increased. Bearing flaking (on the A side) was diagnosed by measuring the density of steel dust in the bearing grease. In heat exchanger fans generally, pressure pulsations are greater on the fan blade side at low rotation speeds, making it difficult to diagnose bearing condition using the vibration meter. There are thus definite advantages to measuring the steel dust density.

After Disassembly

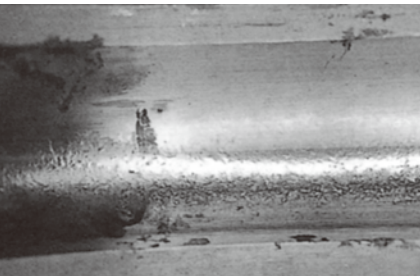
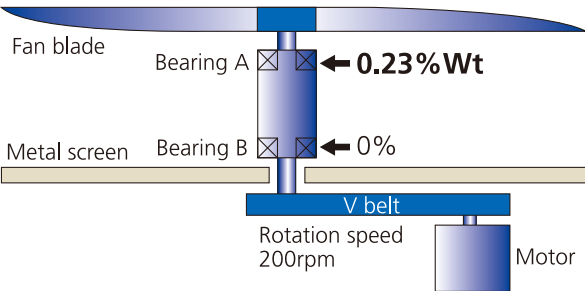


Severe concentrated flaking is apparent on one side of the inner race.



Light flaking has also occurred on the bearings (balls).

Results of measuring density of steel dust in grease



Indentations concentrated on one side are also apparent on the outer race.



Indentations and flaking – due to abrasions by foreign matter (wear particles) – are apparent inside the cage.

Criterion

The following table is an example of the criterion. This criterion is relatively strict in order to carry out appropriate corrective lubrication improvements, to detect the abnormal trend at an early stage.

Steel Dust Concentration in Grease

	Criterion	Countermeasure
Normal value	Less than 0.05%	Management of steel dust contents in the grease at normal cycle.
Precaution value	0.05 – 0.1%	Repeat grease lubrication and measure the steel dust concentration again 1 month later.
Irregular value	More than 0.1 %	Countermeasure for improvement of lubrication, precision diagnosis at short cycle management.

Steel Dust Concentration in Oil

	Criterion (ppm)		Countermeasure
	Large sized machine	Small sized machine	
Normal value	Less than 30	Less than 100	Management of steel dust contents in the oil at normal cycle.
Precaution value	30 - 100	100 - 300	Repeat lubrication and measure the steel dust concentration again 1 month later.
Irregular value	More than 100	More than 300	Countermeasure for improvement of lubrication, precision diagnosis at short cycle management.