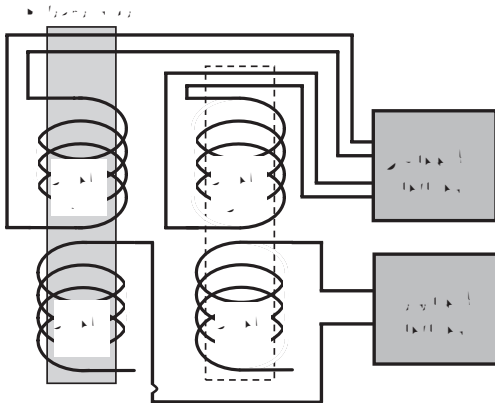


## 1. Introduction

Although the vibration method has long been used as a bearing diagnosis method<sup>1)</sup>, in some cases effective diagnosis is difficult with extremely low speed rotating machinery. Ferrography, in which the wear condition of bearings is assessed based on the concentration of iron powder in grease, can be used to compensate for this shortcoming, but it is difficult to grasp the continuously changing condition of iron powder concentration with the conventional method, as that method relies on sample analysis. Moreover, the time and work required by analysis was also a problem. To improve these drawbacks, JFE Advantech developed and commercialized “On-line Ferrous Wear Debris Sensor,

Advantech. The configuration of the sensor section is shown in Fig. 1.

The following explains the principle of measurement



in this device, referring to Fig. 1. Coils A and C in Fig. 1 are respectively exciting circuits. The excitation force in the two coils is equalized in advance. Coils B and D are detecting circuits. These two coils are connected in opposite directions, with Coil D as the reference coil and Coil B as the detecting coil. When piping for grease which contains a metal such as iron powder passes through Coils A and B, the electromotive force at Coil B will show a different value from that at Coil D due to the difference in magnetic permeability. Therefore, the amount of iron powder can be obtained by measuring the difference in electromotive force between the two coils.

## 2.2 Features of Product

This device has the following features, while also realizing in an on-line device measurement accuracy equal to that of the portable-type iron powder meters

Detected particles	Ferrous wear debris
Measurement range (mass%)	0.000 to 2.000
Accuracy (%)	±1 F.S. (full scale)
Number of measurement point	1 to 5
Measurement interval	5 seconds/point (minimum)
Analogue output	DC 4 - 20 mA
Communication interface	RS-232C (Option)

