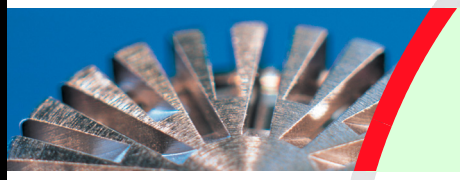


PRODUCT DATA

Magnetic Transducer — MM-0002

The Magnetic Transducer MM-0002 is a variable reluctance device that can be used as a velocity sensitive vibration pickup or as an electromagnetic vibration exciter. The moving part is either the tested structure itself, if it is ferromagnetic, or one of the high permeability discs supplied, which is glued onto the vibrating structure in front of the electromagnet.

Uses

- Contact-free velocity detection or excitation
- Vibration measurement where absolute values are not necessary
- Counting mechanical events, or time between events with electronic counter
- Triggering stroboscopes, oscilloscopes, tracking filters, etc.

Features

- No physical contact with structure under test
- High sensitivity
- Small mechanical dimensions
- Operating temperature up to 250°C (480°F)
- Unaffected by humidity or pressure

Applications

The Magnetic Transducer is used where changes in vibratory motion must be detected without contact or added mass, and absolute amplitude measurements are not necessary. It has a great variety of applications when used with auxiliary electronic equipment such as counters, time lapse devices, flip-flops and relay circuitry etc. The magnetic transducer is also particularly suitable for charting the nodal patterns of vibrating plates or thin-walled shells. It should be noted that the transducer will also be sensitive to motion of non-ferromagnetic conducting materials (parts made of aluminium, copper, etc.) due to the formation of eddy-currents.

Brüel & Kjær signal generator Types 1054 and 1051 are well suited signal sources for the transducer when it is used as a vibration exciter. The regulation circuit of the generators may be used to give constant current drive to the transducer, providing constant exciting force through an extensive frequency range.

The Magnetic Transducer may be used as a contact-free rotary speed detector in applications with the Stroboscope Types 4912 and 4913. Adaptor JP-0145 (see accessories) is used for connection to these instruments.

Description

The Magnetic Transducer MM-0002 consists of a cylindrical Ticonal permanent magnet on which a Teflon® based coil is wound. The winding, with 8000 turns of polyester insulated wire, combines high sensitivity with low internal impedance. Coil and magnet are electrically isolated from the housing, which is made of nickel plated brass. The coaxial output terminal is gold plated to ensure a good contact.

A 1.2 m (4 ft) long low-noise screened cable is supplied with MM-0002. The cable is Teflon insulated with special treatment against triboelectric noise and can withstand temperatures up to 260 °C (500 °F).

Fig. 1 *Typical sensitivity versus mean distance curve*

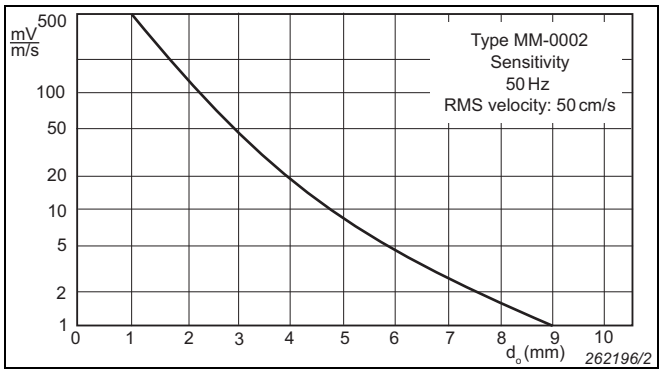


Fig. 2 *Variation of static attraction as a function of distance*

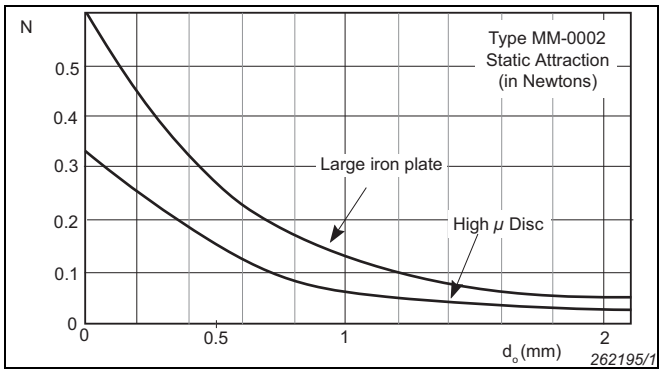
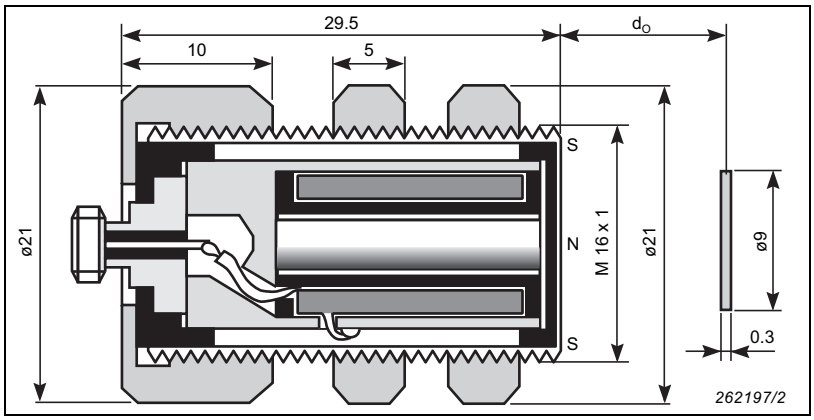


Fig. 3 *Cross-section view of the Magnetic Transducer and one high-permeability disk with indication of the main dimensions in mm*



Specifications – Magnetic Transducer MM-0002

SENSITIVITY
150 mV per m/s with 2 mm mean distance between electromagnet housing and high-μ disc (see Fig. 1).
The sensitivity in front of a large iron plate is about 2.5 times (8 dB) higher

FREQUENCY RESPONSE
Velocity sensitivity is essentially independent of the frequency (varies less than ± 10% up to 2000 Hz)

INTERNAL IMPEDANCE
1800 Ω in series with 400 mH
The resistance may be higher, (especially at high frequencies when operating in front of massive iron parts) because of eddy-current losses

MAXIMUM INPUT VOLTAGE
100 V at normal ambient temperature
20 V at maximum ambient temperature
250 °C (480 °F)

MAXIMUM CONTINUOUS CURRENT
50 mA at normal ambient temperature
10 mA at maximum ambient temperature
250 °C (480 °F)

STATIC MAGNETIC ATTRACTION
See Fig. 2

DISTORTION
Not more than 5% if the relative peak-to-peak amplitude ($\Delta d/d_o$) is smaller than 5%. Distortion is mostly second harmonic (the moving-iron transducer is non-linear because of the square-law relationship between force and distance)

TEMPERATURE RANGE
From approx. –150 °C (–240 °F) up to +250 °C (+480 °F). Ambient pressure and humidity have practically no influence on the transducer's open-circuit sensitivity

DIMENSIONS
See Fig. 3

WEIGHT (WITHOUT CABLE)
52 g (1.8 oz.)

Ordering Information

MM-0002	Magnetic Transducer	JP-0028	14 mm B&K (Male) to 10-32UNF Microdot (Female) Adaptor	JP-0145	BNC (Male) to 10-32 UNF (Female) Adaptor
Includes the following accessories:					
AO-0038	High-temperature cable			YO-0010	High-μ discs x 10

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Brüel & Kjær reserves the right to change specifications and accessories without notice

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