

Product Data

Photoelectric Tachometer Probe — MM0012

USES:

- Synchronizing various Brüel & Kjær instruments with rotary or reciprocatory motion
- Reflective object detection
- Displacement detection

FEATURES:

- Combined transmitter-receiver
- Low power consumption from 6V to 10V DC supply
- Small dimensions

Photoelectric Tachometer Probe Type MM0012 is typically used with Data Collector Type 2526, Multichannel Analysis System 3550, Multichannel Data Acquisition System Type 3551, Signal Analyser Unit Type 2035, Generator and Sampling Module Type 3106 and Stroboscope Type 4912 in synchronism with rotating or reciprocating machine parts. These instruments are provided with a combined trigger input and power supply socket which accepts the cable from the MM0012 directly.

The MM0012 is a combined infra-red light source and pick up device which is built into a common housing. Its output signal and power supply are conveyed from and to the probe via a double shielded BNT connector at the rear of the housing. A 3 m long cable terminated with matching connectors QA0158 is supplied with the probe. The 'eye' of the probe is fitted with an infra-red filter to reduce its sensitivity to visible light, particularly from interference by AC mains powered lamps.

When projected at a non-reflecting surface, minimal light is reflected back to the sensor eye which results in virtually zero volts DC output. When projected at a reflective surface the output voltage will rise to a positive level depending on the proxim-



ity and reflectivity of the surface. Typical output signals obtained from a rotating shaft with a strip of white and black tape attached are shown in Fig. 1.

In use, the probe is mounted on a suitable stiff bracket, by means of screws through the two mounting slots in the body, so that the infra-red (invisible) light beam is projected

perpendicularly onto the surface of the rotating or reciprocating machine part.

The signal amplitude generated by the MM0012 is a function of the difference in reflectivity of the contrasting surfaces passing the field of view, the distance to the reflecting surface, and the degree of light dispersion from curved surfaces.

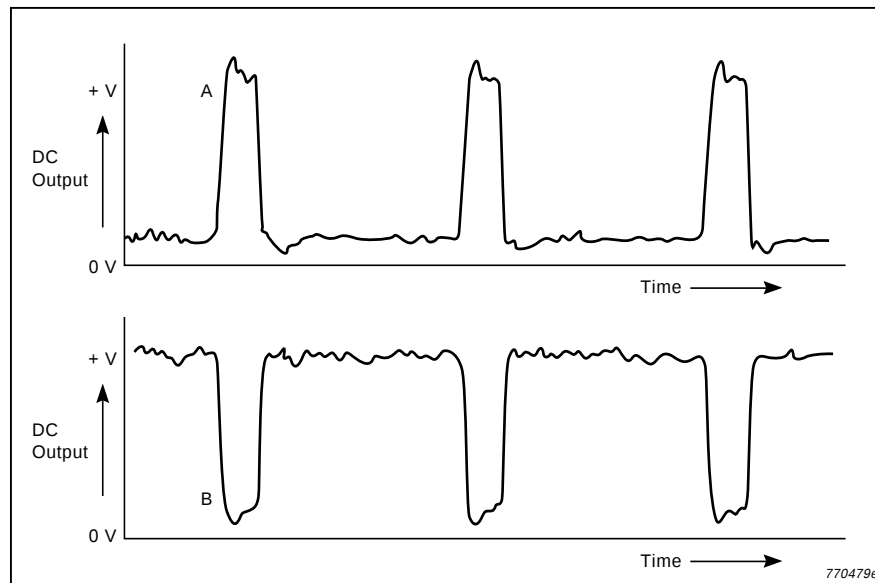


Fig.1 Typical output signals from Photoelectric Tachometer Probe MM0012 projected at a rotating shaft. (A) from a white stripe on a black background, and (B) a black stripe on a white background

The best results are obtained using a short piece of self-adhesive reflective tape (see Accessories Available) on a dark matt background.

A strip of ordinary white or black tape, whichever gives the best contrast, glued onto the machine part, is also satisfactory.

At a distance of 1 to 2 mm from a clean white surface the MM0012 will give an output of several volts, depending on the supply voltage. At 15 to 20 mm distance from a white surface several tens of mV output can be expected. A typical output voltage against distance curve is shown in Fig. 2.

The MM0012's effective output can be considerably increased by projecting a DC powered lamp beam onto the reflective surface so that the light intensity reflected back to the eye is increased. A Penlite type pocket light is ideal as it is usually equipped with a bulb with an integral lens producing a concentrated parallel beam of light. The auxilliary light source should be positioned adjacent to the MM0012 so that its beam is projected in a path as close as possible to the MM0012's infra-red beam. In this way a satisfactory signal can be obtained at distances of 200 mm or more.

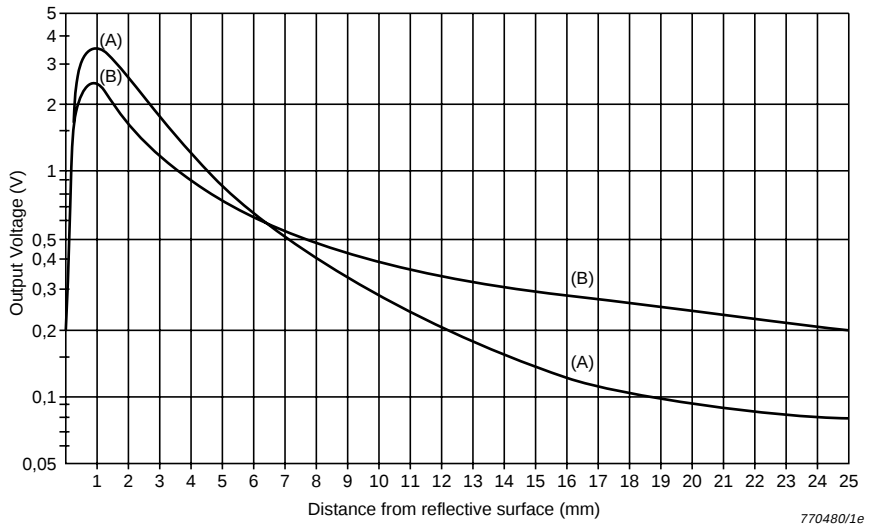


Fig.2 Typical output voltage of Photoelectric Tachometer Probe MM0012 plotted against distance from a reflective surface, (A) a piece of ordinary white card, (B) a piece of 3M reflective sheet Scotchlite 5270. Supply voltage 8 V.

If the MM0012 is to be used for purposes other than triggering Brüel & Kjær instruments that will require an additional power supply, a separate battery box can be made up. A double shielded BNT socket (JJ 0315) matching the plugs used on the connecting cable is available from Brüel & Kjær. Longer cables can be made up using plug JP 0315.

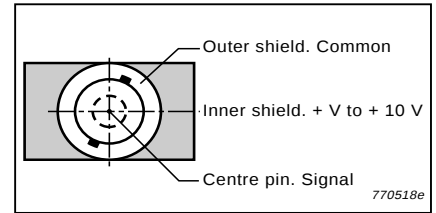


Fig.3 Rear view of Photoelectric Tachometer Probe MM0012 showing double shielded BNT connector

Specifications MM0012

TRANSDUCER TYPE:
Combined infra-red light source and photo-sensor, fitted with infra-red filter

SENSITIVITY:
Non-calibrated, typical sensitivity shown in Fig. 1.
Minimum: 100 mV at 10 mm distance from a flat white card

POLARITY:
Positive for reflective surfaces

MIN. LOAD IMPEDANCE:
10 kΩ

RESPONSE TIME:
200 μs for full output. Equivalent to a 10 mm long reflective surface passing at 50 m/s

CONNECTOR:
BNT (BNC with double shield), see Fig. 3

CABLE:
AO 0158. 3 m long terminated at both ends with BNT connectors (double shielded BNC)

POWER SUPPLY:
+6 V to +10 VDC
<40 mA at 8 V
+ on inner shield

Note: All values are typical and measured at 25 °C (77 °F), unless measurement uncertainty or tolerance field is specified. All uncertainty values are specified at 2σ (i.e. expanded uncertainty using a coverage factor of 2)

DIMENSIONS:

The diagram shows a side view and a top view of the probe. The side view shows a total length of 32 mm (12.6 inches) with two 3.5 mm (1.4 inches) wide slots. The distance between the centers of the slots is 12 mm (4.7 inches). The top view shows a circular body with an outer diameter of 14 mm (5.5 inches) and an inner eye diameter of 5.5 mm (2.2 inches). The distance from the center of the eye to the edge of the body is 13 mm (5.1 inches). The total width of the body is 20 mm (7.9 inches). The drawing is labeled 770521/2e.

COMPLIANCE WITH STANDARDS:

	CE-mark indicates compliance with EMC Directive
EMC Emission	EN 50081-1 : Generic emission standard. Part 1: Residential, commercial and light industry.
EMC Immunity	EN 50082-2 : Generic immunity standard. Part 2: Industrial environment. Note: The above is guaranteed using accessories listed in this Product Data sheet only.
Temperature	IEC 68-2-1 & IEC 68-2-2: Environmental Testing. Cold and Dry Heat. Operating Temperature: -10 to + 50 °C (14 to 122°F)

Ordering Information

Type MM0012 Photoelectric Tachometer Probe
Includes the following accessories:
Instruction Manual
3m Cable AO 0158

Accessories Available

Double shielded BNT socket (BNT).....JJ 0315
Matching PlugJP 0315
Reflective Tape (1 roll.)QA 0110

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



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