

## Photoelectric Tachometer Probe MM-0024

### Uses

- Contact-free detection of reflective objects
- Synchronisation of Brüel & Kjær instruments with rotary or reciprocatory machine parts

### Features

- Combined infrared transmitter/receiver
- Operating range up to 800 mm (31.5 in) and 20000 rpm
- Low power consumption from 4 V to 12 V DC supply
- No physical contact with the machine element under test



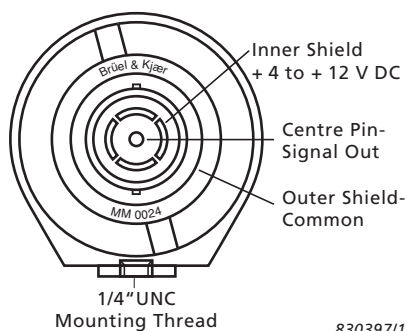
### Description

Photoelectric Tachometer Probe MM-0024 is especially designed for remote tuning and triggering of vibration measurement and balancing instrumentation in synchronism with rotating or reciprocating machine parts.

MM-0024 connected with Reflective Tape QA-0137 has the advantage that it may be located any distance between 50 and approximately 800 mm from the subject to be investigated, thus safely separating the probe from possible contact with moving parts or an otherwise hazardous environment.

The light alloy casing of the probe contains both a transmitter and receiver of infrared radiation. The DC power supply to the transmitter and the output pulses from the receiver are conveyed to and from the probe via a double-shielded BNT socket at the rear of its housing (Fig. 1). A 3 m long cable, AO-0158, terminated with matching connectors, is supplied.

**Fig. 1** Rear view of probe showing BNT socket connections



### Use of the Probe

Use of the probe is very straight-forward. It is mounted on a convenient static part of the machine using a magnetic clamp, or a suitable bracket. Alternatively, a camera tripod with standard 1/4" UNC (DIN 4503) thread can be employed instead. The probe should be directed such that its infrared window faces the subject on which a small strip of self-adhesive reflective tape has been previously attached. This has the property of reflecting the infrared beam back to the receiver during each cycle of the moving part, resulting in a positive electrical pulse output from the receiver to the measurement instrumentation. A three metre roll of reflective tape is supplied with the probe.

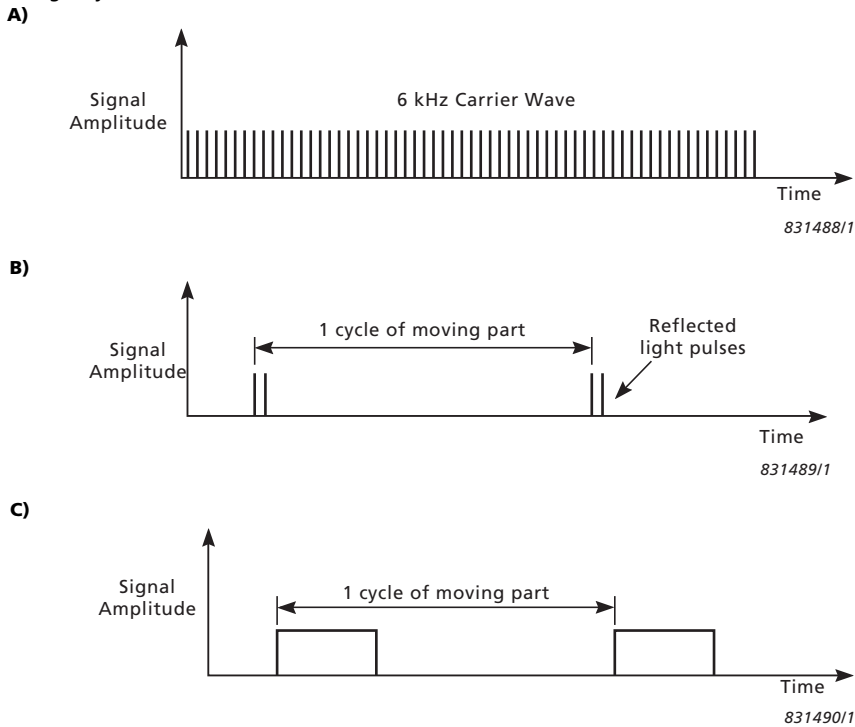
For optimal performance the probe employs a light pulse transmitting technique, plus sensitive electronics for its receiver. Modulation of the transmitted beam at a pulse repetition frequency of 6 kHz permits a higher peak intensity to be developed than if an unmodulated beam were used. (Fig. 2A).

The receiver detects periodic trains of modulated light pulses corresponding only to reflections from the strip (Fig. 2B).

The output pulses from the receiver are of constant magnitude (at approximately the same peak voltage as the DC power supply), irrespective of the distance separating the subject and the receiver up to a maximum of approximately 800 mm (Fig. 2C).

A small LED flashes on the probe body when reflected light pulses are received, giving the user a positive indication of correct orientation relative to the moving object.

**Fig. 2 Use of the probe: A) Infrared radiation modulated by 6kHz carrier wave; B) Received signal showing bursts of reflected light pulses; C) Demodulated output signal from the receiver**



## Specifications – Photoelectric Tachometer Probe MM-0024

**NOTE:** All data stated without tolerances are typical values

### GENERAL SPECIFICATIONS

**Transducer Type:** Combined infrared transmitter and receiver

**Operating Range:** 50 mm up to approximately 800 mm

**Frequency Range:** 200 to 20000 rpm (3.3 to 333.3 Hz)

**Output Voltage:** Peak output voltage level is approximately the same as the power supply DC level (unloaded)

**Polarity:** Positive for reflective surface

**Output Load Impedance:** 10 k $\Omega$

**Maximum Output Load Current:** 10 mA (sink current)

**Response Time:** 200 ms minimum for full output. Equivalent to a 10 mm long reflective surface passing at 50 m/s

**Connector:** Double-shielded BNT. See Fig. 1

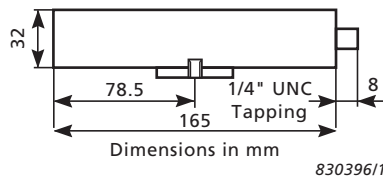
**Power Supply:** Input Voltage +4 V to +12 V DC

**Current Consumption:** <60 mA with 6 V supply; <130 mA with 12 V supply

### ENVIRONMENTAL

**Weight:** 171 g (6 oz)

**Dimensions:**



### COMPLIANCE WITH STANDARDS

**Safety:** IEC 1010-1 (1990): Safety Requirements for Electrical Equipment for Measurement Control and Laboratory Use  
**EMC Emission:** EN 50081-1 (1992): Generic emission standard. Part 1: Residential, commercial and light industry

**EMC Immunity:** EN 50082-2 (1995): Generic immunity standard. Part 2: Industrial environment. (Final draft.)

**NOTE:** The above is guaranteed using accessories listed in this document only.

**Temperature:** IEC 68-2-1 & IEC 68-2-2: Environmental Testing. Cold and Dry Heat.

- Operating Temperature: –10 to +55 °C
- Storage Temperature: –25 to +70 °C

**Humidity:** IEC 68-2-3: 90% RH (non-condensing at 40 °C)

### Mechanical:

- IEC 68-2-6: Vibration: 0.3 mm, 20 m/s<sup>2</sup>, 10 – 500 Hz (non-operating)
- IEC 68-2-27: Shock: 1000 m/s<sup>2</sup> (non-operating)
- IEC 68-2-29: Bump: 1000 bumps at 250 m/s<sup>2</sup> (non-operating)



## Ordering Information

### MM-0024 Photoelectric Tachometer Probe

includes the following accessories:

- QA-0137: 3 m roll of reflective tape
- AO-0158: 3 m long BNT to BNT cable

### OPTIONAL ACCESSORIES

QA-0137 3 m roll of reflective tape  
 UA-0587 Tripod

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