



Monitran
Sensors for Industry



ECPD

Eddy Current Probe
and Drivers





ECPD Eddy Current Probes and Drivers

Introduction

Monitran eddy current probes and drivers provide simple, cost-effective solutions whenever you need rapid-response, non-contact measurement of vibration, proximity or displacement in your static or rotating machinery.

Established in 1986, Monitran remains a privately owned company, based near High Wycombe 35 miles west of London.

We manufacture in the United Kingdom and source the majority of our materials and components from selected quality-managed local and national suppliers. This enables us to respond quickly to orders both for standard products and for custom-built solutions.

We believe that customer service is of paramount importance. For this reason our experienced engineers are always on hand to offer advice and assistance in the selection of sensors and solutions to best suit your application.

Our products include general and special purpose accelerometers, velocity sensors, eddy current probes and LVDTs. They are used in a diverse range of applications including industrial processing, power stations, water treatment, wind turbines, mining and the oil and gas industry. As an OEM we can also provide a full custom design and development service.

Proximity sensors work on the eddy current principle. A proximity system consists of an eddy current probe, extension cable and driver. A high-frequency RF signal is generated by the driver, sent through the extension and probe cables and radiated from the probe tip. The tip consists of a precision wound copper coil inside a chemical and temperature resistant PEEK case.

The tip is either mounted on a threaded stainless steel rod allowing easy gap adjustment on a bracket via two locking nuts or a flat, low profile mount. The driver demodulates the signal, amplifies and linearises it to provide an output proportional to the probe to target gap and/or vibration of the target.

External overview

The Eddy Current Probe consists of a precision-wound copper coil inside a chemical- and temperature-resistant PEEK tip. This is mounted on a threaded stainless steel rod for easy gap adjustment or a flat, low-profile mount. It is supplied with 1m of integral overbraided coaxial cable. Operates up to 180°C. Operating gap depends on the tip diameter.

Current output drivers give a 4-20mA output directly proportional to the measured component and allow direct connection to PLCs and other industrial controllers.

ECPD Eddy Current Probes and Drivers

Applications and Technical Specifications

Our eddy current probes provide simple, cost-effective solutions whenever you need rapid-response, non-contact measurement of vibration, proximity or displacement in your static or rotating machinery.

Typical applications:

- Pumps
- Turbines
- DC gap machine tools
- Gauges
- Plain metal bearings
- Centrifuges

As well as many other engineering and laboratory applications.

Monitran eddy current probes at a glance:

- DC output for measuring gap between probe tip and target
- AC output for profiling behaviour of rotating components
- Resistant to contamination from oil, dirt, dust and water
- Ruggedly built and rigorously tested to withstand harsh conditions
- Manufactured in the UK to ISO 9001:2008

Important note

Eddy current probe sets are individually calibrated

An eddy current probe arrangement consists of an accurately calibrated set of components comprising; probe, driver and extension cable. Changing any of the components will nullify the calibration. If any element needs replacing the whole set must be returned for recalibration.

General specifications:

| | |
|---------------------------------|---------------------------------|
| Case material | Stainless steel |
| Tip material | PEEK, encapsulated with potting |
| Cable | Overbraided stainless steel |
| Frequency range | DC to 10kHz |
| Probe operating temperature | -30°C to 180°C |
| Probe temperature sensitivity | <5°C at 150°C |
| Maximum non-condensing humidity | 95% |
| Output impedance | 50 Ω |
| Non-linearity | <1% |

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Technical Specifications

Eddy current probes consist of a precision-wound copper coil inside a chemical and temperature resistant PEEK tip, and our drivers output either voltage or current (in the 4-20mA range).

The MTN/EP080 (probe) and MTN/ECPD (driver) below are a common pairing, and are suitable for use in most industries. Applications include pump monitors, turbines, DC gap machine tools and gauges. Cable length between probe and driver can be up to 9 metres.



Sensitivity:
8mV/ μ m (nominal)
Range: 0 to 2mm
Linearity: 1% normal
Operating temperature:
-30 to 180°C
Diameter: 6mm
Length: 36mm
Thread: M8

Power requirement:
21V DC @ 30mA
Operating temperature:
-20 to 80°C



Cables

As standard, each eddy current probe in our range will be supplied with 1 metre of integral cable; coaxial, ETFE insulation with an internal copper braid and stainless steel over braid. Extension cables (with the same characteristics) are available up to 8 metres in length.

Other probes available include:

MTN/EP200

Its operating gap is from 0 to 5mm and its sensitivity is 3.6mV/ μ m (nominal). Its dimensions are 13mm (OD) by 62mm (length, incl. tip) and it has M16 thread. A derivative, the **MTN/EP200F**, has low-profile mount. Both are supplied with an **MTN/ECPD** driver as standard.

MTN/EP340

Its operating gap is from 0 to 8.5mm and its sensitivity is 2mV/ μ m (nominal). Its dimensions are 20.5mm (OD) and 75mm (length, incl. tip) and it has an M24 thread. A derivative, the **MTN/EP340F**, has low-profile mount. Both are supplied with an **MTN/ECPD** driver as standard.

MTN/EP480

Its operating gap is from 0 to 12mm and its sensitivity is 1.4mV/ μ m (nominal). Its dimensions are 25mm (OD) and 99mm (length, incl. tip) and it has an M30 thread. It is supplied with an **MTN/ECPD** driver as standard.

Other drivers available include:

MTN/ECPD24V

It is also a **voltage output** driver suitable for conventional +24V DC power supplies. It outputs 0 to 16V proportional to **probe gap**.

MTN/ECPD/78

It is also a **voltage output** driver suitable for conventional +24V DC power supplies. It outputs 0 to 10V proportional to **probe gap**.

MTN/ECPD/60

It is +24V DC three-wired loop-powered **current output** driver. It outputs 4-20mA proportional to **vibration**.

MTN/ECPD2-AC

It is +24V DC two-wired loop-powered **current output** driver. It outputs 4-20mA proportional to **vibration**.

MTN/ECPD2-DC

It is +24V DC two-wired loop-powered **current output** driver. It outputs 4-20mA proportional to **probe gap**.

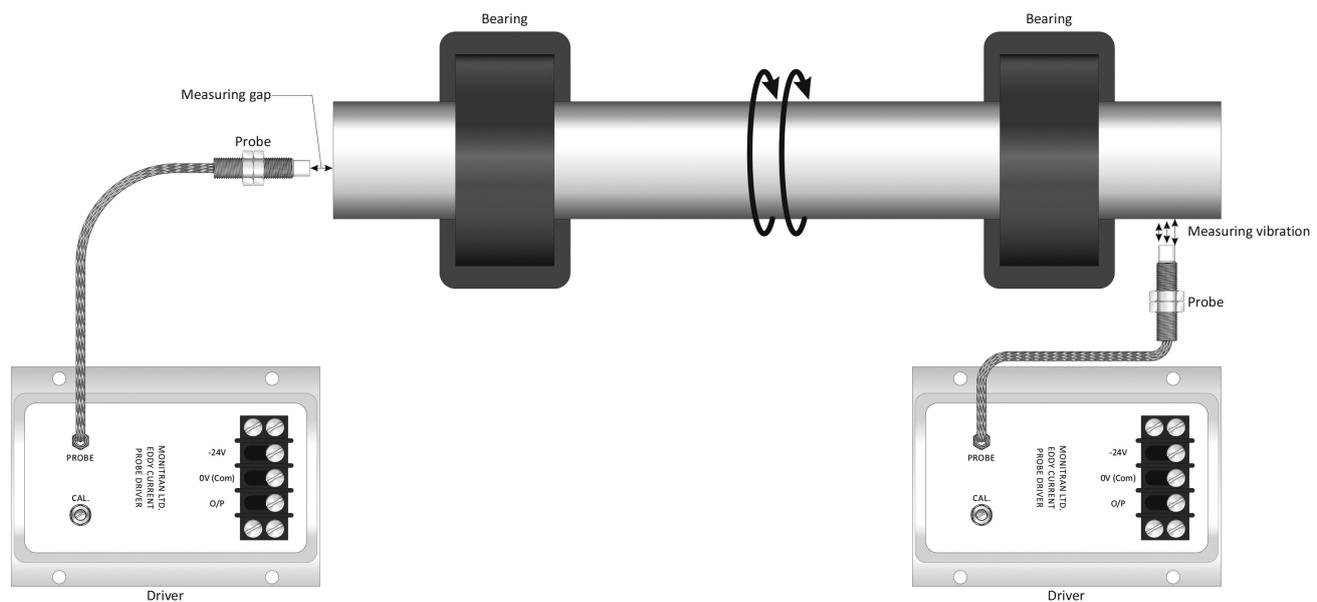
MTN/ECPD85

It is +24V DC three-wired loop-powered **current output** driver, outputting 4 to 20mA proportional to **probe gap**.

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Typical Application Setup

When monitoring the displacement of rotating shafts in pumps or turbines for example, it is important to use a reliable non-contact sensor so that changes in performance indicating future failure can be monitored.



Eddy current displacement sensors are non-contact devices capable of high-resolution measurement of the position of a conductive target. The probe consists of a thermally stable plastic tip and when connected to the driver unit it produces a high frequency oscillation that induces eddy currents in the target material.

The eddy currents induced in the target and hence the oscillation amplitude are proportional to the probe gap. (They detect the distance of the target by sensing fluctuations in the magnetic field generated by a reference coil in the tip of the probe.) The eddy current driver unit contains a high frequency oscillator that drives the probe.

Rectifying and linear circuits inside the unit convert the oscillator voltage from the probe into a DC voltage proportional to the gap. The driver unit is powered by +24V DC (or -24V) supply and gives a positive output in respect to the power supply 0V, DC voltage can be used for setting the probe to the correct distance from a given target of known material (stainless steel).





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