

# RPM Transducer

## PR 9376



- Rugged construction
- 20 kHz frequency range
- 1.5 mm mechanical resolution (modulus 1)
- High output pulse voltage
- 1  $\mu$ s pulse rise/fall time
- Short circuit proof output
- Temperature range -30...+100 °C

### Application:

The **RPM Transducer PR 9376** is ideally suited for contactless measurement of rotational frequency of ferromagnetic machinery components. Universal design, simple mounting and excellent characteristics enable it to be used in a wide range of applications both in industry as well as in laboratories.

In combination with certain electronic equipment for evaluation purposes, e. g. the **epro RMS 700** or **MMS 6000** Rotational Speed Monitoring System, a wide range of tasks can be solved, such as measuring, monitoring, supervision, or control of rotational forward/reverse detection, slip, gear ratio or backlash etc.

Due to high resolution, fast internal electronic and the sharp edged output pulses the PR 9376 is suitable for measurement of extremely high as well as very low rotational speeds with high resolution.

Further applications are e. g. signaling approximation of passing or sideways approaching machinery parts for alarming, switching, counting mechanical events or passing components, etc.

### Operation and construction:

The head of PR 9376 is a differential sensor consisting of two magnetosensitive semiconductor resistors which are connected in

series and mounted above a small permanent magnet. Two resistors of the transducer-electronic part complete this configurati-

on into a Wheatstone Bridge which controls a following DC-switching amplifier with fast push-pull short circuit proof output.



When a triggermark of soft ferromagnetic iron or steel approaches the transducer at right-angles (i. e. from the side) it disturbs the magnetic field of the internal magnet, this unbalances the bridge and switches the output voltage to HIGH. The signal is kept on HIGH until the rear edge of the triggermark passes the sensor and causes an unbalance of the bridge in the opposite direction.

The output signal is a pulsed voltage with sharp pulse edges. So capacitive coupling to subsequent electronic equipment is even possible at lowest trigger frequencies.

High quality electronic circuitry encapsulated in a robust stainless steel housing and the Teflon insulation of the connection cable (if necessary additionally protected by a flexible metal tube)

ensure a trouble free operation even in harsh industrial environments. The plain transducer surface allows simple oil proof and watertight installation by means of standard cable glands.

**Technical Data:**

**Principle measurement :**

Differential magnetic field sensor

**Triggering:**

Contactless by mechanical triggermarks

Material of triggermarks:

soft ferromagnetic iron or steel

Trigger frequency range: 0... 20 kHz

Permissible gap: 1.5 mm

at material St 37 (see diagram)

Dimensional limits of triggermarks:

Standard toothed wheel modulus 1

at evolute toothing and material St 37

Special trigger wheel: see diagram

**Output:**

Short circuit proof push-pull output stage. Load can be connected to meas. zero or supply.

Output pulse voltage:

at 100 (2.2) K load and 12 V supply

HIGH 10 (7) V

LOW 1 (1) V

Pulse rise and fall time: <1 µs

at not load and all the frequency range

Dynamic output resistance: <1 K

Permissible load:

resistive 400

capacitive 30 nF

**Supply**

Supply voltage: 8...31.2 V DC

34 V for max. 1 s without damage

Permissible ripple:

10 % of suppl. Voltage

Current consumption: 25 mA

at 25 °C, 24 V supply and no load

**Mechanics:**

Stainless steel housing; encapsulated electronic circuit; sensor head material of

synthetic resin reinforced by an enclosed brass tube; cable is teflon insulated, with or without flexible metal protection tube.

**Dimensions:** (see also diagram)

diameter: 14 mm

length of transducer: 124 mm

length of cable: 3 m

Weight with / without package:

PR9376/00 330 g / 210 g

PR 9376/20 530 g / 410 g

inclusive mounting set

**Environmental conditions:**

Temperature:

Reference 25 °C

Operating range 30 °...+100 °C

Limit for max. 30 s.

without damage 120 °C

Storage temperature -40 °...+100 °C

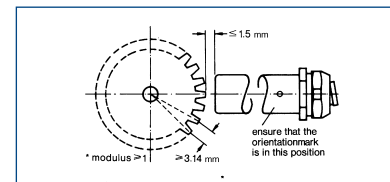
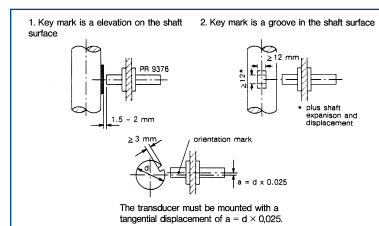
Protection:

IP 66 according to DIN 40050

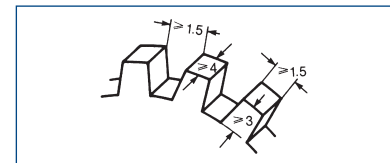
\* The output becomes high impedance (no current flow) at low-level if its load is connected to meas.zero, or at HIGH-level if its load is connected to the supply.

**Using RPM Transducer PR 9376 for reference measurement:** (1 pulse per turn)

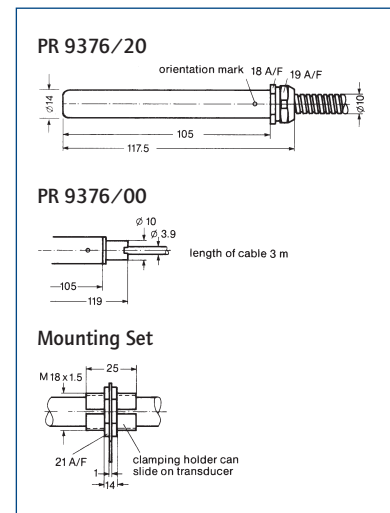
If PR 9376 is used for reference measurement, i. e. with only one mark on the shaft for collar, following hints are important:



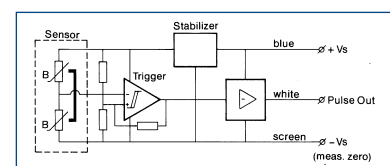
Positioning of the transducer



Triggermark dimensional limits (dimensions in mm)



Dimensions PR 9376/20, PR9376/00, Mounting set (dimensions in mm)



Circuit diagram PR 9376/20, PR9376/00

**Order numbers:**

PR 9376/00 RPM Transducer without metal cable protection: ..... 9408-093 76001

PR 9376/20 RPM Transducer with metal cable protection: ..... 9408-093 76201