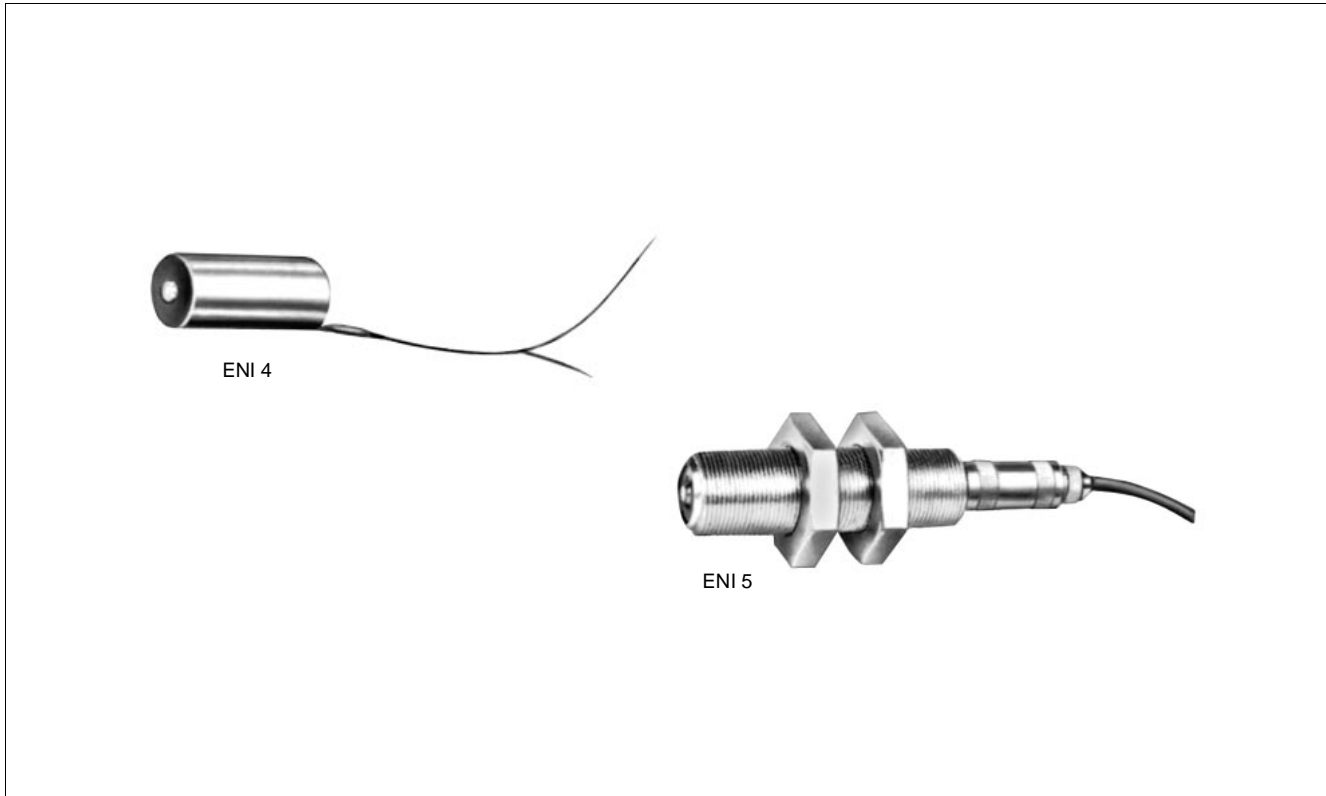


Non-contacting Rotary Speed Sensors

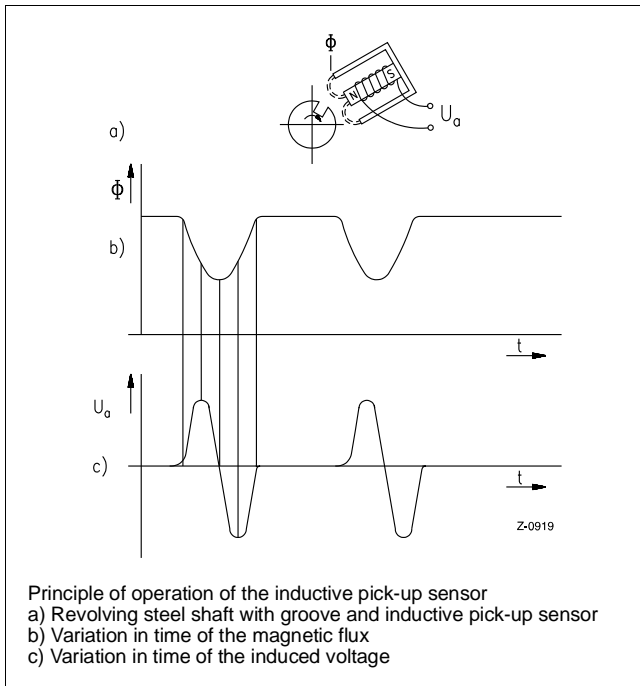
ENI 4, ENI 5 for high rotary speeds; ENI 11, ENI 12 for low rotary speeds



Description

The inductive pick-up sensors consist of a small cylindrical permanent magnet, an induction coil and an iron casing which provides the return. The magnet has a tip made of ferromagnetic material and carries the coil in which voltages are induced by changes in the stray magnetic field.

The stray magnetic field is sufficiently affected by the passing of iron parts at pick-up sensor tip so that voltage pulses of a height sufficient to drive follow-up equipment are generated. Frequently, wires welded on or rivets attached to a shaft are sufficient to generate the induction voltage. Grooves, toothed gears or toothed disks can also be used with the inductive pick-up sensors to generate the voltage pulses.



Voltage magnitude and circumferential speed

The voltage signal is obtained by induction. Therefore, the voltage obtained from the pick-up sensor is a function of the speed of the passing iron parts, i.e. of the circumferential speed of the toothed disks or the like. The circumferential speeds in the following table are given for an air gap of 0.8 mm.

When designing the system, the circumferential speed should, if possible, be higher than that given. If this circumferential speed is not obtained, then the air gap can be reduced, as far as this is allowed by the tolerances. An air gap of 0.4 mm suffices for half the circumferential speed, an air gap of 0.2 mm suffices for 1/4 of the lowest circumferential speed given.

Type	ENI 4, ENI 5	
v_{min} for	300 mV (peak-to-peak)	30 m/min
v_{min} for	100 mV (peak-to-peak)	10 m/min

Lowest pulse frequency, minimum number of poles

In order to achieve a short response time of the transmitter, 10 Hz should be the lowest frequency used.

The minimum number of iron parts, teeth or the like on the periphery of the revolving toothed gear depends on the rotary speed n to be measured. The minimum number of teeth is obtained as follows:

$$p = \frac{600}{n^{1)}$$

The number obtained, p , is rounded up to the next highest integer.

Measuring range of the follow-up equipment

The maximum rotary speed to be measured n_{max} and the specified number of poles p determine the measuring range of the follow-up equipment.

$$\text{Measuring range } f_{max} = \frac{n_{max}^{1)}}{60} \cdot p \text{ [pps]}$$

Pitch diameter

The lowest circumferential speed v_{min} together with the minimum rotary speed to be measured n_{min} result in the required diameter of the toothed disk or shaft:

$$D = \frac{v_{min}}{n_{min}^{1)} \cdot 3.14} \text{ [m]}$$

¹⁾ Insert n in rpm

Technical data

Rotary Speed Sensor for high rotary speeds

Type: ENI 4, ENI 5

Frequency range
approx. 3.5...10.000 pps

Voltage output
100 mV (peak-to-peak) at 3.5 pps and $v = 10$ m/min
with an air gap of 0.8 mm and a load of 10 k Ω

Winding
800 Ω , approx. 100 mH

Permissible ambient temperature
-50...+150 °C

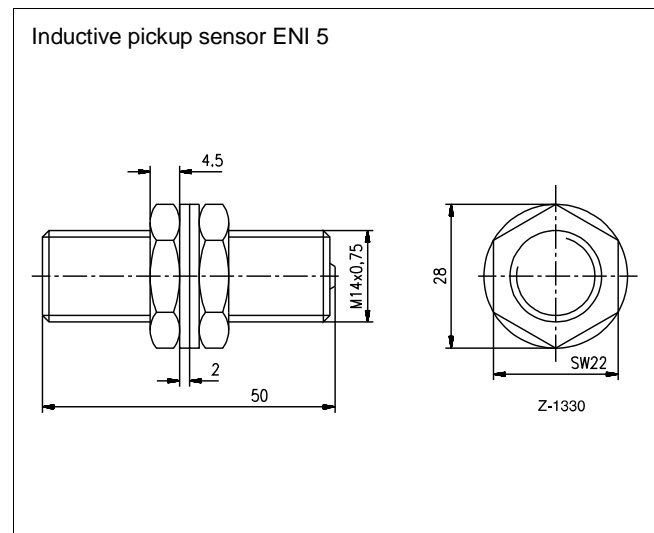
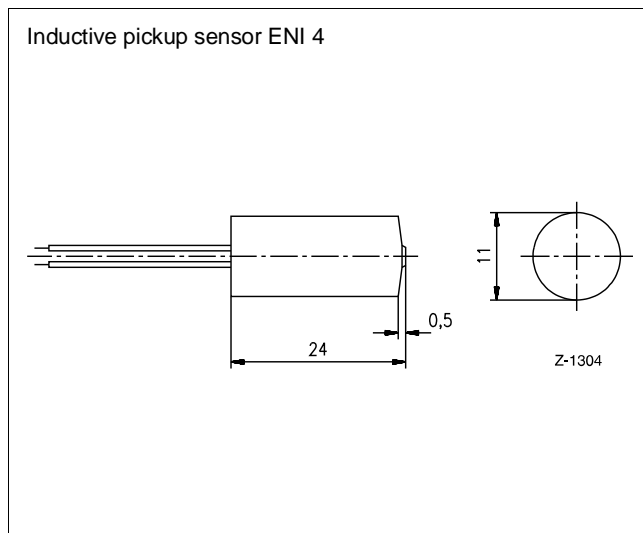
Dimensions
see dimensional drawings

Connection
ENI 4: two connection wires approx. 200 mm long
ENI 5: plug HF/G/S, or permanently attached cable

Tooth dimensions
Tooth width 3 mm
Tooth space 3 mm

Weight
ENI 4: 15 g
ENI 5: 70 g

Dimensional drawings (all dimensions in mm)



Ordering information

Non-contacting rotary speed sensors ENI 4, ENI 5 for high rotary speeds

Catalog No.

Inductive pickup sensor	ENI 4	14632-7592127 ¹⁾
	ENI 5 for plug connection (without plug)	14632-7592128 ¹⁾
	ENI 5 with permanently attached cable, 4 m long	14632-8008356 ¹⁾

Required accessories

Suppl./Catalog No.

For ENI 5	Plug	14639-0882763
	Cable with plug (4 m long)	14639-7851443 ¹⁾
	Cable with plug	14604-8808901
	Cable length ... m (max. 50 m)	301 <input type="text"/>

At this sign complete the Suppl. No. with clear text.

For ordering suffices the Catalog No.
Attach the 3-digit Suppl. No. for cable length required.

¹⁾ Ex stock

Technical data

HF Pickup Sensors for low rotary speeds

Type: ENI 11, ENI 12

Principle of measurement

Oscillator circuit with inductive feedback

Actuation

By metal parts approaching pick-up sensor face

Switching currents

1...3 mA (approximate values)

Temperature

Operating range -25...+65 °C

Power supply

7.7...8.7 V DC

Sensing distance

	ENI 11	ENI 12
Iron	2...5 mm	0...2 mm
Alu, Cu	0...2 mm	0...1 mm

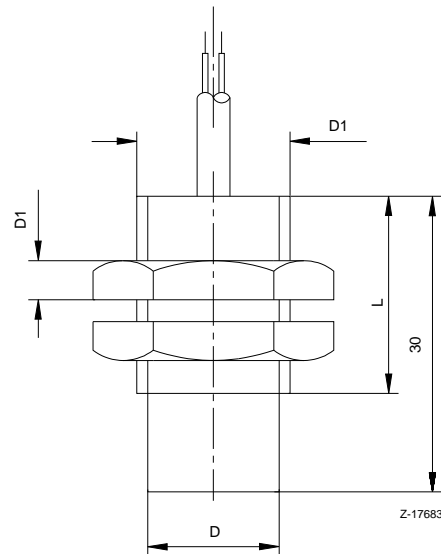
Connecting cable

5 m long 1 m long

Weight

approx. 30 g approx. 20 g

Dimensional drawing (dimensions in mm)



Type	D	D1	L
ENI 11	∅ 11.8	M12 · 1	20
ENI 12	∅ 7	M 8 · 1	25

Ordering information

Non-contacting rotary speed sensors ENI 11, ENI 12 for low rotary speeds

Catalog No.

HF pick-up sensor	ENI 11	14633-7592129 ¹⁾
	ENI 12 for plug connection (without plug)	14633-7592138 ¹⁾

For ordering suffices the Catalog No.

¹⁾ Ex stock