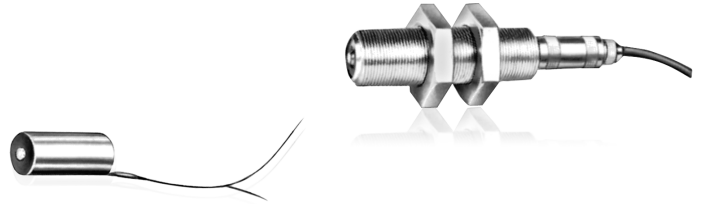


ENI 4, ENI 5, ENI 11, ENI 12 Non-contacting rotary speed sensors



ENI 4, ENI 5

— For high rotary speeds

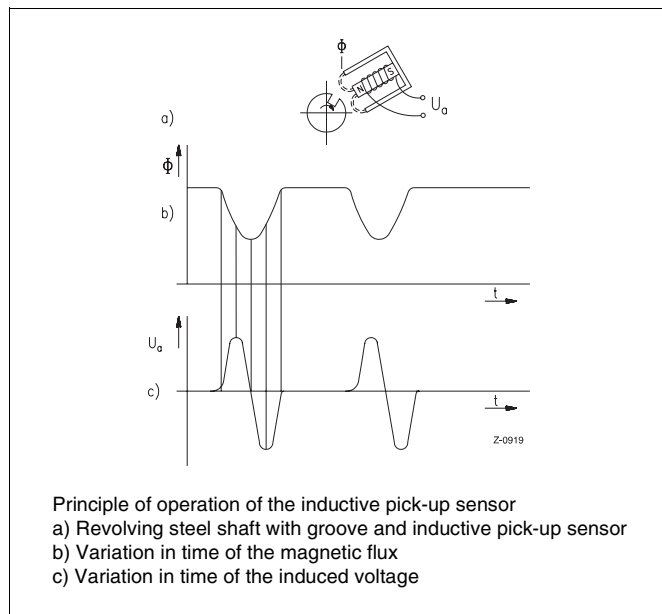
ENI 11, ENI 12

— For low rotary speeds

Function and system design

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.

Typ ENI 4, ENI 5	
v_{min} for	
300 mV (peak-to-peak)	30 m/min
v_{min} für	
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.

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

Pitch diameter

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

$$D = \frac{v_{min}}{n_{min}^{1)} \cdot 3,14} [m]$$

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

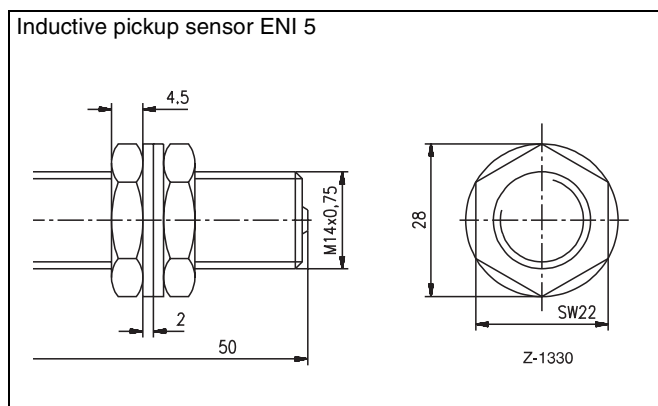
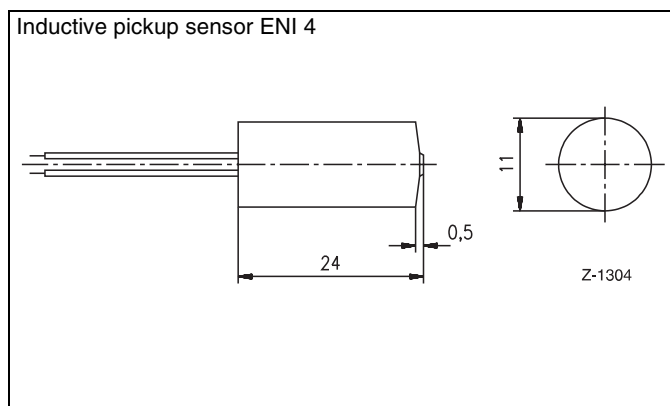
Dimensions
 see dimensional drawings

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)



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

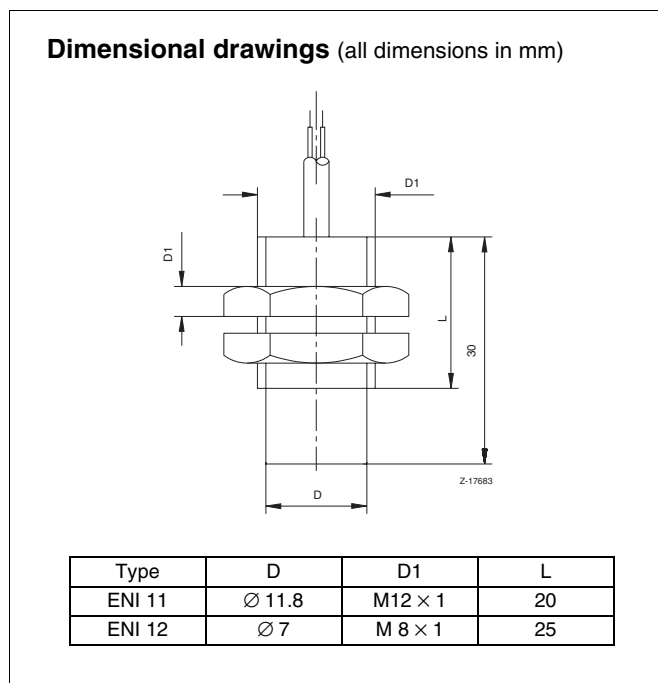
Sensing distance

	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 drawings (all dimensions in mm)



ENI 4, ENI 5; ENI 11, ENI 12

Non-contacting rotary speed sensors for high and low rotary speeds

10/14-2.12 EN

Ordering information				
	Catalog No.	Code		
Non-contacting rotary speed sensors ENI 4, ENI 5 for high rotary speeds				
Inductive sensor				
ENI 4	14632-7592127 ¹⁾			
ENI 5 for plug connection (without plug)	14632-7592128 ¹⁾			
ENI 5 with permanently attached cable,	14632-8008356 ¹⁾			
Accessories for ENI 5				
Plug	14639-0882763			
Cable with plug (4 m long)	14639-7851443 ¹⁾			
Cable with plug	14604-8808901V			
Cable length ... m (max. 50 m) (cable length in clear text)		301		
Non-contacting rotary speed sensors ENI 11, ENI 12 for low rotary speeds				
HF pick-up sensor				
ENI 11 (5 m cable included)	14633-7592129 ¹⁾			
ENI 12 for plug connection (without plug)	14633-7592138 ¹⁾			

¹⁾ ex stock version

²⁾ price / m

Contact us

ABB Ltd.

Process Automation

Howard Road, St. Neots
Cambridgeshire, PE19 8EU
UK

Tel: +44 (0)1480 475321

Fax: +44 (0)1480 217948

ABB Inc.

Process Automation

125 E. County Line Road
Warminster, PA 18974
USA

Tel: +1 215 674 6000

Fax: +1 215 674 7183

ABB Automation Products GmbH

Process Automation

Borsigstr. 2
63755 Alzenau
Germany

Tel: +49 551 905-534

Fax: +49 551 905-555

www.abb.com

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