Data Sheet 10/14-2.15-EN

ENI 21, 22, 23
Optoelectric rotary speed sensors with pulse output

Detection of rotational direction and rotational speed

Signal height independent of rotary speed

Logic signal for detecting the direction of rotation

Rugged construction for use under extreme environmental conditions

The rotary speed sensors with pulse output operate using optoelectric scanning of a slotted disk. The large pulse amplitudes guarantee low susceptibility to interference. Even in the case of very small rotary speeds, the entire signal height extent is delivered.

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Description

The scanning element consists of an infrared diode, a rotating slotted disk and a phototransistor. The slotted disk has, for example, 60 slots and interrupts the beam of light between the infrared diode and the phototransistor at a certain frequency depending upon the rotary speed. The phototransistor drives a threshold switch which produces square waves as output signals. The height of the square waves is dependent on the supply voltage.

In the standard version ENI 21, the slotted disk is scanned with a single optoelectric system. However, the compact construction of the electronics using integrated circuits makes scanning possible with up to 3 systems.

In the model without protective circuit, the infrared diodes of systems 1 to 3 are conncected in series with the supply voltage. The protective circuit consists of a 2nd internal supply circuit for the infrared diodes of the 2nd system of ENI 22/ENI 22 R and of the 3rd system of ENI 23.

The variable construction provides the following possibilities:
Up to 3 outputs with the same number of pulses and output (3) with 1 pulse per rotation.

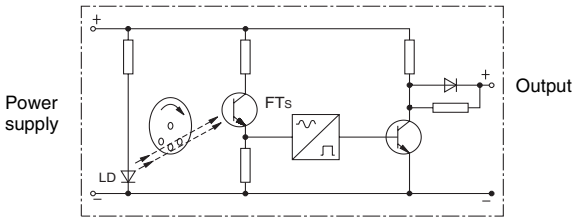
The version ENI 22/R is available for detecting the direction of rotation. A logic signal and 2 pulse signals are provided as output. This signal can be used to drive a transistor relay or the like.

The compact design which is insensitive to vibration meets the extreme requirements of heavy machine and vehicle construction. Generously dimensioned terminals facilitate electrical connection.

A circuit for protection against reversed polarity prevents destruction of the electronics by improper handling. All pulse outputs are short-circuit proof.

The sturdy light alloy housing is splashproof and guarantees operational reliability even under severe environmental conditions. The shaft which mounted on two sets of ball bearings is sealed by means of a shaft seal.

Functional diagramm



Technical Data

Input

Max. speed
6000 min^{-1} with max. 60 pulses/rev.
1000 min^{-1} with 600 pulses/rev.

Output

ENI 21; ENI 22; ENI 23: Square pulses
For number of pulses see ordering information

Signal height
$U_a = (U_H - 7\ V) \times R_a/(R_a + 1.2)\ k\Omega$

Source resistance
$R_q = 1.2\ k\Omega$

Switching action
$t_{on}/t_{off} = 1/0.6...1/1.6$

Rise time/fall time
$t = 5\ \mu s$ for $R_a = 1k\Omega$, $U_H = 24\ V$, $T = 25\ °C$

Phase offset
Output 2 is offset electrically with respects to outputs 1 and 3
by approx. 90° with 30 and 60 pulses/rev.
by approx. 45° with 15 pulses/rev.

ENI 22 R: Sensing of direction of rotation
Logic signal output
+15 V; $I_{Load} \leq 2$ mA, load $\geq 7\ k\Omega$

Power supply

Direct voltage
$U_H = 18...28$ V DC

Permissible residual ripple
20 % (peak-to-peak)
18 V and 30 V are the minimum or maximum values

Current consumptions
60 mA with $U_H = 24$ V DC and 1 pick-up system
plus 20 m A for each additional pick-up system
38 mA with $U_H = 18$ V DC and 1 pick-up system

General and safety characteristics

Environment conditions

Climatc group
HQC to DIN 40040

Ambient temperature
-25...+80 °C

Transportation and storage temperature
-40...+80 °C

Relative humidity
≤ 95 % annual average, condensation permitted

Mechanical stress

Flywheel effect
6.88 10^{-5} kgm^2

Required torque
approx. 1.5 Ncm

Max. shaft load
50 N axially and 100 N radially

Vibration
50 g at 0...50 Hz; shock max. 80 g

Housing and mounting

Degree of protection: IP 56 to DIN 40050

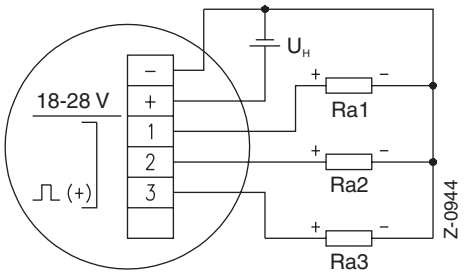
Cable entry: M 24 × 1.4 mm

Mounting position: arbitrary

Weight: approx. 1.8 kg

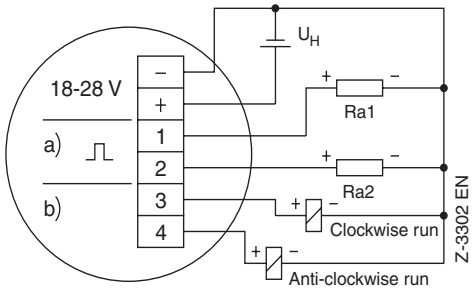
Connection diagrams

Connection of ENI 21; ENI 22; ENI 23



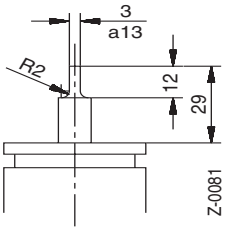
Connection of ENI 22 R

a) Pulse outputs
b) Directional signal 0/+15 V

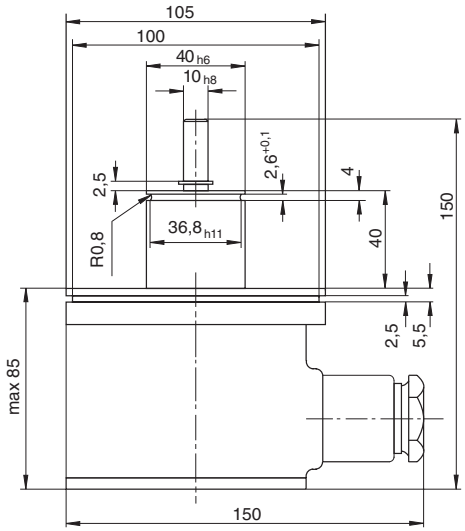


Dimensional drawings (dimensions in mm)

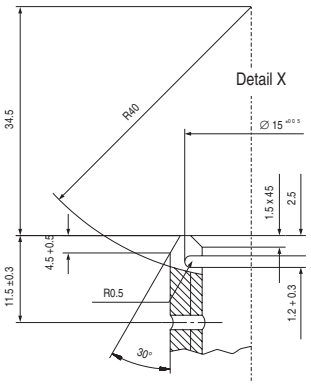
Shaft with reed

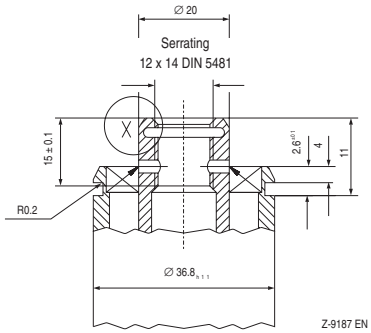


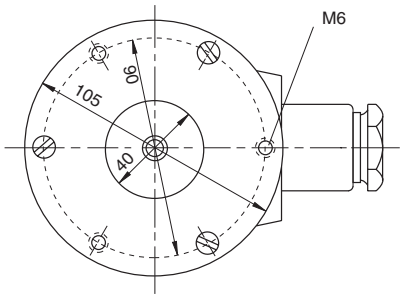
Rotational speed sensor with cylindrical shaft



Shaft with serrated hub







Z-0080

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10/14-2.15 EN

Stock version			
	Catalog No.		
Rotary speed sensor ENI 21 with 1 output, 60 pulse/rev., cylindical shaft	V14631A-1301000		

Ordering information											
		Catalog No.								Code		
Optoelectric rotational speed sensors ENI 21, 23, 22 R		**V14631A-**			**0**		**0**	**0**	**0**			
ENI 21	with 1 output		1									
ENI 22	with 2 outputs		2									
ENI 23	with 3 outputs		3									
ENI 22 R	with 2 outputs and sensing of direction of rotation		4									
Number of pulses	15 pulses/rev.			1								
	30 pulses/rev.			2								
	60 pulses/rev.			3								
Shaft	cylindrcal					1						
	with serrated hub					2						
	with reed					3						
Additional ordering information												
With protective circuit (only for ENI 22, ENI 22 R and ENI 23)										305		

[1] Pulse number identical for outputs 1 to 3

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