



Technical Information

GEL SEI10

2-channel speed sensor

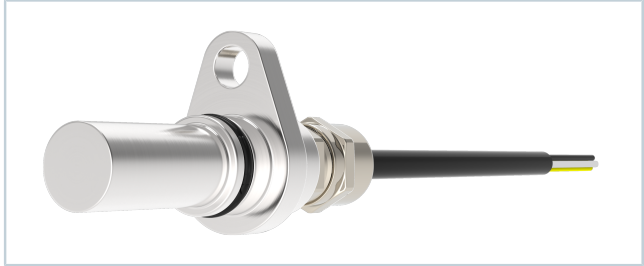
Incremental speed sensor

D-51T-SEI10 | Date of issue 2025-08-15

General

Description

- Application-proven speed sensor using magnetic scanning
- Maintenance- and wear-free operation by contactless rotary motion measuring
- Wide measuring range for reliable detection of creeping without pulse loss and also for fast rotary motion
- Detection of direction by evaluating two channels with 90° phase offset



Features

- Ferromagnetic target wheel module: 1.00 to 2.00
- High-speed sensor with up to 40 kHz
- Suitable for asynchronous motor applications
- ASIL B (D) compliant (ISO 26262) or SIL 2 to SIL 3 for safety applications (on request by selectable error detection of output signals)

Advantages

- Tolerant behavior to assembly deviations thanks to advanced calibration technology
- Cost-effective
- Suitable for rough environments and extreme temperatures
- Wide temperature range from -40 °C to +125 °C
- Easy to install due to large measuring distance
- Degree of protection: IP 67 sensor housing

Field of application

- High-resolution detection of rotational speed and direction of rotation in motors, vehicle chassis or directly on wheels, especially robust for heavy-duty applications.
 - On- and off-road industrial vehicles
 - Agricultural vehicles
 - Special purpose machine construction



Do you have special requirements regarding flange shape, shaft length, number of channels, cable protection, cable outlet, connector assembly or EMC concept? Talk to us. Our experts can design the optimal solution for your application from an extensive modular system and will be pleased to advise you how to customize your solution in the most cost-efficient way.

Write to support@lenord.de or call +49 208 9963-215.

Technical data

Power supply	Option A 5 V	Option B 24 V
Electrical data		
Supply voltage U _B (reverse polarity protected)	5 V DC ± 10 % 4.5 to 5.5 V DC	4.5 to 24 V DC
Current consumption I _B (without load)	Maximum: 30 mA	Maximum: 70 mA
Frequency range	Maximum: 40kHz	
Duty cycle	Minimum: 40 % Typical: 50 % Maximum: 60 %	
Phase offset ⁽¹⁾	Minimum: 70° Typical: 90° Maximum: 110°	
Mechanical data		
Housing material / Flange material	Stainless steel (aluminum and brass possible upon request)	
Sensor weight (incl. 2 m cable)	approx. 140 g	
Cable data		
Cable	halogen-free and screened ⁽²⁾	
Cable diameter	5.2 ± 0.1 mm	
Cable cross section	4 × 0.5 mm ²	
Minimum bending radius static/dynamic	16 mm/27 mm	
Environmental tests		
Working and operating temperature ⁽³⁾	-40 °C to +125 °C	
Storage temperature	-40 °C to +125 °C	
Dielectric strength	500 V AC/750 V DC (DIN EN 50155:2022-06)	
Electromagnetic compatibility	DIN EN 61000-4-2:2009-12 (only ESD handling) DIN EN 61000-4-4:2013-04 (fast transients and burst) VO043644-21-100941 (UNECE R10) VW TL81000 (2021-19) - Interference Emission Antennas (RE-Test) - Interference Immunity Antenna ALSE - Interference Immunity Current Injection (BCI)	
Salt spray test	ISO 9227-11	
Vibration resistance	ISO 16750-3	
Chemical loads	ISO 16750-5	
Degree of protection on measuring side ⁽⁴⁾	IP 67	
Vibration resistance	DIN EN 61373:2011-04 (shocks and vibration) DIN EN 60068-2-6:2008-10 (sinusoidal vibration)	
MTTF value	2,000,000 h at 55 °C	
Requirements for the target wheel		
Material	Ferromagnetic steel	
Tooth form	Involute gear teeth as per DIN 867 (others upon request)	
Width	≥ 10 mm (smaller upon request)	
Module m	1.00/1.25/1.50/1.75/2.00	
Air gap	(see air gap table)	

(1) High-precision phase displacement available as an option

(2) Specification upon request

(3) Short period for extreme temperatures

(4) Degree of protection on the cable outlet side depends on cable gland or cable protection

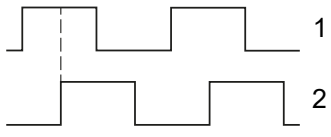
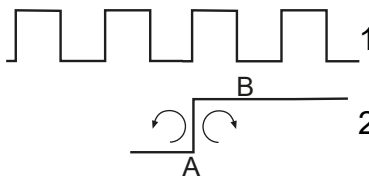
Description

The SEI10 is a sensor for rotational speed and position detection of ferromagnetic target wheels in electric motors for automotive and industrial applications.

The sensor has two independent differential channels. The sensor is able to eliminate the effects of magnetic and system offsets and detect false output transitions caused by vibrations in electric motors at startup and low speed. There are different signal output patterns to control rotational speed and direction of rotation with high accuracy.

Advanced calibration techniques are used to optimize signal offset and amplitude. This makes the sensor very insensitive to variations in air gap, speed and temperature.

The sensor is available for a variety of applications requiring two-phase rotational speed and position signals or simultaneous high-resolution rotational speed and direction information. Selectable error detection mode options are available upon request to realize ASIL B, ASIL B (D), SIL 2 or 3 applications.

Output signals and connection		
Output signals	Supply voltage	Pulse diagram
NPN 2 channels, 90° phase offset	4.5 V to 24 V	
NPNQ Open Collector track 1 with double frequency, track 2 for direction of rotation	4.5 V to 24 V	 A First switching point after change of direction B $V_{OUT (HIGH)}$

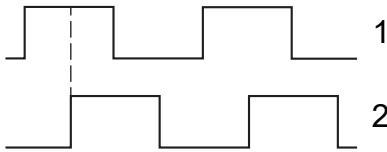
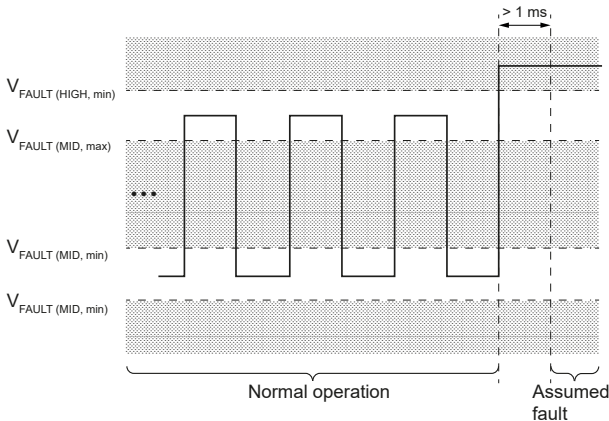
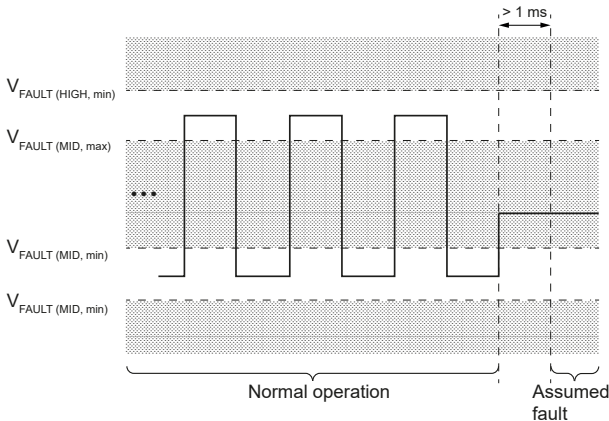
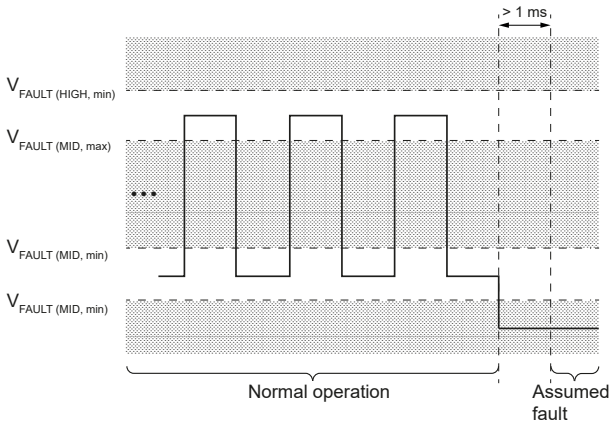
Cable assignment

Observe EMC notes in the relevant documents.

Function	Color
Track 2/direction of rotation	white
Track 1	yellow
UB	black
GND	blue

Output signals

Safety functionality, upon request

Output signals	Supply voltage	Pulse diagram
NPNA 2 channels, 90° phase offset	Low Signal: 1.2 to 3.6 V High Signal: 8.4 V to 10.8 V	
Internal diagnostics triggers error statuses(1). High-voltage signal	11.4 V to 12.6 V > 1 ms	
Error in the IC output control Medium voltage signal	3.6 V to 8.4 V > 1 ms	
Short circuit of output to ground Low-voltage signal	0 V to 1.2 V > 1 ms	

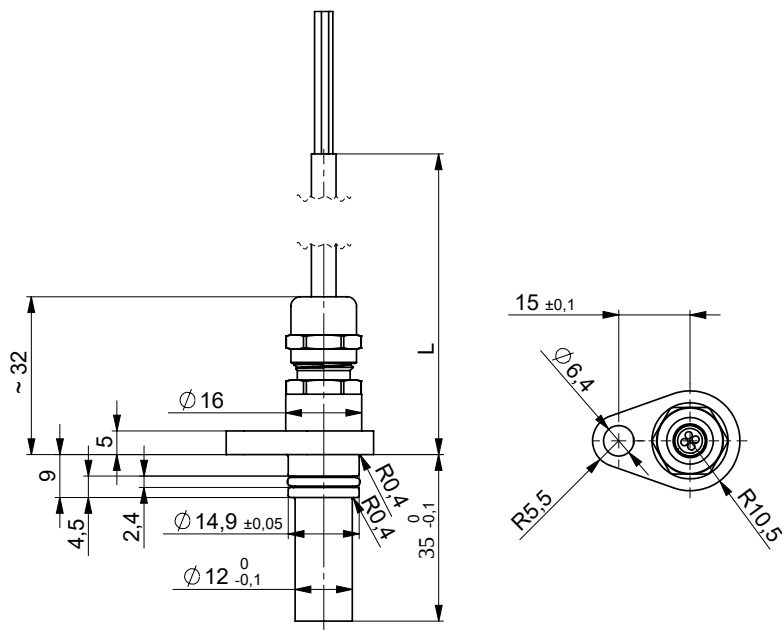
All values are valid at a pull-up resistor of 1 k Ω

(1) Refer to the safety manual to determine the error causes.

Dimensional drawing and hole pattern

Dimensional drawing

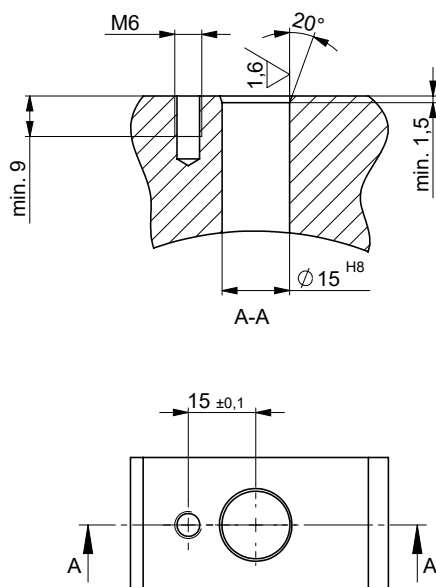
All dimensions in mm, general tolerance DIN ISO 2768 mK



L depending on type code

Hole pattern

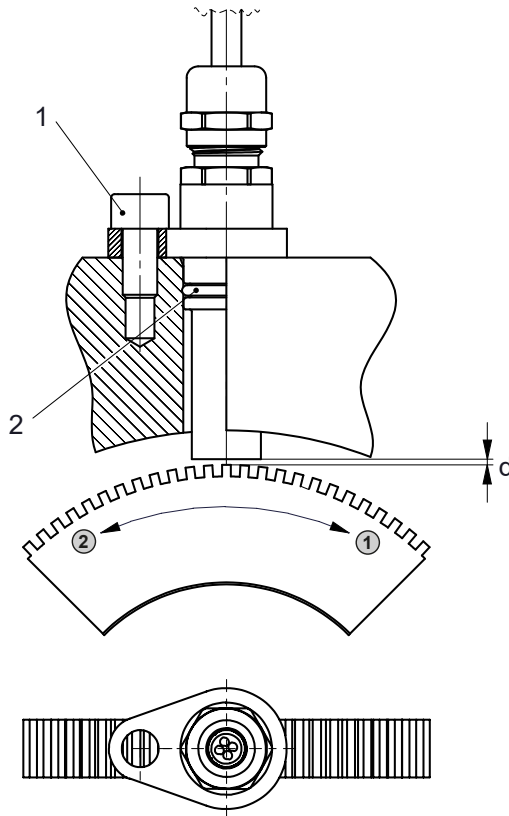
All dimensions in mm, general tolerance DIN ISO 2768 mK



The hole pattern applies to sensors with module 2.00. With a different target wheel module, the mounting bracket of the sensor changes. Corresponding drawings are available upon request.

Assembly drawing

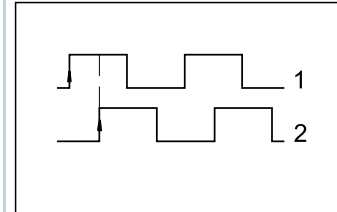
All dimensions in mm, general tolerance DIN ISO 2768 mK



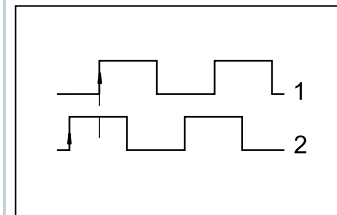
d Air gap (see air gap table)

- 1 Fastening screw (recommended: M6 x 20, DIN EN ISO 4762)
- 2 Sealing ring 11.8 x 1.8

Signal for direction of rotation 1



Signal for direction of rotation 2



The assembly drawing applies to sensors with module 2.00. With a different target wheel module, the mounting bracket of the sensor changes. Corresponding drawings are available upon request.

Assembly notes



For proper assembly, always follow all instructions and directions contained in the sensor product information.

- Recommended cable fixation: 300 mm from the connector
- Tightening torque for M6 screws depending on threaded bore and fastening material
- The EMC notes in the product information must be observed.
- **Screening concept:** Should the electromagnetic environment require special screening concepts, Lenord+Bauer offers support based on extensive knowledge and experience in integrating the sensor into the screening concept of the application.

Air gap table

Module	Permissible air gap	Nominal air gap	max. permissible radial runout
1.00	0.2 to 0.8 mm	0.5 mm	±0.3 mm
1.25	0.2 to 1.2 mm	0.7 mm	
1.50	0.2 to 1.6 mm	0.9 mm	
1.75	0.2 to 2.0 mm	1.2 mm	
2.00	0.2 to 2.4 mm	1.5 mm	

Type code GEL SEI10

SEI10	Product code										
▼	A	Flange mounting									
		Simple screw connection									
	12	Diameter									
		Tube diameter in mm									
	A	Power supply									
		5 V DC ± 10 % (4.5 to 5.5 V DC)									
	B	24 V (4.5 to 24 V DC)									
		100 125 150 175 200	Module m								
	m= 1.00										
	m= 1.25										
	m= 1.50										
	m= 1.75										
	0 1 2	Output									
		NPN: Open Collector track 1 and track 2									
		NPNQ: Open Collector track 1 with double frequency, track 2 for direction of rotation									
	A	Setting									
		Standard phase setting(2)									
01000 02000	Cable length L(3)										
	Cable length 1000 mm										
A B	Cable										
	Cable without screening										
00 01	Cable connection										
	Flying lead										
A B	Cable protection										
	Without cable protection										
E	Housing material										
	Stainless steel										
SEI10	—	—	—	—	—	—	—	—	—	—	◀Type code

(1) In preparation

(2) Ideal conditions depend on the user application

(3) Further cable lengths upon request



A Y-number is assigned for a customer-specific version. A special version is manufactured according to drawing or application description and may deviate from the standard technical specifications.

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Europe

Germany

Lenord, Bauer & Co. GmbH

Dohlenstrasse 32
46145 Oberhausen
Tel. +49(0) 208 9963 0
E-Mail info@lenord.de
www.lenord.de

Italy

Lenord+Bauer Italia S.r.l.

Via Gustavo Fara, 26
20124 Milano
Tel. +39 340 1047184
E-Mail salesitaly@lenord.com
www.lenord.com

North America

USA

Lenord+Bauer USA Inc.

32000 Northwestern Highway, Suite 150
Farmington Hills, MI 48334
Tel. +1 248 4467003
orders@lenord.com
E-Mail Info-us@lenord.com
www.lenord.com

Asia

China

Lenord+Bauer Automation Technology (Shanghai) Co.

Block 42, Room 302, No.1000,
Jinhai Road, 201206 Shanghai
Tel. +86 21 50398270
E-Mail Info@lenord.cn
www.lenord.cn

India

Lenord+Bauer India Private Limited

registered office at 417 Golden Square
Prime Serviced Office, Davanam Sarovar
Portico Suites, Hosur Main Road,
Bengaluru, Karnataka 560068
Tel. +919901516814
E-Mail info@lenord.co.in
www.lenord.co.in

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