Speed sensor
MiniCoder GEL 2472
two electrically isolated measuring systems
in a single housing

SENSORLINE
LENORD+BAUER

Technical information

version 06.06

The MiniCoder family from Lenord + Bauer offers space-saving solutions for the contactless measurement of rotational movements with direction sensing.

The MiniCoders operate from 0 Hz on for the detection of very slow movements without pulse loss and up to 20 kHz for the direct integration into high-speed motors and machines.

The high interference immunity ensures reliable function even under adverse operating conditions.

The MiniCoder GEL 2472 accomodates two independent measuring systems in one housing permitting connection of two different electronic control systems, e.g. wheel slip prevention and traction control. This configuration also permits the use of different supply voltages.

Main features
- module range from m = 2.0 to m = 3.0
- measuring frequency from 0 to 20 kHz
- simple flange-mounting
- robust stainless steel casing
- customized cable fittings
- very high protection class IP 68
- wide temperature range -40 °C to +120 °C
- high electromagnetic compatibility

Fields of application
rail vehicles
- traction control
- anti-skid protection and wheel slip prevention
- motor speed control
- vehicle speed

Output signals
Two electrically isolated systems that can be combined from
system 1 optionally:
- one square-wave signal and one direction signal
- one square-wave signal
- two 90°-shifted square-wave signals for direction sensing

and system 2:
- one square-wave signal

Internet: http://www.lenord.de
E-Mail: info@lenord.de
Tel.: +49 (0)208 9963-0
Fax: +49 (0)208 676292
Lenord, Bauer & Co. GmbH
Dohlenstrasse 32
46145 Oberhausen, Germany

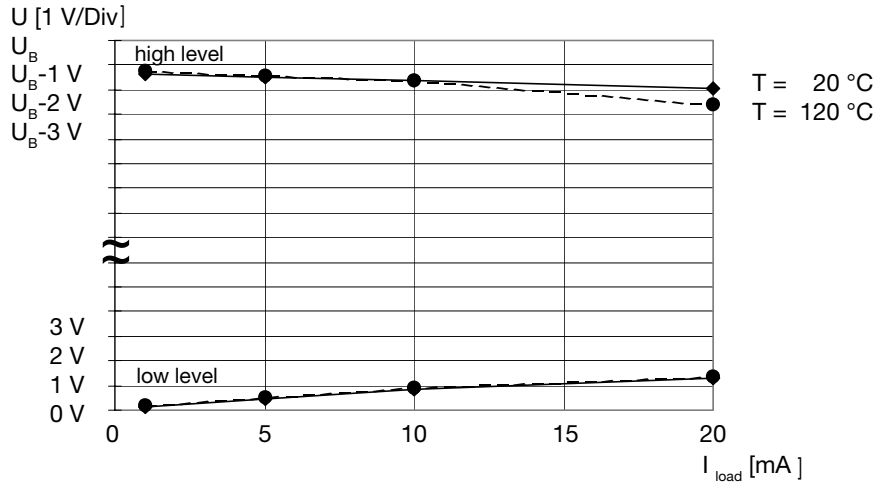
Technical data

Electrical data	
Supply voltage	U_B = 10 ... 20 V DC, reverse polarity protected
Current consumption without load	$I_B \leq$ 40 mA
Output signals	electrically isolated, push-pull driver I_{max} = 20 mA
Input and output frequency	0 ... 20 kHz
Duty	0.5 +/- 0.25
Rise time (2 m cable)	$\geq$ 10 V/µs
Max. cable length	100 m
Electromagnetic compatibility * Case 1: screen connected to housing Case 2: screen not connected to housing	 rail vehicles: EN 50121-3-2 industry applications: EN 61000-6-1 to 4 rail vehicles: test in according with EN 50121-3-2 [1)]
Insulation resistance	500 V
Connection	fully potted cable outlet with stress relief, 2 x 4 x 0,5 mm^2 separated screen cable specification: please request separately
Mechanical data	
Module	m = 2.0; 3.0 (other modules available on request)
Admissible air gap	depending on module, frequency and temperature range up to max. 1.5 mm
Working and operating temperature range	-40°C ... +120°C
Storage temperature range	-40°C ... +120°C
Protection class	IP 68
Vibration resistance (EN 60068 part 2-6)	200 m/s^2
Shock resistance (EN 60068 part 2-27)	2000 m/s^2
Width of the target wheel	$\geq$ 20 mm taking into account all tolerances
Form of the target wheel	standard: m = 2.0 to 3.0, involute teeth according to DIN 867
Material of the target wheel	ferromagnetic steel
Weight with 2 m cable without fittings	approx. 550 g
Housing	stainless steel

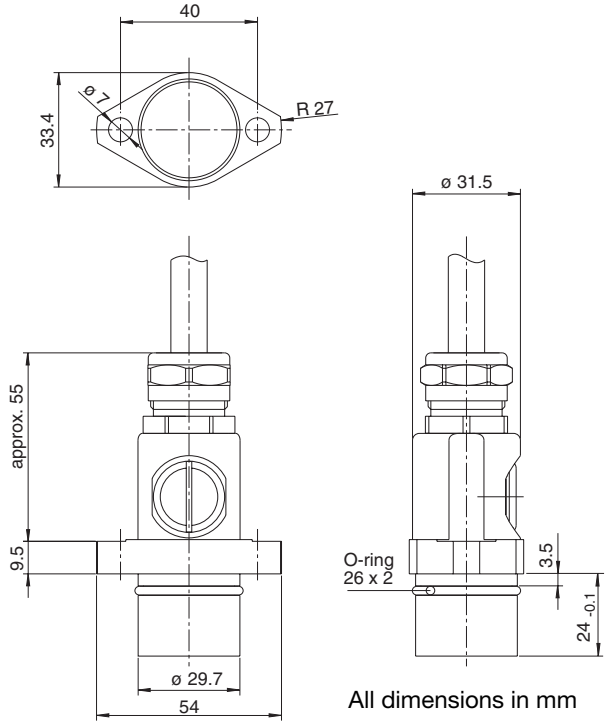
[1)] When the shield is not connected at the encoder end, the test level in acc. with EN 61000-4-4 may be lowered depending on installation conditions.

* Test according to EN 61000-4-3: In some cases strong electromagnetic fields can inherently affect the sensor's HF-oscillator when the sensor is mounted in the open. Sensors installed in a casing are generally sufficiently screened from such fields.

Output level (typical course)

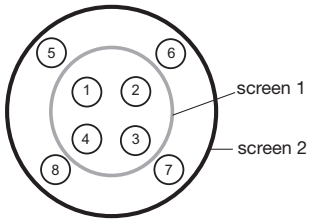


Dimensions GEL 2472



All dimensions in mm

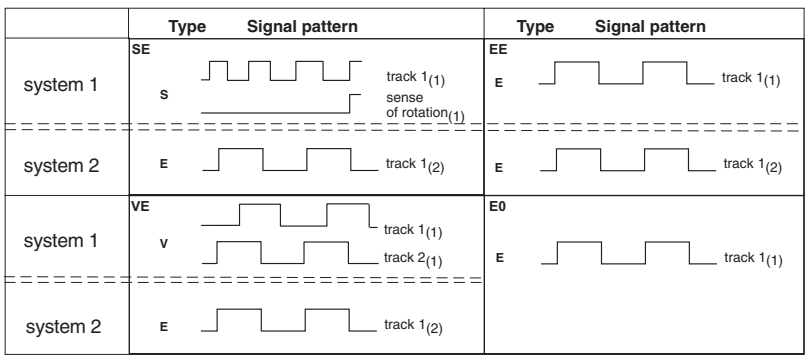
Cable core assignment



	No.	Core colour	Connection
system 1	1	red	$+U_{B(1)}$
	2	yellow	track $1_{(1)}$
	3	black	track $2_{(1)}$
	4	blue	$0\ V_{(1)}$
system 2	5	pink	$+U_{B(2)}$
	6	grey	$0\ V_{(2)}$
	7	white	track $1_{(2)}$
	8	brown	

Signal pattern GEL 2472

Signal pattern S:
Sense of rotation low for clockwise rotation (see installation drawing)
Signal pattern V:
Track 2 leading track 1 for clockwise rotation (see installation drawing)



We have agencies in:
Austria
Belgium
Canada
Denmark
Finland
France
Germany
Great Britain
Israel
Italy
Korea
Malaysia
Norway
Portugal
Sweden
Switzerland
Spain
the Czech Republic
the Netherlands
the USA
Turkey

LENORD +BAUER
... automates motion.

Lenord, Bauer & Co. GmbH
Dohlenstrasse 32
46145 Oberhausen, Germany
Phone: +49 (0)208 9963-0
Fax: +49 (0)208 676292
info@lenord.de
www.lenord.de

EMC installation advice and ESD instructions

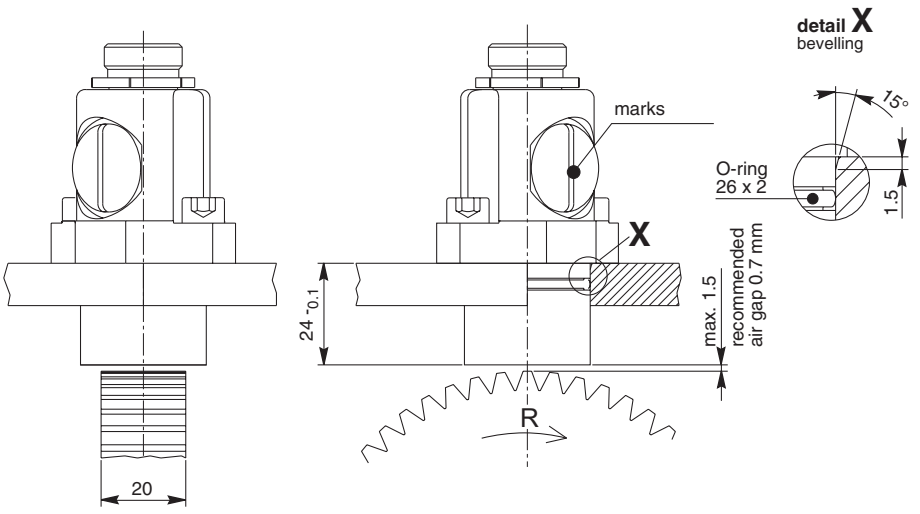
EMC installation advice

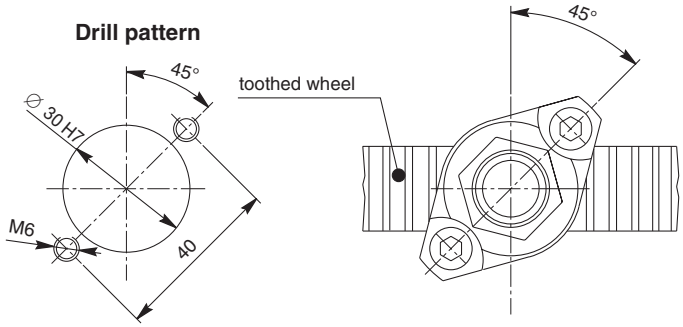
- Connect the screen at the end of the cable using **a large contact surface**, if possible.
- Keep all unscreened cables **as short as possible**.
- Keep grounding connections **as short as possible** using large cross-sections (low-induction grounding strip, ribbon cable)
- Lay signal and control cables **away** from power lines.
- The power supply must correspond to installation class 0 or 1 in according with B.3 of EN 61000-4-5 of 1995.

ESD instructions

As with any other electronic device, when connecting the MiniCoder suitable precautions against electrostatic discharge must be taken. Do not touch connector pins and connecting wires without such precautions.
Observe the guidelines in EN 100015-1.

Installation drawing

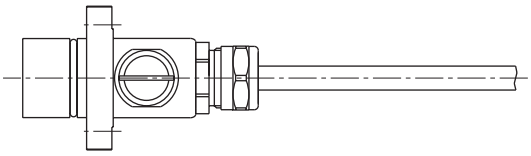




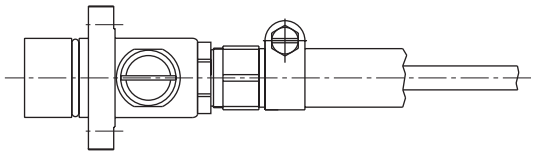
All dimensions in mm

Examples of customized cable connections, Type code

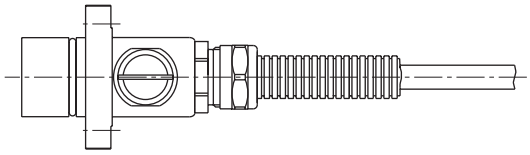
Encoder end



standard cable

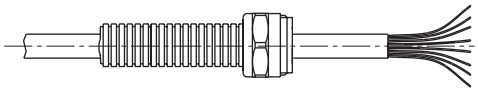


rubber conduit

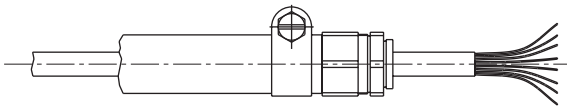


flexible conduit

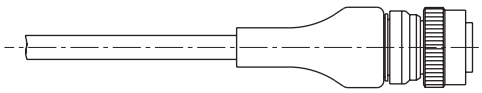
Cable end



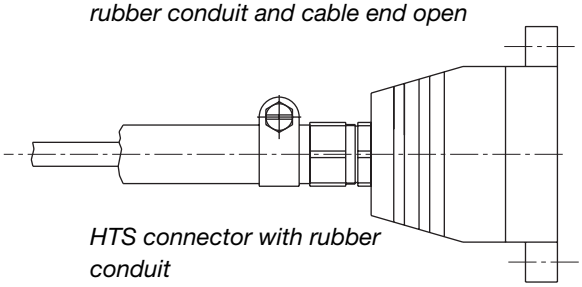
flexible conduit connection and cable end open



rubber conduit and cable end open



connector with shrink moulded sleeve



HTS connector with rubber conduit

Type code GEL 2472

	SE S- and E-Signal, electrically isolated **VE** V- and E-Signal, electrically isolated **EE** two square-wave signal, electrically isolated **E0** one square-wave signal	**Signal pattern**				
		MMM for signal pattern EE or E0 **200** module 2.0 **300** module 3.0	**Module**			
			L cable screen connected to encoder housing **P** cable screen not connected to encoder housing	**Cable screen**		
				xxxx cm of cable length	**Cable length (cm)**	
					N standard cable **S** with special fittings	**Preparation**
2472	_ _	_ _ _	_	_ _ _ _	_	

Ordering information

If customized cable, conduit and connectors are required, please supply detailed specifications.
Module specification not required for signal types EE or E0 within a range m = 2.0 to m = 3.0.