Incremental Linear Measuring Scale

GEL 220/221

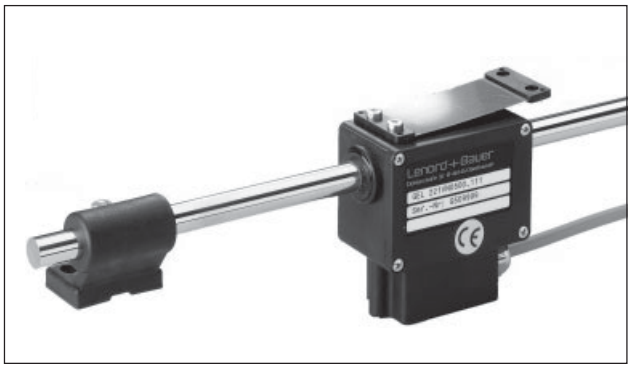
magnetic measuring system

SENSORLINE

LENORD+BAUER

Technical Information

version 04.04



General information

- for the measuring of length up to 2000 mm (special length on request)
- resolution due to edge evaluation 0.1 mm or 0.01 mm
- with reference mark
- protection class IP 66
- corrosion and abraison resistant hard chrome-plated measuring rod
- easy adjustment and mounting
- dirt scraper on sensor housing
- encapsulated measuring system
- operating temperature range -20°C ... + 85°C
- maintenance free

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

Design, Function
Technical data

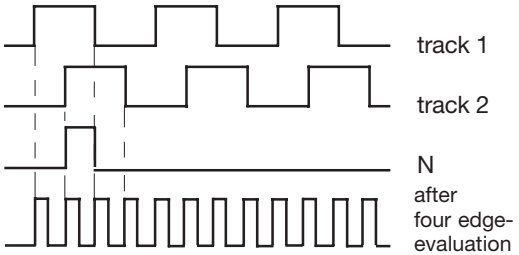
Design and Function

The linear measuring scales consists of a hard chrome-plated steel rod and an enclosed plastic measuring head made from durethan bkv 30h6011. They differ in the obtainable resolution of 0.1 mm for the GEL 220 and 0.01 mm for the GEL 221. The distance is measured through the housing wall, the measuring system operating with semiconductors which are controlled by magnetic fields.

Signal pattern VN

Two tracks with square-wave signals offset by 90°. On the third track N (option) a reference signal with defined length is output.

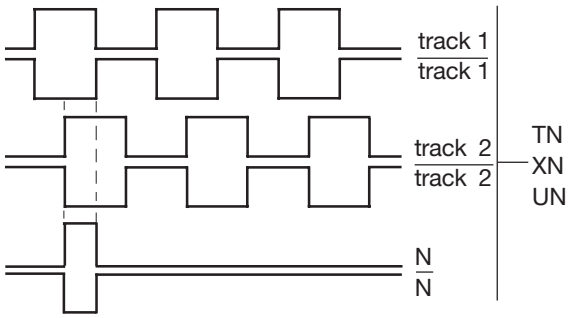
Signal pattern VN
operating voltage U_B= 10 ... 30 V DC
signal voltage U_S= 10 ... 30 V DC



Signal pattern T, TN, U, UN, X, XN

Both tracks and the reference signal (option) are additionally output as inverse signals.

signal pattern	operating voltage U_B	signal voltage U_S
TN	5 V DC ± 5%	5 V
UN	10 ... 30 V DC	5 V
XN	10 ... 30 V DC	10 ... 30 V



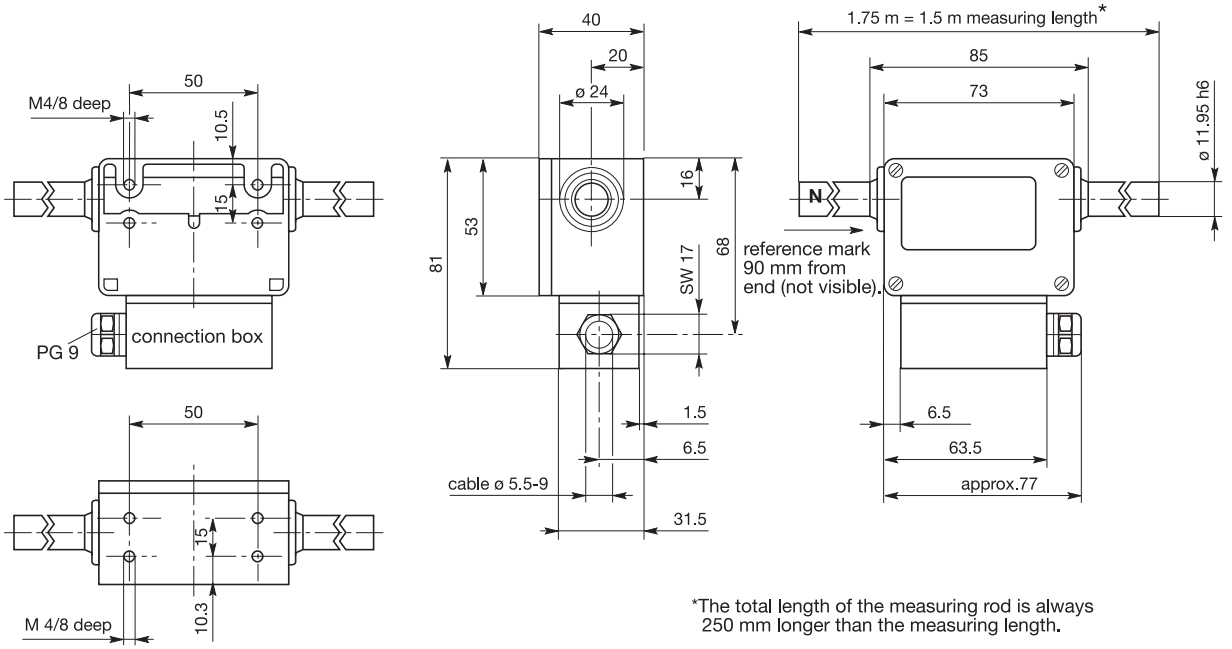
Technical data according to DIN 32876/32878

	GEL 220	GEL 221
expansion co-efficient	12 µm/(K · m)	
measuring force	5 N	
nominal measuring speed	2 m/s	
max. measuring speed	8 m/s	4 m/s
resolution	0.1 mm	0.01 mm
tolerance per m	0.1 mm	0.05 mm
incremental deviation	0.03 mm	0.003 mm
repeatability	0.01 mm	0.002 mm
position error upon reversal	0.01 mm	0.002 mm
operating treshold	0.135 mm	0.016 mm
max. pulse frequency	200 kHz	
power consumption (R_L =∞)	1.1 W	
ambient temperature range according to DIN 32876	0 °C ... + 70 °C (standard) -20 °C ... + 85 °C (option)	
operating temperature range according to DIN 32876	-20 °C ... + 85 °C	
storage temperature range according to DIN 32876	-40 °C ... + 105 °C	
protection class according to DIN 40050	IP 66	
vibration protection according to IEC 68 part 2-27 frequency range peak acceleration frequency cycles	 10 ... 2,000 Hz 100 m/s² 10	
shock protection according to IEC	1,000 m/s² duration 11 ms	
insulation strength acc. to DIN 57660 part 500 (8.2.2) or VDE 0113 (13.1)	R_i > 1 MΩ, at a test voltage of 500 V	
EMC (when observing the installation instructions) electromagnetic emissions electromagnetic immunity	 EN 50081-1 EN 61000-6-2	

The linear measuring scale is in strict conformity with Directive EMC 89/336/EEC of the European Union and is therefore carries by the CE mark.

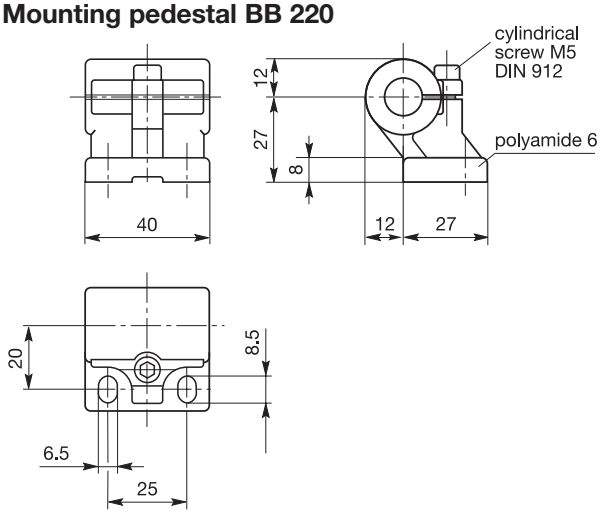
Dimensioned drawings, Pin layout

Linear measuring scale GEL 220//221

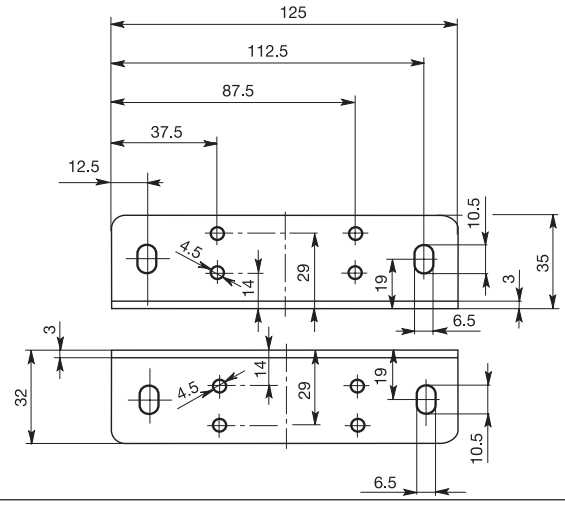


*The total length of the measuring rod is always 250 mm longer than the measuring length.

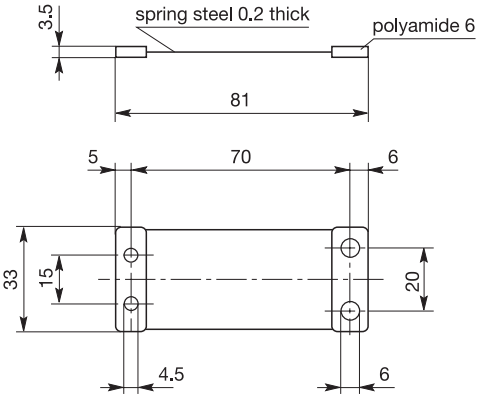
Mounting pedestal BB 220



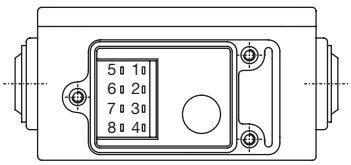
Mounting bracket MW 220



Trailing plate SB 220



Pin layout



pole	signal	
1	track 1	
2	track 2	
3	reference signal	
4	0 V, earth	
5	$\overline{\text{track 1}}$	only by signal pattern TN, UN, XN
6	$\overline{\text{track 2}}$	
7	$\overline{\text{reference signal}}$	
8	$+U_S$	5 V DC (TN), 10 ... 30 V DC (XN, UN, VN)

Type code

Mounting instructions

- Mount the measuring head as shown in the dimensioned drawing. The reference signal may either be on the right or on the left side. Since the measuring sensor is symmetric, it can be inserted either from the right or from the left side.
- If the enclosed trailing plate is used, any deviations which might occur in parallelism between the linear measuring scale and the machine can be compensated.
- If the measuring head is connected to the machine by means of a mounting bracket, you should make sure that there is no bracing between the mounting bracket and the mounting point.
- Should you need a special measuring length, the rod can be shortened by cutting it off at the unmarked end.

Caution

Avoid concentrated loads and strong impacts on the rod.

Maximum cable length

Between Linear Scale and following electronics. Cable screen should be earthed at receiver end only. All indicated values are guidelines with respect to cable type LiYCY 6 x 0.25 mm².

U_S= 5 V (TN, UN)						
f [kHz]	5	10	20	50	100	200
L_{max} [m]	100	100	100	100	100	100

U_S= 20 V (VN)						
f [kHz]	5	10	20	50	100	200
L_{max} [m]	100	100	100	100	74	37

U_S= 20 V (XN)						
f [kHz]	5	10	20	50	100	200
L_{max} [m]	100	100	95	38	19	19

Type code

							resolution (after four edge-evaluation)
							0 0.1 mm
							1 0.01 mm
							signal pattern (see page 2)
							T U_B = 5 V DC, logic level TTTL
							U U_B = 10 ... 30 V DC, logic level TTL
							V U_B = 10 ... 30 V DC, logic level HTL
							X U_B = 10 ... 30 V DC, logic level HTL
							reference signal
							N with reference signal
							- without reference signal
							measuring length (special lengths on request)
							0 5 0 0 500 mm
							1 0 0 0 1000 mm
							1 5 0 0 1500 mm
							2 0 0 0 2000 mm (only obtainable without reference signal)
							ambient temperature range
							0 0°C ... +70°C (standard)
							1 -20°C ... +85°C (option)
							certification
							0 no (standard)
							1 yes (option)
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Accessories (incl. in the scope of supply)

Mounting set GEL 234 consisting of:
1 Plug socket SG 220
2 Mounting pedestals BB 220
1 Mounting bracket MW 220
1 Trailing plate SB 220
4 Mounting screws M4 x 8 (for mounting the trailing plate or the mounting bracket onto the measuring head)
10 Crimp contacts CK 220.