

**GEL 220/221**  
Magnetic Incremental  
Linear Measuring Scale



06/98

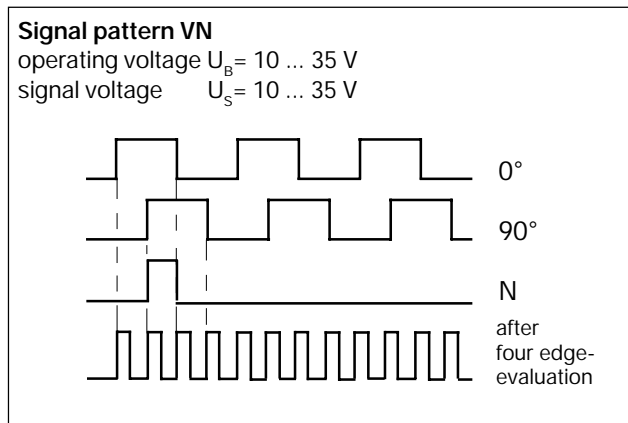
# Design, Function Technical Data

## 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.

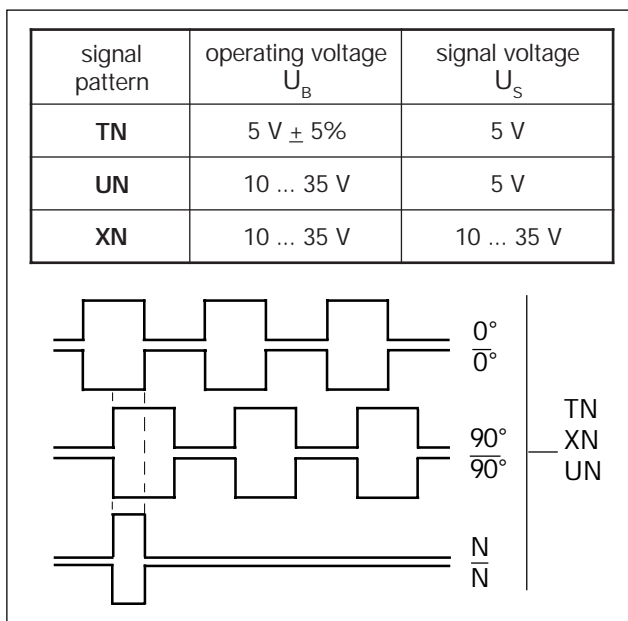
## Signal pattern VN

Signal pattern V consists of two sinusoidal signals which are displaced by 90° and converted into square waves. These are output on two channels. The reference signal is output on the third channel, with its position and length being defined by the output signal. The outputs are designed as push-pull stages and they are sustained short-circuit-proof.



## Signal pattern TN, UN, XN

Both pulse signals of V are additionally output as inverse signals. This also applies to the reference signal. The output signals of TN and UN are RS-422-A and RS 485 compatible.

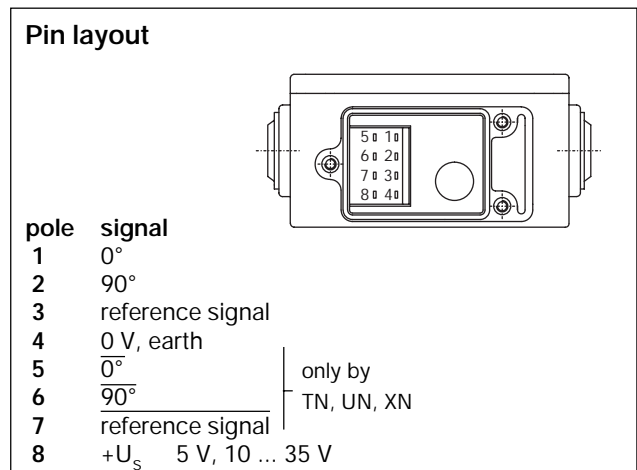
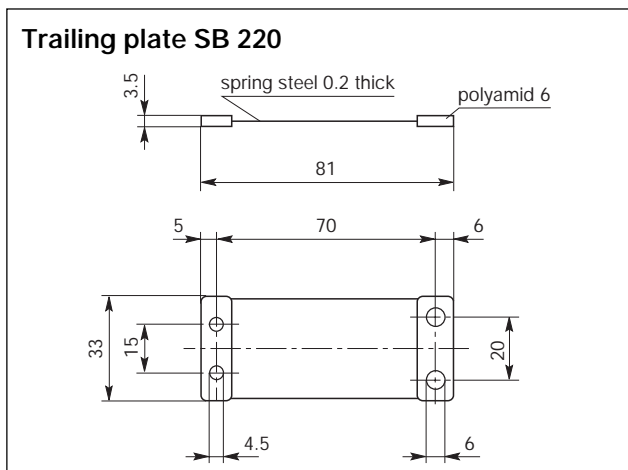
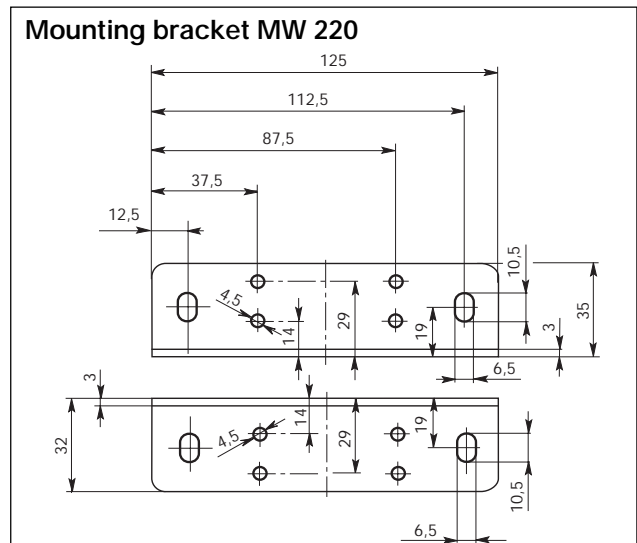
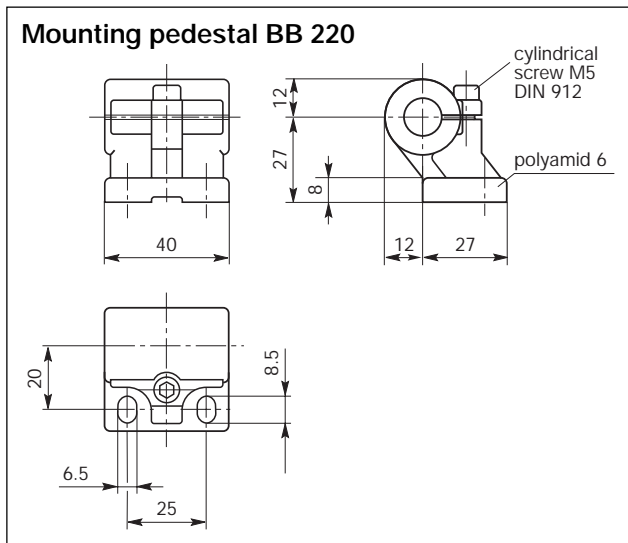
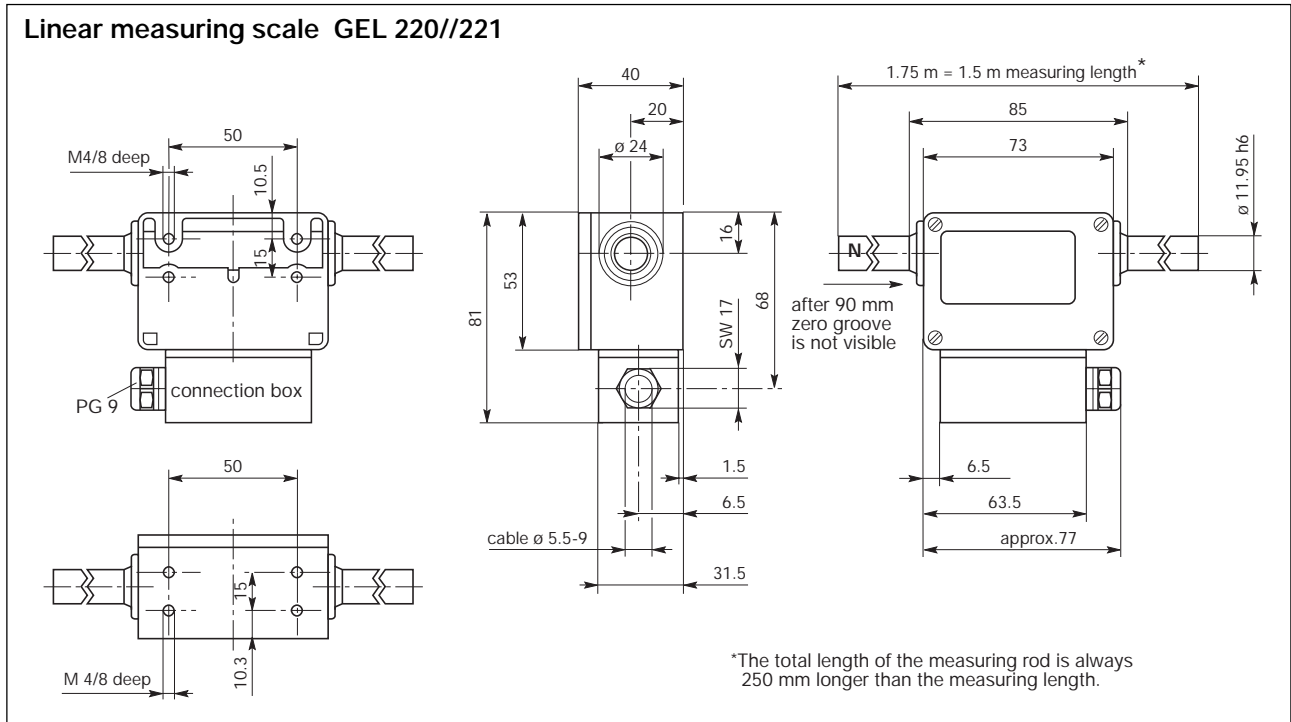


## Technical data according to DIN 32876/32878

	GEL 220	GEL 221
stretching co-efficient	12 $\mu\text{m}/(\text{K} \cdot \text{m})$	
measuring force	3 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 ( $R_L = \infty$ )	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 $\text{m/s}^2$ 10	
shock protection according to IEC	1,000 $\text{m/s}^2$ duration 11 ms	
insulation strength acc. to DIN 57660 part 500 (8.2.2) or VDE 0113 (13.1)	$R_i > 1 \text{ M}\Omega$ , at a test voltage of 500 V	
EMC (when observing the installation instructions) electromagnetic emissions electromagnetic immunity	EN 50081-1 EN 50082-2	

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

# Dimensioned Drawings, Pin Layout



# 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 mm<sup>2</sup>.

U <sub>s</sub> = 5 V (TN, UN)						
f [kHz]	5	10	20	50	100	200
L <sub>max</sub> [m]	100	100	100	100	100	100

U <sub>s</sub> = 20 V (VN)						
f [kHz]	5	10	20	50	100	200
L <sub>max</sub> [m]	100	100	100	100	74	37

U <sub>s</sub> = 20 V (XN)						
f [kHz]	5	10	20	50	100	200
L <sub>max</sub> [m]	100	100	95	38	19	19

## Type Code

22X	X	X	XXXX	1	X	X	description
						0	<b>certification</b> no (standard)
						1	yes (option)
						0	<b>ambient temperature range</b> 0°C ... +70°C (standard)
						1	-20°C ... +85°C (option)
						0500	<b>measuring length</b>
						1000	special lengths on request
						1500	
						N	<b>reference signal</b>
						V	<b>signal pattern</b> operating voltage 10 ... 35 V=
						T	operating voltage 5 V=
						U	operating voltage 0 ... 35 V=
						X	operating voltage 10 ... 35 V=
						0	<b>resolution (after four edge-evaluation)</b> 0.1 mm
						1	0.01 mm

## 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 10 (for mounting the trailing plate or the mounting bracket onto the measuring head)

10 Crimp contacts CK 220.