

BE163C PHOTOELECTRIC LINEAR ENCODER

*Exposed Linear Encoder - High accuracy,
 High resolution, Electrically identical and
 Mechanically similar to LID300 encoders*

The linear encoder **BE163C** is used to convert linear displacements of machine key components into electrical signals containing information about the value and direction of the displacement. Common applications include coordinate and precision machine tools, coordinate measuring machines, microscopes and other high precision equipment.



The system consists of an exposed scale and an encoder read head that works on the transmitted light principle. The scanning portion of the head self-aligns with the scale and thus maintains a constant gap between scanning unit and scale.

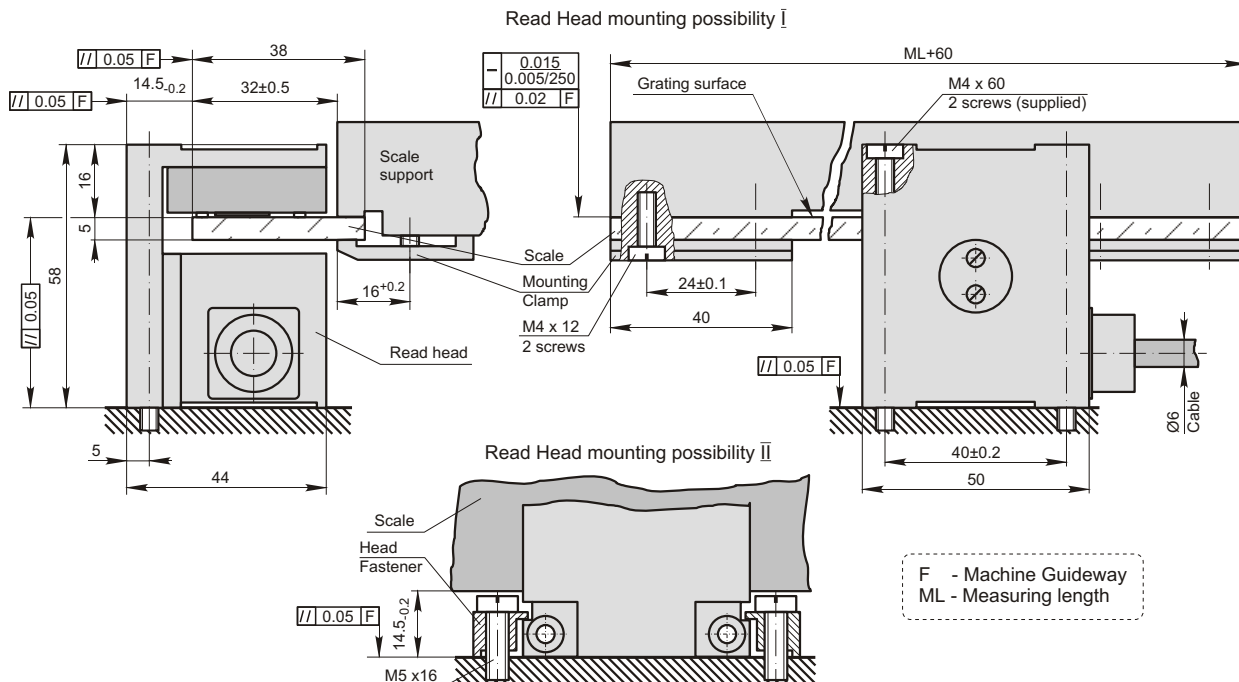
The glass scale has a grating with two line tracks. One track is the periodic graduation with a constant line pitch of 20 µm. The second contains a reference mark, which can be located 40 mm from either end, from both ends, or in the middle of the measurement range. Unique location of reference marks can also be supplied upon request.

The output signals are sinusoidal and phase shifted by 90°. With an external pulse shaping and interpolation unit (available separately) one can obtain square wave outputs with resolutions of 0.5 µm, 0.2 µm or 0.1 µm. The system is available in three accuracy grades. Connector, interpolation unit and scale mounting clamp are optional based on customer's request.

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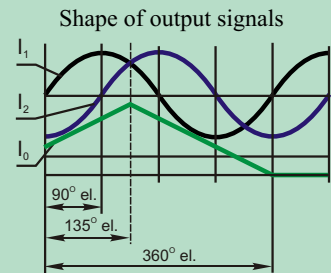
Mechanical Data

Measuring lengths (ML), mm	120, 170, 220, 270, 320, 340, 420, 470, 520, 620, 650, 720, 820, 920, 940, 1020 (others ML on request)	Max. acceleration	40 m/s ²
Standard grating pitch	20 µm	Required moving force	< 0.05 N
Accuracy grades to any metre within the ML (at 20°C)	±3; ±2 µm ±1 for ML ≤ 320 mm	Protection (IEC 529)	IP00
Reference marks (RI):	- middle of ML - 40 mm from either end - 40 mm from both ends - others locations on request	Weight	(0.34+0.53×ML) kg (ML in metres)
Max. traversing speed	45 m/min	Coefficient of temperature expansion of glass scale	8.5 µm/m °C
		Operating temperature	0...+50°C
		Storage & transportation temperature	-20...+70°C
		Permissible vibration (40 to 2000 Hz)	≤ 10 m/s ²
		Permissible shock (11 ms)	≤ 50 m/s ²
		Relative humidity (without condensation of moisture)	≤ 80%



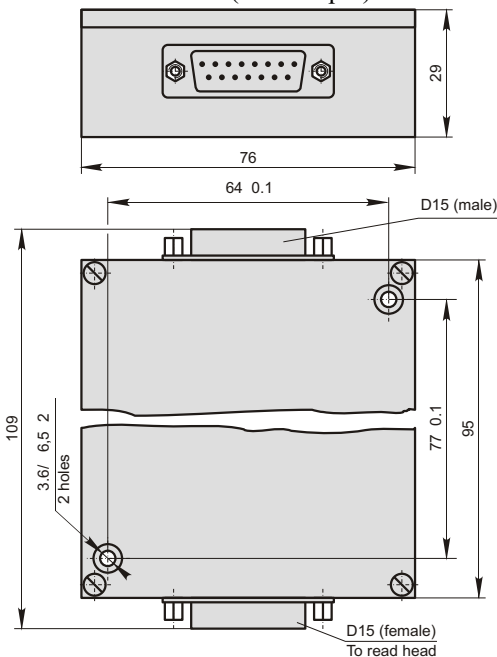
Electrical Data

Power supply	+5 V \pm 5% / < 90 mA
Light source	LED
Resolution at x5, x10, x25 and x50 interpolation	1.0, 0.5, 0.2 μ m (after 4-fold dividing in subsequent electronics)
Incremental signals	Two sinusoidal I_1 and I_2 . Amplitude at 1 k load: - $I_1 = 11-16 \mu$ A - $I_2 = 11-16 \mu$ A
Reference signal	Quasi-triangle I_0 . Signal magnitude at 1 k load: - $I_0 = 4-8 \mu$ A
Maximum operating frequency	50 kHz
Direction of signals	I_2 lags I_1 at reading head displacement from left to right
Standard cable length	1 m, without connector
Max. cable length	3 m
Cable diameter	6 mm

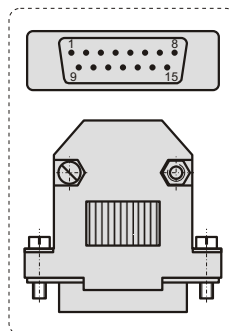


Accessories

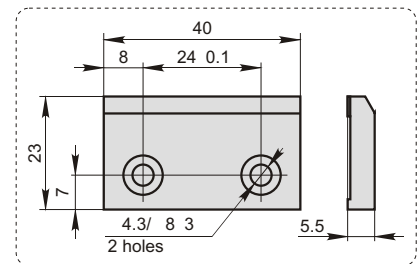
NK5, NK10, NK25 Interpolation unit x5, x10, x25 (TTL output)



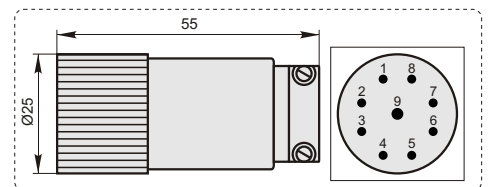
D15 15-pin flat connector



BE163C.05.008 Scale mounting clamp



C9 9-pin round connector. Not available with NK50



Order form

BE163C - XXX - XX - XX - XX/X - X

Measuring length:
012 - 120 mm
052 - 520 mm
.....
102 - 1020 mm

Reference marks:
N - none RI
S1 - middle of ML
S2 - 40 mm from left end
S3 - 40 mm from right end
S4 - 40 mm from both ends

Accuracy:
01 - $\pm 1 \mu$ m
02 - $\pm 2 \mu$ m
03 - $\pm 3 \mu$ m

Cable length:
01 - 1m
02 - 2m
03 - 3m

Type of connector:
W - without connector
C9 - round, 9 pins
D15 - flat, 15 pins

Mounting clamp:
0 - without clamp
1 - with clamp