PHOTOELECTRIC LINEAR ENCODER

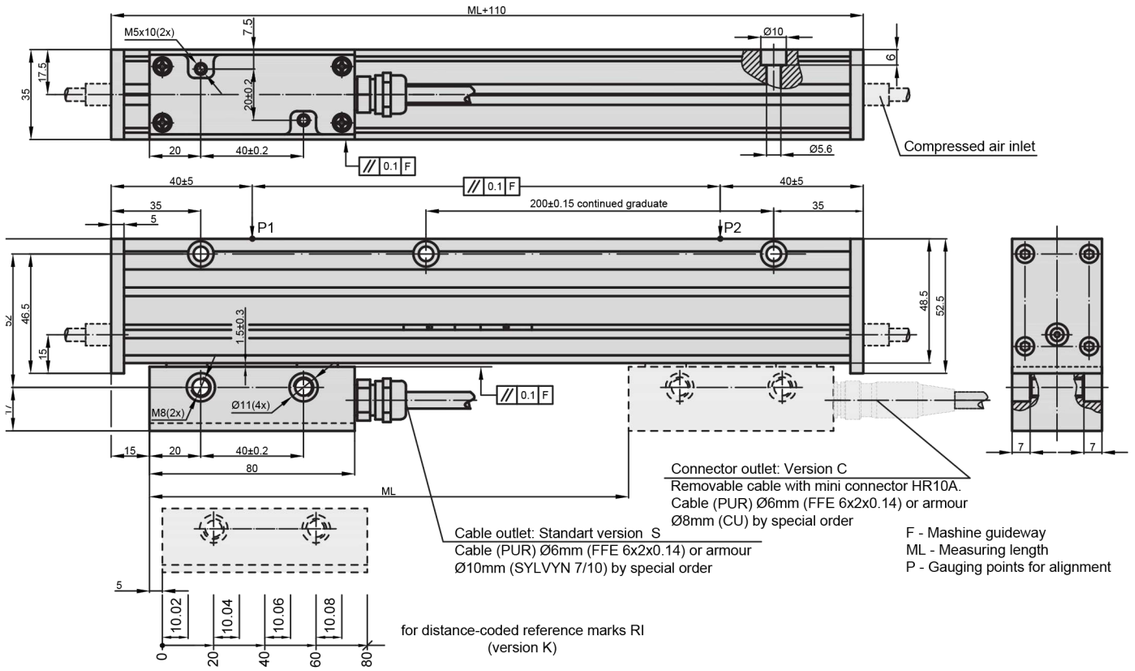
L35

Distance Coded reference mark

Analog output signals

High vibration resistance

Photoelectric linear encoder L35 is an incremental linear displacement measuring device that has up to 3.240 mm measuring length, up to ±3 µm accuracy grades to any meter within the ML depending on measuring length demanded. L35 series is more vibration resistant than L18 series of encoders.

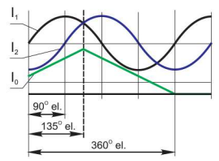
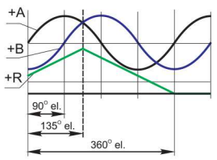
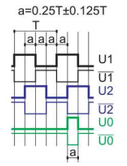


MECHANICAL DATA

Measuring lengths (ML), mm	170; 220; 270; 320; 370; 420; 470; 520; 620; 720; 820; 920; 1020; 1140; 1240; 1340; 1440; 1540; 1640; 1740; 1840; 1940; 2040; 2140; 2240; 2340; 2440; 2540; 2640; 2740; 2840; 2940; 3040; 3140; 3240 (other intermediate lengths on request)
Accuracy grades to any metre within the ML (at 20°C): - for ML from 170 up to 2040 mm - for ML from 2040 up to 3240 mm	 ±5; ±3 ±10 µm
Grating period	20 µm; 40 µm
Reference marks (RI): -standard for ML ≤ 1020 mm -standard for ML > 1140 mm -optional	 35mm from both ends of ML 45mm from both ends of ML one RI at any location, two or more RI's separated by distances of (n x 50 mm)

- distance-coded - selection by magnets	see drawing standard - one magnet (RI) in ML middle
Max. traversing speed: -when interpolation factor is 1,2,5,10 -when interpolation factor is 25 -when interpolation factor is 50	 1 m/s (shortly 2 m/s) 0.5 m/s 0.4 m/s
Required moving force with sealing lips	< 5 N
Protection (IEC 529): -without compressed air -with compressed air (optional)	 IP54 IP64
Weight	0.4 kg + 2.8 kg/m
Operating temperature	0...+50°C
Storage temperature	-20...+70°C
Permissible vibration (40 to 2000 Hz)	≤ 150 m/s²
Permissible shock (11 ms)	≤ 300 m/s²

ELECTRICAL DATA

Version	L35TA ⁓ 11 µApp	L35-AV ⁓ 1 Vpp	L35-F ⊓⊔ TTL; ⊓⊔ HTL
Power supply	+5 V ± 5% / < 90 mA	+5 V ± 5% < 90 mA	+5 V ± 5%/ < 120 mA;+12V±5%/ < 130mA
Light source	LED	LED	LED
Resolution	Depends on external subdividing electronics	Depends on external subdividing electronics	5; 2.5; 1; 0.5; 0.2; 0.1 µm (after 4-fold dividing in subsequent electronics)
Incremental signals	Two sinusoidal I1 and I2 Amplitude at 1 kΩ load: - I1 = 7-16 µA - I2 = 7-16 µA	Differential sine +A/-A and +B/-B Amplitude at 120 Ω load: - A = 0.6-1.2 V - B = 0.6-1.2 V	Differential square-wave U1/$\overline{U1}$ and U2/$\overline{U2}$. Signal levels at 20 mA load current: - low (logic "0") ≤ 0,5 V at Up=+5V - high (logic "1") ≥ 2,4 V at Up=+5V - low (logic "0") ≤ 1,5 V at Up=+12V (HTL) - high (logic "1")≥(Up-2) V at Up=+12V (HTL)
Reference signal	One quasi-triangular I_0. Signal magnitude at 1 kΩ load: - I_0 = 2-8 µA (usable component)	One quasi-triangular +R and its complementary -R per revolution. Signals magnitude at 120Ω load - R = 0.2-0.8 V (usable component)	One differential square-wave U0/$\overline{U0}$ per revolution. Signal levels at 20 mA load current: - low (logic "0") ≤ 0.5 V at Up=+5V - high (logic "1") ≥ 2.4 V at Up=+5V - low (logic "0") ≤ 1,5 V at Up=+12V (HTL) - high (logic "1")≥(Up-2)V at Up=+12V(HTL)
Maximum operating frequency	50 kHz (v=1 m/s) 100 kHz (v=2 m/s shortly)	50 kHz (v=1 m/s) 100 kHz (v=2 m/s shortly)	(50 x k) kHz for k =1, 2, 5, 10 1000 kHz for k = 25, 50, where k- interpolation factor
Direction of signals (displacement from left to right)	I_2 lags I_1	B+ lags A+	U_2 lags U_1
Standard cable length	3 m, without connector	3 m, without connector	3 m, without connector
Maximum cable length	5 m	25 m	25 m
Output signals			

Note: If cable extension is used the power supply conductor section should not be smaller than 0.5 mm².

ACCESSORIES

CONNECTORS FOR CABLE	B12 12-pin round connector	C9 9-pin round connector	C12 12-pin round connector	D9 9-pin flat connector	D15 15-pin flat connector	RS10 10-pin round connector	ONC 10-pin round connector	HR10A 12-pins round mini connector
DIGITAL READOUT DEVICES	CS3000					CS5500		
EXTERNAL INTERPOLATOR	NK							

ORDER FORM

L35 - **X1** - **X2** - **X3** - **X4** - **X5** - **X6/X7**

Output signals And resolution (X1):	Measuring length (X2):	Reference Marks (X3):	Accuracy (X4):	Cable or Connector Outlet (X5):	Cable length (X6):	Connector type (X7):
A - Sinusoidal **AV** - Sinusoidal **F01** - TTL / HTL 0.1µm **F02** - TTL / HTL 0.2µm **F05** - TTL / HTL 0.5µm **F10** - TTL / HTL 1.0µm **F25** - TTL / HTL 2.5µm **F50** - TTL / HTL 5.0µm	**0070** - 70 mm **0520** - 520 mm ... **3240** - 3240 mm	**N** - none RI **S** - standard **M** - every 50mm **K** - distance-coded **Ln/XXX** - n'RI with 50-fold steps /XXX distance of the first RI from the beginning of ML, mm **O** - selection by magnets (standard - one magnet (RI) in ML middle)	**10** - ±10 µm* **05** - ±5 µm* **03** - ±3 µm* (optional) *depends on length	**S** - version S (cable outlet) **C** - version C (connector outlet)	**01** - 1m **02** - 2m **03** - 3m ... **CP01**- 1m armoured **CP02** - 2m armoured **CP03** - 3m armoured ...	**W** - without connector **B12** - round, 12 pins **C9** -round, 9 pins **C12** - round, 12 pins **D9** - flat, 9 pins **D15** - flat, 15 pins **RS10** - round, 10 pins **ONC** - round, 10 pins

ORDER EXAMPLE: 1) L35-F05-2040-O-10-C-CP03/C12