

PHOTOELECTRIC LINEAR ENCODER

L18



Distance Coded reference mark

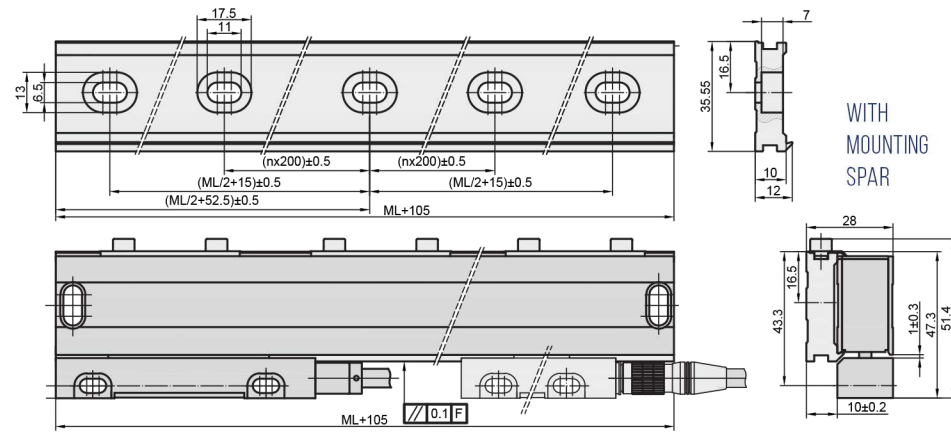


Analog output signals



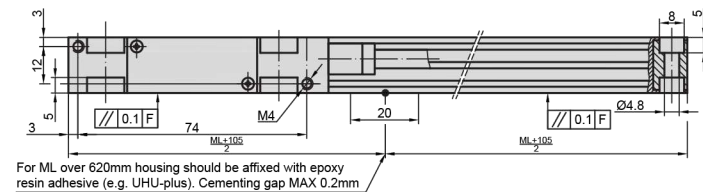
Photoelectric linear encoder L18 is an incremental linear displacement measuring device that can have up to 2.040 mm measuring

length, grating period of $\pm 20 \mu\text{m}$ or $\pm 40 \mu\text{m}$ and accuracy that can reach up to $3 \mu\text{m}$.

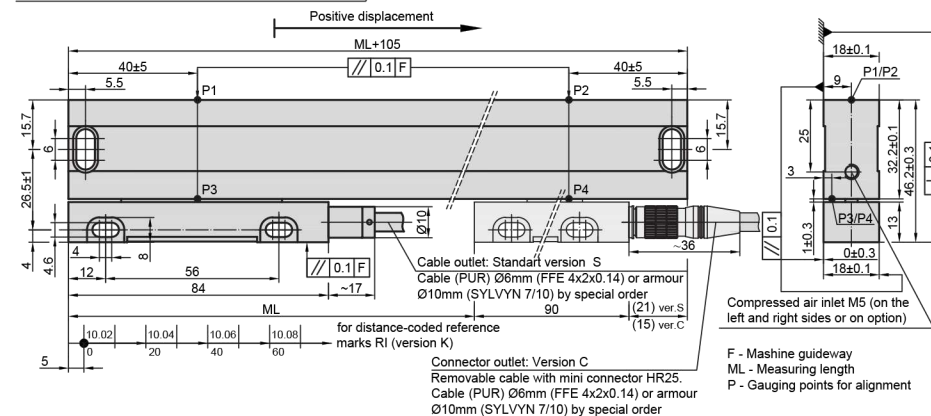


WITH MOUNTING SPAR

ML	n
70 ... 520	0
570 ... 920	1
1020 ... 1340	2
1440 ... 1740	3
1840 ... 2040	4



WITHOUT MOUNTING SPAR



For ML over 620mm housing should be affixed with epoxy resin adhesive (e.g. UHU-plus). Cementing gap MAX 0.2mm

Positive displacement

Compressed air inlet M5 (on the left and right sides or on option)
F - Machine guideway
ML - Measuring length
P - Gauging points for alignment

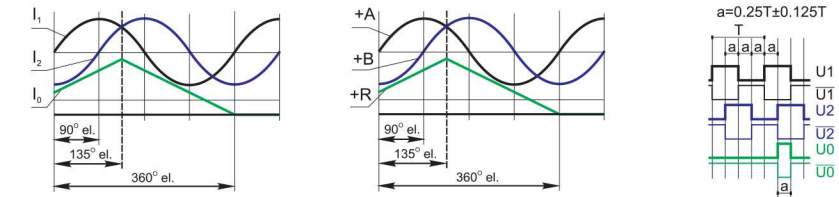
MECHANICAL DATA

Measuring lengths (ML), mm	70, 120, 170, 220, 270, 320, 370, 420, 520, 620, 720, 820, 920, 1020, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 1940, 2040 (mounting spar optional up to ML 1240, mandatory from ML 1340 to 2040)	Max. traversing speed: -when interpolation factor is 1,2,5,10 1 m/s -when interpolation factor is 25 0.5 m/s -when interpolation factor is 50 0.4 m/s
Accuracy grades to any metre within the ML (at 20°C)	$\pm 10; \pm 5; \pm 3 \mu\text{m}$ (optional)	Required moving force with sealing lips < 3 N
Grating period	20 μm ; 40 μm (optional)	Protection (IEC 529) -without compressed air IP53 -with compressed air (optional) IP64
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, or two or more RI's separated by distances of $n \times 50$ mm or distance-coded	Weight 0.4 kg + 0.8 kg/m
		Operating temperature 0...+50°C
		Storage temperature -20...+70°C
		Permissible vibration (40 to 2000 Hz) $\leq 30 \text{ m/s}^2$
		Permissible shock (11 ms) $\leq 100 \text{ m/s}^2$

ELECTRICAL DATA

Version	L18-A $\sim 11 \mu\text{App}$	L18-AV $\sim 1 \text{ Vpp}$	L18-F \square TTL
Power supply	+5 V $\pm 5\%$ / < 90 mA	+5 V $\pm 5\%$ < 120 mA	+5 V $\pm 5\%$ / < 120 mA
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 I_1 and I_2 Amplitude at 1 k Ω load: - $I_1 = 7\text{-}16 \mu\text{A}$ - $I_2 = 7\text{-}16 \mu\text{A}$	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") $\leq 0.5 \text{ V}$ - high (logic "1") $\geq 2.4 \text{ V}$
Reference signal	One quasi-triangular I_0 peak per revolution. Signal magnitude at 1 k Ω load: - $I_0 = 2\text{-}8 \mu\text{A}$ (usable component)	One quasi-triangular +R and its complementary -R per revolution. Signals magnitude at 120 Ω 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 - high (logic "1") > 2.4 V
Maximum operating frequency	50 kHz	50 kHz	50x kHz, when interpolation factor is 1, 2, 5, 10 1000 kHz when interpolation factor is 25, 50
Direction of signals	I_2 lags I_1 at reading head displacement from left to right	B+ lags A+ at reading head displacement from left to right	$U2$ lags $U1$ at reading head displacement from left to right
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.

B12	C9	C12	D9	D15	RS10	ONC
12-pin round connector	9-pin round connector	12-pin round connector	9-pin flat connector	15-pin flat connector	10-pin round connector	10-pin round connector

DIGITAL READOUT DEVICES	CS3000	CS5500
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EXTERNAL INTERPOLATOR	NK
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ORDER FORM

L18 - X1 - X2 - X3 - X4 - X5 - X6/X7 - X8

Output signals And resolution (X1):	Measuring length (X2):	Reference marks (X3):	Accuracy (X4):	Cable or connector outlet (X5):	Cable length (X6):	Connector type (X7):	Mounting Spar (X8):
A - Sinusoidal AV - Sinusoidal F01 - TTL 0.1 μm F02 - TTL 0.2 μm F05 - TTL 0.5 μm F10 - TTL 1.0 μm F25 - TTL 2.5 μm F50 - TTL 5.0 μm	0070 - 70 mm 0520 - 520 mm ... 2040 - 2040 mm	N - none RI S - standard M - every 50 mm K - distance coded Ln/XXX - n RI with 50-fold steps /XXX distance of the first RI from the beginning of ML, mm	03 - $\pm 3 \mu\text{m}$ 05 - $\pm 5 \mu\text{m}$ 10 - $\pm 10 \mu\text{m}$	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	M - with mounting spar W - without mounting spar

ORDER EXAMPLE: 1) L18-F10-0420-L1/100-05-S-03/W-W