L18 PHOTOELECTRIC LINEAR ENCODER

(L18-A, L18-AV, L18-F)

The sealed linear encoder L18 is used to convert linear displacements of machine key components into electrical signals containing information about the value and direction of the displacement.

The encoder consists of a glass grating scale installed into a rigid hollow housing and a ball-bearing-guided reading head. To be able to work in harsh environments such as lubricants and chips, the encoder has sealing lips. Filtered air can be supplied into the housing of the encoder for extra protection.

The photoelectric unit of the reading head generates sinusoidal micro-current or TTL square-wave (standard RS422) output signals.

The encoder has three versions by its output signals:

L18-A - Sinusoidal signals, with amplitude approx. 11 µApp, require external subdividing electronics.

L18-AV - Sinusoidal signals, with amplitude approx. 1 Vpp, require external subdividing electronics.

L18-F - Square-wave, with integrated subdividing electronics for interpolation x1, x2, x5, x10, x 25, x50.

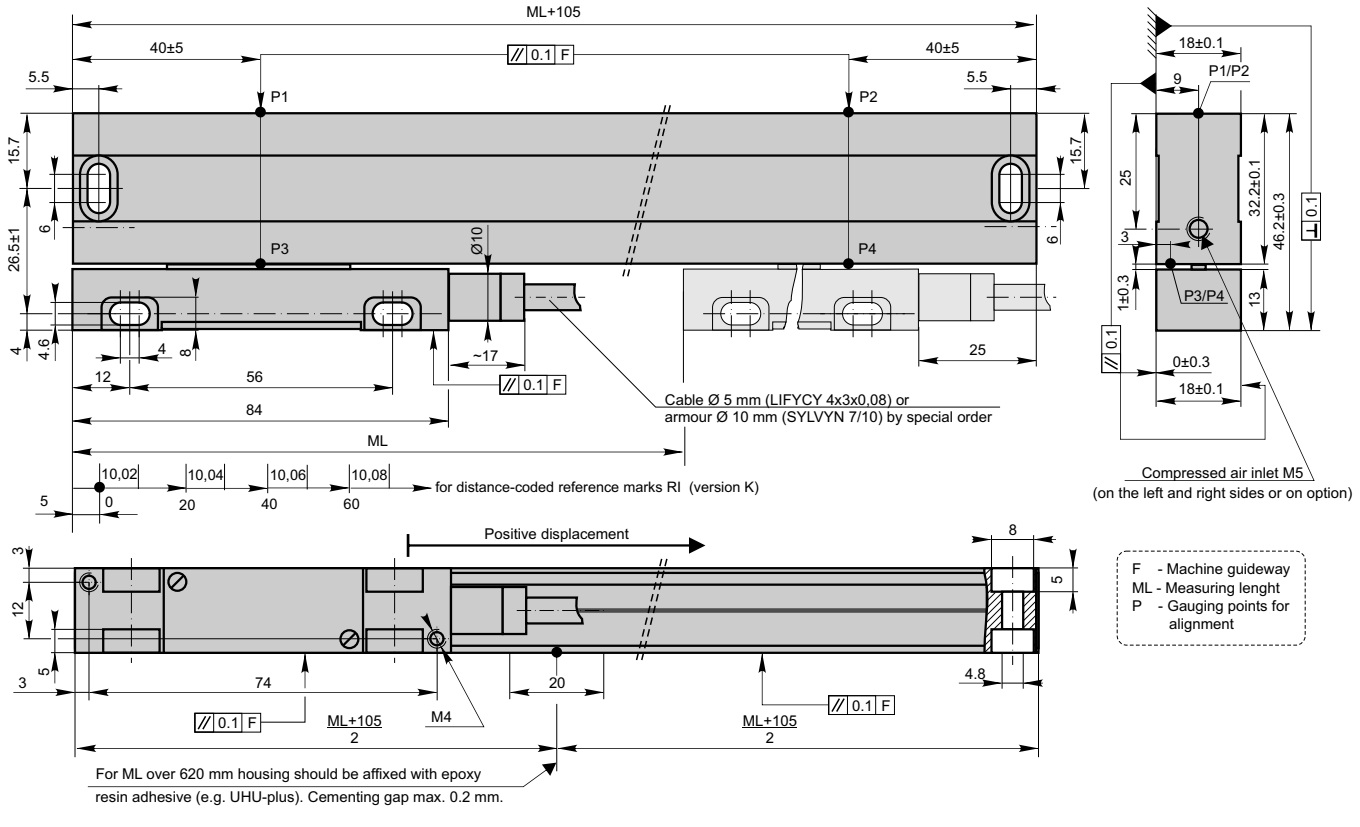
Precizika Metrology
Zirmunu 139
LT-09120 Vilnius
Lithuania
t 3705 2363600
f 3705 2363609
http://www.precizika.lt
E-mail:info@precizika.lt

ISO 9001:2000

■ Mechanical Data

♦Measuring lengths (ML), mm	70, 120, 170, 220, 270, 320, 370, 420, 520, 620, 720, 820, 920, 1020, 1140, 1240
♦Accuracy grades to any metre within the ML (at 20°C)	±10; ±5 µm ±3 µm on option
♦Grating period	20 µm; 40 µm (on option)
♦Reference marks (RI)	
-standard for ML ≤ 1020 mm	35mm from both ends of ML
-standard for ML > 1140 mm	45mm from both ends of ML
-optional	one RI at any location, or two or more RI's separated by distances of n x 50 mm or distance-coded

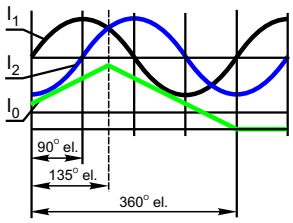
♦Max. traversing speed:	
-when interpolation factor is 1,2,5,10	1 m/s
-when interpolation factor is 25	0,5 m/s
-when interpolation factor is 50	0,4 m/s
♦Required moving force with sealing lips	< 3 N
♦Protection (IEC 529)	
-without compressed air	IP53
-with compressed air	IP64
♦Weight	0.4 kg + 0.8 kg/m
♦Operating temperature	0...+50°C
♦Storage temperature	-20...+70°C
♦Permissible vibration (40 to 2000 Hz)	≤ 30 m/s²
♦Permissible shock (11 ms)	≤ 100 m/s²



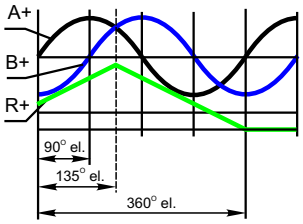
■ Electrical Data

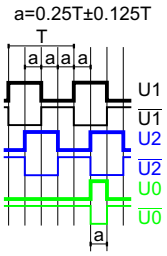
Version	**L18-A** ∿ 11 µApp	**L18-AV** ∿ 1**Vpp**	**L18-F** ⊓⊔ TTL
♦Power supply	+5 V±5% / < 90 mA	+5 В ±5% < 120 мА	+5 V±5% / < 120 mA
♦Light source	LED	LED	LED
♦Resolution dividing	Depends on external subdividing electronics	Depends on external subdividing electronics	5; 2.5; 1; 0.5; 0.2; 0.1 µm (after 4-fold in subsequent electronics)
□ Incremental signals	Two sinusoidal I_1 and I_2. Amplitude at 1 kΩ load: I_1 = 7-16 µA I_2 = 7-16 µA	Two sinusoidal A+ and B+ and their inverted A- and B- Amplitude at 120 Ω load: A = 0.6-1.2 V B = 0.6-1.2 V	Square-wave U1, U2 and their inverted $\overline{U1}$, $\overline{U2}$. Signal levels at 20 mA load current: low ("0" logic) ≤ 0.5 V high ("1" logic) ≥ 2.4 V
♦Reference signal	One quasi-triangle I_0. Signal magnitude at 1 kΩ load: I_0 = 2-8 µA (usable component)	One quasi-triangle R+ and its inverted R+ Signal magnitude at 120 Ω load: R = 0.2-0.8 V(usable component)	Square-wave U0 and its inverted $\overline{U0}$. Signal levels at 20 mA load current: low ("0" logic) ≤ 0.5 V high ("1" logic) ≥ 2.4 V
♦Maximum operating frequency	50 kHz	50 kHz	50xk 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

Note: If cable extension is used the power supply conductor section should be not smaller than 0.5 mm^2.



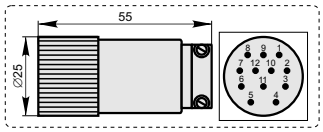
Inverted signals are not shown



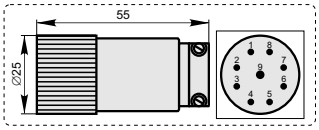


■ Accessories

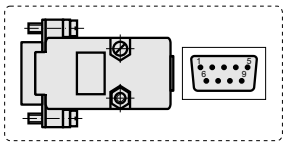
C12
12-pin round connector for **L18-F and L18-AV**



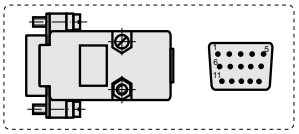
C9
9-pin round connector for **L18-A**



D9
9-pin flat connector for **L18-A , L18-F and L18-**



D15
15-pins flat connector for connection to DRO CS3000 and CS5000 Only for **L18-F**



■ Order form

L18 – X – XXX – X/XXX – XX – XX/X

Version by output signals and resolution:
A, **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

Measuring length:
007 - 70 mm
052 - 520 mm
.....
124 - 1240 mm

Reference marks:
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

Accuracy:
05 - ±5 µm
10 - ±10 µm

Cable length:
01 - 1m
02 - 2m
03 - 3m
... - ...
Cable armour dia 10 mm is available on option

Type of connector:
W - without connector
C12 - round, 12 pins
C9 - round, 9 pins
D9 - flat, 9 pins
D15 - flat, 15 pins

CE

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