

# L18 PHOTOELECTRIC (L18-A, L18-AV, L18-F) LINEAR ENCODER

The linear encoder L18 is similar to the MSA 6707 (RSF) and LS403 (Heidenhain) type encoder in electrical parameters, mounting and overall dimensions.



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.

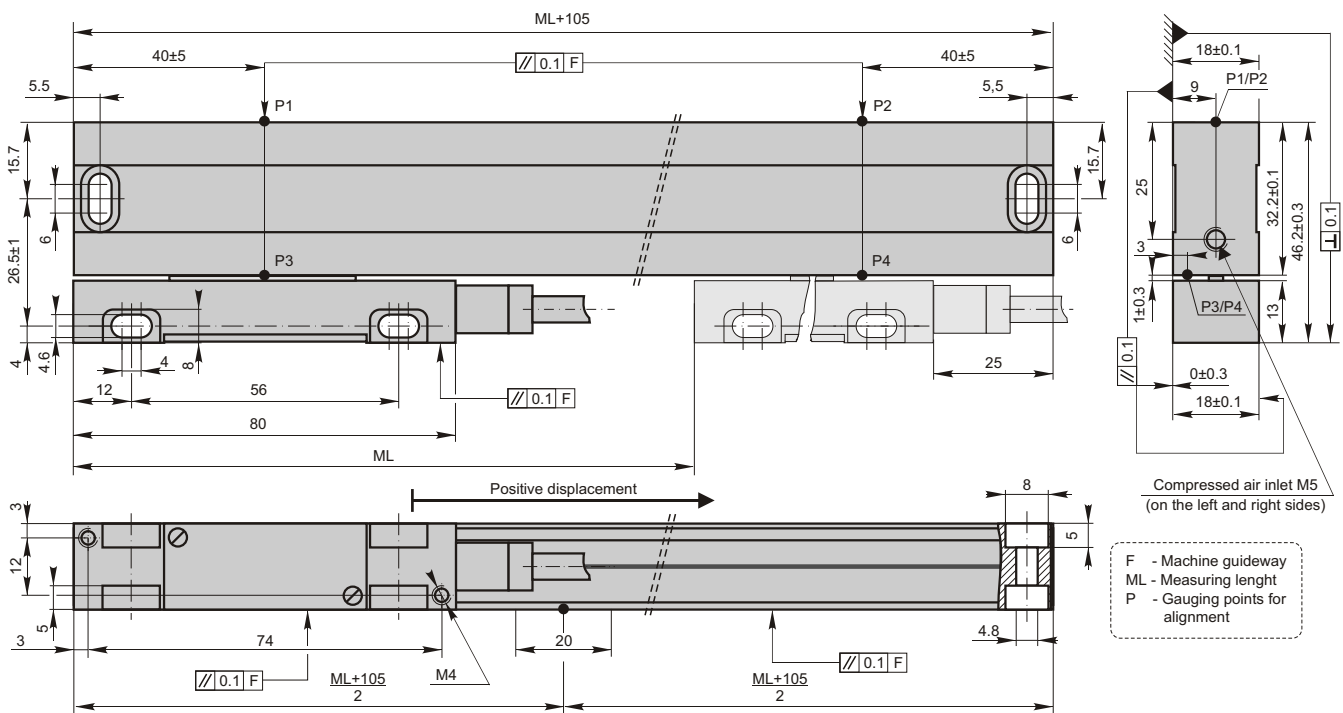
The encoder has three versions by its output signals:

- L18-A** - Sinusoidal signals, with amplitude approx. 11  $\mu$ A<sub>pp</sub>, require external subdividing electronics.
- L18-AV** - Sinusoidal signals, with amplitude approx. 1 V<sub>pp</sub>, require external subdividing electronics.
- L18-F** - Square-wave, with integrated subdividing electronics for interpolation x1, x2, x5 or x10.

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## Mechanical Data

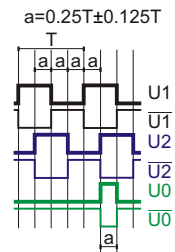
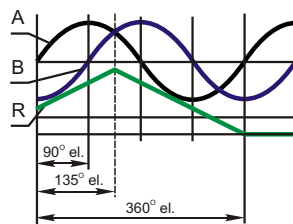
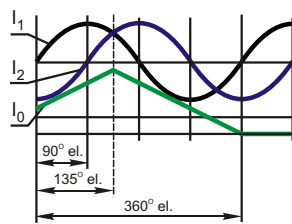
Measuring lengths (ML), mm	70, 120, 170, 220, 270, 320, 370, 420, 520, 620, 720, 820, 920, 1020, 1140, 1240	Max. traversing speed	60 m/min
Accuracy grades to any metre within the ML (at 20°C)	±10; ±5 $\mu$ m	Required moving force with sealing lips	< 3 N
Grating period	20 $\mu$ m	Protection (IEC 529)	IP53 IP64
Reference marks (RI)		Weight	0.4 kg + 0.8 kg/m
-standard for ML ≤ 1020 mm	35mm from both ends of ML	Operating temperature	0...+50°C
-standard for ML > 1140 mm	45mm from both ends of ML	Storage temperature	-20...+70°C
-optional	one RI at any location, or two or more RI's separated by distances of n x 50 mm	Permissible vibration (40 to 2000 Hz)	≤ 30 m/s <sup>2</sup>
		Permissible shock (11 ms)	≤ 100 m/s <sup>2</sup>



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

## Electrical

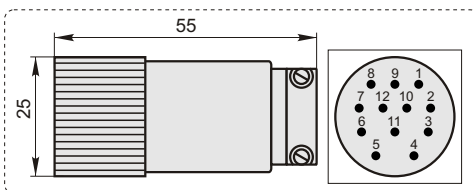
Version	L18-A $\sim 11 \mu\text{App}$	L18-AV $\sim 1\text{Vpp}$	L18-F $\square$ TTL
Power supply	+5 V $\pm 5\%$ / < 90 mA	+5 B $\pm 5\%$ < 120 mA	+5 V $\pm 5\%$ / < 120 mA
Light source	LED	LED	LED
Resolution	Depends on external subdividing electronics	Depends on external subdividing electronics	5; 2.5; 1; 0.5 $\mu\text{m}$ (after 4-fold dividing in subsequent electronics)
Incremental signals	Two sinusoidal $I_1$ and $I_2$ . Amplitude at 1 k load:  - $I_1 = 7\text{-}16 \mu\text{A}$ - $I_2 = 7\text{-}16 \mu\text{A}$	Two sinusoidal A and B. Amplitude at 120 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) $\leq 0.5$ V - high ("1" logic) $\geq 2.4$ V
Reference signal	One quasi-triangle $I_0$ . Signal magnitude at 1 k load: - $I_0 = 2\text{-}8 \mu\text{A}$ (usable component)	One quasi-triangle R. Signal magnitude at 120 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) $\leq 0.5$ V - high ("1" logic) $\geq 2.4$ V
Maximum operating frequency	50 kHz	50 kHz	500 kHz (at x10 interpolation)
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
Cable diameter	5 mm	5 mm	5 mm



## Accessories

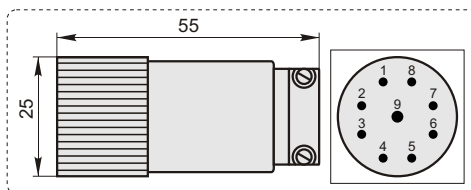
### C12

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



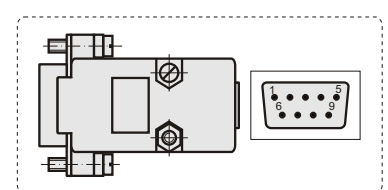
### C9

9-pin round connector for L18-A



### D9

9-pin flat connector for L18-A, L18-F and L18-AV



## Order form

L18 - X - XXX - X/XXX - XX - XX/X

Version by output signals and resolution:  
**A** - Sinusoidal  
**F05** - TTL 0.5  $\mu\text{m}$   
**F10** - TTL 1.0  $\mu\text{m}$   
**F25** - TTL 2.5  $\mu\text{m}$   
**F50** - TTL 5.0  $\mu\text{m}$

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

Reference marks:  
**N** - none RI  
**S** - standard  
**M** - every 50 mm  
**Ln/XXX** - n RI with 50-fold steps /XXX distance of the first RI from the beginning of ML, mm

Accuracy:  
**05** -  $\pm 5 \mu\text{m}$   
**10** -  $\pm 10 \mu\text{m}$

Cable length:  
**01** - 1m  
**02** - 2m  
**03** - 3m  
 ... - ...  
 Cable armour dia 10,5 mm is available on option

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