

The SPO Series of photoelectric linear encoders features reproducible thermal behavior and has a reversible reading head with detachable cable.

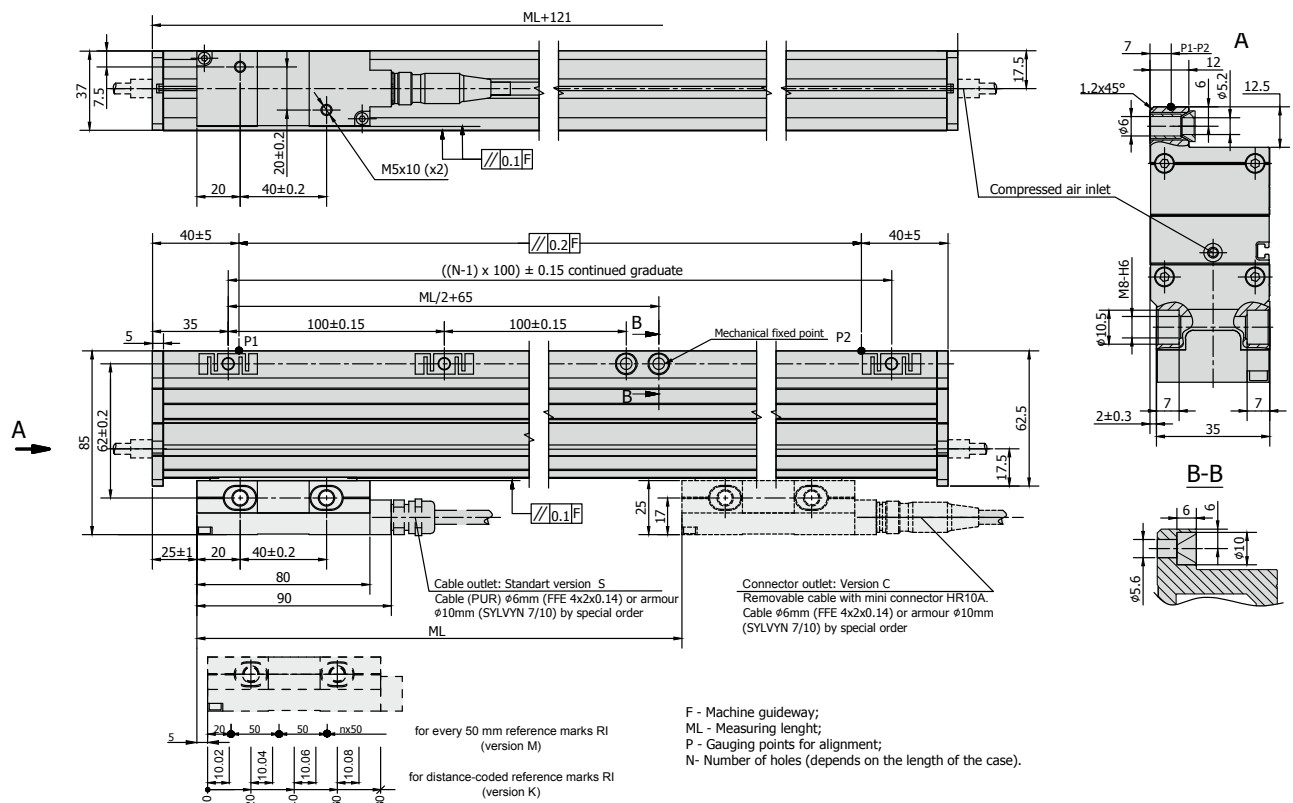
Travel Length Max.: 3240mm (127.5")

Outputs: 1Vpp or TTL with or without distance coded reference

Grating Period: $\pm 20\mu\text{m}$ or $\pm 40\mu\text{m}$

Accuracy Grade: $3\mu\text{m}$ or $5\mu\text{m}$

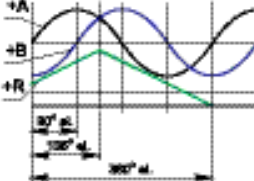
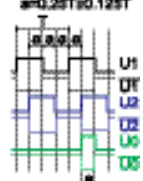
Resolution: $0.1\mu\text{m}$ or $0.2\mu\text{m}$



MECHANICAL DATA

Measuring lengths (ML), mm	140, 240, 340, 440, 540, 640, 740, 840, 940, 1040, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 2040, 2240, 2440, 2640, 2840, 3040, 3240	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
Accuracy grades to any metre within the ML (at 20°C): - for ML from 170 up to 2040 mm - or ML from 2040 up to 3240 mm	± 5 ; ± 3 (optional) $\pm 10 \mu\text{m}$	Required moving force with sealing lips	< 5 N
Grating period	20 μm ; 40 μm	Protection (IEC 529): - without compressed air - with compressed air	IP54 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, two or more RI's separated by distances of (n x 50 mm)	Weight	0.4 kg + 2.8 kg/m
- distance-coded - selection by magnets	see drawing standard - one magnet (RI) in ML middle	Operating temperature	0...+50°C
		Storage temperature	-20...+70°C
		Permissible vibration (40 to 2000 Hz)	$\leq 150 \text{ m/s}^2$
		Permissible shock (11 ms)	$\leq 300 \text{ m/s}^2$

ELECTRICAL DATA

VERSION	SPO-VP \sim 1 Vpp	SPO-TT \square TTL; \square HTL
Power supply	+5 V \pm 5% < 120 mA	+5 V \pm 5% / < 120 mA; +12V \pm 5% / < 130mA
Light source	LED	LED
Resolution	Depends on external subdividing electronics	0.2; 0.1 μ m (after 4-fold dividing in subsequent electronics)
Incremental signals	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 V at Up=+5V - high (logic "1") \geq 2,4 V at Up=+5V - low (logic "0") \leq 1,5 V at Up=+12V (HTL) - high (logic "1") \geq (Up-2) V at Up=+12V (HTL)
Reference signal	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") \leq 0.5 V at Up=+5V - high (logic "1") \geq 2.4 V at Up=+5V - low (logic "0") \leq 1,5 V at Up=+12V (HTL) - high (logic "1") \geq (Up-2)V at Up=+12V(HTL)
Maximum operating frequency	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)	B+ lags A+	U ₂ lags U ₁
Standard cable length	3 m, without connector	3 m, without connector
Maximum cable length	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
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ORDER FORM

SPO - XXX - XXXX - X / XXX - XX - XX - X - XX / X

OUTPUT SIGNALS AND RESOLUTION:	MEASURING LENGTH:	REFERENCE MARKS:	ACCURACY:	SUPPLY VOLTAGE:	CABLE OR CONNECTOR OUTLET:	CABLE LENGTH:	CONNECTOR TYPE:
A - Sinusoidal AV - Sinusoidal F01 - TTL / HTL 0.1 μ m F02 - TTL / HTL 0.2 μ m	0070 - 70mm 0520 - 520mm ... 3240 - 3240mm	N - none RI S - standard M - every 50mm K - distance-coded Ln/XXX - nRI 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)	05 - \pm 5 μ m 03 - \pm 3 μ m (optional)	05V - +5V	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 C9 - round, 9 pins C12 - round, 12 pins D9 - flat, 9 pins D15 - flat, 15 pins
ORDER EXAMPLE:	1) SPO-F05-2040-O-10-05V-C-CP03/C12						

Features and specifications subject change without notice.
Product Bulliten SPO1117EN
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