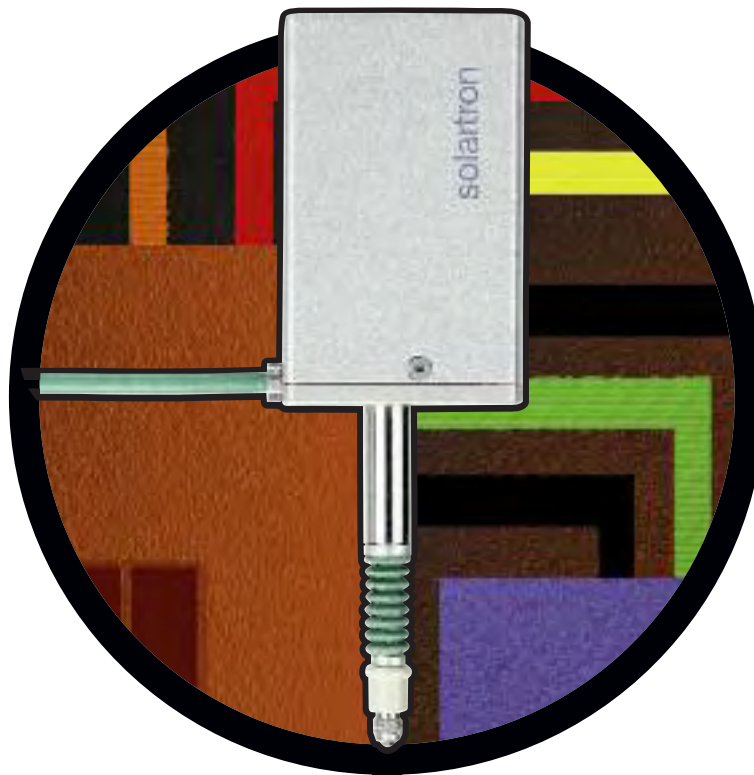


# Linear encoders



**The Linear Encoder range of gauges consists of high accuracy optical probes designed for use in applications where consistent sub micron measurement accuracy is required. In contrast to traditional gauging probes, the accuracy is maintained along the entire measurement range.**

The linear encoders also serve many displacement and positioning applications due to the high purity of their optically generated sine wave electrical output, which enables a high level of electronic interpolation. Also, their proven high repeatability is a testament to the excellent mechanics and bearings used in the range.

A probe consists of the probe head (including guidance mechanism), cable and connector. The connector type depends on the probe's electrical output, but is compatible with industry standards such as 1Vpp and 11  $\mu$ A and TTL. In the case of the Digital Linear Encoder, the standard Probe Interface Electronics (PIE) is used which can be connected directly to a Solartron Digital Readout, a PC or a PLC via Solartron's Orbit Network System.

- > A choice of 12 mm or 25 mm measurement ranges
- > Spring, free, pneumatic, cable release
- > Up to 0.4  $\mu$ m accuracy
- > Up to 0.0125  $\mu$ m resolution
- > Outputs: Sinewave Voltage 1 Vpp  
Sinewave Current 11  $\mu$ A  
TTL  
Digital (Orbit®)
- > CE approved
- > Verification / calibration Traceable to NPL (National Physical Laboratory)



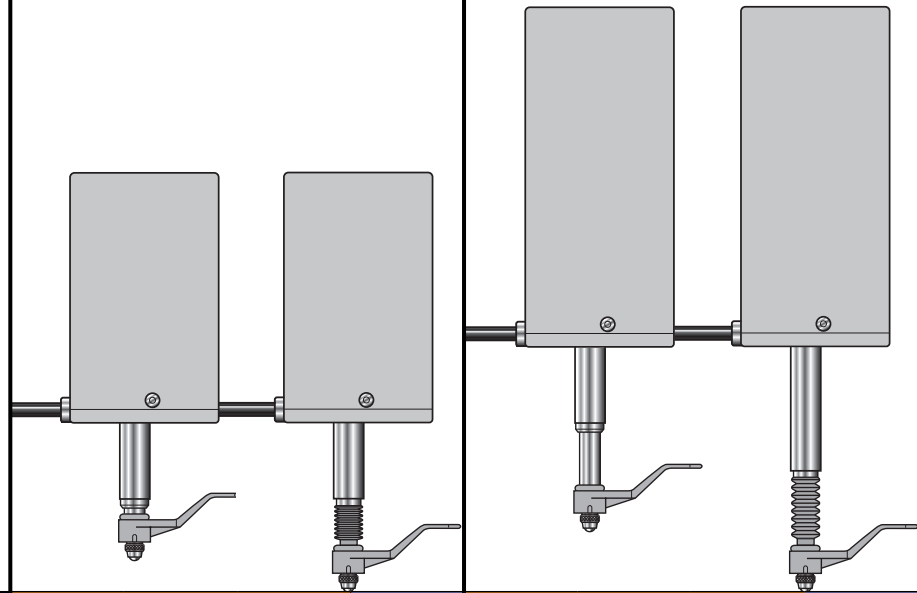


## 64 Specification Spring Actuation and Pneumatic

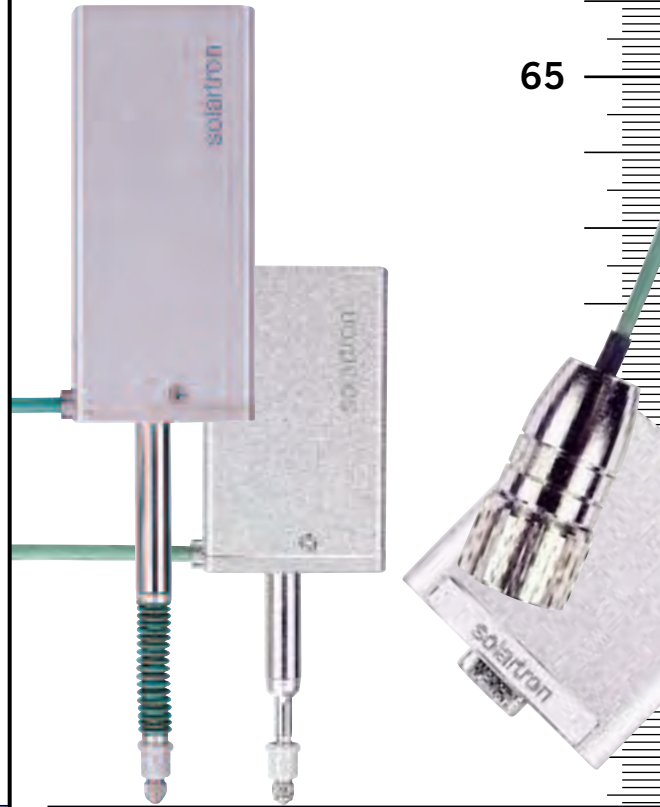
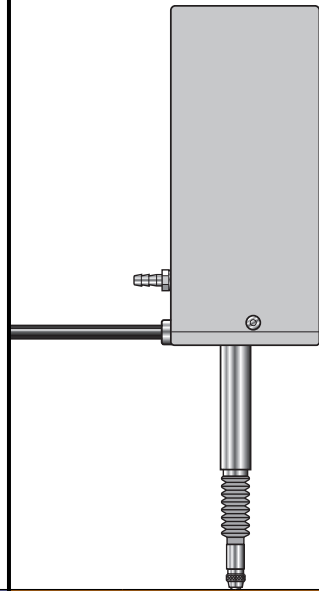
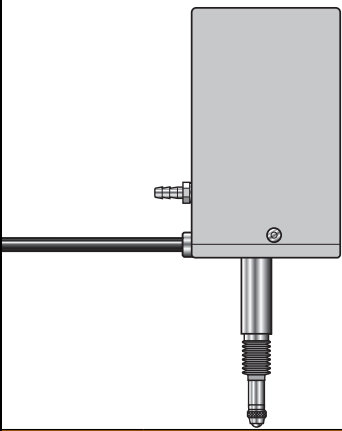


### Cable Lift

The cable lift allows the probe tip of a linear encoder to be retracted without touching the transducer.



Product type	Analogue			Digital	Analogue			Digital
	TTL <sup>1</sup>	Voltage	Current		TTL <sup>1</sup>	Voltage	Current	
Standard Spring	LE/12/S	LE/12/SV	LE/12/SC	LE/12/S	LE/25/S	LE/25/SV	LE/25/SC	LE/25/S
Pneumatic								
<b>Measurement</b>								
Measurement Range (mm)	12				25			
Travel Range (mm)	13				26			
Accuracy (µm)	±0.5			±0.4	±0.5			±0.4
Repeatability (µm)	0.1				0.1			
Resolution (µm)	Dependent on Electronics <sup>2</sup>			0.05	Dependent on Electronics <sup>2</sup>			0.05
Reference mark position (mm)	3 approximately (from the end stop)				3 approximately (from the end stop)			
Max gauging speed (m/s)	Dependent on Electronics <sup>5</sup>			0.5	Dependent on Electronics <sup>2</sup>			0.5
Tip Force (N)	Up	0.1			Up	0.1		
	Down	0.6			Down	0.6		
	Horizontal	0.5			Horizontal	0.5		
Temperature Coefficient (µm/°C)	-0.35 to -0.5				-0.4 to -0.7			
<b>Mechanical</b>								
Material	Scale	Quartz			Scale	Quartz		
	Shaft	Hardened stainless steel			Shaft	Hardened stainless steel		
	Gaiter	Viton® (IP65 only)			Gaiter	Viton® (IP65 only)		
Mounting (mm)	Ø8h6				Ø8h6			
<b>Environmental</b>								
Storage Temperature (°C)	-20 to +70				-20 to +70			
Operating Temperature (°C)	+10 to +50				+10 to +50			
IP Rating (probe only)	Choice of IP50 or IP65				Choice of IP50 or IP65			
<b>Electrical Interface</b>								
Power supply (VDC ±5%)	5				5			
Output signal type	TTL	1 V <sub>pp</sub>	11 µA <sub>pp</sub>	Orbit	TTL	1 V <sub>pp</sub>	11 µA <sub>pp</sub>	Orbit
Output signal period (µm)	see note <sup>2</sup>	10	10	0.05	see note <sup>2</sup>	10	10	0.05
Cable length <sup>4</sup> (m)	2	2	2	-	2	2	2	-
Connector	for options contact sales office			Orbit PIE	for options contact sales office			Orbit PIE



Analogue			Digital	Analogue			Digital
TTL <sup>1</sup>	Voltage	Current		TTL <sup>1</sup>	Voltage	Current	
LE/12/P	LE/12/PV	LE/12/PC	LE/12/P	LE/25/P	LE/25/PV	LE/25/PC	LE/25/P
12				25			
13				26			
±0.5			±0.4	±0.5			±0.4
0.1				0.1			
Dependent on Electronics <sup>2</sup>			0.05	Dependent on Electronics <sup>2</sup>			0.05
3 approximately (from the end stop)				3 approximately (from the end stop)			
Dependent on Electronics <sup>5</sup>			0.5	Dependent on Electronics <sup>5</sup>			0.5
0.1				0.1			
0.6				0.6			
0.5				0.5			
-0.35 to -0.5				-0.4 to -0.7			
Quartz				Quartz			
Hardened stainless steel				Hardened stainless steel			
Viton® (IP65 only)				Viton® (IP65 only)			
Ø8h6				Ø8h6			
-20 to +70				-20 to +70			
10 to +50				+10 to +50			
IP65				IP65			
5				5			
TTL	1 V <sub>pp</sub>	11 µA <sub>pp</sub>	Orbit	TTL	1 V <sub>pp</sub>	11 µA <sub>pp</sub>	Orbit
see note <sup>2</sup>	10	10	0.05	see note <sup>2</sup>	10	10	0.05
2	2	2	-	2	2	2	-
for options contact sales office			Orbit PIE	for options contact sales office			Orbit PIE

- 1 TTL probes supplied with inline interpolation circuitry (iBox).
- 2 TTL resolution is dependent on the user's counter electronics.
- 3 A special version of the Linear Encoder has been developed to allow the Linear Encoder to be used as part of an Orbit network dynamic measurement system. This allows synchronisation of the probe reading to another data acquisition or control event. This special linear encoder integrates an encoder, interpolation module and Encoder Input Module. However since the Encoder Input Module has a maximum input frequency of 1.2MHz, this limits the gauging speed to 0.24ms<sup>-1</sup>. For more information on this device and ordering information, please refer to the website.
- 4 Longer cable available on request
- 5 For TTL, see table below

Probe signal period (µm)	Configurator interpolation	Quad edge period (µm)	Max Gauging speed (m/s)
0.4	A (x25)	0.1 (x100)	0.5
0.2	B (x50)	0.05 (x200)	0.5
0.1	C (x100)	0.025 (x400)	0.4
0.05	D (x200)	0.0125 (x800)	0.2

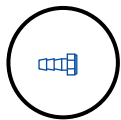
The counter electronics is required to have sufficient bandwidth for the gauging speed, the following formula can be used to calculate the encoder signal frequency and the suitability of the end electronics.

$$\text{Output Frequency (kHz)} = \text{gauging speed (ms}^{-1}\text{)} \times 100 \times (\text{Configurator Interpolation Rate})/4$$

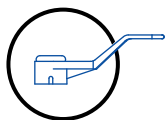
Viton is a registered trademark of Dupont Dow Elastomers



# 66 Dimensions (mm)



Air inlet nozzle on pneumatic (P) versions



Lift for spring (S) versions

