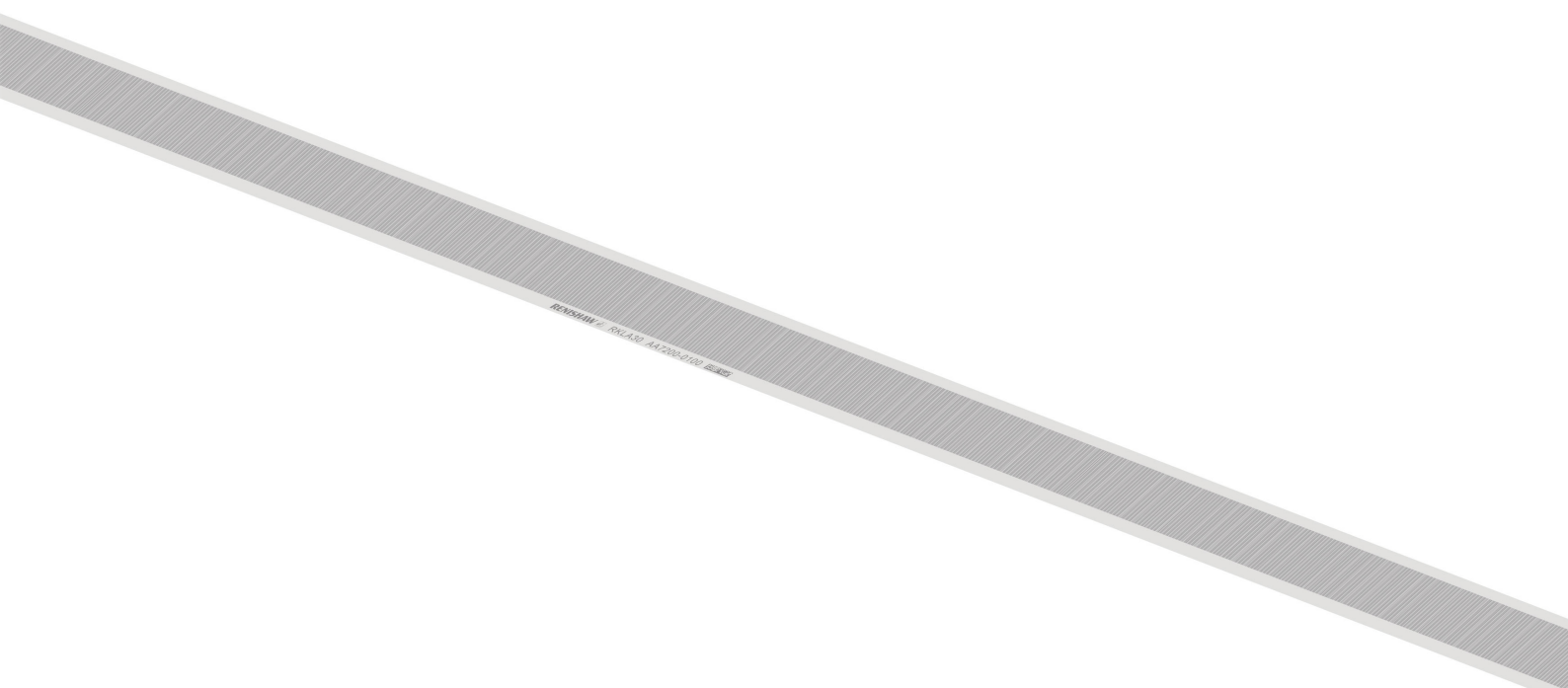


RKLA30 absolute linear encoder scale



RKLA30 is a robust, 6 mm wide stainless steel encoder tape scale with a thickness of 0.15 mm. This allows the scale, when rigidly fixed to a machine axis, to become ‘mastered’ to the machine substrate, matching its thermal expansion coefficient and behaviour. Differential movement between the scale and the machine is thus minimised, improving the metrological performance that can be achieved with simple thermal system compensation.

Designed for applications that demand high accuracy and absolute positioning, RKLA30 is read by Renishaw’s RESOLUTE™ absolute readhead, which offers resolutions down to 1 nm, 100 m/s maximum speed, ultra low Sub-Divisional Error (SDE) and jitter, resulting in a linear encoder system that outperforms any other encoder in its class.

RKLA30 tape scale also combines $\pm 5 \mu\text{m}/\text{m}$ accuracy with the mechanical and chemical ruggedness of stainless steel, easy coiling and cut-to-length convenience.

RKLA30 is installed onto the axis substrate by a self-adhesive backing tape and a simple application tool makes this a quick, straightforward and inexpensive process. The scale ends are rigidly fixed to the axis substrate by means of epoxy fastened end clamps, eliminating the need to drill holes.

- Mastered scale matches the coefficient of thermal expansion of the substrate
- High accuracy ($\pm 5 \mu\text{m}/\text{m}$) absolute scale. Further improvement possible with error correction.
- Narrow 6 mm wide scale suitable for confined spaces
- Suitable for partial arc applications
- ‘Cut-to-length’ convenience
- Lengths up to 21 m
- Compatible with RESOLUTE™ absolute readheads
- High solvent immunity

RKLA30 scale specifications*

Form (H × W)	0.15 mm × 6 mm including adhesive
Pitch	30 μm
Accuracy (at 20 °C)	±5 μm/m
Supplied length	20 mm to 21 m
Material	Hardened and tempered stainless steel
Mass	4.6 g/m
Coefficient of thermal expansion (at 20 °C)	Matches that of substrate material when scale ends fixed by epoxy mounted end clamps
Temperature	Storage -20 °C to +80 °C
	Operating† 0 °C to +70 °C
	Installation +10 °C to +35 °C
Humidity	95% relative humidity (non-condensing) to IEC 60068-2-78
Shock	Operating 500 m/s ² , 11 ms, ½ sine, 3 axes
Vibration	Operating 300 m/s ² max @ 55 to 2000 Hz, 3 axes
End fixing	Epoxy mounted end clamps (A-9523-4015)
	Approved epoxy adhesive (A-9531-0342)
	Scale end movement typically < 1 μm up to 40 °C

* For information on partial arc applications refer to *RKL scale for partial arc applications* data sheet (Renishaw part no. L-9517-9897).

† To limit maximum tension in the scale $(CTE_{\text{substrate}} - CTE_{\text{scale}}) \times (T_{\text{use extreme}} - T_{\text{install}}) \leq 550 \mu\text{m/m}$ where $CTE_{\text{scale}} = \sim 10.1 \mu\text{m/m}^\circ\text{C}$.

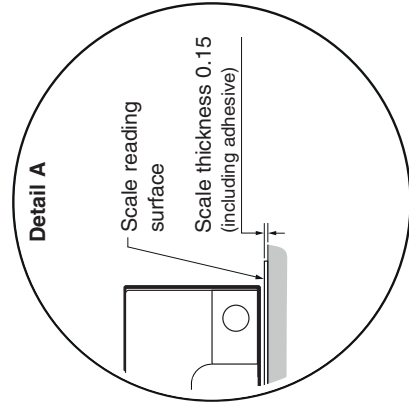
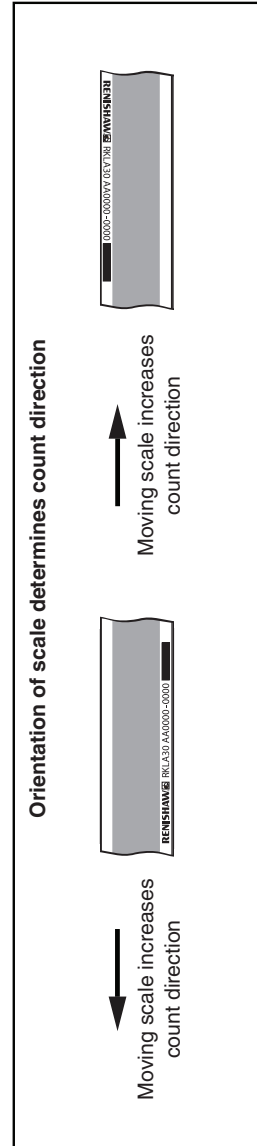
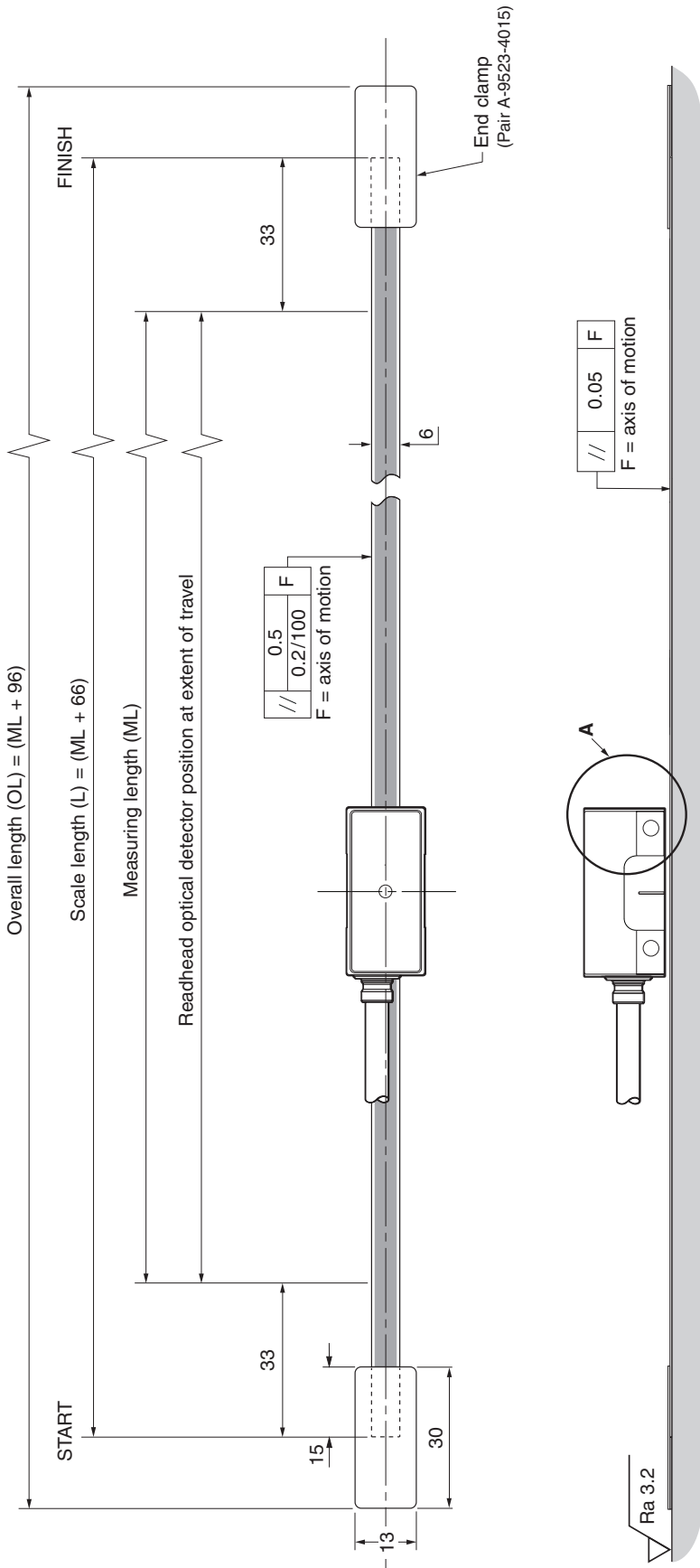
Compatible with RESOLUTE readheads



- ▶ True absolute optical encoder: absolute position is determined immediately upon switch-on, eliminating reference returns
- ▶ Single track nominal 30 μm pitch optical scale combines absolute position and incremental phase information into one code
- ▶ Resolution to 1 nm
- ▶ Low SDE (± 40 nm) and low jitter (to 10 nm RMS) for smoother velocity control and rock-solid positional stability
- ▶ 100 m/s maximum speed for all resolutions
- ▶ Wide set-up tolerances: ± 150 μm rideheight, $\pm 0.5^\circ$ yaw, pitch and roll
- ▶ Other high-accuracy linear scales also available:
 - RELA30 low expansion, high stability scale with ± 1 μm accuracy on lengths up to 1 metre. Available in lengths up to 1.5 metres.
 - RSLA30 stainless steel spars with ± 4 μm total accuracy over an entire 5 m length
 - RTLA30/RTLA30-S stainless steel tape scale with ± 5 $\mu\text{m}/\text{m}$ accuracy. Available in lengths up to 21 metres.

RKLA30 scale installation drawing

Dimensions and tolerances in mm



Resolution, speed and scale lengths

RESOLUTE is available with a variety of resolutions. The choice of resolution depends on the serial protocol being used.

RESOLUTE with **BiSS C** serial comms is available with 1 nm, 5 nm and 50 nm resolution options.

The maximum reading speed is 100 m/s.

The maximum scale length is determined by the readhead resolution and the number of position bits in the serial word.

Resolution	Maximum scale length (m)		
	36 position bits	32 position bits	26 position bits
1 nm	21	4.295	0.067
5 nm	21	21	0.336
50 nm	21	21	3.355

RESOLUTE with **Siemens DRIVE-CLiQ** serial comms is available with 1 nm and 50 nm resolution options.

The maximum reading speed is 100 m/s.

The maximum scale length is determined by the readhead resolution and the number of position bits in the serial word.

Resolution	Maximum scale length (m)	
	36 bit position bits	26 position bits
1 nm	17.18	-
50 nm	-	13.42

RESOLUTE with **Mitsubishi** serial comms is available with 1 nm and 50 nm resolution options.

The maximum reading speed is 100 m/s.

The maximum scale length is determined by the readhead resolution and the number of position bits in the serial word.

Resolution	Maximum scale length (m) with 40 position bits
1 nm	2.1
50 nm	21

RESOLUTE with **Yaskawa** serial comms is available with 1 nm and 50 nm resolution options.

The maximum scale length is determined by the readhead resolution and the number of position bits in the serial word.

Resolution	Maximum scale length (m) with 36 position bits	Maximum reading speed (m/s)
1 nm	1.8	3.6
50 nm	21	100

RESOLUTE with **Panasonic** serial comms is available with 1 nm, 50 nm and 100 nm resolution options.

For the **Panasonic** protocol, the maximum scale length of 21 m is available at all resolutions.

Resolution	Maximum reading speed (m/s)	
	Panasonic A5 series	Panasonic A6 series
1 nm	0.4	4
50 nm	20	100
100 nm	40	100

RESOLUTE with **FANUC** serial comms is available with 1 nm and 50 nm resolution options.

The maximum reading speed is 100 m/s.



For the **FANUC** protocol, the maximum scale length of 21 m is available at all resolutions.

RKLA30-S part numbers



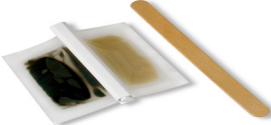
Part number	Available lengths	Available in increments of	Ordering instructions
A-6667-xxxx	20 mm to 21 m	10 mm	xxxx is the length in cm. Ordering A-6667-0450, for example, will result in a length of 4500 mm.

Accessory part numbers

RKLA30 scale

Part description	Part number	Product image
Guillotine (For cutting RKLA30 scale)	A-9589-0071	
RKLA30-S side mount scale applicator	A-6547-1918	

End clamp

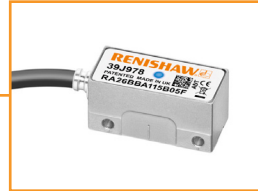
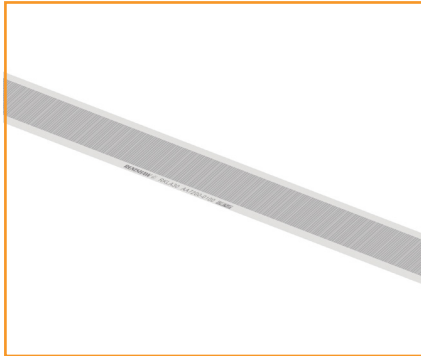
Part description	Part number	Product image
RGC-F End clamp kit - epoxy mounted. The RGC-F end clamps master the RKLA30 scale to the substrate material to match its thermal expansion.	A-9523-4015	
End clamp kit, epoxy mounted, narrow The end clamps master the RKLA30 scale to the substrate material to match its thermal expansion.	A-9523-4027	
RGG-2 (2 part epoxy) The RGG-2 epoxy is recommended for the mounting of end clamps.	A-9531-0342	

Setting Gauge

Part description	Part number	Product image
0.8 mm setting shim (blue)	M-9517-0122	

Compatible products

RKLA30 scale



RESOLUTE standard readheads

For worldwide contact details, visit www.renishaw.com/contact

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