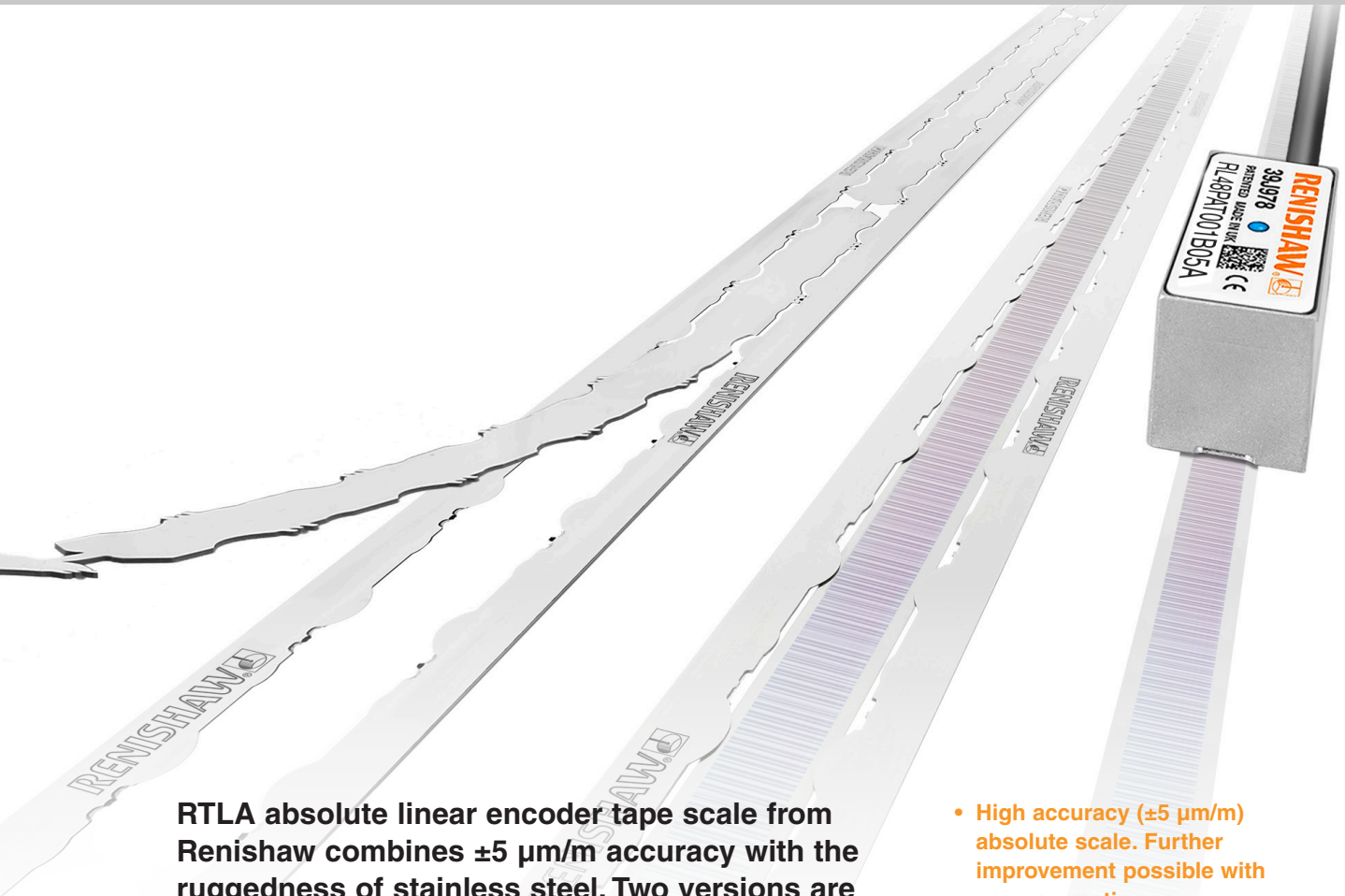


RTLA high accuracy absolute linear encoder scale system



RTLA absolute linear encoder tape scale from Renishaw combines $\pm 5 \mu\text{m}/\text{m}$ accuracy with the ruggedness of stainless steel. Two versions are available: self-adhesive RTLA-S and RTLA for use with the revolutionary *FASTRACK*™ track system from Renishaw.

Designed for applications that demand high-accuracy and an independent expansion coefficient with tape scale convenience, RTLA-S and RTLA are read by Renishaw's ground-breaking RESOLUTE™ absolute readhead.

1 nm resolution, 100 m/s maximum speed, ultra low SDE and jitter result in a linear encoder system that outperforms any other encoder in its class.

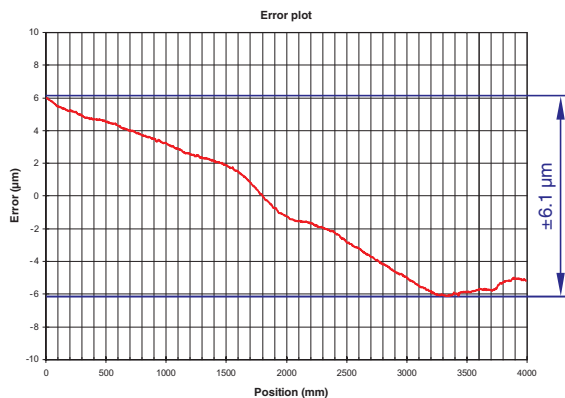
RTLA-S is laid onto the substrate using its self-adhesive backing tape. A patented application tool makes this a quick, simple and inexpensive process. A clamp is fitted at a single point to lock the scale to the substrate.

RTLA (without self-adhesive) is used with *FASTRACK*. In this case, the scale is held securely in place by two miniature, yet rugged, guide rails. Again, the scale is clamped in a single point to allow independent expansion with extremely low hysteresis, even over wide temperature ranges. If damaged, the scale can be pulled out of the guide rails and quickly replaced, even where access is limited, thus reducing machine downtime. This feature also makes the new linear encoder system ideal for large machines that need to be sectioned for transportation.

RTLA-S and RTLA with *FASTRACK* are suitable for many applications, including FPD manufacturing and inspection machines, P-V manufacturing, linear motors with aluminium substrates, axes that are exposed to potential damage, large CMMs and other machines that require the scale to be installed/removed for transit, or simply for any application where thermal expansion of the scale must be independent of the machine structure.

- High accuracy ($\pm 5 \mu\text{m}/\text{m}$) absolute scale. Further improvement possible with error correction
- Compatible with RESOLUTE absolute readheads
- RTLA scale expands at its own low thermal coefficient ($10.1 \pm 0.2 \mu\text{m}/\text{m}/^\circ\text{C}$ @ 20°C)
- Use with *FASTRACK* for very low hysteresis
- *FASTRACK* guide rails are pre-aligned in reels for cut-to-suit flexibility
- Quick installation. *FASTRACK* adds fast scale replacement capability
- Scale can be locked to the substrate at a single datum point anywhere along the axis
- RTLA scale can bridge gaps in the *FASTRACK* of up to 25 mm
- High solvent immunity

System features

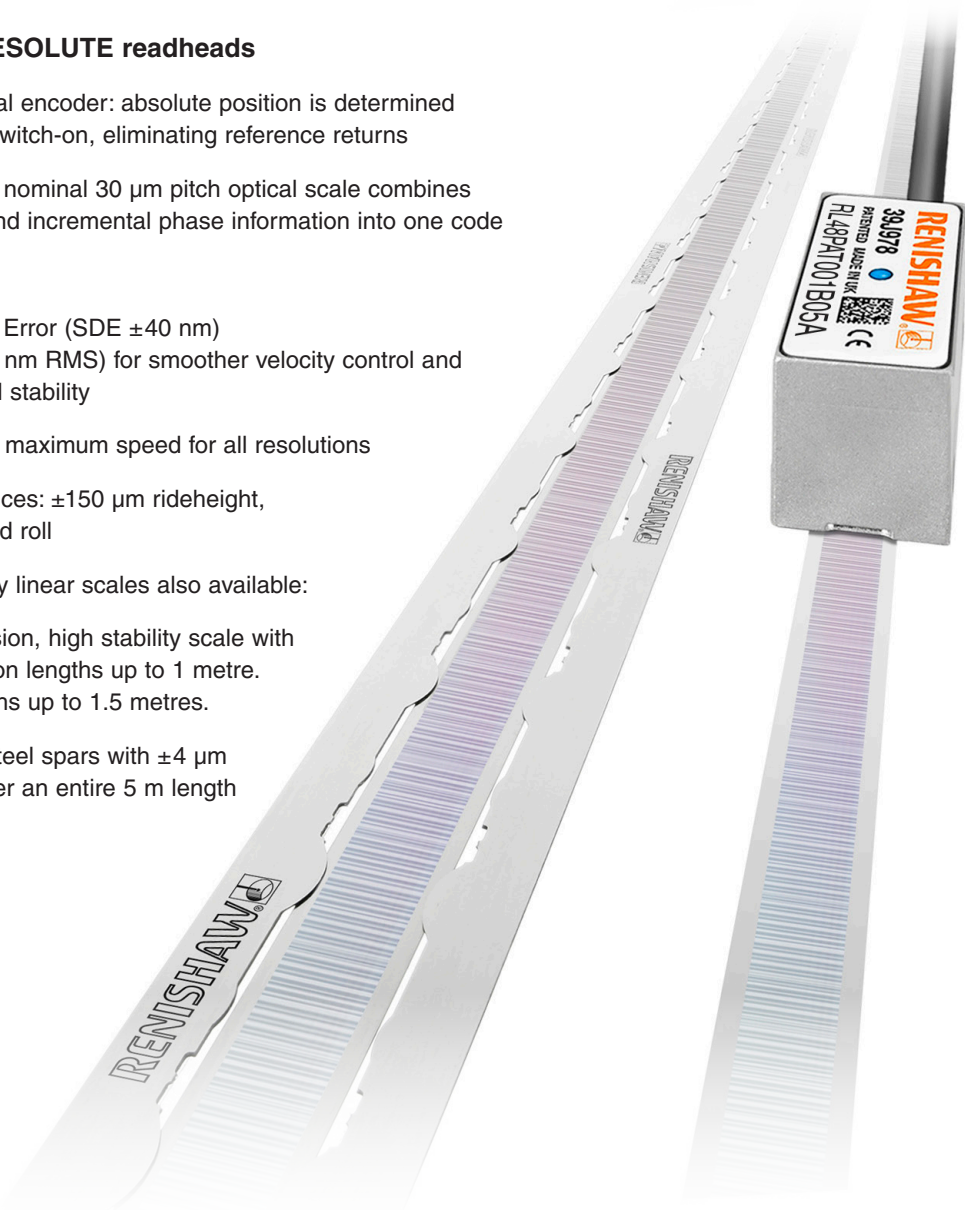


High accuracy RTLA and RTLA-S scale

- ▶ $\pm 5 \mu\text{m}/\text{m}$ accuracy @ 20°C , including slope and linearity. Further improvement possible with error correction
- ▶ Hardened stainless steel construction is rugged and reliable, with high scratch and solvent resistance
- ▶ Independent expansion coefficient ($10.1 \pm 0.2 \mu\text{m}/\text{m}/^\circ\text{C}$ @ 20°C)
- ▶ Very low hysteresis: sub-micron on a centre-clamped 2 m axis over the entire operating temperature range, for example
- ▶ Nominal $30 \mu\text{m}$ absolute graduations
- ▶ Scale can be cut to length using a guillotine for easy customisation
- ▶ Track mounted using the revolutionary new *FASTRACK* or self-adhesive mounted (RTLA-S)

Compatible with RESOLUTE readheads

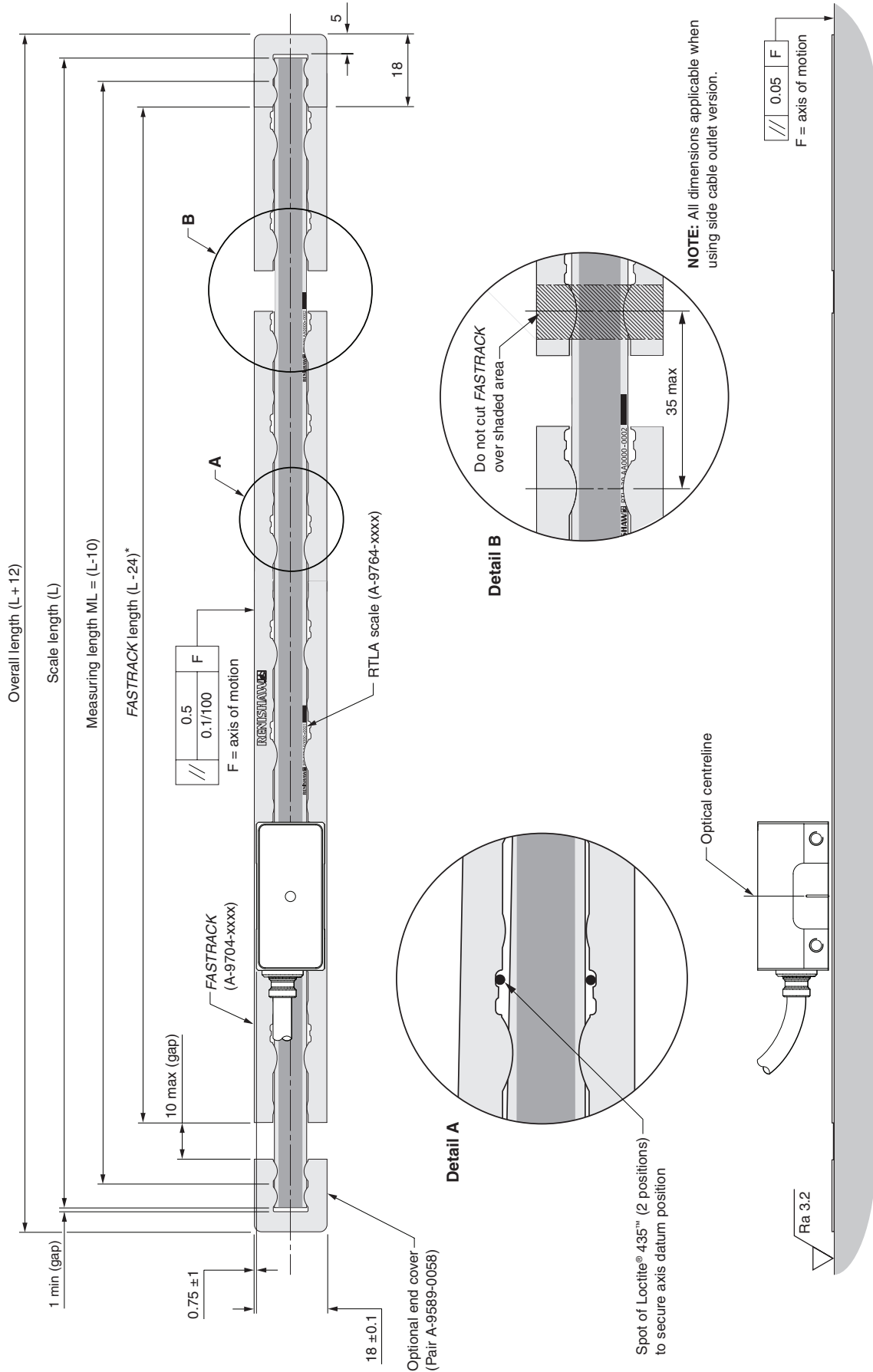
- ▶ True absolute optical encoder: absolute position is determined immediately upon switch-on, eliminating reference returns
- ▶ Unique single track nominal $30 \mu\text{m}$ pitch optical scale combines absolute position and incremental phase information into one code
- ▶ Resolution to 1 nm
- ▶ Low Sub-Divisional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



RTLA with FASTRACK carrier installation drawing (adhesive datum clamp)

For further details, please refer to RESOLUTE RTLA and FASTRACK installation guide (M-9533-9134)

Dimensions and tolerances in mm

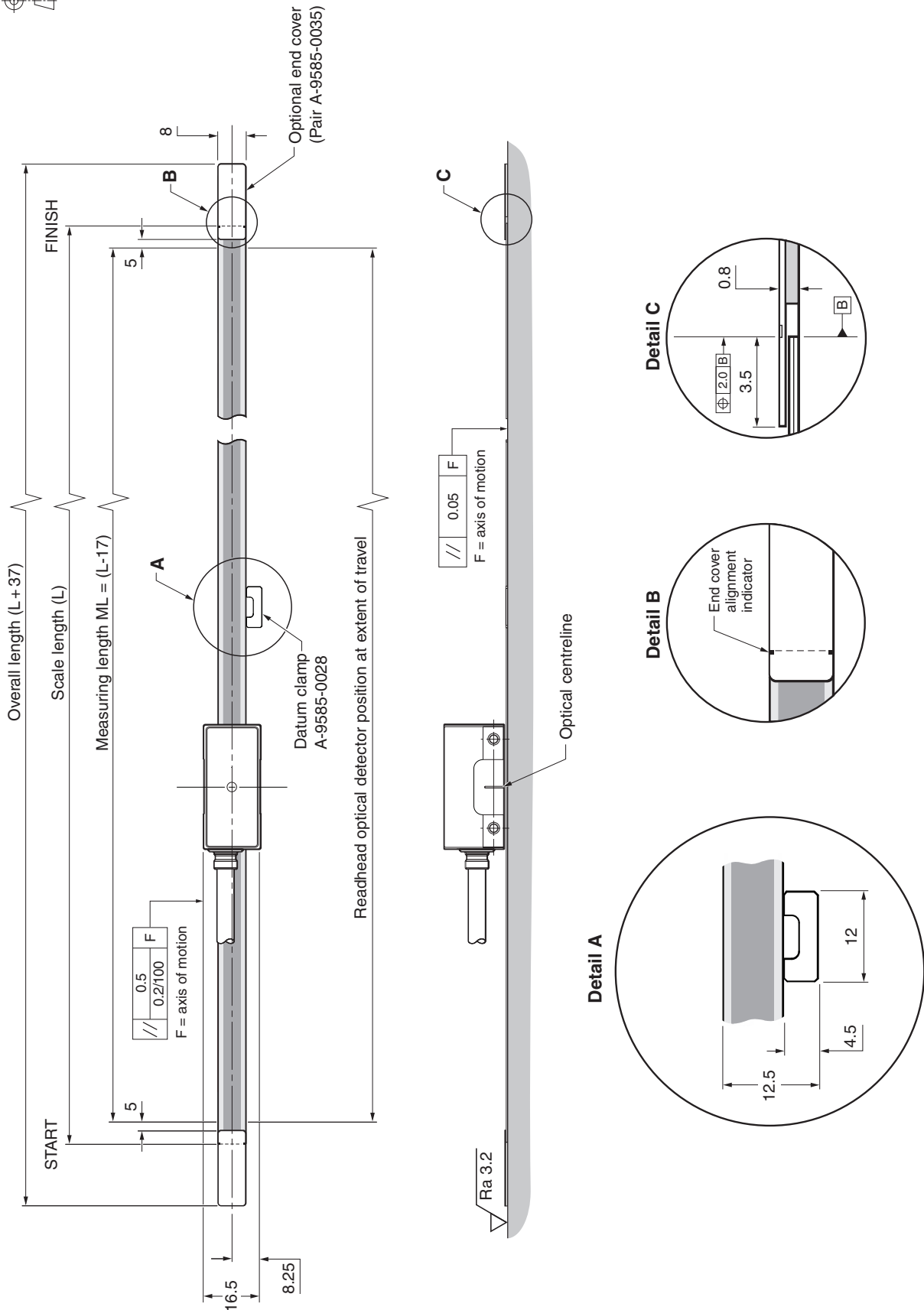


*Assumes 1 mm gap between scale and end covers and zero gap between FASTRACK and end covers.
 NOTE: Minimum recommended FASTRACK length = 100 mm

RTLA-S installation drawing (mechanical datum clamp)

For further details, please refer to RESOLUTE RTLA-S installation guide (M-9553-9433)

Dimensions and tolerances in mm



RTLA-S, RTLA and *FASTRACK* specifications

Description	RTLA-S	Self-adhesive absolute high-accuracy hardened and tempered martensitic stainless steel for use with RESOLUTE readheads.
	RTLA	Absolute high-accuracy hardened and tempered martensitic stainless steel scale for use with <i>FASTRACK</i> and RESOLUTE readheads.
	<i>FASTRACK</i>	Hardened stainless steel guide rails with integral sacrificial spacers, with self-adhesive backing tape for easy installation
Form	RTLA-S	0.4 mm x 8 mm (H x W) including adhesive
	<i>FASTRACK</i>	0.4 mm x 18 mm (H x W) including adhesive
Accuracy	RTLA/RTLA-S	±5 µm/m @20 °C
Thermal expansion	RTLA/RTLA-S	10.1 ±0.2 µm/m/°C @20 °C
	<i>FASTRACK</i>	10.1 ±0.2 µm/m/°C @20 °C
Temperature (system)	Storage	-20 °C to +80 °C
	Operating	0 °C to +80 °C
Humidity (system)		95% maximum relative humidity (non-condensing) to EN 60068-2-78
Shock (system)	Non-operating	1000 m/s ² , 6 ms, ½ sine, 3 axes
Vibration (system)	Operating	100 m/s ² max @ 55 to 2000 Hz, 3 axes
Mass	RTLA-S	12.9 g/m
	RTLA	12.2 g/m
	<i>FASTRACK</i>	24 g/m
Minimum recommended length	<i>FASTRACK</i>	100 mm
Maximum supplied length	RTLA-S	21 m
	RTLA	21 m
	<i>FASTRACK</i>	25 m

Resolution 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 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 word	32 bit position word	26 bit position word
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 scale word length is determined by the readhead resolution and the number of position bits in the serial word.

Resolution	Maximum scale length (m)	
	34 bit position word	28 bit position word
1 nm	17.18	N/A
50 nm	N/A	13.42

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

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

Resolution	Maximum scale length (m) with 40 bit position word
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 word length is determined by the readhead resolution and the number of position bits in the serial word.

Resolution	Maximum scale length (m) with 36 bit position word
1 nm	1.8
50 nm	21

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

For **FANUC** protocol, maximum scale length is available at all resolutions.

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

For **Panasonic** protocol, maximum scale length is available at all resolutions.

Speed

For the maximum speed of the various serial protocols please refer to the relevant RESOLUTE protocol Data sheet.

RTLA-S, RTLA and *FASTRACK* part numbers

Scale type	Length	Available in increments of:	Part number (where xxxx is the length in cm)
RTLA-S	100 mm to 21 m	10 mm	A-9763-xxxx
RTLA	100 mm to 21 m	10 mm	A-9764-xxxx
<i>FASTRACK</i>	100 mm to 25 m	25 mm*	A-9704-xxxx
*NOTE: Part numbers for <i>FASTRACK</i> lengths ending in 25 mm are:			A-9704-xxx3
Part numbers for <i>FASTRACK</i> lengths ending in 75 mm are:			A-9704-xxx8

Accessories

Datum clamp

Adhesive datum clamp (RTLA-S only)	A-9585-0028
Adhesive for clamp (Loctite 435)	P-AD03-0012
Bolted datum clamp (<i>FASTRACK</i> only)	A-9589-0096

Setting gauge

RTLA with <i>FASTRACK</i> 0.6 mm setting shim (red)	M-9589-0090
RTLA-S 0.8 mm setting shim (blue)	M-9517-0122

Separator kit (*FASTRACK* only)

RTLA/RESOLUTE - centre section removal tool	A-9589-0066
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End cover

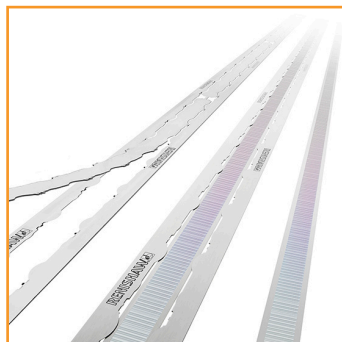
End cover kit (<i>FASTRACK</i> only)	A-9589-0058
End cover kit (RTLA-S only)	A-9585-0035

Scale/track cutting jig

Guillotine kit	A-9589-0071
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FASTRACK compatible products

FASTRACK/RTLA



RESOLUTE



Installation guide M-9553-9134
Data sheet *BiSS* L-9517-9448
FANUC L-9517-9442
Mitsubishi L-9517-9454
Panasonic L-9517-9460
Siemens DRIVE-CLiQ L-9517-9524
Yaskawa L-9517-9436

RESOLUTE UHV



Data sheet L-9517-9530

RTLA-S



Installation guide M-9553-9433

For worldwide contact details, please visit our main website at www.renishaw.com/contact

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