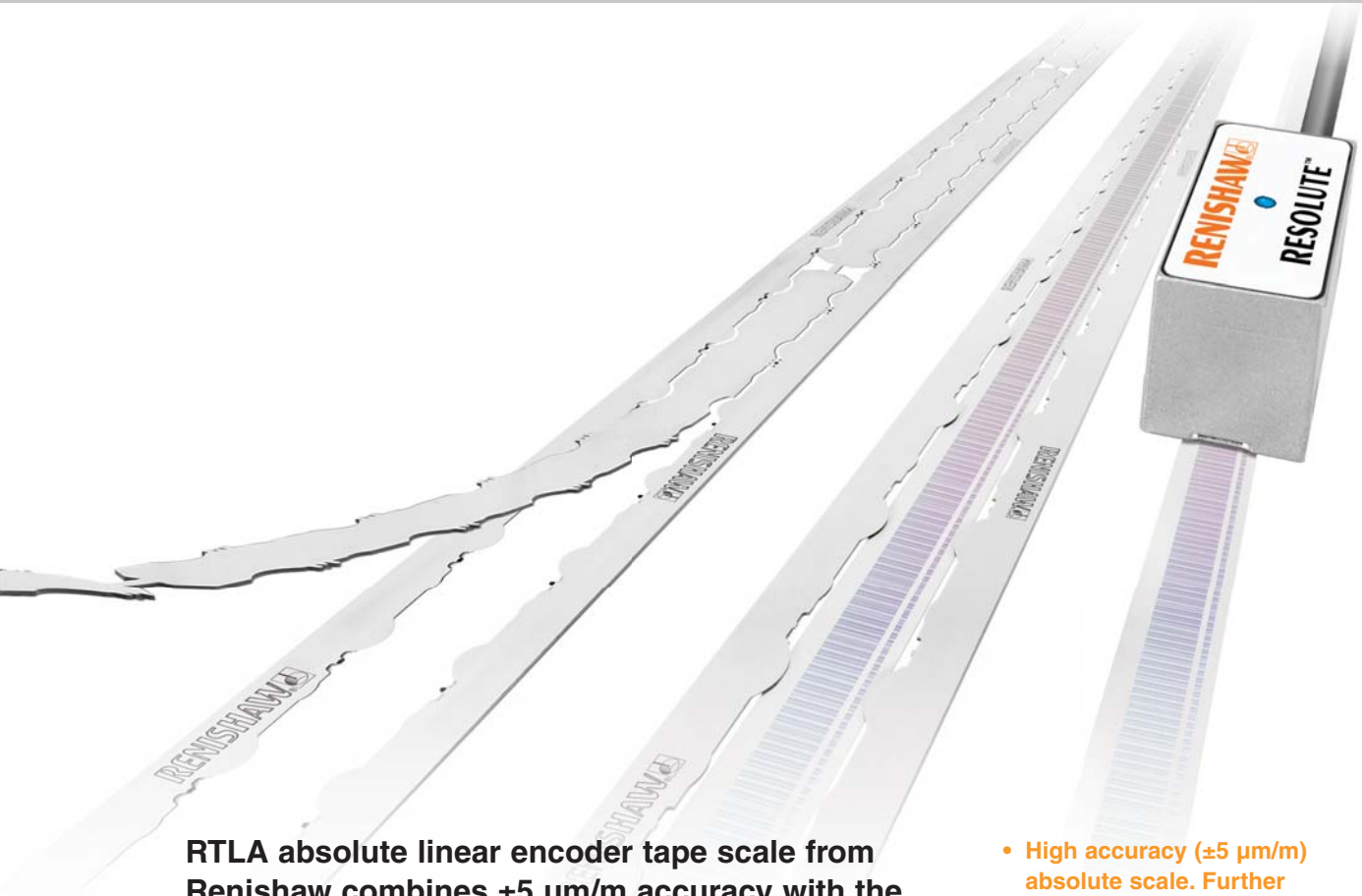
Data sheet
L-9517-9418-02-B

RENISHAW
apply innovation™

FASTRACK™ and RTLA-S high-accuracy absolute linear encoder scale system



RTLA absolute linear encoder tape scale from Renishaw combines ±5 µm/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.

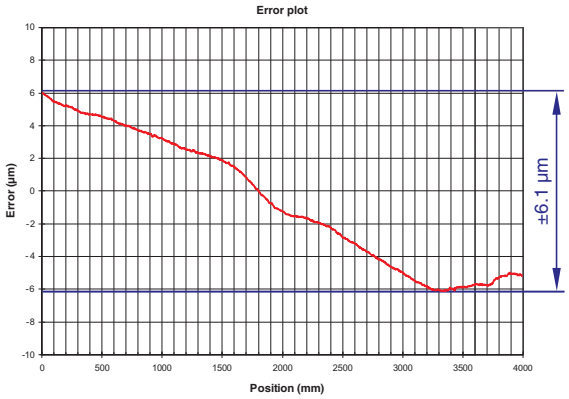
RTLA-S is laid onto the substrate using its self-adhesive backing tape. A patented application tool makes this a quick, simple and inexpensive process. A clamp is fitted at a single point to lock the scale to the substrate.

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 (±5 µm/m) absolute scale. Further improvement possible with error correction**
- **Compatible with RESOLUTE absolute readheads**
- **RTLA scale expands at its own low thermal coefficient (10.6 µm/m/°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 substrate up to 25 mm**
- **High solvent immunity**
- **Incremental RTLC version for TONiC™ readheads also available**

System features



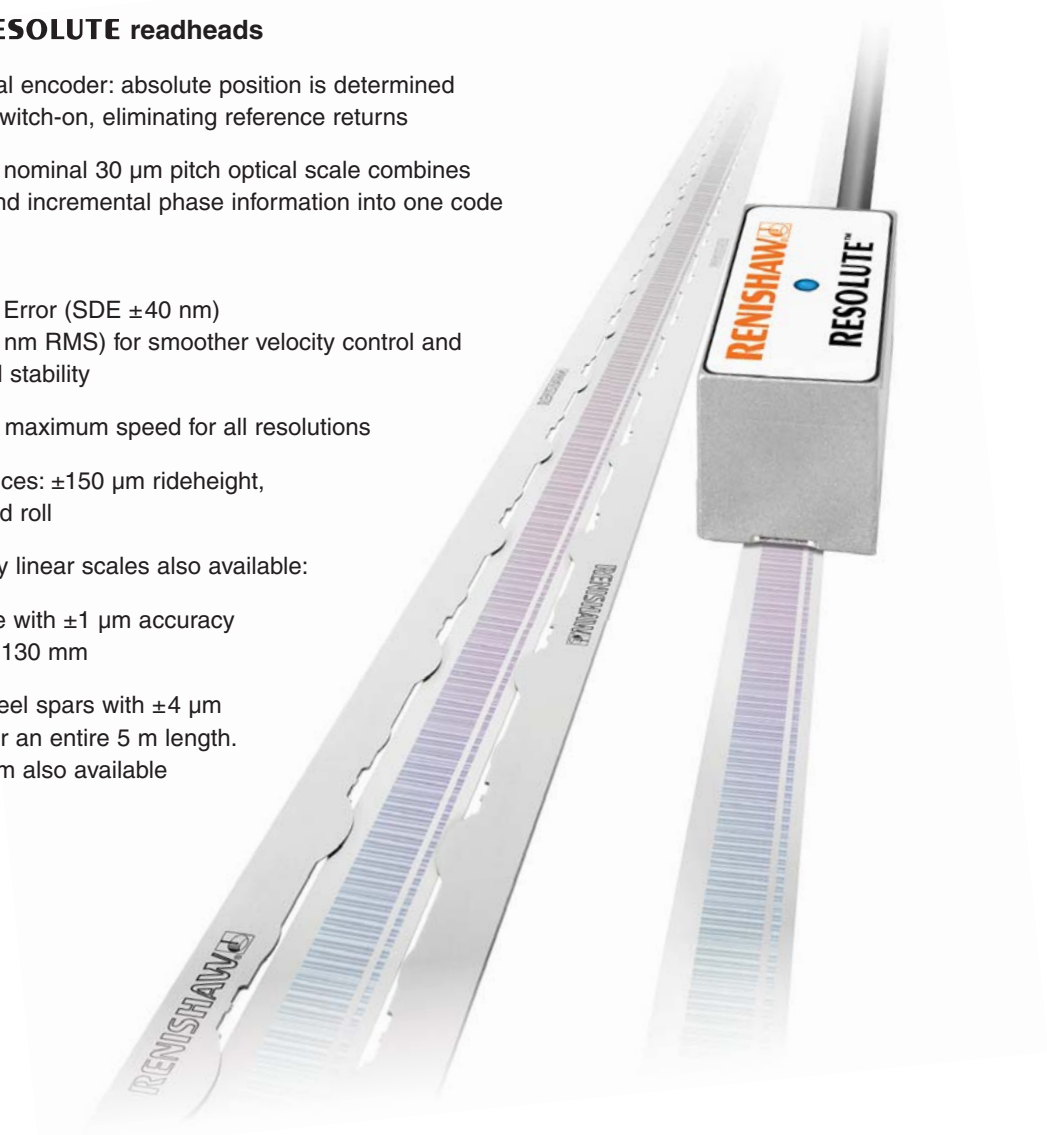
Example accuracy test result of 4000 mm length of RTLA scale

High accuracy RTLA and RTLA-S scale

- ±5 µm/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 (10.6 µm/m/°C)
- Very low hysteresis: sub-micron on a centre-clamped 2 m axis over the entire operating temperature range, for example
- Nominal 30 µm 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 µm pitch optical scale combines absolute position and incremental phase information into one code
- Resolution to 1 nm
- Low Sub-Divisional Error (SDE ±40 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: ±150 µm rideheight, ±0.5° yaw, pitch and roll
- Other high-accuracy linear scales also available:
  - RELA Invar® scale with ±1 µm accuracy on lengths up to 1130 mm
  - RSLA stainless steel spars with ±4 µm total accuracy over an entire 5 m length. Lengths up to 10 m also available on special order.

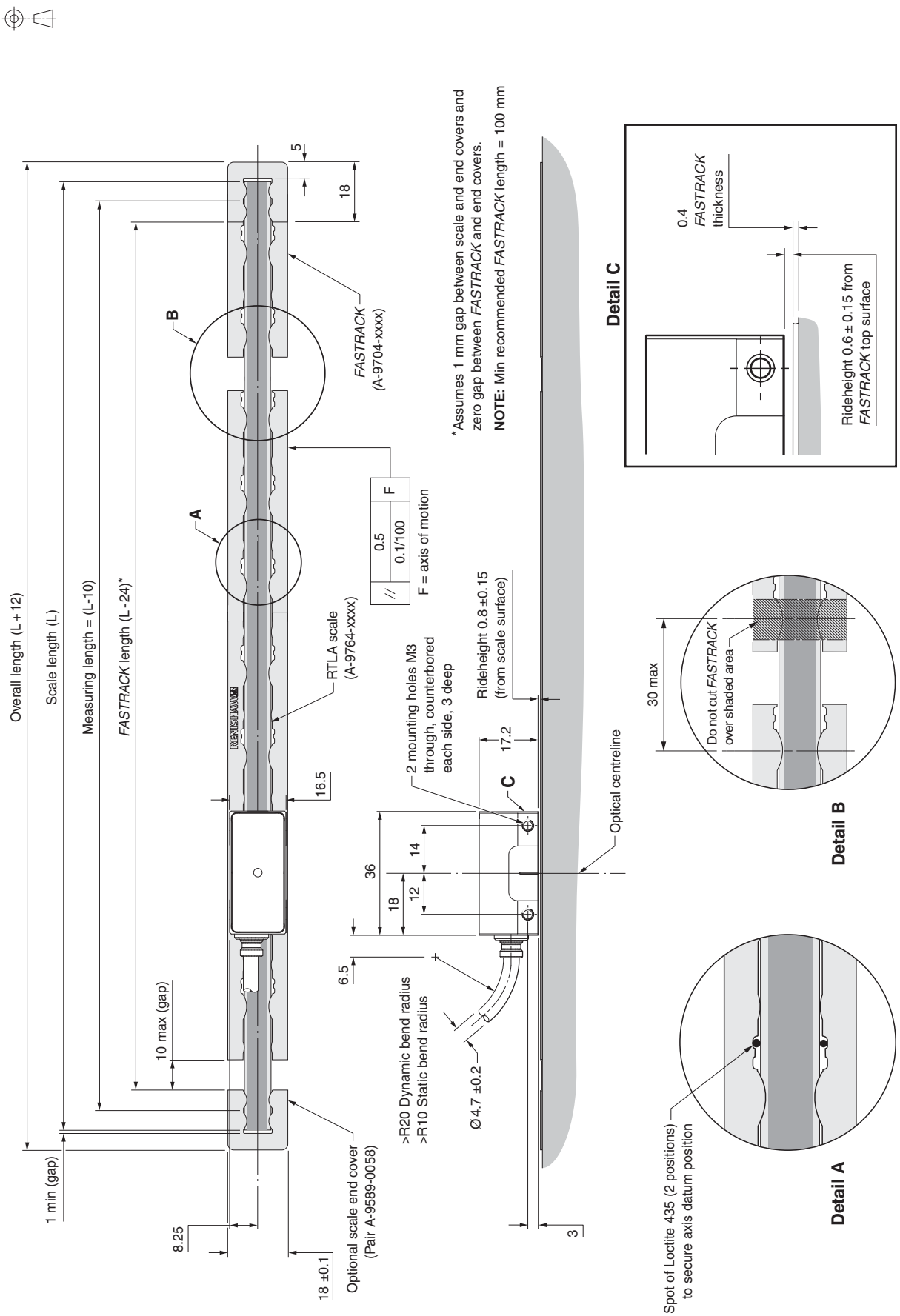


RENISHAW
apply innovation™

FASTRACK with RESOLUTE installation drawing (adhesive datum clamp method)

For further details, please refer to RESOLUTE *FASTRACK* installation guide

Dimensions and tolerances in mm

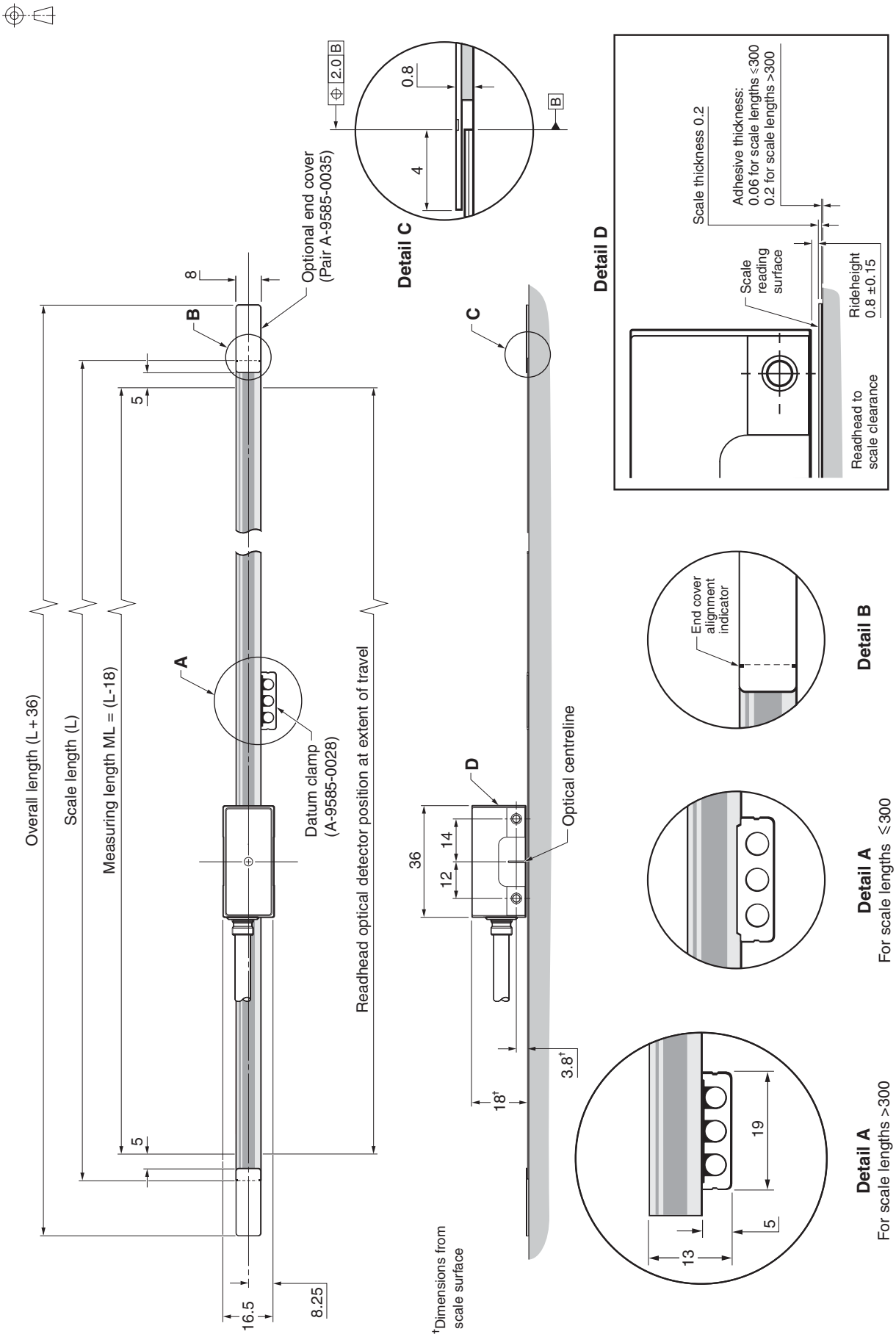


RENISHAW
apply innovation™

RTLA-S installation drawing (mechanical datum clamp method)

For further details, please refer to RESOLUTE RTLA-S installation guide

Dimensions and tolerances in mm



RENISHAW
apply innovation™

FASTRACK/RTLA-S specifications

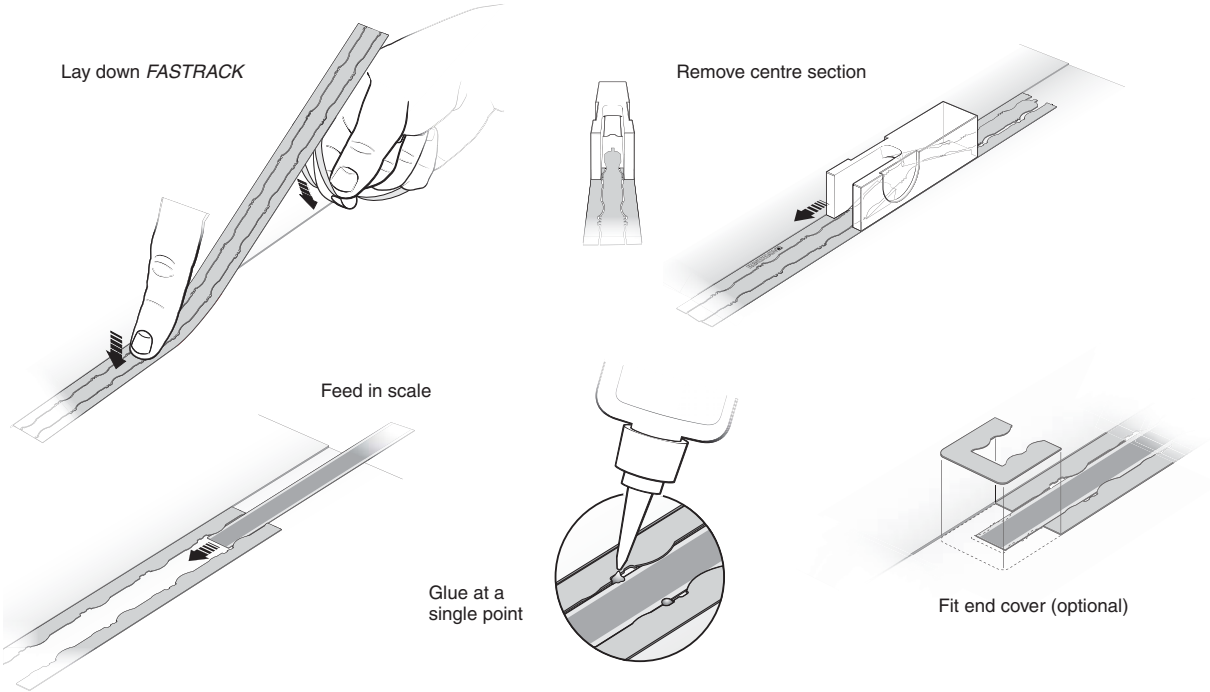
Description	*FASTRACK*	Hardened stainless steel guide rails with integral sacrificial spacers, with self-adhesive backing tape for easy installation
	RTLA	Absolute high-accuracy hardened and tempered martensitic stainless steel scale for use with *FASTRACK* and RESOLUTE readheads.
	RTLA-S	Self-adhesive absolute high-accuracy hardened and tempered martensitic stainless steel for use with RESOLUTE readheads.
Form	*FASTRACK*	0.4 mm x 18 mm (H x W)*
	RTLA-S	(>300 mm) 0.4 mm x 8 mm (H x W)* (≤300 mm) 0.26 mm x 8 mm (H x W)*
Accuracy	RTLA	±5 µm/m@20 °C
	RTLA-S	±5 µm/m@20 °C
Thermal expansion	*FASTRACK*	~10.6 µm/m/°C
	RTLA/RTLA-S	~10.6 µm/m/°C
Temperature	Storage	-20 °C to +70 °C
	Operating	0 °C to +70 °C
Humidity		Rated up to +40 °C, 95% maximum relative humidity (non-condensing)
Acceleration	Operating	500 m/s² BS EN 60068-2-7: 1993 (IEC 68-2-7:1987)
Shock	Non-operating	1000 m/s², 6 ms, ½ sine BS EN 60068-2-27: 1993 (IEC 68-2-27:1987)
Vibration	Operating	100 m/s² max @ 55 to 2000 Hz BS EN 60068-2-6: 1996 (IEC 68-2-6:1995)
Mass	*FASTRACK*	24 g/m
	RTLA	12.5 g/m
	RTLA-S	12.9 g/m
Minimum recommended length	*FASTRACK*	100 mm
Maximum supplied length	*FASTRACK*	25 m
	RTLA	10 m
	RTLA-S	10 m†

*Including adhesive

†For lengths >2 m *FASTRACK* with RTLA is recommended

FASTRACK installation

NOTE: For full details of *FASTRACK* installation, please refer to the RESOLUTE *FASTRACK* installation guide. *FASTRACK* features a unique installation technique that allows the encoder to be installed quicker, easier and allows wider cutting tolerances. For machines that are sectioned before being shipped to their installation site, simply lay down multiple lengths of *FASTRACK* with gaps up to 25 mm at the point where the substrate mates together, safe in the knowledge that the scale can be removed and re-installed as many times as necessary. For details on installing RTLA-S refer to RESOLUTE RTLA-S installation guide.



Renishaw plc
New Mills, Wotton-under-Edge,
Gloucestershire GL12 8JR
United Kingdom

T +44 (0)1453 524524
F +44 (0)1453 524901
E uk@renishaw.com
www.renishaw.com

RENISHAW
apply innovation™

FASTRACK/RTLA and RTLA-S part numbers

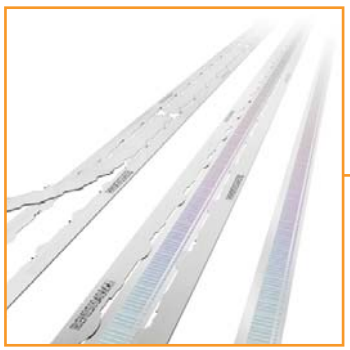
Scale type	Length	Increments	Part number (where xxxx is the length in cm)
FASTRACK	100 mm to 25 m	25 mm*	A-9704-xxxx
RTLA	100 mm to 1 m 1 m to 10 m	50 mm 100 mm	A-9764-xxxx
RTLA-S	100 mm to 10 m	10 mm	A-9763-xxxx

***NOTE:** Part numbers for scale lengths ending in 25 mm are: A-9704-xxx3
Part numbers for scale 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-AD03-0015
Bolted datum clamp (*FASTRACK* only)	A-9589-0096
Setting gauge	
FASTRACK with RTLA 0.6 mm setting shim (metal)	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
End cover	
End cover kit (*FASTRACK* only)	A-9589-0058
End cover kit (RTLA-S only)	A-9585-0035
Scale/track cutting jig	
Guillotine kit	A-9589-0071

FASTRACK compatible products



FASTRACK/RTLA

FASTRACK/RTLA Installation guide M-9553-9134
RESOLUTE FANUC Data sheet L-9517-9442
RESOLUTE *BiSS* Data sheet L-9517-9448
RESOLUTE Panasonic Data sheet L-9517-9460

RTLA-S

RESOLUTE RTLA-S Installation guide M-9553-9433
RESOLUTE FANUC Data sheet L-9517-9442
RESOLUTE *BiSS* Data sheet L-9517-9448
RESOLUTE Panasonic Data sheet L-9517-9460

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

L-9517-9418-02