Data sheet
L-9517-9305-08-B

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RSLM20 high accuracy incremental linear stainless steel scale

- Total accuracy of ±4 µm over 5 m
- Available in defined lengths up to 5 m
- Coilable for simple storage and handling
- *IN-TRAC* auto-phase optical reference mark
- Robust special composition stainless steel with defined coefficient of thermal expansion 10.1 ±0.2 µm/m/°C @ 20 °C
- Dual limits provide on-scale end-of-travel indication

RSLM20 high accuracy stainless steel scale is compatible with Renishaw's VIONiC™ and TONiC™ range of high performance encoders, offering advanced features including dynamic signal processing and the *IN-TRAC*™ optical reference mark.

RSLM20 scale is available in lengths up to 5 m with an overall accuracy better than ±4 µm on 5 m lengths – an industry first! Combined with readheads featuring ultra-low Sub-Divisional Error (SDE), unique filtering optics, resolutions down to 1 nm and simple installation and setup, RSLM20 provides all the performance of a fine pitch system with the benefits of a 20 µm encoder.

RSLM20 offers the ease of use of a tape scale yet the performance of a glass spar; the scale can be coiled for simple storage and handling yet behaves as a spar once uncoiled. Available with a number of *IN-TRAC* reference mark options and a choice of mechanical or adhesive mounting, RSLM20 is perfect for long-travel applications where metrology cannot be compromised.

RSLM20 scale specifications

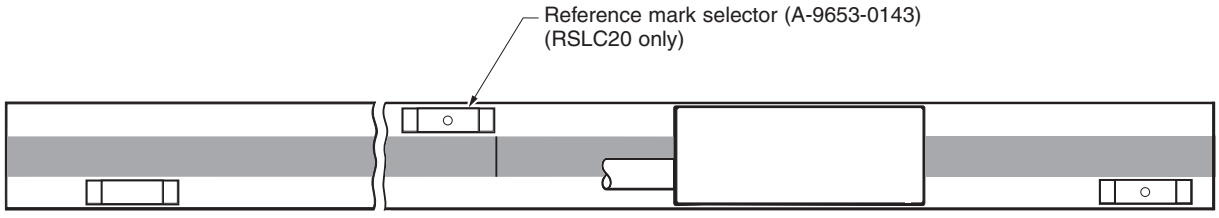
Form (H × W)	1.5 mm × 14.9 mm
Scale lengths	20 mm to 5 m (available in increments of 10 mm)
Pitch	20 µm
Accuracy (at 20 °C)	±1.5 µm up to 1 m ±2.25 µm from 1 m to 2 m ±3 µm from 2 m to 3 m ±4 µm from 3 m to 5 m (includes slope and linearity). Calibration traceable to International Standards.
Material	Hardened martensitic stainless steel
Coefficient thermal expansion (at 20 °C)	10.1 ±0.2 µm/m/°C
Mounting	Epoxy datum point and adhesive tape (nominal thickness 0.2 mm) or datum clamp and mounting clips
Mass	172 g/m
Storage	Lengths over 1.13 m are coiled (> 600 mm diameter)

Reference mark

Type	*IN-TRAC* auto-phase optical reference mark, no physical adjustments required	
Position	**RSLM20**	Midpoint of scale length
	RSLE20	(Option A) – 20 mm from end of scale (for use with 10 mm limits)
	RSLE20	(Option B) – 70 mm from end of scale (for use with 20 mm and 50 mm limits)
	RSLC20	Selectable reference marks every 200 mm
	RSLR20	No *IN-TRAC* reference mark, suitable for use with RGH20; external magnetic reference mark required. Please refer to the RGH20 Data sheet (L-9517-9125) for more information.
Phasing	Auto-phased by readhead calibration routine	
Repeatability	Repeatable to unit of resolution throughout specified temperature and speed range	

Limit switches

Type	Magnetic actuators; with dimple triggers Q limit, without dimple triggers P limit (see image below)
Trigger point	The limit output is nominally asserted when the readhead limit switch sensor passes the limit magnet leading edge, but can trigger up to 3 mm before that edge
Mounting	Customer placed at desired locations
Repeatability	< 0.1 mm



P limit (10 mm, A-9653-0138)

Q limit (10 mm, A-9653-0139)

- Limit and reference mark selector magnets are available in 10 mm, 20 mm and 50 mm lengths and provided on a back plate with self-adhesive tape.
- For RSLM20 and RSLE20 scales VIONiC and TONiC readheads should be ordered with all reference marks output. (No reference mark selector required.)
- For RSLC20 scales VIONiC and TONiC readheads should be ordered with selected reference marks output. (Reference mark selector required at chosen reference mark location.)

Compatible readheads

	VIONiC	TONiC
		
Outputs	Digital resolutions from 5 µm to 2.5 nm direct from the readhead	Analogue 1 Vpp only. RS422 digital resolutions from 5 µm to 1 nm available when connected to a Ti, TD or DOP interface
SDE (typical)	< ±15 nm	±30 nm
Jitter (RMS)	down to 1.6 nm	down to 0.5 nm
Maximum speed	12 m/s	10 m/s

Readhead features

- Filtering optics and Auto Gain Control for high reliability and solid Lissajous signals.
- Dynamic signal processing ensures ultra-low Sub-Divisional Error (SDE).
  Result: smoother scanning performance.
- High signal-to-noise ratio provides ultra-low jitter for optimum positional stability.
- Auto-phasing of *IN-TRAC* reference mark.
- Clocked outputs ensure optimised speed performance for all resolutions, for a wide variety of industry-standard controllers.
- DOP Dual output interfaces available to provide simultaneous analogue and digital outputs (TONiC systems only).

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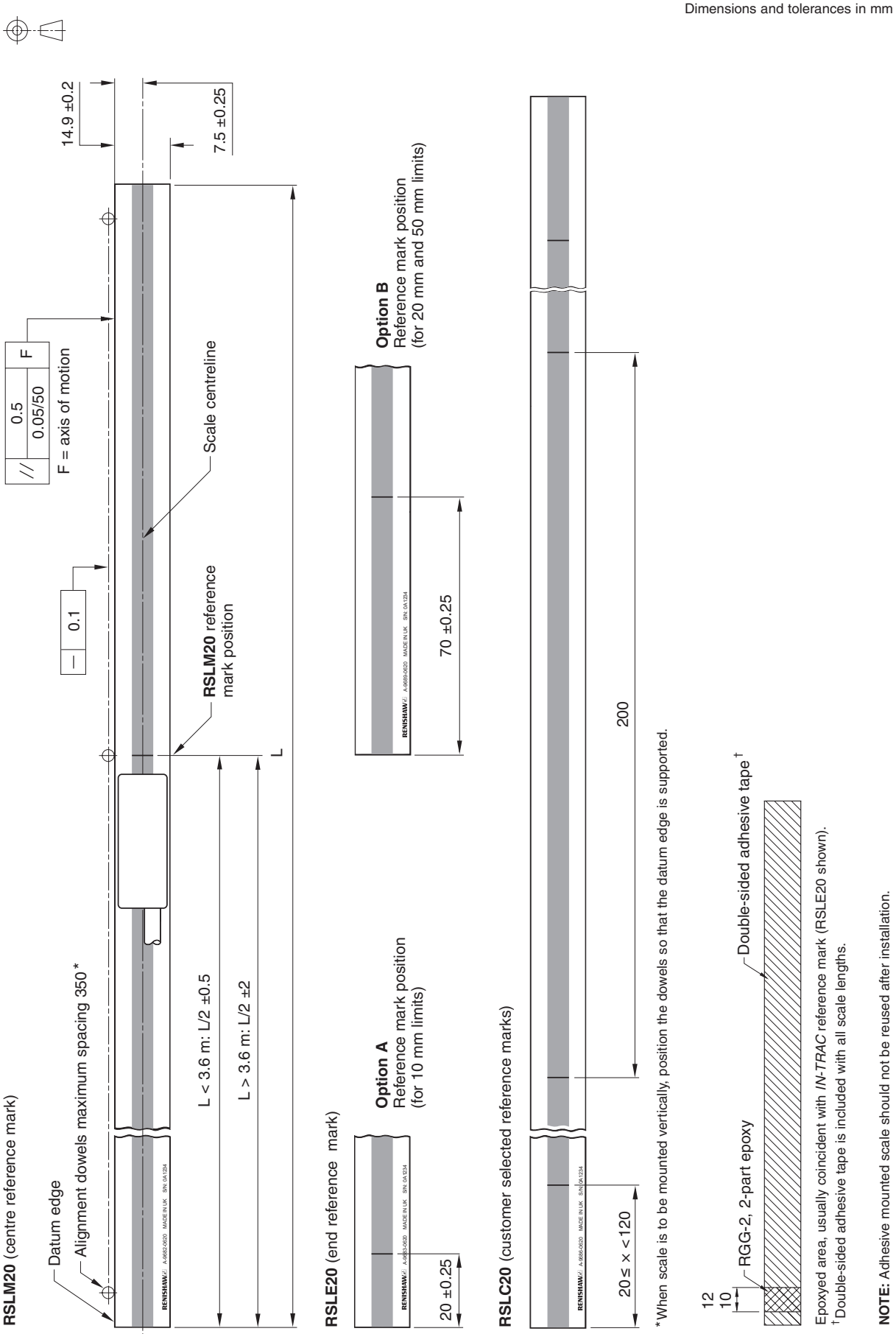
RSLM20 scale installation drawing (adhesive mounting method shown)

For further details please refer to relevant system installation guides

Dimensions and tolerances in mm

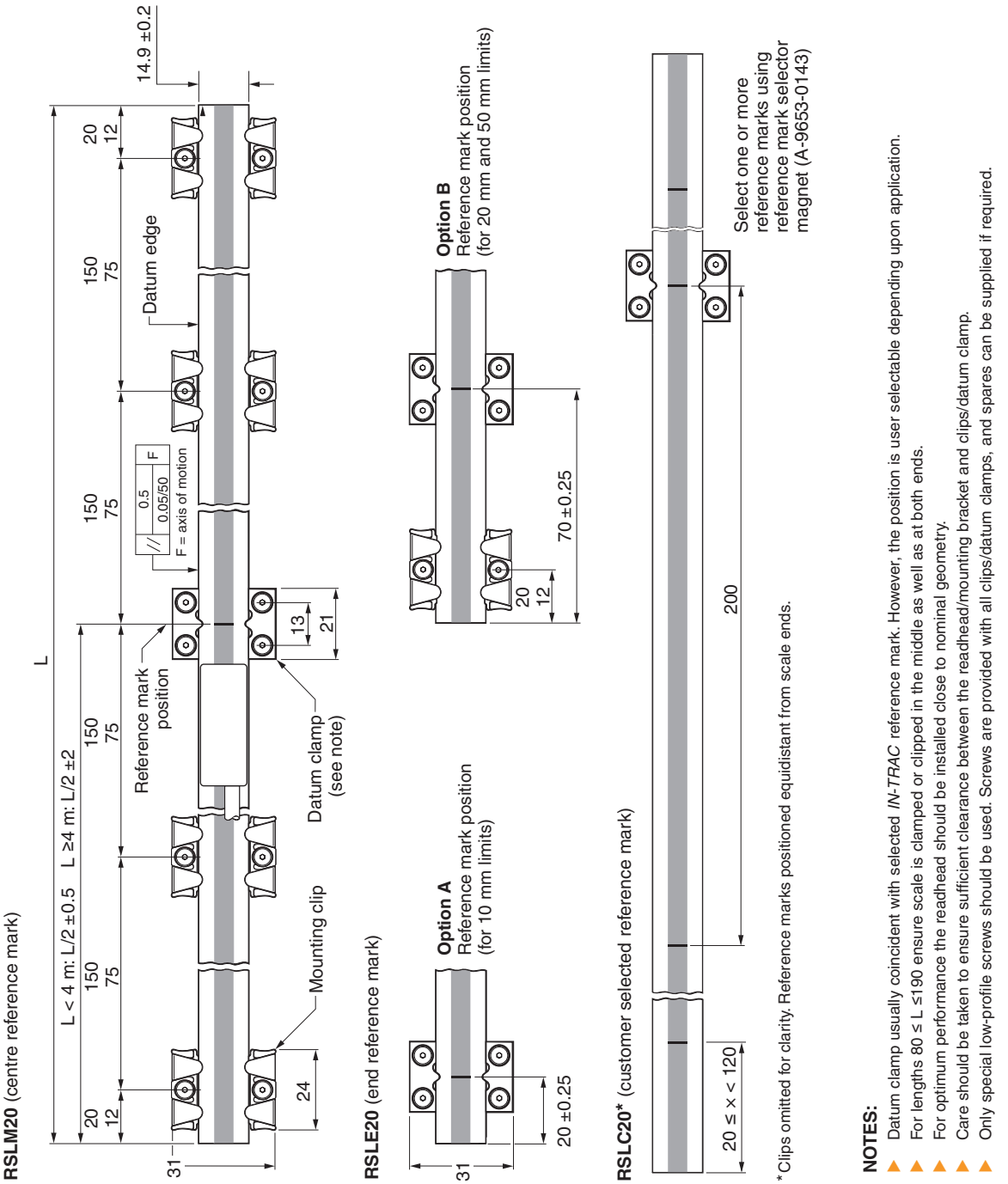


NOTE: Adhesive mounted scale should not be reused after installation.

RSLM20 scale installation drawing (clip/clamp mounting method shown)

For further details please refer to relevant system installation guides

Dimensions and tolerances in mm



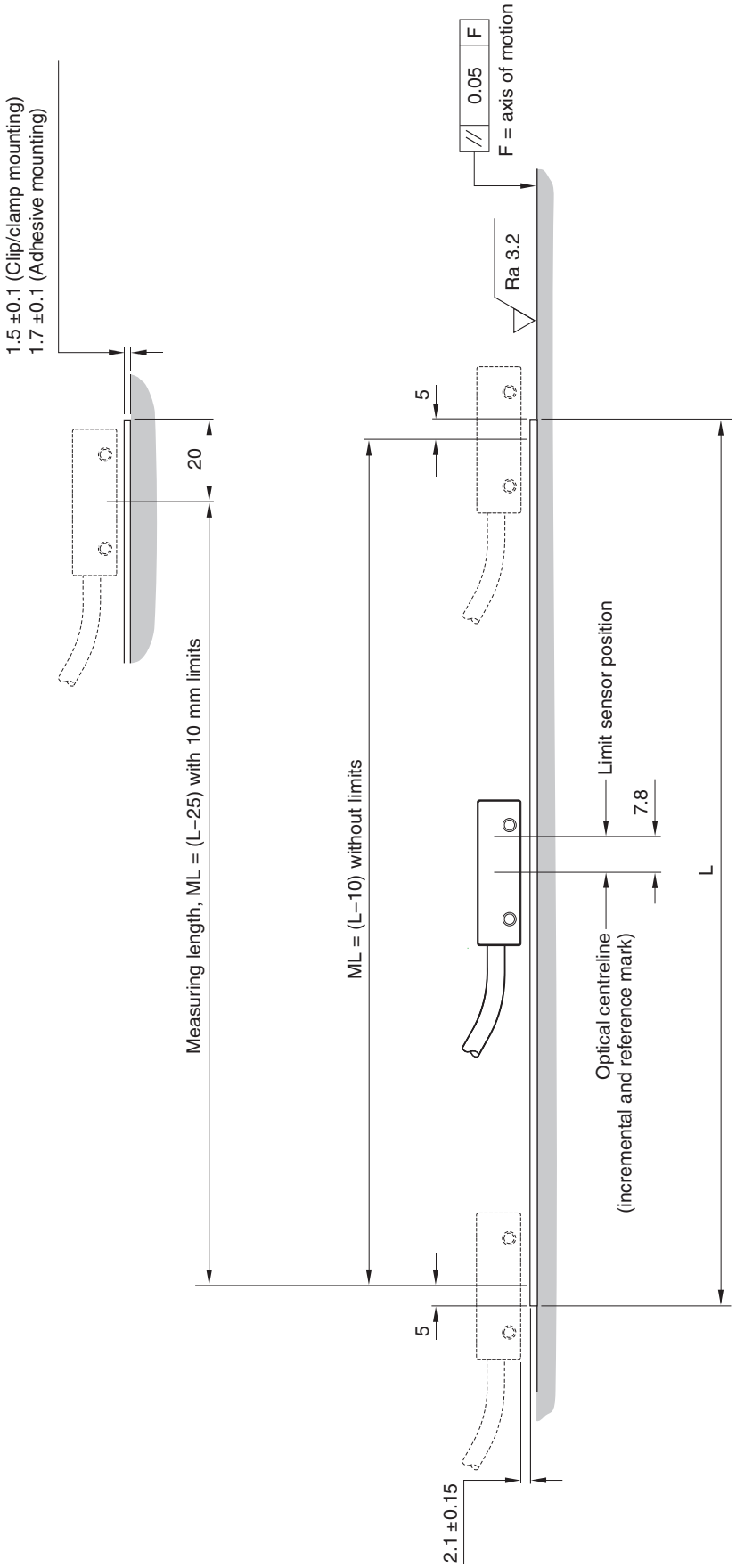
NOTES:

- Datum clamp usually coincident with selected *IN-TRAC* reference mark. However, the position is user selectable depending upon application.
- For lengths 80 ≤ L ≤190 ensure scale is clamped or clipped in the middle as well as at both ends.
- For optimum performance the readhead should be installed close to nominal geometry.
- Care should be taken to ensure sufficient clearance between the readhead/mounting bracket and clips/datum clamp.
- Only special low-profile screws should be used. Screws are provided with all clips/datum clamps, and spares can be supplied if required.

RSLM20 scale measuring length

For further details please refer to relevant system installation guides

Dimensions and tolerances in mm



Scale part numbers

20 µm pitch stainless steel spar scale

Series	Reference mark	Part number	Minimum length	Maximum length	Available in increments of	Ordering instructions
RSLM20	Single *IN-TRAC* reference mark at mid-point of scale length	A-9682-xxxx	20 mm	5 m	10 mm	Replace xxxx with one of the available standard lengths For example, 0480 will result in a length of 480 mm
RSLE20 (option A)	Single *IN-TRAC* reference mark 20 mm from scale end	A-9683-xxxx	50 mm	5 m		
RSLE20 (option B)	Single *IN-TRAC* reference mark 70 mm from scale end	A-9689-xxxx	130 mm	5 m		
RSLC20	Multiple *IN-TRAC* reference marks spaced every 200 mm Reference mark is customer selectable with selector magnet	A-9686-xxxx	280 mm	5 m		
RSLR20	No *IN-TRAC* reference mark	A-9684-xxxx	20 mm	5 m		

Accessory part numbers

Reference mark and limit magnets*

Part description	Part number	Product image
Reference mark selector magnet – Adhesive mounted **NOTE:** Only required for selecting *IN-TRAC* reference mark on RSLC20 scale	A-9653-0143	
Q limit switch actuator magnet Adhesive mounted	A-9653-0139	
P limit switch actuator magnet Adhesive mounted	A-9653-0138	
Magnet applicator device (Aids positioning)	A-9653-0201	

*Longer limit magnets are available. Contact your local subsidiary for more information.

Clip/clamp mounting accessories†

Part description	Part number	Product image
Mounting clips	A-9584-2049	
Datum clamp kit	A-9584-2050	
Replacement M3 screws (pack of 25)	A-9584-2047	
Spare clip setting shim	M-9584-0928	

† UHV and extra wide clip/clamp accessories are available. Contact your local subsidiary for more information.

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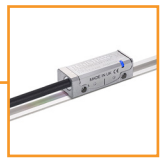
Compatible products

RSLM20
RSLE20
RSLC20

RSLR20



VIONiC

TONiC

RGH20

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

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