Data sheet
L-9517-9393-04-D

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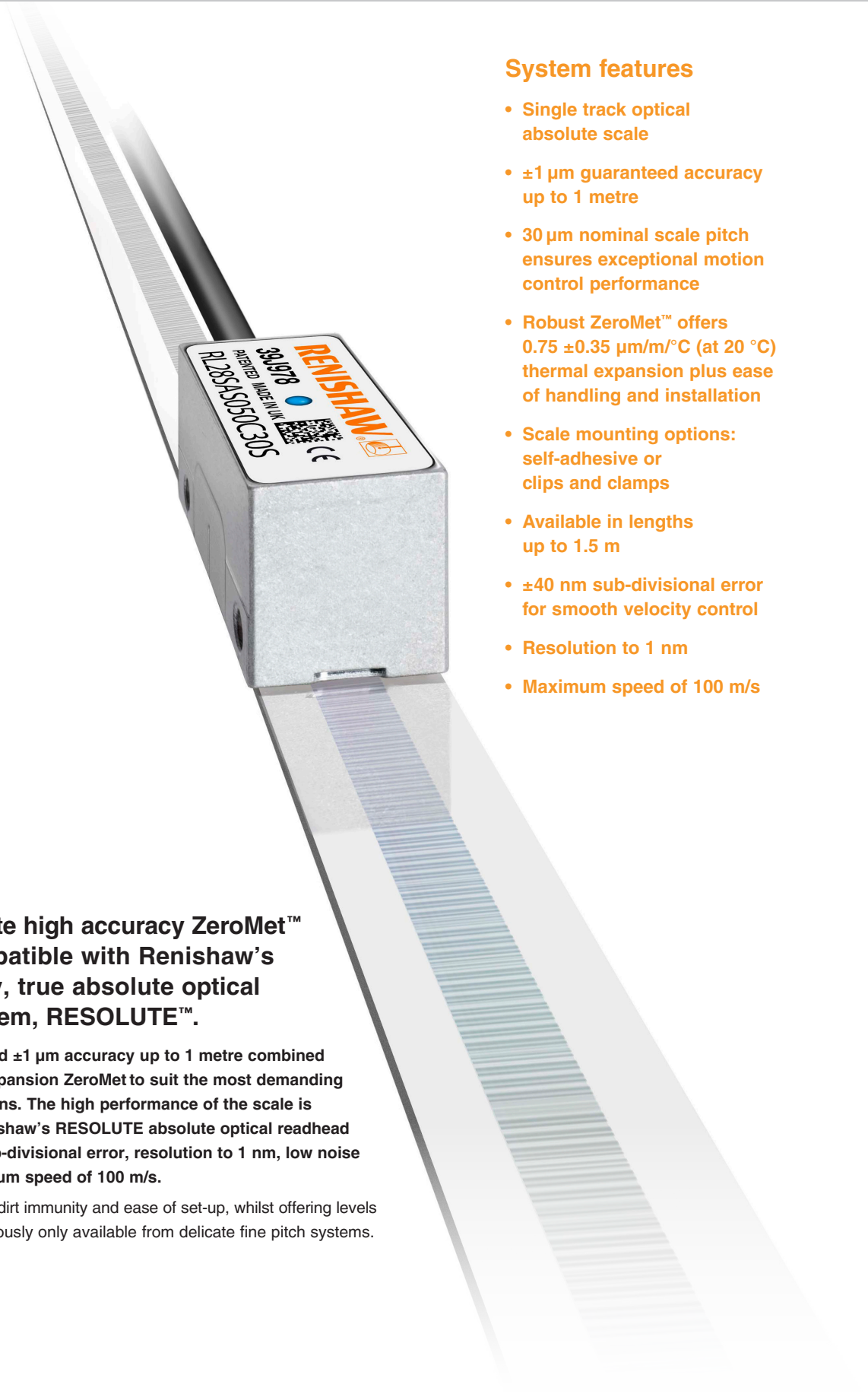
RELA absolute high accuracy scale



System features

- Single track optical absolute scale
- ±1 µm guaranteed accuracy up to 1 metre
- 30 µm nominal scale pitch ensures exceptional motion control performance
- Robust ZeroMet™ offers 0.75 ±0.35 µm/m/°C (at 20 °C) thermal expansion plus ease of handling and installation
- Scale mounting options: self-adhesive or clips and clamps
- Available in lengths up to 1.5 m
- ±40 nm sub-divisional error for smooth velocity control
- Resolution to 1 nm
- Maximum speed of 100 m/s

RELA absolute high accuracy ZeroMet™ scale is compatible with Renishaw's revolutionary, true absolute optical encoder system, RESOLUTE™.

RELA offers certified ±1 µm accuracy up to 1 metre combined with low thermal expansion ZeroMet to suit the most demanding precision applications. The high performance of the scale is augmented by Renishaw's RESOLUTE absolute optical readhead offering ±40 nm sub-divisional error, resolution to 1 nm, low noise (jitter) and a maximum speed of 100 m/s.

RELA provides good dirt immunity and ease of set-up, whilst offering levels of performance previously only available from delicate fine pitch systems.

Specifications

Scale	Track	Single absolute optical track
	Pitch	30 µm
	Form (H x W)	1.6 mm x 14.9 mm
	Maximum length	1.5 m
	Measuring length	See below
	Accuracy	Certified to ±1 µm up to 1 m, ±1 µm/m for lengths >1 m. Calibration traceable to Internation Standards
	Material	ZeroMet. High stability, low-expansion nickel-iron alloy
	Thermal expansion (at 20 °C)	0.75 ±0.35 µm/m/°C
	Mounting	Epoxy datum point and adhesive tape or mechanical datum clamp and mounting clips. Adhesive backing tape is included with all scale (nominal thickness 0.2 mm)
	Mass	184 g/m

For further information on installation and mounting options, please refer to the **RESOLUTE** RSLA/RELA linear installation guide (M-9553-9128), which is available from your local representative or can be downloaded from **www.renishaw.com** or **www.renishawsupport.com**

Measuring lengths

Scale length L (mm)	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**110**
Measuring length ML (mm)	10	20	30	40	50	60	70	100

Scale length L (mm)	**130**	**150**	**180**	**230**	**250**	**280**	**330**	**380**
Measuring length ML (mm)	120	140	170	220	240	270	320	370

Scale length L (mm)	**430**	**480**	**530**	**580**	**630**	**680**	**730**	**780**
Measuring length ML (mm)	420	470	520	570	620	670	720	770

Scale length L (mm)	**880**	**980**	**1030**	**1130**	**1230**	**1330**	**1430**	**1500**
Measuring length ML (mm)	870	970	1020	1120	1220	1320	1420	1490

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	1.5*	1.5*	0.067
5 nm	1.5*	1.5*	0.336
50 nm	1.5*	1.5*	1.5*

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)	
	34 position bits	28 position bits
1 nm	1.5*	N/A
50 nm	N/A	1.5*

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	1.5*
50 nm	1.5*

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	1.5*	3.6
50 nm	1.5*	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 1.5 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 1.5 m* is available at all resolutions

*RELA scale is available up to 1.5 m. For longer lengths, consider RSLA scale (up to 5 m) or RTLA scale (up to 21 m).
For alternative longer length scales visit www.renishaw.com

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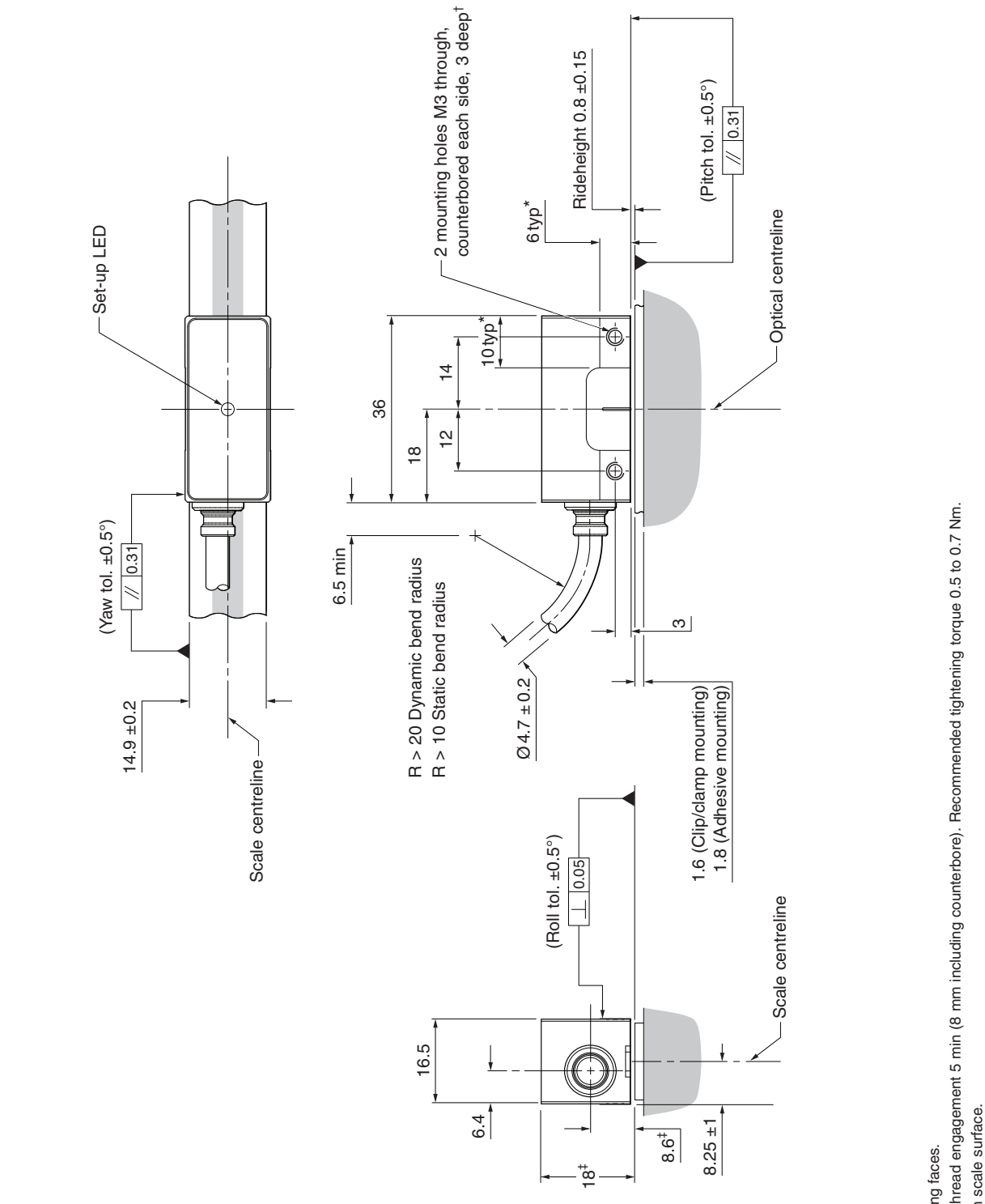
RESOLUTE installation drawing (on RELA scale)

Dimensions and tolerances in mm



* Extent of mounting faces.
† Recommended thread engagement 5 min (8 mm including counterbore). Recommended tightening torque 0.5 to 0.7 Nm.
‡ Dimensions from scale surface.

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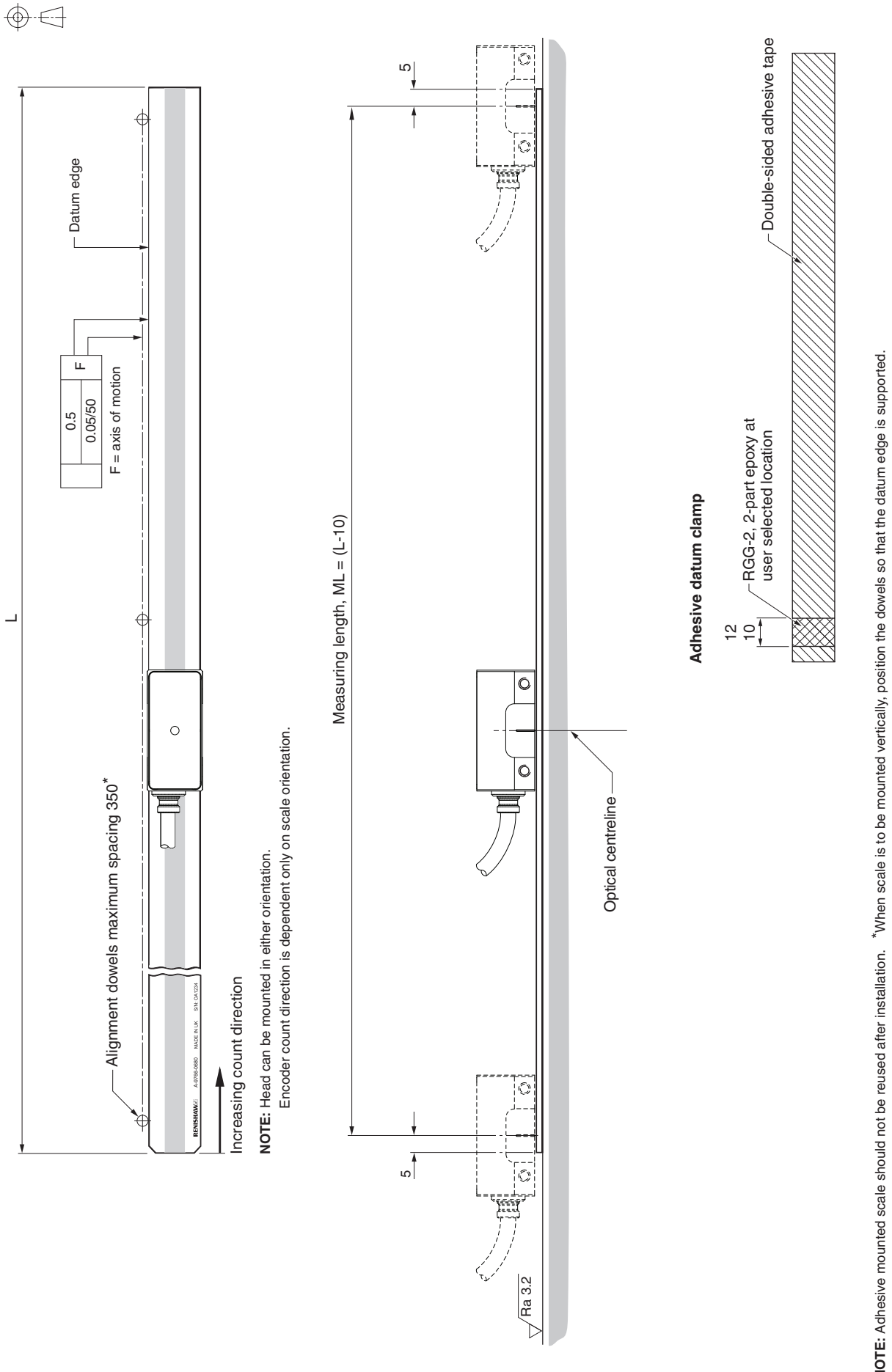
RELA installation drawing (adhesive mount)

Dimensions and tolerances in mm



NOTE: Adhesive mounted scale should not be reused after installation. *When scale is to be mounted vertically, position the dowels so that the datum edge is supported.

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Scale part numbers

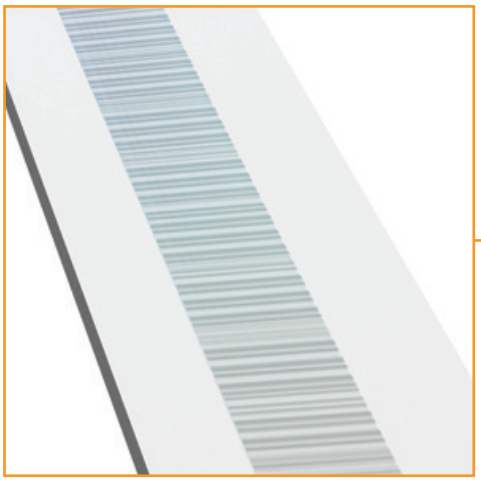
Part number is A-9766-xxxx where xxxx is the total scale length in mm *(see available lengths in table below)*

Actual spar length (mm)

0020	0110	0330	0680	1330
0030	0130	0380	0730	1430
0040	0150	0430	0780	1500
0050	0180	0480	0880	
0060	0230	0530	0980	
0070	0250	0580	1030	
0080	0280	0630	1230	

RELA compatible readheads

RELA



RESOLUTE

Installation guide M-9553-9128

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

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

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