

# EVOLUTE™ absolute optical encoder with Siemens DRIVE-CLiQ serial communications



Incorporating industry-proven technology from the RESOLUTE™ encoder series, EVOLUTE™ is a true absolute 50 µm scale period optical encoder with wide installation tolerances and high immunity to dirt.

Using a scale period of 50 µm gives the EVOLUTE encoder system a generous 500 µm rideheight tolerance and its single-track optics are optimised for contamination resistance. Data redundancy encoded into the robust scale minimises the risk of positional error while sophisticated error checking mechanisms ensure an error flag is always asserted when the position cannot be determined.

The EVOLUTE system provides absolute position with 50 nm resolution. Advanced optical design and high-speed signal processing mean sub-divisional error (SDE) is as low as ±150 nm with noise (jitter) below 10 nm RMS.

EVOLUTE encoders are mechanically identical to RESOLUTE encoders and are supplied with RTLA50 scale that can be used, either in its self-adhesive form, RTLA50-S, or in the *FASTRACK*™ scale carrier system.

- True absolute non-contact optical encoder system: no batteries required
- Wide set-up tolerances for quick and easy installation
- Integral set-up LED enables easy installation and provides diagnostics at a glance
- Enhanced immunity to dirt, scratches and light oils
- 50 nm resolution
- 100 m/s maximum speed for all resolutions
- ±150 nm sub-divisional error for smooth velocity control
- Less than 10 nm RMS jitter for improved positional stability
- Built-in separate position-checking algorithm provides inherent safety
- Readhead is reversible for flexible mounting. Scale orientation defines count direction only
- Scale lengths up to 10.02 m
- Operates up to 80 °C
- Integral over-temperature alarm

**Compatible with:**

- RTLA50-S self-adhesive tape scale
- RTLA50 with *FASTRACK* carrier
- Optional Advanced Diagnostic Tool ADTa-100

## Resolutions and scale lengths

EVOLUTE with Siemens DRIVE-CLiQ serial comms is available with 50 nm resolution option.

The maximum reading speed is 100 m/s.

The maximum scale length is as described in the scale specifications below: i.e., it is not limited by absolute word length.


**Contact your local Renishaw representative for details of other serial protocols.**

## Scale specifications

For more detailed scale information refer to the relevant scale data sheet.

<b>Description</b>	RTLA50-S	Self-adhesive hardened stainless steel tape scale for high-performance motion control systems requiring easiest installation. Lengths up to 10.02 m
	RTLA50/FASTRACK	Carrier-mounted hardened stainless steel tape scale for high-performance motion control systems requiring easier and faster scale installation and field replacement. RTLA50 lengths up to 10.02 m FASTRACK lengths up to 25 m
<b>Accuracy</b> (at 20 °C)		±10 µm/m
<b>Coefficient of thermal expansion</b> (at 20 °C)		10.1 ±0.2 µm/m/°C

## General specifications

<b>Power supply</b>	24 V	3.05 W maximum (encoder: 1.25 W + interface: 1.8 W) 24 Vdc power is provided by the DRIVE-CLiQ network <b>NOTE:</b> The Renishaw DRIVE-CLiQ interface must be powered from a 24 Vdc supply complying with the requirements for SELV of standard IEC 60950-1.
	Ripple	200 mVpp maximum @ frequency up to 500 kHz maximum
<b>Temperature</b> (system)	Storage	-20 °C to +70 °C
	(readhead)	Operating 0 °C to +80 °C
	(interface)	Operating 0 °C to +55 °C
<b>Humidity</b> (system)		95% relative humidity (non-condensing) to IEC 60068-2-78
<b>Sealing</b> (readhead)		IP64
	(interface)	IP67
<b>Acceleration</b>	Operating	500 m/s <sup>2</sup> , 3 axes
<b>Shock</b> (readhead/interface)	Non-operating	500 m/s <sup>2</sup> , 11 ms, ½ sine, 3 axes
<b>Maximum acceleration of scale with respect to readhead</b>		2000 m/s <sup>2</sup> <b>NOTE:</b> This is the worst case figure that is correct for the slowest communications request rates. For faster request rates, the maximum acceleration of scale with respect to the readhead can be higher. For more details, contact your local Renishaw representative.
<b>Vibration</b> (readhead)	Operating	300 m/s <sup>2</sup> , 55 Hz to 2000 Hz, 3 axes
	(interface)	Operating 100 m/s <sup>2</sup> , 55 Hz to 2000 Hz, 3 axes
<b>Mass</b>	Readhead	18 g
	Interface	218 g
	Readhead cable	32 g/m
<b>Cable</b> (readhead to interface)		7 core, tinned and annealed copper, 28 AWG Single-shielded, outside diameter 4.7 ±0.2 mm Flex life > 40 × 10 <sup>6</sup> cycles at 20 mm bend radius 10 m maximum length (refer to Siemens DRIVE-CLiQ specifications for maximum cable length from interface to controller) UL recognised component 

## Optional Advanced Diagnostic Tool ADTa-100



The EVOLUTE encoder system is compatible with the Advanced Diagnostic Tool ADTa-100\* and ADT View software, which acquire detailed real-time data from the readhead to allow easy set-up, optimisation and in-field fault finding.

The intuitive software interface provides:

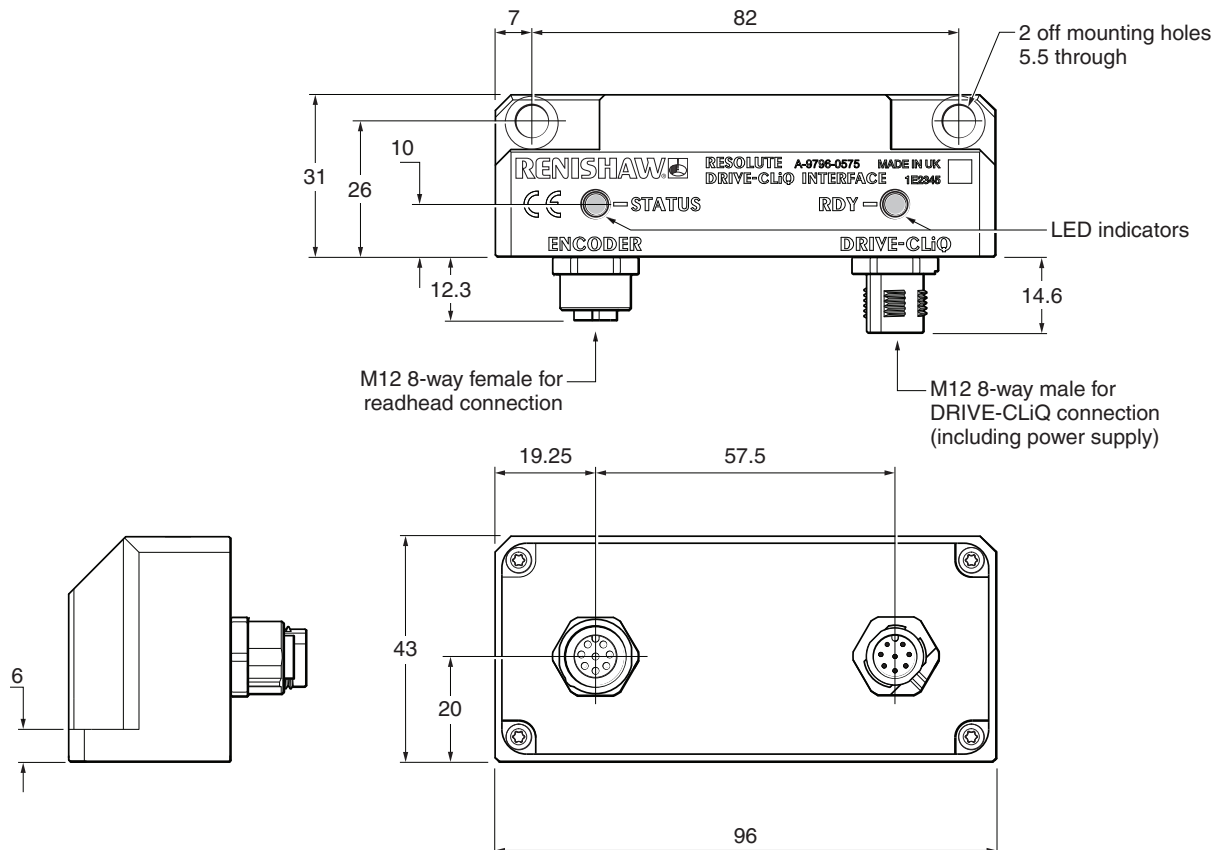
- ▶ Digital readout of encoder position and signal strength
- ▶ Graph of signal strength over the entire axis travel
- ▶ Ability to set a new zero position for the encoder system
- ▶ System configuration information

\*ADTa-100 compatible readheads are marked with the symbol **ADT**

## Siemens DRIVE-CLiQ interface (A-9796-0575)

Dimensions and tolerances in mm

### DRIVE-CLiQ interface installation drawing

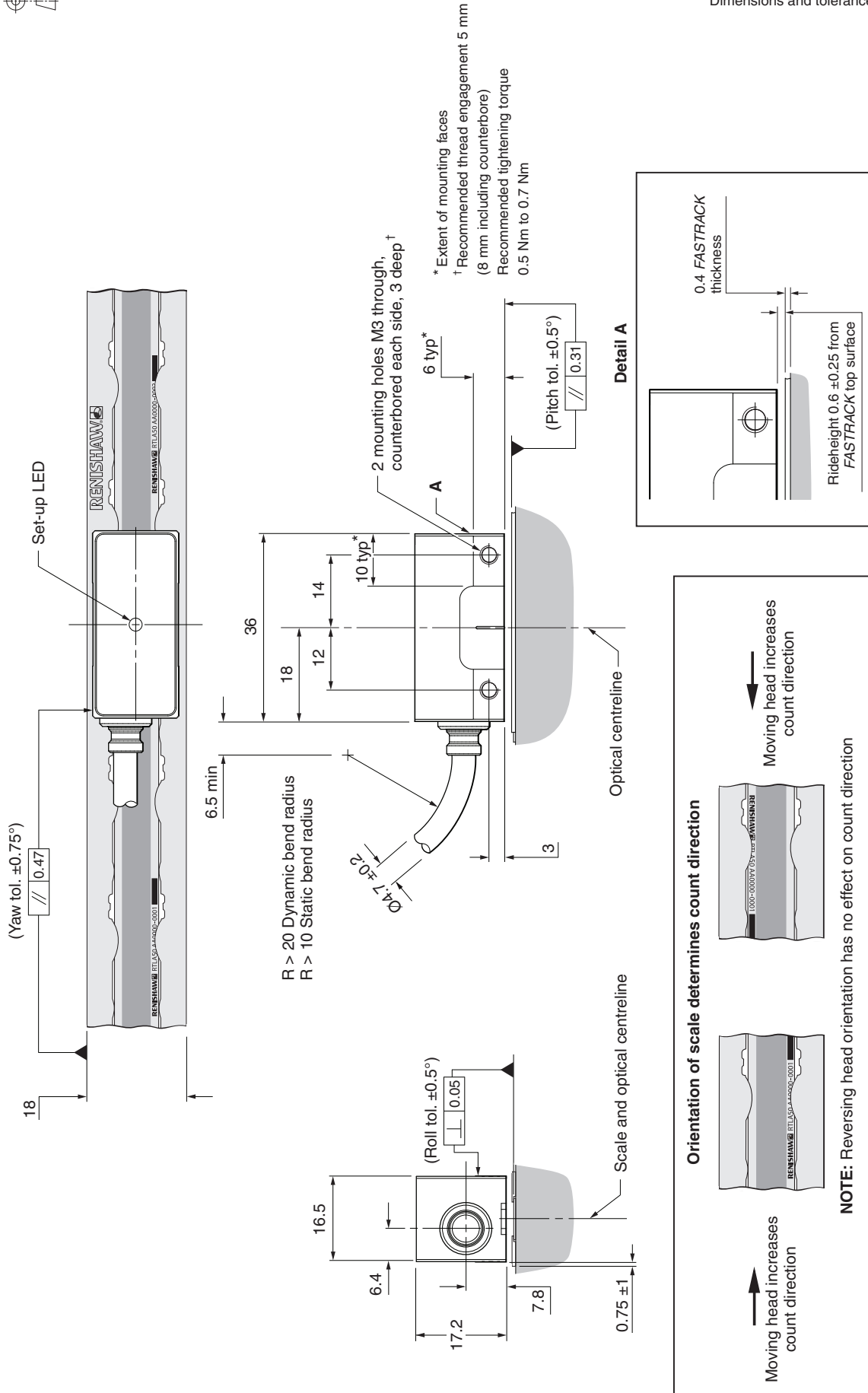


**EVOLUTE installation drawing (RTLA50 and FASTRACK)**

For further details, including side-exit version, refer to EVOLUTE RTLA50/FASTRACK installation guide (M-6183-9040)



Dimensions and tolerances in mm

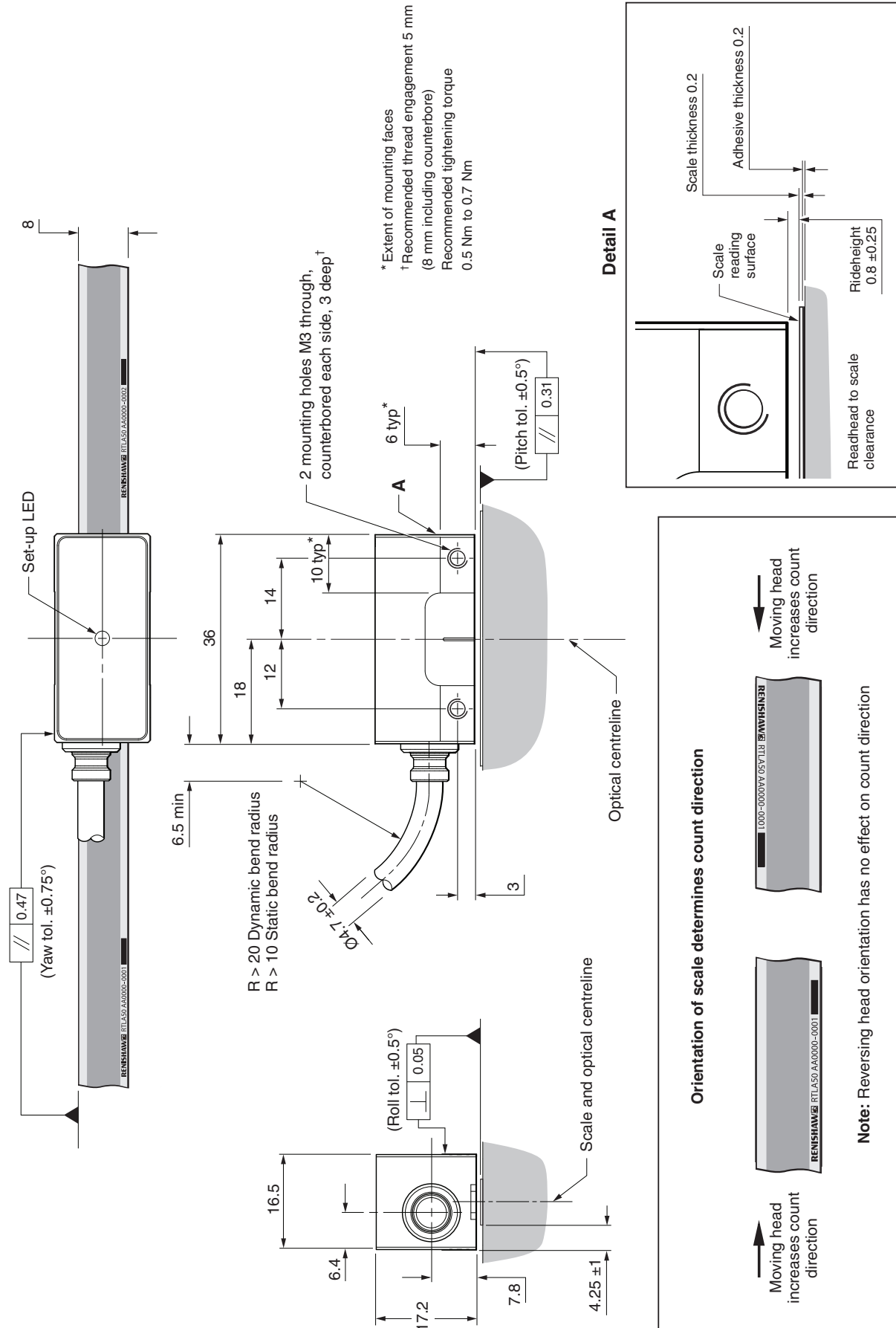


### EVOLUTE installation drawing (RTLA50-S)

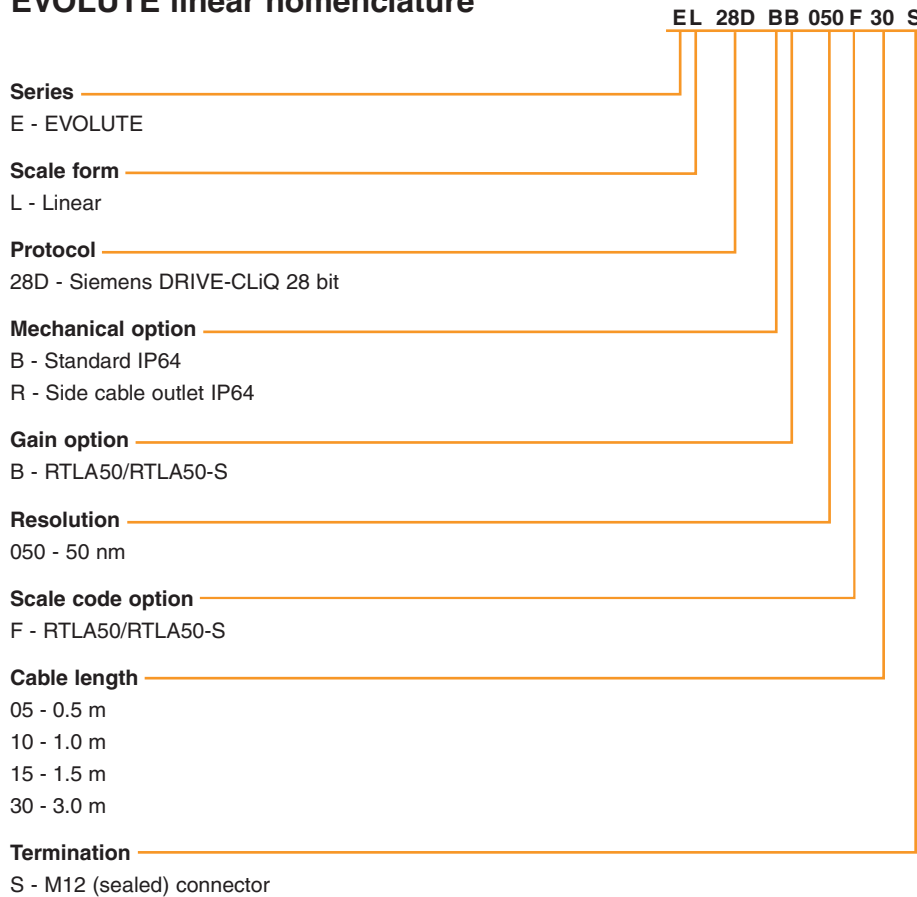
For further details, including side-exit version, refer to EVOLUTE RTLA50-S installation guide (M-6183-9046)



Dimensions and tolerances in mm

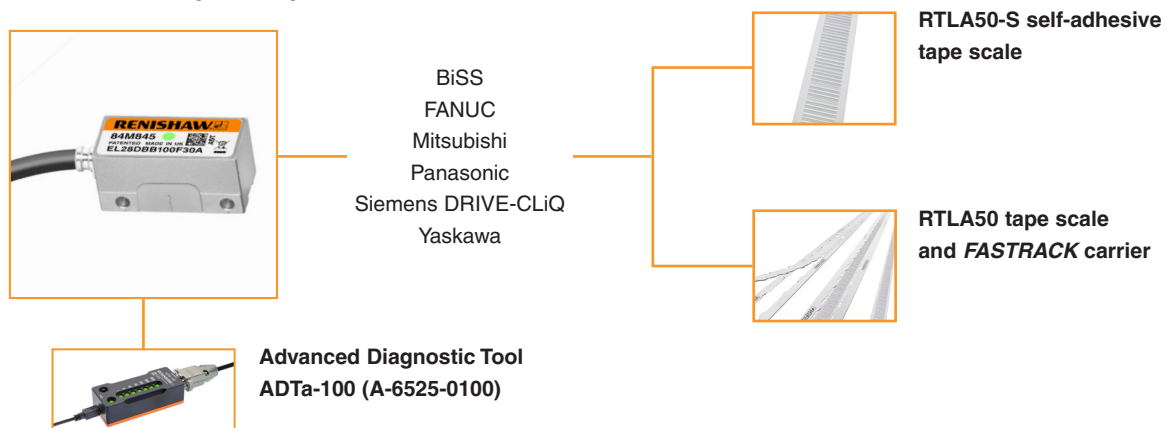


## EVOLUTE linear nomenclature



For scale nomenclature see *RTLA50 absolute linear encoder scale system for EVOLUTE™* data sheet (Renishaw part no. L-9517-9628).

## EVOLUTE compatible products



For more information about ADTa-100 and the scale refer to the relevant data sheets and installation guides which can be downloaded from [www.renishaw.com/evolutedownloads](http://www.renishaw.com/evolutedownloads)

For worldwide contact details, visit [www.renishaw.com/contact](http://www.renishaw.com/contact)

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Registered office: New Mills, Wotton-under-Edge, Gloucestershire, GL12 8JR, UK.



L - 9517 - 9909 - 01

Part no.: L-9517-9909-01-B  
Issued: 02.2021