Data sheet
L-9517-9405-04-A

RENISHAW
apply innovation™

REXA30 ultra-high accuracy absolute angle encoder



With zero coupling losses and exceptional repeatability, the REXA30 ultra-high accuracy angle encoder achieves better than ±1 arc second total installed accuracy.

Like the RESA30 encoder, the REXA30 is a stainless steel ring with the scale graduations marked axially onto the periphery, but with a number of differences to improve upon RESA30's already impressive accuracy.

REXA30 has a thicker cross-section to ensure that the only significant installation error is eccentricity. Eccentricity is easily removed by using 2 readheads, and combining the signals inside the host controller.

The only errors remaining are graduation errors and readhead SDE, both of which are so small they are often negligible.

As a non-contact encoder, REXA30 offers dynamic performance advantages, eliminating coupling losses, oscillation, shaft torsion and other hysteresis errors that plague enclosed encoders.

The REXA30 system operates at temperatures up to +80 °C and speeds to 8 500 rev/min.

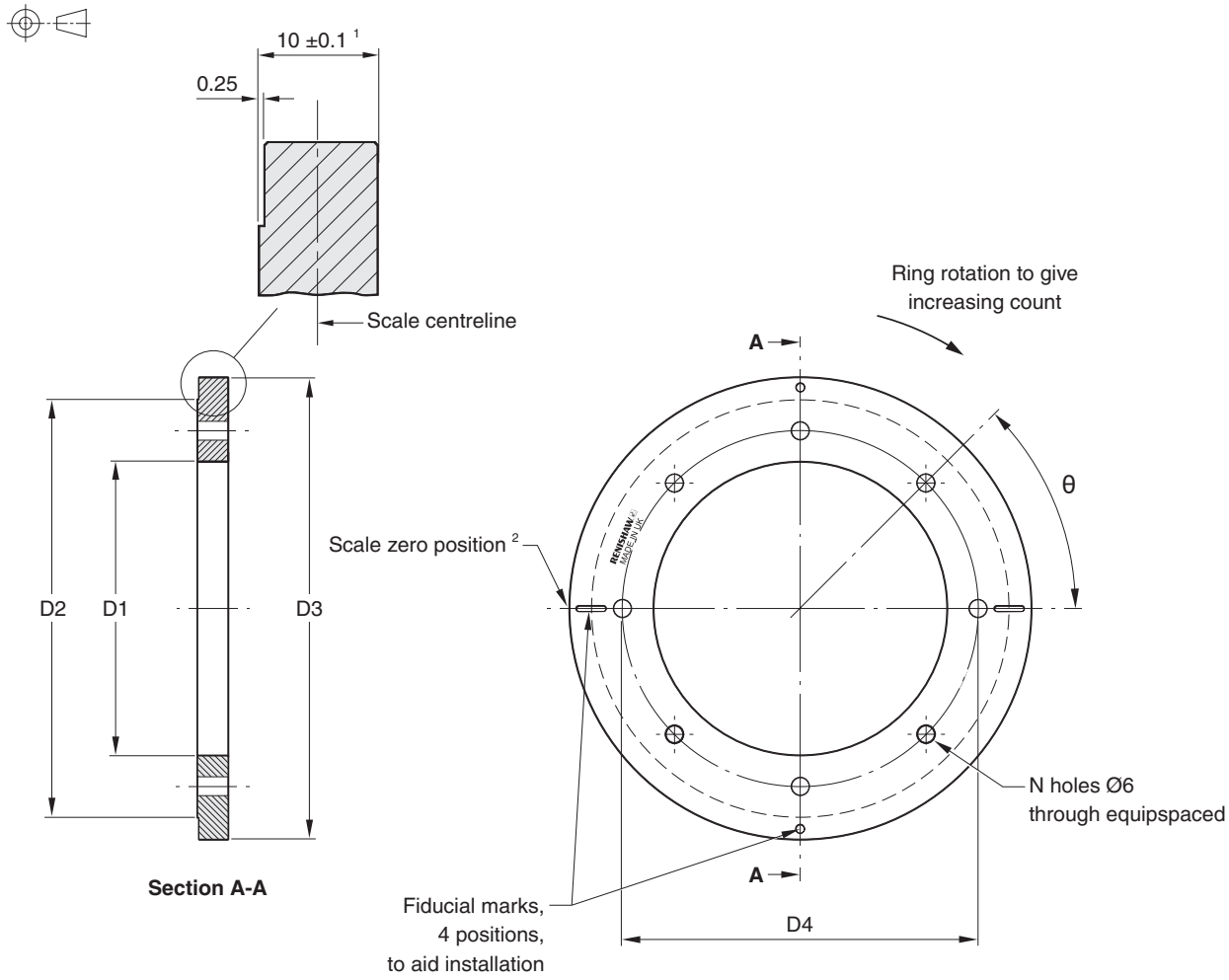
- **Use with two RESOLUTE™ readheads to give ultra-high accuracy**
- **Installed accuracy to ±1 arc second with dual readheads**

REXA30 outer diameter	Total installed accuracy (with 2 readheads)
≥ 100 mm	±1 arc second
75 mm	±1.5 arc second
≤ 57 mm	±2 arc second

- **Sub-divisional error to ±0.04 arc second**
- **Resolutions to 0.00030 arc second**
- **Repeatability to 0.01 arc second**
- **Wide range of standard sizes from 52 mm to 417 mm**
- **Large internal diameter for ease of integration**
- **Flange mounted with easy 4-point adjustment method**

REXA30 installation drawing

Dimensions and tolerances in mm



Nominal external diameter (mm)	Dimensions			Mounting holes		
	D1	D2	D3	N	D4	θ
52 [3]	26	50	52.1 – 52.2	4	38	90°
57 [3]	26	50	57.25 – 57.35	4	38	90°
75	40.5	64.5	75.3 – 75.4	8	52.5	45°
100	57.5	97.5	100.2 – 100.3	8	77.5	45°
103	57.5	97.5	103.0 – 103.2	8	77.5	45°
104	57.5	97.5	104.2 – 104.4	8	77.5	45°
115	68	108	114.5 – 114.7	8	88	45°
150	96	136	150.2 – 150.4	8	116	45°
183	122.5	162.5	183.2 – 183.4	12	142.5	30°
200	136	176	200.2 – 200.4	12	156	30°
206	140.5	180.5	206.1 – 206.5	12	160.5	30°
209	140.5	180.5	208.4 – 208.8	12	160.5	30°
229	160.5	200.5	229.0 – 229.4	12	180.5	30°
255	180.5	220.5	254.4 – 254.8	12	200.5	30°
300	216	256	300.2 – 300.4	12	236	30°
350	256	296	350.2 – 350.4	16	276	22.5°
417	305	345	417.0 – 417.4	16	325	22.5°

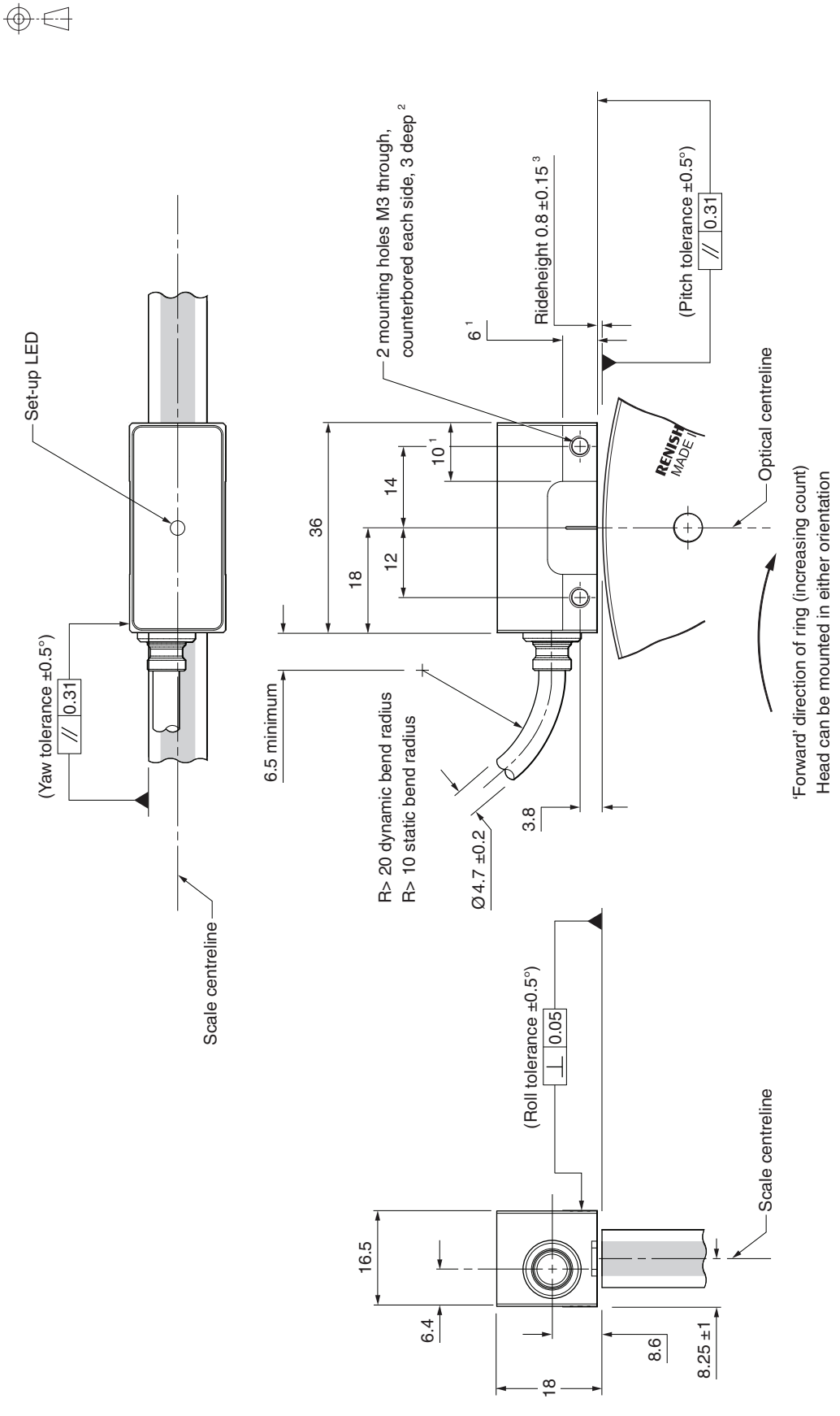
1 Graduations are centered within this dimension.

2 The scale zero position is radially aligned with the centre of the mounting hole to the left of the 'Renishaw' logo.

3 52 mm and 57 mm rings have dimple fiducial features and no slots.

RESOLUTE readhead installation drawing

Dimensions and tolerances in mm



1 Extent of mounting faces.

2 The recommended thread engagement is 5 mm minimum (8 mm including counterbore) and the recommended tightening torque is 0.5 Nm to 0.7 Nm.

3 0.8 ±0.1 mm on 52 mm rings.

For more information on installation and mounting options, refer to the *RESOLUTE™ RESA30 and REXA30 absolute angle encoders* installation guide (Renishaw part no. M-9553-9735). This can be downloaded from our website **www.renishaw.com/resolutedownloads** or contact your local Renishaw representative.

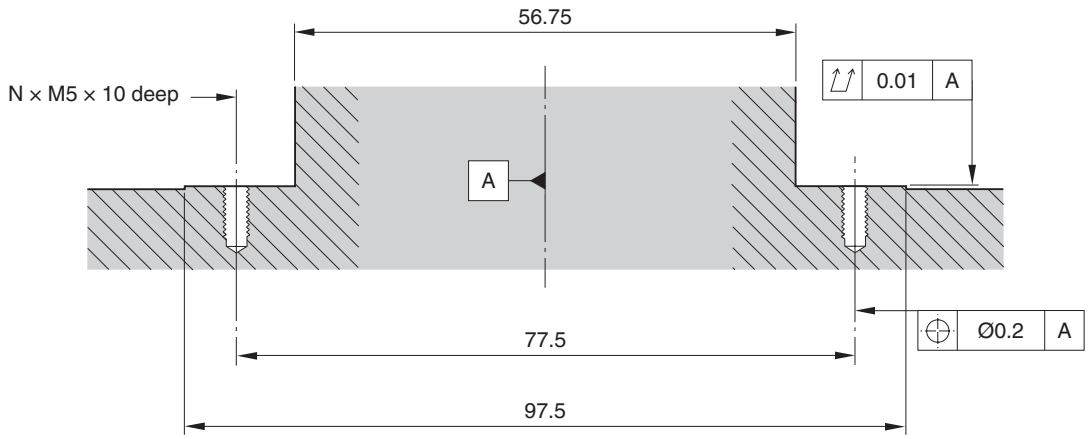
Mounting method

IMPORTANT: Flange mount only. Do **NOT** interference fit.

NOTE: If using REXA30 with a RESOLUTE ETR, please contact your local Renishaw representative for more information.

Example of mounting surface for 104 mm diameter REXA30 ring

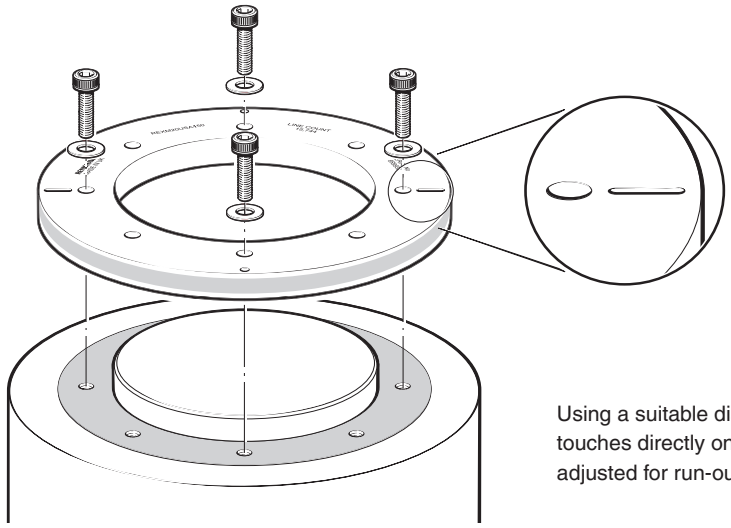
Dimensions in mm



For other ring sizes refer to the *RESOLUTE™ RESA30 and REXA30 absolute angle encoders* installation guide (Renishaw part no. M-9553-9735). This can be downloaded from our website **www.renishaw.com/resolutedownloads**.

Installation technique

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REXA30 rings are made with 4 fiducial points engraved onto the top surface, which simplify alignment.

Using a suitable dial test indicator, positioned so that the stylus ball touches directly onto the scale surface, the ring only needs to be adjusted for run-out at the 4 fiducial points.

Operating specifications

Material			303/304 stainless steel
Coefficient of thermal expansion (at 20 °C)			15.5 ±0.5 µm/m/°C
Temperature	**(system)**	Storage	–20 °C to +80 °C (Standard and FS systems)
			–40 °C to +80 °C (ETR system)
			0 °C to +80 °C (UHV system)
	(readhead)	Operating	0 °C to +80 °C (Standard and FS readheads)
			–40 °C to +80 °C (ETR readhead)
			0 °C to +75 °C (UHV readhead)
	(interface)	Operating	0 °C to +55 °C (DRIVE-CLiQ interface)

Ring mass and inertia

	Nominal external diameter (mm)								
	52	**57**	**75**	**100**	**103**	**104**	**115**	**150**	**183**
Mass (kg)	0.12	0.16	0.24	0.41	0.45	0.47	0.53	0.83	1.16
Moment of inertia (kg-cm^2)	0.52	0.79	2.22	6.94	7.89	8.31	11.7	33.3	70.4

	Nominal external diameter (mm)							
	200	**206**	**209**	**229**	**255**	**300**	**350**	**417**
Mass (kg)	1.35	1.43	1.49	1.68	2.02	2.73	3.59	5.09
Moment of inertia (kg-cm^2)	99	111	118	164	246	468	845	1 700

Speed

Nominal external diameter (mm)	Maximum reading speed (rev/min)
52	8 500
57	7 300
75	7 100
100	4 700
103	4 400
104	4 400
115	3 800
150	2 700
183	2 500
200	2 200
206	2 100
209	2 000
229	1 800
255	1 600
300	1 200
350	1 200
417	900

NOTE: The maximum speed for REXA30 rings is limited by mechanical effects. The readhead is capable of reading much higher speeds. For more information and advice on using angle encoders at high speed, please contact your local Renishaw representative.

Resolution

RESOLUTE is available with a variety of resolutions, to meet the needs of a wide range of applications.

The choice of resolutions depends on the serial protocol being used, but there are no limitations due to ring size, for example, FANUC 27 bit resolution is available on all ring sizes.

BiSS RESOLUTE resolution options:

Resolution	Counts per revolution	Arc second
18 bit	262 144	≈ 4.94
26 bit	67 108 864	≈ 0.019
32 bit	4 294 967 296	≈ 0.00030

NOTE: 32 bit resolution is below the noise floor of the RESOLUTE encoder.

FANUC RESOLUTE resolution options:

Resolution	Counts per revolution	Arc second
27 bit	134 217 728	≈ 0.0097
31 bit	2 147 483 648	≈ 0.0006

Mitsubishi RESOLUTE resolution options:

Resolution	Counts per revolution	Arc second
23 bit	8 388 608	≈ 0.15
27 bit	134 217 728	≈ 0.0097

Panasonic RESOLUTE resolution options:

Resolution	Counts per revolution	Arc second
23 bit	8 388 608	≈ 0.15
32 bit	4 294 967 296	≈ 0.0003

Siemens DRIVE-CLiQ RESOLUTE resolution options:

Resolution	Counts per revolution	Arc second
26 bit	67 108 864	≈ 0.019
29 bit	536 870 912	≈ 0.0024

Yaskawa RESOLUTE resolution options:

	Resolution	Counts per revolution	Arc second
Rotary servomotors:	24 bit	16 777 216	≈ 0.077
Fully closed loop control:	23 bit	8 388 608	≈ 0.154
	26 bit	67 108 864	≈ 0.019
	30 bit	1 073 741 824	≈ 0.0012

Angle encoder part numbers

REXA 30U S A 150 B

Scale code

B = Standard

Outer diameter

052 = 52 mm	150 = 150 mm	300 = 300 mm
057 = 57 mm	183 = 183 mm	350 = 350 mm
075 = 75 mm	200 = 200 mm	417 = 417 mm
100 = 100 mm	206 = 206 mm	
103 = 103 mm	209 = 209 mm	
104 = 104 mm	229 = 229 mm	
115 = 115 mm	255 = 255 mm	

Form

A = Standard

Material

S = Stainless steel

Pitch

30U = 30 µm

Absolute ultra-high accuracy angle encoder series

RENISHAW
apply innovation™

Compatible products

REXA30



RESOLUTE standard readheads



RESOLUTE UHV
(Ultra-High Vacuum) readheads



RESOLUTE ETR
(Extended Temperature Range) readheads



RESOLUTE FS
(Functional Safety) readheads



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