

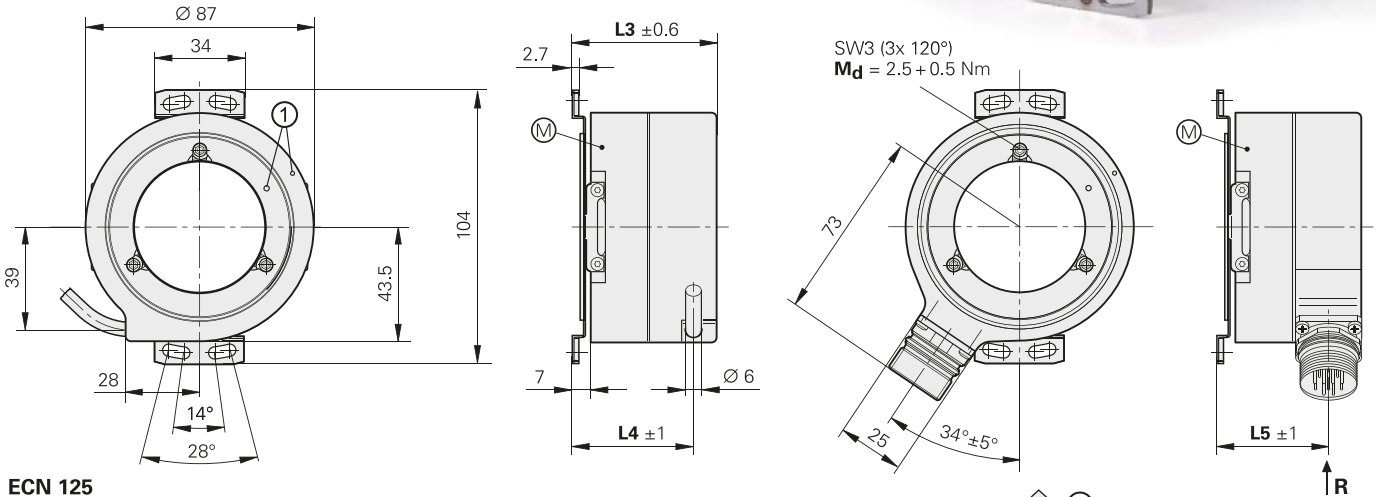
ECN/ERN 100 series

Absolute and incremental rotary encoders

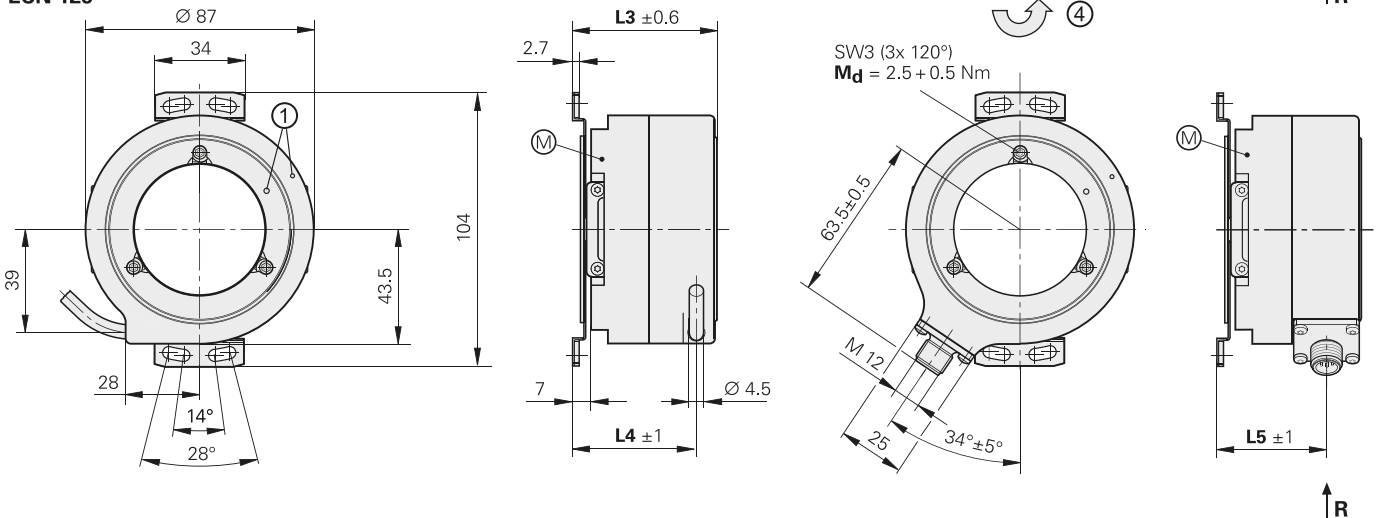
- Stator coupling for plane surface
- Hollow through shaft



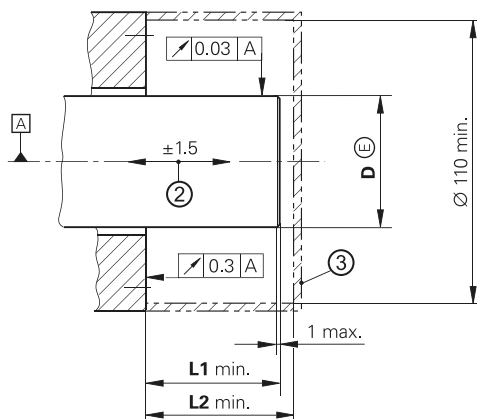
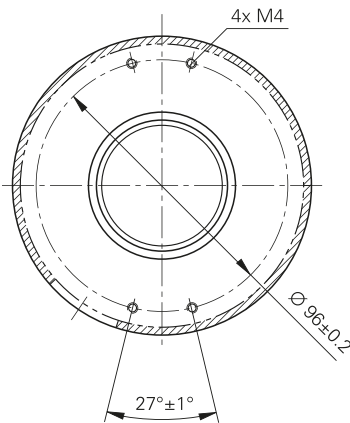
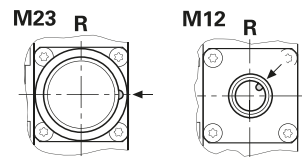
ERN 1x0/ECN 113



ECN 125



Connector coding
R = Radial



D	L1	L2	L3	L4	L5
Ø 20h7	41	43.5	40	32	26.5
Ø 25h7	41	43.5	40	32	26.5
Ø 38h7	56	58.5	55	47	41.5
Ø 50h7	56	58.5	55	47	41.5

mm

Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

Cable radial, also usable axially

▣ = Bearing







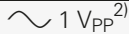
⊙ = Measuring point for operating temperature

1 = ERN: reference mark position ±15°; ECN: Zero position ±15°

2 = Compensation of mounting tolerances and thermal expansion; no dynamic motion permitted

3 = Ensure protection against contact (EN 60 529)

4 = Direction of shaft rotation for output signals as per the interface description

	Absolute		Incremental		
	Singletum		ERN 120	ERN 130	ERN 180
	ECN 125	ECN 113			
Interface	EnDat 2.2	EnDat 2.2			
Ordering designation	EnDat22	EnDat01	–		
Positions per revolution	33554432 (25 bits)	8192 (13 bits)	–		
Code	Pure binary		–		
Elec. permissible speed Deviation ¹⁾	n_{\max} for continuous position value	$\leq 600 \text{ rpm}/n_{\max}$ $\pm 1 \text{ LSB}/\pm 50 \text{ LSB}$	–		
Calculation time t_{cal} Clock frequency	$\leq 7 \mu\text{s}$ $\leq 16 \text{ MHz}$	$\leq 9 \mu\text{s}$ $\leq 2 \text{ MHz}$	–		
Incremental signals	Without				
Line counts*	–	2048	1000 1024 2048	2500 3600 5000	
Reference mark	–	–	One		
Cutoff frequency –3 dB Output frequency Edge separation a	– – –	$\geq 400 \text{ kHz}$ typical – –	– $\leq 300 \text{ kHz}$ $\geq 0.39 \mu\text{s}$	$\geq 180 \text{ kHz}$ typical – –	
System accuracy	$\pm 20''$		1/20 of grating period		
Electrical connection*	<ul style="list-style-type: none"> • Flange socket M12, radial • Cable 1 m/5 m, with M12 coupling 	<ul style="list-style-type: none"> • Flange socket M23, radial • Cable 1 m/5 m, with or without M23 coupling 	<ul style="list-style-type: none"> • Flange socket M23, radial • Cable 1 m/5 m, with or without M23 coupling 		
Voltage supply	DC 3.6 V to 14 V		DC 5 V ± 0.5 V	DC 10 V to 30 V	DC 5 V ± 0.5 V
Power consumption (max.)	3.6 V: $\leq 620 \text{ mW}$ /14 V: $\leq 720 \text{ mW}$		–		
Current consumption (without load)	5 V: $\leq 85 \text{ mA}$ (typical)		$\leq 120 \text{ mA}$	$\leq 150 \text{ mA}$	$\leq 120 \text{ mA}$
Shaft*	Hollow through shaft D = 20 mm, 25 mm , 38 mm, 50 mm				
Mech. permissible speed $n^{3)}$	$D > 30 \text{ mm}$: $\leq 4000 \text{ rpm}$; $D \leq 30 \text{ mm}$: $\leq 6000 \text{ rpm}$				
Starting torque At 20 °C	$D > 30 \text{ mm}$: $\leq 0.2 \text{ Nm}$ $D \leq 30 \text{ mm}$: $\leq 0.15 \text{ Nm}$				
Moment of inertia of rotor/ angle acceleration ⁴⁾	$D = 50 \text{ mm}$ $220 \times 10^{-6} \text{ kgm}^2/\leq 5 \times 10^4 \text{ rad/s}^2$; $D = 38 \text{ mm}$ $350 \times 10^{-6} \text{ kgm}^2/\leq 2 \times 10^4 \text{ rad/s}^2$ $D = 25 \text{ mm}$ $96 \times 10^{-6} \text{ kgm}^2/\leq 3 \times 10^4 \text{ rad/s}^2$; $D = 20 \text{ mm}$ $100 \times 10^{-6} \text{ kgm}^2/\leq 3 \times 10^4 \text{ rad/s}^2$				
Permissible axial motion of measured shaft	$\pm 1.5 \text{ mm}$				
Vibration 55 Hz to 2000 Hz Shock 6 ms	$\leq 200 \text{ m/s}^2$; <i>flange socket version</i> : $\leq 100 \text{ m/s}^2$ (EN 60068-2-6) $\leq 1000 \text{ m/s}^2$ (EN 60068-2-27)				
Max. operating temp. ³⁾	100 °C (85 °C for ERN 130)				
Min. operating temp.	<i>Flange socket or fixed cable</i> : –40 °C; <i>moving cable</i> : –10 °C				
Protection ³⁾ EN 60529	IP64				
Mass	0.6 kg to 0.9 kg depending on the hollow-shaft version				
Valid for ID	810801-xx	810800-xx	589611-xx	589612-xx	589614-xx

Bold: This preferred version is available on short notice. * Please select when ordering

¹⁾Velocity-dependent deviations between the absolute value and incremental signals ²⁾Restricted tolerances: signal amplitude $0.8 V_{PP}$ to $1.2 V_{PP}$

³⁾For the correlation between degree of protection, shaft speed and operating temperature, see *General mechanical information*

⁴⁾At room temperature, determined mathematically; material of mating shaft: 1.4104