



HEIDENHAIN



Product Information

ERN 1185

Incremental Rotary
Encoder with Z1 Track

November 2007

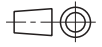
ERN 1185

Rotary encoders with integral bearing for integration in motors

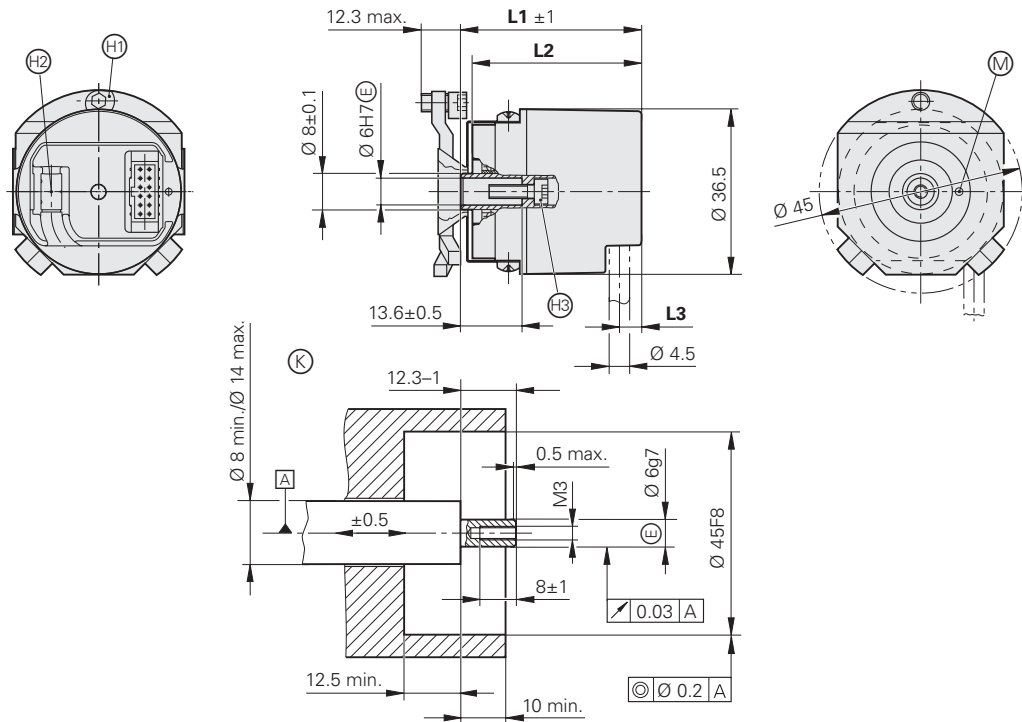
- Mounted stator coupling $\varnothing 45$ mm
- Compact design
- Blind hollow shaft



Dimensions in mm





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



	L1	L2	L3
ERN	39.9	(37.3)	4.8
ECN/EQN	42.45	(37.55)	3.9

- ▣ = Bearing
- ⊙ = Required mating dimensions
- Ⓜ = Measuring point for operating temperature
- Ⓢ = To fasten the ring coupling, turn the eccentric screw (M4) to the right by approx. 90°. Tightening torque 2 ± 0.1 Nm
- Ⓣ = Cable outlet for cables with crimp sleeve 4.3 \pm 0.3 - 7 long
- Ⓤ = Screw ISO 4762 SW2.5 M3 x 10
- ↻ Direction of shaft rotation for output signals as per the interface description

	Incremental
	ERN 1185
Incremental signals	 V _{PP} ¹⁾
Line count*/ System accuracy	512/± 60" 2048/± 40"
Reference mark	One
Cutoff frequency -3dB	512 lines: ≥ 100 kHz 2048 lines: ≥ 400 kHz
Absolute position values	 V _{PP} ¹⁾
Position values per rev	Z1 track ²⁾
Power supply	5V ± 5 %
Current consumption without load	≤ 150 mA
Electrical connection	Via 14-pin PCB connector
Shaft	Blind hollow shaft Ø 6 mm
Stator coupling*	Ø 45 mm
Mechanically permissible speed <i>n</i>	12000 min ⁻¹
Starting torque	≤ 0.001 Nm (at 20 °C)
Moment of inertia of rotor	Approx. 0.3 · 10 ⁻⁶ kgm ²
Natural frequency of the stator coupling	≥ 1500 Hz
Permissible axial motion of measured shaft	± 0.5 mm
Vibration 55 to 2000 Hz Shock 6 ms	≤ 100 m/s ² (EN 60068-2-6) ≤ 1000 m/s ² (EN 60068-2-27)
Max. operating temperature	115 °C
Min. operating temperature	-30 °C
Protection EN 60529	IP 40 when mounted
Weight (approx.)	0.1 kg

* Please indicate when ordering

¹⁾ Restricted tolerances

Signal amplitude:	0.75 to 1.2 V _{PP}
Asymmetry:	0.05
Amplitude ratio:	0.9 to 1.1
Phase angle:	90° ± 5° elec.
Signal-to-noise ratio E, F:	100 mV

²⁾ For sine commutation: One sine and one cosine signal per revolution

Electrical Connection

Pin layout

17-pin HEIDENHAIN coupling or flange socket M23						14-pin PCB connector					
	Power supply					Incremental signals					
	7	1	10	4	11	15	16	12	13	3	2
	1b	7a	5b	3a	/	6b	2a	3b	5a	4b	4a
	U _P	Sensor U _P	0V	Sensor 0V	Inside shield	A+	A-	B+	B-	R+	R-
	Brown/ Green	Blue	White/ Green	White	/	Green/ Black	Yellow/ Black	Blue/ Black	Red/ Black	Red	Black

Other signals						
	14	17	9	8	5	6
	7b	1a	2b	6a	/	/
	C+	C-	D+	D-	T+ ¹⁾	T- ¹⁾
	Gray	Pink	Yellow	Violet	Green	Brown

Cable shield connected to housing;
U_P = power supply; **T** = temperature
Sensor: The sensor line is connected internally with the corresponding power line.
 Vacant pins or wires must not be used!

¹⁾ Only for motor-internal adapter cables

Encoder cable inside the motor housing

Cable diameter 4.5 mm
 16xAWG30/7 for

	PCB connector	Crimp sleeve	Complete With PCB connector and right-angle socket M23, 17-pin	With one connector With PCB connector
ERN 1185	14-pin	∅ 4.5 mm	316594-xx	317900-xx

PUR connecting cables

	17-pin: [(4 × 0.14 mm ²) + 4(2 × 0.14 mm ²) + (4 × 0.5 mm ²)] ∅ 8 mm
Complete with connector (female) and coupling (male)	323 897-xx
Complete with connector (female) and D-sub connector (female) for IK 220	332 115-xx
Complete with connector (female) and D-sub connector (male) for IK 215	324 544-xx
With one connector (female)	309 778-xx

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For more information

- Catalog *Position Encoders for Servo Drives*