



HEIDENHAIN



Preliminary
Product Information

ERP 1000 Series Angle Encoders without Integral Bearing

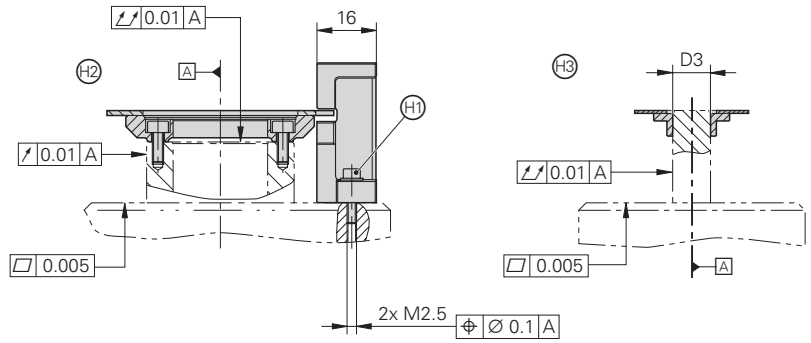
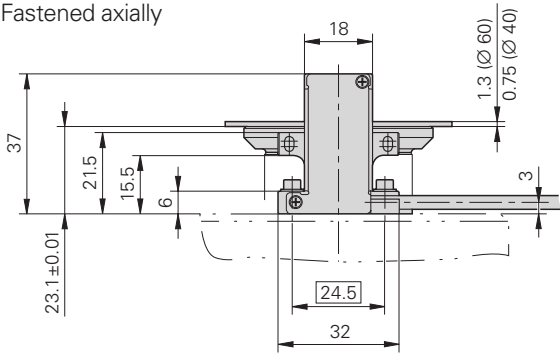
November 2008

ERP 1000 Series

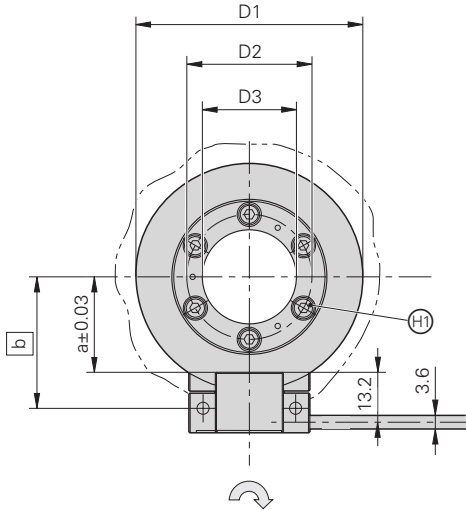
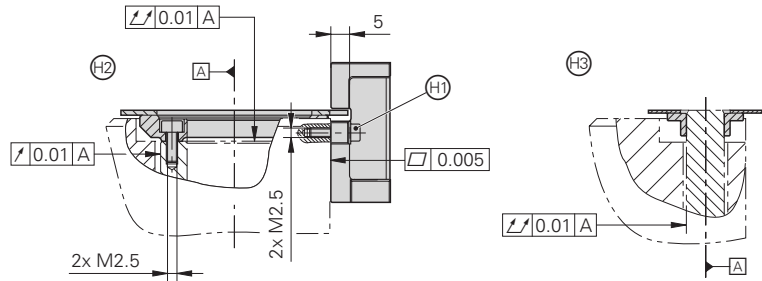
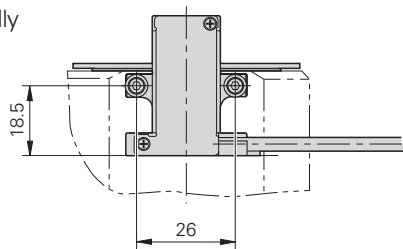
- Interferential scanning principle
- Small circular-scale diameters
- Simple mounting of circular scale by sliding it onto the shaft
- Uniform scanning head for all circular-scale diameters
- Small measuring steps



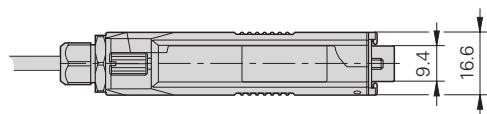
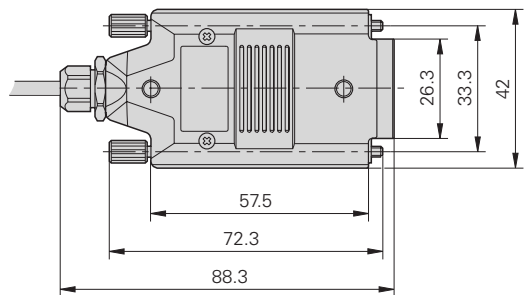
Fastened axially



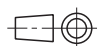
Fastened radially



	D1	a	b	D2	D3
H2	40	15.3	24.8	14.5	8
	60	25.25	34.75	33	25
H3	19	4.7	9.5	/	5.5 f7
	30	10.25	19.75	/	12 f7



Dimensions in mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ±0.2 mm

▣ = Bearing

⊕ = Cylinder head screw ISO 4762-A2-M2.5 and washer ISO 7089-2.5-140HV-A2

⊙ = Circular scale, fastened with screws

⊙ = Circular scale, fixed with adhesive

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

Specifications

Scanning head	ERP 1080 scanning head	ERP 1070 scanning head
Incremental signals	$\sim 1 V_{PP}$	$\square \square \square \text{TTL} \times 25$
Integrated interpolation*	–	25-fold
Cutoff frequency –3 dB	$\geq 200 \text{ kHz}$	–
Scanning frequency	–	$\leq 200 \text{ kHz}$
Edge separation a	–	$\geq 50 \text{ ns}$
Power supply	$5 V \pm 5\%$	
Current consumption (without load)	$\leq 90 \text{ mA}$	$\leq 120 \text{ mA}$
Electrical connection	Cable 3 m with D-sub connector (male), 15-pin	
Cable length	$\leq 30 \text{ m}$ (with HEIDENHAIN cable)	
Vibration 55 to 2000 Hz Shock 11 ms	$\leq 200 \text{ m/s}^2$ $\leq 400 \text{ m/s}^2$	
Operating temperature	0 to 50 °C	
Protection EN 60529	IP 00	
Weight Scanning head Connector Cable	6 g (without cable) 140 g 38 g/m	

Circular scale	ERP 1000 disk/hub assembly			
Measuring standard	Phase grating on glass			
Fastening of circular scale	Fixed to shaft with adhesive		Axial screws	
Drum inside diameter	5.5 mm	12 mm	8 mm	25 mm
Circular scale outside diameter	19 mm	30 mm	40 mm	60 mm
Line count/signal periods*	3600/7200	6000/12000	8192/16384	12500/25000
Reference marks	Distance-coded			
System accuracy ¹⁾	$\pm 100''$	$\pm 50''$	$\pm 40''$	$\pm 15''$
Accuracy of graduation	$\pm 20''$	$\pm 15''$	$\pm 10''$	$\pm 5''$
Mech. perm. speed	$\leq 1666 \text{ min}^{-1}$	$\leq 1000 \text{ min}^{-1}$	$\leq 700 \text{ min}^{-1}$	$\leq 480 \text{ min}^{-1}$
Moment of inertia	$82.3 \times 10^{-9} \text{ kgm}^2$	$0.41 \times 10^{-6} \text{ kgm}^2$	$2.2 \times 10^{-6} \text{ kgm}^2$	$24 \times 10^{-6} \text{ kgm}^2$
Permissible axial motion	$\leq 0.03 \text{ mm}$			
Weight approx.	3 g	6 g	18 g	58 g

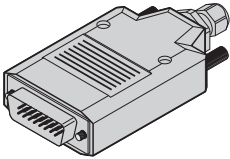

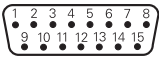
* Please indicate when ordering





¹⁾ Before installation. Additional errors caused by mounting inaccuracy and inaccuracy from the bearing of the drive shaft are not included.

Electrical Connection

Pin Layout

15-pin D-sub connector, male
with integrated interface electronics






	Power supply				Incremental signals						Other signals			
	4	12	2	10	1	9	3	11	14	7	13	8	6	15
 TTL	U _P	Sensor 5 V	0 V	Sensor 0 V	U _{a1}	\overline{U}_{a1}	U _{a2}	\overline{U}_{a2}	U _{a0}	\overline{U}_{a0}	\overline{U}_{aS}	Vacant	Vacant	Vacant
 1V _{PP}					A+	A-	B+	B-	R+	R-	Vacant			
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	/	/	Yellow

Shield on housing; **U_P** = power supply voltage

Sensor: The sensor line is connected internally with the corresponding power line

Vacant pins or wires must not be used.

Connecting Cables

PUR connecting cable [6(2 x 0.19 mm ²)]			
PUR connecting cable [4(2 x 0.14 mm ²) + (4 x 0.5 mm ²)]		Ø 8 mm	Ø 6 mm ¹⁾
Complete with D-sub connector (female), 15-pin, and M23 connector (male), 12-pin		331 693-xx	355 215-xx
With one D-sub connector (female) 15-pin		332 433-xx	355 209-xx
Complete with D-sub connector (female) and D-sub connector (male), both 15-pin		335 074-xx	355 186-xx
Complete with D-sub connector (female) and D-sub connector (female), both 15-pin Assignment for IK 220		335 077-xx	349 687-xx
Cable only		244 957-01	291 639-01

¹⁾ Cable length for Ø 6 mm max. 9 m

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For more information

- Brochure: *Angle Encoders without Integral Bearing*