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HEIDENHAIN



Product Information

ERA 4480

Mechanically compatible
with ERA 180

January 2008

ERA 4480 – Mechanically Compatible with ERA 180

- Mechanically compatible with ERA 180
- Steel circumferential-scale drum with centering collar
- Optional protective cover



ERA 4480 – Mechanically compatible with ERA 180



ERA 4480 with protective cover –
Mechanically compatible with ERA 180

ERA 4480 – Mechanically compatible with ERA 180 ¹⁾								
Incremental signals	~ 1 V _{PP}							
Reference mark	One							
Cutoff frequency –3 dB	≥ 350 kHz							
Power supply without load	5 V ± 10%/max. 100 mA							
Electrical connection	Cable, 1 m, with M23 coupling (12-pin)							
Cable length	≤ 150 m (with HEIDENHAIN cable)							
Drum inside diameter*	40 mm	80 mm	120 mm	180 mm	270 mm	425 mm	512 mm	
Drum outside diameter*	76.75 mm	127.64 mm	178.55 mm	254.93 mm	331.31 mm	484.07 mm	560.46 mm	
Line count	6000	10000	14000	20000	26000	38000	44000	
System accuracy²⁾	± 7,2"	± 4.3"	± 3.5"	± 3.2"	± 3.0"	± 2.4"	± 2.3"	
Accuracy of the graduation³⁾	± 5"	± 3"	± 2.5"			± 2"		
Mech. perm. speed	10000 min ⁻¹	6250 min ⁻¹	4500 min ⁻¹	3250 min ⁻¹	2500 min ⁻¹	1800 min ⁻¹	1500 min ⁻¹	
Moment of inertia of rotor	0.27 · 10 ⁻³ kgm ²	1.9 · 10 ⁻³ kgm ²	7.1 · 10 ⁻³ kgm ²	28 · 10 ⁻³ kgm ²	59 · 10 ⁻³ kgm ²	195 · 10 ⁻³ kgm ²	258 · 10 ⁻³ kgm ²	
Perm. axial movement	≤ ± 0.5 mm (scale drum relative to scanning head)							
Vibration 55 to 2000 Hz Shock 6 ms	≤ 200 m/s ² (EN 60068-2-6) ≤ 1000 m/s ² (EN 60068-2-27)							
Operating temperature	–10 °C to 80 °C (coefficient of expansion of the scale drum approx. 10.5 · 10 ⁻⁶ K ⁻¹)							
Protection* EN 60529								
Without protective cover	IP 00							
With protective cover ⁴⁾ and compressed air	IP 40				–			
Weight (approx.)	Scale drum	0.28 kg	0.68 kg	1.2 kg	2.3 kg	2.6 kg	3.8 kg	3.6 kg
	Protective cover	0.15 kg	0.22 kg	0.31 kg	0.33 kg	–		
Scanning head without cable	Approx. 0.080 kg; <i>Scanning head for protective cover</i> : Approx. 0.090 kg							

* Please indicate when ordering

¹⁾ 20-µm and 80-µm grating periods on request

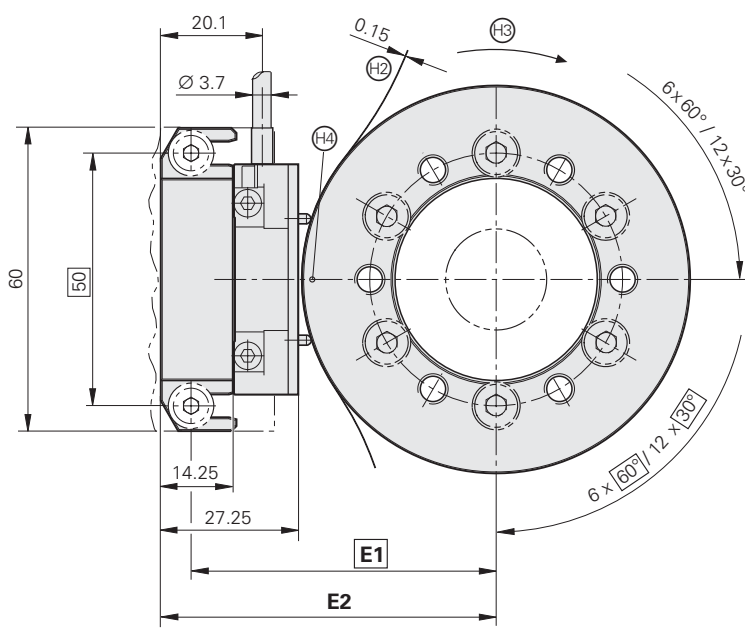
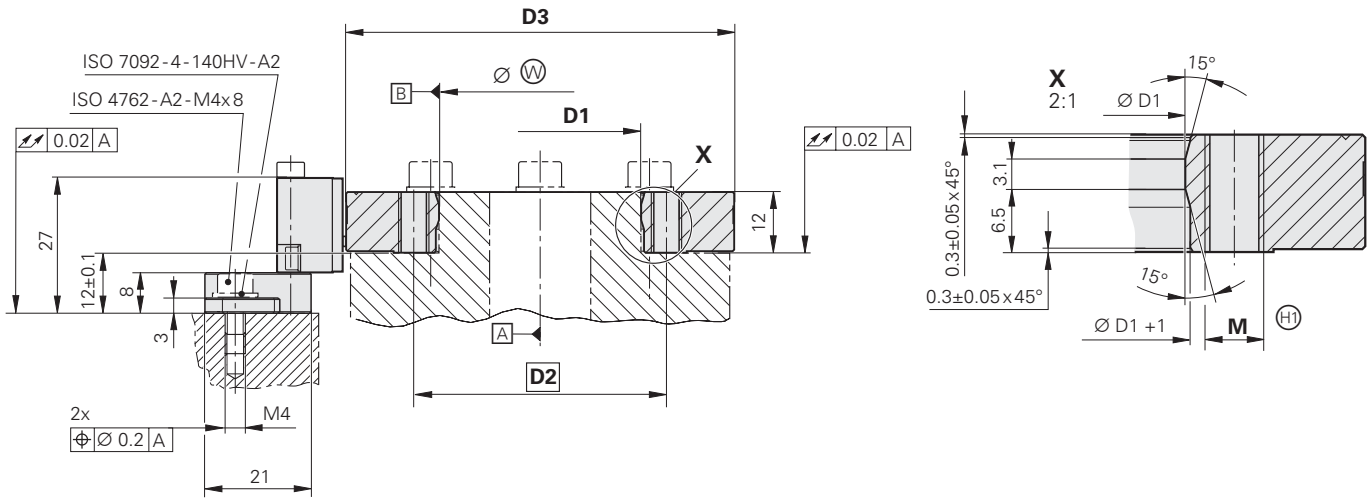
²⁾ Without installation. Additional errors caused by mounting inaccuracy and inaccuracy from the bearing of the measured shaft are not included.

³⁾ For other errors, see *Angle Encoders without Integral Bearing* brochure

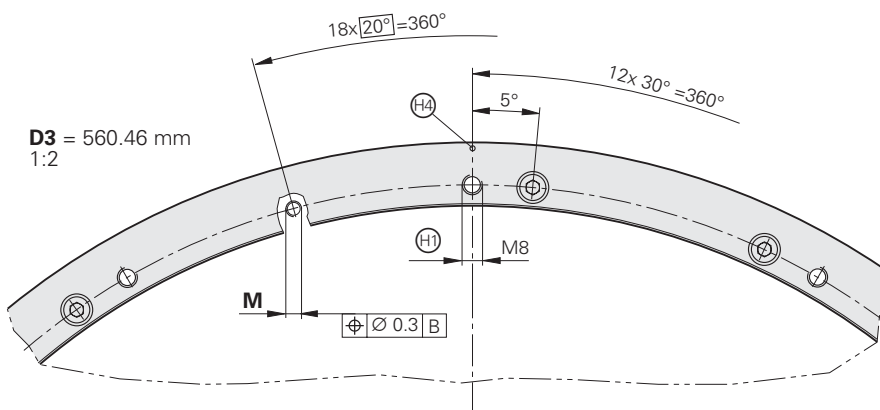
⁴⁾ Please order protective cover separately

ERA 4480 – Mechanically Compatible with ERA 180

Scanning Head without Compressed Air Inlet



ISO 7092-5-140HV-A2
D3: Ø 484.07/Ø 560.46 = ISO 7092-6-140HV-A2
 ISO 4762-A2-M5x20
D3: Ø 484.07/Ø 560.46 = ISO 4762-A2-M6x22



Dimensions in mm

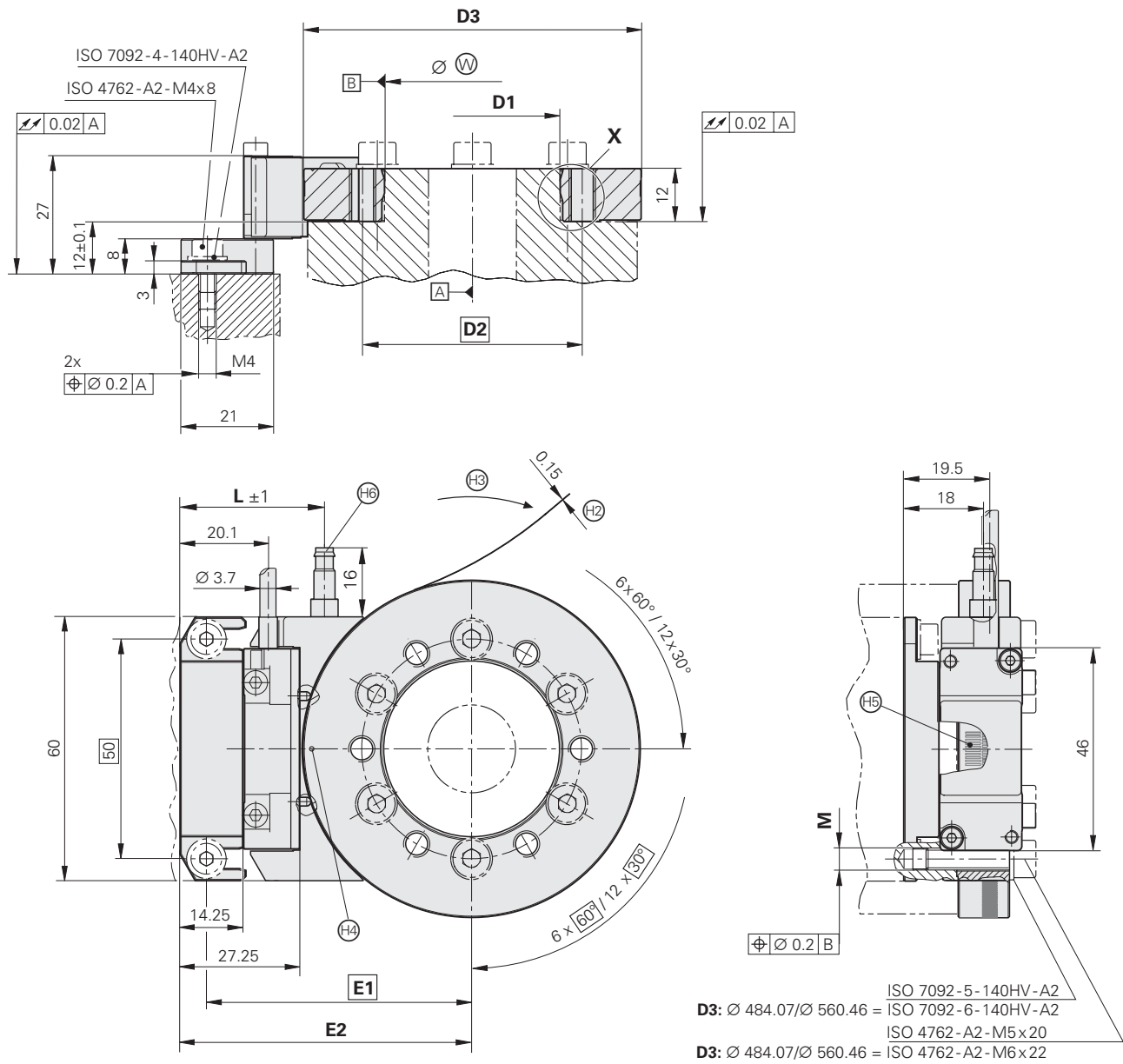


Tolerancing ISO 8015
 ISO 2768 - m H
 < 6 mm: ±0.2 mm

- Ⓐ = Bearing
- Ⓢ = Back-off thread
- Ⓜ = Mounting clearance (spacer foil)
- Ⓢ = Positive direction of rotation
- Ⓜ = Marker for reference mark, position tolerance with respect to reference mark ±1.0 mm

- Ⓜ = Scale reference mark
- Ⓜ = Connecting piece for plastic pressure tubing 6 x 1 mm

Scanning Head with Compressed Air Inlet



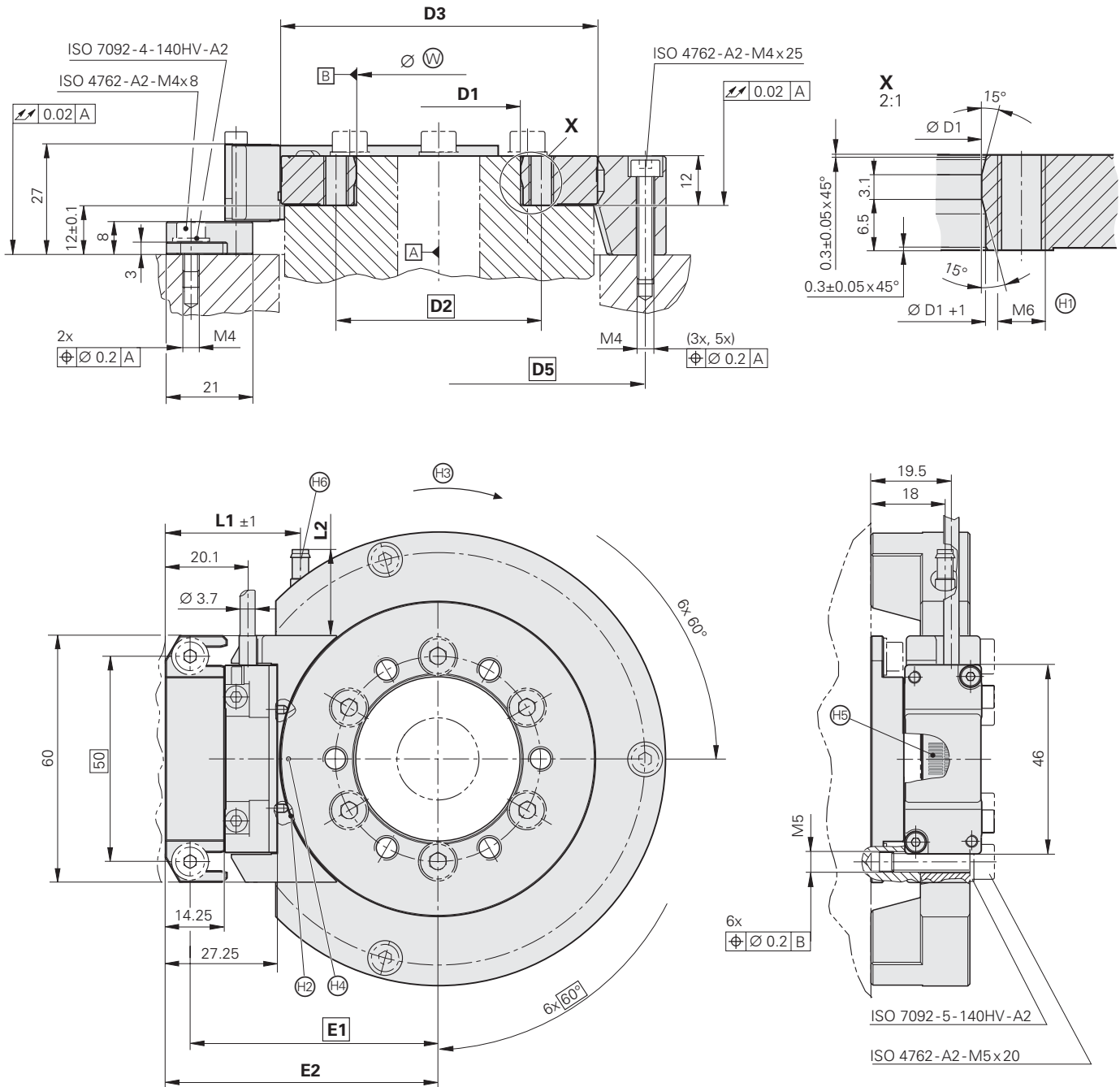
D1	$\varnothing W^{1)}$	$\varnothing W^{2)}$	*)	D2	D3	E1	E2	M	L
$\varnothing 40$ -0.001 -0.005	$\varnothing 40$ +0.004	$\varnothing 40$ +0.009 +0.002	0.001	$\varnothing 50$	$\varnothing 76.75$	60.0	66.5±0.5	6x M5	33.0
$\varnothing 80$ -0.001 -0.005	$\varnothing 80$ +0.006	$\varnothing 80$ +0.013 +0.003	0.0015	$\varnothing 95$	$\varnothing 127.64$	85.0	92.0±0.5	6x M5	29.5
$\varnothing 120$ -0.001 -0.008	$\varnothing 120$ +0.008	$\varnothing 120$ +0.015 +0.003	0.002	$\varnothing 140$	$\varnothing 178.55$	110.0	117.5±0.5	6x M5	28.0
$\varnothing 180$ -0.001 -0.008	$\varnothing 180$ +0.010	$\varnothing 180$ +0.018 +0.004	0.003	$\varnothing 200$	$\varnothing 254.93$	145.0	155.0±0.5	6x M5	27.0
$\varnothing 270$ -0 -0.01	$\varnothing 270$ +0.012	$\varnothing 270$ +0.020 +0.004	0.003	$\varnothing 290$	$\varnothing 331.31$	185.0	194.0±0.5	12x M5	26.0
$\varnothing 425$ -0 -0.01	$\varnothing 425$ +0.015	$\varnothing 425$ +0.020 +0.004	0.006	$\varnothing 445$	$\varnothing 484.07$	262.5	270.0±0.5	12x M6	26.0
$\varnothing 512$ -0 -0.015	$\varnothing 512$ +0.016	$\varnothing 512$ +0.025 +0.005	0.007	$\varnothing 528$	$\varnothing 560.46$	301.0	308.5±0.5	18x M6	26.0

1) Tolerances apply to all newly produced mating shafts

2) Tolerances apply exclusively to replacement of existing ERA 180

*) Circularity of mating diameter (shaft)

ERA 4480 – Mechanically Compatible with ERA 180 with Protective Cover



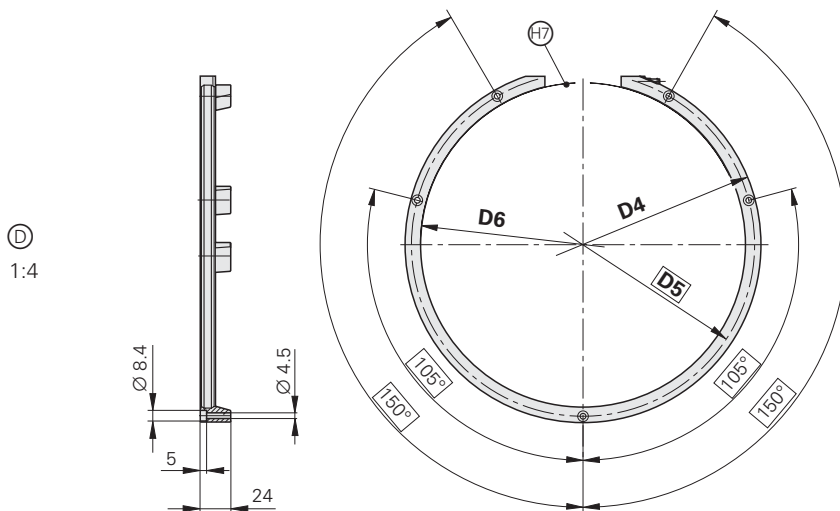
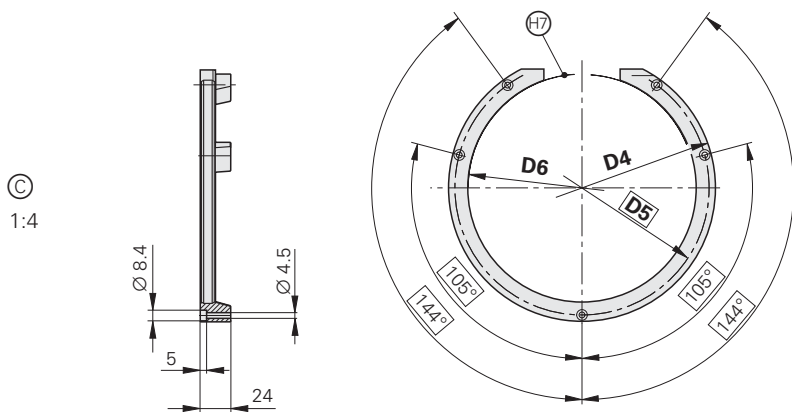
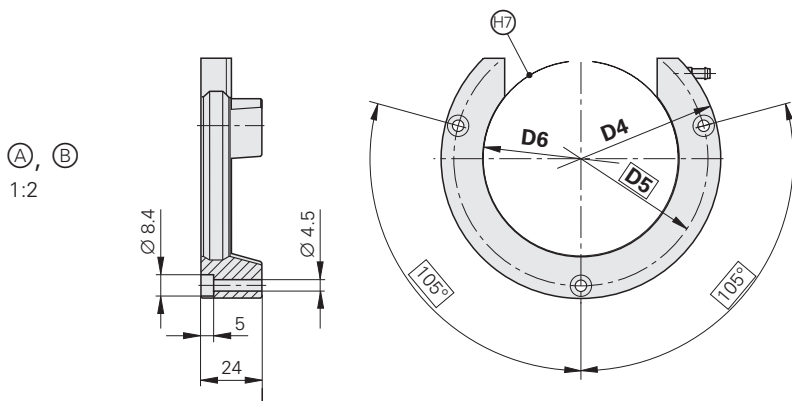
Dimensions in mm



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

- Ⓐ = Bearing
- Ⓕ = Back-off thread
- Ⓜ = Mounting clearance (spacer foil)
- Ⓝ = Positive direction of rotation
- Ⓢ = Marker for reference mark, position tolerance with respect to reference mark ±1.0 mm

- Ⓣ = Scale reference mark
- Ⓟ = Connecting piece for plastic pressure tubing 6 x 1 mm
- Ⓠ = Mounting clearance of protective cover 0.15 mm



D1	Ⓜ ¹⁾	Ⓜ ²⁾	*)	D2	D3	E1	E2	L1	L2
∅ 40 -0.001 -0.005	∅ 40 +0.004	∅ 40 +0.009 +0.002	0.001	∅ 50	∅ 76.75	60	66.5±0.5	33.0	20.3
∅ 80 -0.001 -0.005	∅ 80 +0.006	∅ 80 +0.013 +0.003	0.0015	∅ 95	∅ 127.64	85	92.0±0.5	29.5	20.2
∅ 120 -0.001 -0.008	∅ 120 +0.008	∅ 120 +0.015 +0.003	0.002	∅ 140	∅ 178.55	110	117.5±0.5	28.0	20.3
∅ 180 -0.001 -0.008	∅ 180 +0.010	∅ 180 +0.018 +0.004	0.003	∅ 200	∅ 254.93	145	155.5±0.5	27.0	30.7

	D3	D4	D5	D6
Ⓐ	∅ 76.75	∅ 110	∅ 100	∅ 77.2
Ⓑ	∅ 127.64	∅ 160	∅ 150	∅ 128.2
Ⓒ	∅ 178.55	∅ 210	∅ 200	∅ 179.1
Ⓓ	∅ 254.93	∅ 280	∅ 270	∅ 255.6

¹⁾ Tolerances apply to all newly produced mating shafts

²⁾ Tolerances apply exclusively to replacement of existing ERA 180

*) Circularity of mating diameter (shaft)

Electrical Connection

Pin layout

12-pin M23 coupling					12-pin M23 connector								
Power supply					Incremental signals						Other signals		
U_P	Sensor U _P	0V	Sensor 0V	A+	A-	B+	B-	R+	R-	Vacant	Vacant	Vacant	

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

Sensor: The sensor line is connected internally to the respective power supply

Vacant pins or wires must not be used!

Connecting cable

		12-pin M23
PUR connecting cables	12-pin: [4(2 × 0.14 mm ²) + (4 × 0.5 mm ²)]	Ø 8 mm
Complete with connector (female) and coupling (male)		298401-xx
Complete with connector (female) and connector (male)		298399-xx
Complete with connector (female) and D-sub connector (female) for IK 220		310199-xx
Complete with connector (female) and D-sub connector (male) for IK 115/IK 215		310196-xx
With one connector (female)		309777-xx
Cable without connectors , Ø 8 mm		244957-01

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For more information

- Brochure: *Angle Encoders without Integral Bearing*

