HEIDENHAIN

Preliminary
Product Information

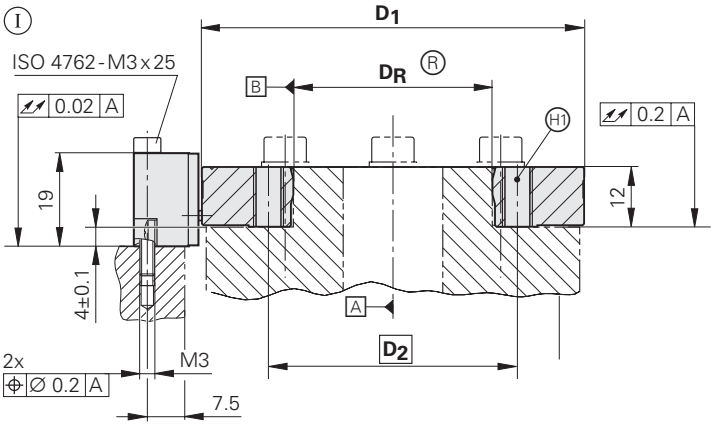
ERA 4280
ERA 4480
ERA 4880

Incremental
Modular Angle Encoders

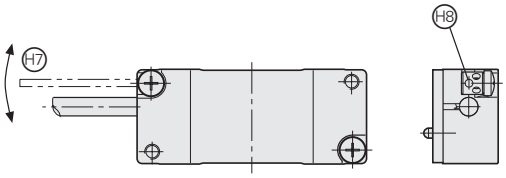
September 2005

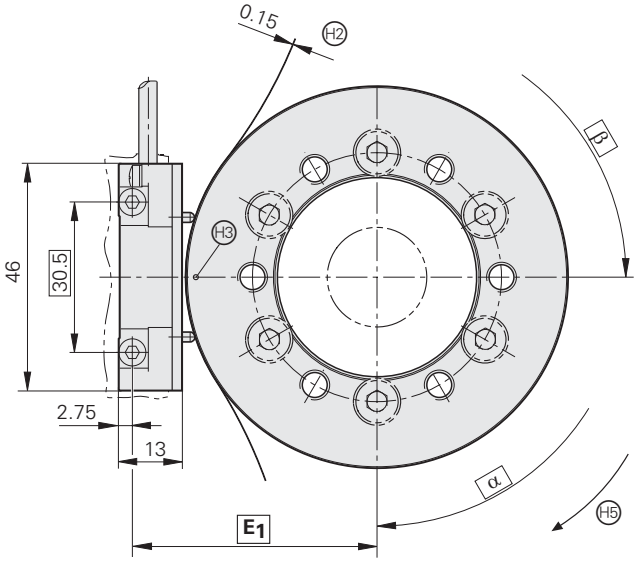
ERA 4280, ERA 4480, ERA 4880

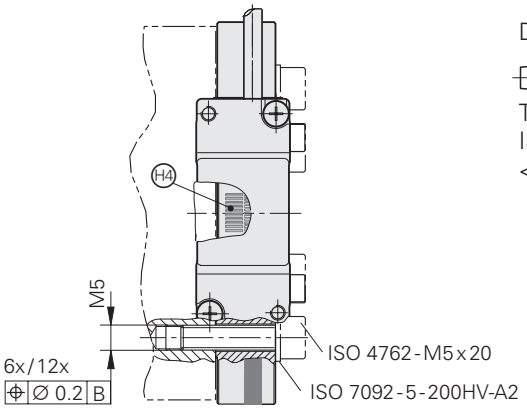
- **Grating on steel drum**
- **Requires less space thanks to smaller scanning head**



Fine adjustment of the ERA 4280 scanning head

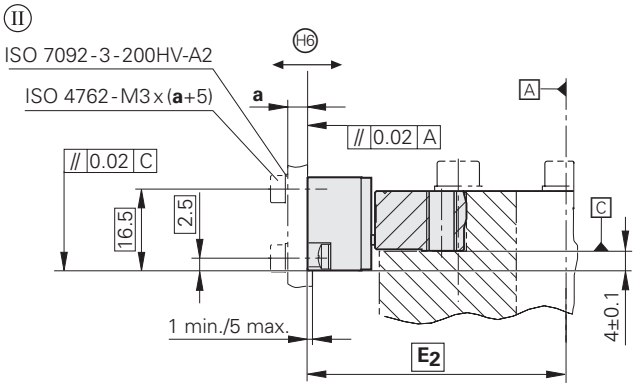






Dimensions in mm

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



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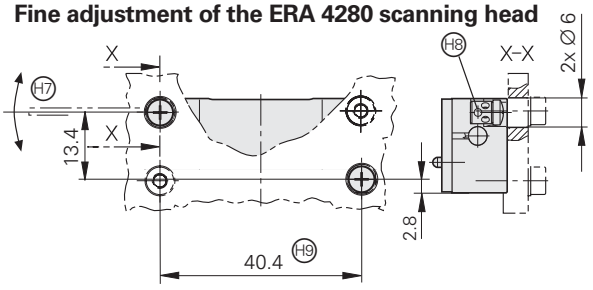
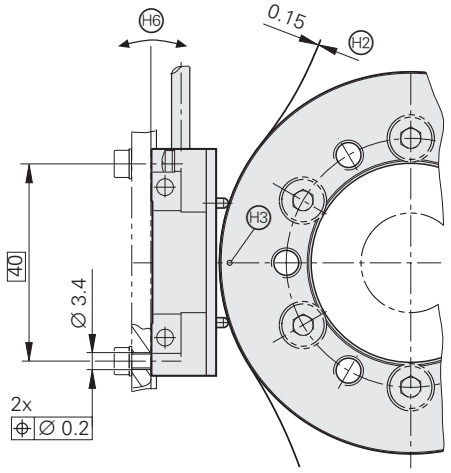




Ⓘ, Ⓘ = Mounting options
A = Ball bearing
Ⓡ = Mating shaft
H1 = Back-off thread M6
H2 = Mounting clearance (spacer foil)
H3 = Marker for reference mark
H4 = Reference mark
H5 = Positive direction of rotation
H6 = Ensure adjustability of mounting surface for scanning head
H7 = ERA 4280 scanning head with eccentric nut for fine adjustment (grating period = 20 µm)
H8 = Eccentric nut
H9 = Mounting holes (only for ERA 4280 scanning head)

Specifications	**ERA 4280**[1)] **ERA 4480**[1)] **ERA 4880**[1)]						
Incremental signals	⌒ 1 V_{PP}						
Scale reference marks*	*ERA 4xxx:* One *ERA 4xxx C:* Distance-coded						
Cutoff frequency –3dB	≥ 350 kHz						
Power supply	5 V ± 10%/max. 100 mA (without load)						
Electrical connection	Cable, 1 m, with M23 coupling (12-pin)						
Max. cable length	150 m (with HEIDENHAIN cable)						
Drum inside diameter*	40 mm	70 mm	80 mm	120 mm	150 mm	180 mm	270 mm
Drum outside diameter*	76.75 mm	104.63 mm	127.64 mm	178.55 mm	208.89 mm	254.93 mm	331.31 mm
Line count *ERA 4280 (20 µm grating period)* *ERA 4480 (40 µm grating period)* *ERA 4480 (80 µm grating period)*	 12 000 6000 3000	 16 384 8 192 4 096	 20 000 10 000 5000	 28 000 14 000 7000	 32 768 16 384 8 192	 40 000 20 000 10 000	 52 000 26 000 13 000
Mech. permissible speed	10 000 rpm	8500 rpm	6250 rpm	4500 rpm	4250 rpm	3250 rpm	2500 rpm
Moment of inertia of rotor	$0.27 \cdot 10^{-3}$ kgm^2	$0.81 \cdot 10^{-3}$ kgm^2	$1.9 \cdot 10^{-3}$ kgm^2	$7.1 \cdot 10^{-3}$ kgm^2	$12 \cdot 10^{-3}$ kgm^2	$28 \cdot 10^{-3}$ kgm^2	$59 \cdot 10^{-3}$ kgm^2
Permissible axial movement	± 0.5 mm						
Vibration 55 to 2000 Hz **Shock** 6 ms	≤ 100 m/s^2 (IEC 60 068-2-6) ≤ 500 m/s^2 (IEC 60 068-2-27)						
Max. operating temperature	80 °C						
Min. operating temperature	–10 °C						
Protection IEC 60 529	IP 00						
Weight (approx.) Scale drum	0.28 kg	0.41 kg	0.68 kg	1.2 kg	1.5 kg	2.3 kg	2.6 kg
Scanning head without cable	0.020 kg						

* Please indicate when ordering
[1)] Availability scheduled for first half of 2006

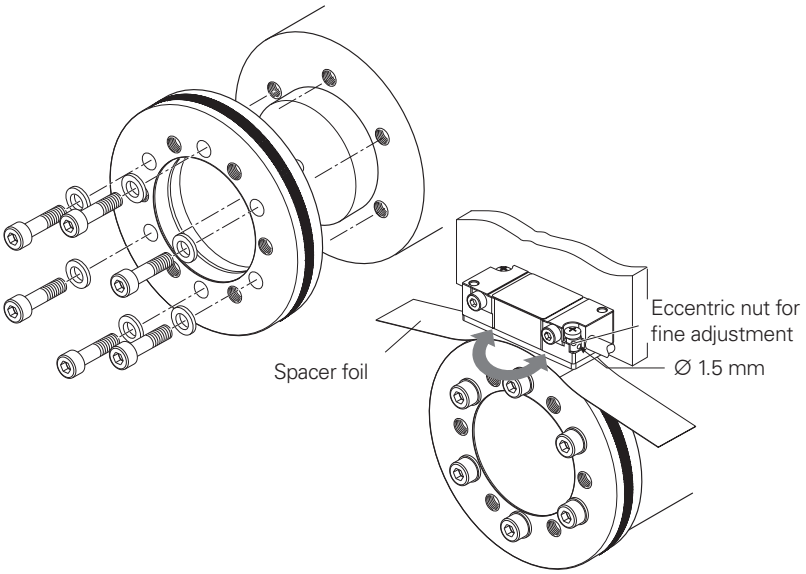
D_1	D_2	D_R	E_1	E_2	α	ß
Ø 76.75	Ø 50	Ø 40+0.005	49.34	52.08	6 x 60° = 360°	6 x 60° = 360°
Ø 104.63	Ø 85	Ø 70+0.005	63.28	66.02		
Ø 127.64	Ø 95	Ø 80+0.005	74.78	77.52		
Ø 178.55	Ø 140	Ø 120+0.008	100.24	102.98		
Ø 208.89	Ø 165	Ø 150+0.008	115.41	118.15		
Ø 254.93	Ø 200	Ø 180+0.008	138.43	141.17		
Ø 331.31	Ø 290	Ø 270+0.008	176.62	179.36	12 x 30° = 360°	12 x 60° = 360°

Assembly

The ERA 4xxx modular angle encoder is supplied as two components: the scale drum and the scanning head.

The circumferential scale drum is slid onto the drive shaft and fastened with screws. The scale drum is centered via the centering collar on its inner circumference. HEIDENHAIN recommends using a transition fit for mounting the scale drum. For mounting, the scale drum may be slowly warmed on a heating plate over a period of approx. 10 minutes to a maximum temperature of 100 °C.

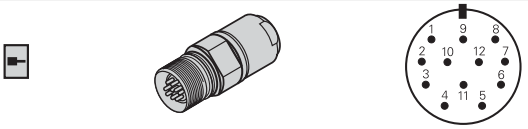
To mount the scanning head, the spacer foil is placed on the radial surface of the scale drum. Then the head is pressed against the foil, fastened, and the foil is removed. The ERA 4280 also features an eccentric nut for fine adjustment of the scanning field.



Electrical Connection

Pin layout

12-pin M23 coupling



	Power supply				Incremental signals						Other signals		
	12	**2**	**10**	**11**	**5**	**6**	**8**	**1**	**3**	**4**	**9**	**7**	**–**
	U_P	**Sensor** U_P	**0 V**	**Sensor** 0 V	**A+**	**A–**	**B+**	**B–**	**R+**	**R–**	**Vacant**	**Vacant**	**Vacant**
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	–	Violet	Yellow

Shield on housing; **U_P** = power supply;
Sensor: The power supply voltage can be sensed over bridges in the connector plug

Encoder cable

PUR connecting cable Ø 8 mm [4(2 x 0.14 mm²) + (4 x 0.5 mm²)]

Complete with M23 connector (female) and M23 coupling (male) Id. Nr. 298401-xx	**Complete** with M23 connector (female) and D-sub connector (female) for IK 220 Id. Nr. 310199-xx	**With one** M23 connector (female) Id. Nr. 309777-xx

For more information
- *Angle Encoders* brochure

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