

# ERA 4280C, ERA 4480C, ERA 4880C

Incremental angle encoder for high accuracy

- Steel scale drum with centering collar
- Optional protective cover available for ERA 4480C
- Consists of scanning head and scale drum



ERA 4000



ERA 4000 with protective cover

<b>Scanning head</b>	
<b>Incremental signals</b>	
Cutoff frequency -3 dB	
<b>Power supply</b>	
<b>Current consumption</b> without load	
<b>Electrical connection</b>	
Cable length	
<b>Vibration</b> 55 to 2000 Hz	
<b>Shock</b> 6 ms	
<b>Operating temperature</b>	
<b>Weight</b> (approx.)	Scanning head
<b>Scale drum</b>	
<b>Measuring standard</b>	
Expansion factor	
<b>Drum inside diameter*</b>	
<b>Drum outside diameter*</b>	
<b>Signal periods/ System accuracy</b> <sup>1)</sup>	ERA 4200
	ERA 4400
	ERA 4800
<b>Accuracy of the graduation</b> <sup>2)</sup>	
<b>Reference marks</b>	
<b>Mechanically permissible speed</b>	
<b>Moment of inertia</b> of rotor	
<b>Perm. axial movement</b>	
<b>Protection*</b> EN 60529	
Without protective cover	
With protective cover <sup>3)</sup> and compressed air	
<b>Weight</b> (approx.)	Scale drum
	Protective cover

<b>AK ERA 4280</b> graduation period 20 $\mu\text{m}$ <b>AK ERA 4480</b> graduation period 40 $\mu\text{m}$ <b>AK ERA 4880</b> graduation period 80 $\mu\text{m}$								
$\sim 1 V_{PP}$								
$\geq 350 \text{ kHz}$								
DC 5 V $\pm 10\%$								
$< 100 \text{ mA}$								
Cable 1 m, with M23 coupling (12-pin)								
$\leq 150 \text{ m}$ (with HEIDENHAIN cable)								
$\leq 200 \text{ m/s}^2$ (EN 60068-2-6) $\leq 1000 \text{ m/s}^2$ (EN 60068-2-27)								
$-10 \text{ }^\circ\text{C}$ to $+80 \text{ }^\circ\text{C}$								
20 g; Scanning head for protective cover: 35 g (each without cable)								

<b>TTR ERA 4200C</b> graduation period 20 $\mu\text{m}$ <b>TTR ERA 4400C</b> graduation period 40 $\mu\text{m}$ <b>TTR ERA 4800C</b> graduation period 80 $\mu\text{m}$								
Steel drum $\alpha_{\text{therm}} \approx 10.5 \cdot 10^{-6} \text{ K}^{-1}$								
40 mm	70 mm	80 mm	120 mm	150 mm	180 mm	270 mm	425 mm	512 mm
76.75 mm	104.63 mm	127.64 mm	178.55 mm	208.89 mm	254.93 mm	331.31 mm	484.07 mm	560.46 mm
12000/ $\pm 6.1$ "	16384/ $\pm 4.5$ "	20000/ $\pm 3.7$ "	28000/ $\pm 3.0$ "	32768/ $\pm 2.9$ "	40000/ $\pm 2.9$ "	52000/ $\pm 2.8$ "	–	–
6000/ $\pm 7.2$ "	8192/ $\pm 5.3$ "	10000/ $\pm 4.3$ "	14000/ $\pm 3.5$ "	16384/ $\pm 3.3$ "	20000/ $\pm 3.2$ "	26000/ $\pm 3.0$ "	38000/ $\pm 2.4$ "	44000/ $\pm 2.3$ "
3000/ $\pm 9.4$ "	4096/ $\pm 6.9$ "	5000/ $\pm 5.6$ "	7000/ $\pm 4.4$ "	8192/ $\pm 4.1$ "	10000/ $\pm 3.8$ "	13000/ $\pm 3.5$ "	–	–
$\pm 5$ "	$\pm 3.7$ "	$\pm 3$ "	$\pm 2.5$ "				$\pm 2$ "	
Distance-coded								
10000 $\text{min}^{-1}$	8500 $\text{min}^{-1}$	6250 $\text{min}^{-1}$	4500 $\text{min}^{-1}$	4250 $\text{min}^{-1}$	3250 $\text{min}^{-1}$	2500 $\text{min}^{-1}$	1800 $\text{min}^{-1}$	1500 $\text{min}^{-1}$
$0.27 \cdot 10^{-3} \text{ kgm}^2$	$0.81 \cdot 10^{-3} \text{ kgm}^2$	$1.9 \cdot 10^{-3} \text{ kgm}^2$	$7.1 \cdot 10^{-3} \text{ kgm}^2$	$12 \cdot 10^{-3} \text{ kgm}^2$	$28 \cdot 10^{-3} \text{ kgm}^2$	$59 \cdot 10^{-3} \text{ kgm}^2$	$195 \cdot 10^{-3} \text{ kgm}^2$	$258 \cdot 10^{-3} \text{ kgm}^2$
$\leq \pm 0.5 \text{ mm}$ (scale drum relative to scanning head)								
IP 00								
IP 40	–	IP 40	IP 40	–	IP 40	IP 40	–	
0.28 kg	0.41 kg	0.68 kg	1.2 kg	1.5 kg	2.3 kg	2.6 kg	3.8 kg	3.6 kg
0.07 kg	–	0.12 kg	0.17 kg	–	0.26 kg	0.35 kg	–	

\* Please select when ordering

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

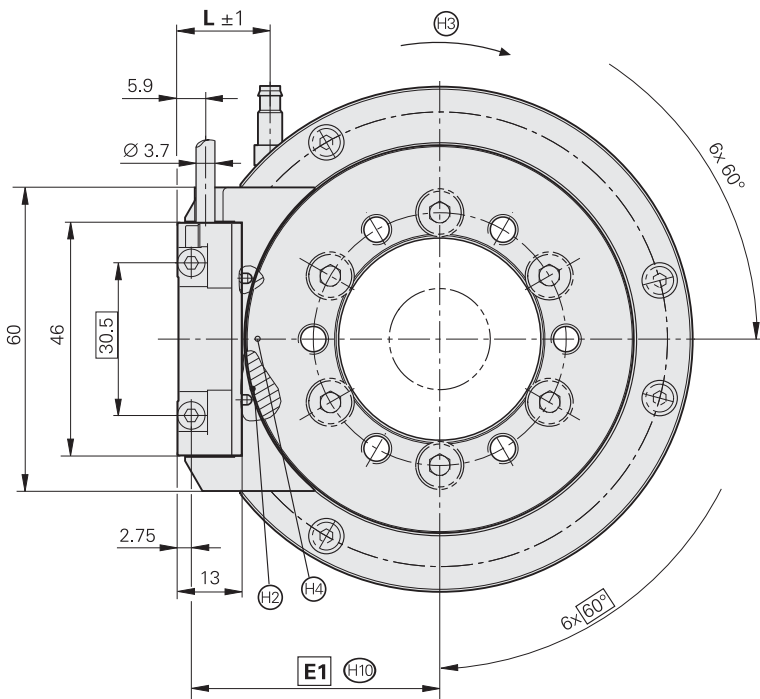
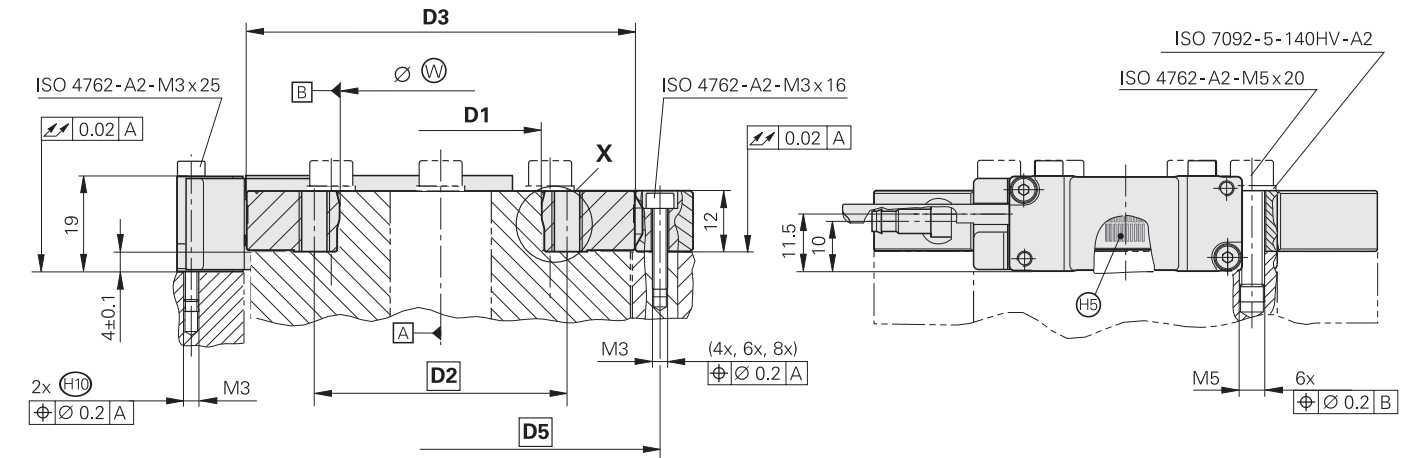
2) For other errors, see *Measuring Accuracy*

3) Only with ERA 4480; the protective cover must be ordered separately

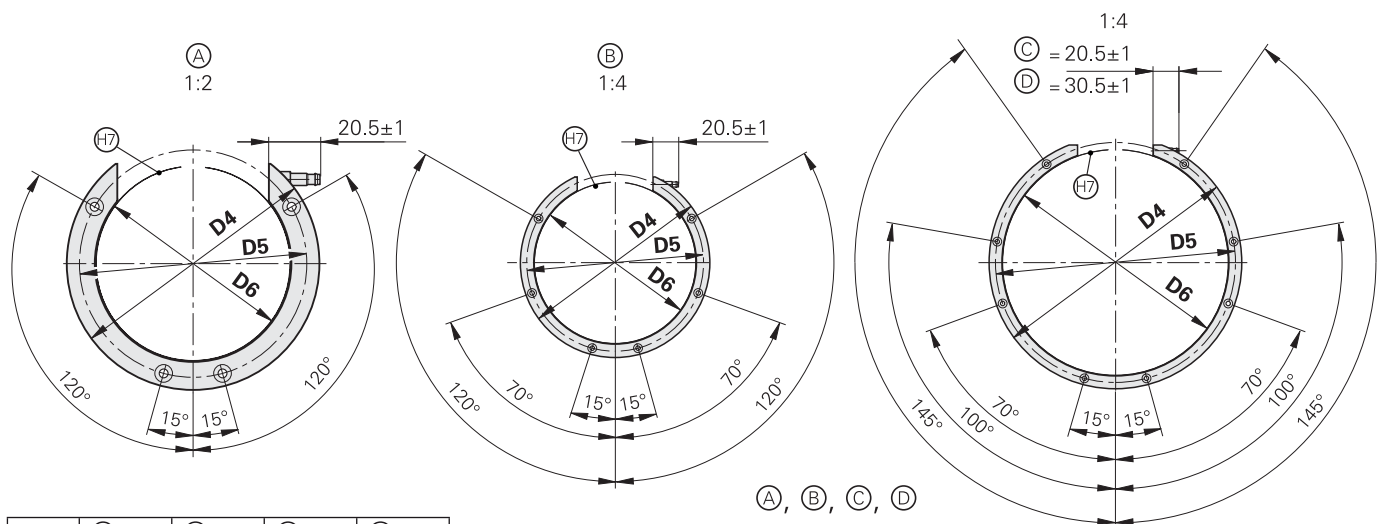


# ERA 4480C

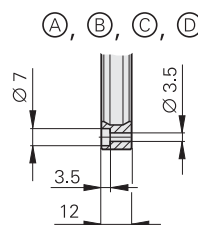
## With Protective Cover



- Ⓚ, Ⓛ = Mounting options
- Ⓜ = Bearing
- Ⓝ = Back-off thread
- Ⓢ = Mounting clearance (spacer foil)
- Ⓣ = Positive direction of rotation for output signals as per interface description
- Ⓤ = Marker for reference mark, position tolerance with respect to reference mark: ±1.0 mm
- Ⓡ = Reference mark
- Ⓢ = Ensure adjustability of mounting surface for scanning head
- Ⓣ = Mounting clearance 0.15 mm (protective cover)
- Ⓤ = Cam bushing
- Ⓡ = Holes required for fine adjustment
- Ⓣ = Position tolerance for threaded holes for securing the scanning head



	A	B	C	D
<b>D3</b>	Ø 76.75	Ø 127.64	Ø 178.55	Ø 254.93
<b>D4</b>	Ø 100	Ø 150	Ø 200	Ø 278
<b>D5</b>	Ø 90	Ø 140	Ø 190	Ø 268
<b>D6</b>	Ø 77.2	Ø 128.2	Ø 179.1	Ø 255.6





<b>Scanning head</b>	<b>AK ERA 4280</b>
<b>Incremental signals</b>	$\sim 1 V_{PP}$
Cutoff frequency -3 dB	$\geq 350$ kHz
<b>Power supply</b>	DC 5 V $\pm$ 10%
<b>Current consumption</b> Without load	< 100 mA
<b>Electrical connection</b>	Cable 1 m, with M23 coupling (12-pin)
Cable length	$\leq 150$ m (with HEIDENHAIN cable)
<b>Vibration</b> 55 to 2000 Hz <b>Shock</b> 6 ms	$\leq 100$ m/s <sup>2</sup> (EN 60068-2-6) $\leq 500$ m/s <sup>2</sup> (EN 60068-2-27)
<b>Operating temperature</b>	-10 °C to +80 °C
<b>Weight</b>	approx. 20 g (without cable)

<b>Scale drum</b>	<b>TTR ERA 4202 C</b>								
<b>Measuring standard</b> Grating period Expansion factor	Steel drum 20 $\mu$ m $\alpha_{therm} \approx 10.5 \cdot 10^{-6} K^{-1}$								
<b>Drum inside diameter*</b>	40 mm	70 mm	80 mm	120 mm	150 mm	180 mm	185 mm	210 mm	270 mm
<b>Drum outside diameter*</b>	76,75 mm	104.63 mm	127.64 mm	178.55 mm	208.89 mm	254.93 mm	208.89 mm	254.93 mm	331.31 mm
<b>Line count</b>	12000	16384	20000	28000	32768	40000	32768	40000	52000
<b>System accuracy</b> <sup>1)</sup>	$\pm 5.1''$	$\pm 3.8''$	$\pm 3.2''$	$\pm 2.5''$	$\pm 2.3''$	$\pm 2.2''$	$\pm 2.3''$	$\pm 2.2''$	$\pm 2.0''$
<b>Accuracy of the graduation</b> <sup>2)</sup>	$\pm 4''$	$\pm 3''$	$\pm 2.5''$	$\pm 2''$	$\pm 1.9''$	$\pm 1.8''$	$\pm 1.9''$	$\pm 1.8''$	$\pm 1.7''$
<b>Reference marks</b>	Distance-coded								
<b>Mech. permissible speed</b>	10000 min <sup>-1</sup>	8500 min <sup>-1</sup>	6250 min <sup>-1</sup>	4500 min <sup>-1</sup>	4250 min <sup>-1</sup>	3250 min <sup>-1</sup>	3250 min <sup>-1</sup>	3250 min <sup>-1</sup>	2500 min <sup>-1</sup>
<b>Moment of inertia</b> of rotor	$0.28 \cdot 10^{-3}$ kgm <sup>2</sup>	$0.83 \cdot 10^{-3}$ kgm <sup>2</sup>	$2.0 \cdot 10^{-3}$ kgm <sup>2</sup>	$7.1 \cdot 10^{-3}$ kgm <sup>2</sup>	$12 \cdot 10^{-3}$ kgm <sup>2</sup>	$28 \cdot 10^{-3}$ kgm <sup>2</sup>	$6.5 \cdot 10^{-3}$ kgm <sup>2</sup>	$20 \cdot 10^{-3}$ kgm <sup>2</sup>	$59 \cdot 10^{-3}$ kgm <sup>2</sup>
<b>Perm. axial movement</b>	$\leq \pm 0.5$ mm (scale drum relative to scanning head)								
<b>Protection</b> EN 60529	IP 00								
<b>Weight</b> (approx.)	0.30 kg	0.42 kg	0.70 kg	1.2 kg	1.5 kg	2.3 kg	0.66 kg	1.5 kg	2.6 kg

\* Please select when ordering

<sup>1)</sup> Before installation. Additional error caused by mounting inaccuracy and inaccuracy from the bearing of the measured shaft are not included.

<sup>2)</sup> For other errors, see *Measuring Accuracy*

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