

# ERA 4000 series

## High-accuracy incremental angle encoder

- Steel scale drum with three-point centering or centering collar
- Optimized scanning performance for very high reliability
- Integrated three-color LED function indicator
- Consists of a scanning head and scale drum

<b>Scanning head</b>	AK ERA 4280 with 20 µm graduation period AK ERA 4480 with 40 µm graduation period AK ERA 4880 with 80 µm graduation period
<b>Interface</b>	~ 1 V <sub>PP</sub> HSP
Cutoff frequency -3 dB	1 MHz
<b>Electrical connection</b>	1 m or 3 m cable 12-pin M12 coupling or 12-pin M23 coupling or 15-pin D-sub connector
Cable length	≤ 150 m (with HEIDENHAIN cable)
Supply voltage	DC 5 V ±0.5 V
Current consumption	< 130 mA (without load)
<b>Vibration</b> 55 Hz to 2000 Hz	With mechanical fault exclusion: ≤ 200 m/s <sup>2</sup> (EN 60068-2-6) Without mechanical fault exclusion: ≤ 200 m/s <sup>2</sup> (EN 60068-2-6)
<b>Shock</b> 11 ms 6 ms	With mechanical fault exclusion: ≤ 200 m/s <sup>2</sup> (EN 60068-2-27) Without mechanical fault exclusion: ≤ 1000 m/s <sup>2</sup> (EN 60068-2-27)
<b>Operating temperature</b>	-10 °C to 70 °C
<b>Relative air humidity</b>	≤ 93% (at 40 °C/4d as per EN 60068-2-78); condensation excluded
<b>Protection</b>	IP40
<b>Mass</b> Scanning head Cable Coupling (M12) Coupling (M23) D-sub connector	≈ 20 g (without cable) ≈ 20 g/m ≈ 15 g ≈ 50 g ≈ 32 g

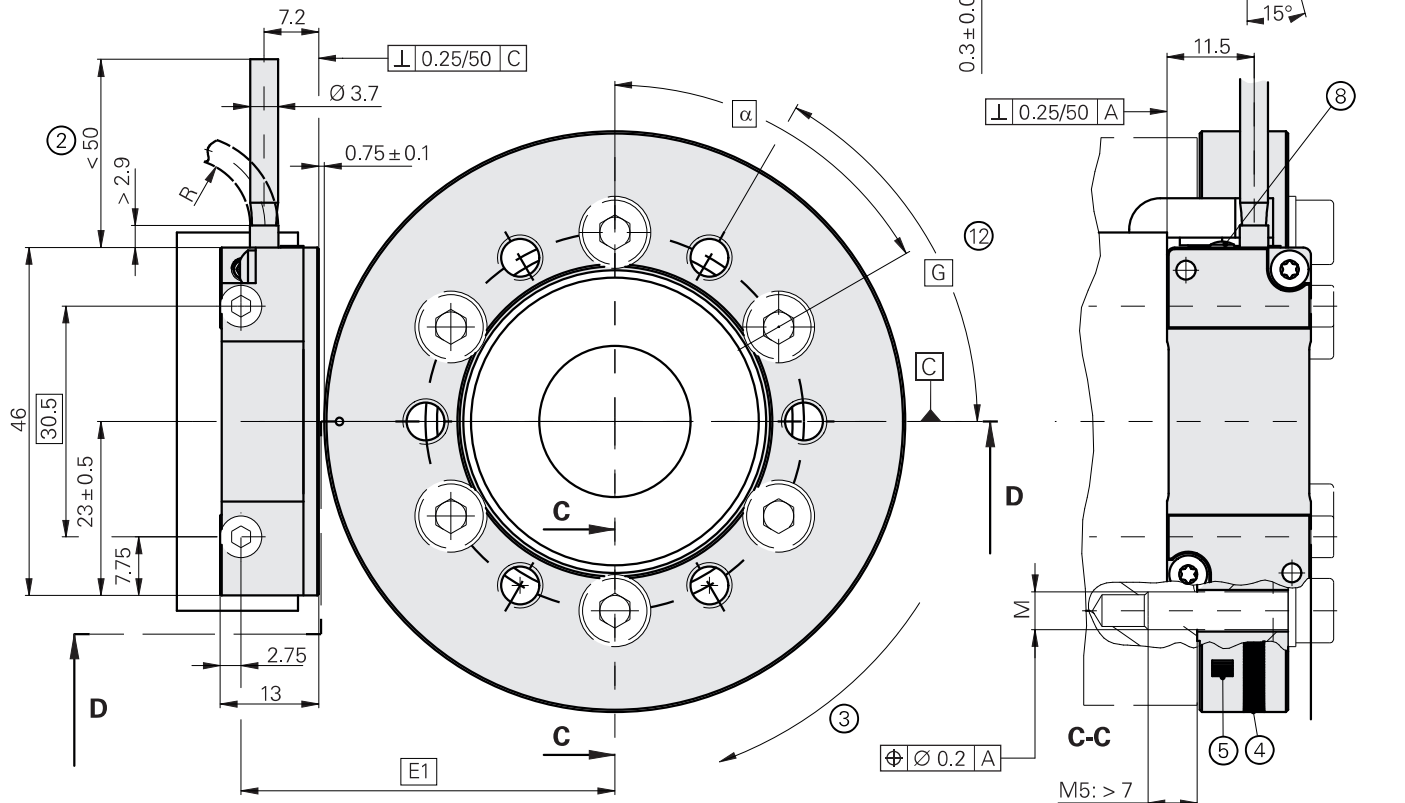
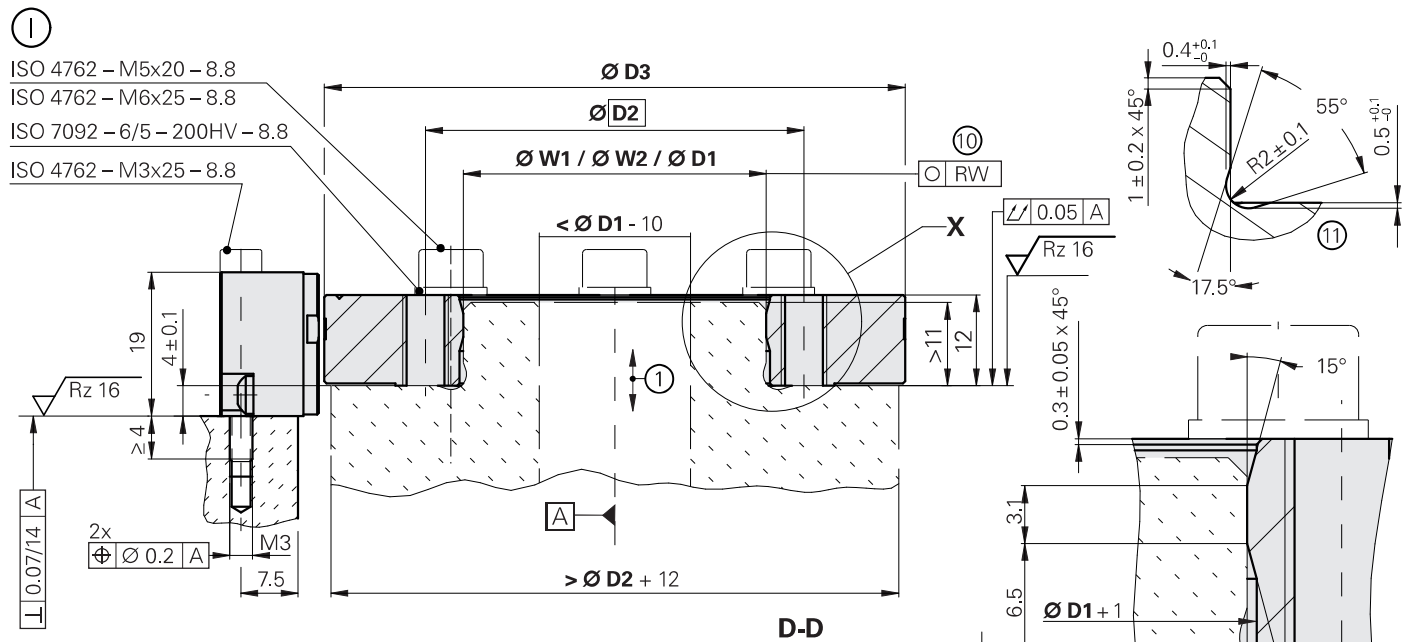
<b>Scale drum with three-point centering</b>	<b>TTR ERA 4202C</b> with 20 µm graduation period					
<b>Measuring standard</b> Coefficient of expansion	Steel drum $\alpha_{\text{therm}} \approx 10.4 \cdot 10^{-6} \text{ K}^{-1}$					
<b>Signal periods</b>	16384	20000	28000	32768	40000	52000
<b>Accuracy of graduation</b>	±3''	±2.5''	±2''	±1.9''	±1.8''	±1.7''
<b>Interpolation error per signal period<sup>1)</sup></b>	±0.24''	±0.19''	±0.14''	±0.12''	±0.10''	±0.07''
<b>Reference marks</b>	Distance-coded or one					
<b>Drum inside diameter*</b>	70 mm	80 mm	120 mm/ 150 mm	150 mm/ 185 mm	180 mm/ 210 mm	270 mm
<b>Drum outside diameter*</b>	104.63 mm	127.64 mm	178.55 mm	208.89 mm	254.93 mm	331.31 mm
Mech. permissible speed	15000 rpm	12250 rpm	8750 rpm	7500 rpm	6250 rpm	4750 rpm
Moment of inertia	$0.83 \cdot 10^{-3} \text{ kgm}^2$	$2.0 \cdot 10^{-3} \text{ kgm}^2$	$7.1/4.5 \cdot 10^{-3} \text{ kgm}^2$	$12/6.4 \cdot 10^{-3} \text{ kgm}^2$	$28/20 \cdot 10^{-3} \text{ kgm}^2$	$59 \cdot 10^{-3} \text{ kgm}^2$
Permissible axial movement	≤ ±0.5 mm (scale drum relative to the scanning head)					
<b>Protection</b> EN 60529	Complete encoder in mounted condition: IP00					
<b>Mass</b>	≈ 0.42 kg	≈ 0.69 kg	≈ 1.2 kg/ 0.66 kg	≈ 1.5 kg/ 0.66 kg	≈ 2.3 kg/ 1.5 kg	≈ 2.6 kg

\* Please select when ordering

<sup>1)</sup> The interpolation error within one signal period and the accuracy of the graduation together yield the encoder-specific error; for additional error from mounting and bearing of the measured shaft, see *Measuring accuracy*

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

## Dimensions



mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 $\leq 6$  mm:  $\pm 0.2$  mm

**W 1** = Without mechanical fault exclusion  
**W 2** = With mechanical fault exclusion

- ①, ② = Mounting possibilities
- = Bearing of mating shaft
- W = Mating diameter (shaft)
- 1 = Permissible axial motion of the measured
- 3 = Positive direction of rotation
- 4 = Incremental track
- 5 = Reference pulse track
- 6 = Space for mounting aid
- 7 = Space for mounting aid
- 8 = Function indicator
- 9 = Mounting aid (accessory)
- 10 = Roundness of mating diameter (shaft)
- 11 = Proposed design for undercut