Scanning head	**AK ERM 2280**
Interface	⌒ 1 V_{PP}
Cutoff frequency –3 dB	≥ 300 kHz
Signal period	≈ 200 µm
Line count*	See *Scale drum*
Electrical connection*	Cable 1 m, with or without coupling
Cable length	≤ 150 m (with HEIDENHAIN cable)
Voltage supply	DC 5 V ±0.5 V
Current consumption	≤ 150 mA (without load)
Vibration 55 Hz to 2000 Hz **Shock** 6 ms	≤ 400 m/s^2 (EN 60 068-2-6) ≤ 1000 m/s^2 (EN 60 068-2-27); *with fault exclusion for loosening of the mech. connection:* 400 m/s^2
Operating temperature	–10 °C to +60 °C
Protection EN 60 529	IP67
Mass	≈ 0.15 kg (without cable)

* Please select when ordering

Scale drum	TTR ERM 2200C and TTR ERM 2200		
Measuring standard	MAGNADUR graduation; signal period of approx. 200 µm		
Line count*	1024	1200	1440
Position error per SP[1)]	±9″	±8″	±6.5″
Accuracy of graduation	±12″	±10″	±8.5″
Reference mark*	Distance-coded or one		
Angle for absolute reference (with distance-coded RM)	≤ 45°	≤ 30°	≤ 24°
Permissible axial motion	±1.25 mm		
Outside diameter	64.37 mm	75.44 mm	90.53 mm
Drum shape	A56	A01	A26
Inside diameter	40 mm	40 mm	55 mm
Bolt hole circles	Ø 50 mm; 6 x M6	Ø 50 mm; 6 x M6	Ø 70 mm; 6 x M6
Mechanically permissible speed	22000 rpm	19000 rpm	18500 rpm
Moment of inertia of rotor	$0.15 \cdot 10^{-3}$ kgm^2	$0.32 \cdot 10^{-3}$ kgm^2	$0.63 \cdot 10^{-3}$ kgm^2
Max. angular acceleration	50000 rad/s^2	27000 rad/s^2	20000 rad/s^2
Mass	0.21 kg	0.35 kg	0.44 kg

***** Please select when ordering

1) Position error within one signal period and the accuracy of the graduation together result in the encoder-specific error; for additional error from mounting and bearing of the measured shaft, see *Measuring accuracy* in the catalog *Modular Angle Encoders with Magnetic Scanning*.

Scale drum	TTR ERM 2200C and TTR ERM 2200								
Measuring standard	MAGNADUR graduation; signal period of approx. 200 µm								
Line count*	2048					2400			
Position error per SP[1)]	±4.5″					±4″			
Accuracy of graduation	±6″					±5.5″			
Reference mark*	Distance-coded or one								
Angle for absolute reference (with distance-coded RM)	≤ 22.5°					≤ 18°			
Permissible axial motion	±1.25 mm								
Outside diameter	128.75 mm					150.88 mm			
Drum shape*	A11	A15	A21	A16	A14	A06	A20	A07	A18
Inside diameter	60 mm	65 mm	70 mm	90 mm	95 mm	80 mm	95 mm	105 mm	110 mm
Bolt hole circles	Ø 75 mm; 6 x M6	Ø 80 mm; 6 x M6	Ø 95 mm; 6 x M6	Ø 105 mm; 6 x M6	Ø 110 mm; 6 x M6	Ø 95 mm; 6 x M6	Ø 110 mm; 6 x M6	Ø 120 mm; 6 x M6	Ø 125 mm; 6 x M6
Mechanically permissible speed	13000 rpm	13000 rpm	14000 rpm	12500 rpm	12500 rpm	11000 rpm	11000 rpm	10500 rpm	10500 rpm
Moment of inertia of rotor	$2.9 \cdot 10^{-3}$ kgm^2	$2.9 \cdot 10^{-3}$ kgm^2	$2.8 \cdot 10^{-3}$ kgm^2	$2.3 \cdot 10^{-3}$ kgm^2	$2.1 \cdot 10^{-3}$ kgm^2	$5.3 \cdot 10^{-3}$ kgm^2	$4.8 \cdot 10^{-3}$ kgm^2	$4.4 \cdot 10^{-3}$ kgm^2	$4.1 \cdot 10^{-3}$ kgm^2
Max. angular acceleration	4400 rad/s^2	4800 rad/s^2	6000 rad/s^2	8000 rad/s^2	9000 rad/s^2	3100 rad/s^2	3900 rad/s^2	4900 rad/s^2	5000 rad/s^2
Mass	1.2 kg	1.1 kg	1.0 kg	0.74 kg	0.65 kg	1.5 kg	1.2 kg	1.0 kg	0.93 kg

***** Please select when ordering

[1)] Position error within one signal period and the accuracy of the graduation together result in the encoder-specific error; for additional error from mounting and bearing of the measured shaft, see *Measuring accuracy* in the catalog *Modular Angle Encoders with Magnetic Scanning*.

Scale drum	TTR ERM 2200C and TTR ERM 2200		
Measuring standard	MAGNADUR graduation; signal period of approx. 200 µm		
Line count*	2400	2800	3520
Position error per SP[1)]	±4″	±3.5″	±3″
Accuracy of graduation	±7″	±6″	±5″
Reference mark*	Distance-coded or one		
Angle for absolute reference (with distance-coded RM)	≤ 18.0°	≤ 14.4°	≤ 16.36°
Permissible axial motion	±1.25 mm		
Outside diameter	150.88 mm	176.03 mm	221.29 mm
Drum shape	A03	A36	A55
Inside diameter	120 mm	140 mm	180 mm
Bolt hole circles	∅ 135 mm; 6 x M6	∅ 155 mm; 6 x M6	∅ 190 mm; 6 x M6
Mechanically permissible speed	10500 rpm	8500 rpm	5500 rpm
Moment of inertia of rotor	$3.4 \cdot 10^{-3}$ kgm^2	$6.3 \cdot 10^{-3}$ kgm^2	$15 \cdot 10^{-3}$ kgm^2
Max. angular acceleration	7000 rad/s^2	4400 rad/s^2	2200 rad/s^2
Mass	0.72 kg	0.99 kg	1.5 kg

* Please select when ordering

1) Position error within one signal period and the accuracy of the graduation together result in the encoder-specific error; for additional error from mounting and bearing of the measured shaft, see *Measuring accuracy* in the catalog *Modular Angle Encoders with Magnetic Scanning*.

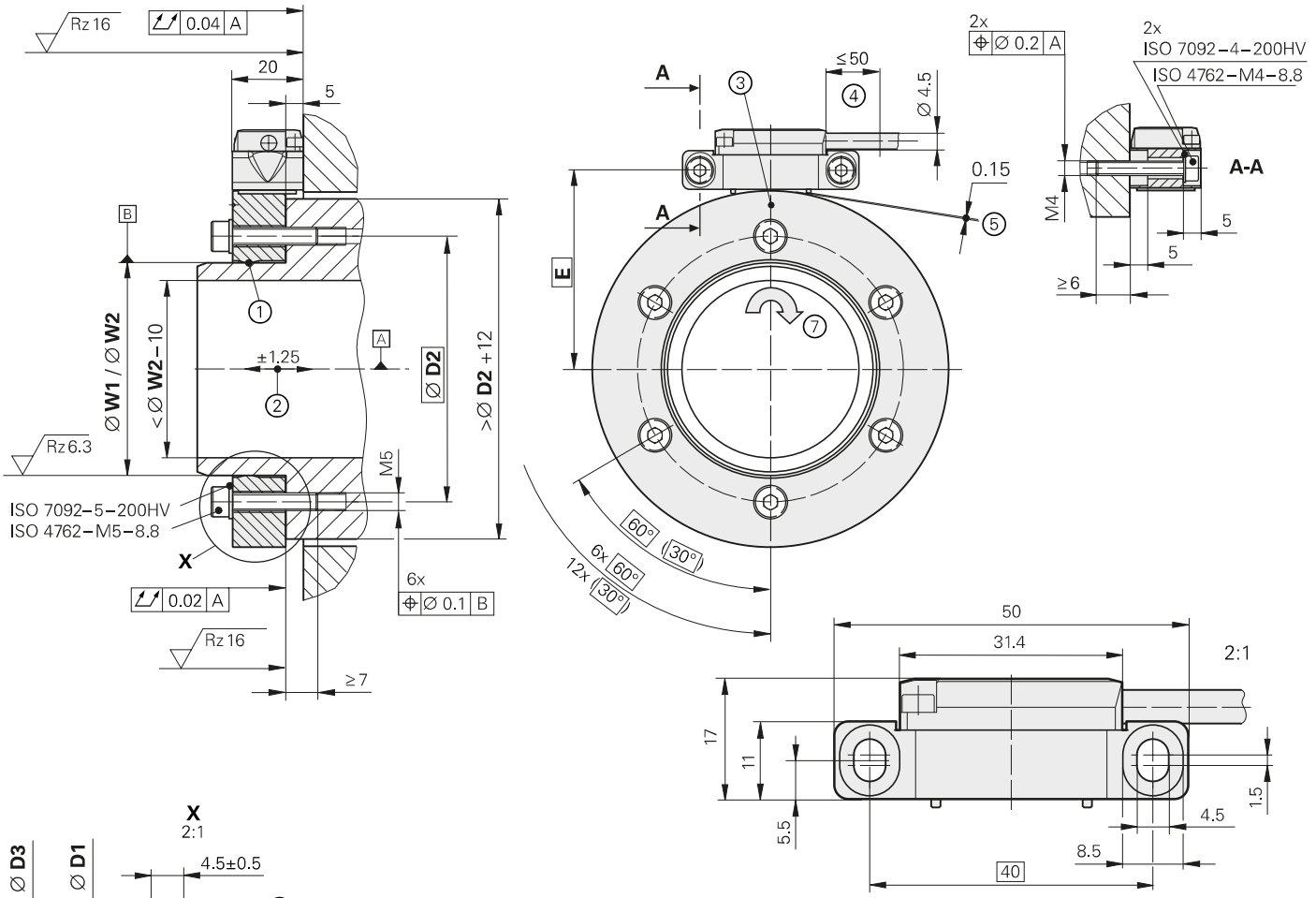
Scale drum	TTR ERM 2200C and TTR ERM 2200						
Measuring standard	MAGNADUR graduation; signal period of approx. 200 µm						
Line count*	4096						5200
Position error per SP[1)]	±2.5″						±2″
Accuracy of graduation	±3.5″					±4.5″	±4″
Reference mark*	Distance-coded or one						
Angle for absolute reference (with distance-coded RM)	≤ 11.25°						≤ 13.85°
Permissible axial motion	±1.25 mm						
Outside diameter	257.5 mm						326.9 mm
Drum shape*	A23	A19	A34	A48	A28	A08	A17
Inside diameter	120 mm	140 mm	160 mm	160 mm	200 mm	220 mm	295 mm
Bolt hole circles	Ø 135 mm; 6 x M6	Ø 155 mm; 6 x M6	Ø 175 mm; 6 x M6	Ø 170 mm; 6 x M6	Ø 215 mm; 6 x M6	Ø 235 mm; 6 x M6	Ø 310 mm; 6 x M6
Mechanically permissible speed	6500 rpm	6500 rpm	6000 rpm	5000 rpm	6000 rpm	6000 rpm	4500 rpm
Moment of inertia of rotor	$47 \cdot 10^{-3}$ kgm^2	$45 \cdot 10^{-3}$ kgm^2	$42 \cdot 10^{-3}$ kgm^2	$42 \cdot 10^{-3}$ kgm^2	$31 \cdot 10^{-3}$ kgm^2	$23 \cdot 10^{-3}$ kgm^2	$42 \cdot 10^{-3}$ kgm^2
Max. angular acceleration	450 rad/s^2	540 rad/s^2	650 rad/s^2	630 rad/s^2	1200 rad/s^2	1800 rad/s^2	1300 rad/s^2
Mass	4.7 kg	4.2 kg	3.6 kg	3.6 kg	2.3 kg	1.6 kg	1.7 kg

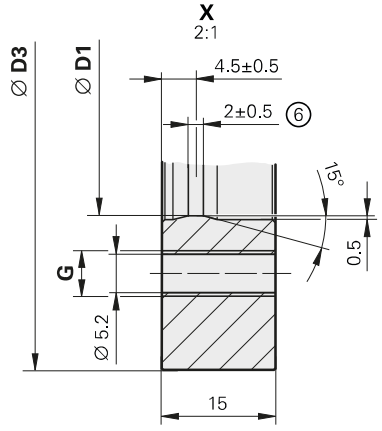
***** Please select when ordering

[1)] Position error within one signal period and the accuracy of the graduation together result in the encoder-specific error; for additional error from mounting and bearing of the measured shaft, see *Measuring accuracy* in the catalog *Modular Angle Encoders with Magnetic Scanning*.

ERM 2400 series

- **Consisting of AK ERM 2420 or AK ERM 2480 and TTR ERM 2400 or TTR ERM 2400 C**
- **Modular encoders with magnetic scanning principle**
- **Signal period approx. 400 µm (at circumference)**
- **For C axis on lathes**
- **Suitable for fault exclusion for loosening of the mechanical connection**





D1	W1	W2	D2	D3	E	G
Ø 40 0/–0.007	Ø 40 +0.009/+0.002	Ø 40 +0.010/+0.003	Ø 50	Ø 64.37	37.9	6x M6
Ø 40 0/–0.007	Ø 40 +0.009/+0.002	Ø 40 +0.010/+0.003	Ø 50	Ø 75.44	43.4	12x Ø 5.2
Ø 55 0/–0.008	Ø 55 +0.010/+0.002	Ø 55 +0.015/+0.007	Ø 65	Ø 75.44	43.4	6x M6
Ø 55 0/–0.008	Ø 55 +0.010/+0.002	Ø 55 +0.015/+0.007	Ø 70	Ø 90.53	51.0	6x M6
Ø 60 0/–0.008	Ø 60 +0.010/+0.002	Ø 60 +0.016/+0.008	Ø 75	Ø 128.75	70.1	6x M6
Ø 65 0/–0.008	Ø 65 +0.010/+0.002	Ø 65 +0.018/+0.010	Ø 80	Ø 128.75	70.1	6x M6
Ø 70 0/–0.008	Ø 70 +0.010/+0.002	Ø 70 +0.019/+0.011	Ø 95	Ø 128.75	70.1	6x M6
Ø 70 0/–0.008	Ø 70 +0.010/+0.002	Ø 70 +0.019/+0.011	Ø 85	Ø 150.88	81.2	6x M6
Ø 80 0/–0.008	Ø 80 +0.010/+0.002	Ø 80 +0.022/+0.014	Ø 95	Ø 150.88	81.2	6x M6
Ø 90 0/–0.010	Ø 90 +0.013/+0.003	Ø 90 +0.027/+0.017	Ø 105	Ø 128.75	70.1	6x M6
Ø 95 0/–0.010	Ø 95 +0.013/+0.003	Ø 95 +0.029/+0.019	Ø 110	Ø 128.75	70.1	6x M6
Ø 95 0/–0.010	Ø 95 +0.013/+0.003	Ø 95 +0.029/+0.019	Ø 110	Ø 150.88	81.2	6x M6
Ø 105 0/–0.010	Ø 105 +0.013/+0.003	Ø 105 +0.031/+0.021	Ø 120	Ø 150.88	81.2	6x M6
Ø 110 0/–0.010	Ø 110 +0.013/+0.003	Ø 110 +0.033/+0.023	Ø 125	Ø 150.88	81.2	6x M6
Ø 120 0/–0.010	Ø 120 +0.013/+0.003	Ø 120 +0.036/+0.026	Ø 135	Ø 257.50	134.5	6x M6
Ø 130 0/–0.012	Ø 130 +0.015/+0.003	Ø 130 +0.041/+0.029	Ø 145	Ø 257.50	134.5	6x M6
Ø 140 0/–0.012	Ø 140 +0.015/+0.003	Ø 140 +0.044/+0.032	Ø 155	Ø 176.03	93.7	6x M6
Ø 140 0/–0.012	Ø 140 +0.015/+0.003	Ø 140 +0.044/+0.032	Ø 155	Ø 257.50	134.5	6x M6
Ø 160 0/–0.012	Ø 160 +0.015/+0.003	Ø 160 +0.049/+0.037	Ø 175	Ø 213.24	112.3	6x M6
Ø 160 0/–0.012	Ø 160 +0.015/+0.003	Ø 160 +0.049/+0.037	Ø 170	Ø 257.50	134.5	6x M6
Ø 160 0/–0.012	Ø 160 +0.015/+0.003	Ø 160 +0.049/+0.037	Ø 175	Ø 257.50	134.5	6x M6
Ø 200 0/–0.014	Ø 200 +0.018/+0.004	Ø 200 +0.063/+0.049	Ø 215	Ø 257.50	134.5	6x M6
Ø 260 0/–0.016	Ø 260 +0.020/+0.004	Ø 260 +0.082/+0.066	Ø 275	Ø 326.9	169.2	6x M6
Ø 330 0/–0.018	Ø 330 +0.022/+0.004	Ø 330 +0.105/+0.087	Ø 345	Ø 362.11	186.8	12x M6
Ø 380 0/–0.018	Ø 380 +0.022/+0.005	Ø 380 +0.119/+0.101	Ø 395	Ø 452.64	232.0	12x M6
Ø 425 0/–0.020	Ø 425 +0.025/+0.005	Ø 425 +0.134/+0.114	Ø 445	Ø 484.07	247.7	12x M6
Ø 450 0/–0.020	Ø 450 +0.025/+0.005	Ø 450 +0.142/+0.122	Ø 465	Ø 484.07	247.7	6x M6

mm

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

W1 = Without mechanical fault exclusion
W2 = With mechanical fault exclusion

Ⓐ = Bearing of mating shaft
① = Shaft fit; ensure full-surface contact
② = Axial tolerance of mating shaft
③ = Reference mark position
④ = Cable support
⑤ = Mounting distance of 0.15 mm set with spacer shim
⑥ = Centering collar