

DC-Micromotors

Precious Metal Commutation

5 mNm

For combination with
 Gearheads:
 20/1, 22E, 22F, 22/2, 22/5, 22/6, 22/7, 23/1, 38/3
 Encoders:
 IE2 – 16 ... 512

Series 2224 ... SR

	2224 U	003 SR	006 SR	012 SR	018 SR	024 SR	036 SR	
1 Nominal voltage	U_N	3	6	12	18	24	36	Volt
2 Terminal resistance	R	0,56	1,94	8,71	17,50	36,30	91,40	Ω
3 Output power	$P_{2 \text{ max.}}$	3,92	4,55	4,05	4,54	3,88	3,46	W
4 Efficiency	$\eta_{\text{max.}}$	80	82	82	82	81	80	%
5 No-load speed	n_o	8 100	8 200	7 800	8 100	7 800	7 800	rpm
6 No-load current (with shaft \varnothing 2,0 mm)	I_o	0,066	0,029	0,014	0,010	0,007	0,005	A
7 Stall torque	M_H	18,5	21,2	19,8	21,4	19,0	16,9	mNm
8 Friction torque	M_R	0,23	0,2	0,2	0,21	0,2	0,22	mNm
9 Speed constant	k_n	2 730	1 380	657	454	328	219	rpm/V
10 Back-EMF constant	k_E	0,366	0,725	1,520	2,200	3,040	4,560	mV/rpm
11 Torque constant	k_M	3,49	6,92	14,50	21,00	29,10	43,50	mNm/A
12 Current constant	k_i	0,286	0,144	0,069	0,048	0,034	0,023	A/mNm
13 Slope of n-M curve	$\Delta n / \Delta M$	438	387	394	379	411	462	rpm/mNm
14 Rotor inductance	L	11	45	200	450	800	1 800	μH
15 Mechanical time constant	τ_m	11	11	11	11	11	11	ms
16 Rotor inertia	J	2,4	2,7	2,7	2,8	2,6	2,3	gcm ²
17 Angular acceleration	$\alpha_{\text{max.}}$	77	78	74	77	74	74	$\cdot 10^3 \text{ rad/s}^2$
18 Thermal resistance	$R_{\text{th} 1} / R_{\text{th} 2}$	5 / 20						K/W
19 Thermal time constant	τ_{w1} / τ_{w2}	6,8 / 440						s
20 Operating temperature range:								
– motor		– 30 ... + 85 (optional – 55 ... + 125)						°C
– rotor, max. permissible		+ 125						°C
21 Shaft bearings		sintered bronze sleeves	ball bearings	ball bearings	ball bearings, preloaded			
22 Shaft load max.:		(standard)	(optional)	(optional)	(optional)			
– with shaft diameter		2,0	2,0	2,0	2,0		mm	
– radial at 3 000 rpm (3 mm from bearing)		1,5	8	8	8		N	
– axial at 3 000 rpm		0,2	0,8	0,8	0,8		N	
– axial at standstill		20	10	10	10		N	
23 Shaft play:								
– radial	\leq	0,03	0,015	0,015	0,015		mm	
– axial	\leq	0,2	0,2	0,2	0		mm	
24 Housing material		steel, black coated						
25 Weight		46						g
26 Direction of rotation		clockwise, viewed from the front face						
Recommended values - mathematically independent of each other								
27 Speed up to	$n_{e \text{ max.}}$	8 000	8 000	8 000	8 000	8 000	8 000	rpm
28 Torque up to	$M_{e \text{ max.}}$	5	5	5	5	5	5	mNm
29 Current up to (thermal limits)	$I_{e \text{ max.}}$	2,200	1,200	0,570	0,400	0,280	0,180	A

