

DC-Micromotors

Precious Metal Commutation

4,5 mNm
6 W

Series 1724 ... SR

Values at 22°C and nominal voltage	1724 T	003 SR	006 SR	012 SR	018 SR	024 SR	
1 Nominal voltage	U_N	3	6	12	18	24	V
2 Terminal resistance	R	0,78	3,41	16,2	32,1	54,6	Ω
3 Efficiency, max.	η_{max}	82	81	80	81	81	%
4 No-load speed	n_0	8 200	8 600	7 900	8 400	8 600	min ⁻¹
5 No-load current, typ. (with shaft \varnothing 1,5 mm)	I_0	0,038	0,02	0,009	0,006	0,005	A
6 Stall torque	M_H	13,2	11,5	10,5	11,2	11,5	mNm
7 Friction torque	M_R	0,13	0,13	0,13	0,12	0,13	mNm
8 Speed constant	k_n	2 760	1 450	666	472	362	min ⁻¹ /V
9 Back-EMF constant	k_E	0,362	0,69	1,5	2,12	2,76	mV/min ⁻¹
10 Torque constant	k_M	3,46	6,59	14,3	20,2	26,3	mNm/A
11 Current constant	k_I	0,289	0,152	0,07	0,049	0,038	A/mNm
12 Slope of n-M curve	$\Delta n / \Delta M$	621	748	752	750	748	min ⁻¹ /mNm
13 Rotor inductance	L	21	75	360	710	1 200	μ H
14 Mechanical time constant	τ_m	8	8	8	8	8	ms
15 Rotor inertia	J	1,2	1	1	1	1	gcm ²
16 Angular acceleration	α_{max}	110	110	100	100	100	$\cdot 10^3$ rad/s ²
17 Thermal resistance	R_{th1} / R_{th2}	4 / 24,5					K/W
18 Thermal time constant	τ_{w1} / τ_{w2}	2,6 / 270					s
19 Operating temperature range:							
– motor		-30 ... +85 (optional version -55 ... +125)					°C
– winding, max. permissible		+125					°C
20 Shaft bearings		sintered bearings		ball bearings, preloaded			
21 Shaft load max.:		(standard)		(optional version)			
– with shaft diameter		1,5		1,5			mm
– radial at 3 000 min ⁻¹ (3 mm from bearing)		1,2		5			N
– axial at 3 000 min ⁻¹		0,2		0,5			N
– axial at standstill		20		10			N
22 Shaft play:							
– radial	\leq	0,03		0,015			mm
– axial	\leq	0,2		0			mm
23 Housing material		steel, black coated					
24 Mass		27					g
25 Direction of rotation		clockwise, viewed from the front face					
26 Speed up to	n_{max}	10 000					min ⁻¹
27 Number of pole pairs		1					
28 Magnet material		NdFeB					

Rated values for continuous operation

29 Rated torque	M_N	2,3	4,2	4,5	4,5	4,5	mNm
30 Rated current (thermal limit)	I_N	0,7	0,7	0,35	0,25	0,19	A
31 Rated speed	n_N	6 790	4 720	3 430	3 990	4 220	min ⁻¹

Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

Note:

The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

The diagram shows the motor in a completely insulated as well as thermally coupled condition (R_{th2} 50% reduced).

The nominal voltage (U_N) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.



