

DC-Micromotors

Precious Metal Commutation

1,7 mNm
3,4 W

Series 1224 ... SR

Values at 22°C and nominal voltage	1224 N	006 SR	012 SR	015 SR	
1 Nominal voltage	U_N	6	12	15	V
2 Terminal resistance	R	4,6	18,2	29,4	Ω
3 Efficiency, max.	η_{max}	82	83	83	%
4 No-load speed	n_0	13 800	13 700	13 400	min ⁻¹
5 No-load current, typ. (with shaft \varnothing 1 mm)	I_0	0,011	0,005	0,004	A
6 Stall torque	M_H	5,31	5,43	5,36	mNm
7 Friction torque	M_R	0,05	0,05	0,05	mNm
8 Speed constant	k_n	2 323	1 151	901	min ⁻¹ /V
9 Back-EMF constant	k_E	0,43	0,869	1,11	mV/min ⁻¹
10 Torque constant	k_M	4,11	8,3	10,6	mNm/A
11 Current constant	k_I	0,243	0,12	0,094	A/mNm
12 Slope of n-M curve	$\Delta n / \Delta M$	2 600	2 523	2 499	min ⁻¹ /mNm
13 Rotor inductance	L	55	220	350	μ H
14 Mechanical time constant	τ_m	5	5	5	ms
15 Rotor inertia	J	0,18	0,18	0,18	gcm ²
16 Angular acceleration	α_{max}	295	302	298	$\cdot 10^3$ rad/s ²
17 Thermal resistance	R_{th1} / R_{th2}	17 / 37			K/W
18 Thermal time constant	τ_{w1} / τ_{w2}	6,5 / 371			s
19 Operating temperature range:					
– motor		-30 ... +85 (optional version	-30 ... +125)		°C
– winding, max. permissible		+85 (optional version	+125)		°C
20 Shaft bearings		sintered bearings			
21 Shaft load max.:					
– with shaft diameter		1			mm
– radial at 3 000 min ⁻¹ (1,5 mm from bearing)		0,5			N
– axial at 3 000 min ⁻¹		0,1			N
– axial at standstill		20			N
22 Shaft play:					
– radial	\leq	0,03			mm
– axial	\leq	0,2			mm
23 Housing material		steel, black coated			
24 Mass		13,5			g
25 Direction of rotation		clockwise, viewed from the front face			
26 Speed up to	n_{max}	16 000			min ⁻¹
27 Number of pole pairs		1			
28 Magnet material		NdFeB			
Rated values for continuous operation					
29 Rated torque	M_N	1,5	1,7	1,7	mNm
30 Rated current (thermal limit)	I_N	0,4	0,22	0,18	A
31 Rated speed	n_N	9 680	8 580	8 270	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.



