

DC-Micromotors

Precious Metal Commutation

0,59 mNm
1,2 W

Series 1516 ... S

Values at 22°C and nominal voltage	1516 T	1,5 S	002 S	4,5 S	006 S	012 S		
1 Nominal voltage	U_N	1,5	2	4,5	6	12	V	
2 Terminal resistance	R	1,11	3,25	14,7	31,2	115	Ω	
3 Efficiency, max.	η_{max}	59	48	50	45	47	%	
4 No-load speed	n_0	14 400	14 200	15 000	15 000	15 600	min ⁻¹	
5 No-load current, typ. (with shaft \varnothing 1,5 mm)	I_0	0,075	0,057	0,027	0,021	0,011	A	
6 Stall torque	M_H	1,2	0,68	0,73	0,59	0,62	mNm	
7 Friction torque	M_R	0,07	0,07	0,07	0,07	0,07	mNm	
8 Speed constant	k_n	10 159	7 827	3 659	2 800	1 445	min ⁻¹ /V	
9 Back-EMF constant	k_E	0,098	0,128	0,273	0,357	0,692	mV/min ⁻¹	
10 Torque constant	k_M	0,94	1,22	2,61	3,41	6,61	mNm/A	
11 Current constant	k_I	1,064	0,82	0,383	0,293	0,151	A/mNm	
12 Slope of n-M curve	$\Delta n / \Delta M$	12 000	20 800	20 600	25 600	25 100	min ⁻¹ /mNm	
13 Rotor inductance	L	16	27	140	240	900	μ H	
14 Mechanical time constant	τ_m	39	45	56	56	60	ms	
15 Rotor inertia	J	0,31	0,21	0,26	0,21	0,23	gcm ²	
16 Angular acceleration	α_{max}	39	32	28	28	27	$\cdot 10^3$ rad/s ²	
17 Thermal resistance	R_{th1} / R_{th2}	8 / 45					K/W	
18 Thermal time constant	τ_{w1} / τ_{w2}	2 / 200					s	
19 Operating temperature range:								
– motor		-30 ... +65 (optional version -30 ... +125)					°C	
– winding, max. permissible		+65 (optional version +125)					°C	
20 Shaft bearings		sintered bearings (standard)		ball bearings, preloaded (optional version)				
21 Shaft load max.:								
– 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, zinc galvanized and passivated						
24 Mass		10					g	
25 Direction of rotation		clockwise, viewed from the front face						
26 Speed up to	n_{max}	18 000					min ⁻¹	
27 Number of pole pairs		1						
28 Magnet material		AlNiCo						
Rated values for continuous operation								
29 Rated torque	M_N		0,59	0,47	0,49	0,41	0,43	mNm
30 Rated current (thermal limit)	I_N		0,7	0,45	0,21	0,14	0,077	A
31 Rated speed	n_N		6 290	2 500	2 980	2 500	2 500	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.



