

# DC-Micromotors

## Precious Metal Commutation

0,7 mNm  
1,2 W

### Series 0816 ... SR

Values at 22°C and nominal voltage	0816 K	003 SR	006 SR	009 SR	012 SR	
1 Nominal voltage	$U_N$	3	6	9	12	V
2 Terminal resistance	$R$	5,4	21,2	47	101,8	$\Omega$
3 Output power	$P_{2nom.}$	0,4	0,4	0,41	0,33	W
4 Efficiency, max.	$\eta_{max.}$	69	69	69	67	%
5 No-load speed	$n_0$	13 250	13 500	13 500	12 600	min <sup>-1</sup>
6 No-load current, typ. (with shaft $\varnothing$ 1 mm)	$I_0$	0,016	0,0083	0,0057	0,0039	A
7 Stall torque	$M_H$	1,15	1,13	1,15	1	mNm
8 Friction torque	$M_R$	0,034	0,034	0,035	0,034	mNm
9 Speed constant	$k_n$	4 526	2 318	1 543	1 085	min <sup>-1</sup> /V
10 Back-EMF constant	$k_E$	0,221	0,431	0,648	0,922	mV/min <sup>-1</sup>
11 Torque constant	$k_M$	2,11	4,12	6,19	8,8	mNm/A
12 Current constant	$k_I$	0,474	0,243	0,162	0,114	A/mNm
13 Slope of n-M curve	$\Delta n / \Delta M$	11 475	11 904	11 714	12 553	min <sup>-1</sup> /mNm
14 Rotor inductance	$L$	53	217	507	1 033	$\mu$ H
15 Mechanical time constant	$\tau_m$	6,1	6,5	6,2	6,5	ms
16 Rotor inertia	$J$	0,051	0,052	0,051	0,049	gcm <sup>2</sup>
17 Angular acceleration	$\alpha_{max.}$	229	219	227	203	$\cdot 10^3$ rad/s <sup>2</sup>
18 Thermal resistance	$R_{th1} / R_{th2}$	20 / 48				K/W
19 Thermal time constant	$\tau_{w1} / \tau_{w2}$	4,2 / 242				s
20 Operating temperature range:						
– motor		-30 ... +85				°C
– winding, max. permissible		+85				°C
21 Shaft bearings		sintered bearings				
22 Shaft load max.:						
– with shaft diameter		1				mm
– radial at 3 000 min <sup>-1</sup> (1,5 mm from bearing)		0,7				N
– axial at 3 000 min <sup>-1</sup>		0,1				N
– axial at standstill		20				N
23 Shaft play:						
– radial	$\leq$	0,02				mm
– axial	$\leq$	0,2				mm
24 Housing material		steel, nickel plated				
25 Mass		4,5				g
26 Direction of rotation		clockwise, viewed from the front face				
27 Speed up to	$n_{max.}$	16 000				min <sup>-1</sup>
28 Number of pole pairs		1				
29 Magnet material		NdFeB				
<b>Rated values for continuous operation</b>						
30 Rated torque	$M_N$	0,7	0,69	0,69	0,61	mNm
31 Rated current (thermal limit)	$I_N$	0,37	0,19	0,13	0,077	A
32 Rated speed	$n_N$	2 540	2 660	2 790	2 500	min <sup>-1</sup>

**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.



