

**NEW**

**DC-Micromotors**  
Precious Metal Commutation

**1,6 mNm**  
**3,1 W**

**Series 1024 ... SR**

Values at 22°C and nominal voltage	1024 K	003 SR	006 SR	009 SR	012 SR		
1 Nominal voltage	$U_N$		3	6	9	12	V
2 Terminal resistance	$R$		1,36	5,96	14,9	23,7	$\Omega$
3 Output power	$P_{2nom.}$		1,63	1,49	1,34	1,49	W
4 Efficiency, max.	$\eta_{max.}$		84	83	82	82	%
5 No-load speed	$n_0$		12 200	12 300	12 000	12 800	min <sup>-1</sup>
6 No-load current, typ. (with shaft $\varnothing$ 1 mm)	$I_0$		0,016	0,008	0,005	0,004	A
7 Stall torque	$M_H$		5,1	4,6	4,28	4,45	mNm
8 Friction torque	$M_R$		0,037	0,037	0,037	0,038	mNm
9 Speed constant	$k_n$		4 098	2 071	1 337	1 078	min <sup>-1</sup> /V
10 Back-EMF constant	$k_E$		0,244	0,483	0,748	0,928	mV/min <sup>-1</sup>
11 Torque constant	$k_M$		2,33	4,61	7,14	8,86	mNm/A
12 Current constant	$k_I$		0,429	0,217	0,14	0,113	A/mNm
13 Slope of n-M curve	$\Delta n / \Delta M$		2 392	2 678	2 791	2 883	min <sup>-1</sup> /mNm
14 Rotor inductance	$L$		16	62	151	218	$\mu$ H
15 Mechanical time constant	$\tau_m$		3	3,4	3,5	3,3	ms
16 Rotor inertia	$J$		0,12	0,12	0,12	0,11	gcm <sup>2</sup>
17 Angular acceleration	$\alpha_{max.}$		425	384	356	404	$\cdot 10^3$ rad/s <sup>2</sup>
18 Thermal resistance	$R_{th1} / R_{th2}$	16 / 51					K/W
19 Thermal time constant	$\tau_{w1} / \tau_{w2}$	6,1 / 251					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)		1					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	$\leq$	0,15					mm
24 Housing material		steel, nickel plated					
25 Mass		10,8					g
26 Direction of rotation		clockwise, viewed from the front face					
27 Speed up to	$n_{max.}$	15 000					min <sup>-1</sup>
28 Number of pole pairs		1					
29 Magnet material		NdFeB					
<b>Rated values for continuous operation</b>							
30 Rated torque	$M_N$		1,6	1,5	1,5	1,4	mNm
31 Rated current (thermal limit)	$I_N$		0,74	0,35	0,22	0,18	A
32 Rated speed	$n_N$		7 640	7 460	6 910	7 780	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.



