

DC-Micromotors

Precious Metal Commutation

0,5 mNm
1,4 W

Series 1016 ... G

Values at 22°C and nominal voltage		1016 N	003 G	006 G	012 G	
1	Nominal voltage	U_N	3	6	12	V
2	Terminal resistance	R	8,7	19,3	95	Ω
3	Output power	$P_{2nom.}$	0,24	0,44	0,36	W
4	Efficiency, max.	$\eta_{max.}$	63	68	68	%
5	No-load speed	n_0	14 200	18 400	16 500	min^{-1}
6	No-load current, typ. (with shaft \varnothing 0,8 mm)	I_0	0,015	0,01	0,004	A
7	Stall torque	M_H	0,64	0,9	0,82	mNm
8	Friction torque	M_R	0,03	0,03	0,03	mNm
9	Speed constant	k_n	4 948	3 173	1 419	min^{-1}/V
10	Back-EMF constant	k_E	0,202	0,315	0,705	mV/min^{-1}
11	Torque constant	k_M	1,93	3,01	6,73	mNm/A
12	Current constant	k_I	0,518	0,332	0,149	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$	22 304	20 342	20 029	min^{-1}/mNm
14	Rotor inductance	L	28	60	310	μH
15	Mechanical time constant	τ_m	9	12,8	10	ms
16	Rotor inertia	J	0,04	0,06	0,05	gcm^2
17	Angular acceleration	$\alpha_{max.}$	159	151	165	$\cdot 10^3 rad/s^2$
18	Thermal resistance	R_{th1} / R_{th2}	26 / 56			K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	3,1 / 260			s
20	Operating temperature range:					
	– motor		-30 ... +85 (optional version -30 ... +125)			$^{\circ}C$
	– winding, max. permissible		+85 (optional version +125)			$^{\circ}C$
21	Shaft bearings		sintered bearings			
22	Shaft load max.:					
	– with shaft diameter		0,8			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
23	Shaft play					
	– radial	\leq	0,03			mm
	– axial	\leq	0,2			mm
24	Housing material		steel, nickel plated			
25	Mass		6,5			g
26	Direction of rotation		clockwise, viewed from the front face			
27	Speed up to	$n_{max.}$	22 000			min^{-1}
28	Number of pole pairs		1			
29	Magnet material		SmCo			
Rated values for continuous operation						
30	Rated torque	M_N	0,43	0,48	0,5	mNm
31	Rated current (thermal limit)	I_N	0,24	0,17	0,08	A
32	Rated speed	n_N	2 500	5 730	3 750	min^{-1}

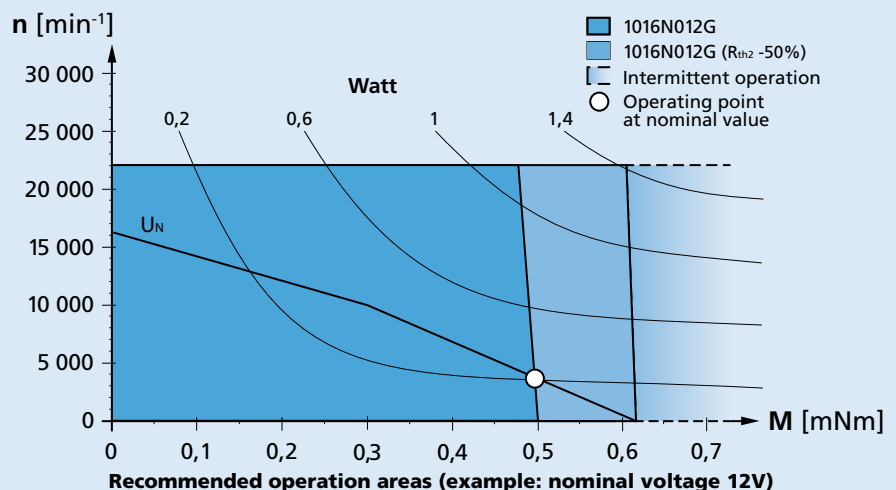
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

Note:

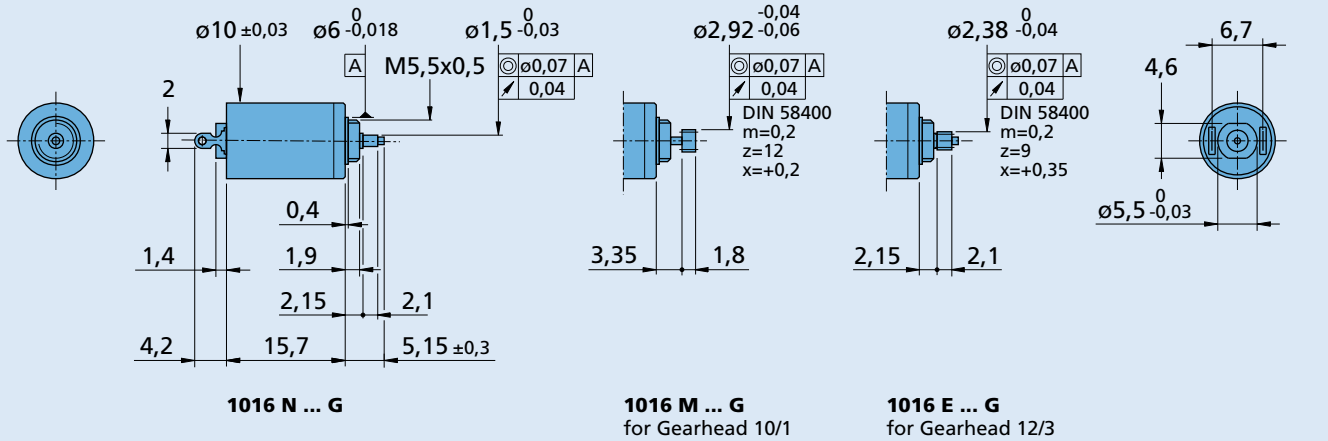
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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.



Dimensional drawing



Options

Example product designation: **1016N012G-K179**

Option	Type	Description
K179	Bearing lubrication	For vacuum of 10 ⁻⁷ Torr @ 20°C
K188	Temperature range	High temperature design (-30...+125°C)
K380	Second shaft end	Ø 1 mm x 3 mm
K440	Bearing	Front ball bearing
K1707	Encoder Combination	Motor with rear end shaft for combination with Encoder HEM3
K1752	Encoder Combination	Motor with rear end shaft for combination with Encoder PA2-100

Product Combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics
10/1 12/3	PA2-100 HEM3-256 W	SC 1801 MCDC 3002