

DC-Micromotors

Precious Metal Commutation

1,3 mNm
2,8 W

Series 1024 ... S

Values at 22°C and nominal voltage		1024 N	003 S	006 S	012 S	
1	Nominal voltage	U_N	3	6	12	V
2	Terminal resistance	R	2,3	10,8	31,6	Ω
3	Output power	$P_{2nom.}$	0,97	0,81	1,11	W
4	Efficiency, max.	$\eta_{max.}$	79	78	79	%
5	No-load speed	n_0	13 800	13 200	14 700	min ⁻¹
6	No-load current, typ. (with shaft \varnothing 1 mm)	I_0	0,016	0,008	0,004	A
7	Stall torque	M_H	2,69	2,34	2,89	mNm
8	Friction torque	M_R	0,03	0,03	0,03	mNm
9	Speed constant	k_n	4 658	2 231	1 240	min ⁻¹ /V
10	Back-EMF constant	k_E	0,215	0,448	0,806	mV/min ⁻¹
11	Torque constant	k_M	2,05	4,28	7,7	mNm/A
12	Current constant	k_I	0,488	0,234	0,13	A/mNm
13	Slope of n-M curve	$\Delta n / \Delta M$	5 135	5 630	5 090	min ⁻¹ /mNm
14	Rotor inductance	L	26	100	344	μ H
15	Mechanical time constant	τ_m	6	7	6	ms
16	Rotor inertia	J	0,12	0,12	0,12	gcm ²
17	Angular acceleration	$\alpha_{max.}$	224	195	241	$\cdot 10^3$ rad/s ²
18	Thermal resistance	R_{th1} / R_{th2}	14 / 41			K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	5 / 289			s
20	Operating temperature range:					
	– motor		-30 ... +85 (optional version -30 ... +125)			°C
	– winding, max. permissible		+85 (optional version +125)			°C
21	Shaft bearings		sintered bearings			
22	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
23	Shaft play:					
	– radial	\leq	0,03			mm
	– axial	\leq	0,2			mm
24	Housing material		steel, black coated			
25	Mass		8,8			g
26	Direction of rotation		clockwise, viewed from the front face			
27	Speed up to	$n_{max.}$	17 000			min ⁻¹
28	Number of pole pairs		1			
29	Magnet material		NdFeB			
Rated values for continuous operation						
30	Rated torque	M_N	0,79	1,2	1,3	mNm
31	Rated current (thermal limit)	I_N	0,4	0,29	0,17	A
32	Rated speed	n_N	9 300	4 660	6 650	min ⁻¹

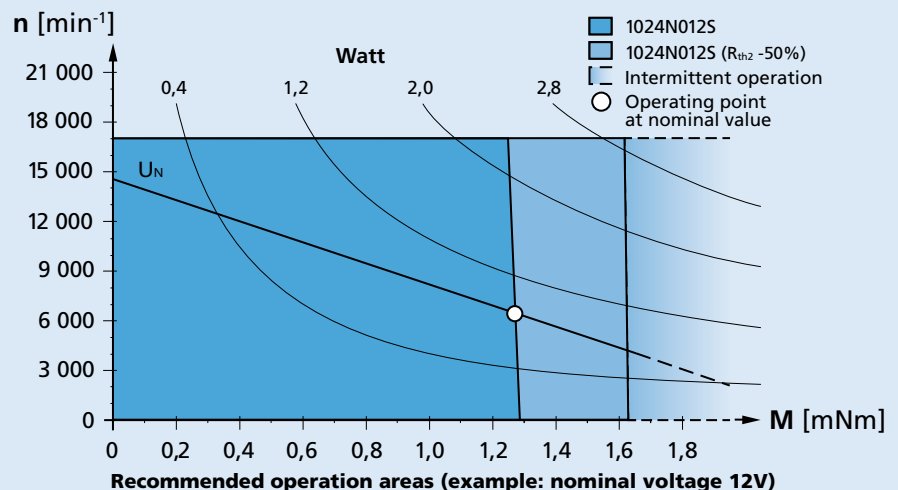
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

Note:

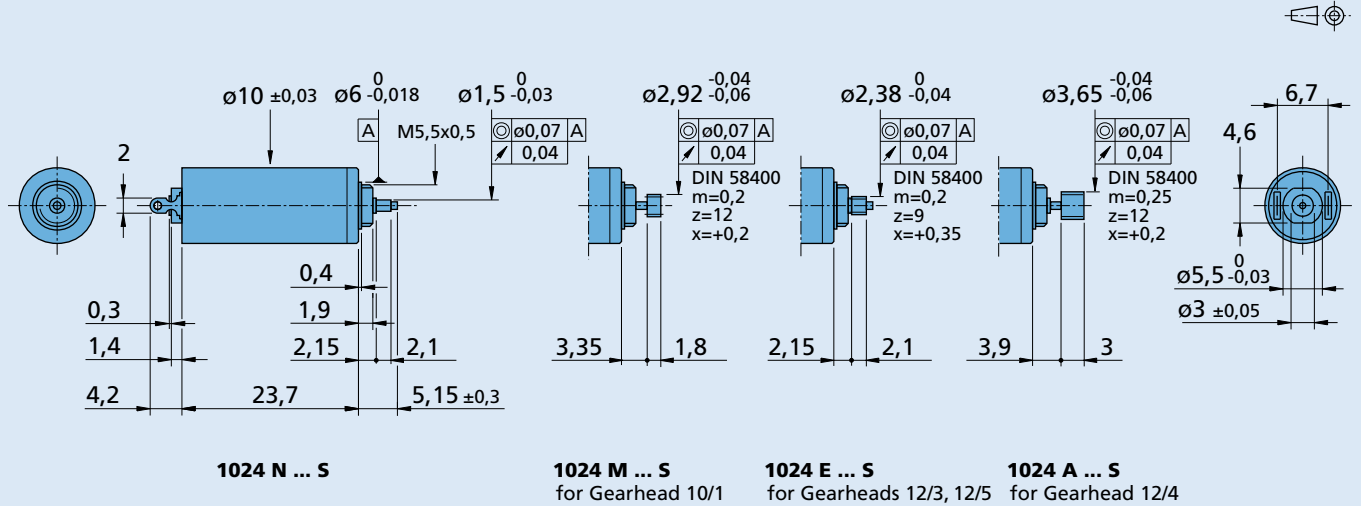
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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: **1024N012S-K179**

Option	Type	Description
K179	Bearing lubrication	For vacuum of 10 ⁻⁷ Torr @ 20°C
K188	Temperature range	Extended temperature range (-30...+125°C)
K380	Second shaft end	Ø 1 mm x 3 mm
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	Cables / Accessories
10/1 12/4 12/3 12/5	PA2-100 HEM3-256 W	SC 1801 MCDC 3002	