

# Flat DC-Micromotors

## Precious Metal Commutation

0,45 mNm  
1,2 W

### Series 1506 ... SR

Values at 22°C and nominal voltage		1506 N	003 SR	006 SR	012 SR	
1	Nominal voltage	$U_N$	3	6	12	V
2	Terminal resistance	$R$	13,5	54,7	155	$\Omega$
3	Output power	$P_{2nom.}$	0,15	0,15	0,22	W
4	Efficiency, max.	$\eta_{max.}$	62	63	67	%
5	No-load speed	$n_0$	11 100	11 800	12 800	min <sup>-1</sup>
6	No-load current, typ. (with shaft $\varnothing$ 0,8 mm)	$I_0$	0,01	0,005	0,003	A
7	Stall torque	$M_H$	0,52	0,49	0,64	mNm
8	Friction torque	$M_R$	0,02	0,02	0,02	mNm
9	Speed constant	$k_n$	3 884	2 053	1 107	min <sup>-1</sup> /V
10	Back-EMF constant	$k_E$	0,257	0,487	0,903	mV/min <sup>-1</sup>
11	Torque constant	$k_M$	2,46	4,65	8,63	mNm/A
12	Current constant	$k_I$	0,407	0,215	0,116	A/mNm
13	Slope of n-M curve	$\Delta n / \Delta M$	21 333	24 135	19 947	min <sup>-1</sup> /mNm
14	Rotor inductance	$L$	275	1 157	3 550	$\mu$ H
15	Mechanical time constant	$\tau_m$	17	19	16	ms
16	Rotor inertia	$J$	0,08	0,08	0,08	gcm <sup>2</sup>
17	Angular acceleration	$\alpha_{max.}$	68	63	83	$\cdot 10^3$ rad/s <sup>2</sup>
18	Thermal resistance	$R_{th1} / R_{th2}$	25 / 35			K/W
19	Thermal time constant	$\tau_{w1} / \tau_{w2}$	4,5 / 48,4			s
20	Operating temperature range:					
	– motor		-25 ... +80			°C
	– winding, max. permissible		+85			°C
21	Shaft bearings		sintered bearings			
22	Shaft load max.:					
	– with shaft diameter		0,8			mm
	– radial at 3 000 min <sup>-1</sup> (3 mm from bearing)		0,5			N
	– axial at 3 000 min <sup>-1</sup>		0,1			N
	– axial at standstill		10			N
23	Shaft play:					
	– radial	$\leq$	0,03			mm
	– axial	$\leq$	0,2			mm
24	Housing material		plastic			
25	Mass		4,3			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		2			
29	Magnet material		NdFeB			
<b>Rated values for continuous operation</b>						
30	Rated torque	$M_N$	0,37	0,35	0,45	mNm
31	Rated current (thermal limit)	$I_N$	0,16	0,081	0,056	A
32	Rated speed	$n_N$	2 500	2 500	2 500	min <sup>-1</sup>

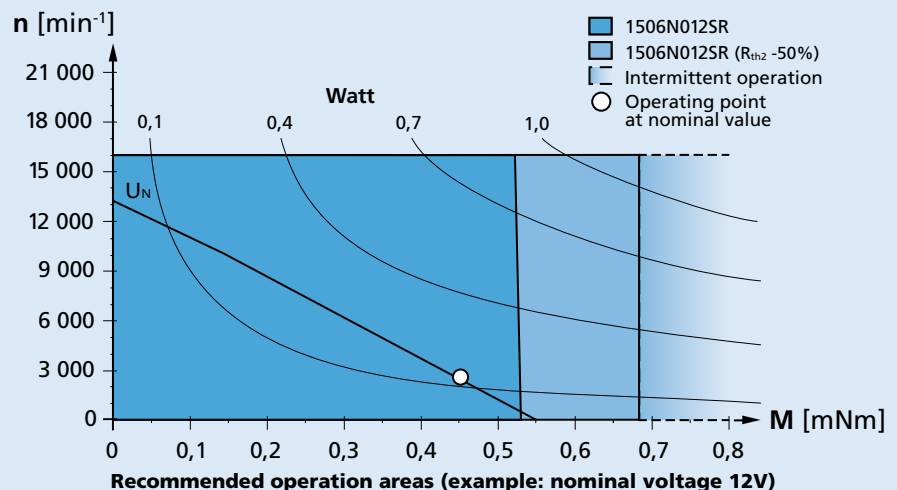
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 0%.

**Note:**

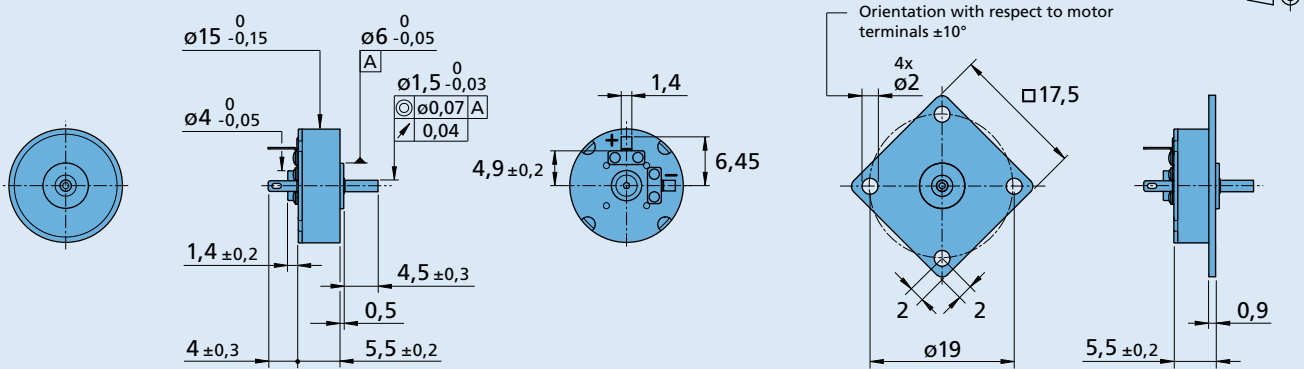
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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.



**Dimensional drawing**



**1506 N ... SR**

**1506 N ... SR X3697**

**Options**

Example product designation: **1506N012SR-3359**

Option	Type	Description
3327	Twin Leads	For motors with twin leads (PVC), length 70 mm, red (+) / black (-)
F	Single Leads	For motors with single leads (PTFE), length 150 mm, red (+) / black (-)
X3697	Flange	Square mounting flange (17,5 x 17,5 mm)
3359	Second shaft end	Length 4,5 mm

**Product Combination**

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
		SC 1801	