

# Brushless DC-Servomotors

## 2 Pole Technology

1,1 mNm  
5,8 W

### Series 0824 ... B

Values at 22°C and nominal voltage	0824 K	006 B	012 B	
1 Nominal voltage	$U_N$	6	12	V
2 Terminal resistance, phase-phase	$R$	2,91	10,7	$\Omega$
3 Efficiency, max.	$\eta_{max.}$	70	70	%
4 No-load speed	$n_0$	35 100	37 500	min <sup>-1</sup>
5 No-load current, typ. (with shaft ø 1 mm)	$I_0$	0,055	0,031	A
6 Stall torque	$M_H$	3,28	3,34	mNm
7 Friction torque, static	$C_0$	0,021	0,021	mNm
8 Friction torque, dynamic	$C_V$	$1,89 \cdot 10^{-6}$	$1,89 \cdot 10^{-6}$	mNm/min <sup>-1</sup>
9 Speed constant	$k_n$	5 968	3 183	min <sup>-1</sup> /V
10 Back-EMF constant	$k_E$	0,168	0,314	mV/min <sup>-1</sup>
11 Torque constant	$k_M$	1,6	3	mNm/A
12 Current constant	$k_I$	0,625	0,333	A/mNm
13 Slope of n-M curve	$\Delta n / \Delta M$	10 855	11 353	min <sup>-1</sup> /mNm
14 Terminal inductance, phase-phase	$L$	30	107	$\mu H$
15 Mechanical time constant	$\tau_m$	2,4	2,5	ms
16 Rotor inertia	$J$	0,0285	0,0285	gcm <sup>2</sup>
17 Angular acceleration	$\alpha_{max.}$	1 561	1 592	$\cdot 10^3 \text{ rad/s}^2$
18 Thermal resistance	$R_{th1} / R_{th2}$	11,2 / 55,2		K/W
19 Thermal time constant	$\tau_{w1} / \tau_{w2}$	3,5 / 112		s
20 Operating temperature range:				
– motor		-20 ... +100		°C
– winding, max. permissible		+125		°C
21 Shaft bearings		ball bearings, preloaded		
22 Shaft load max.:				
– with shaft diameter		1		mm
– radial at 10 000 min <sup>-1</sup> (4 mm from mounting flange)		1,5		N
– axial at 10 000 min <sup>-1</sup> (push only)		0,4		N
– axial at standstill (push only)		10		N
23 Shaft play:				
– radial	$\leq$	0,012		mm
– axial	$=$	0		mm
24 Housing material		aluminium, black anodized		
25 Mass		5,2		g
26 Direction of rotation		electronically reversible		
27 Speed up to	$n_{max.}$	90 000		min <sup>-1</sup>
28 Number of pole pairs		1		
29 Hall sensors		digital		
30 Magnet material		NdFeB		
<b>Rated values for continuous operation</b>				
31 Rated torque	$M_N$	0,89	0,86	mNm
32 Rated current (thermal limit)	$I_N$	0,66	0,341	A
33 Rated speed	$n_N$	22 120	24 560	min <sup>-1</sup>

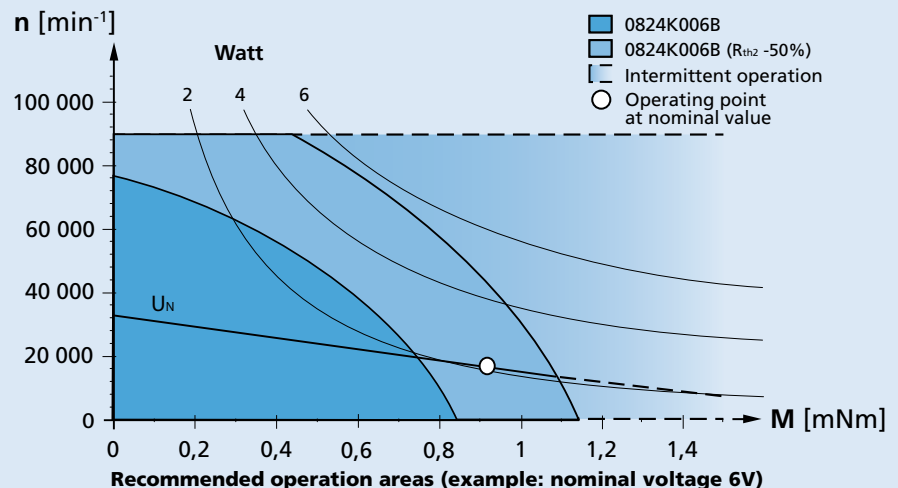
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

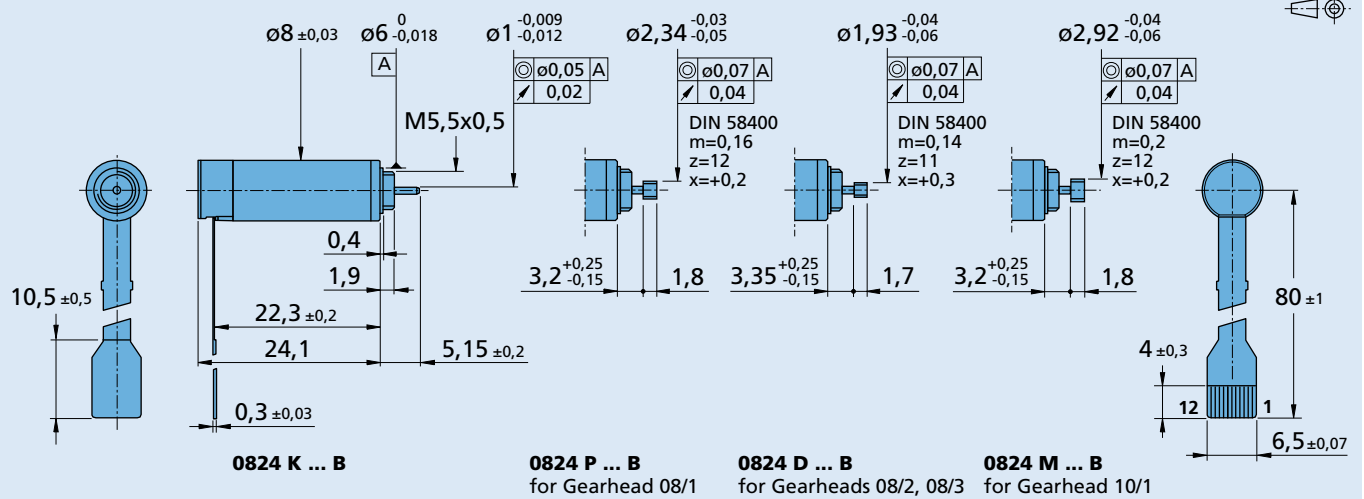
**Note:**

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**

**Option, cable and connection information**

 Example product designation: **0824K006B-K179**

Option	Type	Description	Connection																										
K179	Bearing lubrication	For vacuum of $10^{-7}$ Torr @ 20°C	<table border="1"> <thead> <tr> <th>No.</th> <th>Function</th> </tr> </thead> <tbody> <tr><td>1</td><td>Phase C</td></tr> <tr><td>2</td><td>Phase B</td></tr> <tr><td>3</td><td>Phase A</td></tr> <tr><td>4</td><td>GND</td></tr> <tr><td>5</td><td>U<sub>DD</sub> (+5V)</td></tr> <tr><td>6</td><td>Hall sensor C</td></tr> <tr><td>7</td><td>Hall sensor B</td></tr> <tr><td>8</td><td>Hall sensor A</td></tr> <tr><td>9</td><td>Hall sensor <math>\bar{B}</math></td></tr> <tr><td>10</td><td>Hall sensor <math>\bar{A}</math></td></tr> <tr><td>11</td><td>Hall sensor <math>\bar{C}</math></td></tr> <tr><td>12</td><td>Reserved</td></tr> </tbody> </table> <p><b>Standard flexboard</b> 12 pole, 0,5 mm pitch <b>Recommended connector</b> Molex - ZIF Connector, No. 52745-1297.</p>	No.	Function	1	Phase C	2	Phase B	3	Phase A	4	GND	5	U <sub>DD</sub> (+5V)	6	Hall sensor C	7	Hall sensor B	8	Hall sensor A	9	Hall sensor $\bar{B}$	10	Hall sensor $\bar{A}$	11	Hall sensor $\bar{C}$	12	Reserved
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**Product Combination**

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
08/1 10/1 08/2 08/3	IEM3-1024 AESM-4096	SC 1801 SC 2402 SC 2804 MCBL 3002 AES	6501.00116 Motor adapter (w/wo AES or IEM3) for in combination with SC 2804  6501.00163 Motor adapter (w/wo AES) for in combination with SC1801