

# Brushless DC-Servomotors

## 2 Pole Technology

2,2 mNm  
8,7 W

### Series 1028 ... B

Values at 22°C and nominal voltage		1028 S	006 B	012 B	
1	Nominal voltage	$U_N$	6	12	V
2	Terminal resistance, phase-phase	$R$	1,08	4,37	$\Omega$
3	Efficiency, max.	$\eta_{max}$	73	72	%
4	No-load speed	$n_0$	32 300	33 600	min <sup>-1</sup>
5	No-load current, typ. (with shaft $\varnothing$ 1,2 mm)	$I_0$	0,121	0,065	A
6	Stall torque	$M_H$	9,72	9,22	mNm
7	Friction torque, static	$C_0$	0,06	0,06	mNm
8	Friction torque, dynamic	$C_V$	$4,62 \cdot 10^{-6}$	$4,62 \cdot 10^{-6}$	mNm/min <sup>-1</sup>
9	Speed constant	$k_n$	5 426	2 825	min <sup>-1</sup> /V
10	Back-EMF constant	$k_E$	0,184	0,354	mV/min <sup>-1</sup>
11	Torque constant	$k_M$	1,76	3,38	mNm/A
12	Current constant	$k_I$	0,568	0,296	A/mNm
13	Slope of n-M curve	$\Delta n / \Delta M$	3 329	3 653	min <sup>-1</sup> /mNm
14	Terminal inductance, phase-phase	$L$	24	87	$\mu$ H
15	Mechanical time constant	$\tau_m$	1,9	2,1	ms
16	Rotor inertia	$J$	0,0622	0,0622	gcm <sup>2</sup>
17	Angular acceleration	$\alpha_{max}$	1 803	1 711	$\cdot 10^3$ rad/s <sup>2</sup>
18	Thermal resistance	$R_{th1} / R_{th2}$	6,6 / 42,4		K/W
19	Thermal time constant	$\tau_{w1} / \tau_{w2}$	4,2 / 152		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		1,2		mm
	- radial at 10 000 min <sup>-1</sup> (4 mm from mounting flange)		2,5		N
	- axial at 10 000 min <sup>-1</sup> (push only)		1,3		N
	- axial at standstill (push only)		11		N
23	Shaft play:				
	- radial	$\leq$	0,012		mm
	- axial	$=$	0		mm
24	Housing material		aluminium, black anodized		
25	Mass		9,4		g
26	Direction of rotation		electronically reversible		
27	Speed up to	$n_{max}$	79 000		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	$M_N$	1,68	1,57	mNm
32	Rated current (thermal limit)	$I_N$	1,16	0,57	A
33	Rated speed	$n_N$	25 660	26 800	min <sup>-1</sup>

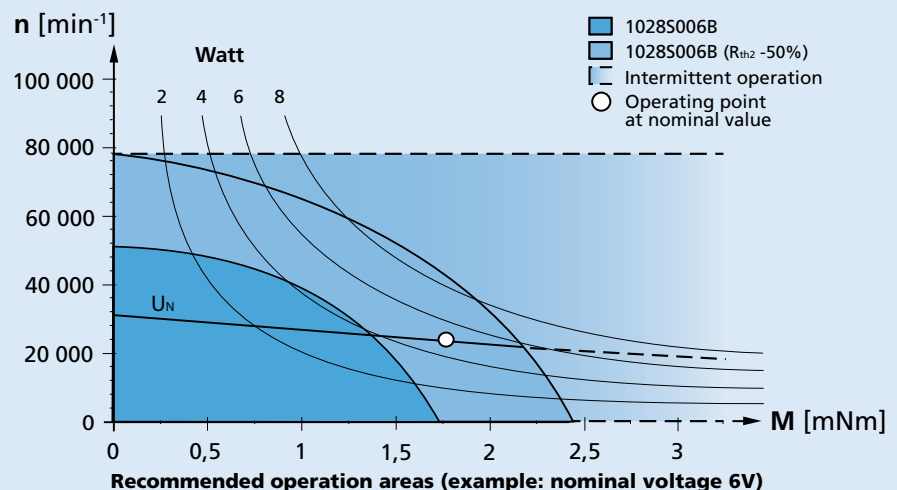
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

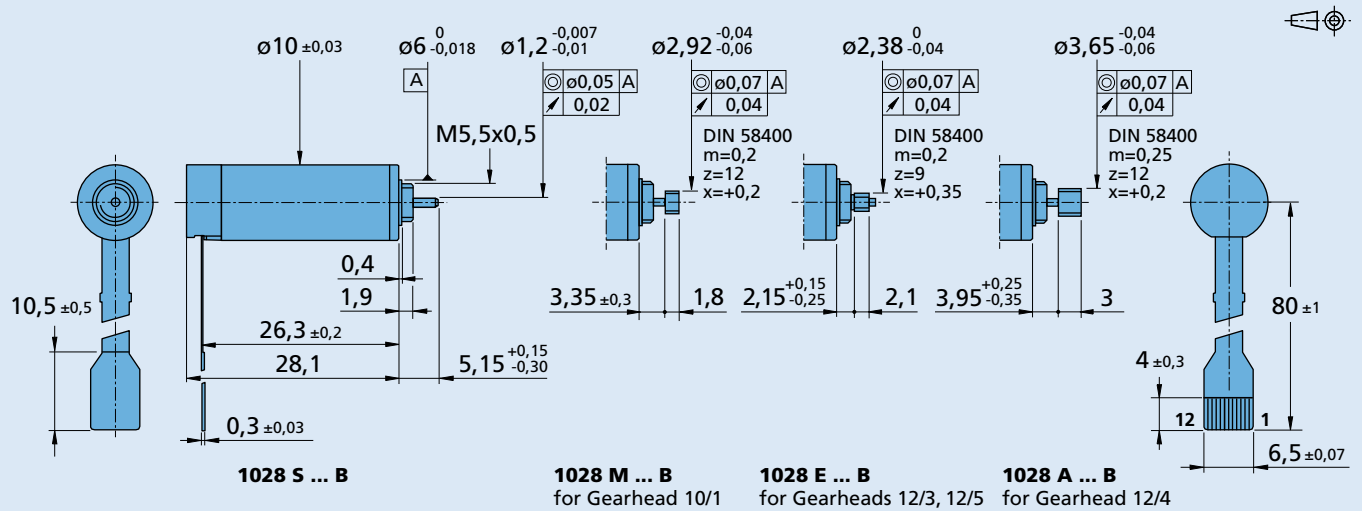
**Note:**

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: **1028S006B-K179**

Option	Type	Description	Connection	
K179	Bearing lubrication	For vacuum of $10^{-5}$ Pa @ 22°C	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
			<b>Standard flexboard</b> 12 pole, 0,5 mm pitch	
			<b>Recommended connector</b> Molex - ZIF Connector, No. 52745-1297.	

**Product combination**

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
10/1 12/3 12/4 12/5	IEM3-1024 AESM-4096	SC 1801 SC 2402 SC 2804 MCBL 3002 AES	To view our large range of accessory parts, please refer to the "Accessories" chapter.