

# Brushless DC-Servomotors

## 2 Pole Technology

1,2 mNm  
4,9 W

### Series 1218 ... B

Values at 22°C and nominal voltage		1218 S	006 B	012 B	
1	Nominal voltage	$U_N$	6	12	V
2	Terminal resistance, phase-phase	$R$	3,14	12	$\Omega$
3	Efficiency, max.	$\eta_{max}$	62	62	%
4	No-load speed	$n_0$	30 500	31 500	$\text{min}^{-1}$
5	No-load current, typ. (with shaft $\varnothing$ 1,2 mm)	$I_0$	0,089	0,047	A
6	Stall torque	$M_H$	3,39	3,44	mNm
7	Friction torque, static	$C_0$	0,066	0,066	mNm
8	Friction torque, dynamic	$C_V$	$3,06 \cdot 10^{-6}$	$3,06 \cdot 10^{-6}$	$\text{mNm}/\text{min}^{-1}$
9	Speed constant	$k_n$	5 276	2 721	$\text{min}^{-1}/\text{V}$
10	Back-EMF constant	$k_E$	0,19	0,368	$\text{mV}/\text{min}^{-1}$
11	Torque constant	$k_M$	1,81	3,51	$\text{mNm}/\text{A}$
12	Current constant	$k_I$	0,553	0,285	$\text{A}/\text{mNm}$
13	Slope of n-M curve	$\Delta n/\Delta M$	9 153	9 301	$\text{min}^{-1}/\text{mNm}$
14	Terminal inductance, phase-phase	$L$	35	132	$\mu\text{H}$
15	Mechanical time constant	$\tau_m$	7,7	7,8	ms
16	Rotor inertia	$J$	0,08	0,08	$\text{gcm}^2$
17	Angular acceleration	$\alpha_{max}$	424	431	$\cdot 10^3 \text{rad}/\text{s}^2$
18	Thermal resistance	$R_{th1} / R_{th2}$	10,6 / 48,3		K/W
19	Thermal time constant	$\tau_{w1} / \tau_{w2}$	2,8 / 169		s
20	Operating temperature range:				
	– motor		-20 ... +100		$^{\circ}\text{C}$
	– winding, max. permissible		+125		$^{\circ}\text{C}$
21	Shaft bearings		ball bearings, preloaded		
22	Shaft load max.:				
	– with shaft diameter		1,2		mm
	– radial at 10 000 $\text{min}^{-1}$ (4 mm from mounting flange)		3,5		N
	– axial at 10 000 $\text{min}^{-1}$ (push only)		2		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		8,3		g
26	Direction of rotation		electronically reversible		
27	Speed up to	$n_{max}$	79 000		$\text{min}^{-1}$
28	Number of pole pairs		1		
29	Hall sensors		digital		
30	Magnet material		NdFeB		
<b>Rated values for continuous operation</b>					
31	Rated torque	$M_N$	0,96	0,95	mNm
32	Rated current (thermal limit)	$I_N$	0,663	0,34	A
33	Rated speed	$n_N$	18 280	19 150	$\text{min}^{-1}$

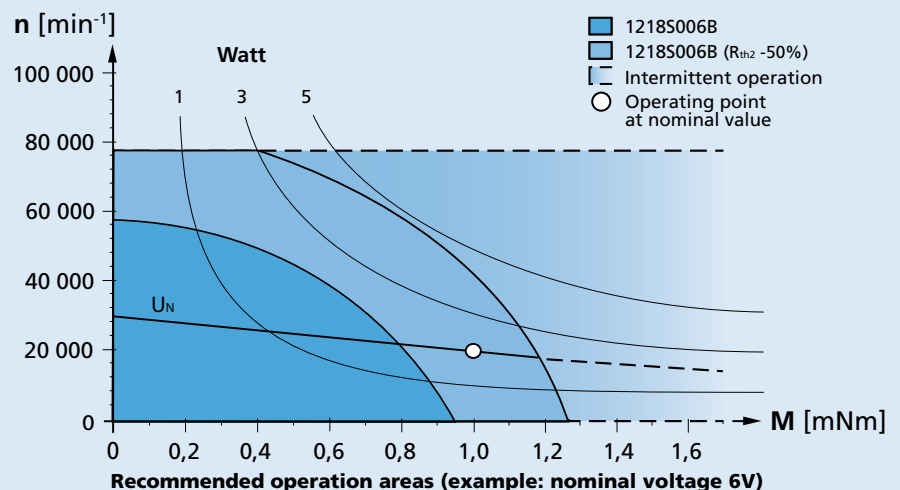
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

**Note:**

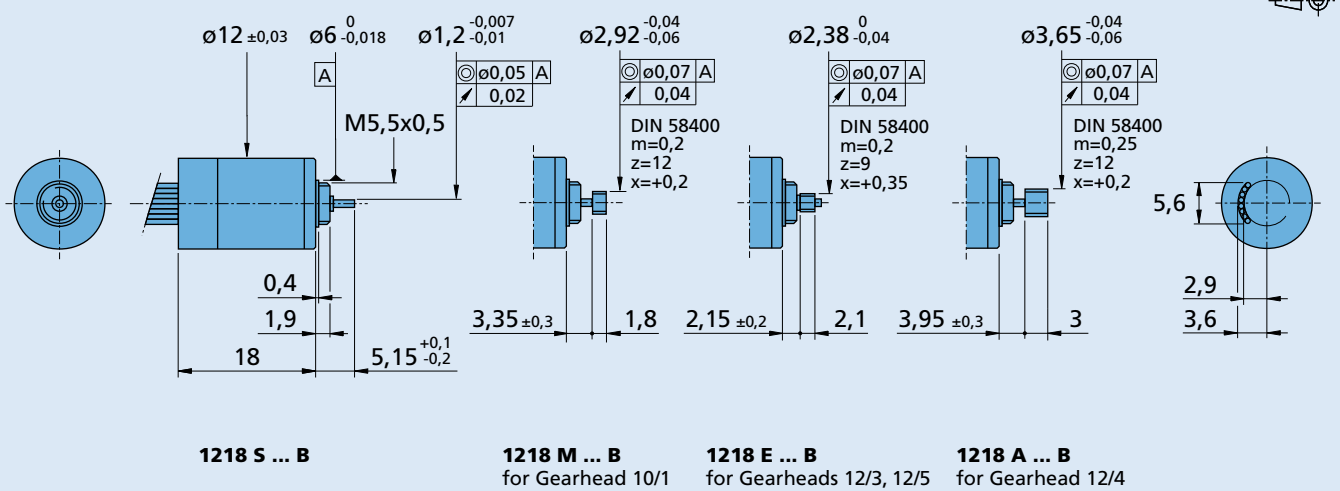
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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: **1218S006B-K1855**

Option	Type	Description	Connection	
			Function	Colour
K1855	Controller combination	Analog Hall sensors for combination with Motion Controller MCBL	Phase C	yellow
K179	Bearing lubrication	For vacuum of $10^{-5}$ Pa @ 22°C	Phase B	orange
			Phase A	brown
			GND	black
			U <sub>DD</sub> (+5V)	red
			Hall sensor C	grey
			Hall sensor B	blue
			Hall sensor A	green
			<b>Standard cable</b>	
			Single wires, material PTFE	
			8 conductors, AWG 30	
			Length: 80 mm ±3 mm	

### Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
10/1 12/3 12/4 12/5		SC 1801 SC 2402 SC 2804 MC 5004 MCBL 3002 MCBL 3003	To view our large range of accessory parts, please refer to the "Accessories" chapter.