

# Brushless DC-Servomotors

## 2 Pole Technology

3,3 mNm  
17 W

### Series 1628 ... B

Values at 22°C and nominal voltage		1628 T	012 B	024 B	
1	Nominal voltage	$U_N$	12	24	V
2	Terminal resistance, phase-phase	$R$	4,36	15,2	$\Omega$
3	Efficiency, max.	$\eta_{max}$	68	69	%
4	No-load speed	$n_0$	30 800	31 600	min <sup>-1</sup>
5	No-load current, typ. (with shaft $\varnothing$ 1,5 mm)	$I_0$	0,087	0,045	A
6	Stall torque	$M_H$	9,79	11	mNm
7	Friction torque, static	$C_0$	0,148	0,148	mNm
8	Friction torque, dynamic	$C_V$	$5,33 \cdot 10^{-6}$	$5,33 \cdot 10^{-6}$	mNm/min <sup>-1</sup>
9	Speed constant	$k_n$	2 645	1 349	min <sup>-1</sup> /V
10	Back-EMF constant	$k_E$	0,378	0,741	mV/min <sup>-1</sup>
11	Torque constant	$k_M$	3,61	7,08	mNm/A
12	Current constant	$k_I$	0,277	0,141	A/mNm
13	Slope of n-M curve	$\Delta n / \Delta M$	3 195	2 896	min <sup>-1</sup> /mNm
14	Terminal inductance, phase-phase	$L$	134	517	$\mu$ H
15	Mechanical time constant	$\tau_m$	18,1	16,4	ms
16	Rotor inertia	$J$	0,54	0,54	gcm <sup>2</sup>
17	Angular acceleration	$\alpha_{max}$	181	204	$\cdot 10^3$ rad/s <sup>2</sup>
18	Thermal resistance	$R_{th1} / R_{th2}$	5,6 / 22,5		K/W
19	Thermal time constant	$\tau_{w1} / \tau_{w2}$	5,7 / 283		s
20	Operating temperature range:				
	– motor		-30 ... +125		°C
	– winding, max. permissible		+125		°C
21	Shaft bearings		ball bearings, preloaded		
22	Shaft load max.:				
	– with shaft diameter		1,5		mm
	– radial at 3 000 min <sup>-1</sup> (4 mm from mounting flange)		17		N
	– axial at 3 000 min <sup>-1</sup> (push only)		10		N
	– axial at standstill (push only)		20		N
23	Shaft play:				
	– radial	$\leq$	0,015		mm
	– axial	$=$	0		mm
24	Housing material		aluminium, black anodized		
25	Mass		30		g
26	Direction of rotation		electronically reversible		
27	Speed up to	$n_{max}$	70 000		min <sup>-1</sup>
28	Number of pole pairs		1		
29	Hall sensors		digital		
30	Magnet material		SmCo		
<b>Rated values for continuous operation</b>					
31	Rated torque	$M_N$	2,62	2,74	mNm
32	Rated current (thermal limit)	$I_N$	0,829	0,442	A
33	Rated speed	$n_N$	19 130	20 540	min <sup>-1</sup>

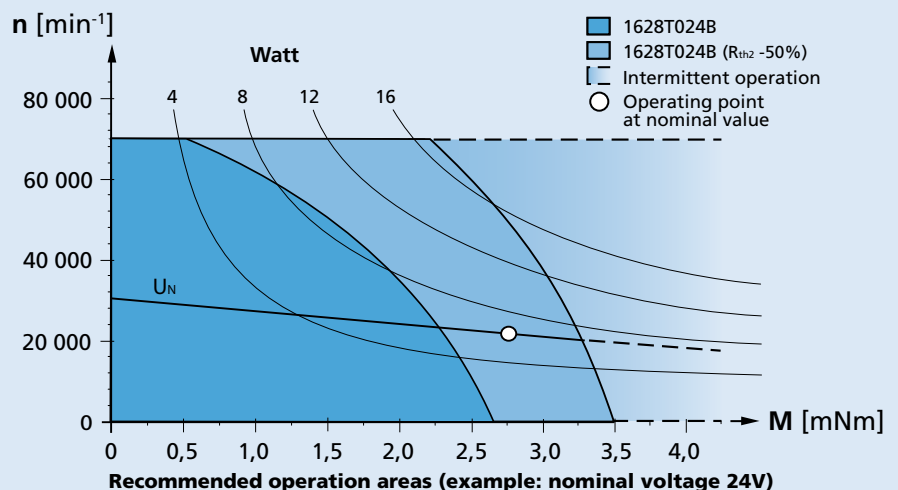
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

**Note:**

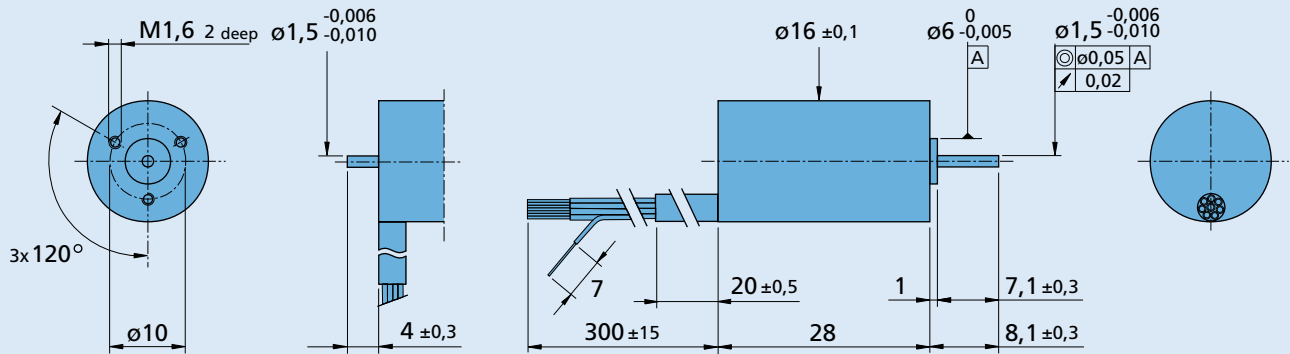
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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



1628 T ... B - K312

1628 T ... B

### Option, cable and connection information

Example product designation: **1628T012B-K1155**

Option	Type	Description	Connection	
			Function	Colour
K1155	Controller combination	Analog Hall sensors for combination with Speed Controller SC or Motion Controller MC	Phase C	yellow
K903	Lead wires length	Single lead wires 1000 mm long in PTFE	Phase B	orange
K313	Encoder combination	Motor with rear end shaft for combination with Encoder IE2	Phase A	brown
K312	Encoder combination	Motor with rear end shaft	GND	black
K179	Bearing lubrication	For vacuum of $10^{-5}$ Pa @ 22°C	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 26	

### Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
15/10 16/7 17/1	IE2-1024	SC 1801 P SC 1801 S SC 2402 P SC 2804 S MC 3001 B MC 3001 P MC 3603 S MC 5004 P	To view our large range of accessory parts, please refer to the "Accessories" chapter.