

Brushless DC-Servomotors

2 Pole Technology

15,9 mNm
96 W

Series 1660 ... BHS

Values at 22°C and nominal voltage		1660 S	024 BHS	036 BHS	048 BHS	
1	Nominal voltage	U_N	24	36	48	V
2	Terminal resistance, phase-phase	R	0,29	0,51	1,12	Ω
3	Efficiency, max.	η_{max}	92	92	92	%
4	No-load speed	n_0	52 400	60 100	53 600	min^{-1}
5	No-load current, typ. (with shaft \varnothing 3 mm)	I_0	0,147	0,123	0,076	A
6	Stall torque	M_H	385	442	394	mNm
7	Friction torque, static	C_0	0,16	0,16	0,16	mNm
8	Friction torque, dynamic	C_V	$9,43 \cdot 10^{-6}$	$9,43 \cdot 10^{-6}$	$9,43 \cdot 10^{-6}$	$\text{mNm}/\text{min}^{-1}$
9	Speed constant	k_n	2 038	1 527	1 037	min^{-1}/V
10	Back-EMF constant	k_E	0,491	0,655	0,964	$\text{mV}/\text{min}^{-1}$
11	Torque constant	k_M	4,69	6,26	9,21	mNm/A
12	Current constant	k_I	0,21	0,16	0,11	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$	127	124	127	$\text{min}^{-1}/\text{mNm}$
14	Terminal inductance, phase-phase	L	29	52	112	μH
15	Mechanical time constant	τ_m	1,2	1,2	1,2	ms
16	Rotor inertia	J	0,9	0,9	0,9	gcm^2
17	Angular acceleration	α_{max}	4 278	4 914	4 372	$\cdot 10^3 \text{rad}/\text{s}^2$
18	Thermal resistance	R_{th1} / R_{th2}	2,1 / 18,2			K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	6,3 / 638			s
20	Operating temperature range:					
	– motor		-30 ... +125			$^{\circ}\text{C}$
	– winding, max. permissible		+125			$^{\circ}\text{C}$
21	Shaft bearings		ball bearings, preloaded			
22	Shaft load max.:					
	– with shaft diameter		3			mm
	– radial at 40 000 min^{-1} (5 mm from mounting flange)		19			N
	– axial at 40 000 min^{-1} (push only)		9			N
	– axial at standstill (push only)		44			N
23	Shaft play:					
	– radial	\leq	0,01			mm
	– axial	$=$	0			mm
24	Housing material		stainless steel			
25	Mass		78			g
26	Direction of rotation		electronically reversible			
27	Speed up to	n_{max}	97 000			min^{-1}
28	Number of pole pairs		1			
29	Hall sensors		digital			
30	Magnet material		NdFeB			
Rated values for continuous operation						
31	Rated torque	M_N	11,6	10,3	11,4	mNm
32	Rated current (thermal limit)	I_N	2,94	1,98	1,48	A
33	Rated speed	n_N	52 370	59 530	53 400	min^{-1}

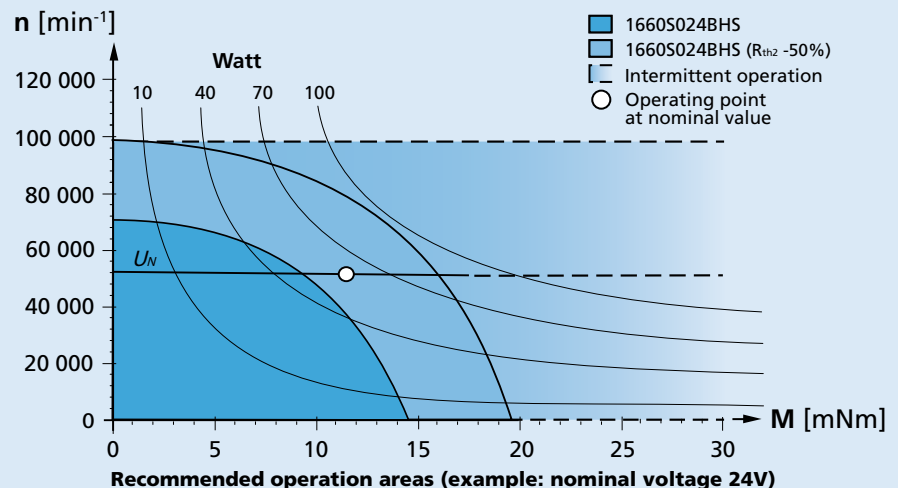
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

Note:

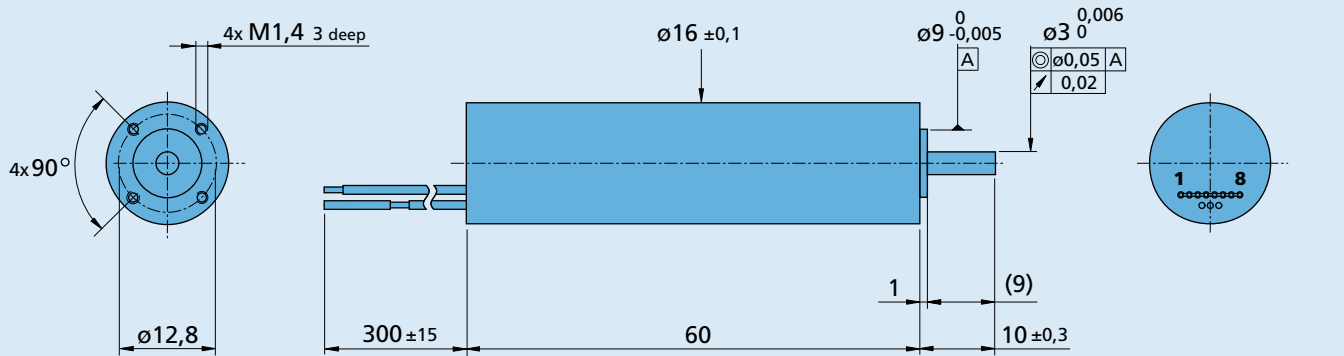
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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



1660 S ... BHS

Option, cable and connection information

Example product designation: **1660S024BHS**

Option	Type	Description	Connection		
			No.	Function	Colour
			-	Phase C	yellow
			-	Phase B	orange
			-	Phase A	brown
			1	GND	red
			2	U _{DD} (4,5 ... 5,5V)	grey
			3	Hall sensor C	grey
			4	Hall sensor B	grey
			5	Hall sensor A	grey
			6	Reserved	grey
			7	Reserved	grey
			8	Reserved	grey

Standard cable
 Single wires, material PTFE
 AWG24, Phase A/B/C
 Flat cable, material PVC
 AWG28, Pitch 1,27 mm
 Hall A,B,C, U_{DD}, GND

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
15/10 17/1 20/1R	IEM3-1024	SC 5004 P SC 5008 S	To view our large range of accessory parts, please refer to the "Accessories" chapter.