

**NEW**

**Brushless DC-Servomotors**  
2 Pole Technology

**18,7 mNm**  
**81 W**

**Series 1660 ... BHT**

Values at 22°C and nominal voltage		1660 S	024 BHT	036 BHT	048 BHT	
1	Nominal voltage	$U_N$	24	36	48	V
2	Terminal resistance, phase-phase	$R$	0,49	1,1	1,93	$\Omega$
3	Efficiency, max.	$\eta_{max}$	90	90	90	%
4	No-load speed	$n_0$	34 900	35 200	35 500	min <sup>-1</sup>
5	No-load current, typ. (with shaft $\varnothing$ 3 mm)	$I_0$	0,133	0,09	0,069	A
6	Stall torque	$M_H$	344	341	343	mNm
7	Friction torque, static	$C_0$	0,43	0,43	0,43	mNm
8	Friction torque, dynamic	$C_V$	$1,28 \cdot 10^{-5}$	$1,28 \cdot 10^{-5}$	$1,28 \cdot 10^{-5}$	mNm/min <sup>-1</sup>
9	Speed constant	$k_n$	1 368	918	694	min <sup>-1</sup> /V
10	Back-EMF constant	$k_E$	0,731	1,09	1,441	mV/min <sup>-1</sup>
11	Torque constant	$k_M$	6,98	10,4	13,7	mNm/A
12	Current constant	$k_I$	0,143	0,096	0,073	A/mNm
13	Slope of n-M curve	$\Delta n / \Delta M$	95	97	97	min <sup>-1</sup> /mNm
14	Terminal inductance, phase-phase	$L$	52	114	203	$\mu$ H
15	Mechanical time constant	$\tau_m$	1,2	1,2	1,3	ms
16	Rotor inertia	$J$	1,2	1,2	1,2	gcm <sup>2</sup>
17	Angular acceleration	$\alpha_{max}$	2 796	2 772	2 787	$\cdot 10^3$ rad/s <sup>2</sup>
18	Thermal resistance	$R_{th1} / R_{th2}$	2,1 / 18,2			K/W
19	Thermal time constant	$\tau_{w1} / \tau_{w2}$	6,8 / 631			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		3			mm
	- radial at 40 000 min <sup>-1</sup> (5 mm from mounting flange)		19			N
	- axial at 40 000 min <sup>-1</sup> (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	$n_{max}$	76 000			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	$M_N$	13,9	13,7	13,6	mNm
32	Rated current (thermal limit)	$I_N$	2,38	1,58	1,18	A
33	Rated speed	$n_N$	34 490	34 740	35 070	min <sup>-1</sup>

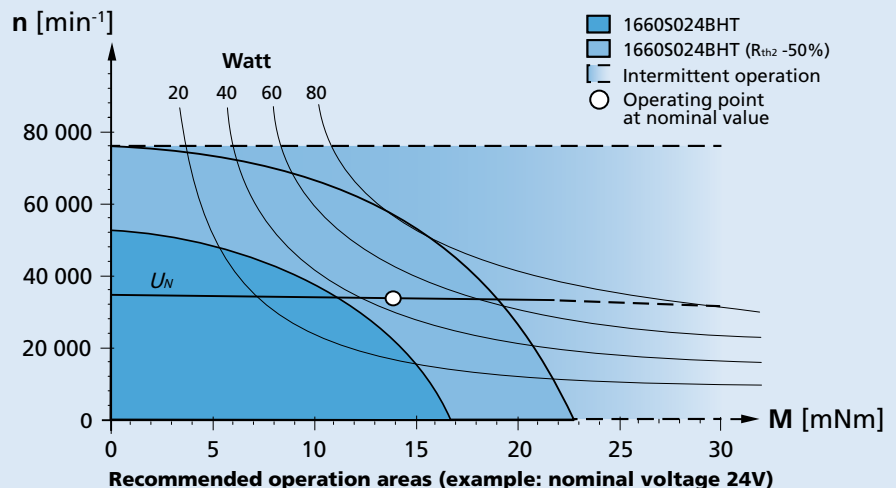
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

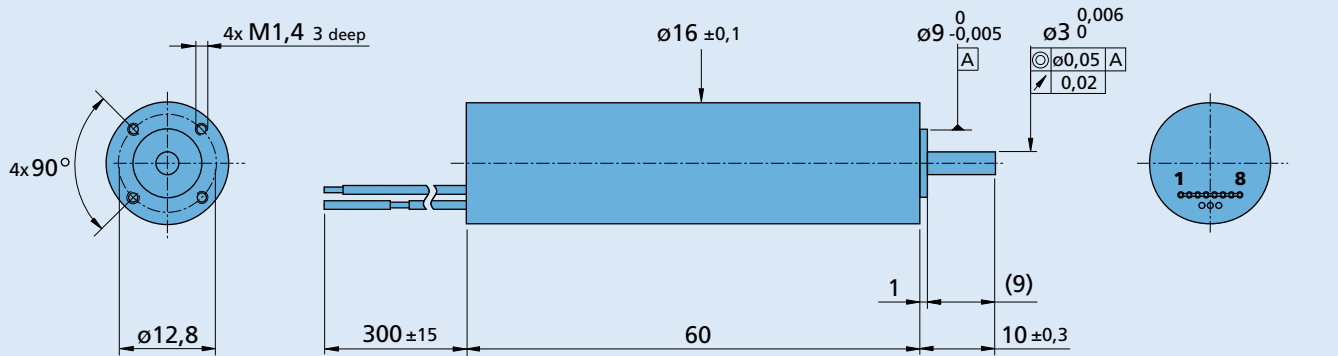
**Note:**

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**

**1660 S ... BHT**
**Option, cable and connection information**

 Example product designation: **1660S024BHT**

Option	Type	Description	Connection		
			No.	Function	Colour
			-	Phase C	yellow
			-	Phase B	orange
			-	Phase A	brown
			1	GND	red
			2	U <sub>DD</sub> (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<sub>DD</sub>, 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 MC 5004 P MC 5004 P STO MC 5005 S	To view our large range of accessory parts, please refer to the "Accessories" chapter.