

**NEW**

**Brushless DC-Servomotors**  
2 Pole Technology

**8 mNm**  
**58,5 W**

**Series 1645 ... BHS**

Values at 22°C and nominal voltage		1645 S	024 BHS	036 BHS	048 BHS	
1	Nominal voltage	$U_N$	24	36	48	V
2	Terminal resistance, phase-phase	$R$	0,684	1,51	2,81	$\Omega$
3	Efficiency, max.	$\eta_{max}$	90	90	90	%
4	No-load speed	$n_0$	62 000	62 900	61 400	$\text{min}^{-1}$
5	No-load current, typ. (with shaft $\varnothing$ 3 mm)	$I_0$	0,0988	0,0674	0,0486	A
6	Stall torque	$M_H$	137	138	135	mNm
7	Friction torque, static	$C_0$	0,114	0,114	0,114	mNm
8	Friction torque, dynamic	$C_V$	$4,49 \cdot 10^{-6}$	$4,49 \cdot 10^{-6}$	$4,49 \cdot 10^{-6}$	$\text{mNm}/\text{min}^{-1}$
9	Speed constant	$k_n$	2 450	1 650	1 210	$\text{min}^{-1}/\text{V}$
10	Back-EMF constant	$k_E$	0,409	0,606	0,825	$\text{mV}/\text{min}^{-1}$
11	Torque constant	$k_M$	3,9	5,79	7,88	$\text{mNm}/\text{A}$
12	Current constant	$k_I$	0,256	0,173	0,127	$\text{A}/\text{mNm}$
13	Slope of n-M curve	$\Delta n/\Delta M$	429	431	432	$\text{min}^{-1}/\text{mNm}$
14	Terminal inductance, phase-phase	$L$	46	103	190	$\mu\text{H}$
15	Mechanical time constant	$\tau_m$	2,6	2,6	2,7	ms
16	Rotor inertia	$J$	0,59	0,59	0,59	$\text{gcm}^2$
17	Angular acceleration	$\alpha_{max}$	2 330	2 350	2 300	$\cdot 10^3 \text{rad}/\text{s}^2$
18	Thermal resistance	$R_{th1} / R_{th2}$	3,1 / 22			K/W
19	Thermal time constant	$\tau_{w1} / \tau_{w2}$	6,5 / 580			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 $\text{min}^{-1}$ (5 mm from mounting flange)		18			N
	– axial at 40 000 $\text{min}^{-1}$ (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		58,2			g
26	Direction of rotation		electronically reversible			
27	Speed up to	$n_{max}$	100 000			$\text{min}^{-1}$
28	Number of pole pairs		1			
29	Hall sensors		digital			
30	Magnet material		NdFeB			
<b>Rated values for continuous operation</b>						
31	Rated torque	$M_N$	6,09	6,02	6,1	mNm
32	Rated current (thermal limit)	$I_N$	1,86	1,24	0,924	A
33	Rated speed	$n_N$	61 300	62 100	60 600	$\text{min}^{-1}$

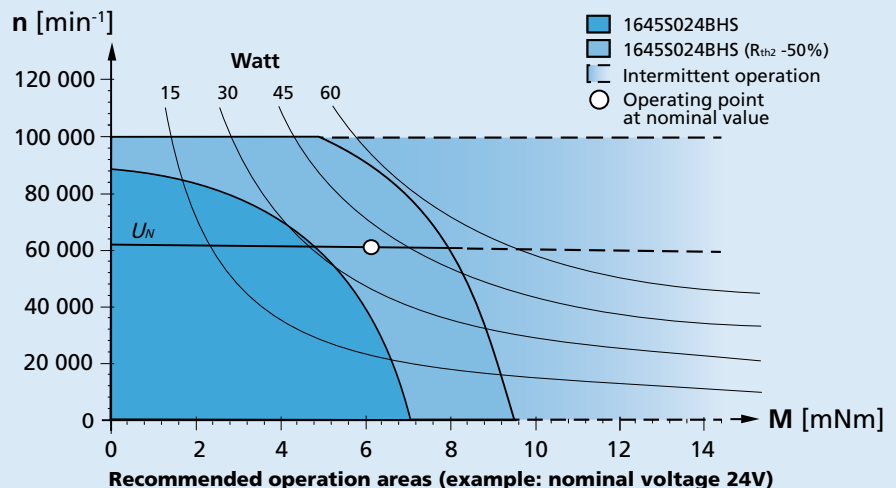
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

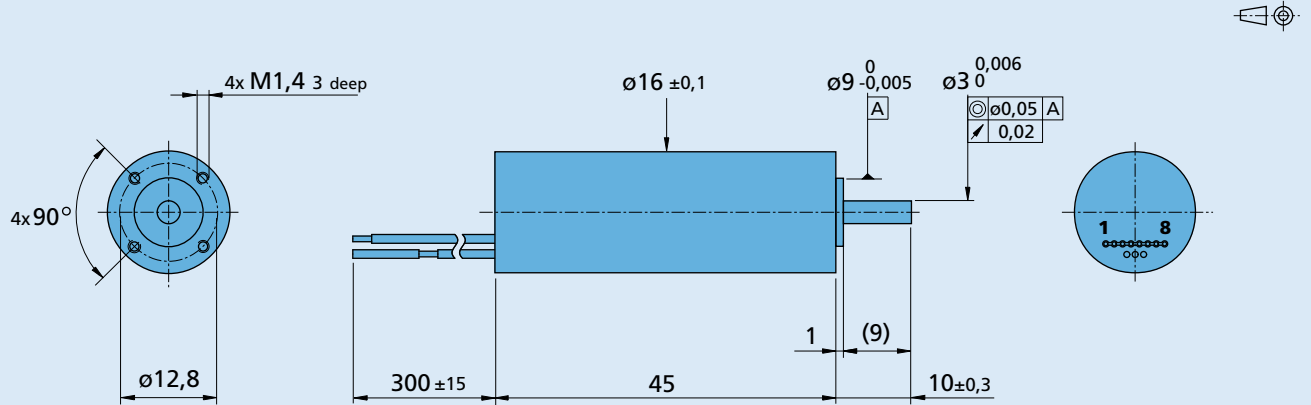
**Note:**

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**

**1645 S ... BHS**
**Option, cable and connection information**

 Example product designation: **1645S024BHS**

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
			<b>Standard cable</b>		
			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 5005 S	To view our large range of accessory parts, please refer to the "Accessories" chapter.