

Brushless DC-Servomotors

4 Pole Technology

18 mNm
23 W

Series 2250 ... BX4 S

Values at 22°C and nominal voltage		2250 S	012 BX4 S	018 BX4 S	024 BX4 S	
1	Nominal voltage	U_N	12	18	24	V
2	Terminal resistance, phase-phase	R	1,55	3,17	5,9	Ω
3	Efficiency, max.	η_{max}	71	71	72	%
4	No-load speed	n_0	10 700	11 400	10 900	min^{-1}
5	No-load current, typ. (with shaft \varnothing 3 mm)	I_0	0,188	0,139	0,095	A
6	Stall torque	M_H	82,6	85,8	85,7	mNm
7	Friction torque, static	C_0	0,54	0,54	0,54	mNm
8	Friction torque, dynamic	C_V	$1,3 \cdot 10^{-4}$	$1,3 \cdot 10^{-4}$	$1,3 \cdot 10^{-4}$	$\text{mNm}/\text{min}^{-1}$
9	Speed constant	k_n	890	628	448	min^{-1}/V
10	Back-EMF constant	k_E	1,124	1,593	2,231	$\text{mV}/\text{min}^{-1}$
11	Torque constant	k_M	10,7	15,2	21,3	mNm/A
12	Current constant	k_I	0,093	0,066	0,047	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$	128	131	124,8	$\text{min}^{-1}/\text{mNm}$
14	Terminal inductance, phase-phase	L	64,3	129	250	μH
15	Mechanical time constant	τ_m	6,9	7	6,7	ms
16	Rotor inertia	J	5,1	5,1	5,1	gcm^2
17	Angular acceleration	α_{max}	162	168	168	$\cdot 10^3 \text{rad}/\text{s}^2$
18	Thermal resistance	R_{th1} / R_{th2}	3,7 / 15,1			K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	13 / 550			s
20	Operating temperature range:					
	– motor		-40 ... +100			$^{\circ}\text{C}$
	– winding, max. permissible		+125			$^{\circ}\text{C}$
21	Shaft bearings		ball bearings, preloaded			
22	Shaft load max.:					
	– with shaft diameter		3			mm
	– radial at 3 000 min^{-1} (5 mm from mounting flange)		20			N
	– axial at 3 000 min^{-1} (push / pull)		2			N
	– axial at standstill (push / pull)		20			N
23	Shaft play:					
	– radial	\leq	0,015			mm
	– axial	$=$	0			mm
24	Housing material		stainless steel			
25	Mass		88			g
26	Direction of rotation		electronically reversible			
27	Speed up to	n_{max}	26 000			min^{-1}
28	Number of pole pairs		2			
29	Hall sensors		digital			
30	Magnet material		NdFeB			
Rated values for continuous operation						
31	Rated torque	M_N	13,6	13	13,7	mNm
32	Rated current (thermal limit)	I_N	1,59	1,09	0,81	A
33	Rated speed	n_N	8 580	9 310	8 720	min^{-1}

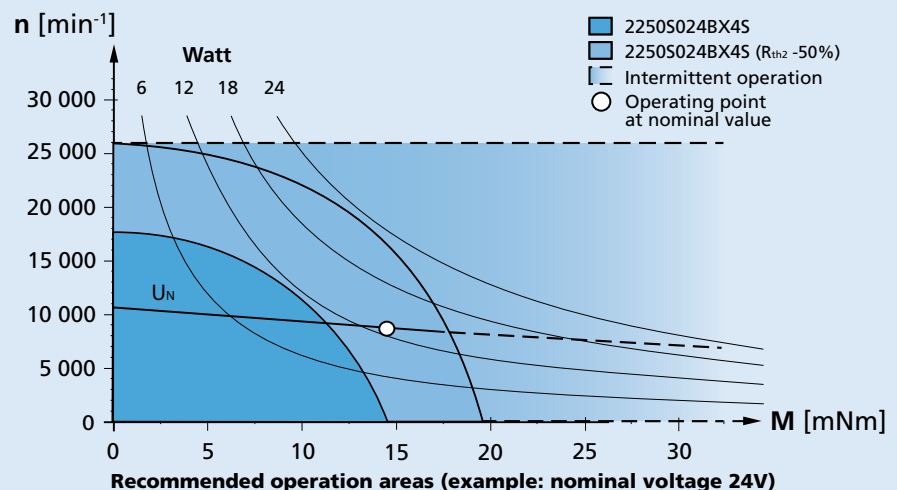
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

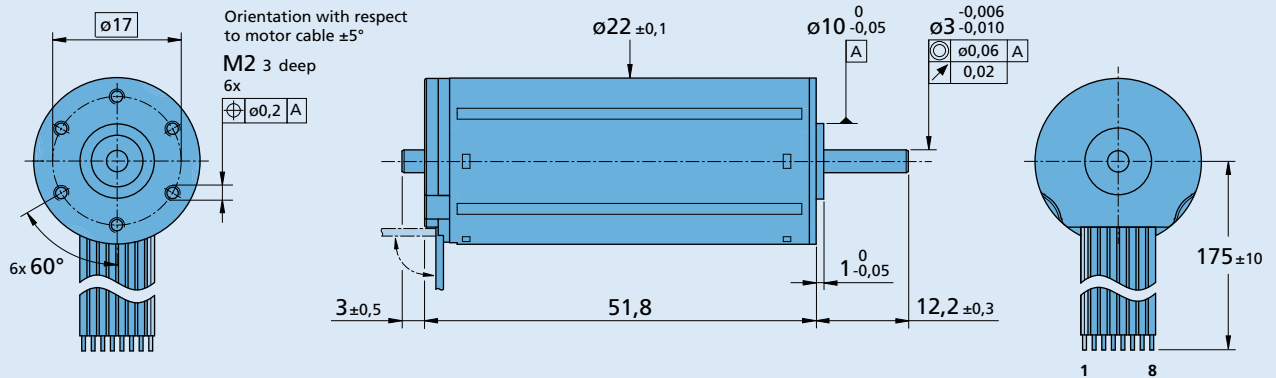
Note:

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

2250 S ... BX4 S
Option, cable and connection information

 Example product designation: **2250S024BX4S-3830**

Option	Type	Description	Connection																																					
			standard	Option: 4935																																				
3830	Connector 	AWG 26 / PVC ribbon cable with connector MOLEX Microfit 3.0, 43025-0800, recommended mating connector 43020-0800	<table border="1"> <thead> <tr> <th>No.</th> <th>Function</th> <th>Function</th> <th>Colour</th> </tr> </thead> <tbody> <tr><td>1</td><td>Phase C</td><td>Phase C</td><td>yellow</td></tr> <tr><td>2</td><td>Phase B</td><td>Phase B</td><td>orange</td></tr> <tr><td>3</td><td>Phase A</td><td>Phase A</td><td>brown</td></tr> <tr><td>4</td><td>GND</td><td>GND</td><td>black</td></tr> <tr><td>5</td><td>U_{DD} (+5V)</td><td>U_{DD} (+5V)</td><td>red</td></tr> <tr><td>6</td><td>Hall sensor C</td><td>Hall sensor C</td><td>grey</td></tr> <tr><td>7</td><td>Hall sensor B</td><td>Hall sensor B</td><td>blue</td></tr> <tr><td>8</td><td>Hall sensor A</td><td>Hall sensor A</td><td>green</td></tr> </tbody> </table>	No.	Function	Function	Colour	1	Phase C	Phase C	yellow	2	Phase B	Phase B	orange	3	Phase A	Phase A	brown	4	GND	GND	black	5	U _{DD} (+5V)	U _{DD} (+5V)	red	6	Hall sensor C	Hall sensor C	grey	7	Hall sensor B	Hall sensor B	blue	8	Hall sensor A	Hall sensor A	green	
No.	Function	Function	Colour																																					
1	Phase C	Phase C	yellow																																					
2	Phase B	Phase B	orange																																					
3	Phase A	Phase A	brown																																					
4	GND	GND	black																																					
5	U _{DD} (+5V)	U _{DD} (+5V)	red																																					
6	Hall sensor C	Hall sensor C	grey																																					
7	Hall sensor B	Hall sensor B	blue																																					
8	Hall sensor A	Hall sensor A	green																																					
4935	Single wires	Motor with single wires (PTFE), length 175 mm, AWG26	Standard cable Insulation: PVC 8 conductors, AWG 26 pitch 1,27 mm, wires tinned																																					
X4935	Single wires	Motor with single wires (PTFE), length 300 mm, AWG26																																						
Y4935	Single wires	Motor with single wires (PTFE), length 600 mm, AWG26																																						
Y158	Shaft end	Motor without second shaft end																																						

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
22F 22/7 26A BS22-1.5	IE3-1024 IE3-1024 L IER3-10000 IER3-10000 L AES-4096	SC 2402 P SC 2804 S 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.