Brushless DC-Servomotors 32 mNm

4 Pole Technology 31 W

Series 2250 ... BX4

Values at 22°C and nominal voltage		2250 S	012 BX4	018 BX4	024 BX4	
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.	$\eta_{max.}$	76	76	77	%
4	No-load speed	n_0	6 000	6 400	6 200	min^{-1}
5	No-load current, typ. (with shaft ø 3 mm)	I_0	0,128	0,094	0,066	A
6	Stall torque	M_H	147	152	151	mNm
7	Friction torque, static	C_0	0,8	0,8	0,8	mNm
8	Friction torque, dynamic	C_V	$2{,}6 \cdot 10^{-4}$	$2{,}6 \cdot 10^{-4}$	$2{,}6 \cdot 10^{-4}$	mNm/min^{-1}
9	Speed constant	k_n	502	354	255	min^{-1}/V
10	Back-EMF constant	k_E	1,994	2,825	3,927	mV/min^{-1}
11	Torque constant	k_M	19	27	37,5	mNm/A
12	Current constant	k_I	0,053	0,037	0,027	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$	40,8	41,6	40,3	min^{-1}/mNm
14	Terminal inductance, phase-phase	L	62,8	126	250	µH
15	Mechanical time constant	τ_m	4,3	4,3	4,2	ms
16	Rotor inertia	J	10	10	10	gcm^2
17	Angular acceleration	$\alpha_{max.}$	147	152	151	$\cdot 10^3 rad/s^2$
18	Thermal resistance	R_{th1} / R_{th2}	3,5 / 15			K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	12 / 660			s
20	Operating temperature range:					
	– motor		-40 ... +100			°C
	– winding, max. permissible		+125			°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	≤	0,015			mm
	– axial	=	0			mm
24	Housing material		stainless steel			
25	Mass		105			g
26	Direction of rotation		electronically reversible			
27	Speed up to	$n_{max.}$	20 000			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	26,2	25,5	26,2	mNm
32	Rated current (thermal limit)	I_N	1,66	1,15	0,85	A
33	Rated speed	n_N	4 740	5 140	4 870	min^{-1}

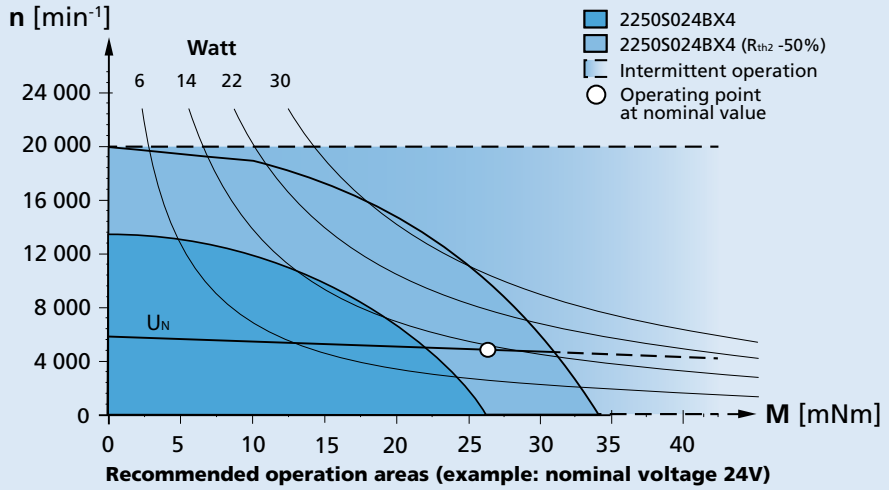
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

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.

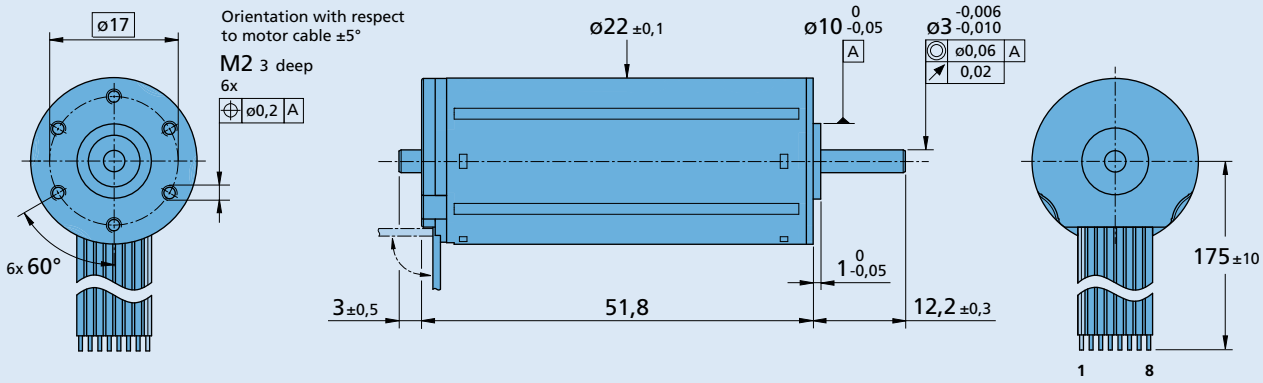
The diagram shows the motor in a completely insulated as well as thermally coupled condition (R_{th2} 50% reduced).

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.



Recommended operation areas (example: nominal voltage 24V)

Dimensional drawing



2250 S ... BX4

Option, cable and connection information

Example product designation: **2250S024BX4-3692**

Option	Type	Description
3830	Connector 	AWG 26 / PVC ribbon cable with connector MOLEX Microfit 3.0, 43025-0800, recommended mating connector 43020-0800
4935	Single wires	Motor with single wires (PTFE), length 175 mm, AWG26
X4935	Single wires	Motor with single wires (PTFE), length 300 mm, AWG26
Y4935	Single wires	Motor with single wires (PTFE), length 600 mm, AWG26
4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 175 mm, AWG26
X4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 300 mm, AWG26
Y4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 600 mm, AWG26
Y158	Shaft end	Motor without second shaft end
3692	Controller combination	Analog Hall sensors for combination with Motion Controller MCBL
5327	Controller combination	For SIN-COS sensor model with integrated temperature sensor and combination with MC V3.0

Connection standard

No.	Function
1	Phase C
2	Phase B
3	Phase A
4	GND
5	U_{DD} (+5V)
6	Hall sensor C
7	Hall sensor B
8	Hall sensor A

Standard cable

Insulation: PVC
8 conductors,
AWG 26,
pitch 1,27 mm ,
wires tinned.

Option: 4935/4747

Function	Colour
Phase C	yellow
Phase B	orange
Phase A	brown
GND	black
U_{DD} (+5V)	red
Hall sensor C	grey
Hall sensor B	blue
Hall sensor A	green

Option: 5327

No.	Function
1	Phase C
2	Phase B
3	Phase A
4	GND
5	U_{DD} (+5V)
6	NTC
7	SIN
8	COS

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
22GPT 22/7 26A 32GPT 22L ... ML 22L ... PB 22L ... SB 32L ... ML 32L ... PB 32L ... SB 32L ... TL	IE3-1024 IE3-1024 L IER3-10000 IER3-10000 L AEMT-12/16 L AES-4096 L	SC 2402 P SC 2804 S SC 5004 P SC 5008 S MCBL 3002 P MCBL 3002 S MCBL 3003 P MCBL 3006 S MC 3001 B MC 3001 P MC 5004 P MC 5005 S	To view our large range of accessory parts, please refer to the “Accessories” chapter.