

Brushless DC-Servomotors

4 Pole Technology

18 mNm
23 W

Series 2232 ... BX4

Values at 22°C and nominal voltage	2232 S	006 BX4	012 BX4	015 BX4	018 BX4	024 BX4		
1 Nominal voltage	U_N		6	12	15	18	24	V
2 Terminal resistance, phase-phase	R		0,73	3,5	4,58	7,04	12,5	Ω
3 Efficiency, max.	η_{max}		74	74	74	73	74	%
4 No-load speed	n_0		7 100	6 700	7 100	7 100	7 100	min^{-1}
5 No-load current, typ. (with shaft \varnothing 3 mm)	I_0		0,16	0,072	0,06	0,053	0,039	A
6 Stall torque	M_H		64,7	58,7	64	60,7	61,7	mNm
7 Friction torque, static	C_0		0,46	0,46	0,46	0,46	0,46	mNm
8 Friction torque, dynamic	C_V		$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	$\text{mNm}/\text{min}^{-1}$
9 Speed constant	k_n		1 198	562	480	399	295	min^{-1}/V
10 Back-EMF constant	k_E		0,835	1,78	2,08	2,504	3,393	$\text{mV}/\text{min}^{-1}$
11 Torque constant	k_M		7,97	17	19,9	23,9	32,4	mNm/A
12 Current constant	k_I		0,125	0,059	0,05	0,042	0,031	A/mNm
13 Slope of n-M curve	$\Delta n/\Delta M$		110	114	110	118	114	$\text{min}^{-1}/\text{mNm}$
14 Terminal inductance, phase-phase	L		25	115	156	225	410	μH
15 Mechanical time constant	τ_m		5,9	6,1	5,9	6,3	6,1	ms
16 Rotor inertia	J		5,1	5,1	5,1	5,1	5,1	gcm^2
17 Angular acceleration	α_{max}		127	115	125	119	121	$\cdot 10^3 \text{rad}/\text{s}^2$
18 Thermal resistance	R_{th1} / R_{th2}	3,9 / 18,8						K/W
19 Thermal time constant	τ_{w1} / τ_{w2}	7,9 / 520						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		65						g
26 Direction of rotation		electronically reversible						
27 Speed up to	n_{max}	29 000						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		14,8	14,7	14,8	14,3	14,6	mNm
32 Rated current (thermal limit)	I_N		2,22	1	0,89	0,72	0,54	A
33 Rated speed	n_N		5 030	4 450	5 040	4 930	4 840	min^{-1}

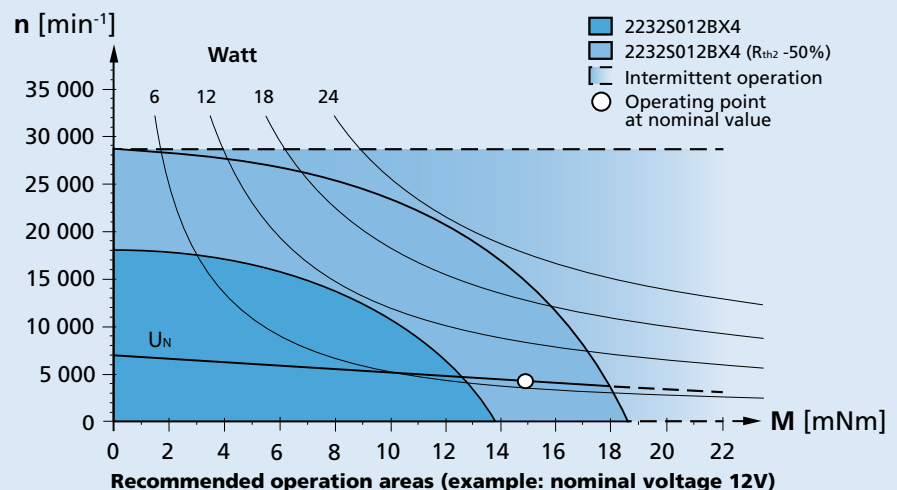
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

Note:

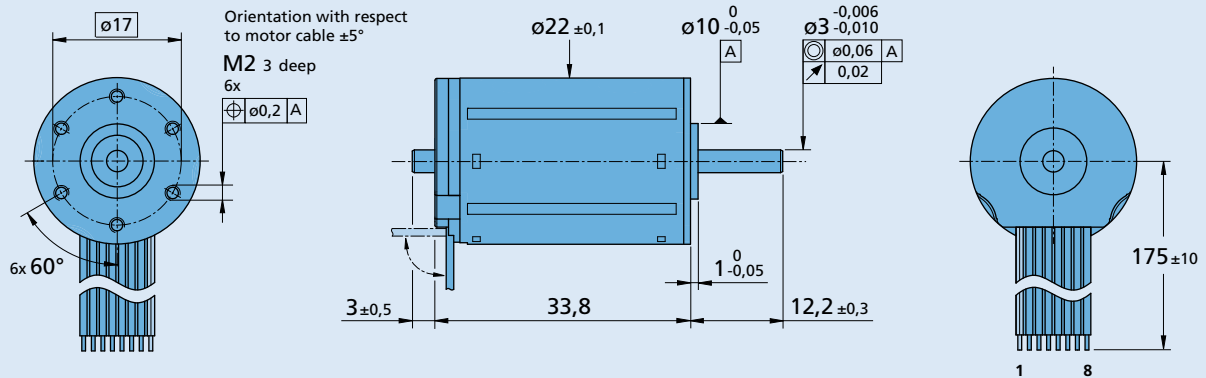
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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



2232 S ... BX4

Option, cable and connection information

Example product designation: **2232S012BX4-3692**

Option	Type	Description	Connection standard	
			No.	Function
3830	Connector 	AWG 26 / PVC ribbon cable with connector MOLEX Microfit 3.0, 43025-0800, recommended mating connector 43020-0800	1	Phase C
4935	Single wires	Motor with single wires (PTFE), length 175 mm, AWG26	2	Phase B
X4935	Single wires	Motor with single wires (PTFE), length 300 mm, AWG26	3	Phase A
Y4935	Single wires	Motor with single wires (PTFE), length 600 mm, AWG26	4	GND
4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 175 mm, AWG26	5	U _{DD} (+5V)
X4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 300 mm, AWG26	6	Hall sensor C
Y4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 600 mm, AWG26	7	Hall sensor B
Y158	Shaft end	Motor without second shaft end	8	Hall sensor A
3692	Controller combination	Analog Hall sensors for combination with Motion Controller MCBL		

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

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

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 1801 P SC 1801 S SC 2402 P SC 2804 S SC 5004 P SC 5008 S MCBL 3002 P MCBL 3002 S MCBL 3003 P MCBL 3006 S MCBL 3002 P AES MCBL 3002 S AES MCBL 3003 P AES MCBL 3006 S AES MC 5004 P MC 5004 P STO MC 5005 S	To view our large range of accessory parts, please refer to the "Accessories" chapter.