Brushless DC-Servomotors
4 Pole Technology

18 mNm
23 W

Series 2232 ... BX4

Values at 22°C and nominal voltage		2232 S		012 BX4	024 BX4	
1	Nominal voltage	U_N		12	24	V
2	Terminal resistance, phase-phase	R		3,5	12,5	Ω
3	Efficiency, max.	$\eta_{max.}$		74	74	%
4	No-load speed	n_o		6 700	7 100	rpm
5	No-load current, typ. (with shaft ø 3 mm)	I_o		0,072	0,039	A
6	Stall torque	M_H		58,7	61,7	mNm
7	Friction torque, static	C_o		0,46	0,46	mNm
8	Friction torque, dynamic	C_v		$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	mNm/rpm
9	Speed constant	k_n		562	295	rpm/V
10	Back-EMF constant	k_E		1,780	3,393	mV/rpm
11	Torque constant	k_M		17	32,4	mNm/A
12	Current constant	k_I		0,059	0,031	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$		114	114	rpm/mNm
14	Terminal inductance, phase-phase	L		115	410	µH
15	Mechanical time constant	τ_m		6,1	6,1	ms
16	Rotor inertia	J		5,1	5,1	gcm^2
17	Angular acceleration	$\alpha_{max.}$		115	121	$\cdot 10^3 rad/s^2$
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			°C
	– winding, max. permissible		+ 125			°C
21	Shaft bearings		ball bearings, preloaded			
22	Shaft load, max. permissible:					
	– with shaft diameter		3			mm
	– radial at 3 000 rpm (5 mm from mounting flange)		20			N
	– axial at 3 000 rpm (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		65			g
26	Direction of rotation		electronically reversible			
27	Speed up to	$n_{max.}$	29 000			rpm
28	Number of pole pairs		2			
29	Hall sensors		digital			
30	Magnet material		NdFeB			
Rated values for continuous operation						
31	Rated torque	M_N		14,7	14,6	mNm
32	Rated current (thermal limit)	I_N		1,00	0,54	A
33	Rated speed	n_N		4 450	4 840	rpm

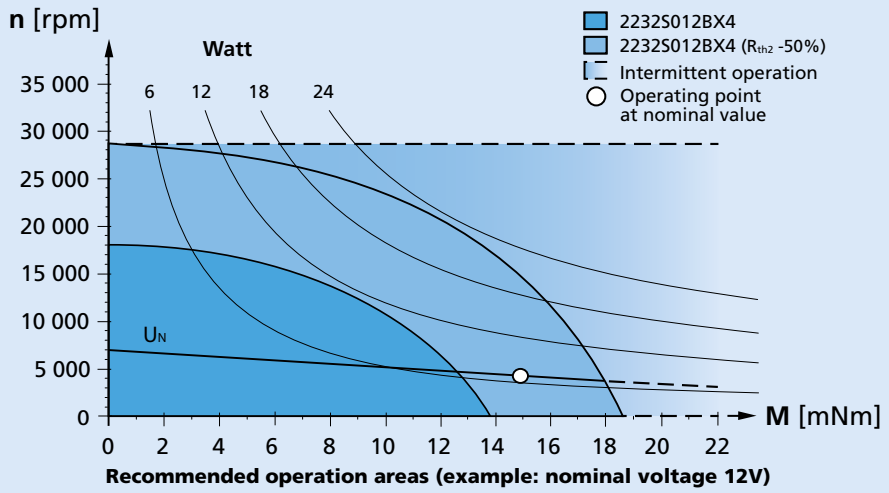
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

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.

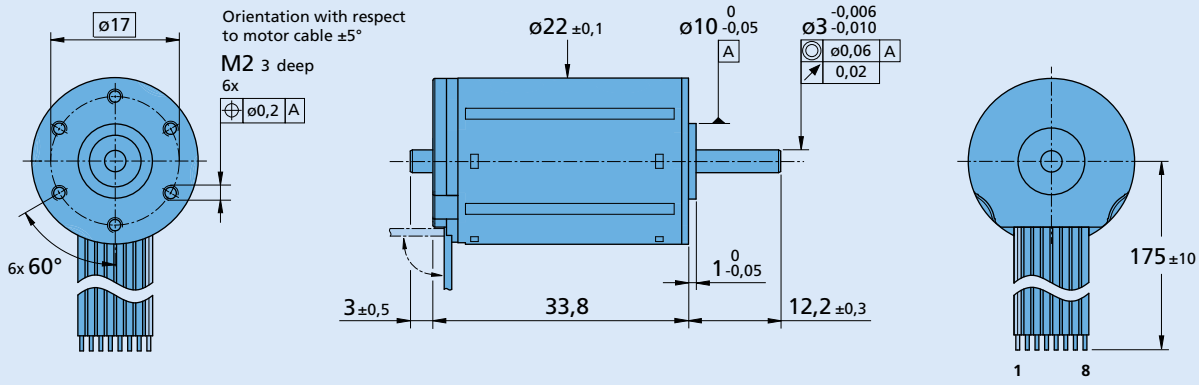
The diagram shows the motor in a completely insulated as well as thermally coupled condition (R_{th2} 50% reduced).

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 12V)

Dimensional drawing



2232 S ... BX4

Option, cable and connection information

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

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

Connection standard

No.	Function	Option: 4935/4747 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

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
22/F 22/7 26A BS22-1.5	IE3-1024 IE3-1024L AES-4096	SC 1801 SC 2402 SC 2804 SC 5004 SC 5008 MCBL 3002 MCBL 3003 MCBL 3006	6501.00085 Motor adapter for MCBL 3002 S / SC 1801 (motor with connector 3830) 6501.00086 Motor adapter for MCBL 3006 S / SC 2804 and 5008 (motor with connector 3830) 6501.00141 Extension cable, motor with connector 3830, 8 single wires, length 300 mm for combination with SC and MC 6501.00142 Extension cable, motor with connector 3830, 8 single wires, length 1000 mm for combination with SC and MC