FAULHABER

18 mNm
23 W

Brushless DC-Servomotors

4 Pole Technology

Series 2232 ... BX4

Values at 22°C and nominal voltage	2232 S		006 BX4	012 BX4	015 BX4	018 BX4	024 BX4	
Nominal voltage	U_N		6	12	15	18	24	V
Terminal resistance, phase-phase	R		0,73	3,5	4,58	7,04	12,5	Ω
Efficiency, max.	$\eta_{max.}$		74	74	74	73	74	%
No-load speed	n_0		7 100	6 700	7 100	7 100	7 100	min^{-1}
No-load current, typ. (with shaft ø 3 mm)	I_0		0,16	0,072	0,06	0,053	0,039	A
Stall torque	M_H		64,7	58,7	64	60,7	61,7	mNm
Friction torque, static	C_0		0,46	0,46	0,46	0,46	0,46	mNm
Friction torque, dynamic	C_V		$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	$1,1 \cdot 10^{-4}$	mNm/min^{-1}
Speed constant	k_n		1 198	562	480	399	295	min^{-1}/V
Back-EMF constant	k_E		0,835	1,78	2,08	2,504	3,393	mV/min^{-1}
Torque constant	k_M		7,97	17	19,9	23,9	32,4	mNm/A
Current constant	k_I		0,125	0,059	0,05	0,042	0,031	A/mNm
Slope of n-M curve	$\Delta n/\Delta M$		110	114	110	118	114	min^{-1}/mNm
Terminal inductance, phase-phase	L		25	115	156	225	410	µH
Mechanical time constant	τ_m		5,9	6,1	5,9	6,3	6,1	ms
Rotor inertia	J		5,1	5,1	5,1	5,1	5,1	gcm^2
Angular acceleration	$\alpha_{max.}$		127	115	125	119	121	$\cdot 10^3 rad/s^2$
Thermal resistance	R_{th1} / R_{th2}	3,9 / 18,8						K/W
Thermal time constant	τ_{w1} / τ_{w2}	7,9 / 520						s
Operating temperature range:								
– motor		-40 ... +100						°C
– winding, max. permissible		+125						°C
Shaft bearings		ball bearings, preloaded						
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
Shaft play:								
– radial	≤	0,015						mm
– axial	=	0						mm
Housing material		stainless steel						
Mass		65						g
Direction of rotation		electronically reversible						
Speed up to	$n_{max.}$	29 000						min^{-1}
Number of pole pairs		2						
Hall sensors		digital						
Magnet material		NdFeB						
Rated values for continuous operation								
Rated torque	M_N		14,8	14,7	14,8	14,3	14,6	mNm
Rated current (thermal limit)	I_N		2,22	1	0,89	0,72	0,54	A
Rated speed	n_N		5 030	4 450	5 040	4 930	4 840	min^{-1}

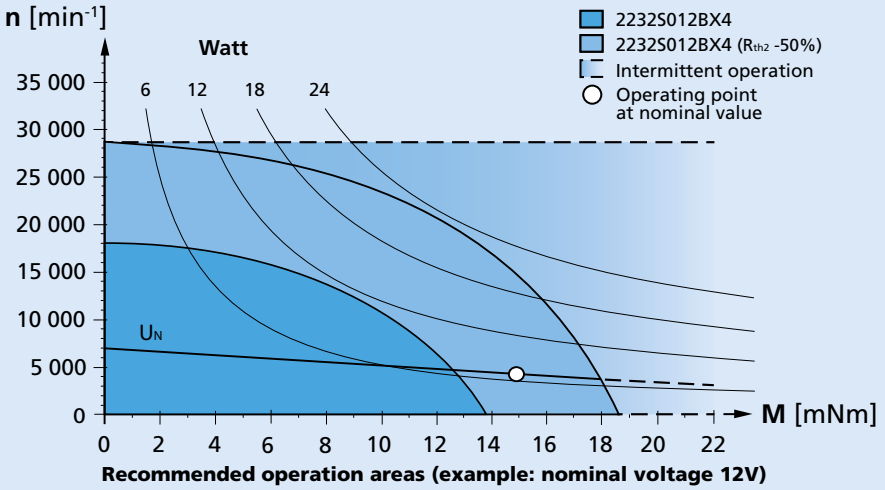
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

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.



Recommended operation areas (example: nominal voltage 12V)

For notes on technical data and lifetime performance refer to "Technical Information".

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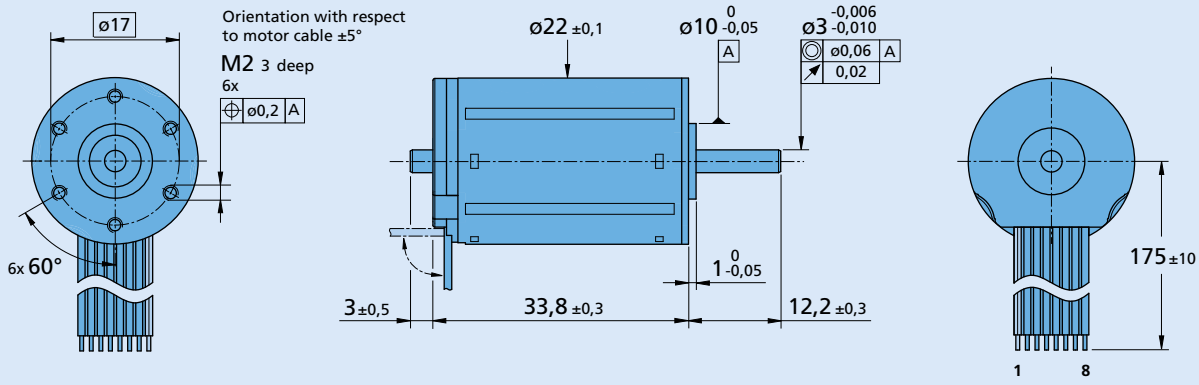
Dimensional drawing



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 Speed Controller SC or Motion Controller MC
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 22GPT LN 22GPT HT 22/7 26A 22L ... ML 22L ... SB 22L ... PB	IE3-1024 IE3-1024 L IER3-10000 IER3-10000 L AES-4096 L AEMT-12/16 L	SC 1801 P SC 1801 S SC 2402 P SC 2804 S SC 5004 P SC 5008 S MC 3001 B MC 3001 P MC 3602 B MC 3603 S MC 3606 B MC 5004 P MC 5005 S	To view our large range of accessory parts, please refer to the “Accessories” chapter.

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