

# Brushless DC-Servomotors

## 4 Pole Technology

### 6,3 / 12 mNm

For combination with  
 Gearheads:  
 22F  
 Encoders:  
 IE3 ...  
 Drive Electronics:  
 SC 2804

### Series 2232 ... BX4

	2232 S	012 BX4 S	024 BX4 S	012 BX4	024 BX4	
1 Nominal voltage	U <sub>N</sub>	12	24	12	24	Volt
2 Terminal resistance, phase-phase	R	3,5	12,4	3,5	12,4	Ω
3 Output power <sup>1) 2)</sup>	P <sub>2 max.</sub>	3,8	3,9	7,6	7,7	W
4 Efficiency	η <sub>max.</sub>	60,9	61,7	66,9	67,6	%
5 No-load speed	n <sub>0</sub>	13 200	14 000	6 600	7 000	rpm
6 No-load current (with shaft ø 3,0 mm)	I <sub>0</sub>	0,163	0,088	0,112	0,061	A
7 Stall torque	M <sub>H</sub>	27,3	29,4	55,7	59,9	mNm
8 Friction torque, static	C <sub>0</sub>	0,6	0,6	0,85	0,85	mNm
9 Friction torque, dynamic	C <sub>v</sub>	5,5 · 10 <sup>-5</sup>	5,5 · 10 <sup>-5</sup>	1,5 · 10 <sup>-4</sup>	1,5 · 10 <sup>-4</sup>	mNm/rpm
10 Speed constant	k <sub>n</sub>	1 173	616	579	304	rpm/V
11 Back-EMF constant	k <sub>E</sub>	0,852	1,623	1,728	3,288	mV/rpm
12 Torque constant	k <sub>M</sub>	8,14	15,50	16,50	31,40	mNm/A
13 Current constant	k <sub>I</sub>	0,123	0,065	0,061	0,032	A/mNm
14 Slope of n-M curve	Δn/ΔM	504	493	123	120	rpm/mNm
15 Terminal inductance, phase-phase	L	130	470	120	440	μH
16 Mechanical time constant	τ <sub>m</sub>	22	22	6,7	6,5	ms
17 Rotor inertia	J	4,2	4,2	5,2	5,2	gcm <sup>2</sup>
18 Angular acceleration	α <sub>max.</sub>	65	70	107	115	·10 <sup>3</sup> rad/s <sup>2</sup>
19 Thermal resistance	R <sub>th 1</sub> / R <sub>th 2</sub>	2 / 17		2 / 17		K/W
20 Thermal time constant	τ <sub>w1</sub> / τ <sub>w2</sub>	4,1 / 360		4,1 / 370		s
21 Operating temperature range		- 40 ... + 100		- 40 ... + 100		°C
22 Shaft bearings		ball bearings, preloaded				
23 Shaft load max.:						
- radial at 3 000 rpm (4 mm from mounting flange)		20				N
- axial at 3 000 rpm		2				N
- axial at standstill		20				N
24 Shaft play:						
- radial	≤	0,015				mm
- axial	=	0				mm
25 Housing material		stainless steel				
26 Weight		70				g
27 Direction of rotation		electronically reversible				
28 Number of pole pairs		2				

#### Recommended values - mathematically independent of each other

29 Speed up to <sup>2)</sup>	n <sub>e max.</sub>	16 500	16 500	10 400	10 400	rpm
30 Torque up to <sup>1) 2)</sup>	M <sub>e max.</sub>	6,2	6,3	11,8	12	mNm
31 Current up to <sup>1) 2)</sup>	I <sub>e max.</sub>	0,94	0,50	0,90	0,48	A

<sup>1)</sup> at 5 000 rpm

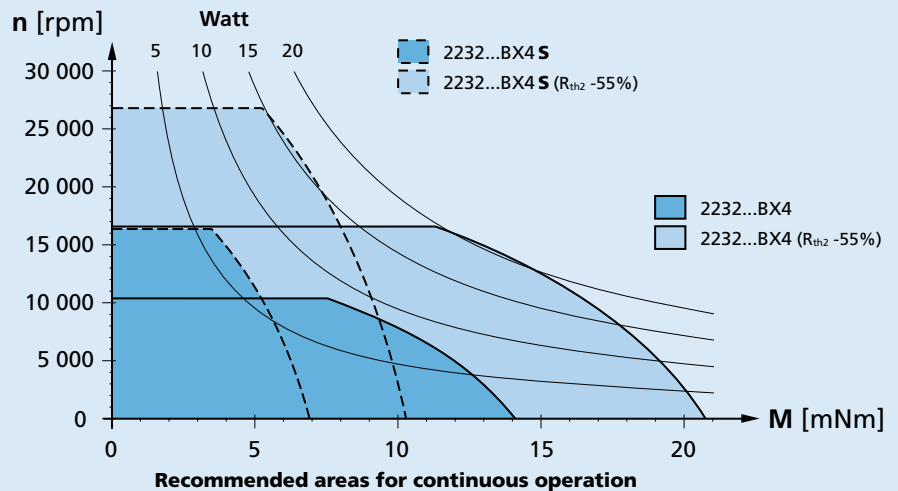
<sup>2)</sup> thermal resistance R<sub>th 2</sub> not reduced

#### Note:

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

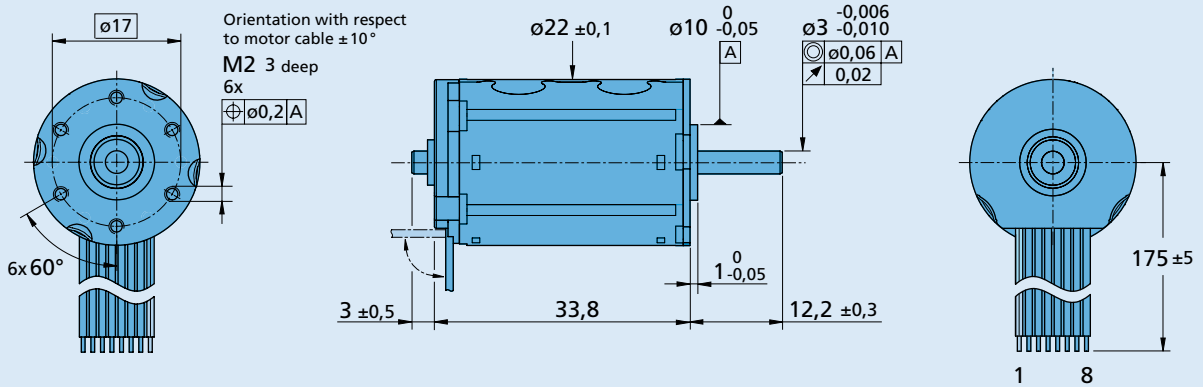
The motor can provide more power with adequate cooling (for ex. R<sub>th2</sub> reduction of -55%).

The maximum available torque and speed will be reduced if the ambient temperature is higher than 22°C and/or the motor is thermally insulated to the ambient environment.



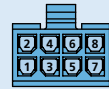
**2232 ... BX4 and BX4 S**

M1:1


**2232 S ... BX4 and BX4 S**
**Options**

- connector variants

**Motor:**  
 AWG 26 / PVC ribbon cable (8-conductors),  
 with connector MicroFit


**Full product description**

- Examples:  
 2232S024BX4  
 2232S012BX4S

**Cable and connection information**
