

# Brushless DC-Servomotors

## 4 Pole Technology

### 19 mNm

For combination with  
 Gearheads:  
 22F, 22/7, 26A  
 Encoders:  
 2232...BX4 + Encoder  
 Drive Electronics:  
 Speed Controller

### Series 2232 ... BX4

	2232 S	012 BX4	024 BX4	
1 Nominal voltage	$U_N$	12	24	Volt
2 Terminal resistance, phase-phase	R	3,5	12,4	$\Omega$
3 Output power <sup>1)</sup>	$P_{2 \text{ max.}}$	7,6	7,7	W
4 Efficiency	$\eta_{\text{ max.}}$	66,9	67,6	%
5 No-load speed	$n_0$	6 600	7 000	rpm
6 No-load current (with shaft $\varnothing$ 3,0 mm)	$I_0$	0,112	0,061	A
7 Stall torque	$M_H$	55,7	59,9	mNm
8 Friction torque, static	$C_0$	0,85	0,85	mNm
9 Friction torque, dynamic	$C_v$	$1,5 \cdot 10^{-4}$	$1,5 \cdot 10^{-4}$	mNm/rpm
10 Speed constant	$k_n$	579	304	rpm/V
11 Back-EMF constant	$k_E$	1,728	3,288	mV/rpm
12 Torque constant	$k_M$	16,50	31,40	mNm/A
13 Current constant	$k_I$	0,061	0,032	A/mNm
14 Slope of n-M curve	$\Delta n / \Delta M$	123	120	rpm/mNm
15 Terminal inductance, phase-phase	L	120	440	$\mu\text{H}$
16 Mechanical time constant	$\tau_m$	6,7	6,5	ms
17 Rotor inertia	J	5,2	5,2	$\text{gcm}^2$
18 Angular acceleration	$\alpha_{\text{ max.}}$	107	115	$\cdot 10^3 \text{ rad/s}^2$
19 Thermal resistance	$R_{\text{th} 1} / R_{\text{th} 2}$	2 / 17		K/W
20 Thermal time constant	$\tau_{w1} / \tau_{w2}$	4,1 / 370		s
21 Operating temperature range		- 40 ... + 100		$^{\circ}\text{C}$
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	$\leq$	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		
<b>Recommended values - mathematically independent of each other</b>				
29 Speed up to	$n_e \text{ max.}$	22 000	22 000	rpm
30 Torque up to <sup>1) 2)</sup>	$M_e \text{ max.}$	12 / 19	12 / 19	mNm
31 Current up to <sup>1) 2)</sup>	$I_e \text{ max.}$	0,90 / 1,40	0,48 / 0,74	A

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

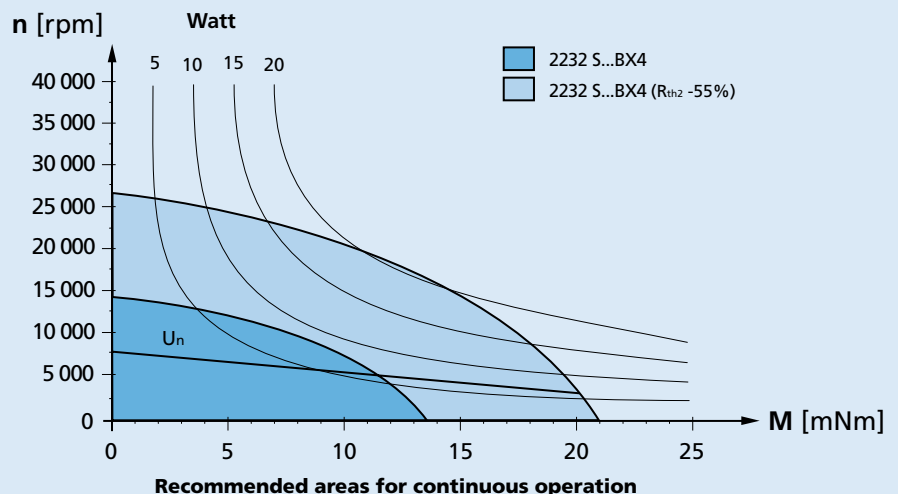
<sup>2)</sup> thermal resistance  $R_{\text{th} 2}$  not reduced / thermal resistance  $R_{\text{th} 2}$  by 55% reduced

#### 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.

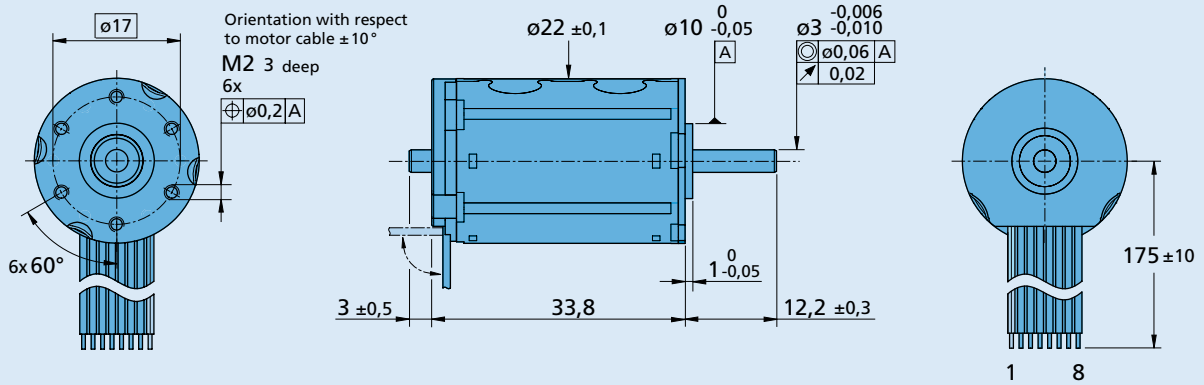
The diagram shows the motor in a completely insulated as well as thermally coupled condition ( $R_{\text{th} 2}$  55% reduced).

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**

M 1:1

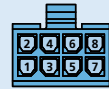


**2232 S ... BX4**

**Options**

- Connector variant (Option no. 3830)

**Motor:**  
AWG 26 / PVC ribbon cable  
with connector Micro-Fit



- Analog Hall sensors (Option no. 3692)

**Full product description**

- Examples:  
**2232S024BX4**

**Cable and connection information**

