

# Brushless DC-Servomotors

## 4 Pole Technology

53 mNm  
45 W

### Series 3242 ... BX4

Values at 22°C and nominal voltage	3242 G	012 BX4	018 BX4	024 BX4	036 BX4	042 BX4	048 BX4	
1 Nominal voltage	$U_N$	12	18	24	36	42	48	V
2 Terminal resistance, phase-phase	$R$	0,92	2,01	3,67	8,96	11,7	15,1	$\Omega$
3 Efficiency, max.	$\eta_{max}$	78	78	78	77	78	78	%
4 No-load speed	$n_0$	5 600	5 500	5 600	5 500	5 500	5 500	min <sup>-1</sup>
5 No-load current, typ. (with shaft $\varnothing$ 5 mm)	$I_0$	0,179	0,117	0,089	0,059	0,05	0,044	A
6 Stall torque	$M_H$	268,7	280	269,4	251	262	265	mNm
7 Friction torque, static	$C_0$	1,3	1,3	1,3	1,3	1,3	1,3	mNm
8 Friction torque, dynamic	$C_V$	$4,1 \cdot 10^{-4}$	$4,1 \cdot 10^{-4}$	$4,1 \cdot 10^{-4}$	$4,1 \cdot 10^{-4}$	$4,1 \cdot 10^{-4}$	$4,1 \cdot 10^{-4}$	mNm/min <sup>-1</sup>
9 Speed constant	$k_n$	461	304	231	152	130	114	min <sup>-1</sup> /V
10 Back-EMF constant	$k_E$	2,168	3,285	4,335	6,571	7,666	8,762	mV/min <sup>-1</sup>
11 Torque constant	$k_M$	20,7	31,4	41,4	62,8	73,1	83,7	mNm/A
12 Current constant	$k_I$	0,048	0,032	0,024	0,016	0,014	0,012	A/mNm
13 Slope of n-M curve	$\Delta n / \Delta M$	20,5	19,5	20,4	21,7	20,8	20,6	min <sup>-1</sup> /mNm
14 Terminal inductance, phase-phase	$L$	60	132	240	529	719	940	$\mu$ H
15 Mechanical time constant	$\tau_m$	6,4	6,1	6,4	6,8	6,5	6,5	ms
16 Rotor inertia	$J$	30	30	30	30	30	30	gcm <sup>2</sup>
17 Angular acceleration	$\alpha_{max}$	90	93,2	90	83,6	87,2	88,3	$\cdot 10^3$ rad/s <sup>2</sup>
18 Thermal resistance	$R_{th1} / R_{th2}$	2,3 / 11,6						K/W
19 Thermal time constant	$\tau_{w1} / \tau_{w2}$	13 / 880						s
20 Operating temperature range:								
– motor		-40 ... +100						°C
– winding, max. permissible		+125						°C
21 Shaft bearings		ball bearings, preloaded						
22 Shaft load max.:								
– with shaft diameter		5						mm
– radial at 3 000 min <sup>-1</sup> (5 mm from mounting flange)		50						N
– axial at 3 000 min <sup>-1</sup> (push / pull)		5						N
– axial at standstill (push / pull)		50						N
23 Shaft play:								
– radial	$\leq$	0,015						mm
– axial	$=$	0						mm
24 Housing material		stainless steel						
25 Mass		179						g
26 Direction of rotation		electronically reversible						
27 Speed up to	$n_{max}$	17 000						min <sup>-1</sup>
28 Number of pole pairs		2						
29 Hall sensors		digital						
30 Magnet material		NdFeB						
<b>Rated values for continuous operation</b>								
31 Rated torque	$M_N$	41,8	43	41,8	40,7	41,6	41,8	mNm
32 Rated current (thermal limit)	$I_N$	2,43	1,64	1,21	0,78	0,68	0,6	A
33 Rated speed	$n_N$	4 600	4 580	4 600	4 480	4 520	4 530	min <sup>-1</sup>

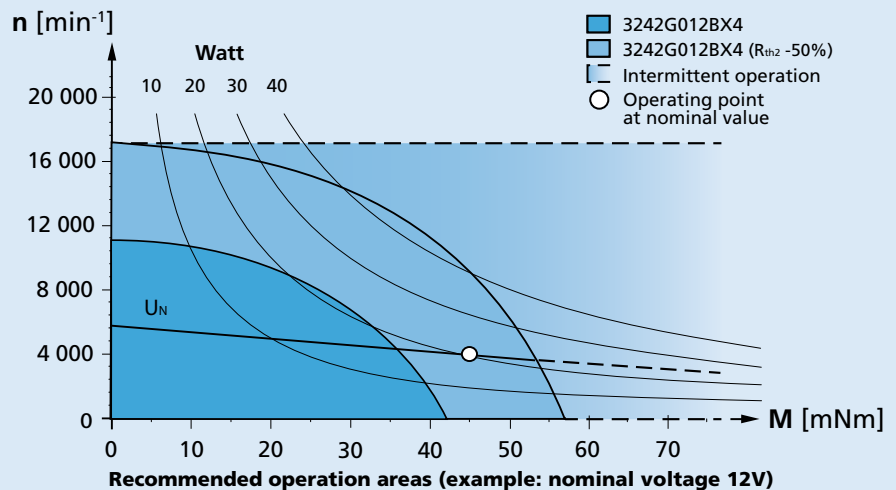
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

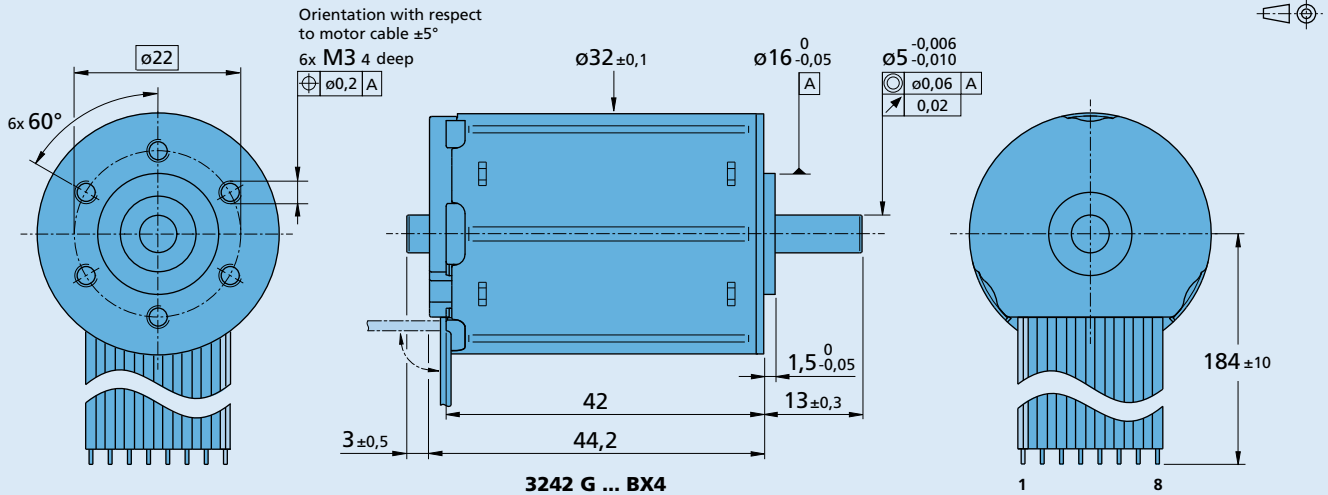
**Note:**

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**

**Option, cable and connection information**

 Example product designation: **3242G012BX4-3692**

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	Option: 4935/4747	
4935	Single wires	Motor with single wires (PTFE), length 184 mm, AWG22	1	Phase C
X4935	Single wires	Motor with single wires (PTFE), length 300 mm, AWG22	2	Phase B
Y4935	Single wires	Motor with single wires (PTFE), length 600 mm, AWG22	3	Phase A
4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 184 mm, AWG22	4	GND
X4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 300 mm, AWG22	5	U <sub>DD</sub> (+5V)
Y4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 600 mm, AWG22	6	Hall sensor C
Y158	Shaft end	Motor without second shaft end	7	Hall sensor B
3692	Controller combination	Analog Hall sensors for combination with Motion Controller MCBL	8	Hall sensor A
			<b>Standard cable</b>	
			Insulation: PVC	
			8 conductors, AWG 24	
			pitch 2,54 mm, wires tinned	

**Product combination**

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
32A	IE3-1024	SC 2402 P	MBZ  To view our large range of accessory parts, please refer to the "Accessories" chapter.
32ALN	IE3-1024 L	SC 2804 S	
32GPT	IER3-10000	SC 5004 P	
32/3	IER3-10000 L	SC 5008 S	
32/3R	AES-4096	MCBL 3002 P	
38A	AES-4096 L	MCBL 3002 S	
38/1		MCBL 3003 P	
38/1 S		MCBL 3006 S	
38/2		MCBL 3002 P AES	
38/2 S		MCBL 3002 S AES	
42GPT		MCBL 3003 P AES	
		MCBL 3006 S AES	
		MC 5004 P	
		MC 5004 P STO	
		MC 5005 S	
		MC 5010 S	