

# 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>

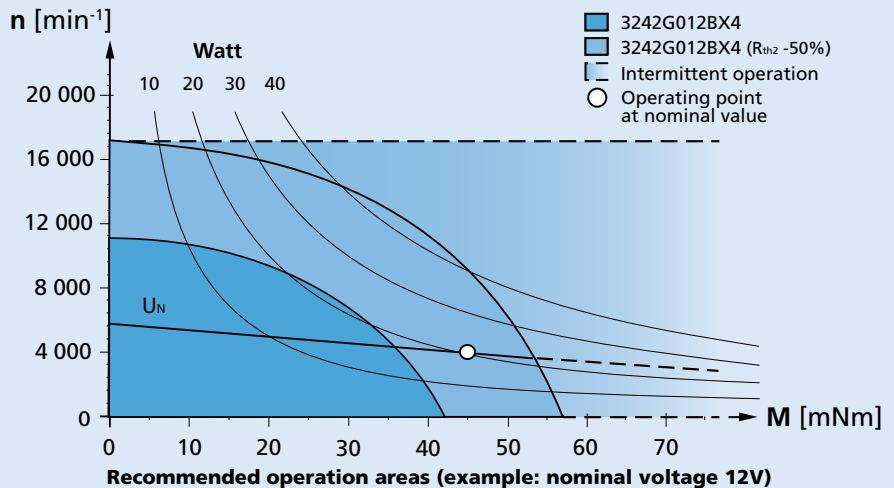
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

**Note:**

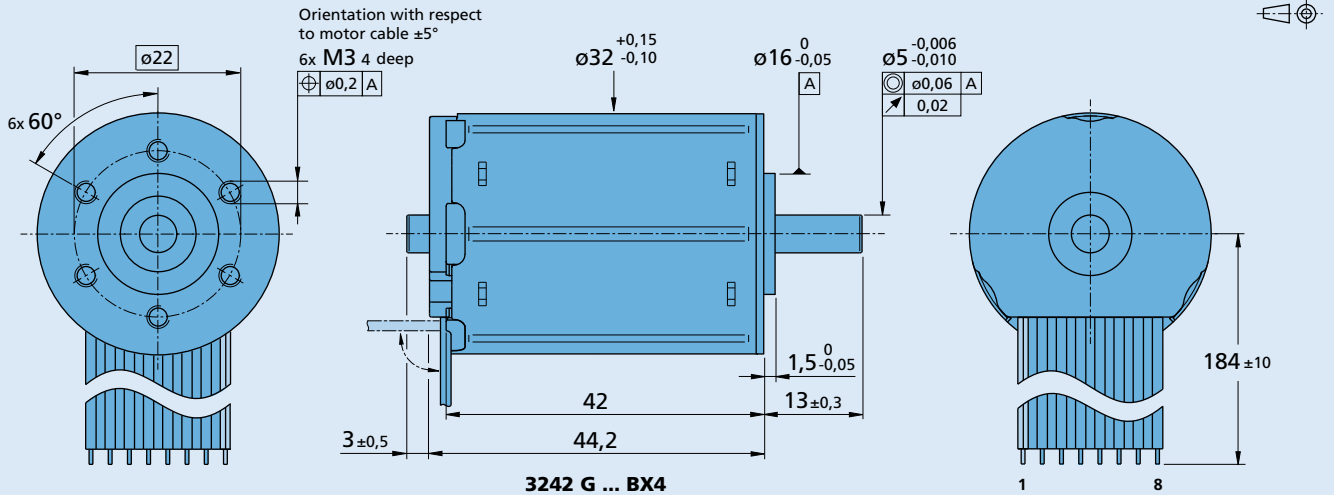
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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
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 184 mm, AWG22
X4935	Single wires	Motor with single wires (PTFE), length 300 mm, AWG22
Y4935	Single wires	Motor with single wires (PTFE), length 600 mm, AWG22
4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 184 mm, AWG22
X4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 300 mm, AWG22
Y4747	Temperature range	Up to 150°C, winding max. 150°C, with single wires (PTFE), length 600 mm, AWG22
Y158	Shaft end	Motor without second shaft end
3692	Controller combination	Analog Hall sensors for combination with Speed Controller SC or Motion Controller MC

#### Connection standard

No.	Function	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 <sub>DD</sub> (+5V)	U <sub>DD</sub> (+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

#### Option: 4935/4747

#### Standard cable

Insulation: PVC  
8 conductors, AWG 24  
pitch 2,54 mm, wires tinned

### Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
32GPT 32/3R 38/1 38/1 S 38/2 38/2 S 42GPT 32L ... TL 32L ... ML 32L ... SB 32L ... PB	IE3-1024 IE3-1024 L IER3-10000 IER3-10000 L AEMT-12/16 L AES-4096 L	SC 2402 P SC 2804 S SC 5004 P SC 5008 S MC 3602 B MC 3603 S MC 3606 B MC 5004 P MC 5005 S MC 5010 S	MBZ Brake MBZ is available in combination with analog Hall sensors only.  To view our large range of accessory parts, please refer to the "Accessories" chapter.