

# Brushless DC-Servomotors

## 22,1 mNm

**For combination with**  
 Gearheads:  
 30/1(S), 38/1(S), 38/2(S)  
 Encoders:  
 IE3-1024(L), 5500, 5540  
 Drive Electronics:  
 Speed Controller, Motion Controller

### Series 3056 ... B

	3056 K	012 B	024 B	036 B	048 B	
1 Nominal voltage	$U_N$	12	24	36	48	Volt
2 Terminal resistance, phase-phase	R	1,6	6,6	13,7	26,5	$\Omega$
3 Output power <sup>1)</sup>	$P_{2 \text{ max.}}$	48	51	49	49	W
4 Efficiency	$\eta_{\text{ max.}}$	73	74	74	74	%
5 No-load speed	$n_o$	8 790	8 200	8 840	8 740	rpm
6 No-load current (with shaft $\varnothing$ 4,0 mm)	$I_o$	0,168	0,075	0,056	0,042	A
7 Stall torque	$M_H$	95	98	99	100	mNm
8 Friction torque, static	$C_o$	0,91	0,91	0,91	0,91	mNm
9 Friction torque, dynamic	$C_v$	$1,4 \cdot 10^{-4}$	$1,4 \cdot 10^{-4}$	$1,4 \cdot 10^{-4}$	$1,4 \cdot 10^{-4}$	mNm/rpm
10 Speed constant	$k_n$	750	350	251	186	rpm/V
11 Back-EMF constant	$k_E$	1,334	2,861	3,981	5,374	mV/rpm
12 Torque constant	$k_M$	12,74	27,32	38,02	51,32	mNm/A
13 Current constant	$k_i$	0,078	0,037	0,026	0,019	A/mNm
14 Slope of n-M curve	$\Delta n / \Delta M$	94	84	91	89	rpm/mNm
15 Terminal inductance, phase-phase	L	160	720	1 400	2 520	$\mu\text{H}$
16 Mechanical time constant	$\tau_m$	13	12	13	12	ms
17 Rotor inertia	J	13,6	13,6	13,6	13,6	gcm <sup>2</sup>
18 Angular acceleration	$\alpha_{\text{ max.}}$	70	72	73	73	$10^3 \text{ rad/s}^2$
19 Thermal resistance	$R_{\text{th} 1} / R_{\text{th} 2}$	3,3 / 9,4				K/W
20 Thermal time constant	$\tau_{w1} / \tau_{w2}$	19 / 1 034				s
21 Operating temperature range		- 30 ... +125				$^{\circ}\text{C}$
22 Shaft bearings		ball bearings, preloaded				
23 Shaft load max.:						
– radial at 3 000/20 000 rpm (7,4 mm from mounting flange)		72 / 51				N
– axial at 3 000/20 000 rpm (axial push-on only)		18 / 12				N
– axial at standstill (axial push-on only)		62				N
24 Shaft play:						
– radial	$\leq$	0,015				mm
– axial	$=$	0				mm
25 Housing material		aluminium, black anodized				
26 Weight		190				g
27 Direction of rotation		electronically reversible				
<b>Recommended values - mathematically independent of each other</b>						
28 Speed up to <sup>2)</sup>	$n_{\text{e max.}}$	28 000	28 000	28 000	28 000	rpm
29 Torque up to <sup>1) 2)</sup>	$M_{\text{e max.}}$	20,7	22,1	21,2	21,5	mNm
30 Current up to <sup>1) 2)</sup>	$I_{\text{e max.}}$	1,94	0,96	0,66	0,50	A

<sup>1)</sup> at 22 000 rpm

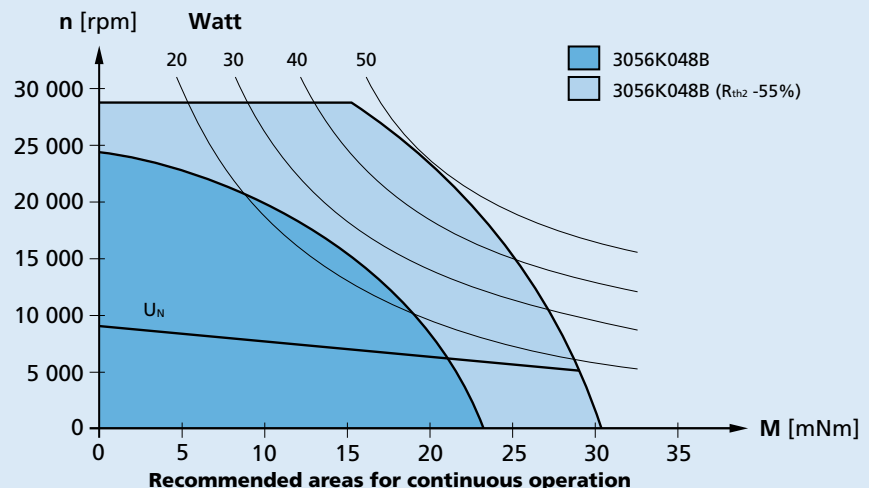
<sup>2)</sup> thermal resistance  $R_{\text{th} 2}$  by 55% reduced

#### 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.

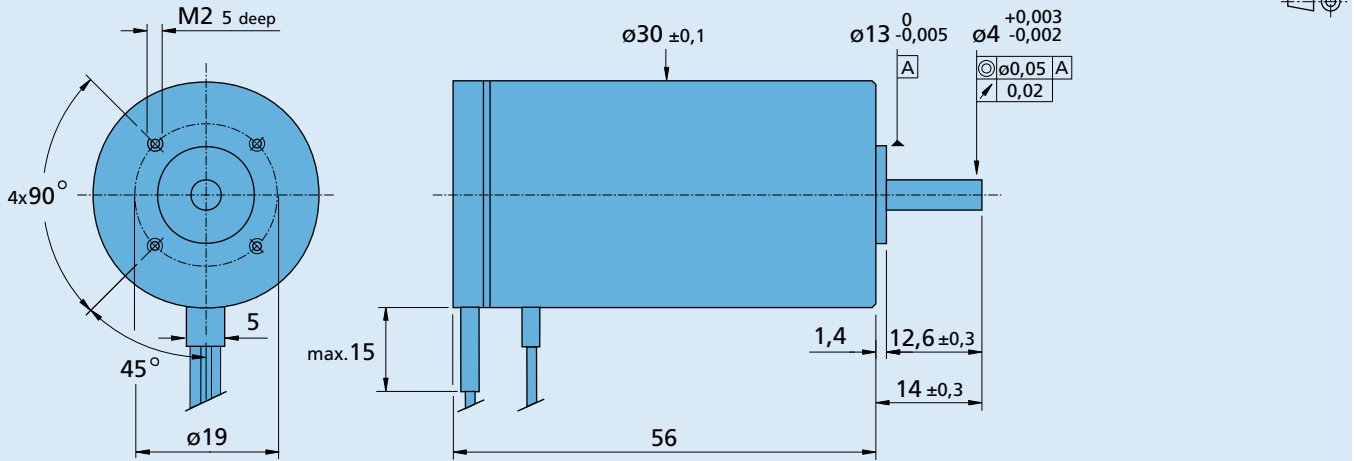


**Options**

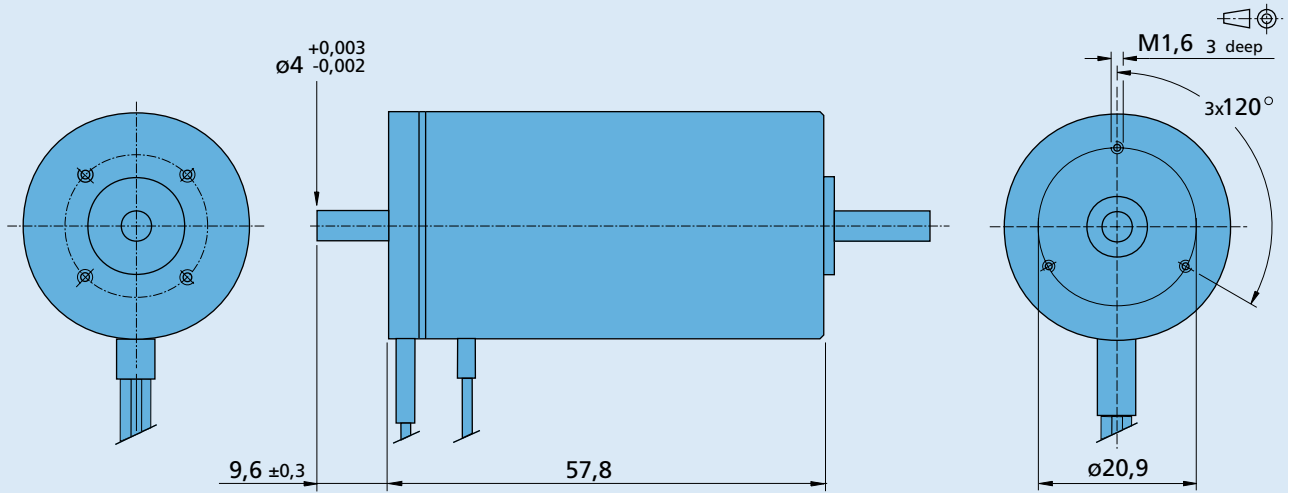
K1000:  
Motors in autoclavable version.

K1155:  
Motors for operation with Motion Controllers

**3056 K ... B**



**3056 K ... B - K312 with rear end shaft**



**Cable and connection information**

