

Brushless DC-Servomotors

5,2 mNm

For combination with
 Gearheads:
 20/1
 Encoders:
 IE2-1024, 5500, 5540
 Drive Electronics:
 Speed Controller, Motion Controller

Series 2036 ... B

	2036 U	012 B	024 B	036 B	048 B	
1 Nominal voltage	U_N	12	24	36	48	Volt
2 Terminal resistance, phase-phase	R	3,4	14,0	27,9	62,2	Ω
3 Output power ¹⁾	$P_{2 \text{ max.}}$	20	19	18	18	W
4 Efficiency	$\eta_{\text{ max.}}$	70	69	69	69	%
5 No-load speed	n_o	17 600	18 000	19 500	17 400	rpm
6 No-load current (with shaft \varnothing 2,0 mm)	I_o	0,102	0,053	0,040	0,025	A
7 Stall torque	M_H	22	21	22	20	mNm
8 Friction torque, static	C_o	0,27	0,27	0,27	0,27	mNm
9 Friction torque, dynamic	C_v	$2,14 \cdot 10^{-5}$	$2,14 \cdot 10^{-5}$	$2,14 \cdot 10^{-5}$	$2,14 \cdot 10^{-5}$	mNm/rpm
10 Speed constant	k_n	1 506	773	557	374	rpm/V
11 Back-EMF constant	k_E	0,664	1,294	1,796	2,677	mV/rpm
12 Torque constant	k_M	6,34	12,36	17,15	25,56	mNm/A
13 Current constant	k_i	0,158	0,081	0,058	0,039	A/mNm
14 Slope of n-M curve	$\Delta n / \Delta M$	808	875	906	909	rpm/mNm
15 Terminal inductance, phase-phase	L	148	600	1 160	2 500	μH
16 Mechanical time constant	τ_m	16	18	18	18	ms
17 Rotor inertia	J	1,95	1,95	1,95	1,95	gcm^2
18 Angular acceleration	$\alpha_{\text{ max.}}$	114	107	113	100	10^3 rad/s^2
19 Thermal resistance	$R_{\text{th} 1} / R_{\text{th} 2}$	5,7 / 19,9				K/W
20 Thermal time constant	τ_{w1} / τ_{w2}	9 / 577				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 (4,5 mm from mounting flange)		14 / 7				N
– axial at 3 000/20 000 rpm (push-on only)		8 / 4				N
– axial at standstill (push-on only)		30				N
24 Shaft play:						
– radial	\leq	0,015				mm
– axial	$=$	0				mm
25 Housing material		aluminium, black anodized				
26 Weight		50				g
27 Direction of rotation		electronically reversible				
Recommended values - mathematically independent of each other						
28 Speed up to ²⁾	$n_{\text{e max.}}$	50 000	50 000	50 000	50 000	rpm
29 Torque up to ^{1) 2)}	$M_{\text{e max.}}$	5,2	4,9	4,8	4,8	mNm
30 Current up to ^{1) 2)}	$I_{\text{e max.}}$	0,98	0,48	0,34	0,23	A

¹⁾ at 36 000 rpm

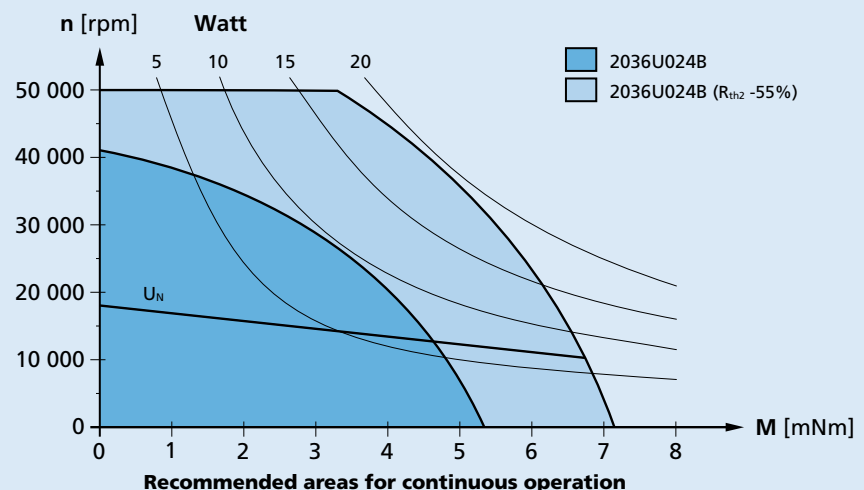
²⁾ thermal resistance $R_{\text{th} 2}$ by 55% reduced

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.

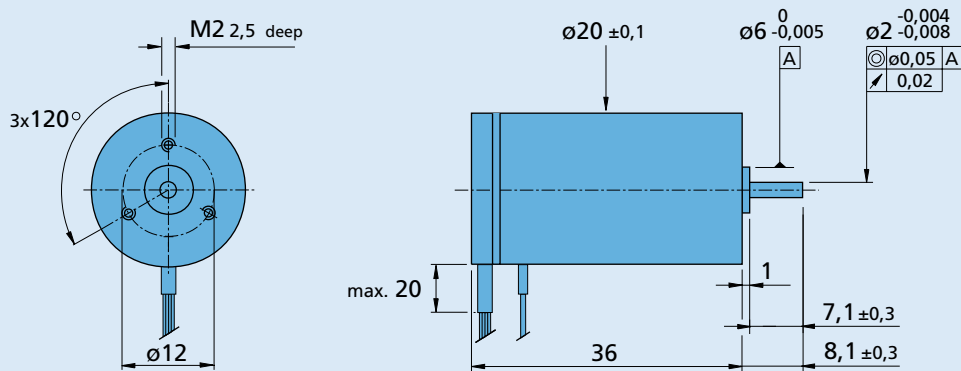


Options

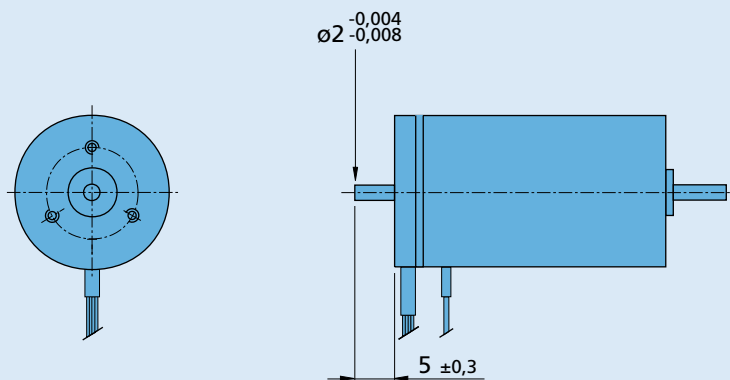
K1000:
Motors in autoclavable version.

K1155:
Motors for operation with Motion Controllers

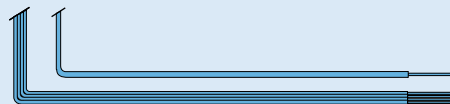
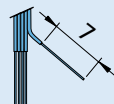
2036 U ... B



2036 U ... B - K312 with rear end shaft

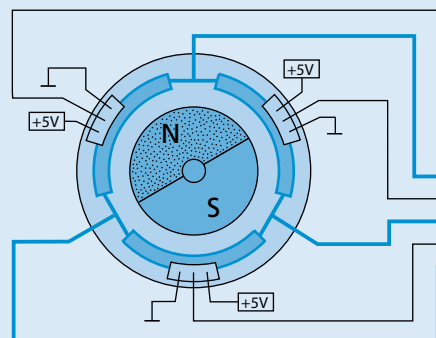


Cable and connection information



Cable

Single wires, material PTFE
Length 300 mm \pm 15 mm
3 conductors, AWG 24
5 conductors, AWG 26



Connection

Function	Colour
A Hall sensor	green
A Phase	brown
B Hall sensor	blue
B Phase	orange
C Hall sensor	grey
C Phase	yellow
+5V Logical supply	red
GND Logical	black