

Brushless DC-Servomotors

sensorless, with optional Hall Sensors
SMARTSHELL® Technology

5,7 mNm

For combination with
Gearheads:
15/5(S), 15/8, 16/7
Drive Electronics:
Speed Controller

Series 1536 ... BSL

	1536 U	009 BSL	012 BSL	024 BSL	
1 Nominal voltage	U_N	9	12	24	Volt
2 Terminal resistance, phase-phase	R	3,28	5,48	21,42	Ω
3 Output power ¹⁾	$P_{2 \text{ max.}}$	22	21	21	W
4 Efficiency	$\eta_{\text{ max.}}$	69	69	69	%
5 No-load speed	n_o	15 100	15 900	16 200	rpm
6 No-load current (with shaft \varnothing 2,0 mm)	I_o	0,086	0,069	0,036	A
7 Stall torque	M_H	15	15	15	mNm
8 Friction torque, static	C_o	0,230	0,230	0,230	mNm
9 Friction torque, dynamic	C_v	$1,61 \cdot 10^{-5}$	$1,61 \cdot 10^{-5}$	$1,61 \cdot 10^{-5}$	mNm/rpm
10 Speed constant	k_n	1 739	1 364	698	rpm/V
11 Back-EMF constant	k_E	0,575	0,733	1,433	mV/rpm
12 Torque constant	k_M	5,49	7,00	13,68	mNm/A
13 Current constant	k_I	0,182	0,143	0,073	A/mNm
14 Slope of n-M curve	$\Delta n / \Delta M$	1 039	1 068	1 093	rpm/mNm
15 Terminal inductance, phase-phase	L	102	170	654	μH
16 Mechanical time constant	τ_m	6	6	6	ms
17 Rotor inertia	J	0,55	0,55	0,55	gcm^2
18 Angular acceleration	$\alpha_{\text{ max.}}$	269	275	274	10^3 rad/s^2
19 Thermal resistance	$R_{\text{th} 1} / R_{\text{th} 2}$	1,9 / 20,9			K/W
20 Thermal time constant	τ_{w1} / τ_{w2}	2 / 430			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)		5,5 / 4,5 for series 1536 U ... B ..			N
- radial at 3 000/20 000 rpm (2,0 mm from mounting flange)		6 / 5 for series 1536 E ... B ..			N
- axial at 3 000/20 000 rpm (push-on only)		4 / 3,5			N
- axial at standstill (push-on only)		17			N
24 Shaft play:					
- radial	\leq	0,015			mm
- axial	$=$	0			mm
25 Housing material		mounting face in aluminium, housing in plastic			
26 Weight		33			g
27 Direction of rotation		electronically reversible			
Recommended values - mathematically independent of each other					
28 Speed up to ²⁾	$n_{e \text{ max.}}$	55 000	55 000	55 000	rpm
29 Torque up to ^{1) 2)}	$M_{e \text{ max.}}$	5,7	5,6	5,6	mNm
30 Current up to ^{1) 2)}	$I_{e \text{ max.}}$	1,19	0,92	0,47	A

¹⁾ at 36 000 rpm

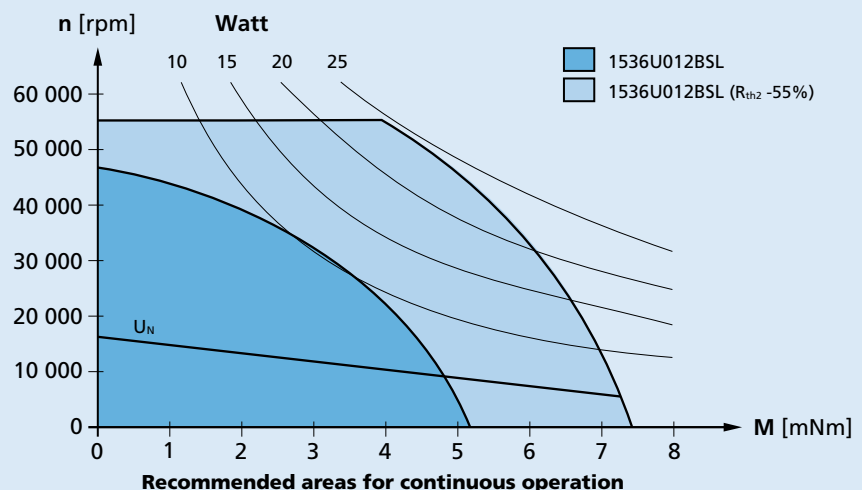
²⁾ thermal resistance $R_{\text{th} 2}$ by 55% reduced

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.

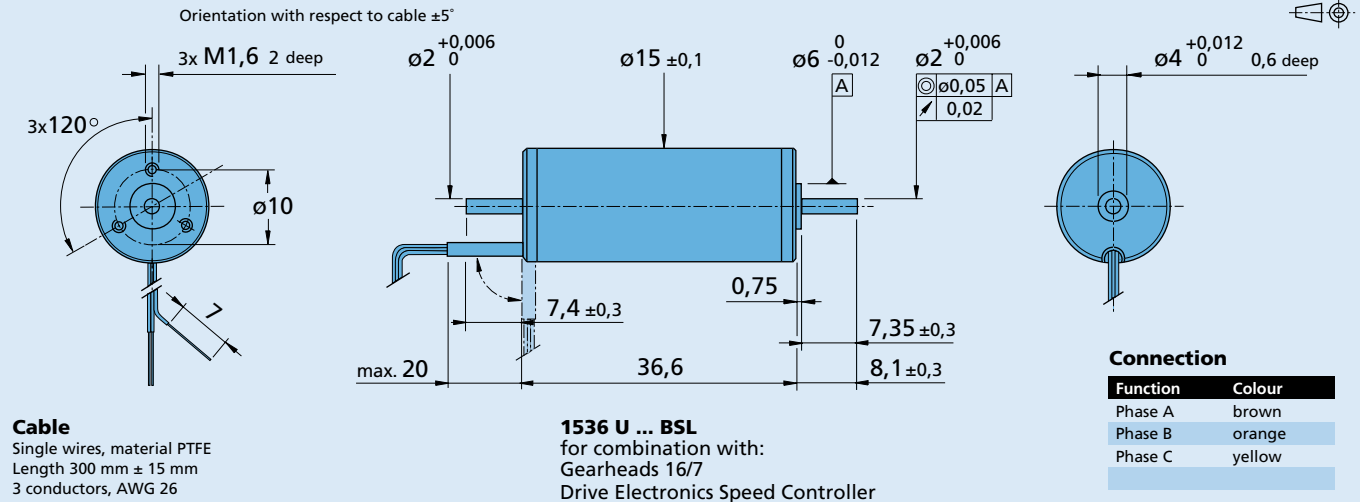


Options

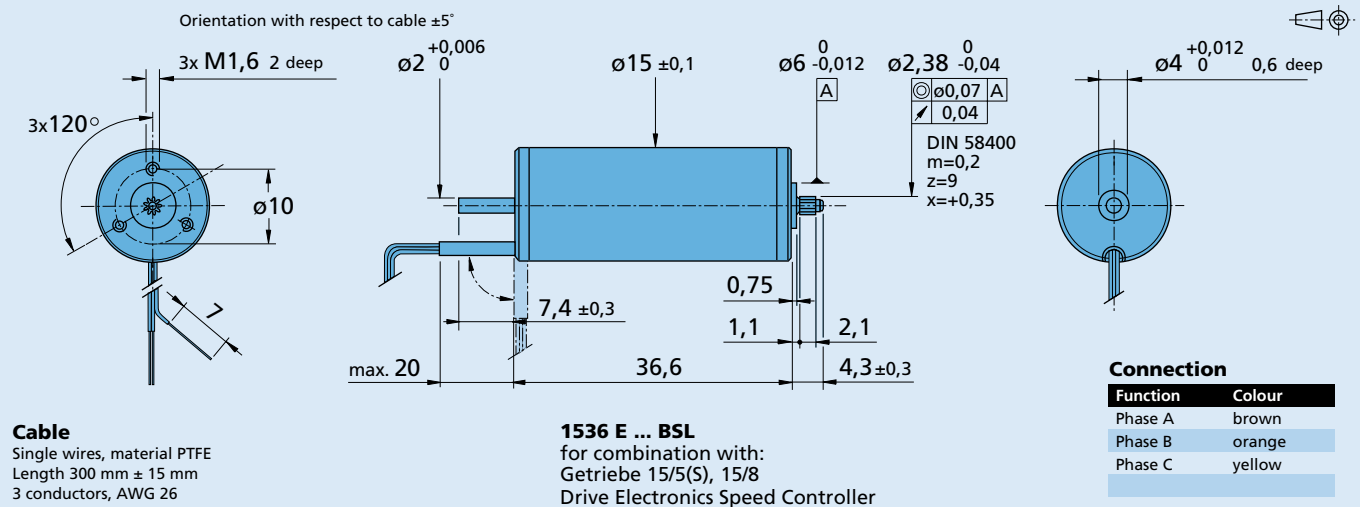
Motors with digital sensors:
1536 U ... BDS, 1536 E ... BDS

Motors with analog sensors:
1536 U ... BAS, 1536 E ... BAS

1536 U ... BSL sensorless



1536 E ... BSL sensorless



1536 U ... BAS, 1536 U ... BDS, 1536 E ... BAS, 1536 E ... BDS with Hall sensors

