Brushless DC-Servomotors

sensorless, with optional Hall Sensors
SMARTSHELL® Technology

2,1 mNm

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

Series 1524 ... BSL

			1524 U		006 BSL	009 BSL	012 BSL	
1	Nominal voltage	U_N			6	9	12	Volt
2	Terminal resistance, phase-phase	R			4,30	9,7	15,3	Ω
3	Output power [1]	$P_{2\ max.}$			8	8	8	W
4	Efficiency	$\eta_{max.}$			54	53	54	%
5	No-load speed	n_o			18 500	19 200	19 900	rpm
6	No-load current (with shaft ø 2,0 mm)	I_o			0,110	0,078	0,062	A
7	Stall torque	M_H			4	4	4	mNm
8	Friction torque, static	C_o			0,140	0,140	0,140	mNm
9	Friction torque, dynamic	C_v			$9{,}5 \cdot 10^{-6}$	$9{,}5 \cdot 10^{-6}$	$9{,}5 \cdot 10^{-6}$	mNm/rpm
10	Speed constant	k_n			3 339	2 318	1 805	rpm/V
11	Back-EMF constant	k_E			0,299	0,431	0,554	mV/rpm
12	Torque constant	k_M			2,86	4,12	5,29	mNm/A
13	Current constant	k_I			0,350	0,243	0,189	A/mNm
14	Slope of n-M curve	$\Delta n/\Delta M$			5 020	5 457	5 221	rpm/mNm
15	Terminal inductance, phase-phase	L			82	169	273	µH
16	Mechanical time constant	τ_m			15	16	16	ms
17	Rotor inertia	J			0,30	0,30	0,30	gcm^2
18	Angular acceleration	$\alpha_{max.}$			129	123	133	$\cdot 10^3 rad/s^2$
19	Thermal resistance	$R_{th\,1}$ / $R_{th\,2}$	2,6 / 29,0					K/W
20	Thermal time constant	τ_{w1} / τ_{w2}	1 / 326					s
21	Operating temperature range		– 30 ... +125					°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 / 4	for series 1524 U ... B ..				N
	– radial at 3 000/20 000 rpm (2,0 mm from mounting flange)		5,5 / 4,5	for series 1524 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	≤	0,015					mm
	– axial	=	0					mm
25	Housing material		mounting face in aluminium, housing in plastic					
26	Weight		20					g
27	Direction of rotation		electronically reversible					
Recommended values - mathematically independent of each other								
28	Speed up to [2]	$n_{e\ max.}$			62 000	62 000	62 000	rpm
29	Torque up to [1] [2]	$M_{e\ max.}$			2,1	2,0	2,1	mNm
30	Current up to [1] [2]	$I_{e\ max.}$			0,91	0,61	0,48	A

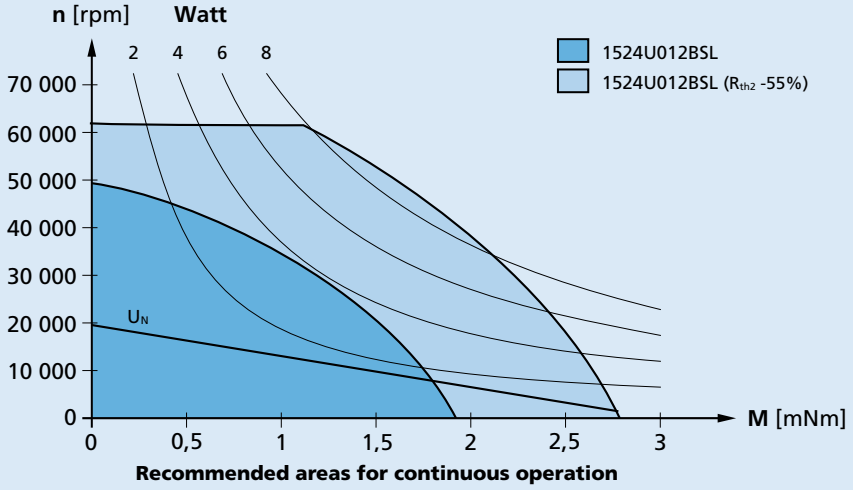
[1] at 36 000 rpm
[2] thermal resistance $R_{th\,2}$ by 55% reduced

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 ($R_{th\,2}$ 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.

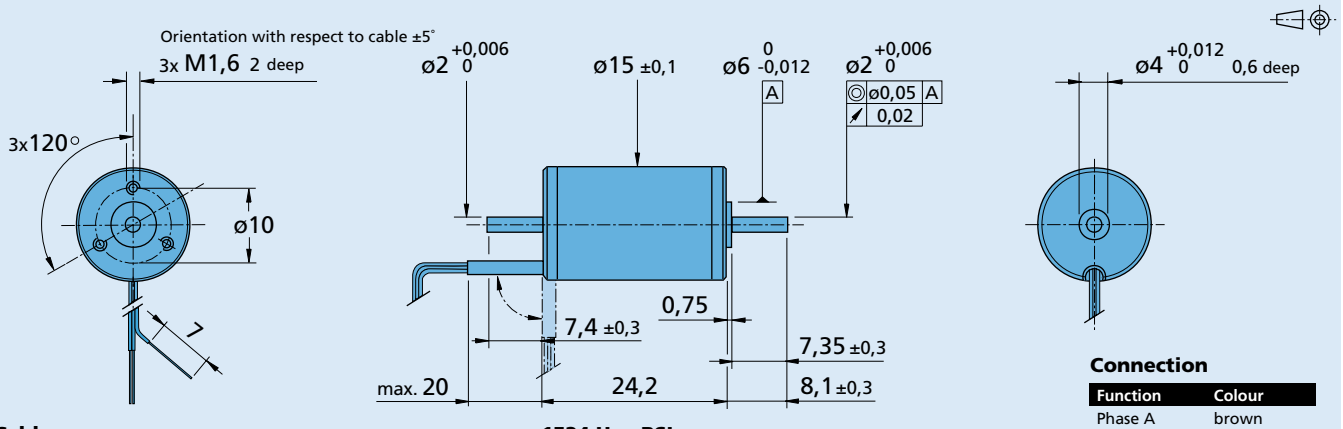


For notes on technical data and lifetime performance refer to "Technical Information".
Edition 2012 – 2013

www.faulhaber.com

Options
Motors with digital sensors:
1524 U ... BDS, 1524 E ... BDS
Motors with analog sensors:
1524 U ... BAS, 1524 E ... BAS

1524 U ... BSL sensorless



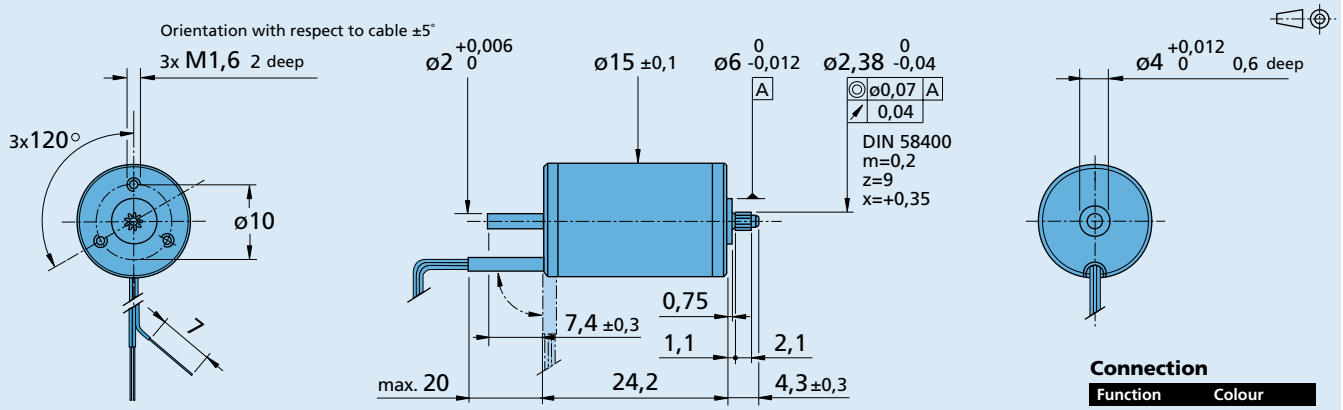
Cable
Single wires, material PTFE
Length 300 mm ± 15 mm
3 conductors, AWG 26

1524 U ... BSL
for combination with:
Gearheads 16/7
Drive Electronics Speed Controller

Connection

Function	Colour
Phase A	brown
Phase B	orange
Phase C	yellow

1524 E ... BSL sensorless



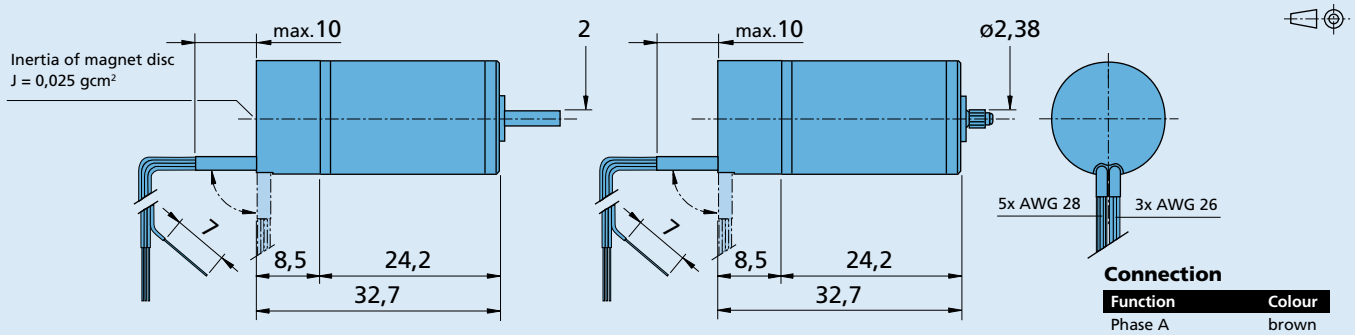
Cable
Single wires, material PTFE
Length 300 mm ± 15 mm
3 conductors, AWG 26

1524 E ... BSL
for combination with:
Getriebe 15/5(S), 15/8
Drive Electronics Speed Controller

Connection

Function	Colour
Phase A	brown
Phase B	orange
Phase C	yellow

1524 U ... BAS, 1524 U ... BDS, 1524 E ... BAS, 1524 E ... BDS with Hall sensors



Cable
Single wires, material PTFE
Length 300 mm ± 15 mm
3 conductors, AWG 26
5 conductors, AWG 28

1524 U ... BDS
for combination with:
Drive Electronics Speed Controller

1524 U ... BAS
for combination with:
Drive Electronics Motion Controllers

1524 E ... BDS
for combination with:
Drive Electronics Speed Controller

1524 E ... BAS
for combination with:
Drive Electronics Motion Controllers

Connection

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