Brushless DC-Servomotors

2 Pole Technology

20 mNm

68 W

Series 2057 ... B

Values at 22°C and nominal voltage		2057 S		012 B	024 B	
1	Nominal voltage	U_N		12	24	V
2	Terminal resistance, phase-phase	R		0,5	1,32	Ω
3	Efficiency, max.	$\eta_{max.}$		83	84	%
4	No-load speed	n_0		22 800	26 800	min^{-1}
5	No-load current, typ. (with shaft ø 3 mm)	I_0		0,2	0,136	A
6	Stall torque	M_H		120	155	mNm
7	Friction torque, static	C_0		0,12	0,12	mNm
8	Friction torque, dynamic	C_V		$3{,}84 \cdot 10^{-5}$	$3{,}84 \cdot 10^{-5}$	mNm/min^{-1}
9	Speed constant	k_n		1 910	1 118	min^{-1}/V
10	Back-EMF constant	k_E		0,524	0,894	mV/min^{-1}
11	Torque constant	k_M		5	8,54	mNm/A
12	Current constant	k_I		0,2	0,117	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$		191	173	min^{-1}/mNm
14	Terminal inductance, phase-phase	L		41	120	µH
15	Mechanical time constant	τ_m		7,9	7,1	ms
16	Rotor inertia	J		4	4	gcm^2
17	Angular acceleration	$\alpha_{max.}$		304	393	$\cdot 10^3 rad/s^2$
18	Thermal resistance	R_{th1} / R_{th2}	1,5 / 11,6			K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	6,1 / 455			s
20	Operating temperature range:					
	– motor		-30 ... +125			°C
	– winding, max. permissible		+125			°C
21	Shaft bearings		ball bearings, preloaded			
22	Shaft load max.:					
	– with shaft diameter		3			mm
	– radial at 3 000 min^{-1} (5 mm from mounting flange)		28			N
	– axial at 3 000 min^{-1} (push only)		17			N
	– axial at standstill (push only)		75			N
23	Shaft play:					
	– radial	≤	0,015			mm
	– axial	=	0			mm
24	Housing material		aluminium, black anodized			
25	Mass		95			g
26	Direction of rotation		electronically reversible			
27	Speed up to	$n_{max.}$	55 000			min^{-1}
28	Number of pole pairs		1			
29	Hall sensors		digital			
30	Magnet material		SmCo			
Rated values for continuous operation						
31	Rated torque	M_N		17	17	mNm
32	Rated current (thermal limit)	I_N		3,52	2,07	A
33	Rated speed	n_N		18 990	23 510	min^{-1}

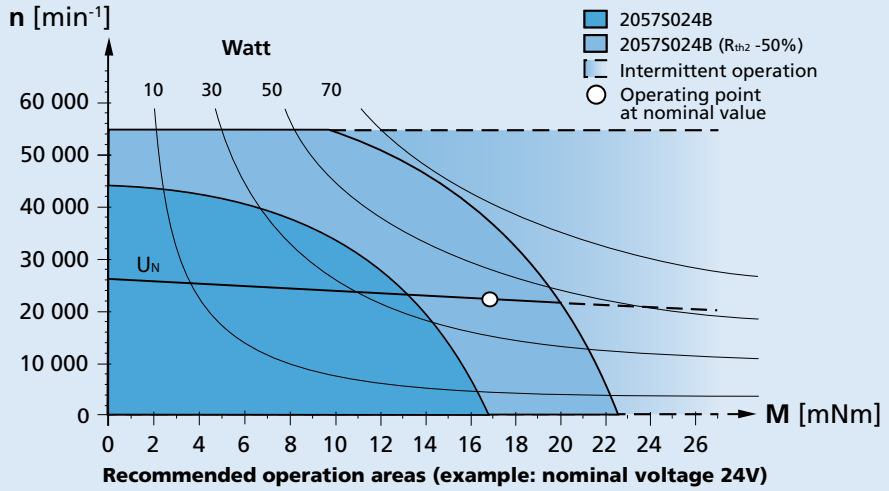
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

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.



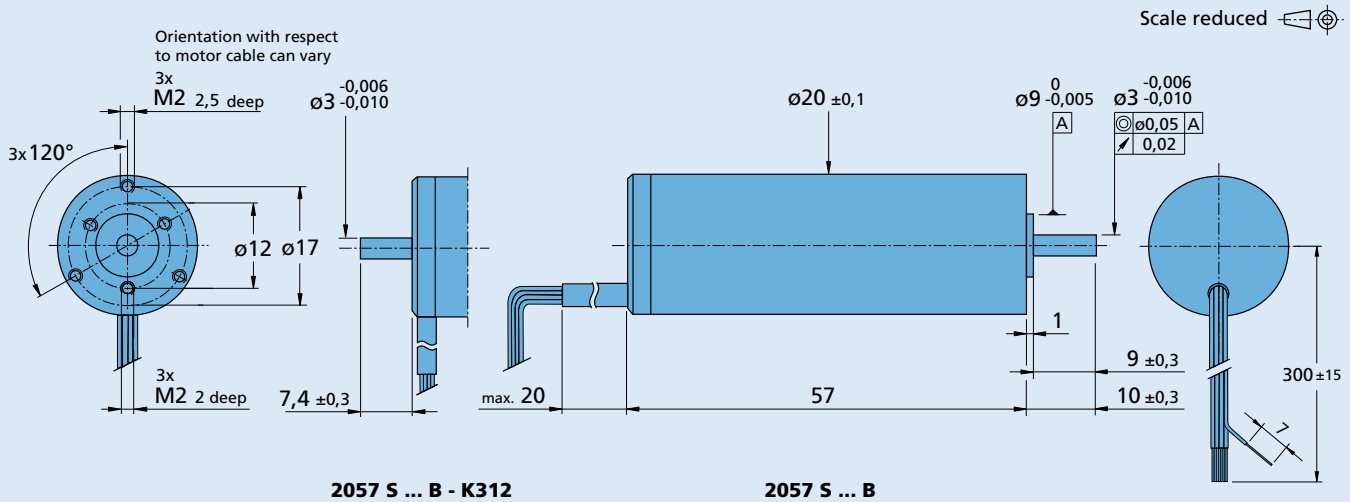
Recommended operation areas (example: nominal voltage 24V)

For notes on technical data and lifetime performance refer to "Technical Information".

Edition 2017

Dimensional drawing

Scale reduced



2057 S ... B - K312 **2057 S ... B**

Option, cable and connection information

Example product designation: **2057S012B-K1155**

Option	Type	Description
K1155	Controller combination	Analog Hall sensors for combination with Speed Controller SC and Motion Controller MCBL
K313	Encoder combination	Motor with rear end shaft for combination with Encoder IE2
K312	Encoder combination	Motor with rear end shaft for combination with Encoder HEDS/HEDL/HEDM
K179	Bearing lubrication	For vacuum of 10^{-5} Pa @ 22°C

Connection

Function	Colour
Phase C	yellow
Phase B	orange
Phase A	brown
GND	black
U_{DD} (+5V)	red
Hall sensor C	grey
Hall sensor B	blue
Hall sensor A	green

Standard cable

Single wires, material PTFE
AWG 24: Phase A/B/C
AWG 26: Hall A/B/C, U_{DD}, GND

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
20/1R 23/1	IE2-1024 HEDS 5500 HEDL 5540	SC 2804 SC 5004 SC 5008 MC 5004 MC 5005 MCBL 3003 MCBL 3006	To view our large range of accessory parts, please refer to the “Accessories” chapter.

For notes on technical data and lifetime performance refer to “Technical Information”.