Brushless DC-Servomotors

2 Pole Technology

19,5 mNm

63,2 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	0,523	1,32	Ω
3	Efficiency, max.	$\eta_{max.}$	83	84	%
4	No-load speed	n_0	21 000	24 900	min^{-1}
5	No-load current, typ. (with shaft ø 3 mm)	I_0	0,187	0,129	A
6	Stall torque	M_H	127	172	mNm
7	Friction torque, static	C_0	0,15	0,15	mNm
8	Friction torque, dynamic	C_V	4,13·10^{-5}	4,13·10^{-5}	mNm/min^{-1}
9	Speed constant	k_n	1 720	1 010	min^{-1}/V
10	Back-EMF constant	k_E	0,582	0,991	mV/min^{-1}
11	Torque constant	k_M	5,55	9,46	mNm/A
12	Current constant	k_I	0,18	0,106	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$	162	141	min^{-1}/mNm
14	Terminal inductance, phase-phase	L	38,5	114	µH
15	Mechanical time constant	τ_m	6,78	5,9	ms
16	Rotor inertia	J	4	4	gcm²
17	Angular acceleration	$\alpha_{max.}$	318	430	·10³rad/s²
18	Thermal resistance	R_{th1} / R_{th2}	2,5 / 12		K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	7,3 / 720		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		NdFeB_Br		
Rated values for continuous operation					
31	Rated torque	M_N	16,1	16,2	mNm
32	Rated current (thermal limit)	I_N	3,38	1,99	A
33	Rated speed	n_N	18 300	22 400	min^{-1}

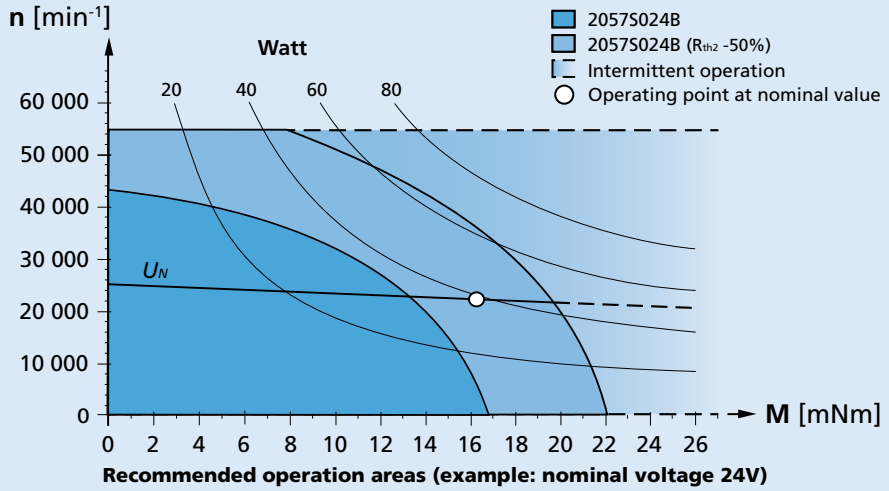
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

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".

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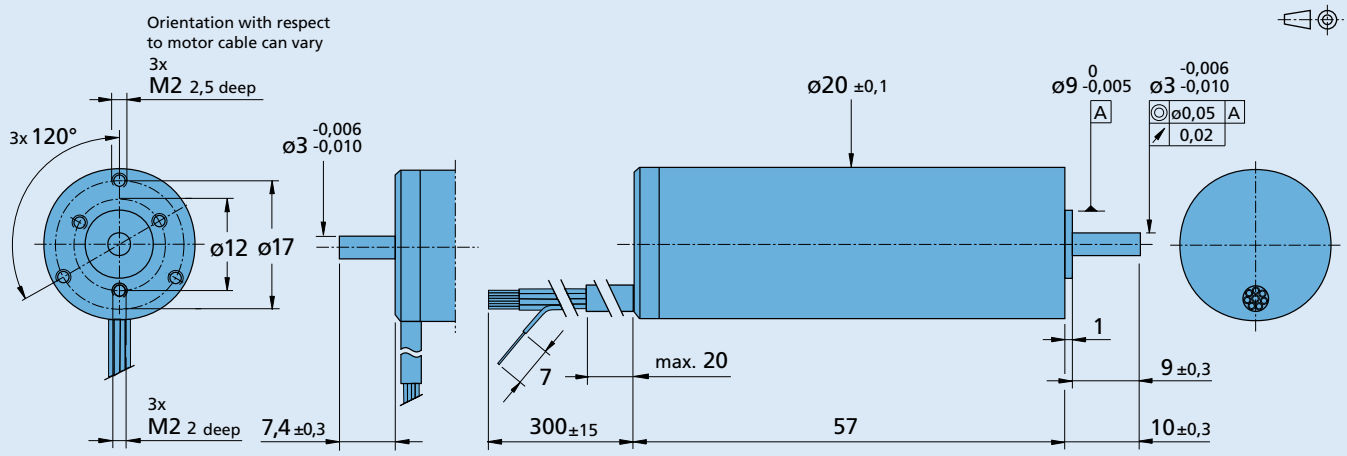
Dimensional drawing



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 22GPT 23/1 22L ... ML 22L ... PB 22L ... SB	IE2-1024 HEDS 5500 HEDL 5540	SC 2804 S SC 5004 P SC 5008 S MCBL 3003 P MCBL 3006 S MC 5004 P MC 5005 S	To view our large range of accessory parts, please refer to the “Accessories” chapter.

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