

Brushless DC-Servomotors

2 Pole Technology

12 mNm
69 W

Series 2057 ... BHS

Values at 22°C and nominal voltage		2057 S	024 BHS	
1	Nominal voltage	U_N	24	V
2	Terminal resistance, phase-phase	R	1,46	Ω
3	Efficiency, max.	η_{max}	88	%
4	No-load speed	n_0	36 500	min^{-1}
5	No-load current, typ. (with shaft \varnothing 3 mm)	I_0	0,064	A
6	Stall torque	M_H	104	mNm
7	Friction torque, static	C_0	0,104	mNm
8	Friction torque, dynamic	C_V	$8,18 \cdot 10^{-6}$	$\text{mNm}/\text{min}^{-1}$
9	Speed constant	k_n	1 511	min^{-1}/V
10	Back-EMF constant	k_E	0,662	$\text{mV}/\text{min}^{-1}$
11	Torque constant	k_M	6,32	mNm/A
12	Current constant	k_I	0,158	A/mNm
13	Slope of n-M curve	$\Delta n / \Delta M$	349	$\text{min}^{-1}/\text{mNm}$
14	Terminal inductance, phase-phase	L	120	μH
15	Mechanical time constant	τ_m	7,5	ms
16	Rotor inertia	J	2	gcm^2
17	Angular acceleration	α_{max}	509	$\cdot 10^3 \text{rad}/\text{s}^2$
18	Thermal resistance	R_{th1} / R_{th2}	3,4 / 12,3	K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	13,1 / 403	s
20	Operating temperature range:			
	– motor		-30 ... +125	$^{\circ}\text{C}$
	– winding, max. permissible		+125	$^{\circ}\text{C}$
21	Shaft bearings		ball bearings, preloaded	
22	Shaft load max.:			
	– with shaft diameter		3	mm
	– radial at 40 000 min^{-1} (5 mm from mounting flange)		22	N
	– axial at 40 000 min^{-1} (push only)		12	N
	– axial at standstill (push only)		75	N
23	Shaft play:			
	– radial	\leq	0,05	mm
	– axial	$=$	0	mm
24	Housing material		aluminium, black anodized	
25	Mass		81	g
26	Direction of rotation		electronically reversible	
27	Speed up to	n_{max}	65 000	min^{-1}
28	Number of pole pairs		1	
29	Hall sensors		digital	
30	Magnet material		NdFeB	
Rated values for continuous operation				
31	Rated torque	M_N	10,1	mNm
32	Rated current (thermal limit)	I_N	1,87	A
33	Rated speed	n_N	34 370	min^{-1}

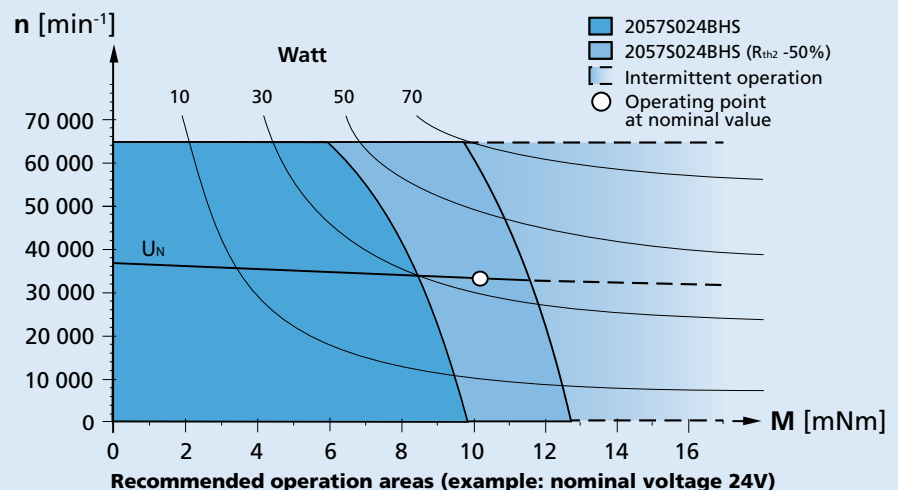
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

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.

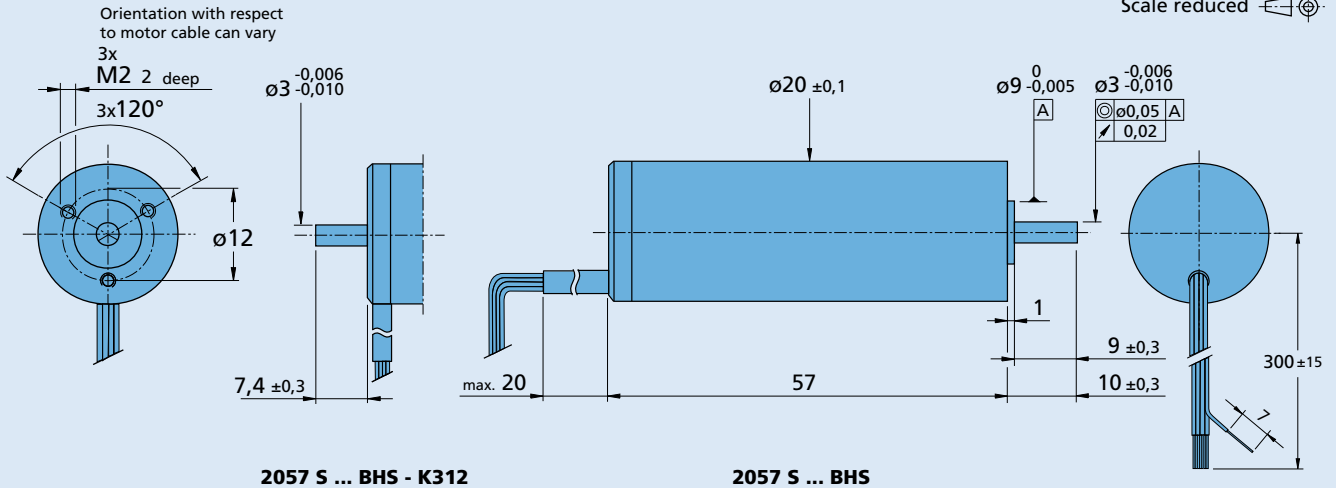
The diagram shows the motor in a completely insulated as well as thermally coupled condition (R_{th2} 50% reduced).

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.



Dimensional drawing

Scale reduced



2057 S ... BHS - K312

2057 S ... BHS

Option, cable and connection information

 Example product designation: **2057S024BHS-K2470**

Option	Type	Description	Connection	
			Function	Colour
K2470	Controller combination	Analog Hall sensors for combination with Speed Controller SC and Motion Controller MCBL	Phase C	yellow
K313	Encoder combination	Motor with rear end shaft for combination with Encoder IE2	Phase B	orange
K312	Encoder combination	Motor with rear end shaft for combination with Encoder HEDS/HEDL/HEDM	Phase A	brown
K179	Bearing lubrication	For vacuum of 10^{-5} Pa @ 22°C	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 3006	To view our large range of accessory parts, please refer to the "Accessories" chapter.