

Brushless DC-Servomotors

2 Pole Technology, High Speed, for Autoclave Sterilisation

18,7 mNm

91,2 W

Series 2057 ... BA

Values at 22°C and nominal voltage		2057 S	024 BA	
1	Nominal voltage	U_N	24	V
2	Terminal resistance, phase-phase	R	0,427	Ω
3	Efficiency, max.	η_{max}	90	%
4	No-load speed	n_0	44 300	min^{-1}
5	No-load current, typ. (with shaft \varnothing 3 mm)	I_0	0,178	A
6	Stall torque	M_H	309	mNm
7	Friction torque, static	C_0	0,0559	mNm
8	Friction torque, dynamic	C_V	$1,95 \cdot 10^{-5}$	$\text{mNm}/\text{min}^{-1}$
9	Speed constant	k_n	1 740	min^{-1}/V
10	Back-EMF constant	k_E	0,576	$\text{mV}/\text{min}^{-1}$
11	Torque constant	k_M	5,5	mNm/A
12	Current constant	k_I	0,182	A/mNm
13	Slope of n-M curve	$\Delta n / \Delta M$	135	$\text{min}^{-1}/\text{mNm}$
14	Terminal inductance, phase-phase	L	36,2	μH
15	Mechanical time constant	τ_m	4,2	ms
16	Rotor inertia	J	3	gcm^2
17	Angular acceleration	α_{max}	1 030	$\cdot 10^3 \text{rad}/\text{s}^2$
18	Thermal resistance	R_{th1} / R_{th2}	1,1 / 15	K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	5 / 630	s
20	Operating temperature range:			
	– motor		-30 ... +140	°C
	– winding, max. permissible		+140	°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		stainless steel	
25	Mass		100	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	13,7	mNm
32	Rated current (thermal limit)	I_N	3	A
33	Rated speed	n_N	43 200	min^{-1}

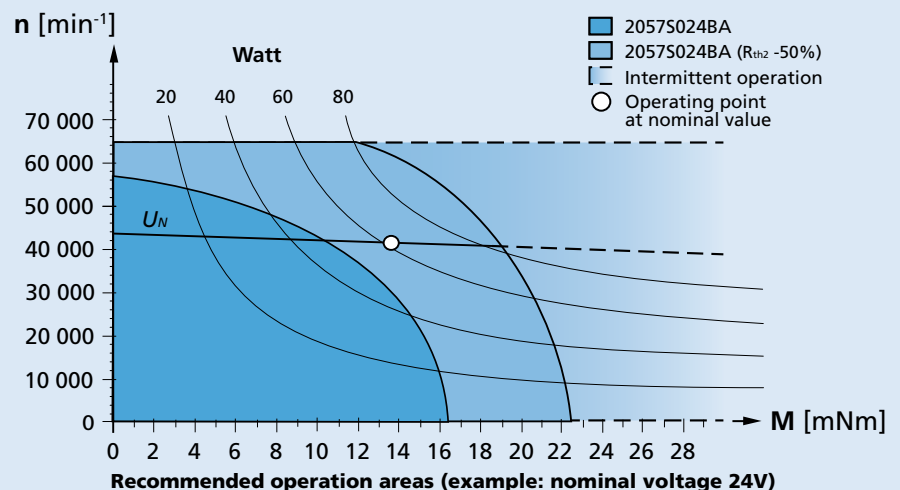
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

Note:

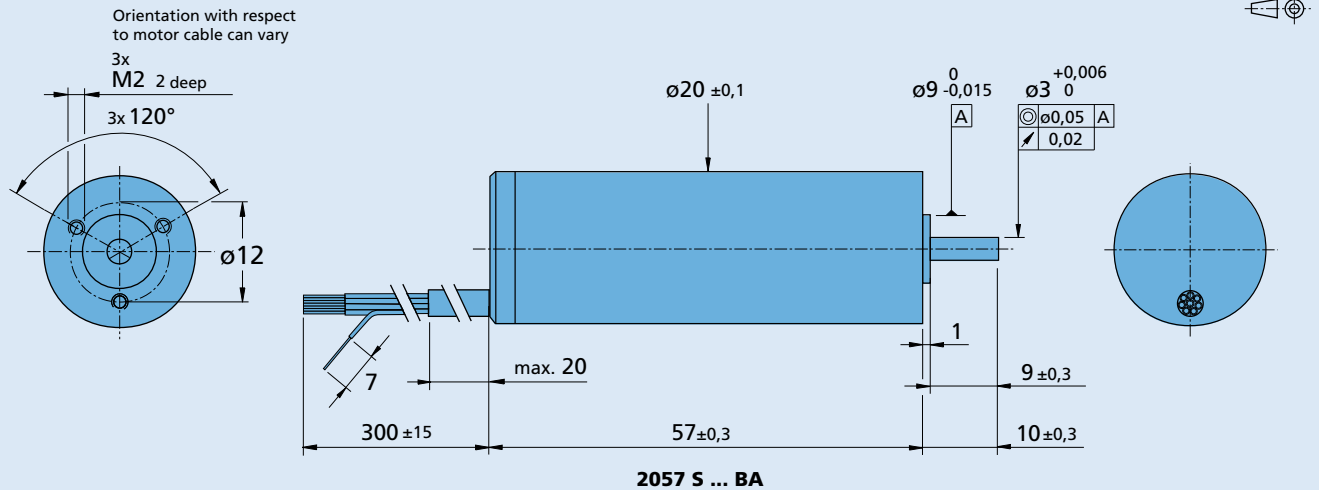
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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




Option, cable and connection information

Example product designation: **2057S024BA-K3825**

Option	Type	Description	Function	Colour	
K3825	Sensor	Sensorless	Phase C	yellow	Standard cable Single wires, material PTFE AWG 24: Phase A/B/C AWG 26: Hall A/B/C, U _{DD} , GND
			Phase B	orange	
			Phase A	brown	
			GND	black	
			U _{DD} (+5V)	red	
			Hall sensor C	grey	
			Hall sensor B	blue	
			Hall sensor A	green	

Autoclavable

Sterilisation Process

Reference	Description	
Sterilisation conditions	134°C at ca. 3.1 bar abs., 100% RH	 <p>Contact your sales representative for more detailed information</p>
Holding time	18 minutes	
Number of cycles, typical	1 000	
Number of cycles (sensorless, K3825), typical	1 500	

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
		SC 5004 P SC 5008 S	To view our large range of accessory parts, please refer to the "Accessories" chapter.