

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.	η_{max}	83	84	%
4	No-load speed	n_0	22 800	26 800	min ⁻¹
5	No-load current, typ. (with shaft $\varnothing$ 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	α_{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	$\leq$	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.



