

DC-Micromotors

Graphite Commutation

137 mNm
98,2 W

Series 3863 ... CR

Values at 22°C and nominal voltage	3863 H	012 CR	018 CR	024 CR	036 CR	048 CR			
Nominal voltage	U_N		12	18	24	36	48	V	
Terminal resistance	R		0,161	0,365	0,663	1,55	2,59	Ω	
Rotor inductance	L		44,3	92,4	177	398	708	μH	
Efficiency, max.	η_{max}		83	84	85	85	86	%	
No-load current, typ.	I_0		0,338	0,234	0,163	0,113	0,0845	A	
No-load speed	n_0		5 680	5 990	5 800	5 840	5 860	min^{-1}	
Stall torque	M_H		1 410	1 370	1 410	1 370	1 460	mNm	
Rotor inertia	J		120	110	120	110	115	gcm^2	
Friction torque	M_R		6,5	6,5	6,5	6,5	6,5	mNm	
Torque constant	k_M		19,9	28,8	39,8	59,8	79,7	mNm/A	
Speed constant	k_n		479	332	240	160	120	min^{-1}/V	
Slope of n-M curve	$\Delta n/\Delta M$		3,88	4,21	3,99	4,13	3,89	$\text{min}^{-1}/\text{mNm}$	
Thermal resistance:									
- winding to housing	R_{th1}	2,8						K/W	
- housing to ambient (external plastic flange)	R_{th2p}	7,7						K/W	
- housing to ambient (external metal flange)	R_{th2m}	1,5						K/W	
Thermal time constant:									
- winding	τ_{w1}	58						s	
- housing (external plastic flange)	τ_{w2p}	1 200						s	
- housing (external metal flange)	τ_{w2m}	240						s	
Operating temperature range:									
- motor		-30 ... +125						$^{\circ}\text{C}$	
- winding, max. permissible		+155						$^{\circ}\text{C}$	
Shaft bearings								ball bearings, preloaded	
Shaft diameter								6	mm
Radial shaft load max.:									
- dynamic at 3 000 min^{-1} (3 mm from bearing)		60						N	
Axial shaft load max.:									
- dynamic at 3 000 min^{-1}		6						N	
- static (shaft unsupported)		50						N	
- static (shaft supported)		2 800						N	
Shaft play, max.:									
- radial		0,015						mm	
- axial		0						mm	
Speed up to	n_{max}	7 000						min^{-1}	
Number of pole pairs		1							
Mass		390						g	
Housing material		steel, nickel plated							
Magnet material		NdFeB							
Rated values for continuous operation									
Rated torque	M_N		69,5	99,5	131	132	137	mNm	
Rated current (thermal limit)	I_N		4	4	4	2,71	2,1	A	
Rated speed	n_N		5 400	5 630	5 440	5 450	5 510	min^{-1}	

Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2p} value has been reduced by 50%.

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 different conditions of thermal coupling, i.e. mounted respectively on a plastic flange and a metal flange.

The nominal voltage (U_N) curve shows, up to the thermal limit, the operating point at nominal voltage for the motor mounted on a plastic flange. Higher torque can be achieved by further reducing the thermal resistance.

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.



