



## DC-Micromotors

### Graphite Commutation

131 mNm  
110 W

## Series 3863 ... CR

Values at 22°C and nominal voltage		3863 H	012 CR	018 CR	024 CR	036 CR	048 CR	
1	Nominal voltage	$U_N$	12	18	24	36	48	V
2	Terminal resistance	$R$	0,16	0,36	0,64	1,55	2,58	$\Omega$
3	Efficiency, max.	$\eta_{max.}$	83	84	85	86	86	%
4	No-load speed	$n_0$	5 600	5 900	5 800	5 800	5 800	min <sup>-1</sup>
5	No-load current, typ. (with shaft ø 6 mm)	$I_0$	0,335	0,232	0,168	0,112	0,084	A
6	Stall torque	$M_H$	1 424	1 394	1 455	1 363	1 461	mNm
7	Friction torque	$M_R$	6,5	6,5	6,5	6,5	6,5	mNm
8	Speed constant	$k_n$	480	332	240	160	120	min <sup>-1</sup> /V
9	Back-EMF constant	$k_E$	2,08	3,01	4,17	6,25	8,33	mV/min <sup>-1</sup>
10	Torque constant	$k_M$	19,9	28,8	39,8	59,8	79,7	mNm/A
11	Current constant	$k_I$	0,05	0,035	0,025	0,017	0,013	A/mNm
12	Slope of n-M curve	$\Delta n / \Delta M$	3,9	4,1	3,9	4,1	3,9	min <sup>-1</sup> /mNm
13	Rotor inductance	$L$	45	90	180	400	700	μH
14	Mechanical time constant	$\tau_m$	4,8	4,8	4,8	4,8	4,7	ms
15	Rotor inertia	$J$	120	110	120	110	115	gcm <sup>2</sup>
16	Angular acceleration	$\alpha_{max.}$	119	127	121	124	127	·10 <sup>3</sup> rad/s <sup>2</sup>
17	Thermal resistance	$R_{th1} / R_{th2}$	2,5 / 6					K/W
18	Thermal time constant	$\tau_{w1} / \tau_{w2}$	50 / 900					s
19	Operating temperature range:							
	– motor		-30 ... +125					°C
	– winding, max. permissible		+155					°C
20	Shaft bearings		ball bearings, preloaded					
21	Shaft load max.:							
	– with shaft diameter		6					mm
	– radial at 3 000 min <sup>-1</sup> (3 mm from bearing)		60					N
	– axial at 3 000 min <sup>-1</sup>		6					N
	– axial at standstill		50					N
22	Shaft play:							
	– radial	≤	0,015					mm
	– axial	=	0					mm
23	Housing material		steel, black coated					
24	Mass		390					g
25	Direction of rotation		clockwise, viewed from the front face					
26	Speed up to	$n_{max.}$	7 000					min <sup>-1</sup>
27	Number of pole pairs		1					
28	Magnet material		NdFeB					
Rated values for continuous operation								
29	Rated torque	$M_N$	69	99	129	126	131	mNm
30	Rated current (thermal limit)	$I_N$	4	4	4	2,6	2	A
31	Rated speed	$n_N$	5 430	5 660	5 510	5 500	5 550	min <sup>-1</sup>

**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.



