

# DC-Micromotors

## Graphite Commutation

40 mNm  
34 W

### Series 2657 ... CXR

Values at 22°C and nominal voltage	2657 W	012 CXR	018 CXR	024 CXR	030 CXR	036 CXR	048 CXR		
1 Nominal voltage	$U_N$	12	18	24	30	36	48	V	
2 Terminal resistance	$R$	0,72	1,53	2,98	4,84	6,76	12,61	$\Omega$	
3 Efficiency, max.	$\eta_{max}$	81	85	83	84	85	83	%	
4 No-load speed	$n_0$	5 600	5 500	5 800	5 700	5 800	5 800	min <sup>-1</sup>	
5 No-load current, typ. (with shaft $\varnothing$ 4 mm)	$I_0$	0,104	0,067	0,052	0,041	0,035	0,026	A	
6 Stall torque	$M_H$	306,7	347,3	302,9	300,7	306,9	283,1	mNm	
7 Friction torque	$M_R$	2	2	2	2	2	2	mNm	
8 Speed constant	$k_n$	494	321	247	196	165	122	min <sup>-1</sup> /V	
9 Back-EMF constant	$k_E$	2,024	3,113	4,05	5,11	6,07	8,205	mV/min <sup>-1</sup>	
10 Torque constant	$k_M$	19,33	29,73	38,67	48,84	58	78,35	mNm/A	
11 Current constant	$k_I$	0,052	0,034	0,026	0,02	0,017	0,013	A/mNm	
12 Slope of n-M curve	$\Delta n / \Delta M$	18,4	16,5	19	19,4	19,2	19,6	min <sup>-1</sup> /mNm	
13 Rotor inductance	$L$	90	214	365	579	816	1 500	$\mu$ H	
14 Mechanical time constant	$\tau_m$	3,3	2,9	3,4	3,4	3,4	3,5	ms	
15 Rotor inertia	$J$	17	17	17	17	17	17	gcm <sup>2</sup>	
16 Angular acceleration	$\alpha_{max}$	180	204	178	177	180	172	$\cdot 10^3$ rad/s <sup>2</sup>	
17 Thermal resistance	$R_{th1} / R_{th2}$	4,4 / 12,6						K/W	
18 Thermal time constant	$\tau_{w1} / \tau_{w2}$	28 / 810						s	
19 Operating temperature range:									
– motor		-30 ... +100						°C	
– winding, max. permissible		+125						°C	
20 Shaft bearings		sintered bearings (standard)			ball bearings, preloaded (optional version)				
21 Shaft load max.:									
– with shaft diameter		4			4				mm
– radial at 3 000 min <sup>-1</sup> (3 mm from bearing)		10			20				N
– axial at 3 000 min <sup>-1</sup>		2			2				N
– axial at standstill		50			20				N
22 Shaft play:									
– radial	$\leq$	0,03			0,015				mm
– axial	$\leq$	0,15			0				mm
23 Housing material		steel, zinc galvanized and passivated							
24 Mass		156						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							
<b>Rated values for continuous operation</b>									
29 Rated torque	$M_N$	39	43	40	40	40	40	mNm	
30 Rated current (thermal limit)	$I_N$	2,4	1,7	1,2	0,97	0,82	0,61	A	
31 Rated speed	$n_N$	5 040	5 020	5 110	5 050	5 140	5 050	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.



