

# DC-Micromotors

## Graphite Commutation

26 mNm  
21 W

### Series 2642 ... CXR

Values at 22°C and nominal voltage	2642 W	012 CXR	015 CXR	018 CXR	024 CXR	036 CXR	048 CXR		
1 Nominal voltage	$U_N$	12	15	18	24	36	48	V	
2 Terminal resistance	$R$	1,46	2,17	3,29	5,84	13,78	24,06	$\Omega$	
3 Efficiency, max.	$\eta_{max}$	76	81	80	78	80	79	%	
4 No-load speed	$n_0$	5 800	5 600	5 800	5 900	5 800	5 900	min <sup>-1</sup>	
5 No-load current, typ. (with shaft $\varnothing$ 4 mm)	$I_0$	0,092	0,07	0,06	0,045	0,03	0,022	A	
6 Stall torque	$M_H$	144,6	165,3	153,2	150,5	148	149	mNm	
7 Friction torque	$M_R$	1,7	1,7	1,7	1,7	1,7	1,7	mNm	
8 Speed constant	$k_n$	514	395	337	252	167	125	min <sup>-1</sup> /V	
9 Back-EMF constant	$k_E$	1,945	2,53	2,965	3,962	6,001	7,994	mV/min <sup>-1</sup>	
10 Torque constant	$k_M$	18,57	24,16	28,31	37,83	57,31	76,34	mNm/A	
11 Current constant	$k_I$	0,054	0,041	0,035	0,026	0,017	0,013	A/mNm	
12 Slope of n-M curve	$\Delta n / \Delta M$	40,4	35,5	39,2	39	40,1	39,4	min <sup>-1</sup> /mNm	
13 Rotor inductance	$L$	135	232	313	560	1 283	2 280	$\mu$ H	
14 Mechanical time constant	$\tau_m$	5,1	4,5	4,9	4,9	5	5	ms	
15 Rotor inertia	$J$	12	12	12	12	12	12	gcm <sup>2</sup>	
16 Angular acceleration	$\alpha_{max}$	121	138	128	125	123	124	$\cdot 10^3$ rad/s <sup>2</sup>	
17 Thermal resistance	$R_{th1} / R_{th2}$	4,7 / 15,2						K/W	
18 Thermal time constant	$\tau_{w1} / \tau_{w2}$	20 / 720						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		114						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	$M_N$	25	26	26	26	26	26	mNm	
30 Rated current (thermal limit)	$I_N$	1,6	1,32	1,08	0,82	0,54	0,41	A	
31 Rated speed	$n_N$	4 770	4 660	4 750	4 770	4 710	4 750	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.



