

# DC-Micromotors

## Graphite Commutation

41 mNm  
30 W

### Series 3242 ... CR

Values at 22°C and nominal voltage	3242 G	012 CR	018 CR	024 CR	036 CR	048 CR		
1 Nominal voltage	$U_N$		12	18	24	36	48	V
2 Terminal resistance	$R$		1,27	2,73	5	10,5	19,7	$\Omega$
3 Efficiency, max.	$\eta_{max}$		72	70	73	71	73	%
4 No-load speed	$n_0$		5 200	5 300	5 300	5 500	5 400	min <sup>-1</sup>
5 No-load current, typ. (with shaft $\varnothing$ 5 mm)	$I_0$		0,234	0,157	0,117	0,081	0,058	A
6 Stall torque	$M_H$		181	196	189	202	193	mNm
7 Friction torque	$M_R$		4,8	4,8	4,8	4,8	4,8	mNm
8 Speed constant	$k_n$		464	304	231	156	116	min <sup>-1</sup> /V
9 Back-EMF constant	$k_E$		2,15	3,29	4,33	6,42	8,58	mV/min <sup>-1</sup>
10 Torque constant	$k_M$		20,6	31,4	41,3	61,3	82	mNm/A
11 Current constant	$k_I$		0,049	0,032	0,024	0,016	0,012	A/mNm
12 Slope of n-M curve	$\Delta n / \Delta M$		28,7	26,4	28	26,7	28	min <sup>-1</sup> /mNm
13 Rotor inductance	$L$		135	310	540	1 220	2 200	$\mu$ H
14 Mechanical time constant	$\tau_m$		7,5	7,5	7,5	7,5	7,5	ms
15 Rotor inertia	$J$		25	27	26	27	26	gcm <sup>2</sup>
16 Angular acceleration	$\alpha_{max}$		73	73	74	75	75	$\cdot 10^3$ rad/s <sup>2</sup>
17 Thermal resistance	$R_{th1} / R_{th2}$	2,5 / 9						K/W
18 Thermal time constant	$\tau_{w1} / \tau_{w2}$	17 / 660						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			5					mm
– radial at 3 000 min <sup>-1</sup> (3 mm from bearing)			50					N
– axial at 3 000 min <sup>-1</sup>			5					N
– axial at standstill			50					N
22 Shaft play:								
– radial	$\leq$	0,015						mm
– axial	$=$	0						mm
23 Housing material			steel, black coated					
24 Mass			175					g
25 Direction of rotation			clockwise, viewed from the front face					
26 Speed up to	$n_{max}$		6 000					min <sup>-1</sup>
27 Number of pole pairs			1					
28 Magnet material			NdFeB					

#### Rated values for continuous operation

29 Rated torque	$M_N$		40	41	41	41,7	41	mNm
30 Rated current (thermal limit)	$I_N$		2,5	1,7	1,3	0,89	0,65	A
31 Rated speed	$n_N$		3 580	3 690	3 690	3 900	3 780	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.



