

# DC-Micromotors

## Graphite Commutation

19 mNm  
24 W

### Series 2342 ... CR

Values at 22°C and nominal voltage	2342 S	006 CR	012 CR	018 CR	024 CR	036 CR	048 CR	
1 Nominal voltage	$U_N$	6	12	18	24	36	48	V
2 Terminal resistance	$R$	0,4	1,9	4,1	7,1	15,9	31,2	$\Omega$
3 Efficiency, max.	$\eta_{max}$	81	80	81	81	81	81	%
4 No-load speed	$n_0$	9 000	8 100	8 000	8 500	8 100	8 000	min <sup>-1</sup>
5 No-load current, typ. (with shaft $\varnothing$ 3 mm)	$I_0$	0,17	0,075	0,048	0,038	0,024	0,017	A
6 Stall torque	$M_H$	87,2	80	86,5	85,4	91,4	84,4	mNm
7 Friction torque	$M_R$	0,98	1	0,99	0,99	0,99	0,95	mNm
8 Speed constant	$k_n$	1 650	713	462	366	231	170	min <sup>-1</sup> /V
9 Back-EMF constant	$k_E$	0,604	1,4	2,16	2,73	4,34	5,87	mV/min <sup>-1</sup>
10 Torque constant	$k_M$	5,77	13,4	20,7	26,1	41,4	56,1	mNm/A
11 Current constant	$k_I$	0,173	0,075	0,048	0,038	0,024	0,018	A/mNm
12 Slope of n-M curve	$\Delta n / \Delta M$	103	101	92,5	99,5	88,6	94,8	min <sup>-1</sup> /mNm
13 Rotor inductance	$L$	13,5	65	150	265	590	1 050	$\mu$ H
14 Mechanical time constant	$\tau_m$	6	6	6	6	6	6	ms
15 Rotor inertia	$J$	5,6	5,7	6,2	5,8	6,5	6	gcm <sup>2</sup>
16 Angular acceleration	$\alpha_{max}$	160	140	140	150	140	140	$\cdot 10^3$ rad/s <sup>2</sup>
17 Thermal resistance	$R_{th1} / R_{th2}$	3 / 15						K/W
18 Thermal time constant	$\tau_{w1} / \tau_{w2}$	6,5 / 490						s
19 Operating temperature range:								
– motor		-30 ... +100						°C
– winding, max. permissible		+125						°C
20 Shaft bearings		ball bearings, preloaded						
21 Shaft load max.:								
– with shaft diameter		3						mm
– radial at 3 000 min <sup>-1</sup> (3 mm from bearing)		20						N
– axial at 3 000 min <sup>-1</sup>		2						N
– axial at standstill		20						N
22 Shaft play:								
– radial	$\leq$	0,015						mm
– axial	$=$	0						mm
23 Housing material		steel, black coated						
24 Mass		88						g
25 Direction of rotation		clockwise, viewed from the front face						
26 Speed up to	$n_{max}$	11 000						min <sup>-1</sup>
27 Number of pole pairs		1						
28 Magnet material		NdFeB						

#### Rated values for continuous operation

29 Rated torque	$M_N$	14	17	18	17	19	18	mNm
30 Rated current (thermal limit)	$I_N$	2,9	1,5	1	0,78	0,53	0,38	A
31 Rated speed	$n_N$	7 140	6 090	6 040	6 470	6 160	5 910	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.



