

# DC-Micromotors

## Graphite Commutation

41,6 mNm  
25,3 W

### Series 3242 ... CR

Values at 22°C and nominal voltage	3242 G	012 CR	018 CR	024 CR	036 CR	048 CR			
Nominal voltage	$U_N$		12	18	24	36	48	V	
Terminal resistance	$R$		1,27	2,73	5,03	10,5	19,7	$\Omega$	
Rotor inductance	$L$		136	312	542	1 220	2 170	$\mu\text{H}$	
Efficiency, max.	$\eta_{max}$		68	70	69	71	70	%	
No-load current, typ.	$I_0$		0,238	0,156	0,119	0,0792	0,0594	A	
No-load speed	$n_0$		5 270	5 290	5 390	5 440	5 450	$\text{min}^{-1}$	
Stall torque	$M_{H1}$		185	199	191	208	197	mNm	
Rotor inertia	$J$		25	27	26	27	26	$\text{gcm}^2$	
Friction torque	$M_R$		4,8	4,8	4,8	4,8	4,8	mNm	
Torque constant	$k_M$		21	31,9	42	63	84	$\text{mNm/A}$	
Speed constant	$k_n$		455	300	228	152	114	$\text{min}^{-1}/\text{V}$	
Slope of n-M curve	$\Delta n/\Delta M$		27,6	25,7	27,3	25,3	26,7	$\text{min}^{-1}/\text{mNm}$	
Thermal resistance:									
- winding to housing	$R_{th1}$	4,1						K/W	
- housing to ambient (external plastic flange)	$R_{th2p}$	12						K/W	
- housing to ambient (external metal flange)	$R_{th2m}$	1,3						K/W	
Thermal time constant:									
- winding	$\tau_{w1}$	30						s	
- housing (external plastic flange)	$\tau_{w2p}$	850						s	
- housing (external metal flange)	$\tau_{w2m}$	95						s	
Operating temperature range:									
- motor		-30 ... +125						$^{\circ}\text{C}$	
- winding, max. permissible		+155						$^{\circ}\text{C}$	
Shaft bearings								ball bearings, preloaded	
Shaft diameter								5	mm
Radial shaft load max.:									
- dynamic at 3 000 $\text{min}^{-1}$ (3 mm from bearing)		50						N	
Axial shaft load max.:									
- dynamic at 3 000 $\text{min}^{-1}$		5						N	
- static (shaft unsupported)		50						N	
- static (shaft supported)		2 000						N	
Shaft play, max.:									
- radial		0,015						mm	
- axial		0						mm	
Speed up to	$n_{max}$	6 000						$\text{min}^{-1}$	
Number of pole pairs		1							
Mass		175						g	
Housing material		steel, nickel plated							
Magnet material		NdFeB							

#### Rated values for continuous operation

Rated torque	$M_N$		38,9	40,9	39,7	41,6	40,5	mNm
Rated current (thermal limit)	$I_N$		2,44	1,68	1,24	0,863	0,632	A
Rated speed	$n_N$		3 610	3 690	3 730	3 860	3 800	$\text{min}^{-1}$

**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2p}$  value has been reduced by 50%.

#### 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 different conditions of thermal coupling, i.e. mounted respectively on a plastic flange and a metal flange.

The nominal voltage ( $U_N$ ) curve shows, up to the thermal limit, the operating point at nominal voltage for the motor mounted on a plastic flange. Higher torque can be achieved by further reducing the thermal resistance.

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.



