

# DC-Micromotors

## Graphite Commutation

51 mNm  
45 W

### Series 2657 ... CR

Values at 22°C and nominal voltage	2657 W	012 CR	018 CR	024 CR	036 CR	048 CR	
1 Nominal voltage	$U_N$	12	18	24	36	48	V
2 Terminal resistance	$R$	0,71	1,7	2,84	6,78	12,5	$\Omega$
3 Efficiency, max.	$\eta_{max}$	84	81	85	82	84	%
4 No-load speed	$n_0$	6 300	6 300	6 400	6 480	6 400	min <sup>-1</sup>
5 No-load current, typ. (with shaft $\varnothing$ 4 mm)	$I_0$	0,115	0,077	0,058	0,039	0,028	A
6 Stall torque	$M_H$	278	269	286	273	265	mNm
7 Friction torque	$M_R$	2	2	2	2	2	mNm
8 Speed constant	$k_n$	552	363	274	182	136	min <sup>-1</sup> /V
9 Back-EMF constant	$k_E$	1,81	2,75	3,65	5,51	7,37	mV/min <sup>-1</sup>
10 Torque constant	$k_M$	17,3	26,3	34,8	52,6	70,4	mNm/A
11 Current constant	$k_I$	0,058	0,038	0,029	0,019	0,014	A/mNm
12 Slope of n-M curve	$\Delta n / \Delta M$	22,7	23,5	22,4	23,4	24,2	min <sup>-1</sup> /mNm
13 Rotor inductance	$L$	95	210	380	850	1 550	$\mu$ H
14 Mechanical time constant	$\tau_m$	3,9	3,9	3,9	3,9	3,9	ms
15 Rotor inertia	$J$	16	16	17	16	15	gcm <sup>2</sup>
16 Angular acceleration	$\alpha_{max}$	170	170	170	170	170	$\cdot 10^3$ rad/s <sup>2</sup>
17 Thermal resistance	$R_{th1} / R_{th2}$	1,9 / 9					K/W
18 Thermal time constant	$\tau_{w1} / \tau_{w2}$	10 / 580					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		4					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		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	$M_N$	45	49	51	50	50	mNm
30 Rated current (thermal limit)	$I_N$	3	2,3	1,8	1,2	0,86	A
31 Rated speed	$n_N$	5 250	4 960	5 060	5 020	4 920	min <sup>-1</sup>

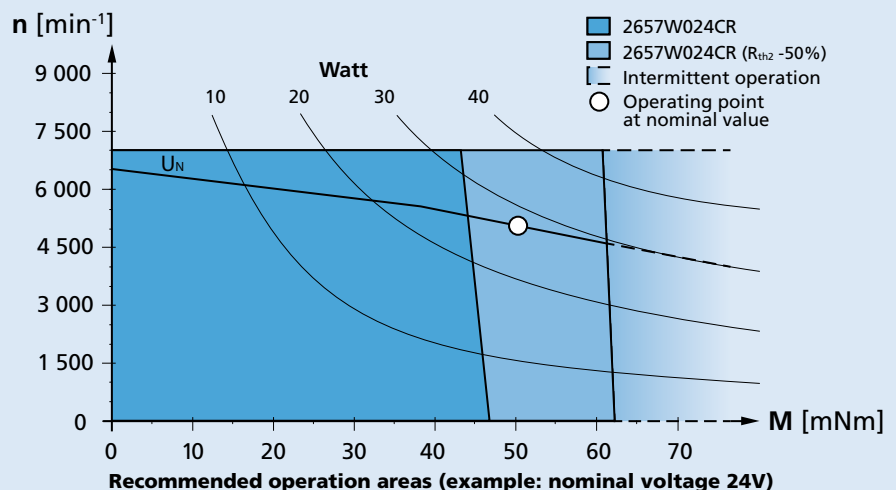
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

**Note:**

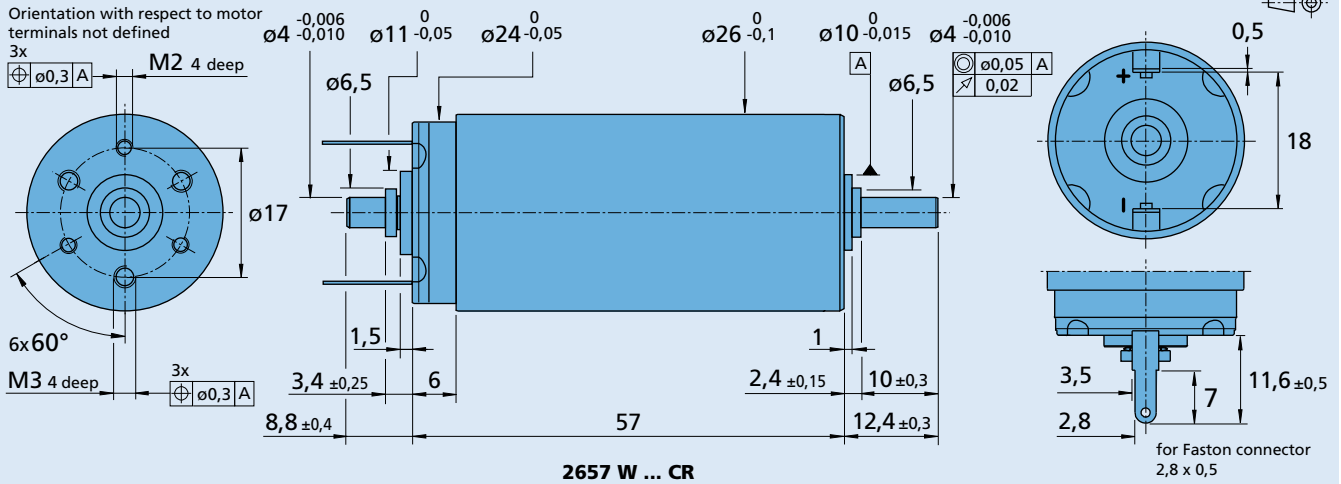
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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.



**Dimensional drawing**



**Options**

Example product designation: **2657W012CR-158**

Option	Type	Description
U	Single Leads	For motors with single leads (PTFE), length 160 mm, red (+) / black (-)
158	Shaft end	No second shaft end

**Product combination**

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
26A 26/1 26/1 R 30/1 30/1 S 32A 32ALN BS22-1.5	IE3-1024 IE3-1024 L IERS3-500 IERS3-500 L IER3-10000 IER3-10000 L	SC 2402 P SC 2804 S SC 5004 P SC 5008 S MCDC 3003 P MCDC 3006 S MC 5004 P MC 5005 S	MBZ  To view our large range of accessory parts, please refer to the "Accessories" chapter.