

# DC-Micromotors

## Graphite Commutation

### 8,8 mNm

For combination with  
Gearheads:  
15/10, 16/7, 17/1, 20/1  
Encoders:  
IE2-1024, IE2-16

## Series 1741 ... CXR

Values at 22°C and nominal voltage		1741 U	006 CXR	012 CXR	018 CXR	024 CXR	
1	Nominal voltage	$U_N$	6	12	18	24	V
2	Terminal resistance	R	1,3	5,8	15	26,9	$\Omega$
3	Output power	$P_{2nom.}$	5,67	5,54	4,95	4,8	W
4	Efficiency, max.	$\eta_{max.}$	72	74	75	75	%
5	No-load speed	$n_0$	7 100	7 600	7 300	7 300	rpm
6	No-load current, typ. (with shaft $\varnothing$ 2 mm)	$I_0$	0,055	0,028	0,017	0,013	A
7	Stall torque	$M_H$	30,6	27,9	26,1	26,2	mNm
8	Friction torque	$M_R$	0,4	0,4	0,4	0,4	mNm
9	Speed constant	$k_n$	1 303	668	420	314	rpm/V
10	Back-EMF constant	$k_E$	0,768	1,496	2,378	3,185	mV/rpm
11	Torque constant	$k_M$	7,33	14,29	22,71	30,41	mNm/A
12	Current constant	$k_I$	0,136	0,07	0,044	0,033	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$	231	271	278	278	rpm/mNm
14	Rotor inductance	L	35	135	340	600	$\mu H$
15	Mechanical time constant	$\tau_m$	4,3	4,5	4,4	4,4	ms
16	Rotor inertia	J	1,8	1,6	1,5	1,5	gcm <sup>2</sup>
17	Angular acceleration	$\alpha_{max.}$	170	175	174	174	$\cdot 10^3 \text{rad/s}^2$
18	Thermal resistance	$R_{th1} / R_{th2}$	7 / 23				K/W
19	Thermal time constant	$\tau_{w1} / \tau_{w2}$	8 / 440				s
20	Operating temperature range:						
	- motor		-30 ... +100				°C
	- winding, max. permissible		+125				°C
21	Shaft bearings		ball bearings, preloaded				
22	Shaft load max.:						
	- with shaft diameter		2				mm
	- radial at 3 000 rpm (3 mm from bearing)		8				N
	- axial at 3 000 rpm		0,8				N
	- axial at standstill		10				N
23	Shaft play						
	- radial	$\leq$	0,015				mm
	- axial	$=$	0				mm
24	Housing material		steel, zinc galvanized and passivated				
25	Mass		45				g
26	Direction of rotation		clockwise, viewed from the front face				
27	Speed up to	$n_{max.}$	9 000				rpm
28	Number of pole pairs		1				
29	Magnet material		NdFeB				
<b>Rated values for continuous operation</b>							
30	Rated torque	$M_N$	8,8	8,4	8,4	8,4	mNm
31	Rated current (thermal limit)	$I_N$	1,4	0,69	0,43	0,33	A
32	Rated speed	$n_N$	4 280	4 410	3 940	3 940	rpm

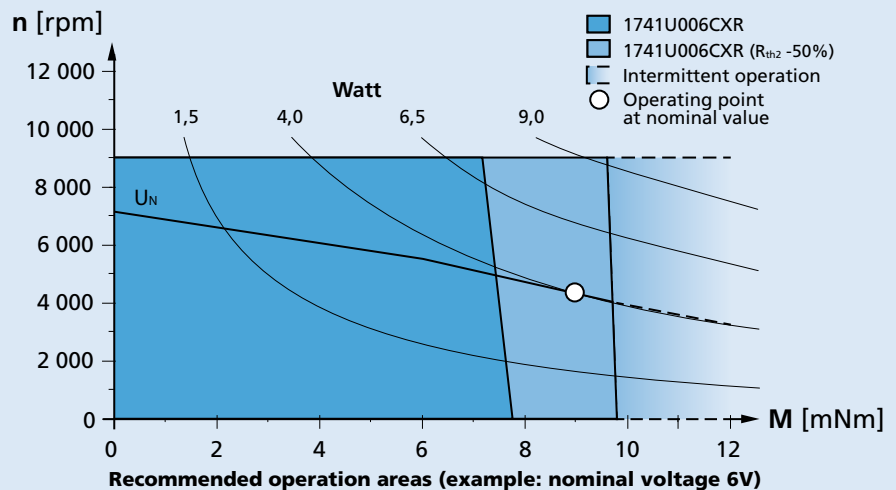
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

### 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 ( $R_{th2} \geq 50\%$  reduced).

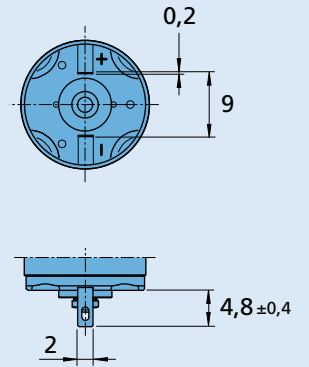
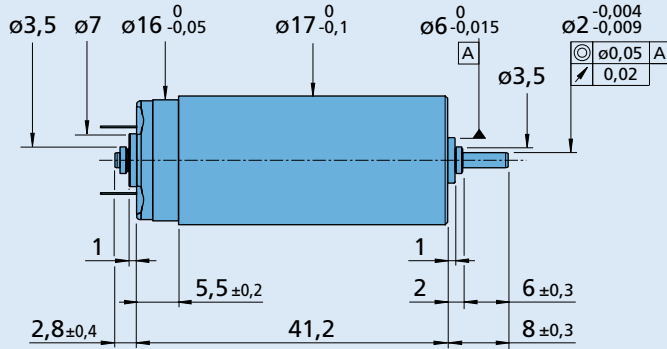
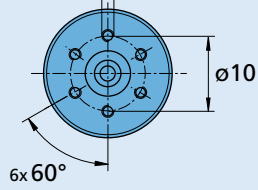
The nominal voltage ( $U_N$ ) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.



**Dimensional drawing**

Orientation with respect to motor terminals not defined

6x  
 $\oplus \begin{matrix} \text{A} \\ \text{0,3} \end{matrix}$  M1,6 3,5 deep



**1741 U ... CXR**