

DC-Micromotors

Graphite Commutation

3,6 mNm

For combination with
 Gearheads:
 13A, 14/1
 Encoders:
 IE2-1024, IE2-16

Series 1336 ... CXR

Values at 22°C and nominal voltage		1336 U	006 CXR	012 CXR	024 CXR	
1	Nominal voltage	U_N	6	12	24	V
2	Terminal resistance	R	3,98	15,6	63,7	Ω
3	Output power	$P_{2nom.}$	1,75	1,96	2	W
4	Efficiency, max.	$\eta_{max.}$	58	62	64	%
5	No-load speed	n_0	8 300	8 700	8 900	rpm
6	No-load current, typ. (with shaft \varnothing 2 mm)	I_0	0,058	0,029	0,014	A
7	Stall torque	M_H	8,1	8,6	8,6	mNm
8	Friction torque	M_R	0,35	0,35	0,35	mNm
9	Speed constant	k_n	1 568	783	392	rpm/V
10	Back-EMF constant	k_E	0,638	1,277	2,552	mV/rpm
11	Torque constant	k_M	6,09	12,19	24,37	mNm/A
12	Current constant	k_I	0,164	0,082	0,041	A/mNm
13	Slope of n-M curve	$\Delta n / \Delta M$	1 025	1 003	1 024	rpm/mNm
14	Rotor inductance	L	70	280	1 100	μH
15	Mechanical time constant	τ_m	5,9	6	6	ms
16	Rotor inertia	J	0,55	0,57	0,56	gcm ²
17	Angular acceleration	$\alpha_{max.}$	147	152	154	$\cdot 10^3 \text{ rad/s}^2$
18	Thermal resistance	R_{th1} / R_{th2}	13 / 28			K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	11 / 245			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, nickel plated			
25	Mass		21			g
26	Direction of rotation		clockwise, viewed from the front face			
27	Speed up to	$n_{max.}$	10 000			rpm
28	Number of pole pairs		1			
29	Magnet material		NdFeB			
Rated values for continuous operation						
30	Rated torque	M_N	3,5	3,6	3,6	mNm
31	Rated current (thermal limit)	I_N	0,7	0,36	0,18	A
32	Rated speed	n_N	2 780	3 170	3 250	rpm

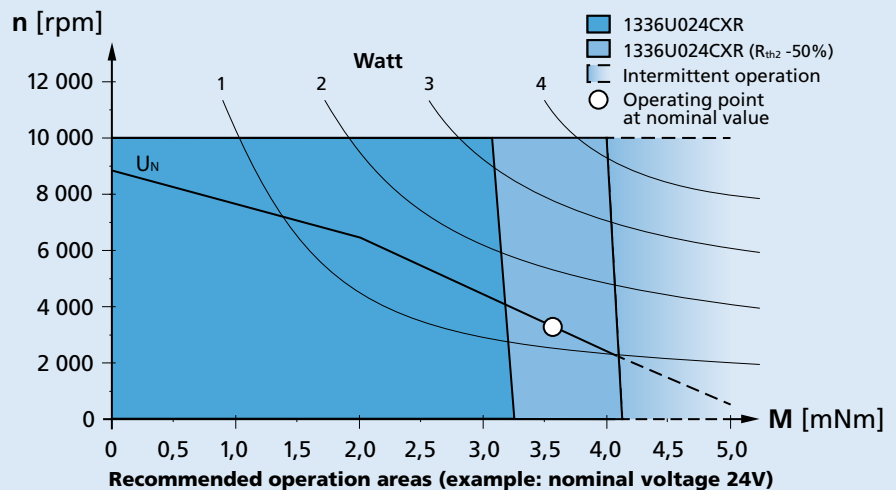
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

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} 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.

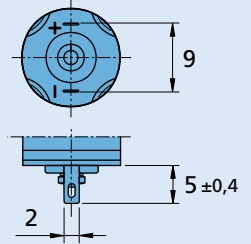
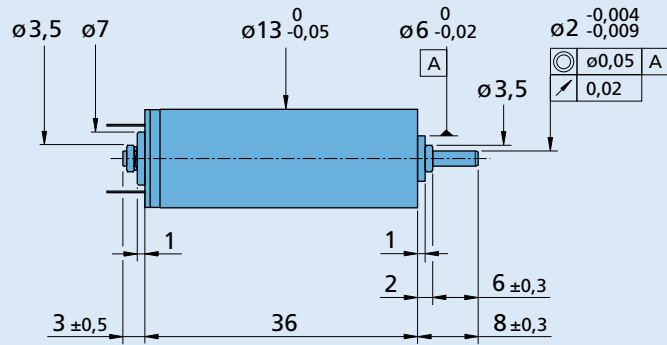
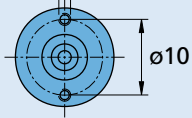


Dimensional drawing

Orientation with respect to motor
terminals not defined

2x

$\oplus \varnothing 0,3$	A
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1336 U ... CXR