DC-Micromotors

Precious Metal Commutation

6,8 mNm

For combination with
Gearheads:
20/1, 22/2, 22/5, 22/7, 22E, 22EKV, 22F, 23/1
Encoders:
IE2-1024, IE2-16, IEH2-4096

Series 2224 ... SR

Values at 22°C and nominal voltage		2224 U	003 SR	006 SR	012 SR	018 SR	024 SR	036 SR	
1	Nominal voltage	U_N	3	6	12	18	24	36	V
2	Terminal resistance	R	0,56	1,94	8,71	17,5	36,3	91,4	Ω
3	Output power	$P_{2nom.}$	3,92	4,55	4,05	4,54	3,88	3,46	W
4	Efficiency, max.	$\eta_{max.}$	80	82	82	82	81	80	%
5	No-load speed	n_0	8 100	8 200	7 800	8 100	7 800	7 800	rpm
6	No-load current, typ. (with shaft ø 2 mm)	I_0	0,066	0,029	0,014	0,01	0,007	0,005	A
7	Stall torque	M_H	18,5	21,2	19,8	21,4	19	16,9	mNm
8	Friction torque	M_R	0,23	0,2	0,2	0,21	0,2	0,22	mNm
9	Speed constant	k_n	2 730	1 380	657	454	328	219	rpm/V
10	Back-EMF constant	k_E	0,366	0,725	1,52	2,2	3,04	4,56	mV/rpm
11	Torque constant	k_M	3,49	6,92	14,5	21	29,1	43,5	mNm/A
12	Current constant	k_I	0,286	0,144	0,069	0,048	0,034	0,023	A/mNm
13	Slope of n-M curve	$\Delta n/\Delta M$	438	387	394	379	411	462	rpm/mNm
14	Rotor inductance	L	11	45	200	450	800	1 800	µH
15	Mechanical time constant	τ_m	11	11	11	11	11	11	ms
16	Rotor inertia	J	2,4	2,7	2,7	2,8	2,6	2,3	gcm²
17	Angular acceleration	$\alpha_{max.}$	77	78	74	77	74	74	·10³rad/s²
18	Thermal resistance	R_{th1} / R_{th2}	5 / 20						K/W
19	Thermal time constant	τ_{w1} / τ_{w2}	6,8 / 440						s
20	Operating temperature range:								
	– motor		-30 ... +85 (optional version -55 ... +125)						°C
	– winding, max. permissible		+125						°C
21	Shaft bearings		sintered bearings		ball bearings		ball bearings, preloaded		
22	Shaft load max.:		(standard)		(optional version)		(optional version)		
	– with shaft diameter		2		2		2		mm
	– radial at 3 000 rpm (3 mm from bearing)		1,5		8		8		N
	– axial at 3 000 rpm		0,2		0,8		0,8		N
	– axial at standstill		20		10		10		N
23	Shaft play								
	– radial	≤	0,03		0,015		0,015		mm
	– axial	≤	0,2		0,2		0		mm
24	Housing material		steel, black coated						
25	Mass		46						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						
Rated values for continuous operation									
30	Rated torque	M_N	2,2	4,5	6,7	6,8	6,6	6,1	mNm
31	Rated current (thermal limit)	I_N	0,7	0,7	0,52	0,37	0,25	0,16	A
32	Rated speed	n_N	7 170	6 390	4 390	4 800	4 300	4 060	rpm

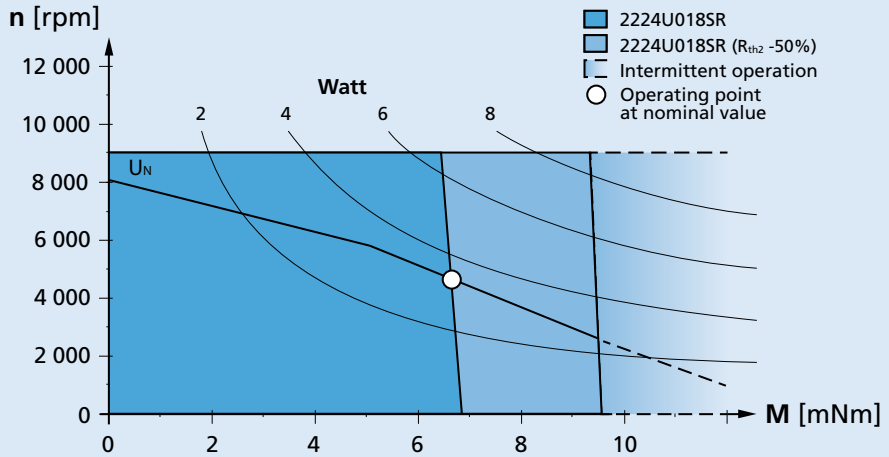
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

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.

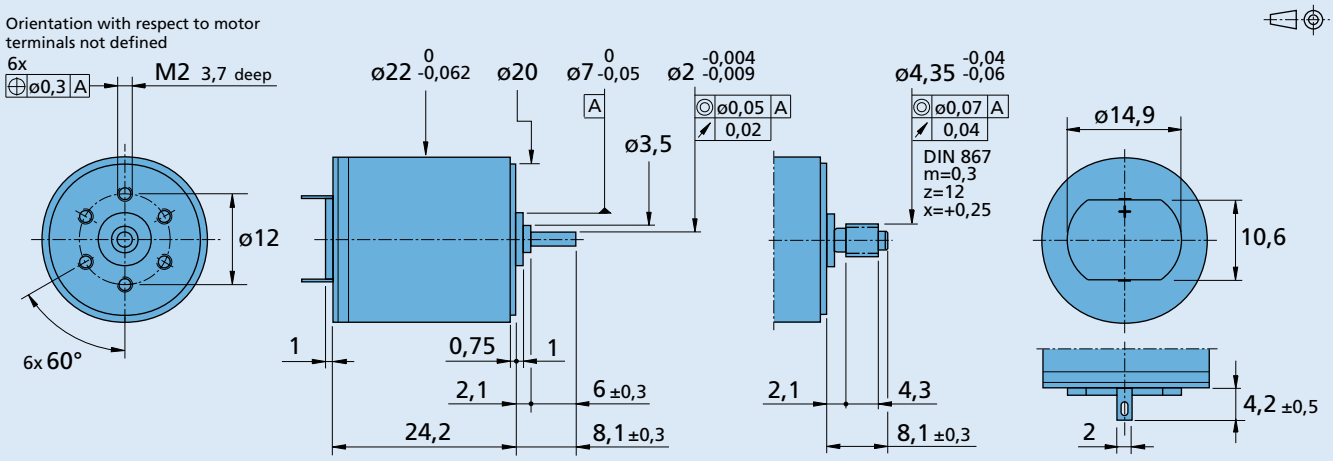
The diagram shows the motor in a completely insulated as well as thermally coupled condition (R_{th2} 50% reduced).

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.



Recommended operation areas (example: nominal voltage 18V)

Dimensional drawing



2224 U ... SR **2224 R ... SR**