DC-Micromotors

Precious Metal Commutation

6,8 mNm

8,5 W

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

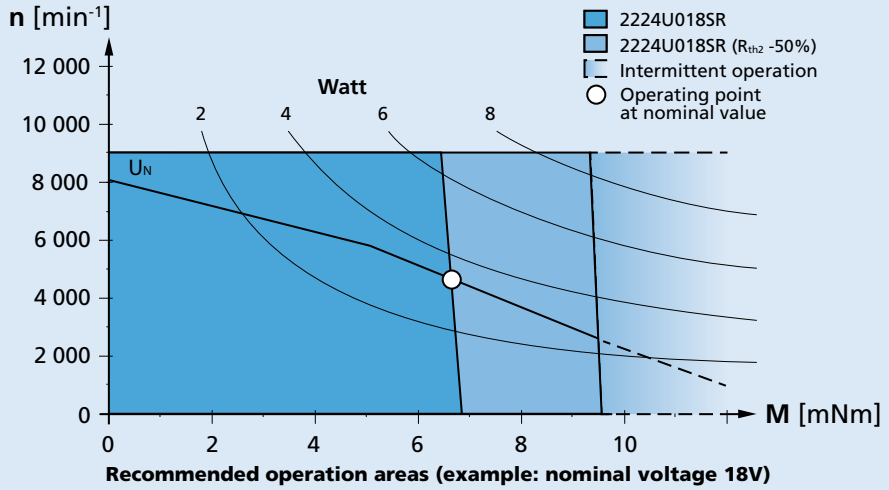
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

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)

For notes on technical data and lifetime performance refer to "Technical Information".

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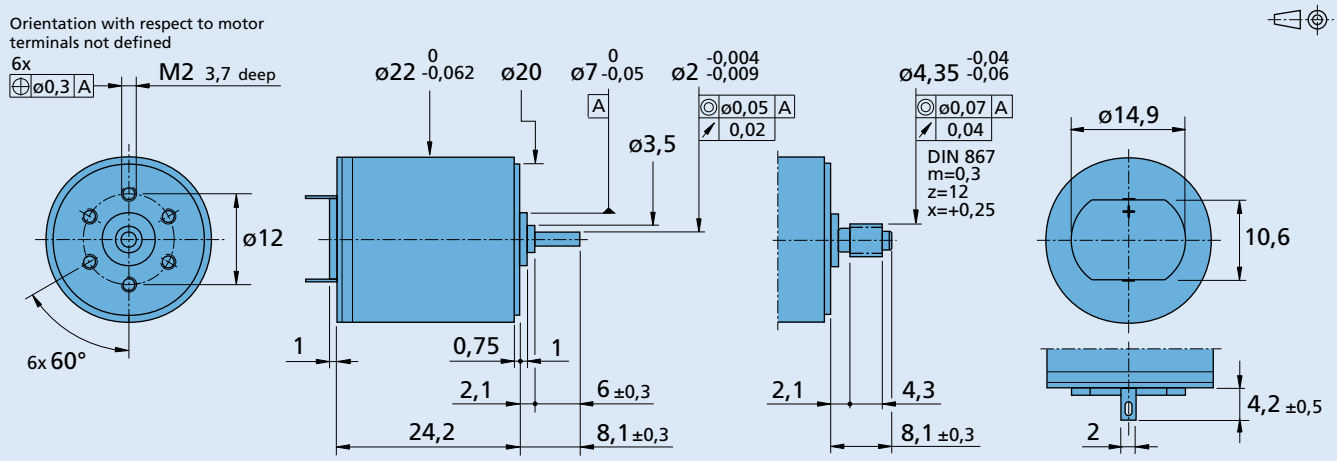
Dimensional drawing



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

Options

Example product designation: **2224U012SR-277**

Option	Type	Description
L	Twin Leads	For motors with twin leads (PVC), length 150 mm, red (+) / black (-)
4924	Twin Leads	For motors with twin leads (PVC), length 300 mm, red (+) / black (-)
X4924	Twin Leads	For motors with twin leads (PVC), length 600 mm, red (+) / black (-)
4925	Twin Leads	For motors with twin leads (PVC), length 150 mm, red (+) / black (-), with connector AMP 179228-2
X4925	Twin Leads	For motors with twin leads (PVC), length 300 mm, red (+) / black (-), with connector AMP 179228-2
Y4925	Twin Leads	For motors with twin leads (PVC), length 600 mm, red (+) / black (-), with connector AMP 179228-2
F	Single Leads	For motors with single leads (PTFE), length 150 mm, red (+) / black (-)
277	Bearings	2 preloaded ball bearings

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
20/1R 22E 22EKV 22F 22/2 22/5 22/7 23/1	IE2-16 IE2-1024 IEH2-4096 IEH3-4096 IEH3-4096 L	SC 1801 P SC 1801 S SC 2402 P SC 2804 S MCDC 3002 P MCDC 3002 S MCDC 3003 P MCDC 3006 S MC 5004 P	To view our large range of accessory parts, please refer to the “Accessories” chapter.

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