

DC-Micromotors

Precious Metal Commutation

10 mNm
8,5 W

Series 2232 ... SR

Values at 22°C and nominal voltage	2232 U	006 SR	009 SR	012 SR	015 SR	018 SR	024 SR		
1 Nominal voltage	U_N	6	9	12	15	18	24	V	
2 Terminal resistance	R	0,81	2,14	4,09	6,61	9,04	16,4	Ω	
3 Efficiency, max.	η_{max}	87	86	86	85	86	86	%	
4 No-load speed	n_0	7 100	7 400	7 100	7 100	7 100	7 100	min ⁻¹	
5 No-load current, typ. (with shaft \varnothing 2 mm)	I_0	0,035	0,0241	0,0175	0,0139	0,0116	0,0087	A	
6 Stall torque	M_H	59,2	48,3	46,8	45,2	47,6	46,7	mNm	
7 Friction torque	M_R	0,28	0,28	0,28	0,28	0,28	0,28	mNm	
8 Speed constant	k_n	1 190	827	595	476	397	298	min ⁻¹ /V	
9 Back-EMF constant	k_E	0,84	1,21	1,68	2,1	2,52	3,36	mV/min ⁻¹	
10 Torque constant	k_M	8,03	11,5	16	20,1	24,1	32,1	mNm/A	
11 Current constant	k_I	0,125	0,087	0,062	0,05	0,042	0,031	A/mNm	
12 Slope of n-M curve	$\Delta n / \Delta M$	120	153	152	157	149	152	min ⁻¹ /mNm	
13 Rotor inductance	L	45	90	180	280	400	710	μ H	
14 Mechanical time constant	τ_m	6	6	6	6	6	6	ms	
15 Rotor inertia	J	4,8	3,8	3,8	3,8	3,8	3,8	gcm ²	
16 Angular acceleration	α_{max}	120	120	120	120	120	120	$\cdot 10^3$ rad/s ²	
17 Thermal resistance	R_{th1} / R_{th2}	4 / 13						K/W	
18 Thermal time constant	τ_{w1} / τ_{w2}	7 / 340						s	
19 Operating temperature range:									
– motor		-30 ... +85 (optional version -30 ... +125)							°C
– winding, max. permissible		+125							°C
20 Shaft bearings		sintered bearings			ball bearings, preloaded (optional version)				
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	\leq	0,03			0,015				mm
– axial	\leq	0,2			0				mm
23 Housing material		steel, black coated							
24 Mass		62							g
25 Direction of rotation		clockwise, viewed from the front face							
26 Speed up to	n_{max}	8 000							min ⁻¹
27 Number of pole pairs		1							
28 Magnet material		NdFeB							
Rated values for continuous operation									
29 Rated torque	M_N	10	10	10	10	10	10	mNm	
30 Rated current (thermal limit)	I_N	1,3	0,93	0,67	0,53	0,44	0,33	A	
31 Rated speed	n_N	5 900	5 810	5 510	5 420	5 530	5 490	min ⁻¹	

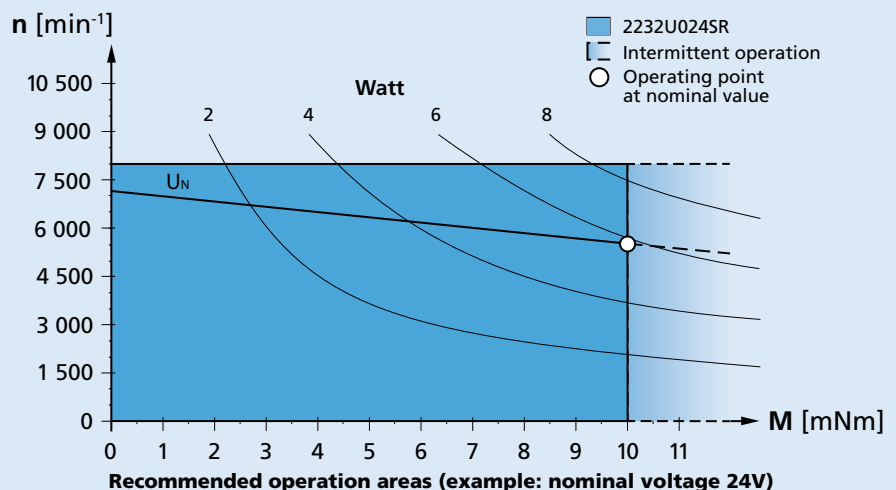
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

Note:

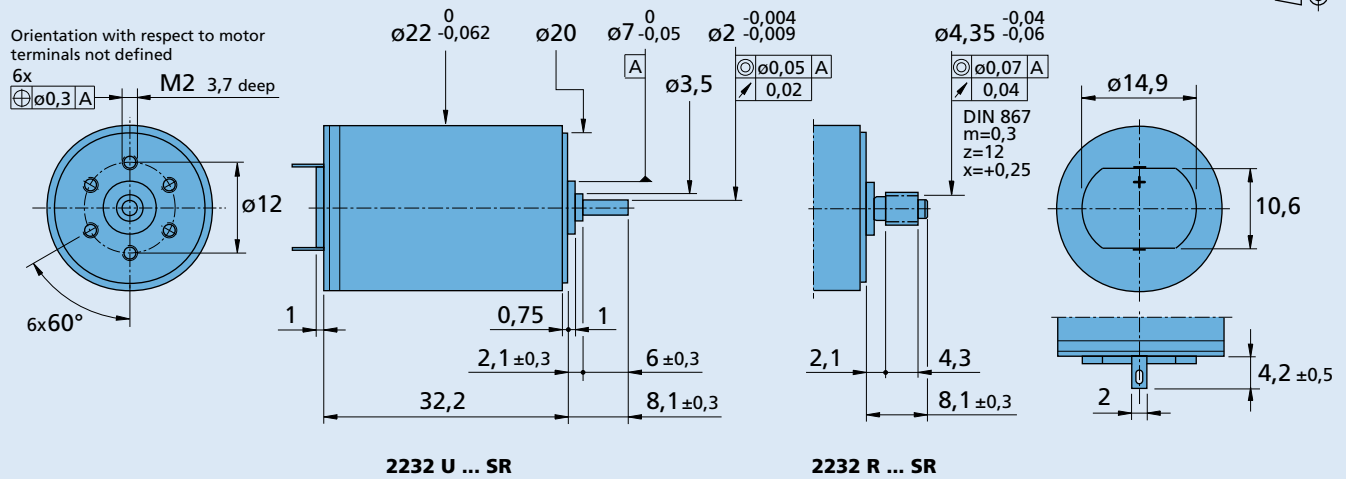
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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.



Dimensional drawing



Options

Example product designation: **2232U012SR-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 22GPT 22/2 22/5 22/7 23/1 26A	IE2-1024 IEH2-4096 IEH3-4096 IEH3-4096L	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 3001 B MC 3001 P MC 5004 P	To view our large range of accessory parts, please refer to the "Accessories" chapter.