

DC-Micromotors

Precious Metal Commutation

10 mNm
8,37 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		
Nominal voltage	U_N	6	9	12	15	18	24	V	
Terminal resistance	R	0,81	2,14	4,09	6,61	9,04	16,4	Ω	
Rotor inductance	L	44,4	93,1	178	281	399	710	μH	
Efficiency, max.	η_{max}	87	85	85	85	85	85	%	
No-load current, typ.	I_0	0,0352	0,0243	0,0176	0,014	0,0117	0,0088	A	
No-load speed	n_0	7 160	7 410	7 150	7 100	7 150	7 150	min^{-1}	
Stall torque	M_H	59	48,5	46,7	45,4	47,5	46,5	mNm	
Rotor inertia	J	4,8	3,8	3,8	3,8	3,8	3,8	gcm^2	
Friction torque	M_R	0,28	0,28	0,28	0,28	0,28	0,28	mNm	
Torque constant	k_M	8	11,6	16	20,1	24	32	mNm/A	
Speed constant	k_n	1 190	825	597	474	398	299	min^{-1}/V	
Slope of n-M curve	$\Delta n/\Delta M$	121	152	153	156	150	153	$\text{min}^{-1}/\text{mNm}$	
Thermal resistance:									
- winding to housing	R_{th1}	6,9						K/W	
- housing to ambient (external plastic flange)	R_{th2p}	19						K/W	
- housing to ambient (external metal flange)	R_{th2m}	1,8						K/W	
Thermal time constant:									
- winding	τ_{w1}	12						s	
- housing (external plastic flange)	τ_{w2p}	500						s	
- housing (external metal flange)	τ_{w2m}	46						s	
Operating temperature range:									
- motor		-30 ... +85 (optional version -30 ... +125)							$^{\circ}\text{C}$
- winding, max. permissible		+125							$^{\circ}\text{C}$
Shaft bearings		sintered bearings			ball bearings, preloaded				
Shaft diameter		2			2				mm
Radial shaft load max.:									
- dynamic at 3 000 min^{-1} (3 mm from bearing)		1,5			8				N
Axial shaft load max.:									
- dynamic at 3 000 min^{-1}		0,2			0,8				N
- static (shaft unsupported)		20			10				N
Shaft play, max.:									
- radial		0,03			0,015				mm
- axial		0,2			0				mm
Speed up to	n_{max}	8 000							min^{-1}
Number of pole pairs		1							
Mass		62							g
Housing material		steel, nickel plated							
Magnet material		NdFeB							

Rated values for continuous operation

Rated torque	M_N	10	10	10	10	10	10	mNm
Rated current (thermal limit)	I_N	1,36	0,958	0,694	0,553	0,462	0,347	A
Rated speed	n_N	5 920	5 710	5 430	5 320	5 470	5 420	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%.

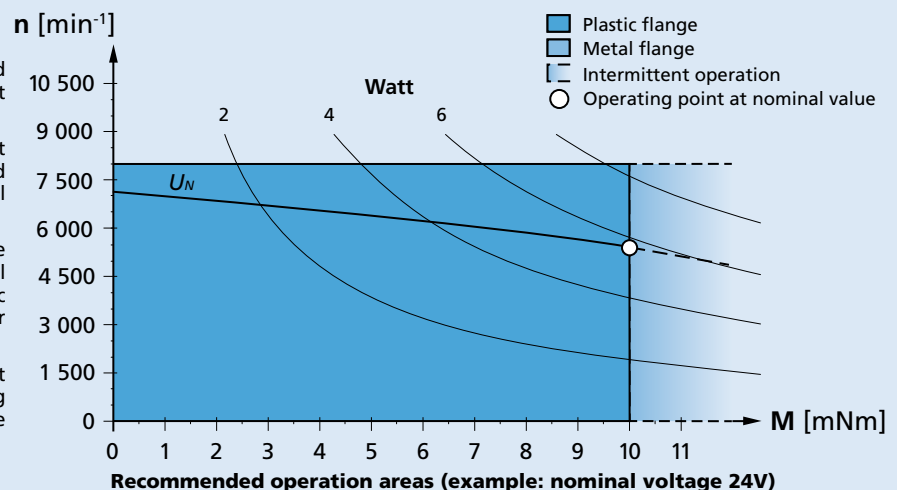
Note:

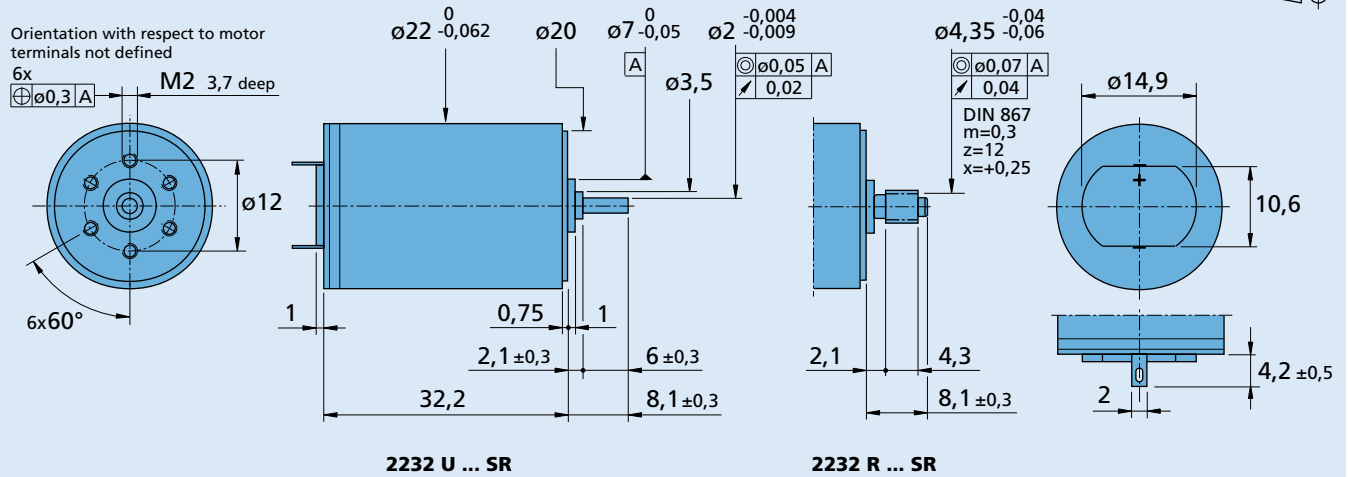
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

The diagram shows the motor in different conditions of thermal coupling, i.e. mounted respectively on a plastic flange and a metal flange.

The nominal voltage (U_N) curve shows, up to the thermal limit, the operating point at nominal voltage for the motor mounted on a plastic flange. Higher torque can be achieved by further reducing the thermal resistance.

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 MC 3001 B MC 3001 P MC 3603 S MC 5004 P	To view our large range of accessory parts, please refer to the "Accessories" chapter.