DC-Micromotors

10 mNm

Precious Metal Commutation

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.	$\eta_{max.}$	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	gcm²
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	min⁻¹/mNm
Thermal resistance:								
– winding to housing	R_{th1}	6,9						K/W
– housing to ambient (external plastic flange)	$R_{th2\,p}$	19						K/W
– housing to ambient (external metal flange)	$R_{th2\,m}$	1,8						K/W
Thermal time constant:								
– winding	τ_{w1}	12						s
– housing (external plastic flange)	$\tau_{w2\,p}$	500						s
– housing (external metal flange)	$\tau_{w2\,m}$	46						s
Operating temperature range:								
– motor		-30 ... +85 (optional version -30 ... +125)						°C
– winding, max. permissible		+125						°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 $R_{th2\,p}$ value has been reduced by 0%.

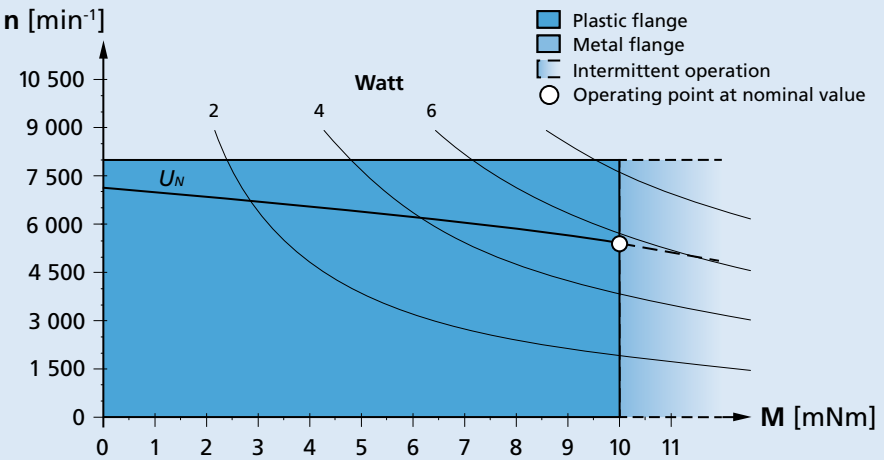
Note:

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.

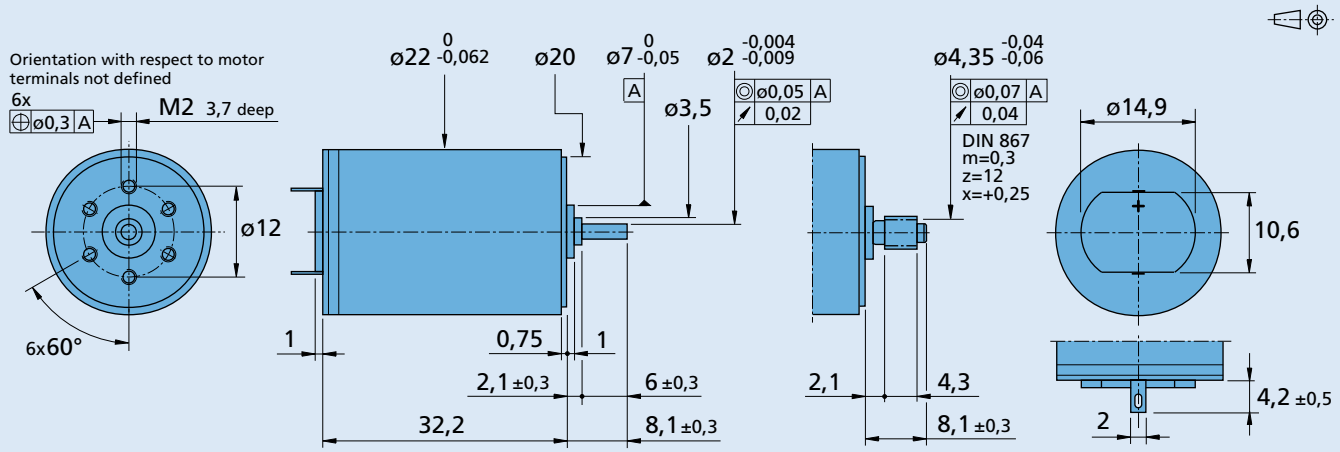
Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.



Recommended operation areas (example: nominal voltage 24V)

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

Dimensional drawing



2232 U ... SR **2232 R ... SR**

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.

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