DC-Micromotors

Precious Metal Commutation

5,9 mNm

8 W

Series 2233 ... S

Values at 22°C and nominal voltage		2233 T	4,5 S	006 S	012 S	018 S	024 S	030 S	
1	Nominal voltage	U_N	4,5	6	12	18	24	30	V
2	Terminal resistance	R	1,2	2,7	9,6	25	52	97	Ω
3	Efficiency, max.	$\eta_{max.}$	86	85	85	83	83	81	%
4	No-load speed	n_0	8 500	7 700	8 200	9 000	8 400	8 700	min^{-1}
5	No-load current, typ. (with shaft ø 1,5 mm)	I_0	0,02	0,014	0,007	0,005	0,004	0,003	A
6	Stall torque	M_H	20,2	16	17,3	13,4	12,4	9,9	mNm
7	Friction torque	M_R	0,1	0,1	0,1	0,1	0,1	0,1	mNm
8	Speed constant	k_n	1 895	1 296	684	508	354	293	min^{-1}/V
9	Back-EMF constant	k_E	0,528	0,772	1,46	1,97	2,82	3,41	mV/min^{-1}
10	Torque constant	k_M	5,04	7,37	14	18,8	27	32,6	mNm/A
11	Current constant	k_I	0,198	0,136	0,072	0,053	0,037	0,031	A/mNm
12	Slope of n-M curve	$\Delta n/\Delta M$	421	483	472	676	678	877	min^{-1}/mNm
13	Rotor inductance	L	60	120	440	800	1 600	2 400	µH
14	Mechanical time constant	τ_m	11,5	10	11	17	11	12,9	ms
15	Rotor inertia	J	2,6	2	2,2	2,5	1,6	1,4	gcm²
16	Angular acceleration	$\alpha_{max.}$	77	80	78	54	78	71	·10³rad/s²
17	Thermal resistance	R_{th1} / R_{th2}	4 / 27						K/W
18	Thermal time constant	τ_{w1} / τ_{w2}	4 / 660						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			
21	Shaft load max.:		(standard)			(optional version)			
	– with shaft diameter		1,5			2			mm
	– radial at 3 000 min^{-1} (3 mm from bearing)		1,2			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, zinc galvanized and passivated						
24	Mass		61						g
25	Direction of rotation		clockwise, viewed from the front face						
26	Speed up to	$n_{max.}$	10 000						min^{-1}
27	Number of pole pairs		1						
28	Magnet material		AlNiCo						
Rated values for continuous operation									
29	Rated torque	M_N	3,4	5	5,9	4,9	4,9	4,3	mNm
30	Rated current (thermal limit)	I_N	0,7	0,7	0,43	0,27	0,19	0,14	A
31	Rated speed	n_N	6 930	4 800	4 600	4 830	4 170	3 860	min^{-1}

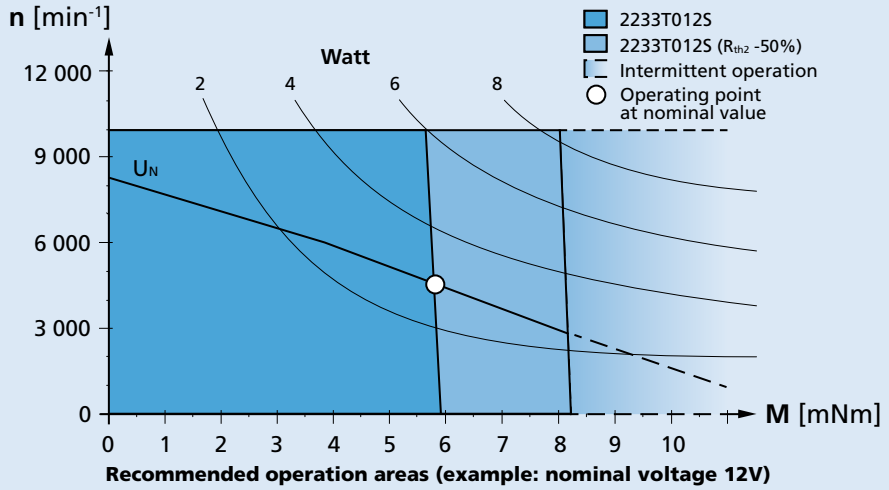
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

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).

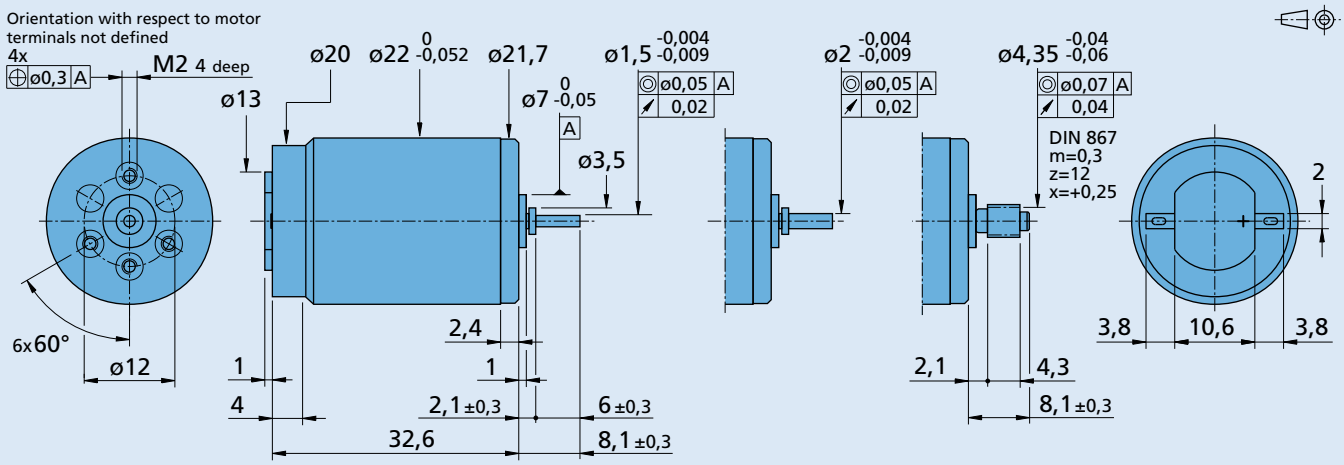
The nominal voltage (U_N) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.



Recommended operation areas (example: nominal voltage 12V)

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

Dimensional drawing



2233 T ... S **2233 U ... S** **2233 F/R ... S**

Options

Example product designation: **2233T012S-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
22E 22EKV 22/2 22/5 22/7 23/1		SC 1801 P SC 1801 S SC 2402 P SC 2804 S	To view our large range of accessory parts, please refer to the “Accessories” chapter.