

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.	η_{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 \varnothing 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	μ H	
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	gcm ²	
16 Angular acceleration	α_{max}	77	80	78	54	78	71	$\cdot 10^3$ rad/s ²	
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 -55 ... +125)							°C
– winding, max. permissible		+125							°C
20 Shaft bearings		sintered bearings (standard)			ball bearings, preloaded (optional version)				
21 Shaft load max.:		1,5			2				mm
– with shaft diameter		1,2			8				N
– radial at 3 000 min ⁻¹ (3 mm from bearing)		0,2			0,8				N
– axial at 3 000 min ⁻¹		20			10				N
– axial at standstill									
22 Shaft play:									
– radial	\leq	0,03			0,015				mm
– axial	\leq	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	

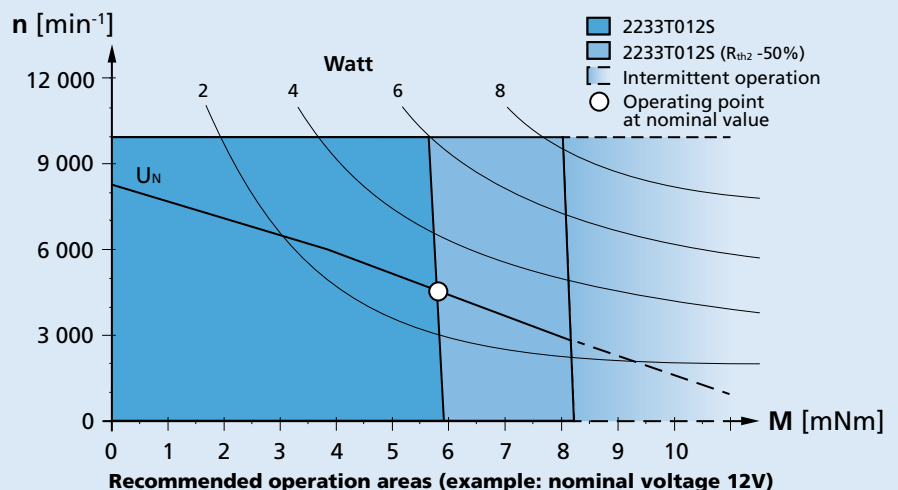
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

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.

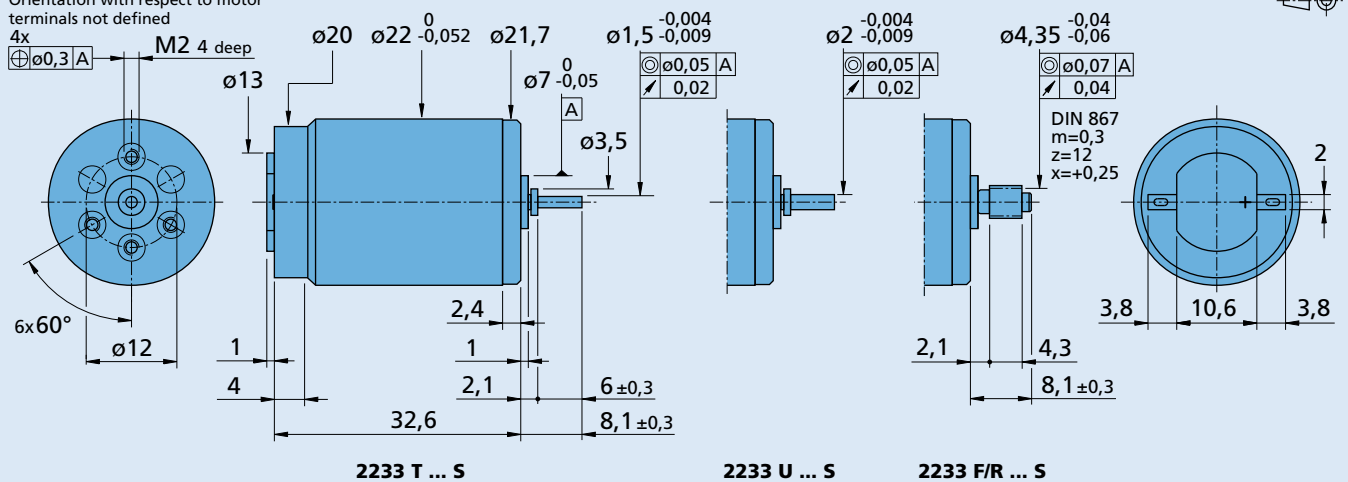
The diagram shows the motor in a completely insulated as well as thermally coupled condition (R_{th2} 50% reduced).

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.



Dimensional drawing

Orientation with respect to motor terminals not defined


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	HEDS 5500 HEDL 5540	SC 1801 P SC 1801 S SC 2402 P SC 2804 S MCDC 3002 P MCDC 3002 S MCDC 3003 P MCDC 3006 S	To view our large range of accessory parts, please refer to the "Accessories" chapter.