

DC-Micromotors

Precious Metal Commutation

5,39 mNm

8,39 W

Series 2230 ... S

Values at 22°C and nominal voltage	2230 T	003 S	006 S	012 S	015 S	024 S	040 S		
Nominal voltage	U_N	3	6	12	15	24	40	V	
Terminal resistance	R	0,534	3,04	10,5	20,4	48,3	198	Ω	
Rotor inductance	L	33,2	133	504	914	2 180	8 120	μH	
Efficiency, max.	η_{max}	84	81	82	81	80	77	%	
No-load current, typ.	I_0	0,0393	0,0196	0,0101	0,0075	0,0053	0,0029	A	
No-load speed	n_0	9 310	9 280	9 520	8 830	9 160	7 870	min^{-1}	
Stall torque	M_H	17,1	12	13,5	11,7	12,2	9,55	mNm	
Rotor inertia	J	3,7	2,5	2,7	2,7	2,4	2,4	gcm^2	
Friction torque	M_R	0,12	0,12	0,12	0,12	0,13	0,14	mNm	
Torque constant	k_M	3,06	6,12	11,9	16,1	24,8	47,9	mNm/A	
Speed constant	k_n	3 120	1 560	801	595	386	200	min^{-1}/V	
Slope of n-M curve	$\Delta n/\Delta M$	545	776	707	756	752	824	$\text{min}^{-1}/\text{mNm}$	
Thermal resistance:									
- winding to housing	R_{th1}	7,1						K/W	
- housing to ambient (external plastic flange)	R_{th2p}	20						K/W	
- housing to ambient (external metal flange)	R_{th2m}	10						K/W	
Thermal time constant:									
- winding	τ_{w1}	8,4						s	
- housing (external plastic flange)	τ_{w2p}	430						s	
- housing (external metal flange)	τ_{w2m}	220						s	
Operating temperature range:									
- motor		-30 ... +85 (optional version -30 ... +125)							$^{\circ}\text{C}$
- winding, max. permissible		+125							$^{\circ}\text{C}$
Shaft bearings									
Shaft diameter		sintered bearings			ball bearings, preloaded				
Radial shaft load max.:		1,5			2				mm
- dynamic at 3 000 min^{-1} (3 mm from bearing)		1,2			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}	11 000							min^{-1}
Number of pole pairs		1							
Mass		50							g
Housing material		steel, zinc galvanized and passivated							
Magnet material		AlNiCo							

Rated values for continuous operation

Rated torque	M_N	2,02	4,12	5,39	5,21	5,21	4,87	mNm
Rated current (thermal limit)	I_N	0,7	0,7	0,47	0,338	0,219	0,107	A
Rated speed	n_N	8 170	5 450	4 400	3 510	3 870	2 500	min^{-1}

Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2p} value has been reduced by 0%.

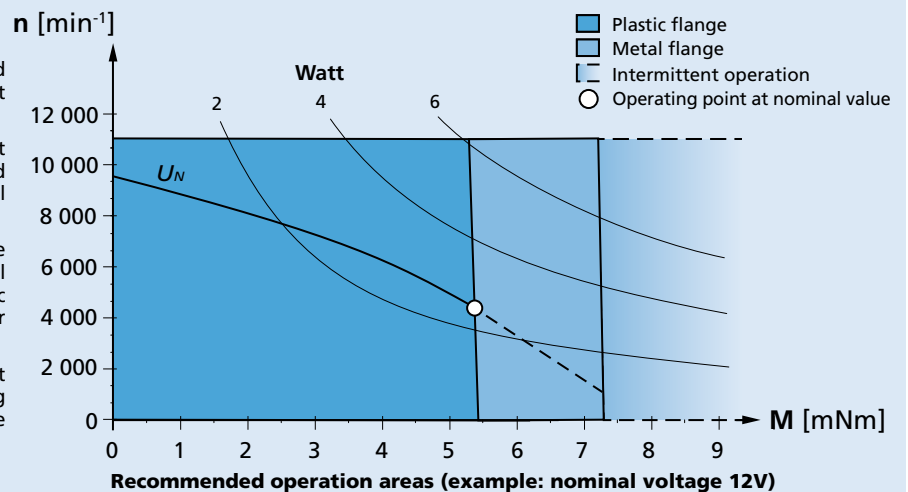
Note:

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.

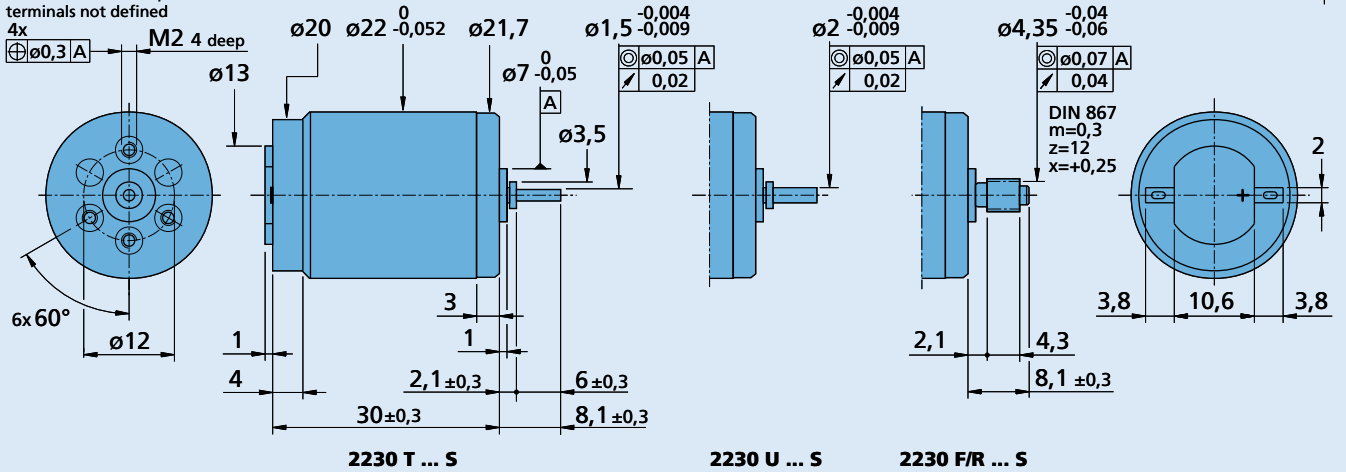
The nominal voltage (U_N) curve shows, up to the thermal limit, the operating point at nominal voltage for the motor mounted on a plastic flange. Higher torque can be achieved by further reducing the thermal resistance.

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

Orientation with respect to motor terminals not defined



Options

Example product designation: **2230T012S-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.