DC-Micromotors

Precious Metal Commutation

4,7 mNm

7,5 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	
1	Nominal voltage	U_N	3	6	12	15	24	40	V
2	Terminal resistance	R	0,6	3	10,8	21	50	193	Ω
3	Efficiency, max.	$\eta_{max.}$	83	82	83	82	81	78	%
4	No-load speed	n_0	9 600	9 300	9 500	8 400	9 000	8 200	min^{-1}
5	No-load current, typ. (with shaft ø 1,5 mm)	I_0	0,04	0,019	0,01	0,007	0,005	0,003	A
6	Stall torque	M_H	14,7	12,1	13,2	11,9	12	9,37	mNm
7	Friction torque	M_R	0,12	0,12	0,12	0,12	0,13	0,14	mNm
8	Speed constant	k_n	3 230	1 560	799	566	379	208	min^{-1}/V
9	Back-EMF constant	k_E	0,31	0,639	1,25	1,77	2,64	4,81	mV/min^{-1}
10	Torque constant	k_M	2,96	6,1	12	16,9	25,2	45,9	mNm/A
11	Current constant	k_I	0,338	0,164	0,084	0,059	0,04	0,022	A/mNm
12	Slope of n-M curve	$\Delta n/\Delta M$	653	769	720	706	750	875	min^{-1}/mNm
13	Rotor inductance	L	35	150	420	900	2 200	8 000	µH
14	Mechanical time constant	τ_m	25	20	20	20	19	22	ms
15	Rotor inertia	J	3,7	2,5	2,7	2,7	2,4	2,4	gcm²
16	Angular acceleration	$\alpha_{max.}$	40	49	50	44	50	39	·10³rad/s²
17	Thermal resistance	R_{th1} / R_{th2}	4 / 28						K/W
18	Thermal time constant	τ_{w1} / τ_{w2}	4,5 / 602						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		50						g
25	Direction of rotation		clockwise, viewed from the front face						
26	Speed up to	$n_{max.}$	11 000						min^{-1}
27	Number of pole pairs		1						
28	Magnet material		AlNiCo						
Rated values for continuous operation									
29	Rated torque	M_N	2	4,1	4,6	4,7	4,5	4,2	mNm
30	Rated current (thermal limit)	I_N	0,7	0,7	0,4	0,29	0,18	0,094	A
31	Rated speed	n_N	8 260	5 370	5 210	4 160	4 650	3 490	min^{-1}

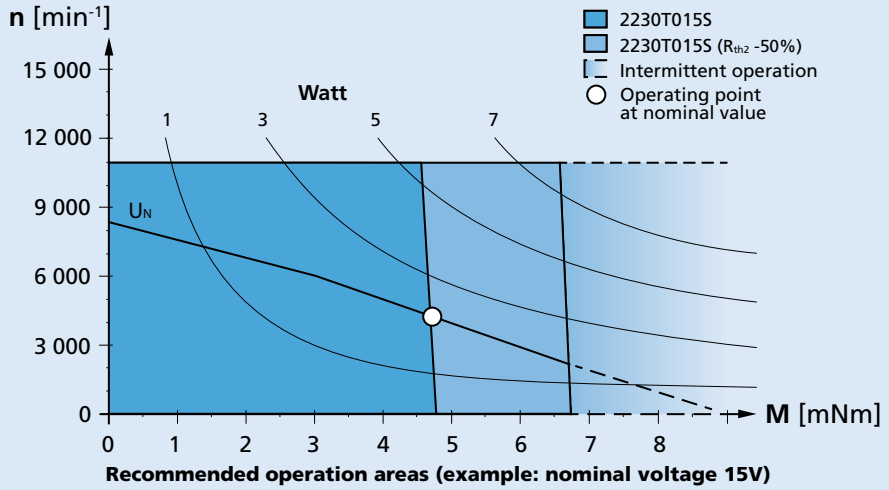
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

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).

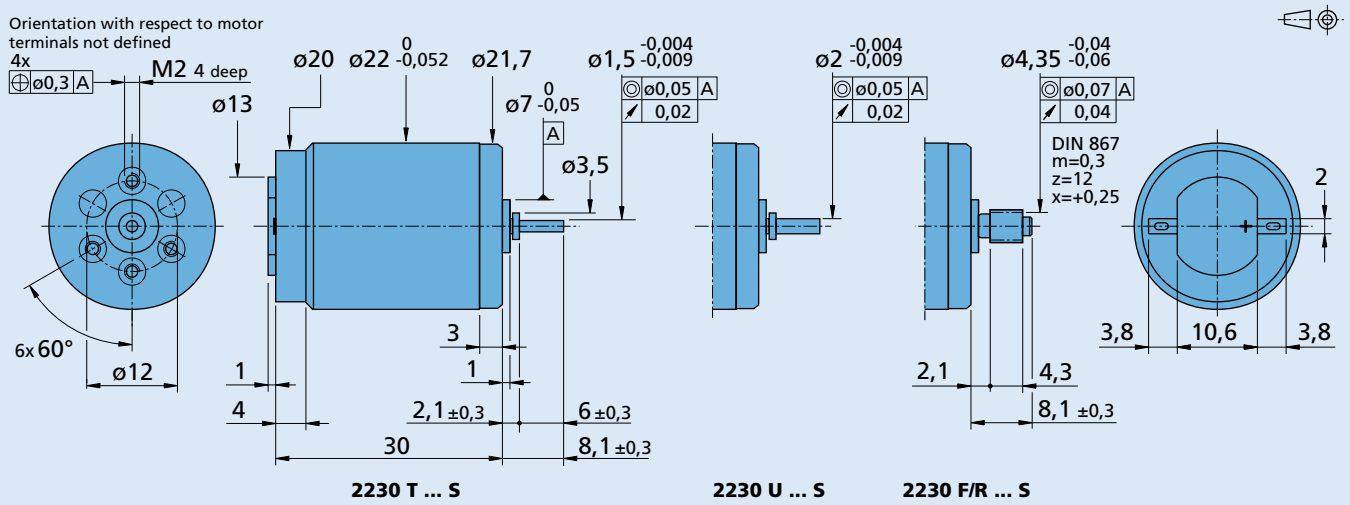
The nominal voltage (U_N) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.



Recommended operation areas (example: nominal voltage 15V)

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

Dimensional drawing



2230 T ... S **2230 U ... S** **2230 F/R ... S**

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.

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