

DC-Micromotor

Graphite Commutation

5.7 mNm

For combination with:
Gearheads: MD22P
Encoder: ME2-16

Series MD2230

| | | MD2230E | 006V | 012V | 024V | | |
|---------------------------|---|-------------------------------------|-----------------------------------|--------|---------|------------------------------|----------|
| 1 | Nominal voltage | U_N | 6 | 12 | 24 | Volt | |
| 2 | Winding resistance | R | ± 12% | 2.40 | 17.50 | 198 | Ω |
| 3 | Output power | $P_{2 \text{ max.}}$ | 3.48 | 1.85 | 0.41 | W | |
| 4 | Efficiency | $\eta_{\text{ max.}}$ | 66 | 60 | 25 | % | |
| 5 | No-load speed | n_o | ± 12% | 8,000 | 5,300 | 5,000 | rpm |
| 6 | No-load current max. (shaft \varnothing 2 mm) | I_o | ± 50% | 0.090 | 0.035 | 0.003 | A |
| 7 | Stall torque | M_H | 17.26 | 14.07 | 4.18 | mNm | |
| 8 | Friction torque | M_R | 0.62 | 0.72 | 1.03 | mNm | |
| 9 | Speed constant | k_N | 1,383 | 465 | 277 | rpm/V | |
| 10 | Back-EMF constant | k_E | 0.72 | 2.15 | 3.61 | mV/rpm | |
| 11 | Torque constant | k_M | 6.90 | 20.52 | 34.49 | mNm/A | |
| 12 | Current constant | k_I | 0.145 | 0.049 | 0.029 | A/mNm | |
| 13 | Slope of n-M curve | $\Delta n/\Delta M$ | 463 | 377 | 1,196 | rpm/mNm | |
| 14 | Rotor inductance | L | 1,300 | 11,000 | 135,000 | μH | |
| 15 | Mechanical time constant | τ_m | 20 | 19 | 60 | ms | |
| 16 | Rotor inertia | J | 4 | 4.5 | 3.6 | gcm^2 | |
| 17 | Angular acceleration | $\alpha_{\text{ max.}}$ | 43 | 31 | 12 | $\cdot 10^3 \text{ rad/s}^2$ | |
| 18 | Thermal resistance | $R_{\text{th} 1} / R_{\text{th} 2}$ | 5.5 / 28 | | | $^{\circ}\text{C/W}$ | |
| 19 | Thermal time constant | τ_{w1} | 750 | | | s | |
| 20 | Operating temperature range: | | | | | | |
| | - motor | | - 10 to + 50 | | | $^{\circ}\text{C}$ | |
| | - rotor, max. permissible | | + 120 | | | $^{\circ}\text{C}$ | |
| 21 | Shaft bearing | | sintered bronze sleeves | | | | |
| 22 | Shaft load max.: | | | | | | |
| | - with shaft diameter | | 2 | | | mm | |
| | - radial at 3,000 rpm (3 mm from bearing) | | 2 | | | N | |
| | - axial at 3,000 rpm | | 1 | | | N | |
| | - axial at standstill (shaft supported) | | 294 | | | N | |
| 23 | Shaft play | | | | | | |
| | - radial | \leq | 0.025 | | | mm | |
| | - axial | \leq | 0.05 to 0.45 | | | mm | |
| 24 | Housing material | | steel, zinc-plating (chrome free) | | | | |
| 25 | Weight | | 40 | | | g | |
| 26 | Direction of rotation | | CW | | | | |
| Recommended values | | | | | | | |
| 27 | Speed up to | $n_{e \text{ max.}}$ | 10,000 | 10,000 | 10,000 | rpm | |
| 28 | Torque up to | $M_{e \text{ max.}}$ | 5.207 | 5.731 | 2.864 | mNm | |
| 29 | Current up to (thermal limits) | $I_{e \text{ max.}}$ | 0.938 | 0.347 | 0.103 | A | |



