

DC-Micromotors

Graphite Commutation

224 mNm
160 W

Series 3890 ... CR

| Values at 22°C and nominal voltage | 3890 H | 018 CR | 024 CR | 036 CR | 048 CR | |
|---|-------------------------|---------------------------------------|--------|--------|--------|---------------------------------|
| 1 Nominal voltage | U_N | 18 | 24 | 36 | 48 | V |
| 2 Terminal resistance | R | 0,21 | 0,36 | 0,78 | 1,38 | Ω |
| 3 Efficiency, max. | η_{max} | 86 | 87 | 87 | 88 | % |
| 4 No-load speed | n_0 | 5 400 | 5 400 | 5 400 | 5 500 | min ⁻¹ |
| 5 No-load current, typ. (with shaft \varnothing 6 mm) | I_0 | 0,323 | 0,242 | 0,161 | 0,121 | A |
| 6 Stall torque | M_H | 2 642 | 2 760 | 2 887 | 2 911 | mNm |
| 7 Friction torque | M_R | 10 | 10 | 10 | 10 | mNm |
| 8 Speed constant | k_n | 300 | 225 | 150 | 112 | min ⁻¹ /V |
| 9 Back-EMF constant | k_E | 3,332 | 4,443 | 6,665 | 8,887 | mV/min ⁻¹ |
| 10 Torque constant | k_M | 31,82 | 42,43 | 63,65 | 84,86 | mNm/A |
| 11 Current constant | k_I | 0,031 | 0,024 | 0,016 | 0,012 | A/mNm |
| 12 Slope of n-M curve | $\Delta n / \Delta M$ | 2 | 1,9 | 1,8 | 1,8 | min ⁻¹ /mNm |
| 13 Rotor inductance | L | 60 | 110 | 240 | 430 | μ H |
| 14 Mechanical time constant | τ_m | 3,4 | 3,3 | 3,3 | 3,3 | ms |
| 15 Rotor inertia | J | 164 | 164 | 171 | 171 | gcm ² |
| 16 Angular acceleration | α_{max} | 161 | 168 | 169 | 170 | $\cdot 10^3$ rad/s ² |
| 17 Thermal resistance | R_{th1} / R_{th2} | 1,9 / 4,2 | | | | K/W |
| 18 Thermal time constant | τ_{w1} / τ_{w2} | 58 / 910 | | | | s |
| 19 Operating temperature range: | | | | | | |
| – motor | | -30 ... +125 | | | | °C |
| – winding, max. permissible | | +155 | | | | °C |
| 20 Shaft bearings | | ball bearings, preloaded | | | | |
| 21 Shaft load max.: | | | | | | |
| – with shaft diameter | | 6 | | | | mm |
| – radial at 3 000 min ⁻¹ (3 mm from bearing) | | 60 | | | | N |
| – axial at 3 000 min ⁻¹ | | 6 | | | | N |
| – axial at standstill | | 50 | | | | N |
| 22 Shaft play: | | | | | | |
| – radial | \leq | 0,015 | | | | mm |
| – axial | $=$ | 0 | | | | mm |
| 23 Housing material | | steel, black coated | | | | |
| 24 Mass | | 550 | | | | g |
| 25 Direction of rotation | | clockwise, viewed from the front face | | | | |
| 26 Speed up to | n_{max} | 6 000 | | | | min ⁻¹ |
| 27 Number of pole pairs | | 1 | | | | |
| 28 Magnet material | | NdFeB | | | | |

Rated values for continuous operation

| | | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------------------|
| 29 Rated torque | M_N | 139 | 182 | 222 | 224 | mNm |
| 30 Rated current (thermal limit) | I_N | 5 | 5 | 4,3 | 3,2 | A |
| 31 Rated speed | n_N | 5 190 | 5 240 | 5 350 | 5 360 | 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 25%.

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.



