

DC-Micromotors

Precious Metal Commutation

4,5 mNm
6 W

Series 1724 ... SR

| Values at 22°C and nominal voltage | 1724 T | 003 SR | 006 SR | 012 SR | 018 SR | 024 SR | |
|---|-------------------------|---|--------|---|--------|--------|---------------------------------|
| 1 Nominal voltage | U_N | 3 | 6 | 12 | 18 | 24 | V |
| 2 Terminal resistance | R | 0,78 | 3,41 | 16,2 | 32,1 | 54,6 | Ω |
| 3 Output power | $P_{2nom.}$ | 2,83 | 2,58 | 2,17 | 2,47 | 2,58 | W |
| 4 Efficiency, max. | $\eta_{max.}$ | 82 | 81 | 80 | 81 | 81 | % |
| 5 No-load speed | n_0 | 8 200 | 8 600 | 7 900 | 8 400 | 8 600 | min ⁻¹ |
| 6 No-load current, typ. (with shaft \varnothing 1,5 mm) | I_0 | 0,038 | 0,02 | 0,009 | 0,006 | 0,005 | A |
| 7 Stall torque | M_H | 13,2 | 11,5 | 10,5 | 11,2 | 11,5 | mNm |
| 8 Friction torque | M_R | 0,13 | 0,13 | 0,13 | 0,12 | 0,13 | mNm |
| 9 Speed constant | k_n | 2 760 | 1 450 | 666 | 472 | 362 | min ⁻¹ /V |
| 10 Back-EMF constant | k_E | 0,362 | 0,69 | 1,5 | 2,12 | 2,76 | mV/min ⁻¹ |
| 11 Torque constant | k_M | 3,46 | 6,59 | 14,3 | 20,2 | 26,3 | mNm/A |
| 12 Current constant | k_I | 0,289 | 0,152 | 0,07 | 0,049 | 0,038 | A/mNm |
| 13 Slope of n-M curve | $\Delta n / \Delta M$ | 621 | 748 | 752 | 750 | 748 | min ⁻¹ /mNm |
| 14 Rotor inductance | L | 21 | 75 | 360 | 710 | 1 200 | μ H |
| 15 Mechanical time constant | τ_m | 8 | 8 | 8 | 8 | 8 | ms |
| 16 Rotor inertia | J | 1,2 | 1 | 1 | 1 | 1 | gcm ² |
| 17 Angular acceleration | $\alpha_{max.}$ | 110 | 110 | 100 | 100 | 100 | $\cdot 10^3$ rad/s ² |
| 18 Thermal resistance | R_{th1} / R_{th2} | 4 / 24,5 | | | | | K/W |
| 19 Thermal time constant | τ_{w1} / τ_{w2} | 2,6 / 270 | | | | | s |
| 20 Operating temperature range: | | | | | | | |
| – motor | | -30 ... +85 (optional version -55 ... +125) | | | | | °C |
| – winding, max. permissible | | +125 | | | | | °C |
| 21 Shaft bearings | | sintered bearings (standard) | | ball bearings, preloaded (optional version) | | | |
| 22 Shaft load max.: | | | | | | | |
| – with shaft diameter | | 1,5 | | 1,5 | | | mm |
| – radial at 3 000 min ⁻¹ (3 mm from bearing) | | 1,2 | | 5 | | | N |
| – axial at 3 000 min ⁻¹ | | 0,2 | | 0,5 | | | N |
| – axial at standstill | | 20 | | 10 | | | N |
| 23 Shaft play: | | | | | | | |
| – radial | \leq | 0,03 | | 0,015 | | | mm |
| – axial | \leq | 0,2 | | 0 | | | mm |
| 24 Housing material | | steel, black coated | | | | | |
| 25 Mass | | 27 | | | | | g |
| 26 Direction of rotation | | clockwise, viewed from the front face | | | | | |
| 27 Speed up to | $n_{max.}$ | 10 000 | | | | | min ⁻¹ |
| 28 Number of pole pairs | | 1 | | | | | |
| 29 Magnet material | | NdFeB | | | | | |
| Rated values for continuous operation | | | | | | | |
| 30 Rated torque | M_N | 2,3 | 4,2 | 4,5 | 4,5 | 4,5 | mNm |
| 31 Rated current (thermal limit) | I_N | 0,7 | 0,7 | 0,35 | 0,25 | 0,19 | A |
| 32 Rated speed | n_N | 6 790 | 4 720 | 3 430 | 3 990 | 4 220 | 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.



