

DC-Micromotors

Precious Metal Commutation

2,8 mNm

For combination with

Gearheads:

15/10, 15/5, 15/5 S, 15/8, 15A, 16/7, 16A

Encoders:

IE2-1024, IE2-16, IEH2-4096

Series 1524 ... SR

| Values at 22°C and nominal voltage | 1524 T | 003 SR | 006 SR | 009 SR | 012 SR | 018 SR | 024 SR | |
|---|-------------------------|---|--------|----------------------------------|--------|---|--------|------------------------------|
| 1 Nominal voltage | U_N | 3 | 6 | 9 | 12 | 18 | 24 | V |
| 2 Terminal resistance | R | 1,1 | 5,1 | 10,4 | 19,8 | 44 | 79,6 | Ω |
| 3 Output power | $P_{2nom.}$ | 1,92 | 1,7 | 1,88 | 1,75 | 1,78 | 1,75 | W |
| 4 Efficiency, max. | $\eta_{max.}$ | 77 | 77 | 77 | 76 | 77 | 78 | % |
| 5 No-load speed | n_0 | 10 800 | 9 700 | 10 100 | 9 900 | 9 900 | 9 900 | rpm |
| 6 No-load current, typ. (with shaft \varnothing 1,5 mm) | I_0 | 0,047 | 0,021 | 0,014 | 0,011 | 0,007 | 0,005 | A |
| 7 Stall torque | M_H | 6,8 | 6,68 | 7,12 | 6,76 | 6,86 | 6,75 | mNm |
| 8 Friction torque | M_R | 0,12 | 0,12 | 0,12 | 0,13 | 0,12 | 0,11 | mNm |
| 9 Speed constant | k_n | 3 660 | 1 650 | 1 140 | 840 | 560 | 419 | rpm/V |
| 10 Back-EMF constant | k_E | 0,273 | 0,607 | 0,877 | 1,19 | 1,79 | 2,38 | mV/rpm |
| 11 Torque constant | k_M | 2,61 | 5,8 | 8,37 | 11,4 | 17,1 | 22,8 | mNm/A |
| 12 Current constant | k_I | 0,384 | 0,172 | 0,119 | 0,088 | 0,059 | 0,044 | A/mNm |
| 13 Slope of n-M curve | $\Delta n / \Delta M$ | 1 590 | 1 450 | 1 420 | 1 460 | 1 440 | 1 470 | rpm/mNm |
| 14 Rotor inductance | L | 17 | 70 | 150 | 250 | 560 | 1 000 | μH |
| 15 Mechanical time constant | τ_m | 10 | 10 | 10 | 10 | 10 | 10 | ms |
| 16 Rotor inertia | J | 0,6 | 0,66 | 0,67 | 0,65 | 0,66 | 0,65 | gcm ² |
| 17 Angular acceleration | $\alpha_{max.}$ | 110 | 100 | 110 | 100 | 100 | 100 | $\cdot 10^3 \text{ rad/s}^2$ |
| 18 Thermal resistance | R_{th1} / R_{th2} | 4,5 / 31 | | | | | | K/W |
| 19 Thermal time constant | τ_{w1} / τ_{w2} | 2,4 / 300 | | | | | | 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 (optional version) | | ball bearings, preloaded (optional version) | | |
| 22 Shaft load max.: | | | | | | | | |
| – with shaft diameter | | 1,5 | | 1,5 | | 1,5 | | mm |
| – radial at 3 000 rpm (3 mm from bearing) | | 1,2 | | 5 | | 5 | | N |
| – axial at 3 000 rpm | | 0,2 | | 0,5 | | 0,5 | | N |
| – axial at standstill | | 20 | | 10 | | 10 | | N |
| 23 Shaft play | | | | | | | | |
| – radial | \leq | 0,03 | | 0,015 | | 0,015 | | mm |
| – axial | \leq | 0,2 | | 0,2 | | 0 | | mm |
| 24 Housing material | | steel, black coated | | | | | | |
| 25 Mass | | 21 | | | | | | g |
| 26 Direction of rotation | | clockwise, viewed from the front face | | | | | | |
| 27 Speed up to | $n_{max.}$ | 13 000 | | | | | | rpm |
| 28 Number of pole pairs | | 1 | | | | | | |
| 29 Magnet material | | NdFeB | | | | | | |
| Rated values for continuous operation | | | | | | | | |
| 30 Rated torque | M_N | 1,7 | 2,8 | 2,8 | 2,8 | 2,8 | 2,8 | mNm |
| 31 Rated current (thermal limit) | I_N | 0,7 | 0,55 | 0,38 | 0,28 | 0,19 | 0,14 | A |
| 32 Rated speed | n_N | 8 100 | 4 300 | 4 800 | 4 510 | 4 510 | 4 450 | rpm |

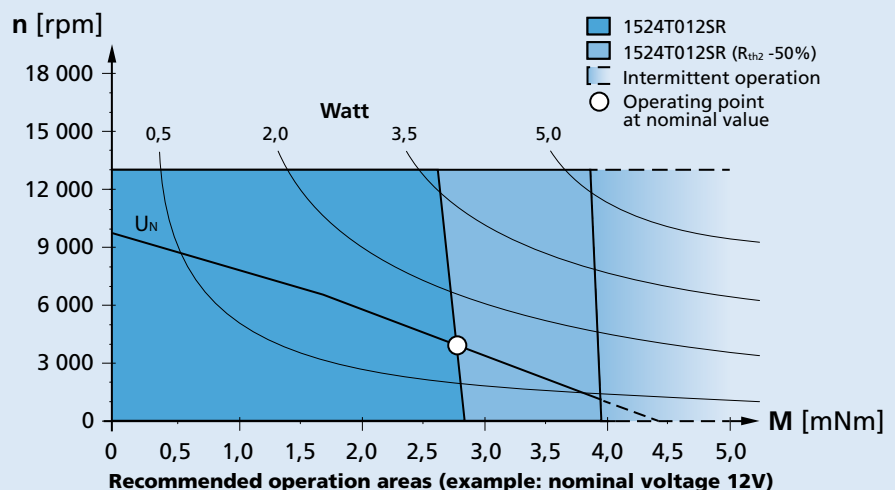
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

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).

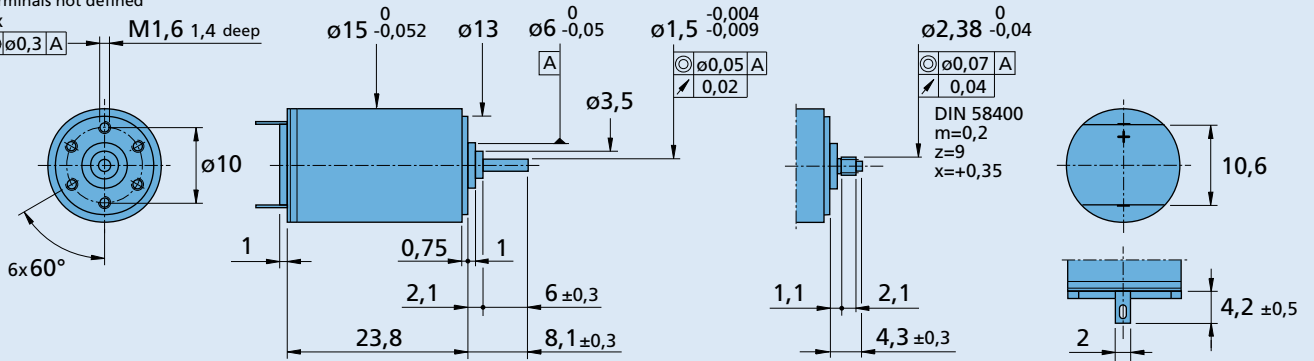
The nominal voltage (U_N) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.



Dimensional drawing

Orientation with respect to motor terminals not defined

6x $\oplus \varnothing 0,3$ A M1,6 1,4 deep



1524 T ... SR

1524 E ... SR