

DC-Micromotors

Precious Metal Commutation

1,7 mNm
3,4 W

Series 1224 ... SR

| Values at 22°C and nominal voltage | 1224 N | 006 SR | 012 SR | 015 SR | |
|---|-------------------------|---------------------------------------|---------------|--------|---------------------------------|
| 1 Nominal voltage | U_N | 6 | 12 | 15 | V |
| 2 Terminal resistance | R | 4,6 | 18,2 | 29,4 | Ω |
| 3 Efficiency, max. | η_{max} | 82 | 83 | 83 | % |
| 4 No-load speed | n_0 | 13 800 | 13 700 | 13 400 | min ⁻¹ |
| 5 No-load current, typ. (with shaft \varnothing 1 mm) | I_0 | 0,011 | 0,005 | 0,004 | A |
| 6 Stall torque | M_H | 5,31 | 5,43 | 5,36 | mNm |
| 7 Friction torque | M_R | 0,05 | 0,05 | 0,05 | mNm |
| 8 Speed constant | k_n | 2 323 | 1 151 | 901 | min ⁻¹ /V |
| 9 Back-EMF constant | k_E | 0,43 | 0,869 | 1,11 | mV/min ⁻¹ |
| 10 Torque constant | k_M | 4,11 | 8,3 | 10,6 | mNm/A |
| 11 Current constant | k_I | 0,243 | 0,12 | 0,094 | A/mNm |
| 12 Slope of n-M curve | $\Delta n / \Delta M$ | 2 600 | 2 523 | 2 499 | min ⁻¹ /mNm |
| 13 Rotor inductance | L | 55 | 220 | 350 | μ H |
| 14 Mechanical time constant | τ_m | 5 | 5 | 5 | ms |
| 15 Rotor inertia | J | 0,18 | 0,18 | 0,18 | gcm ² |
| 16 Angular acceleration | α_{max} | 295 | 302 | 298 | $\cdot 10^3$ rad/s ² |
| 17 Thermal resistance | R_{th1} / R_{th2} | 17 / 37 | | | K/W |
| 18 Thermal time constant | τ_{w1} / τ_{w2} | 6,5 / 371 | | | s |
| 19 Operating temperature range: | | | | | |
| – motor | | -30 ... +85 (optional version | -30 ... +125) | | °C |
| – winding, max. permissible | | +85 (optional version | +125) | | °C |
| 20 Shaft bearings | | sintered bearings | | | |
| 21 Shaft load max.: | | | | | |
| – with shaft diameter | | 1 | | | mm |
| – radial at 3 000 min ⁻¹ (1,5 mm from bearing) | | 0,5 | | | N |
| – axial at 3 000 min ⁻¹ | | 0,1 | | | N |
| – axial at standstill | | 20 | | | N |
| 22 Shaft play: | | | | | |
| – radial | \leq | 0,03 | | | mm |
| – axial | \leq | 0,2 | | | mm |
| 23 Housing material | | steel, black coated | | | |
| 24 Mass | | 13,5 | | | g |
| 25 Direction of rotation | | clockwise, viewed from the front face | | | |
| 26 Speed up to | n_{max} | 16 000 | | | min ⁻¹ |
| 27 Number of pole pairs | | 1 | | | |
| 28 Magnet material | | NdFeB | | | |
| Rated values for continuous operation | | | | | |
| 29 Rated torque | M_N | 1,5 | 1,7 | 1,7 | mNm |
| 30 Rated current (thermal limit) | I_N | 0,4 | 0,22 | 0,18 | A |
| 31 Rated speed | n_N | 9 680 | 8 580 | 8 270 | min ⁻¹ |

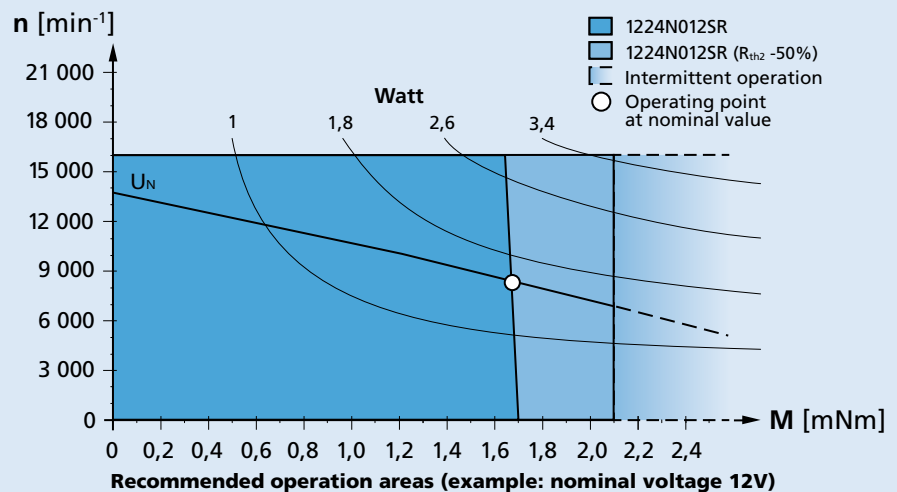
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

Note:

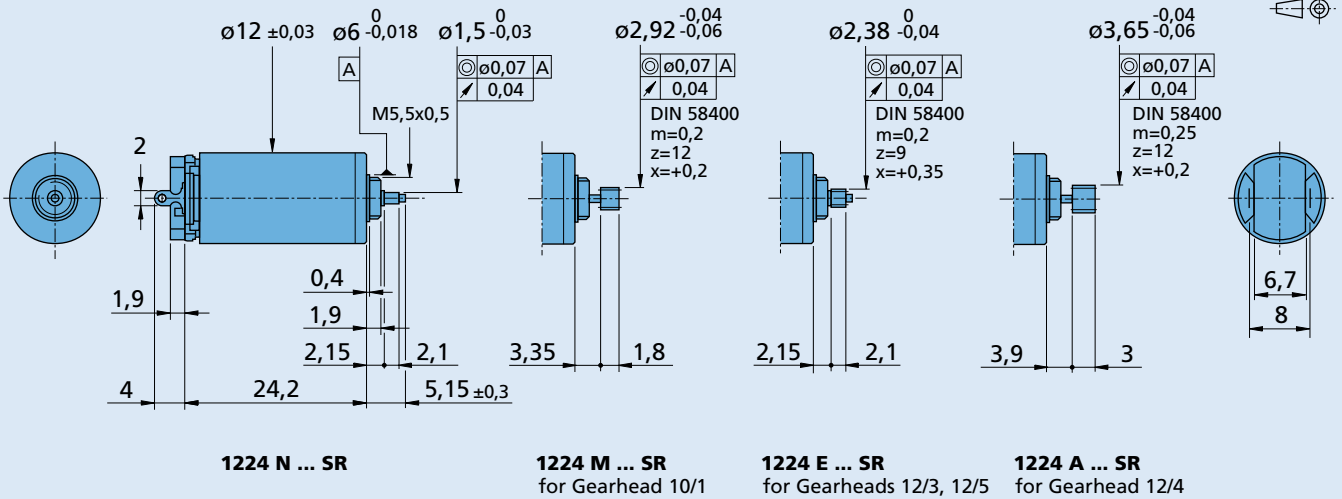
The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

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.



Dimensional drawing



Options

Example product designation: **1224N012SR-K179**

| Option | Type | Description |
|--------|---------------------|--|
| K179 | Bearing lubrication | For vacuum of 10^{-5} Pa @ 22°C |
| K188 | Temperature range | Extended temperature range (-30...+125°C) |
| K380 | Second shaft end | Ø 1 mm x 3 mm |
| K1707 | Encoder combination | Motor with rear end shaft for combination with Encoder HEM3 |
| K1752 | Encoder combination | Motor with rear end shaft for combination with Encoder PA2-100 |
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Product combination

| Precision Gearheads / Lead Screws | Encoders | Drive Electronics | Cables / Accessories |
|-----------------------------------|-----------------------|--|--|
| 10/1 12/3 12/4 12/5 | PA2-100 HEM3-256 W | SC 1801 P SC 1801 S MCDC 3002 P MCDC 3002 S | To view our large range of accessory parts, please refer to the "Accessories" chapter. |