# DC-Micromotors

Graphite Commutation

51 mNm

45 W

## Series 2657 ... CR

| Values at 22°C and nominal voltage | | 2657 W | | 012 CR | 018 CR | 024 CR | 036 CR | 048 CR | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Nominal voltage | $U_N$ | | 12 | 18 | 24 | 36 | 48 | V |
| 2 | Terminal resistance | $R$ | | 0,71 | 1,7 | 2,84 | 6,78 | 12,5 | Ω |
| 3 | Efficiency, max. | $\eta_{max.}$ | | 84 | 81 | 85 | 82 | 84 | % |
| 4 | No-load speed | $n_0$ | | 6 300 | 6 300 | 6 400 | 6 480 | 6 400 | min⁻¹ |
| 5 | No-load current, typ. (with shaft ø 4 mm) | $I_0$ | | 0,115 | 0,077 | 0,058 | 0,039 | 0,028 | A |
| 6 | Stall torque | $M_H$ | | 278 | 269 | 286 | 273 | 265 | mNm |
| 7 | Friction torque | $M_R$ | | 2 | 2 | 2 | 2 | 2 | mNm |
| 8 | Speed constant | $k_n$ | | 552 | 363 | 274 | 182 | 136 | min⁻¹/V |
| 9 | Back-EMF constant | $k_E$ | | 1,81 | 2,75 | 3,65 | 5,51 | 7,37 | mV/min⁻¹ |
| 10 | Torque constant | $k_M$ | | 17,3 | 26,3 | 34,8 | 52,6 | 70,4 | mNm/A |
| 11 | Current constant | $k_I$ | | 0,058 | 0,038 | 0,029 | 0,019 | 0,014 | A/mNm |
| 12 | Slope of n-M curve | $\Delta n/\Delta M$ | | 22,7 | 23,5 | 22,4 | 23,4 | 24,2 | min⁻¹/mNm |
| 13 | Rotor inductance | $L$ | | 95 | 210 | 380 | 850 | 1 550 | µH |
| 14 | Mechanical time constant | $\tau_m$ | | 3,9 | 3,9 | 3,9 | 3,9 | 3,9 | ms |
| 15 | Rotor inertia | $J$ | | 16 | 16 | 17 | 16 | 15 | gcm² |
| 16 | Angular acceleration | $\alpha_{max.}$ | | 170 | 170 | 170 | 170 | 170 | ·10³rad/s² |
| 17 | Thermal resistance | $R_{th1}$ / $R_{th2}$ | | 1,9 / 9 | | | | | K/W |
| 18 | Thermal time constant | $\tau_{w1}$ / $\tau_{w2}$ | | 10 / 580 | | | | | 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 | | | 4 | | | | | mm |
| | – radial at 3 000 min⁻¹ (3 mm from bearing) | | | 20 | | | | | N |
| | – axial at 3 000 min⁻¹ | | | 2 | | | | | N |
| | – axial at standstill | | | 20 | | | | | N |
| 22 | Shaft play: | | | | | | | | |
| | – radial | ≤ | | 0,015 | | | | | mm |
| | – axial | = | | 0 | | | | | mm |
| 23 | Housing material | | | steel, black coated | | | | | |
| 24 | Mass | | | 156 | | | | | g |
| 25 | Direction of rotation | | | clockwise, viewed from the front face | | | | | |
| 26 | Speed up to | $n_{max.}$ | | 7 000 | | | | | min⁻¹ |
| 27 | Number of pole pairs | | | 1 | | | | | |
| 28 | Magnet material | | | NdFeB | | | | | |
| **Rated values for continuous operation** | | | | | | | | | |
| 29 | Rated torque | $M_N$ | | 45 | 49 | 51 | 50 | 50 | mNm |
| 30 | Rated current (thermal limit) | $I_N$ | | 3 | 2,3 | 1,8 | 1,2 | 0,86 | A |
| 31 | Rated speed | $n_N$ | | 5 250 | 4 960 | 5 060 | 5 020 | 4 920 | min⁻¹ |

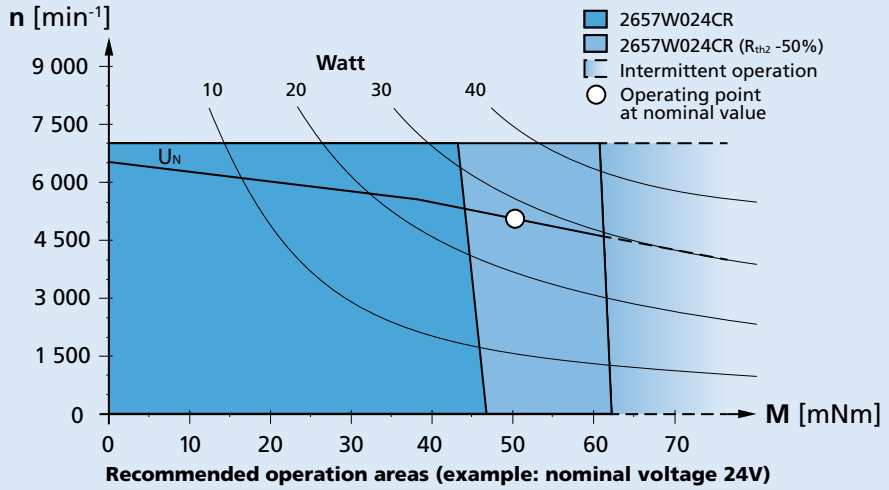
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The $R_{th2}$ value has been reduced by 25%.

**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.




**Recommended operation areas (example: nominal voltage 24V)**

For notes on technical data and lifetime performance refer to "Technical Information".

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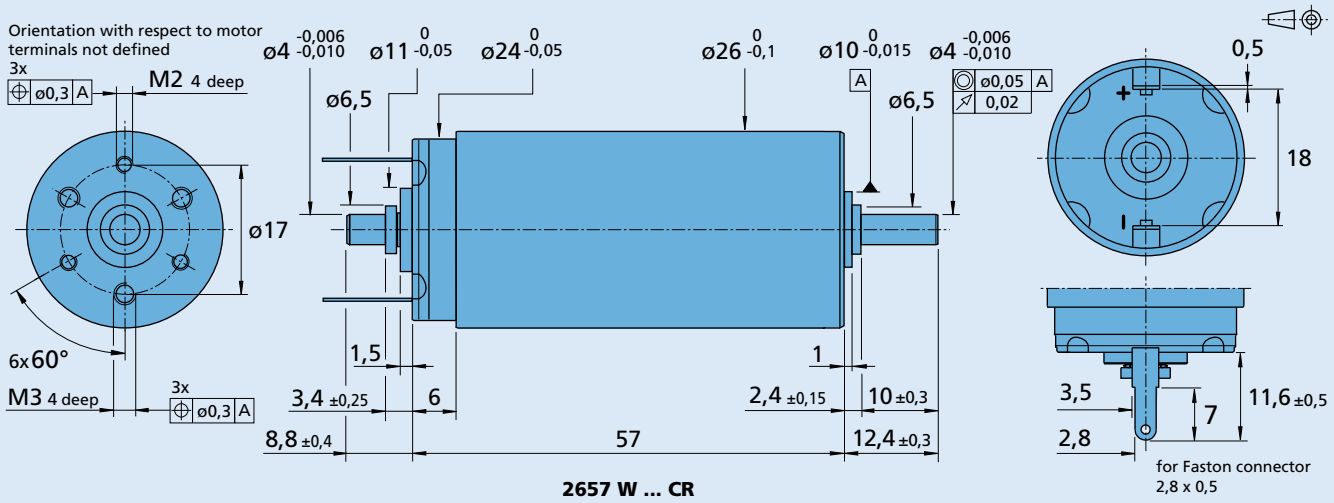
## Dimensional drawing




**2657 W ... CR**

## Options

Example product designation: **2657W012CR-158**

| Option | Type | Description |
|---|---|---|
| U | Single Leads | For motors with single leads (PTFE), length 160 mm, red (+) / black (-) |
| 158 | Shaft end | No second shaft end |

## Product combination

| Precision Gearheads / Lead Screws | Encoders | Drive Electronics | Cables / Accessories |
|---|---|---|---|
| 26A | IE3-1024 | SC 2402 | MBZ |
| 26/1 | IE3-1024 L | SC 2804 | |
| 26/1 S | IERS3-500 | SC 5004 | To view our large range of accessory parts, please refer to the “Accessories” chapter. |
| 30/1 | IERS3-500 L | SC 5008 | |
| 30/1 S | IER3-10000 | MC 5004 | |
| 32A | IER3-10000 L | MC 5005 | |
| 32ALN | | MCDC 3003 | |
| BS22-1.5 | | MCDC 3006 | |