

Brushless DC-Gearmotors

4 Pole Technology

30 mNm

Series 1515 ... B

| Values at 22°C and nominal voltage | | 1515 U | 006 B | 012 B | |
|------------------------------------|----------------------------------|-------------------------|----------------------|----------------------|------------------------------------|
| 1 | Nominal voltage | U_N | 6 | 12 | V |
| 2 | Terminal resistance, phase-phase | R | 22 | 92,7 | Ω |
| 3 | Efficiency, max. | $\eta_{max.}$ | 54 | 53 | % |
| 4 | No-load speed | n_o | 15 000 | 14 900 | min^{-1} |
| 5 | No-load current, typ. | I_o | 0,019 | 0,009 | A |
| 6 | Stall torque | M_H | 0,953 | 0,904 | mNm |
| 7 | Friction torque, static | C_o | 0,019 | 0,019 | mNm |
| 8 | Friction torque, dynamic | C_v | $3,42 \cdot 10^{-6}$ | $3,42 \cdot 10^{-6}$ | $\text{mNm}/\text{min}^{-1}$ |
| 9 | Speed constant | k_n | 2 682 | 1 339 | min^{-1}/V |
| 10 | Back-EMF constant | k_E | 0,373 | 0,747 | $\text{mV}/\text{min}^{-1}$ |
| 11 | Torque constant | k_M | 3,56 | 7,13 | mNm/A |
| 12 | Current constant | k_I | 0,281 | 0,14 | A/mNm |
| 13 | Slope of n-M curve | $\Delta n/\Delta M$ | 16 577 | 17 423 | $\text{min}^{-1}/\text{mNm}$ |
| 14 | Terminal inductance, phase-phase | L | 570 | 2 282 | μH |
| 15 | Mechanical time constant | τ_m | 120 | 126 | ms |
| 16 | Rotor inertia | J | 0,69 | 0,69 | gcm^2 |
| 17 | Angular acceleration | $\alpha_{max.}$ | 14 | 13 | $\cdot 10^3 \text{rad}/\text{s}^2$ |
| 18 | Thermal resistance | R_{th1} / R_{th2} | 65 / 45 | | K/W |
| 19 | Thermal time constant | τ_{w1} / τ_{w2} | 12 / 130 | | s |

Integrated Gearhead

| | | | |
|------------------------------------|---|-------------------------|----|
| Housing material | | plastic | |
| Geartrain material | | metal | |
| Backlash, at no-load | ≤ | 4 | ° |
| Bearings on output shaft | | plastic / brass bearing | |
| Shaft load max.: | | | |
| – radial (5 mm from mounting face) | ≤ | 1,4 | N |
| – axial | ≤ | 0,3 | N |
| Shaft press fit force, max. | ≤ | 5 | N |
| Shaft play: | | | |
| – radial (5 mm from mounting face) | ≤ | 0,08 | mm |
| – axial | ≤ | 0,25 | mm |
| Operating temperature range | | – 25 ... + 80 | °C |

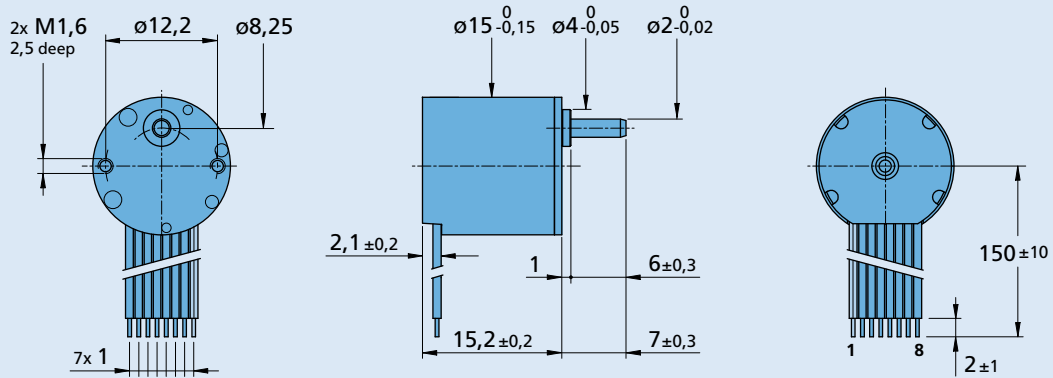
Specifications

| reduction ratio (rounded) | output speed up to n_{max} min^{-1} | weight with motor g | output torque | | direction of rotation (reversible) | efficiency % |
|------------------------------|---|------------------------------|---|---|--|-----------------|
| | | | continuous operation M_{max} mNm | intermittent operation M_{max} mNm | | |
| 6 : 1 | 779 | 6,9 | 1,4 | 3 | = | 81 |
| 13 : 1 | 372 | 7,0 | 2,8 | 5 | ≠ | 73 |
| 39 : 1 | 129 | 7,2 | 7,0 | 10 | = | 60 |
| 112 : 1 | 45 | 7,4 | 19,8 | 30 | ≠ | 59 |
| 324 : 1 | 15 | 7,7 | 30,0 | 50 | = | 53 |

Note: output speed at 5000 min^{-1} input speed. Based on motor 1509 ... B.

Dimensional drawing

Scale enlarged 



1515 U ... B

Option, cable and connection information

Example product designation: **1515U006B-4082**

| Option | Type | Description | Connection | |
|--------|-------------------|--|--------------------------|-----------------------|
| 4082 | Temperature range | Extended temperature range (-40...+85°C) | No. | Function |
| | | | 1 | Phase C |
| | | | 2 | Phase B |
| | | | 3 | Phase A |
| | | | 4 | GND |
| | | | 5 | U _{DD} (+5V) |
| | | | 6 | Hall sensor C |
| | | | 7 | Hall sensor B |
| | | | 8 | Hall sensor A |
| | | | Standard cable | |
| | | | Insulation: PVC | |
| | | | 8 conductors, AWG 28 | |
| | | | pitch 1 mm, wires tinned | |

Product Combination

| Precision Gearheads / Lead Screws | Encoders | Drive Electronics | Cables / Accessories |
|-----------------------------------|----------|------------------------|--|
| | | SC 1801 P SC 1801 S | To view our large range of accessory parts, please refer to the "Accessories" chapter. |