FAULHABER

66 mNm
126 W




# Brushless DC-Servomotors

2 Pole Technology

## Series 3564 ... B

| Values at 22°C and nominal voltage | 3564 K | | 012 B | 024 B | 036 B | 048 B | |
|---|---|---|---|---|---|---|---|
| Nominal voltage | $U_N$ | | 12 | 24 | 36 | 48 | V |
| Terminal resistance, phase-phase | $R$ | | 0,56 | 1,1 | 2,61 | 4,1 | Ω |
| Efficiency, max. | $\eta_{max.}$ | | 82 | 83 | 83 | 83 | % |
| No-load speed | $n_0$ | | 8 300 | 11 500 | 11 600 | 12 800 | $min^{-1}$ |
| No-load current, typ. (with shaft ø 4 mm) | $I_0$ | | 0,198 | 0,166 | 0,112 | 0,099 | A |
| Stall torque | $M_H$ | | 293 | 432 | 408 | 418 | mNm |
| Friction torque, static | $C_0$ | | 1,2 | 1,2 | 1,2 | 1,2 | mNm |
| Friction torque, dynamic | $C_V$ | | $1{,}8 \cdot 10^{-4}$ | $1{,}8 \cdot 10^{-4}$ | $1{,}8 \cdot 10^{-4}$ | $1{,}8 \cdot 10^{-4}$ | $mNm/min^{-1}$ |
| Speed constant | $k_n$ | | 696 | 481 | 323 | 266 | $min^{-1}/V$ |
| Back-EMF constant | $k_E$ | | 1,44 | 2,08 | 3,1 | 3,75 | $mV/min^{-1}$ |
| Torque constant | $k_M$ | | 13,7 | 19,9 | 29,6 | 35,8 | mNm/A |
| Current constant | $k_I$ | | 0,073 | 0,05 | 0,034 | 0,028 | A/mNm |
| Slope of n-M curve | $\Delta n/\Delta M$ | | 28 | 27 | 28 | 31 | $min^{-1}/mNm$ |
| Terminal inductance, phase-phase | $L$ | | 90 | 190 | 410 | 640 | µH |
| Mechanical time constant | $\tau_m$ | | 10,4 | 9,7 | 10,4 | 11,1 | ms |
| Rotor inertia | $J$ | | 34,9 | 34,9 | 34,9 | 34,9 | $gcm^2$ |
| Angular acceleration | $\alpha_{max.}$ | | 84 | 124 | 117 | 120 | $\cdot 10^3 rad/s^2$ |
| | | | | | | | |
| Thermal resistance | $R_{th1}$ / $R_{th2}$ | 1,6 / 6,2 | | | | | K/W |
| Thermal time constant | $\tau_{w1}$ / $\tau_{w2}$ | 15,4 / 820 | | | | | s |
| Operating temperature range: | | | | | | | |
| – motor | | -30 ... +125 | | | | | °C |
| – winding, max. permissible | | +125 | | | | | °C |
| Shaft bearings | | ball bearings, preloaded | | | | | |
| Shaft load max.: | | | | | | | |
| – with shaft diameter | | 4 | | | | | mm |
| – radial at 3 000 $min^{-1}$ (5 mm from mounting flange) | | 112 | | | | | N |
| – axial at 3 000 $min^{-1}$ (push only) | | 50 | | | | | N |
| – axial at standstill (push only) | | 131 | | | | | N |
| Shaft play: | | | | | | | |
| – radial | ≤ | 0,015 | | | | | mm |
| – axial | = | 0 | | | | | mm |
| Housing material | | aluminium, black anodized | | | | | |
| Mass | | 311 | | | | | g |
| Direction of rotation | | electronically reversible | | | | | |
| Speed up to | $n_{max.}$ | 29 000 | | | | | $min^{-1}$ |
| Number of pole pairs | | 1 | | | | | |
| Hall sensors | | digital | | | | | |
| Magnet material | | SmCo | | | | | |
| | | | | | | | |
| **Rated values for continuous operation** | | | | | | | |
| Rated torque | $M_N$ | | 56,2 | 55,3 | 53,5 | 50,4 | mNm |
| Rated current (thermal limit) | $I_N$ | | 4,43 | 3,04 | 1,98 | 1,55 | A |
| Rated speed | $n_N$ | | 6 160 | 9 620 | 9 640 | 10 800 | $min^{-1}$ |

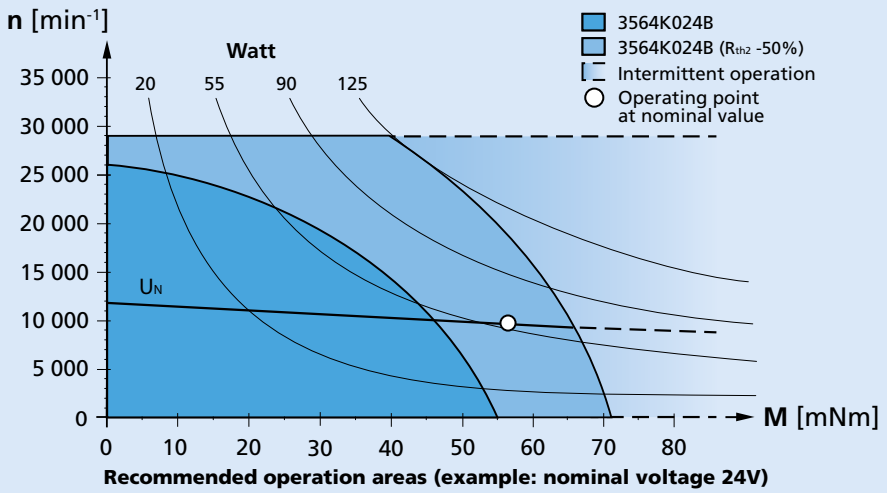
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The $R_{th2}$ value has been reduced by 25%.

**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.



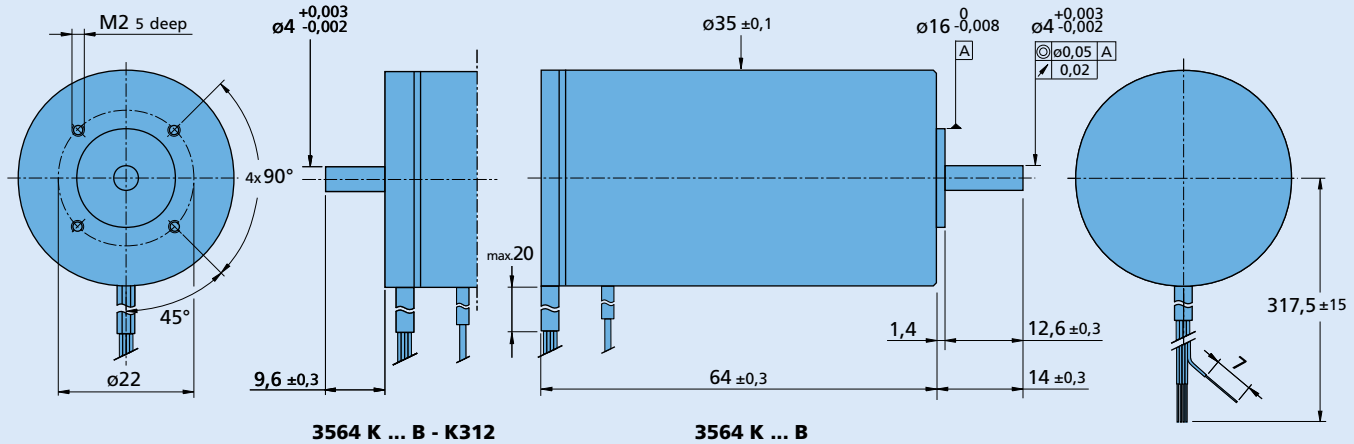

**Recommended operation areas (example: nominal voltage 24V)**

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

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## Dimensional drawing

Scale reduced




## Option, cable and connection information

Example product designation: **3564K012B-K1155**

| Option | Type | Description |
|---|---|---|
| K1155 | Controller combination | Analog Hall sensors for combination with Speed Controller SC or Motion Controller MC |
| K1026 | Sensorless | Motor without Hall sensors |
| K1838 | Encoder combination | Motor with rear end shaft for combination with Encoder IE3 |
| K312 | Encoder combination | Motor with rear end shaft for combination with Encoder HEDS/HEDL/HEDM |
| K3051 | Encoder combination | Motor with rear end shaft for combination with Encoder AES/AEMT |
| K179 | Bearing lubrication | For vacuum of $10^{-5}$ Pa @ 22°C |

### Connection

| Function | Colour |
|---|---|
| Phase C | yellow |
| Phase B | orange |
| Phase A | brown |
| GND | black |
| $U_{DD}$ (+5V) | red |
| Hall sensor C | grey |
| Hall sensor B | blue |
| Hall sensor A | green |

### Standard cable

Single wires, material PTFE
AWG 20: Phase A/B/C
AWG 26: Hall A/B/C, $U_{DD}$, GND

## Product combination

| Precision Gearheads / Lead Screws | Encoders | Drive Electronics | Cables / Accessories |
|---|---|---|---|
| 30/1 | HEDS 5500 | SC 2804 S | MBZ |
| 30/1 S | IE3-1024 | SC 5004 P | |
| 32GPT | IE3-1024 L | SC 5008 S | To view our large range of accessory parts, please refer to the “Accessories” chapter. |
| 32GPT LN | HEDL 5540 | MC 3603 S | |
| 32GPT HT | AES-4096 L | MC 3606 B | |
| 32/3R | AEMT-12/16 L | MC 5005 S | |
| 38/1 | | MC 5010 S | |
| 38/1 S | | | |
| 38/2 | | | |
| 38/2 S | | | |
| 42GPT | | | |
| 32L ... TL | | | |
| 32L ... ML | | | |
| 32L ... SB | | | |
| 32L ... PB | | | |


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