

# Brushless DC-Gearmotors

5 mNm

For combination with  
Drive Electronics:  
Speed controller with adapter board

## Series 1307 ... BH

| Integrated Motor                 |                       | 1307 C | 004 BH  | 006 BH  |                  |
|----------------------------------|-----------------------|--------|---------|---------|------------------|
| Nominal voltage                  | $U_N$                 |        | 4       | 6       | V                |
| Terminal resistance, phase-phase | R                     |        | 16      | 70      | $\Omega$         |
| Output power <sup>1)</sup>       | $P_{2 \max.}$         |        | 0,206   | 0,157   | W                |
| Efficiency                       | $\eta_{\max.}$        |        | 52      | 43      | %                |
| No-load speed                    | $n_0$                 |        | 37 630  | 34 770  | rpm              |
| No-load current                  | $I_0$                 |        | 0,026   | 0,015   | A                |
| Stall torque                     | $M_H$                 |        | 0,249   | 0,136   | mNm              |
| Speed constant                   | $k_n$                 |        | 9 502   | 5 902   | rpm/V            |
| Back-EMF constant                | $k_E$                 |        | 0,105   | 0,169   | mV/rpm           |
| Torque constant                  | $k_M$                 |        | 1,005   | 1,618   | mNm/A            |
| Current constant                 | $k_I$                 |        | 0,995   | 0,618   | A/mNm            |
| Slope of n-M curve               | $\Delta n / \Delta M$ |        | 151 272 | 255 336 | rpm/mNm          |
| Rotor inertia                    | J                     |        | 0,16    | 0,16    | gcm <sup>2</sup> |

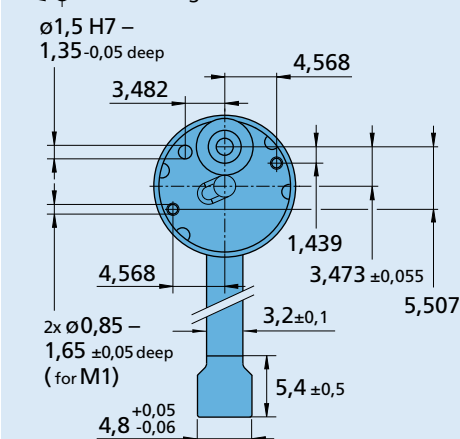
| Drive system                                 |        |                                             |  |    |
|----------------------------------------------|--------|---------------------------------------------|--|----|
| Housing material / Geartrain material        |        | plastic / metal                             |  |    |
| Shaft bearing                                |        | combination ball bearings + sleeve bearings |  |    |
| Shaft load max.:                             |        |                                             |  |    |
| – radial at 10 000 rpm (1,5 mm from bearing) | $\leq$ | 0,5                                         |  | N  |
| – axial at 10 000 rpm                        | $\leq$ | 0,1                                         |  | N  |
| – axial at standstill                        | $\leq$ | 5                                           |  | N  |
| Shaft play:                                  |        |                                             |  |    |
| – radial (3 mm from bearing face)            | $\leq$ | 0,12                                        |  | mm |
| – axial                                      | $\leq$ | 0,2                                         |  | mm |
| Operating temperature range                  |        | 0 ... + 85                                  |  | °C |

| Recommended values - mathematically independent of each other |              |  |        |                   |
|---------------------------------------------------------------|--------------|--|--------|-------------------|
| Speed up to                                                   | $n_{e \max}$ |  | 10 000 | 10 000            |
| Current up to (thermal limits) <sup>2) 3)</sup>               | $I_{e \max}$ |  | 0,205  | 0,098             |
|                                                               |              |  |        | min <sup>-1</sup> |
|                                                               |              |  |        | A                 |

<sup>1)</sup> at 10 000 min<sup>-1</sup> <sup>2)</sup> thermal resistance  $R_{th2}$  not reduced <sup>3)</sup> at standstill

| Integrated Gearhead       |                                   | 004 BH              |                                              | 006 BH                                         |                                              | direction of rotation (reversible)             | efficiency |
|---------------------------|-----------------------------------|---------------------|----------------------------------------------|------------------------------------------------|----------------------------------------------|------------------------------------------------|------------|
| reduction ratio (rounded) | output speed up to $n_{\max}$ rpm | weight with motor g | output torque continuous operation Mmax. mNm | output torque intermittent operation Mmax. mNm | output torque continuous operation Mmax. mNm | output torque intermittent operation Mmax. mNm |            |
| 6 : 1                     | 1 639                             | 2,1                 | 1,0                                          | 1,9                                            | 0,8                                          | 1,5                                            | = 88       |
| 11 : 1                    | 893                               | 2,2                 | 1,6                                          | 3,3                                            | 1,3                                          | 2,6                                            | ≠ 82       |
| 32 : 1                    | 310                               | 2,3                 | 4,4                                          | 8,9                                            | 3,5                                          | 7,1                                            | = 77       |
| 93 : 1                    | 107                               | 2,4                 | 5,0                                          | 15,0                                           | 5,0                                          | 15,0                                           | ≠ 72       |
| 270 : 1                   | 37                                | 2,5                 | 5,0                                          | 15,0                                           | 5,0                                          | 15,0                                           | = 68       |
| 659 : 1                   | 15                                | 3,5                 | 5,0                                          | 15,0                                           | 5,0                                          | 15,0                                           | ≠ 64       |

Scale enlarged



<sup>a)</sup> also available with 2,82 mm output shaft length

1307 C ... BH

### Connection

#### No. Function

- 1 Star point
- 2 Phase A
- 3 Phase A
- 4 Phase B
- 5 Phase B
- 6 Phase C
- 7 Phase C
- 8 Hall sensor In +
- 9 Hall sensor In -
- 10 analog Hall A Out +
- 11 analog Hall A Out -
- 12 analog Hall B Out +
- 13 analog Hall B Out -
- 14 analog Hall C Out +
- 15 analog Hall C Out -

#### Connectors

15-pole; 0,3 mm pitch; e.g.: Hirose: FH23-15S-0.3SHAW (05)