

# DC-Motors

## Graphite Commutation

110 mNm

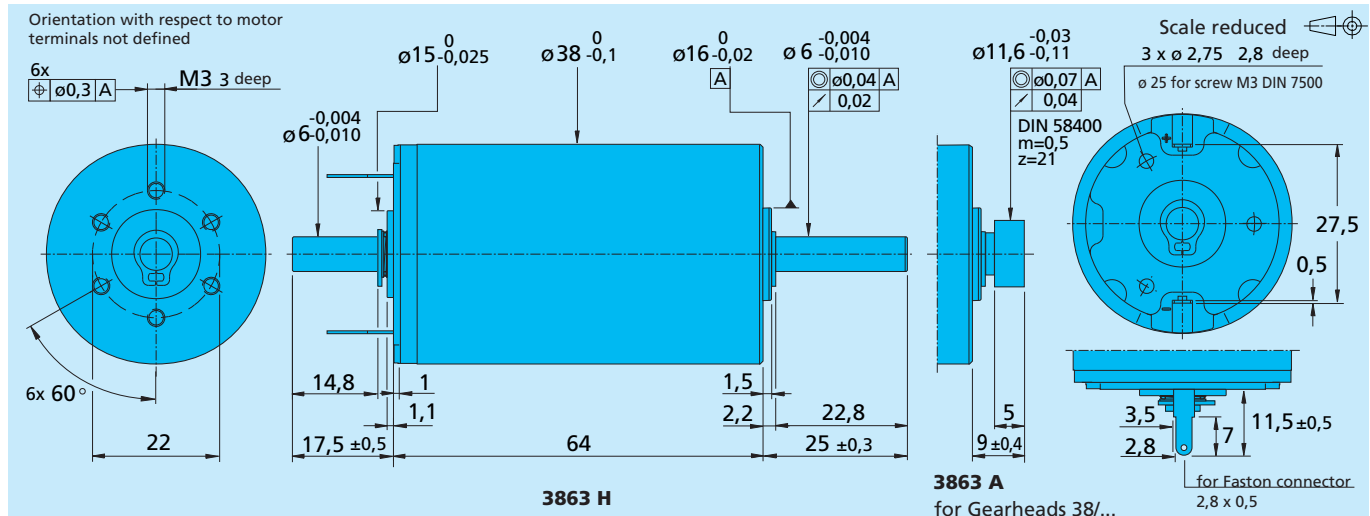
For combination with  
Gearheads: 38/1, 38/2, 44/1  
Encoders: IE2 – 16 ... 512, 5500, 5540

### Series 3863 ... C

|                                                     | 3863 H                  | 012 C                                 | 018 C | 024 C | 036 C | 048 C |                      |
|-----------------------------------------------------|-------------------------|---------------------------------------|-------|-------|-------|-------|----------------------|
| 1 Nominal voltage                                   | $U_N$                   | 12                                    | 18    | 24    | 36    | 48    | Volt                 |
| 2 Terminal resistance                               | $R$                     | 0,16                                  | 0,40  | 0,62  | 1,58  | 2,47  | $\Omega$             |
| 3 Output power                                      | $P_{2 \max.}$           | 204                                   | 189   | 220   | 197   | 226   | W                    |
| 4 Efficiency                                        | $\eta_{\max.}$          | 85                                    | 84    | 85    | 85    | 85    | %                    |
| 5 No-load speed                                     | $n_o$                   | 6 500                                 | 6 600 | 6 700 | 6 400 | 6 700 | rpm                  |
| 6 No-load current (with shaft $\varnothing$ 6,0 mm) | $I_o$                   | 0,480                                 | 0,320 | 0,240 | 0,150 | 0,120 | A                    |
| 7 Stall torque                                      | $M_H$                   | 1 200                                 | 1 090 | 1 250 | 1 170 | 1 290 | mNm                  |
| 8 Friction torque                                   | $M_R$                   | 8,1                                   | 8,0   | 8,0   | 7,9   | 8,1   | mNm                  |
| 9 Speed constant                                    | $k_n$                   | 569                                   | 380   | 287   | 181   | 142   | rpm/V                |
| 10 Back-EMF constant                                | $k_E$                   | 1,76                                  | 2,63  | 3,49  | 5,51  | 7,05  | mV/rpm               |
| 11 Torque constant                                  | $k_M$                   | 16,8                                  | 25,1  | 33,3  | 52,6  | 67,3  | mNm/A                |
| 12 Current constant                                 | $k_I$                   | 0,060                                 | 0,040 | 0,030 | 0,019 | 0,015 | A/mNm                |
| 13 Slope of n-M curve                               | $\Delta n / \Delta M$   | 5,4                                   | 6,1   | 5,4   | 5,5   | 5,2   | rpm/mNm              |
| 14 Rotor inductance                                 | $L$                     | 30                                    | 70    | 130   | 280   | 500   | $\mu H$              |
| 15 Mechanical time constant                         | $\tau_m$                | 6                                     | 6,5   | 6     | 6     | 6     | ms                   |
| 16 Rotor inertia                                    | $J$                     | 110                                   | 100   | 110   | 100   | 110   | $gcm^2$              |
| 17 Angular acceleration                             | $\alpha_{\max.}$        | 110                                   | 110   | 120   | 110   | 120   | $\cdot 10^3 rad/s^2$ |
| 18 Thermal resistance                               | $R_{th 1} / R_{th 2}$   | 1,5 / 6                               |       |       |       |       | K/W                  |
| 19 Thermal time constant                            | $\tau_{w1} / \tau_{w2}$ | 33 / 843                              |       |       |       |       | s                    |
| 20 Operating temperature range:                     |                         |                                       |       |       |       |       |                      |
| – motor                                             |                         | – 30 ... +125                         |       |       |       |       | °C                   |
| – rotor, max. permissible                           |                         | +155                                  |       |       |       |       | °C                   |
| 21 Shaft bearings                                   |                         | ball bearings, preloaded              |       |       |       |       |                      |
| 22 Shaft load max.:                                 |                         |                                       |       |       |       |       |                      |
| – with shaft diameter                               |                         | 6,0                                   |       |       |       |       | mm                   |
| – radial at 3 000 rpm (3 mm from bearing)           |                         | 60                                    |       |       |       |       | N                    |
| – axial at 3 000 rpm                                |                         | 6                                     |       |       |       |       | N                    |
| – axial at standstill                               |                         | 50                                    |       |       |       |       | N                    |
| 23 Shaft play:                                      |                         |                                       |       |       |       |       |                      |
| – radial                                            | $\leq$                  | 0,015                                 |       |       |       |       | mm                   |
| – axial                                             | $=$                     | 0                                     |       |       |       |       | mm                   |
| 24 Housing material                                 |                         | steel, black coated                   |       |       |       |       |                      |
| 25 Weight                                           |                         | 400                                   |       |       |       |       | g                    |
| 26 Direction of rotation                            |                         | clockwise, viewed from the front face |       |       |       |       |                      |

#### Recommended values - mathematically independent of each other

|                                   |               |       |       |       |       |       |     |
|-----------------------------------|---------------|-------|-------|-------|-------|-------|-----|
| 27 Speed up to                    | $n_{e \max.}$ | 8 000 | 8 000 | 8 000 | 8 000 | 8 000 | rpm |
| 28 Torque up to                   | $M_{e \max.}$ | 110   | 110   | 110   | 110   | 110   | mNm |
| 29 Current up to (thermal limits) | $I_{e \max.}$ | 7,6   | 4,9   | 3,8   | 2,4   | 1,9   | A   |



## How to Order a 3863 ... C

| Part number          | Voltage | Description                         | Stocked items |
|----------------------|---------|-------------------------------------|---------------|
| 3863A012C            | 12      | Standard motor                      | yes           |
| 3863A012C2016IE2-512 | 12      | Standard motor with IE2-512 encoder | yes           |
| 3863A018C            | 18      | Standard motor                      | no            |
| 3863A024C            | 24      | Standard motor                      | yes           |
| 3863A024C2016IE2-512 | 24      | Standard motor with IE2-512 encoder | yes           |
| 3863A036C            | 36      | Standard motor                      | no            |
| 3863A048C            | 48      | Standard motor                      | no            |
| 3863H012C            | 12      | Standard motor                      | yes           |
| 3863H018C            | 18      | Standard motor                      | no            |
| 3863H024C            | 24      | Standard motor                      | yes           |
| 3863H036C            | 36      | Standard motor                      | no            |
| 3863H048C            | 48      | Standard motor                      | no            |