

# DC-Micromotors

## Graphite Commutation

### 110 mNm

For combination with

Gearheads:

38/1, 38/1 S, 38/2, 38/2 S, 38A, 44/1

Encoders:

HEDL 5540, HEDM 5500, HEDS 5500, HEDS 5540, IE2-1024, IE2-16

## 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    | V                            |
| 2 Terminal resistance                             | R                                   | 0,16                                  | 0,4   | 0,62  | 1,58  | 2,47  | $\Omega$                     |
| 3 Output power                                    | $P_{2 \text{ max.}}$                | 204                                   | 189   | 220   | 197   | 226   | W                            |
| 4 Efficiency, max.                                | $\eta_{\text{ max.}}$               | 85                                    | 84    | 85    | 85    | 85    | %                            |
| 5 No-load speed                                   | $n_0$                               | 6 500                                 | 6 600 | 6 700 | 6 400 | 6 700 | rpm                          |
| 6 No-load current (with shaft $\varnothing$ 6 mm) | $I_0$                               | 0,48                                  | 0,32  | 0,24  | 0,15  | 0,12  | 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     | 8     | 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                               | $k_i$                               | 0,06                                  | 0,04  | 0,03  | 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   | $\mu\text{H}$                |
| 15 Mechanical time constant                       | $\tau_m$                            | 6                                     | 6,5   | 6     | 6     | 6     | ms                           |
| 16 Rotor inertia                                  | J                                   | 110                                   | 100   | 110   | 100   | 110   | gcm <sup>2</sup>             |
| 17 Angular acceleration                           | $\alpha_{\text{ max.}}$             | 110                                   | 110   | 120   | 110   | 120   | $\cdot 10^3 \text{ rad/s}^2$ |
| 18 Thermal resistance                             | $R_{\text{th} 1} / R_{\text{th} 2}$ | 1,5 / 6                               |       |       |       |       | K/W                          |
| 19 Thermal time constant                          | $\tau_{w1} / \tau_{w2}$             | 33 / 843                              |       |       |       |       | s                            |
| 20 Operating temperature range:                   |                                     |                                       |       |       |       |       |                              |
| – motor   |                                     | -30 ... +125                          |       |       |       |       | $^{\circ}\text{C}$           |
| – rotor, max. permissible                         |                                     | +155                                  |       |       |       |       | $^{\circ}\text{C}$           |
| 21 Shaft bearings                                 |                                     | ball bearings, preloaded              |       |       |       |       |                              |
| 22 Shaft load max.:                               |                                     |                                       |       |       |       |       |                              |
| – with shaft diameter                             |                                     | 6                                     |       |       |       |       | 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  | $\Delta$                            | 0,015                                 |       |       |       |       | mm                           |
| – axial   | $\parallel$                         | 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                    | $n_{e \text{ max.}}$ | 8 000 | 8 000 | 8 000 | 8 000 | 8 000 | rpm |
| 28 Torque up to                   | $M_{e \text{ max.}}$ | 110   | 110   | 110   | 110   | 110   | mNm |
| 29 Current up to (thermal limits) | $I_{e \text{ max.}}$ | 7,6   | 4,9   | 3,8   | 2,4   | 1,9   | A   |

