

# ECI motor.

## ECI-42.XX-K1

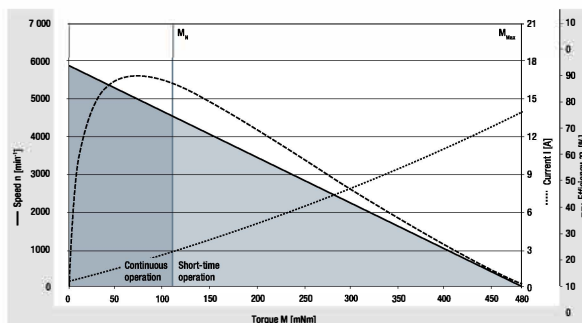


- Highly dynamic 3-phase internal rotor motor with EC technology
- Low cogging torque
- Robust, noise-optimized ball bearing system for a long service life
- High efficiency and high power density realized in a compact design
- Basic motor with electronic module K1 for operation with external control electronics
- Mechanical design and interfaces designed for modular flexibility
- Protection class IP 40 (higher on request) and connection by wires

| Nominal data                                    |                                               |                                                                                                                                                                                                                              |                  |                  |                  |
|-------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|------------------|
| Type                                            |                                               | ECI-42.20-K1-B00                                                                                                                                                                                                             | ECI-42.20-K1-D00 | ECI-42.40-K1-B00 | ECI-42.40-K1-D00 |
| Nominal voltage ( $U_N$ )                       | V DC                                          | 24                                                                                                                                                                                                                           | 48               | 24               | 48               |
| Nominal speed ( $n_n$ )**                       | rpm                                           | 4 000                                                                                                                                                                                                                        |                  |                  |                  |
| Nominal torque ( $M_N$ )**                      | mNm                                           | 110                                                                                                                                                                                                                          | 110              | 220              | 220              |
| Nominal current ( $I_N$ )**                     | A                                             | 2.50                                                                                                                                                                                                                         | 1.30             | 5.10             | 2.60             |
| Nominal output power ( $P_N$ )**                | W                                             | 46                                                                                                                                                                                                                           | 46               | 92               | 92               |
| Starting torque ( $M_{max}$ )                   | mNm                                           | 480                                                                                                                                                                                                                          | 480              | 960              | 960              |
| Permissible peak current ( $I_{max}$ )***       | A                                             | 14                                                                                                                                                                                                                           | 7                | 21               | 11               |
| Speed at no-load operation ( $n_l$ )            | rpm                                           | 5 900                                                                                                                                                                                                                        | 5 900            | 5 700            | 5 700            |
| No-load current ( $I_l$ )                       | A                                             | 0.33                                                                                                                                                                                                                         | 0.10             | 0.40             | 0.20             |
| Permanent stall torque ( $M_{st}$ )             | mNm                                           | 100                                                                                                                                                                                                                          | 100              | 200              | 200              |
| Recommended speed control range                 | rpm                                           | 0 ... 5 000                                                                                                                                                                                                                  |                  |                  |                  |
| Rotor moment of inertia ( $J_r$ )               | kgm <sup>2</sup> x10 <sup>-6</sup>            | 3.42                                                                                                                                                                                                                         | 3.42             | 6.70             | 6.70             |
| Motor constant ( $K_E$ )                        | mVs/rad                                       | 40.9                                                                                                                                                                                                                         | 84.2             | 42.8             | 83.9             |
| Connection resistance ( $R_v$ )                 | $\Omega$                                      | 0.85                                                                                                                                                                                                                         | 3.20             | 0.39             | 1.50             |
| Connection inductance ( $L_v$ )                 | mH                                            | 1.10                                                                                                                                                                                                                         | 4.50             | 0.50             | 1.84             |
| Overload protection                             | To be implemented via the control electronics |                                                                                                                                                                                                                              |                  |                  |                  |
| Permissible ambient temperature range ( $T_U$ ) | °C                                            | 0 ... +40                                                                                                                                                                                                                    |                  |                  |                  |
| Weight                                          | kg                                            | 0.33                                                                                                                                                                                                                         | 0.33             | 0.48             | 0.48             |
| Order no. (wire interface)*                     | IP 40                                         | 932 4220 122                                                                                                                                                                                                                 | 932 4220 123     | 932 4240 122     | 932 4240 123     |
| Subject to alterations                          |                                               | * Classification of protection class refers to installed state with sealing on the flange side<br>** At $T_U$ max. 40°C<br>*** Permissible time for peak current: max. 1 sec. – to be repeated only after complete cool down |                  |                  |                  |

### Characteristic curve

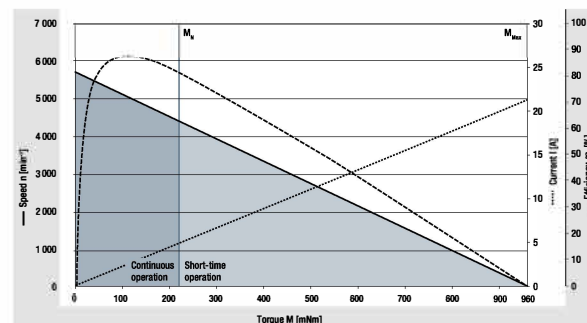
ECI-42.20, 24 V (at 25°C)



<sup>1)</sup> Nominal data, see table

Characteristic curve 48 V on request

ECI-42.40, 24 V (at 25°C)

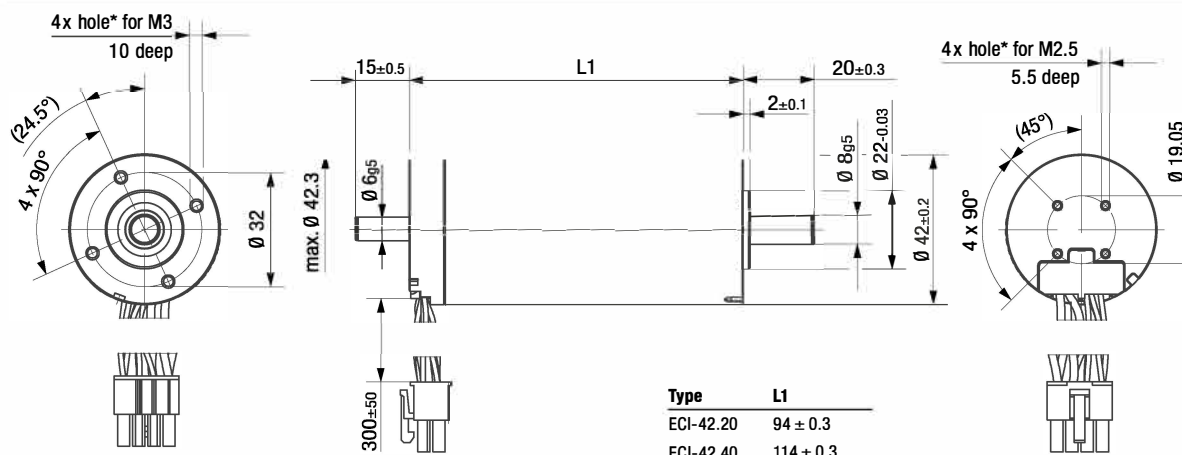


<sup>1)</sup> Nominal data, see table

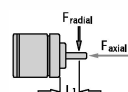
Characteristic curve 48 V on request

## Technical drawing

All dimensions in mm



| Type      | L1        |
|-----------|-----------|
| ECI-42.20 | 94 ± 0.3  |
| ECI-42.40 | 114 ± 0.3 |



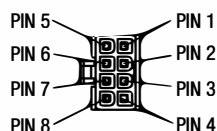
Permissible shaft load at nominal speed and life expectancy L<sub>10</sub> (nominal operation) of 20 000 h (at T<sub>0</sub> max. 40°C)

\* For thread-rolling screws according to DIN 7500

## Electrical connection

## Supply wire

| No. | Color  | Function |
|-----|--------|----------|
| 1   | yellow | Phase W  |
| 5   | violet | Phase V  |
| 6   | brown  | Phase U  |



Molex pin no. 39-01-2085

## Signal wire

| No. | Color | Function       |
|-----|-------|----------------|
| 4   | green | Hall A         |
| 3   | white | Hall B         |
| 8   | gray  | Hall C         |
| 2   | red   | U <sub>s</sub> |
| 7   | black | GND            |

## Modular construction kit

## Brake system

Spring-applied brake  
BFK 457-01 (page 76)

## Encoder system

Optical incremental encoder  
HEDS 5500 (page 78)

## Recommended external control electronics

|                |                    |
|----------------|--------------------|
| VTD-XX.XX-K3   | Speed (page 38)    |
| VTD-XX.XX-K4S  | Position (page 40) |
| VTD-60.13-K5SB | Position (page 42) |

## Basic motor

## Planetary gearheads

NoiselessPlus 42 (page 50)  
Performax® 42 (page 54)  
Performax®Plus 42 (page 58)

## Crown gearheads

EtaCrown® 52 (page 64)  
EtaCrown®Plus 42 (page 68)

For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.

# Crown gearheads.

EtaCrown® 52



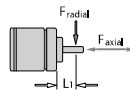
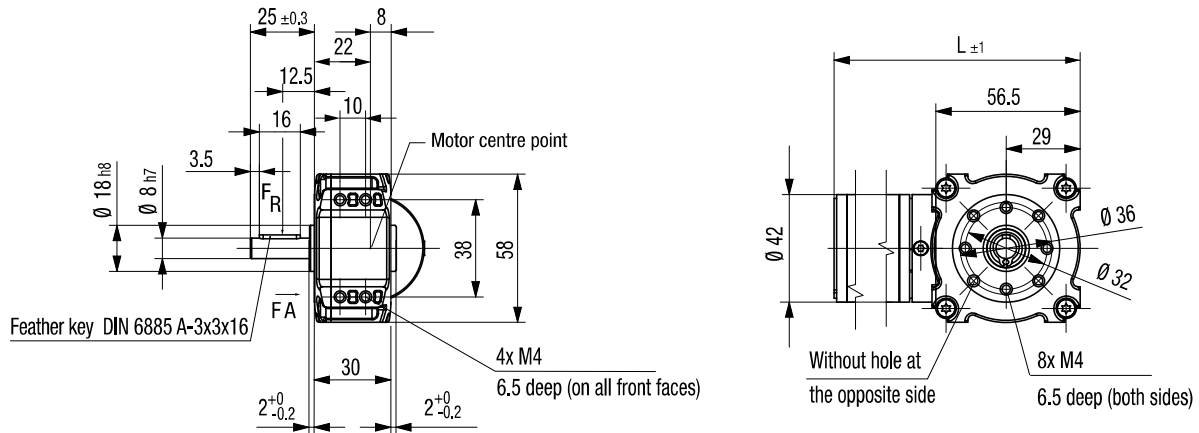
Image of 2-stage gearhead

- Maximum safety in design and operation, as well as optimal vandalism protection; no automatic lock due to high efficiency of the crown wheel technology
- Space-saving installation due to zero offset axle and symmetrical structure
- Flexible application possibilities with various optional shaft outlets and available shaft geometries
- Wide reduction range by means of upstream / downstream planetary stage
- High radial loads due to double ball bearing in the output shaft

| Nominal data                                        |     |                                              |           |           |                |           |           |           |
|-----------------------------------------------------|-----|----------------------------------------------|-----------|-----------|----------------|-----------|-----------|-----------|
| Gearheads                                           |     | EtaCrown® 52.1                               |           |           | EtaCrown® 52.2 |           |           |           |
| Reduction ratio                                     |     | 4.10                                         | 6.70      | 10.1      | 21.2           | 33.3      | 60.0      | 113       |
| No. of stages                                       |     | 1                                            |           |           | 2              |           |           |           |
| Efficiency                                          |     | 0.90                                         |           |           | 0.81           |           |           |           |
| Max. input speed (n <sub>i</sub> )                  | rpm | 6 000                                        |           |           | 6 000          |           |           |           |
| Rated output torque (M <sub>ab</sub> )              | Nm  | 0.21                                         | 0.34      | 0.52      | 0.98           | 1.54      | 2.77      | 3.48      |
| Short-term torque (M <sub>max</sub> )               | Nm  | 0.53                                         | 0.85      | 1.30      | 2.45           | 3.85      | 6.93      | 8.70      |
| Gear play                                           | °   | 0.55 ... 1.1                                 |           |           | 0.55 ... 1.1   |           |           |           |
| Permissible operating temperature (T <sub>v</sub> ) | °C  | -20 ... +80                                  |           |           | -20 ... +80    |           |           |           |
| Operating mode                                      |     | S1                                           |           |           | S1             |           |           |           |
| Protection class                                    |     | IP 50                                        |           |           | IP 50          |           |           |           |
| Weight                                              | kg  | 0.40                                         |           |           | 0.65           |           |           |           |
| Shaft load radial / axial                           | N   | 300 / 150                                    | 350 / 150 | 400 / 150 | 500 / 150      | 570 / 150 | 720 / 150 | 770 / 150 |
| Service life                                        | h   | 5 000                                        |           |           | 5 000          |           |           |           |
| Lubrication                                         |     | Maintenance-free grease lubrication for life |           |           |                |           |           |           |
| Installation position                               |     | any                                          |           |           |                |           |           |           |
| Subject to alterations                              |     | on request                                   |           |           |                |           |           |           |

## Technical drawing

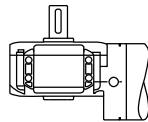
Image of 1-stage gearhead with left shaft end (W05) / All dimensions in mm



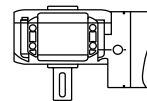
$F_{axial}$  150 N  
 $F_{radial}$  see table  
 $L1$  12.5 mm

Permissible shaft load at nominal speed and life expectancy  $L_{10}$  (nominal operation) and operating factor  $C_b = 1$  (see page 82) of 5 000 h (at  $T_u$  40°C).

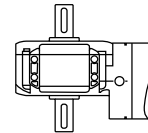
Shaft end, right (W05) (standard)



Shaft end, left (W06)



Shaft end, both sides (W07)



## Length of the possible motor / gearhead combinations

| Motor / gearhead       |    | L - 1-stage | L - 2-stage |
|------------------------|----|-------------|-------------|
| ECI-42.20-K1-E52       | mm | 160         | 189         |
| ECI-42.40-K1-E52       | mm | 180         | 209         |
| Subject to alterations |    |             |             |