

# VD motor.

VD-49.15-K1

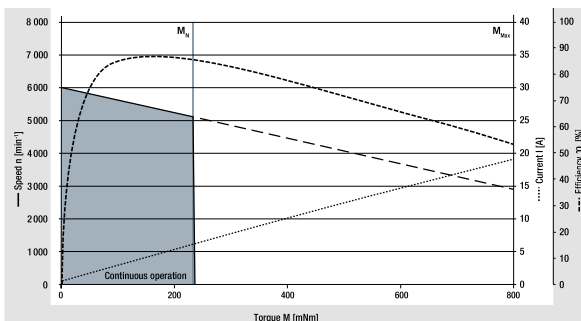


- 3-phase external rotor motor with EC technology
- High poled motor structure for optimum power density
- Basic motor with electronic module K1 for operation on external control electronics
- Very good synchronization characteristics
- Robust mechanical design in IP 54 for industrial applications
- Long lifetime by using precision ball bearings
- Insulation class E
- Electrical connection via cable

| Nominal data                                            |                                                                                                                                                                                                                                       |                                               |                 |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------|
| Type                                                    |                                                                                                                                                                                                                                       | VD-49.15-K1-B00                               | VD-49.15-K1-D00 |
| Nominal voltage (U <sub>N</sub> )                       | V DC                                                                                                                                                                                                                                  | 24                                            | 48              |
| Nominal speed (n <sub>N</sub> )*                        | rpm                                                                                                                                                                                                                                   | 4 500                                         | 5 300           |
| Nominal torque (M <sub>N</sub> )*                       | mNm                                                                                                                                                                                                                                   | 235                                           | 245             |
| Nominal current (I <sub>N</sub> )*                      | A                                                                                                                                                                                                                                     | 6.10                                          | 3.40            |
| Nominal output power (P <sub>N</sub> )*                 | W                                                                                                                                                                                                                                     | 110                                           | 135             |
| Starting torque (M <sub>max</sub> )                     | mNm                                                                                                                                                                                                                                   | 1 150                                         | 1 300           |
| Permissible peak current (I <sub>max</sub> )**          | A                                                                                                                                                                                                                                     | 30.0                                          | 18.5            |
| Speed at no-load operation (n <sub>L</sub> )            | rpm                                                                                                                                                                                                                                   | 6 000                                         |                 |
| No-load current (I <sub>L</sub> )                       | A                                                                                                                                                                                                                                     | 0.47                                          | 0.36            |
| Recommended speed control range                         | rpm                                                                                                                                                                                                                                   | 0 ... 6 000                                   |                 |
| Rotor moment of inertia (J <sub>R</sub> )               | kgm <sup>2</sup> x10 <sup>-6</sup>                                                                                                                                                                                                    | 108                                           |                 |
| Motor constant (K <sub>E</sub> )                        | mVs/rad                                                                                                                                                                                                                               | 41.0                                          | 80.7            |
| Connection resistance (R <sub>v</sub> )                 | Ω                                                                                                                                                                                                                                     | 0.23                                          | 0.62            |
| Connection inductance (L <sub>v</sub> )                 | mH                                                                                                                                                                                                                                    | 0.17                                          | 0.62            |
| Overload protection                                     |                                                                                                                                                                                                                                       | To be implemented via the control electronics |                 |
| Permissible ambient temperature range (T <sub>U</sub> ) | °C                                                                                                                                                                                                                                    | 0 ... +40                                     |                 |
| Weight                                                  | kg                                                                                                                                                                                                                                    | 0.59                                          |                 |
| Order no. (cable type)***                               | IP 54                                                                                                                                                                                                                                 | 937 4915 000                                  | 937 4915 001    |
| Subject to alterations                                  | * At T <sub>U</sub> max. 40°C<br>** Permissible time for peak current: max. 1 sec. – to be repeated only after complete cool down<br>*** Classification of protection class refers to installed state with sealing on the flange side |                                               |                 |

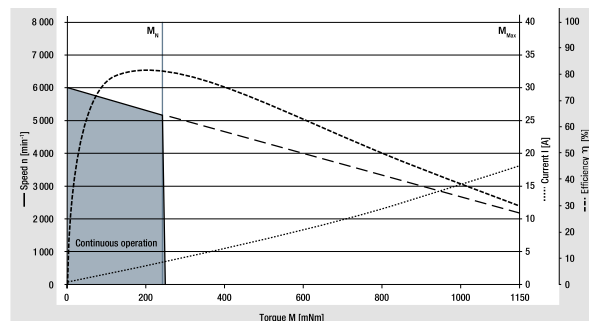
## Characteristic curve

VD-49.15-K1-B00 (at 25°C)



1) Nominal data, see table

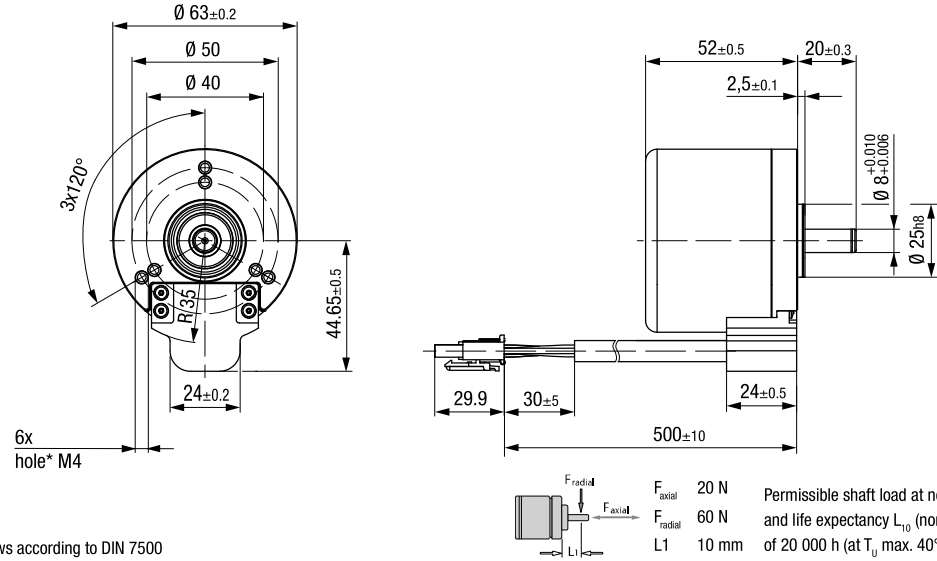
VD-49.15-K1-D00 (at 25°C)



1) Nominal data, see table

## Technical drawing

All dimensions in mm

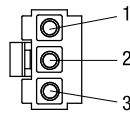


\* For thread-rolling screws according to DIN 7500

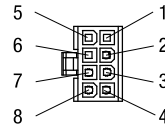
## Electrical connection

### Supply wire

| No. | Color  | Function |
|-----|--------|----------|
| 1   | yellow | Phase W  |
| 2   | violet | Phase V  |
| 3   | brown  | Phase U  |



Molex plug  
no. 39-03-6035



Molex plug  
no. 39-01-2085

### Signal wire

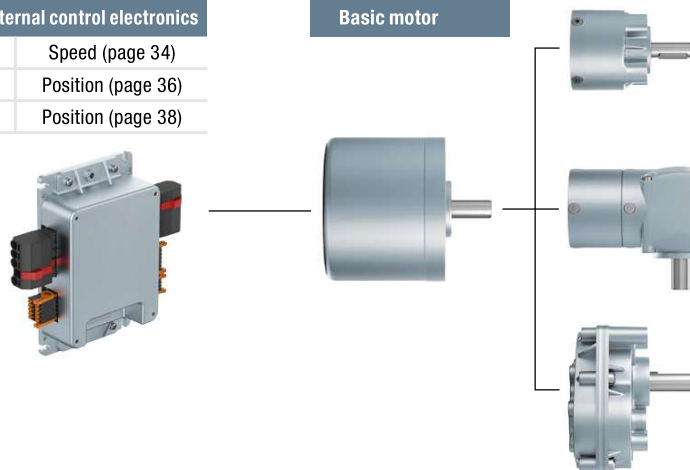
| No. | Color | Function |
|-----|-------|----------|
| 1   | —     | —        |
| 2   | red   | +12 V    |
| 3   | white | Hall B   |
| 4   | green | Hall A   |
| 5   | —     | —        |
| 6   | —     | —        |
| 7   | black | GND      |
| 8   | gray  | Hall C   |

## Modular construction kit

### Recommended external control electronics

|                |                    |
|----------------|--------------------|
| VTD-XX.XX-K3   | Speed (page 34)    |
| VTD-XX.XX-K4S  | Position (page 36) |
| VTD-60.13-K5SB | Position (page 38) |

### Basic motor



### Planetary gearheads

- NoiselessPlus 63 (page 44)
- Performax® 63 (page 46)
- Performax®Plus 63 (page 48)

### Crown gearheads

- EtaCrown® 75 (page 50)
- EtaCrown®Plus 63 (page 52)

### Spur gearheads

- Compactline 91 (page 56)
- Flatline 85 (page 60)

# Crown gearheads.

EtaCrown® 75



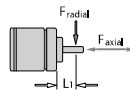
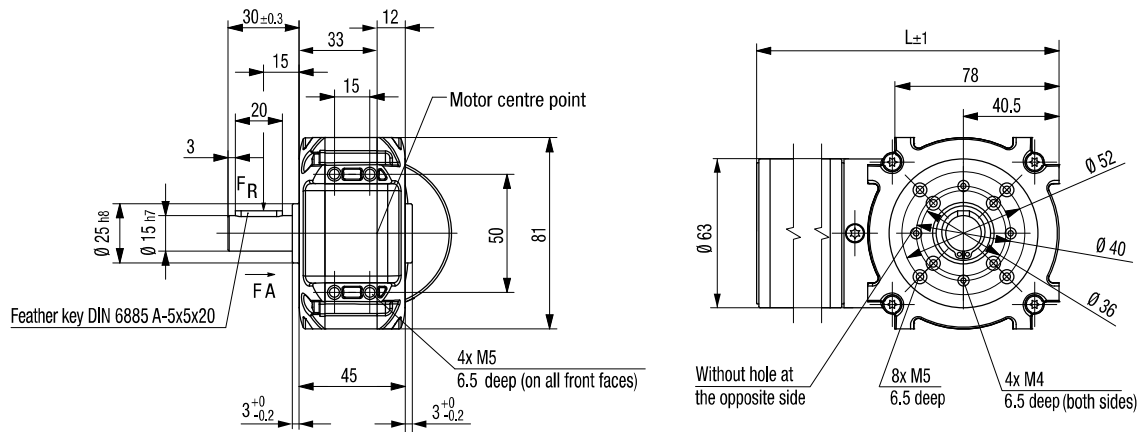
Image of 2-stage gearhead

- 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® 75.1                               |           |           | EtaCrown® 75.2 |           |             |             |
| Reduction ratio                                     |     | 4.10                                         | 6.70      | 10.1      | 20.3           | 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  | 6.00                                         | 5.00      | 2.43      | 10.0           | 10.0      | 10.0        | 10.0        |
| Short-term torque (M <sub>max</sub> )               | Nm  | 15.0                                         | 12.5      | 6.08      | 25.0           | 25.0      | 25.0        | 25.0        |
| Gear play                                           | °   | 0.55 ... 1.1                                 |           |           | 0.55 ... 1.1   |           |             |             |
| Permissible operating temperature (T <sub>o</sub> ) | °C  | -20 ... +80                                  |           |           | -20 ... +80    |           |             |             |
| Operating mode                                      |     | S1                                           |           |           | S1             |           |             |             |
| Protection class                                    |     | IP 50                                        |           |           | IP 50          |           |             |             |
| Weight                                              | kg  | 0.9                                          |           |           | 1.3            |           |             |             |
| Shaft load radial / axial                           | N   | 150 / 500                                    | 250 / 500 | 400 / 500 | 550 / 500      | 800 / 500 | 1 100 / 500 | 1 300 / 500 |
| 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



$F_{axial}$  500 N  
 $F_{radial}$  see table  
 $L1$  15 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) | Hollow shaft (W08)   |
|-----------------------------------|-----------------------|-----------------------------|----------------------|
|                                   |                       |                             |                      |
|                                   |                       |                             | Hollow shaft Ø 10 mm |

## Length of the possible motor / gearhead combinations

| Motor / gearhead |    | L - 1-stage | L - 2-stage |
|------------------|----|-------------|-------------|
| ECI-63.20-K1-E75 | mm | 197         | 233         |
| ECI-63.40-K1-E75 | mm | 217         | 253         |
| ECI-63.60-K1-E75 | mm | 237         | 273         |
| ECI-63.20-K3-E75 | mm | 210         | 246         |
| ECI-63.40-K3-E75 | mm | 230         | 266         |
| ECI-63.60-K3-E75 | mm | 250         | 286         |
| ECI-63.20-K4-E75 | mm | 210         | 246         |
| ECI-63.40-K4-E75 | mm | 230         | 266         |
| ECI-63.60-K4-E75 | mm | 250         | 286         |
| ECI-63.20-K5-E75 | mm | 203         | 239         |
| ECI-63.40-K5-E75 | mm | 223         | 259         |
| ECI-63.60-K5-E75 | mm | 243         | 279         |

Subject to alterations