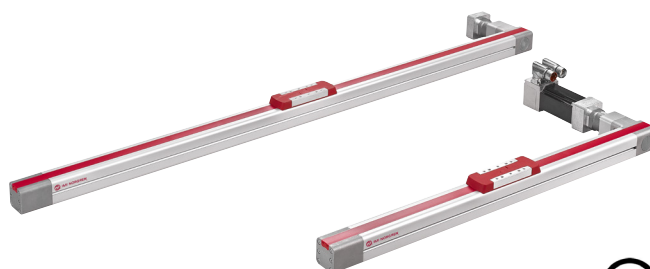


# E/148000/\* Electromechanical rodless tooth belt actuator with or without servo motor



- > □48 ... 100 mm
- > Robust construction
- > High performance internal guiding
- > Reliable performance
- > Long life
- > Servo motors
- > Different feedback systems available
- > Holding brake available
- > Drives available with EtherCAT, PROFINET, PROFIBUS, EtherNet/IP, DeviceNet & CANopen communications



## Technical features

### Function:

Actuator with tooth belt; with or without servo motor

### Actuator size □:

48, 60, 80, 100 mm

### Strokes:

Available 100 ... 5500 mm (short strokes < 100 mm on request)

### Speed:

max. 10 m/s

### Forces $F_{max}$ :

1500 N (thrust force)

### Motor data

#### Voltage:

400 VAC

#### Rated current:

0,7 ... 9 A

#### Power:

0,16 ... 2,2 kW

### Drive data

#### Voltage:

400 VAC

#### Rated current:

3,0 ... 10,5 A

#### Output power:

0,75 ... 4,0 kW

### Duty cycle:

100 %

### Temperature:

#### Operating temperature actuator only:

-20 ... 80 °C (-4 ... 176 °F)

#### Ambient temperature:

Actuator:

-20 ... 80 °C (-4 ... 176 °F)

Motor:

0 ... 40 °C (32 ... 104 °F)

see page 16

#### IP Protection rate motor only:

IP65

### Standard Materials:

End covers: Die cast aluminum

Yoke, carriage, cover and barrel:

Anodized aluminum

Cover strip: TPU

## Technical data

| Actuator size □ (mm)                                                  | 48           | 60           | 80           | 100          |
|-----------------------------------------------------------------------|--------------|--------------|--------------|--------------|
| Tooth belt width (mm)                                                 | 15           | 25           | 29           | 44           |
| Incremental stroke (mm)                                               | 5            | 5            | 4            | 4            |
| Axial clearance (mm)                                                  | 0,2          | 0,2          | 0,45         | 0,45         |
| Available velocity with standard Norgren servo motor, ratio 1:1 (m/s) | 6,0          | 7,8          | 10,0         | 10,0         |
| Max permissible velocity (m/s)                                        | 10,0         | 10,0         | 10,0         | 10,0         |
| F max axial (kN)                                                      | 0,2          | 0,5          | 1,0          | 1,5          |
| Max. torque (Drive shaft) (Nm)                                        | 3,8          | 12,3         | 33,1         | 63,0         |
| Order stroke (mm)*                                                    | 100 ... 3000 | 100 ... 5500 | 100 ... 5500 | 100 ... 5500 |
| Acceleration max (m/s <sup>2</sup> )                                  | 10           |              |              |              |

\*Strokes < 100 mm on request

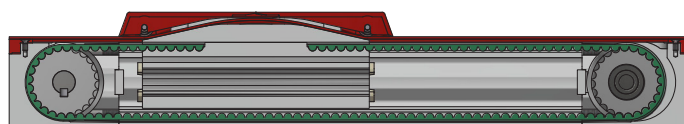
## The function

The new Norgren ELION provides a high performance tooth belt actuator with servo motor. The actuator can easily be configured and ordered with the Norgren online tool:

<https://www.norgren.com/uk/en/technical-support/configurators>

or visit our landing page for more information:

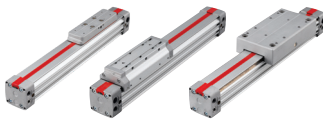
<https://www.norgren.com/uk/en/list/electric-actuators>

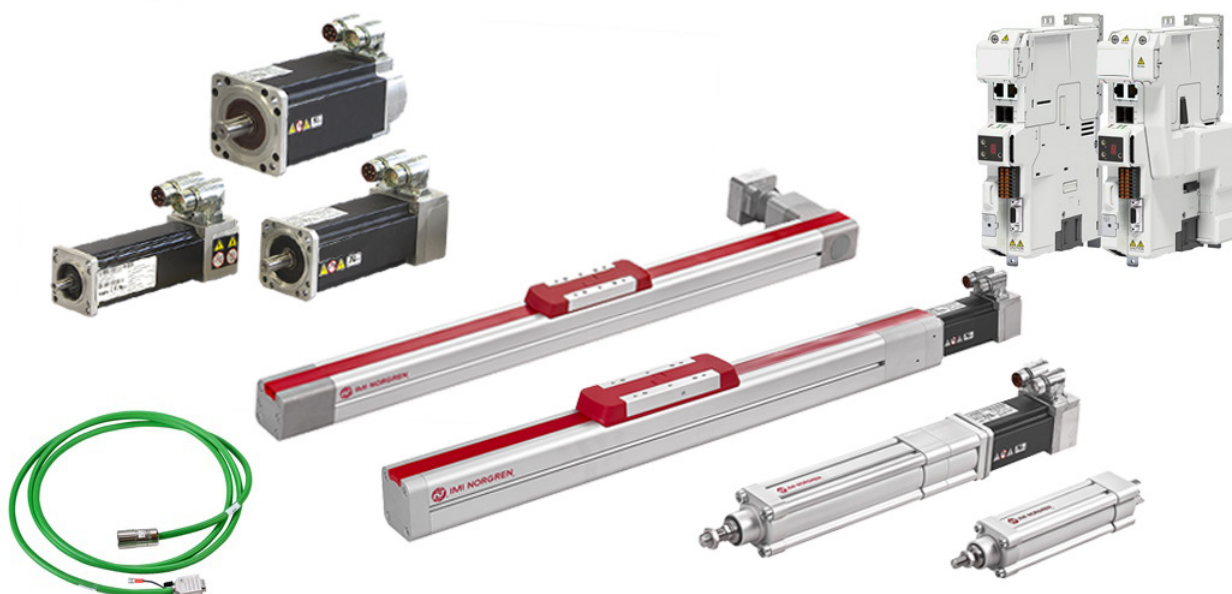


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**Norgren Family** (Actuator ranges in the red frame are shown in this data sheet)

| Picture                                                                            | Function          | Data sheet title                                                                                             | Data sheet number |
|------------------------------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------|-------------------|
|    | Electromechanical | E/809000/* Electromechanical actuator with or with or without servo motor                                    | en 1.6.300        |
|  | Pneumatic         | PRA/802000/M, RA/802000/M, RA/8000, RA/8000/M ISOLine™ 15552 cylinder, double acting                         | en 1.5.220        |
|  | Electromechanical | E/149000/* Electromechanical rodless spindle actuator with or without servo motor                            | en 1.6.400        |
|  | Electromechanical | E/148000/* Electromechanical tooth belt actuator with or without servo motor                                 | en 1.6.500        |
|  | Pneumatic         | M/146000, M/146100, M/146200, LIN-TRA®PLUS rodless cylinder<br>Magnetic & Non-magnetic piston, double acting | en 1.6.009        |



## Rules

The Norgren ELION series E/148000 rodless electric actuator is a combination of a tooth belt drive actuator and an electric servo motor. Therefore, it must be ensured that the system design, installation, commissioning/start-up and maintenance are carried out by personnel who have the necessary training and competence. They must read the safety information and I&M guide carefully. The actuator must not be used as a mechanical stop. A safety stroke should be considered. For further information, please refer to the comments and drawing on page 7.

## Operating conditions

The actuator can perform multiple linear positioning tasks. To prevent damage of the internal guiding system, lateral forces and torque values must be kept within the specifications given in this document. Impact load on the carriage and housing must also be avoided to prevent damage on the tooth belt and bearings. Mechanical impact on the cover band must be avoided.

## Actuator sizing

Tooth belt drive actuators like the Norgren ELION are complex mechanical systems transferring the rotational movement of an electric motor into a linear motion. Please be advised that the technical data presented on page 1 may vary for different applications. For exact sizing, please refer to page 6 ... 7, use the Norgren online configurator or contact our technical service.

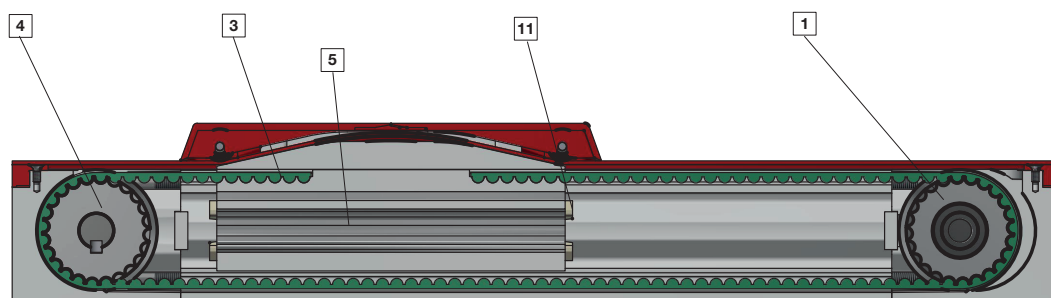
## Motor

The sizing of the motor depends on the load cycle applied to the actuator. At all times, the maximum torque requirements must stay below the intermittent torque the motor can apply. To prevent overheating of the motor, the mean torque demand must be below the continuous torque of the motor. For exact sizing, please refer to page 6 ... 7, use the Norgren online configurator or contact our technical service.

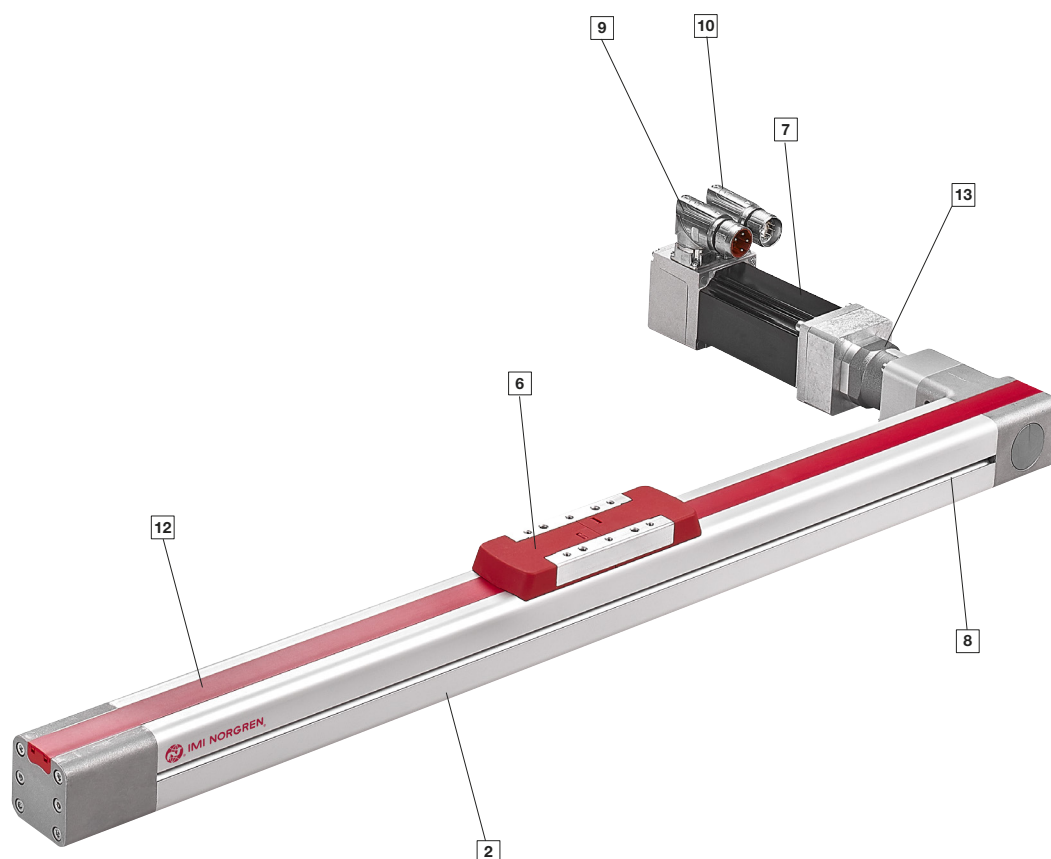
## Mechanical brake

The motors supplied by IMI Precision Engineering can be equipped with a mechanical holding brake. While both hardware and software are designed to high standards of quality and robustness, they are not intended for use as safety functions, i.e. where a fault or failure would result in a risk of injury.

Do not apply the brake while the motor shaft is rotating. The brake can only take a limited number of emergency braking operations and must not be used for repeated dynamic braking.



|    |                                |
|----|--------------------------------|
| 1  | Pulley, loose end              |
| 2  | Profile barrel                 |
| 3  | Toothed belt                   |
| 4  | Pulley, drive end              |
| 5  | Yoke                           |
| 6  | Carriage                       |
| 7  | Motor                          |
| 8  | Switch and mounting groove     |
| 9  | Power cable connector          |
| 10 | Motor feedback cable connector |
| 11 | Internal guiding               |
| 12 | Cover strip                    |
| 13 | Gear box                       |



## Actuator variants

E/148★★★★/★★★★/★★★★/★★★★

| Size     |   | Motor /<br>Gearbox<br>orientation |      | Gear ratio |                                                                                    | Motor Kit           | Flange/Motor                        |             |   |   |   | Stroke<br>(mm)                              |   |
|----------|---|-----------------------------------|------|------------|------------------------------------------------------------------------------------|---------------------|-------------------------------------|-------------|---|---|---|---------------------------------------------|---|
| Sub. 1   |   | Right                             | Left |            |                                                                                    |                     |                                     |             |   |   |   | Sub. 7                                      |   |
|          |   |                                   |      |            |                                                                                    |                     |                                     |             |   |   |   |                                             |   |
| □48 048  | A | B                                 | no   | 01         | Actuator without coupling with housing for customer individual motor (see page 10) | B                   | No Motor                            | X           | X |   |   | 100 ... 3000<br><br>(stroke increment 5 mm) |   |
|          |   |                                   |      |            | Actuator with coupling with housing for customer individual motor (see page 11)    | C                   | No motor                            | 08, 09, 10* |   |   |   |                                             |   |
|          |   |                                   | 1:4  | 04         | With motor kit (see page 12)                                                       | D                   | No motor, flange □40; ØN=30; ØM=46  | X           | 1 |   |   |                                             |   |
|          |   |                                   | 1:7  | 07         |                                                                                    |                     | No motor, flange □55; ØN=40; ØM=63  |             | 2 |   |   |                                             |   |
|          |   |                                   |      |            |                                                                                    |                     | Motor □55 (1,05 Nm)                 | E           | A | B | M | N                                           |   |
| □60 060  | A | B                                 | no   | 01         | Actuator without coupling with housing for customer individual motor (see page 10) | B                   | No Motor                            | X           | X |   |   | 100 ... 5500<br><br>(stroke increment 5 mm) |   |
|          |   |                                   |      |            | Actuator with coupling with housing for customer individual motor (see page 11)    | C                   | No motor                            | 09, 14*     |   |   |   |                                             |   |
|          |   |                                   | 1:3  | 03         | With motor kit (see page 12)                                                       | D                   | No motor, flange □55; ØN=40; ØM=63  | X           | 1 |   |   |                                             |   |
|          |   |                                   | 1:5  | 05         |                                                                                    |                     | No motor, flange □67; ØN=60; ØM=75  |             | 2 |   |   |                                             |   |
|          |   |                                   | 1:7  | 07         |                                                                                    |                     | Motor □55 (1,05 Nm)                 | E           | A | B | M |                                             | N |
|          |   |                                   |      |            |                                                                                    | Motor □67 (2,45 Nm) | J                                   |             |   |   |   |                                             |   |
| □80 080  | A | B                                 | no   | 01         | Actuator without coupling with housing for customer individual motor (see page 10) | B                   | No Motor                            | X           | X |   |   | 100 ... 5500<br><br>(stroke increment 4 mm) |   |
|          |   |                                   |      |            | Actuator with coupling with housing for customer individual motor (see page 11)    | C                   | No motor                            | 14, 20*     |   |   |   |                                             |   |
|          |   |                                   | 1:3  | 03         | With motor kit (see page 12)                                                       | D                   | No motor, flange □67; ØN=60; ØM=75  | X           | 1 |   |   |                                             |   |
|          |   |                                   | 1:5  | 05         |                                                                                    |                     | Motor □67 (2,45 Nm)                 | J           | A | B | M |                                             | N |
|          |   |                                   | 1:7  | 07         |                                                                                    |                     | Motor □67 (3,50 Nm)                 | N           |   |   |   |                                             |   |
| □100 100 | A | B                                 | no   | 01         | Actuator without coupling with housing for customer individual motor (see page 10) | B                   | No Motor                            | X           | X |   |   | 100 ... 5500<br><br>(stroke increment 4 mm) |   |
|          |   |                                   |      |            | Actuator with coupling with housing for customer individual motor (see page 11)    | C                   | No motor                            | 14, 19, 20* |   |   |   |                                             |   |
|          |   |                                   | 1:3  | 03         | With motor kit (see page 12)                                                       | D                   | No motor, flange □67; ØN=60; ØM=75  | X           | 1 |   |   |                                             |   |
|          |   |                                   | 1:5  | 05         |                                                                                    |                     | No motor, flange □89; ØN=80; ØM=100 |             | 2 |   |   |                                             |   |
|          |   |                                   | 1:7  | 07         |                                                                                    |                     | Motor □67 (3,50 Nm)                 | N           | A | B | M |                                             | N |
|          |   |                                   |      |            |                                                                                    | Motor □89 (6,90 Nm) | R                                   |             |   |   |   |                                             |   |

\* = individual Actuator shaft Ø mm on request



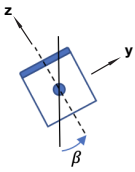
## Sizing Rules and Formulas for loading values

### 1. Definition of the load cycle

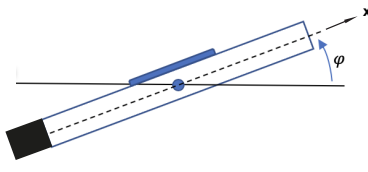
The load cycle includes all movements of the actuator. For every step, the following values must be defined:

- Direction of the movement
- Rotational position (alignment) of the carriage (top, side, down)
- End position of the movement
- External load mass
- Offset position of the center of gravity of the load mass in relation to the carriage
- Acceleration and deceleration
- Maximum velocity
- Constant external forces
- Offset position of the force application in relation to the carriage
- Possible pause times at the end of the movement

Alignment (Roll)



Direction (Pitch)



Due to the high positioning accuracy of the Norgren ELION actuators, the number of steps in one cycle is not limited.

### 2. Calculation of the forces and torques acting on the actuator

For a basic selection of the actuator, the knowledge of the acting forces during the load cycle is essential. For each movement of the load, all forces and torques acting on the actuator must be defined. This includes both external forces applied on the carriage and gravitational forces caused by the load mass applied.

#### 2.1 Calculation of gravitational forces depending on alignment and direction

The Norgren ELION rodless actuator is equipped with an elaborated internal guiding system. To select the size of actuator fitting the application, all torques and forces acting on the bearings must be calculated.

As a first step, the gravitational forces caused by the load mass and the moving mass of the actuator are transformed into the actuator coordinate system:

$$F_{x,g,load} = -m_{load} \cdot g \cdot \sin(\varphi)$$

$$F_{x,g,act} = -m_{mov,act} \cdot g \cdot \sin(\varphi)$$

$$F_{y,g,load} = -m_{load} \cdot g \cdot \sin(\beta) \cdot \cos(\varphi)$$

$$F_{y,g,act} = -m_{mov,act} \cdot g \cdot \sin(\beta) \cdot \cos(\varphi)$$

$$F_{z,g,load} = -m_{load} \cdot g \cdot \cos(\beta) \cdot \cos(\varphi)$$

$$F_{z,g,act} = -m_{mov,act} \cdot g \cdot \cos(\beta) \cdot \cos(\varphi)$$

#### 2.2 Calculation of torque and force values applied on the carriage

The total forces applied on the carriage are calculated as follows:

$$F_{x,a,load} = m_{load} \cdot a$$

$$F_{x,a,act} = m_{mov,act} \cdot a$$

$$F_{x,tot} = F_{x,g,load} + F_{x,a,act} + F_{x,a,load} + F_{x,a,act} + F_{x,ext}$$

$$F_{y,tot} = F_{y,g,load} + F_{y,a,act} + F_{y,ext}$$

$$F_{z,tot} = F_{z,g,load} + F_{z,a,act} + F_{z,ext}$$

The torque values applied are calculated using these forces together with the lever arms through the offset of both the Center of Gravity of the external load and the application point of the external forces:

$$F_{TB} = 1.2 \cdot F_{x,tot}$$

$$M_x = F_{z,g,load} \cdot \Delta y_{COG} + F_{z,ext} \cdot \Delta y_{ext} - F_{y,g,load} \cdot \Delta z_{COG} - F_{y,ext} \cdot \Delta z_{ext}$$

$$M_y = (F_{x,g,load} + F_{x,a,load}) \cdot \Delta z_{COG} + F_{x,ext} \cdot \Delta z_{ext} - F_{z,g,load} \cdot \Delta x_{COG} - F_{z,ext} \cdot \Delta x_{ext} - F_{TB} \cdot \Delta z_{TB}$$

$$M_z = F_{y,g,load} \cdot \Delta x_{COG} + F_{y,ext} \cdot \Delta x_{ext} - (F_{x,g,load} + F_{x,a,load}) \cdot \Delta y_{COG} - F_{x,ext} \cdot \Delta y_{ext}$$

The offset in z-direction must be corrected by the distance between the COG of the moving parts of the actuator and the top of the carriage

->  $z_{COG} = z_i + z_o$  using the following values for  $\Delta z_o$ . The torque applied by the tooth belt is calculated using the given values for  $\Delta z_{TB}$ .

| Size            | 48     | 60       | 80      | 100     |
|-----------------|--------|----------|---------|---------|
| $\Delta z_o$    | 37 mm  | 47 mm    | 61,5 mm | 75,5 mm |
| $\Delta z_{TB}$ | 191 mm | 24,67 mm | 33,1 mm | 42 mm   |

To evaluate whether the forces and torques can be tolerated by the internal bearing system, they are normalised using the maximum tolerable values in every direction and then summarised. If the sum is  $\leq 1$  the bearing is sufficiently sized for the load:

$$\frac{|M_x|}{M_{x,max}} + \frac{|M_y|}{M_{y,max}} + \frac{|M_z|}{M_{z,max}} + \frac{|\sum_j F_{y,tot,j}|}{F_{y,max}} + \frac{|\sum_i F_{z,tot,i}|}{F_{z,max}} \leq 1$$

The maximum values  $M_{x,max}$ ,  $M_{y,max}$ ,  $M_{z,max}$ ,  $F_{y,max}$  and  $F_{z,max}$  depend on the velocity of the movement and can be estimated using the diagrams on page 8.

|                                |                                             |                  |
|--------------------------------|---------------------------------------------|------------------|
| $a$                            | Acceleration/deceleration                   | m/s <sup>2</sup> |
| $m_{mov,act}$                  | Moving mass of the actuator                 | kg               |
| $m_{load}$                     | Load mass applied on actuator               | kg               |
| $\Delta x, \Delta y, \Delta z$ | Distance of forces/loads to actuator centre | m                |
| $\beta$                        | Position of carriage                        | °                |
| $\varphi$                      | Direction of movement                       | °                |
| $g$                            | Gravitational acceleration                  | m/s <sup>2</sup> |

### 3. Selection of the actuator, motor and gear box

#### 3.1 Selection of the actuator

The selection of the actuator is carried out based on the sizing of the internal bearing system. A sufficiently sized bearing system indicates a sufficiently sized actuator.

Additionally, the maximum thrust force necessary during the load cycle must be compared to the maximum force applicable to the actuator

$$F_{\text{tot,max}} < F_{\text{max,actuator}}$$

#### 3.2 Selection of a motor and gear box

For each actuator, two motor sizes are available with different gear box ratios. The selection of the motor and gear box is based on the driving torque  $T$  rotational speed  $n$  of the actuator shaft which have to be calculated for each step of the load cycle.

$$T_{\text{act,step}} = 1,2 \cdot F_{x,\text{tot,step}} \cdot \frac{d_{\text{pulley}}}{2}$$

$$n_{\text{act,step}} = \frac{v_{\text{max,step}}}{d_{\text{pulley}} \cdot \pi}$$

| Size                | 48       | 60       | 80       | 100      |
|---------------------|----------|----------|----------|----------|
| $d_{\text{pulley}}$ | 38,20 mm | 49,34 mm | 66,21 mm | 84,03 mm |

Using a gear box reduces the necessary motor torque whilst increasing the rotational speed of the motor. All values calculated must be below the intermittent torque the motor can deliver (diagr. pages 16 ... 18).

$$T_{\text{mot}} = \frac{T_{\text{act}}}{i_{\text{gear}}}$$

$$n_{\text{mot}} = n_{\text{act}} \cdot i_{\text{gear}}$$

|                       |                                        |       |
|-----------------------|----------------------------------------|-------|
| $T'_{\text{act}}$     | Torque at the actuator shaft           | Nm    |
| $T'_{\text{mot}}$     | Output torque of the motor             | Nm    |
| $n_{\text{act}}$      | Rotational speed of the actuator shaft | min-1 |
| $n_{\text{mot}}$      | Rotational speed of the motor shaft    | min-1 |
| $v_{\text{max,step}}$ | Maximum velocity of each step          | m/s   |

To avoid overheating of the motor, the mean torque  $T_{\text{mot,rms}}$  of the load cycle must be lower than the continuous torque (diagr. pages 16 ... 18).

$$T_{\text{mot,rms}} = \sqrt{\sum \left[ (T_{\text{mot,step}})^2 \cdot \frac{t_{\text{step}}}{t_{\text{tot}}} \right]}$$

$$n_{\text{mot,rms}} = \sqrt{\sum \left[ (n_{\text{mot,step}})^2 \cdot \frac{t_{\text{step}}}{t_{\text{tot}}} \right]}$$

#### 4. Additional mountings

To avoid bending of the actuator, the installation of additional mountings may be necessary. For each actuator size, the maximum unsupported length can be estimated with the forces in y- and z-direction using the diagrams on page 9.

#### 5. Safety stroke

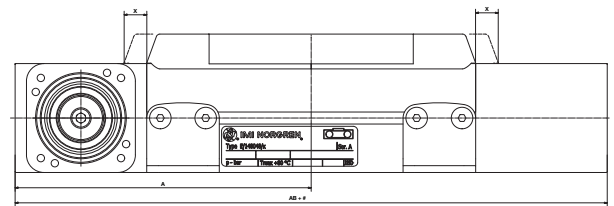
Disregarding the initial set up, the actuator must not touch its mechanical end stops. A safety stroke should be considered, respecting the

application boundaries and environments.

We generally recommend a safety stroke of 20 mm per side for electric rodless actuators. The order stroke = working stroke + safety stroke of

2 x 20 mm.

Please note, that during the initial set up, the actuator might exceed its nominal end position as given (over run "Dimension X") in the drawing below.



Dimension "X"

10 mm for size 48/60

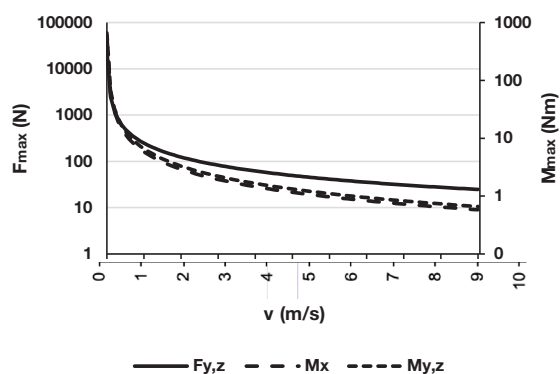
12 mm for size 80/100

For more information please visit:

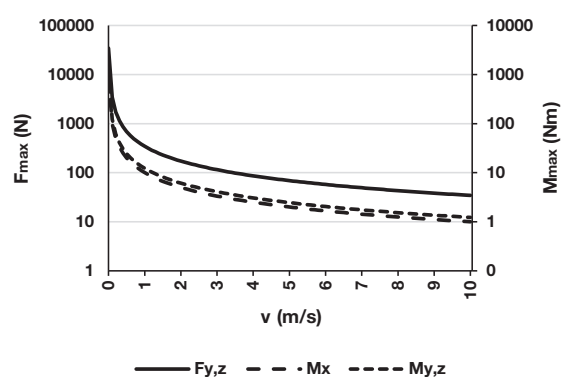
<https://www.norgren.com/uk/en/list/electric-actuators>

## Max. forces and moments

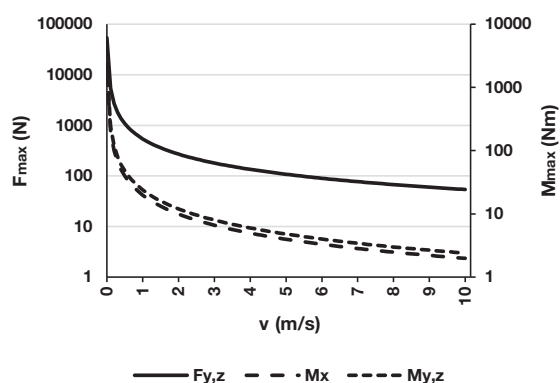
E/148048



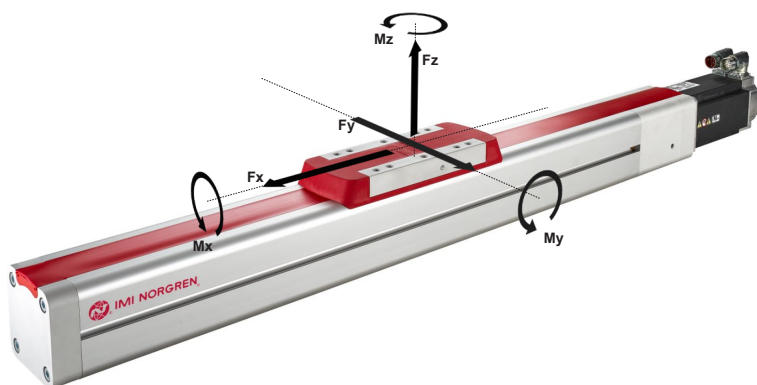
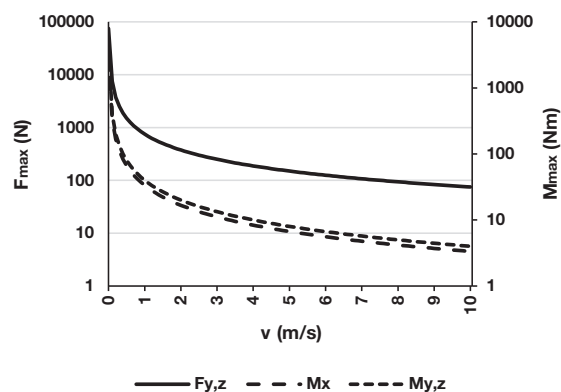
E/148060



E/148080



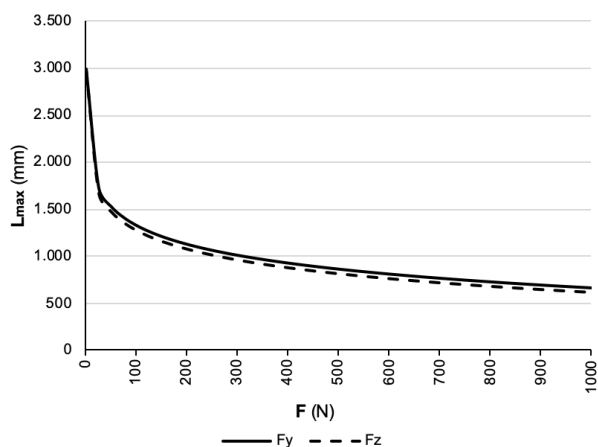
E/148100



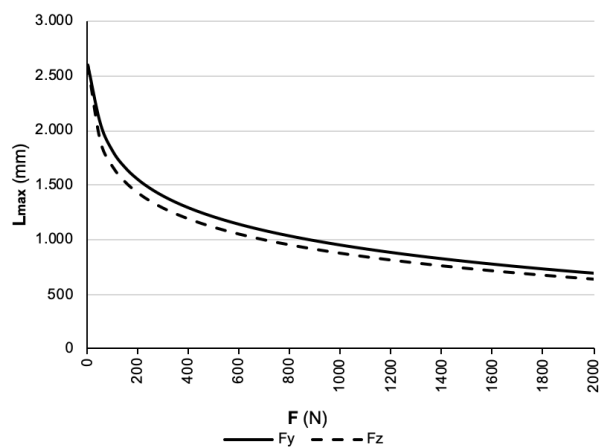
$$\frac{|M_x|}{M_{x,max}} + \frac{|M_y|}{M_{y,max}} + \frac{|M_z|}{M_{z,max}} + \frac{|\sum_j F_{y,tot,j}|}{F_{y,max}} + \frac{|\sum_i F_{z,tot,i}|}{F_{z,max}} \leq 1$$

## Unsupported length

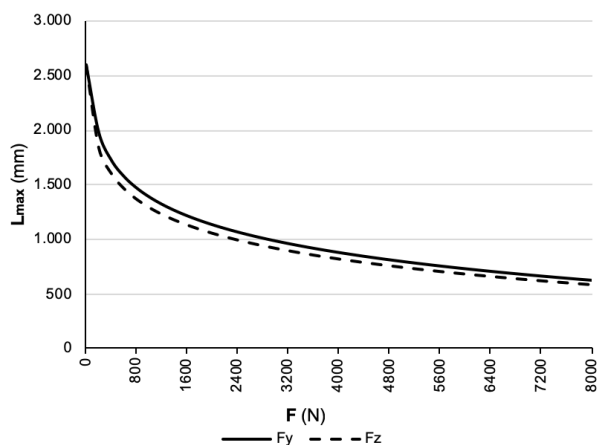
E/148048



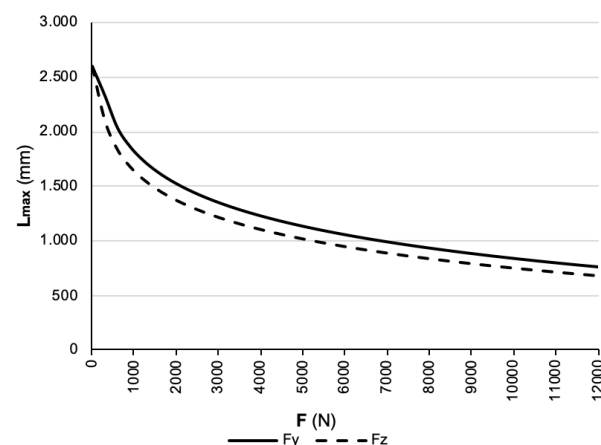
E/148060



E/148080



E/148100

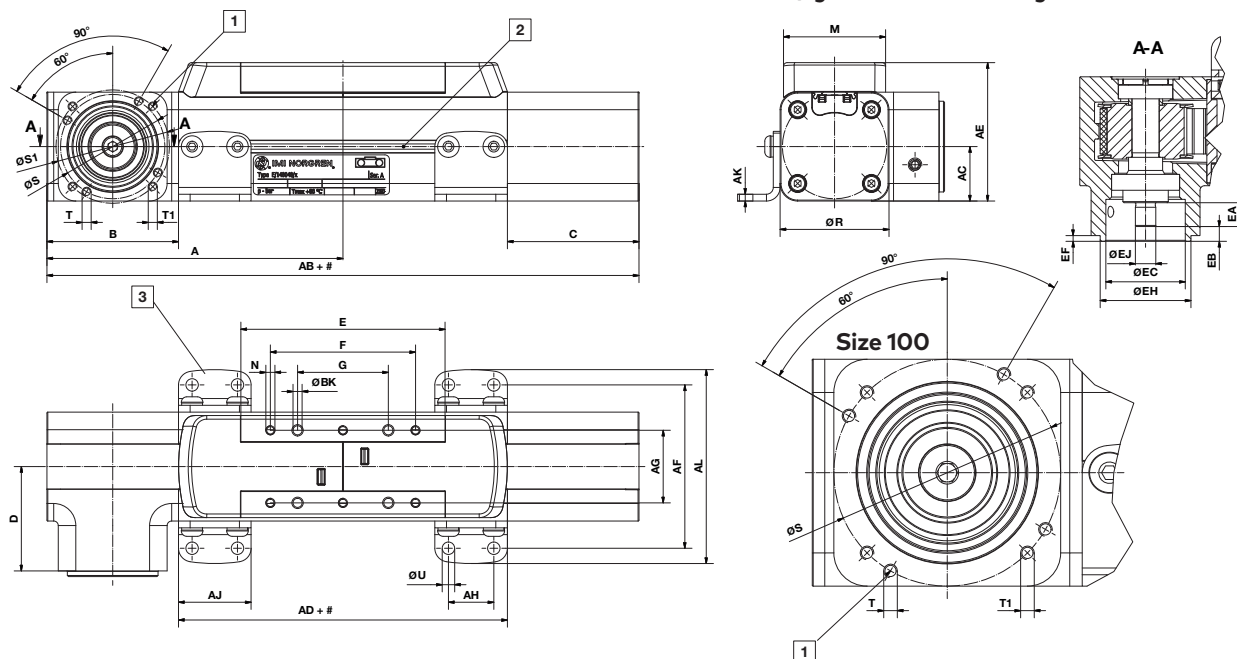


**Basic dimensions E/148000/A01/BXX, E/148000/B01/BXX**  
**Actuator without coupling with housing**  
**for customer individual motor**

Dimensions in mm  
 Projection/First angle



**Shown variant E/148000/A\***  
**Motor/ gear box orientation right**



# Stroke

1 Position of mounting threads for type A and B similar

2 Standard T-slots for groove key (see table page 13)

3 Two site supports include with delivery

| Size | A     | AB  | AC | AD       | AE    | AF  | AG | AH | AJ | AK | AL    | B   | BK           | C   | D  | E   | EA   | Model        |
|------|-------|-----|----|----------|-------|-----|----|----|----|----|-------|-----|--------------|-----|----|-----|------|--------------|
| 48   | 130.5 | 261 | 24 | max. 145 | 61    | 72  | 32 | 20 | 32 | 3  | 85.5  | 58  | 4 H7-8 deep  | 58  | 46 | 90  | 10.5 | E/148048/BXX |
| 60   | 165.5 | 331 | 30 | max. 185 | 77    | 90  | 44 | 28 | 44 | 4  | 108   | 73  | 5 H7-10 deep | 73  | 61 | 120 | 17.5 | E/148060/BXX |
| 80   | 214   | 428 | 40 | max. 230 | 101.5 | 115 | 56 | 36 | 56 | 4  | 137.5 | 99  | 6 H7-10 deep | 99  | 82 | 150 | 20.5 | E/148080/BXX |
| 100  | 254   | 508 | 50 | max. 270 | 125.5 | 140 | 74 | 42 | 66 | 5  | 166.5 | 119 | 8 H7-13 deep | 119 | 94 | 190 | 20.5 | E/148100/BXX |

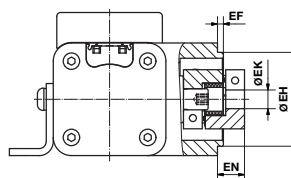
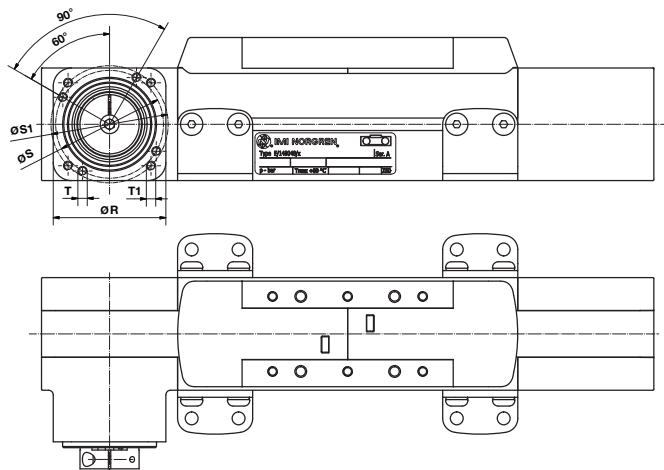
| Size | EB  | EC | EF  | EH    | EJ    | F   | G   | R   | S   | S1 | T            | T1           | N          | M  | U   | Weight at 0 mm (kg) | Weight per 100 mm (kg) | Model        |
|------|-----|----|-----|-------|-------|-----|-----|-----|-----|----|--------------|--------------|------------|----|-----|---------------------|------------------------|--------------|
| 48   | 6.5 | 35 | 2.5 | 40 h7 | 9 h7  | 64  | 40  | 48  | 46  | 50 | M4-10,5 deep | M4-10,5 deep | M4-9 deep  | 45 | 5.5 | 1,6                 | 0,3                    | E/148048/BXX |
| 60   | 4   | 45 | 2.5 | 50 h7 | 13 h7 | 90  | 60  | 60  | 57  | 70 | M5-13,5 deep | M5-13,5 deep | M5-12 deep | 57 | 6.6 | 3,3                 | 0,4                    | E/148060/BXX |
| 80   | 12  | 60 | 2.5 | 66 h7 | 18 h7 | 110 | 80  | 80  | 75  | 92 | M6-12,5 deep | M6-12,5 deep | M5-16 deep | 77 | 9   | 7,1                 | 0,7                    | E/148080/BXX |
| 100  | 13  | 70 | 2.5 | 80 h7 | 25 h7 | 150 | 110 | 100 | 100 | -  | M6-15,5 deep | M6-15,5 deep | M6-16 deep | 97 | 11  | 13,7                | 1,1                    | E/148100/BXX |

**Basic dimensions E/148000/A01/CXX, E/148000/B01/CXX**  
**Actuator with coupling with housing for customer individual motor**

Dimensions in mm  
 Projection/First angle

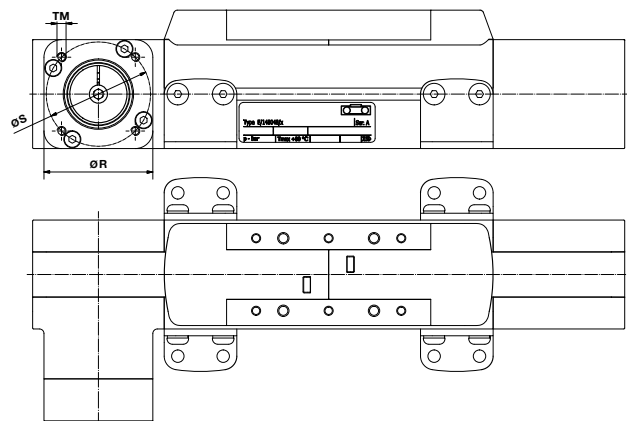


**Shown variant E/148000/A\***  
**Motor/ gear box orientation right**

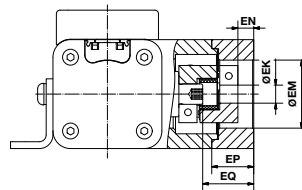


| Size | EF  | EH    | EK | EN   | R   | S   | S1 | T            | T1           | Weight at<br>0 mm<br>(kg) | Weight per<br>100 mm<br>(kg) | Model        |
|------|-----|-------|----|------|-----|-----|----|--------------|--------------|---------------------------|------------------------------|--------------|
| 48   | 2.5 | 40 h7 | 8  | 11.5 | 48  | 46  | 50 | M4-10,5 deep | M4-10,5 deep | 1,65                      | 0,3                          | E/148048/C08 |
| 48   | 2.5 | 40 h7 | 9  | 11.5 | 48  | 46  | 50 | M4-10,5 deep | M4-10,5 deep | 1,65                      | 0,3                          | E/148048/C09 |
| 48   | 2.5 | 40 h7 | 10 | 11,5 | 48  | 46  | 50 | M4-10,5 deep | M4-10,5 deep | 1,65                      | 0,3                          | E/148048/C10 |
| 60   | 2.5 | 50 h7 | 9  | 13   | 60  | 57  | 70 | M5-13,5 deep | M5-13,5 deep | 3,4                       | 0,4                          | E/148060/C09 |
| 60   | 2.5 | 50 h7 | 14 | 13   | 60  | 57  | 70 | M5-13,5 deep | M5-13,5 deep | 3,4                       | 0,4                          | E/148060/C14 |
| 80   | 2.5 | 66 h7 | 14 | 20   | 80  | 75  | 92 | M6-12,5 deep | M6-12,5 deep | 7,25                      | 0,7                          | E/148080/C14 |
| 80   | 2.5 | 66 h7 | 20 | 20   | 80  | 75  | 92 | M6-12,5 deep | M6-12,5 deep | 7,25                      | 0,7                          | E/148080/C20 |
| 100  | 2.5 | 80 h7 | 14 | 27   | 100 | 100 | -  | M6-15,5 deep | M6-15,5 deep | 14                        | 1,1                          | E/148100/C14 |
| 100  | 2.5 | 80 h7 | 19 | 27   | 100 | 100 | -  | M6-15,5 deep | M6-15,5 deep | 14                        | 1,1                          | E/148100/C19 |
| 100  | 2,5 | 80 h7 | 20 | 27   | 100 | 100 | -  | M6-15,5 deep | M6-15,5 deep | 14                        | 1,1                          | E/148100/C20 |

## Basic dimensions E/148000/A01/D\*\*, E/148000/B01/D\*\* Actuator with motor kit (motor flange)



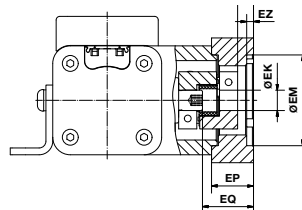
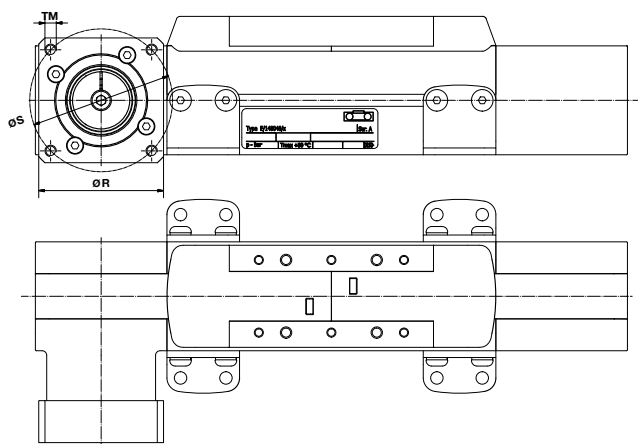
Shown variant E/148000/A\*  
Motor/ gear box orientation right



### Motor kit without gear box/D\*\*

| Size | EK | EM    | EN | EP   | EQ | EZ | R   | S  | TM         | Weight without motor at 0 mm (kg) | Weight per 100 mm (kg) | Model            |
|------|----|-------|----|------|----|----|-----|----|------------|-----------------------------------|------------------------|------------------|
| 48   | 8  | 30 G7 | 12 | 23,5 | 27 | -  | 48  | 46 | M4/12 deep | 2,2                               | 0,3                    | E/148048/*01/DX1 |
| 60   | 9  | 40 G7 | 7  | 20   | 21 | -  | 60  | 63 | M5/12 deep | 4,3                               | 0,4                    | E/148060/*01/DX1 |
| 80   | 14 | 60 G7 | 7  | 27   | 36 | -  | 80  | 75 | M5/15 deep | 8,4                               | 0,7                    | E/148080/*01/DX1 |
| 100  | 14 | 60 G7 | 7  | 34   | 44 | 4  | 100 | 75 | M5/17 deep | 15,5                              | 1,1                    | E/148100/*01/DX1 |

Shown variant E/148000/A\*  
Motor/ gear box orientation right



### Motor kit without gear box/D\*\*

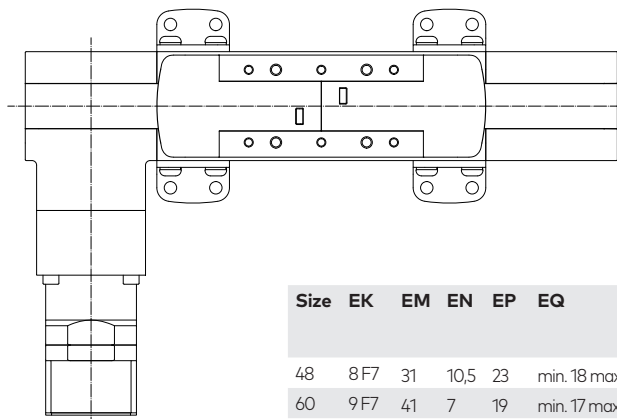
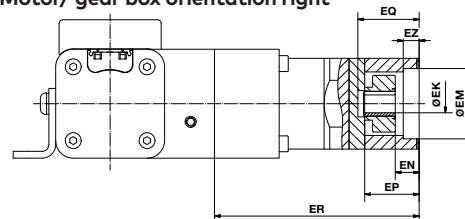
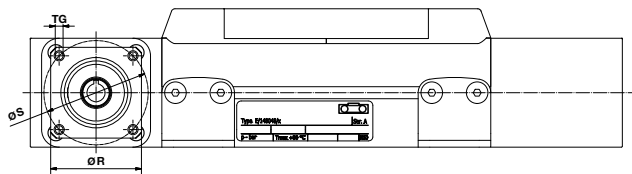
| Size | EK | EM    | EN   | EP   | EQ | EZ | R   | S   | TM         | Weight without motor at 0 mm (kg) | Weight per 100 mm (kg) | Model            |
|------|----|-------|------|------|----|----|-----|-----|------------|-----------------------------------|------------------------|------------------|
| 48   | 9  | 40 G7 | 7    | 18,5 | 22 | 3  | 55  | 63  | M5/10 deep | 3,35                              | 0,3                    | E/148048/*01/DX2 |
| 60   | 14 | 60 G7 | 18,5 | 31,5 | 33 | 3  | 70  | 75  | M5/10 deep | 5,4                               | 0,4                    | E/148060/*01/DX2 |
| 100  | 19 | 80 G7 | 7    | 34   | 44 | -  | 100 | 100 | M6/18 deep | 17,3                              | 1,1                    | E/148100/*01/DX2 |

## Basic dimensions E/148000/A0\*/D\*\*, E/148000/B0\*/D\*\* Actuator With motor kit (see page 12) and gear box

Dimensions in mm  
Projection/First angle

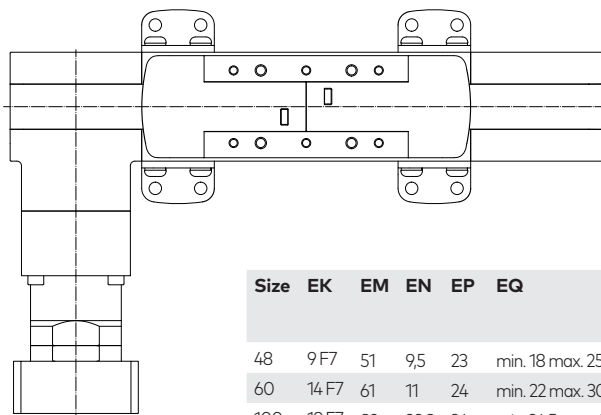
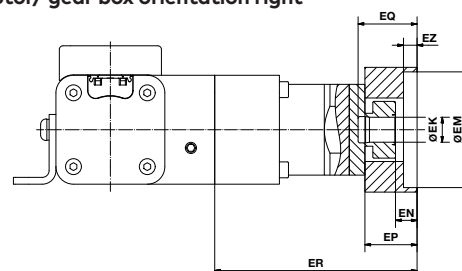
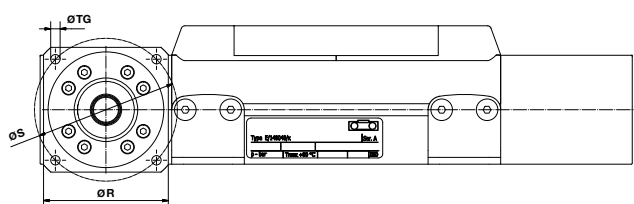


Shown variant E/148000/A\*  
Motor/ gear box orientation right



| Size | EK    | EM | EN   | EP | EQ                | ER    | EZ | R  | S  | TG         | Weight without motor at 0 mm (kg) | Weight per 100 mm (kg) | Model            |
|------|-------|----|------|----|-------------------|-------|----|----|----|------------|-----------------------------------|------------------------|------------------|
| 48   | 8 F7  | 31 | 10,5 | 23 | min. 18 max. 25   | 90    | 6  | 40 | 45 | M4/9 deep  | 4,4                               | 0,3                    | E/148048/*0*/DX1 |
| 60   | 9 F7  | 41 | 7    | 19 | min. 17 max. 25   | 115,5 | 5  | 60 | 63 | M5/11 deep | 6,9                               | 0,4                    | E/148060/*0*/DX1 |
| 80   | 12 F7 | 61 | 5,8  | 21 | min. 24,5 max. 35 | 130,5 | 6  | 80 | 75 | M5/11 deep | 11,45                             | 0,7                    | E/148080/*0*/DX1 |
| 100  | 14 F7 | 61 | 5,8  | 21 | min. 24,5 max. 35 | 129,5 | 6  | 80 | 75 | M5/11 deep | 20,5                              | 1,1                    | E/148100/*0*/DX1 |

Shown variant E/148000/A\*  
Motor/ gear box orientation right



| Size            | Model           | Gear ratio |
|-----------------|-----------------|------------|
| 60, 80, 100     | E/148***/*03/** | 1:3        |
| 48              | E/148048/*04/** | 1:4        |
| 60, 80, 100     | E/148***/*05/** | 1:5        |
| 48, 60, 80, 100 | E/148***/*07/** | 1:7        |

| Size | EK    | EM | EN   | EP | EQ                | ER    | EZ | R  | S   | TG         | Weight without motor at 0 mm (kg) | Weight per 100 mm (kg) | Model            |
|------|-------|----|------|----|-------------------|-------|----|----|-----|------------|-----------------------------------|------------------------|------------------|
| 48   | 9 F7  | 51 | 9,5  | 23 | min. 18 max. 25   | 89    | 6  | 55 | 63  | M5/11 deep | 6,05                              | 0,3                    | E/148048/*0*/DX2 |
| 60   | 14 F7 | 61 | 11   | 24 | min. 22 max. 30   | 119,5 | 10 | 70 | 75  | M5/11 deep | 9,3                               | 0,4                    | E/148060/*0*/DX2 |
| 100  | 19 F7 | 82 | 20,8 | 36 | min. 34,5 max. 45 | 143,5 | 16 | 90 | 100 | M6/13 deep | 25,2                              | 1,1                    | E/148100/*0*/DX2 |

## Mountings

| Mountings V                                                                       |              | Groove key                                                                        |  |
|-----------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------|--|
|  |              |  |  |
| □ <b>Page 17</b>                                                                  |              | <b>Page 17</b>                                                                    |  |
| 48                                                                                | QE/148048/18 | M/P74065                                                                          |  |
| 60                                                                                | QE/148060/18 | M/P74066                                                                          |  |
| 80                                                                                | QE/148080/18 | M/P41858                                                                          |  |
| 100                                                                               | QE/148100/18 | M/P76219                                                                          |  |

## Magnetically operated switches

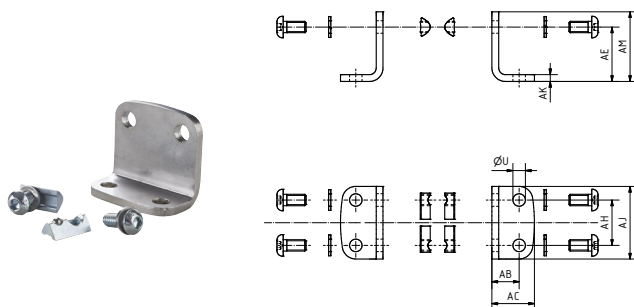
| M/50/**                                                                           |  | Switch mounting bracket                                                           |  |
|-----------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------|--|
|  |  |  |  |
| Ø <b>Page 20</b>                                                                  |  |                                                                                   |  |
| 48                                                                                |  | -                                                                                 |  |
| 60                                                                                |  | M/P76273                                                                          |  |
| 80                                                                                |  | M/P76274                                                                          |  |
| 100                                                                               |  | M/P76275                                                                          |  |

| QE/M*                                                                               |              |
|-------------------------------------------------------------------------------------|--------------|
|  |              |
| □ <b>Page 15 ... 18</b>                                                             |              |
| 55 (1,05 Nm)                                                                        | QE/M05530/** |
| 67 (2,45 Nm)                                                                        | QE/M06730/** |
| 67 (3,50 Nm)                                                                        | QE/M06730/** |
| 89 (6,90 Nm)                                                                        | QE/M08930/** |

## Mountings

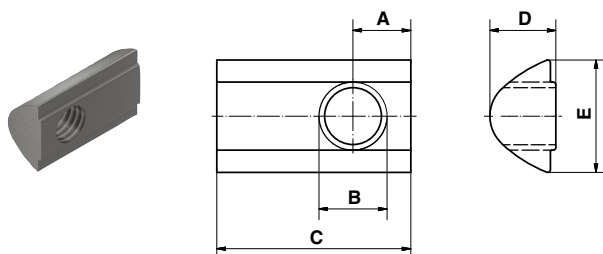
### Centre support V

Dimensions in mm  
Projection/First angle



| Size | AB   | AC   | AE | AH | AK | AJ | AM   | U   | Model        |
|------|------|------|----|----|----|----|------|-----|--------------|
| 48   | 12   | 18.7 | 24 | 20 | 3  | 32 | 30.7 | 5.5 | QE/148048/18 |
| 60   | 15   | 24   | 30 | 28 | 4  | 44 | 39   | 6.6 | QE/148060/18 |
| 80   | 17.5 | 28.7 | 40 | 36 | 4  | 56 | 51.2 | 9   | QE/148080/18 |
| 100  | 20   | 33.2 | 50 | 42 | 5  | 66 | 63.2 | 11  | QE/148100/18 |

## Groove key for guide profile



| Size | A   | B   | C    | D    | E    | Weight (kg) | Model    |
|------|-----|-----|------|------|------|-------------|----------|
| 48   | 4   | M5  | 12   | 4,25 | 8    | 0,01        | M/P74065 |
| 60   | 4,5 | M6  | 17   | 6,25 | 10,5 | 0,02        | M/P74066 |
| 80   | 7,5 | M8  | 23   | 7,3  | 13,5 | 0,03        | M/P41858 |
| 100  | 8,5 | M10 | 28,5 | 9,7  | 16,5 | 0,04        | M/P76219 |

- > Compact servo motor with high dynamics
- > Patented rotor technology
- > Holding brake available
- > Very high torque is required during rapid acceleration and deceleration profiles
- > IP65
- > Rated torques from 1,05 Nm up to 6,9 Nm
- > Optimised for pulse-duty application (300% overload)
- > 400 V three-phase
- > Two different feedback systems ( Resolver or Absolute (Multi turn))



### Technical features

#### Voltage:

400 VAC

#### Rated current:

0,7 ... 9 A

#### Power:

0,16 ... 3,3 kW

#### Rated speed (rpm):

3000

#### Ambient temperature:

0 ... 40 °C (32 ... 104 °F)\*

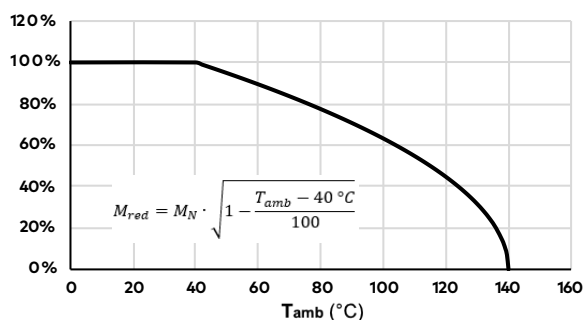
#### Humidity:

0 ... 95%

#### IP Protection rate:

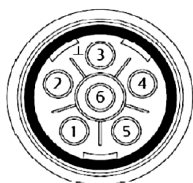
IP65

\* if the ambient temperatures is above 40 °C, the torque must be reduced according to the diagram.



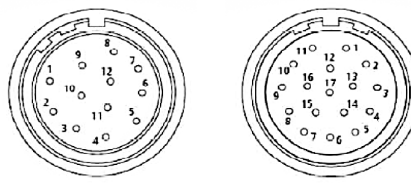
### Connection diagrams socket motor

#### Plug in for motor cable



| Pin   | Function with holding brake | Function without holding brake |
|-------|-----------------------------|--------------------------------|
| 1     | Phase U (R)                 | Phase U (R)                    |
| 2     | Phase V (S)                 | Phase V (S)                    |
| 3     | Ground                      | Ground                         |
| 4     | Phase W (T)                 | Phase W (T)                    |
| 5     | Brake +24 V                 |                                |
| 6     | Brake 0 V                   |                                |
| Shell | Screen                      | Screen                         |

#### Plug in for feedback cable



| Pin  | Function Resolver | Function Absolute (Multi turn) |
|------|-------------------|--------------------------------|
| 1    | Excitation High   | Thermistor                     |
| 2    | Excitation Low    | Thermistor                     |
| 3    | Cos High          | Screen (Optical only)          |
| 4    | Cos Low           |                                |
| 5    | Sin High          |                                |
| 6    | Sin Low           |                                |
| 7    | Thermistor        |                                |
| 8    | Thermistor        | + Clock                        |
| 9    |                   | - Clock                        |
| 10   |                   |                                |
| 11   |                   | + Data                         |
| 12   |                   | - Data                         |
| 13   |                   | - Cos                          |
| 14   |                   |                                |
| 15   |                   |                                |
| 16   |                   |                                |
| 17   |                   | 0 Volts                        |
| Body | Screen            | Screen                         |

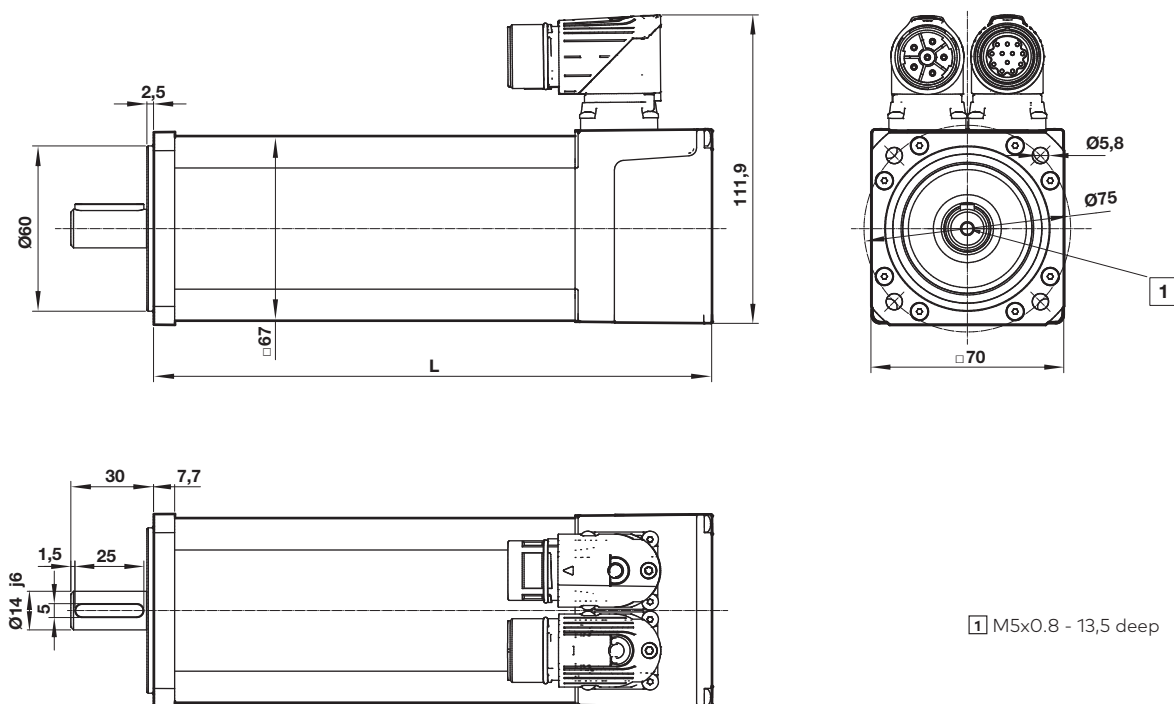
For further information please visit:

<http://acim.nidec.com/drives/control-techniques/downloads/user-guides-and-software/unimotorhd>

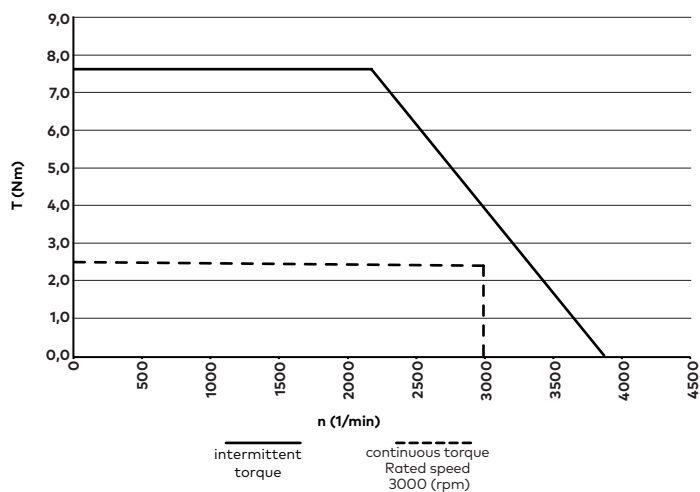
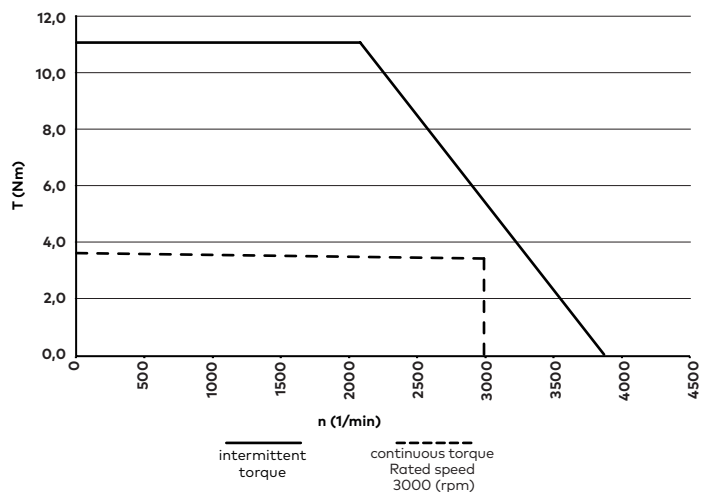


**Motor QE/M06730/\***

Dimensions in mm  
Projection/First angle

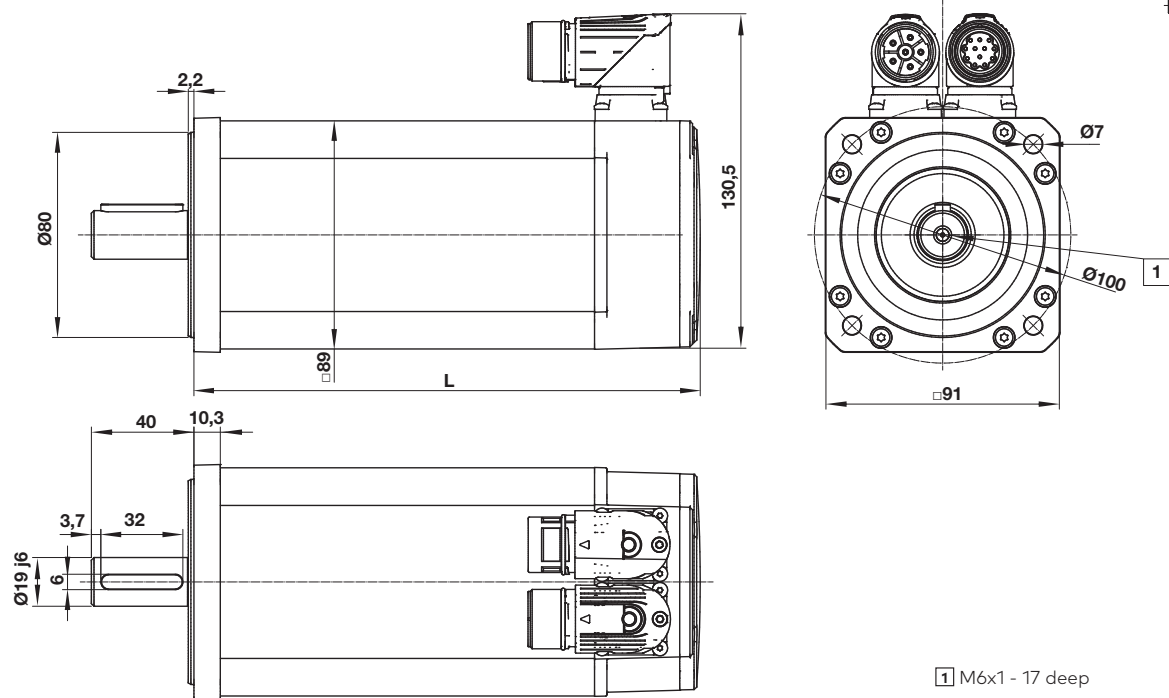


| Motor-code | Feedback system       | Rated torque<br>(Nm) | Rated power<br>(kW) | Stall current<br>(A) | Motor stall torque<br>(Nm) | Motor peak torque<br>(Nm) | Braking torque holding brake<br>(Nm) | Inertia<br>(kg m²) | Brake | L<br>(mm) | Weight<br>(kg) | Nidec reference number | Model           |
|------------|-----------------------|----------------------|---------------------|----------------------|----------------------------|---------------------------|--------------------------------------|--------------------|-------|-----------|----------------|------------------------|-----------------|
| JA         | Resolver              | 2,45                 | 0,77                | 1,59                 | 2,55                       | 7,65                      | -                                    | 0,000053           | -     | 172,7     | 2,6            | 067UDB300BAARA         | QE/M06730/JA/14 |
| JB         | Absolute (Multi turn) | 2,45                 | 0,77                | 1,59                 | 2,55                       | 7,65                      | -                                    | 0,000053           | -     | 172,7     | 2,6            | 067UDB300BAEGA         | QE/M06730/JB/14 |
| JM         | Resolver              | 2,45                 | 0,77                | 1,59                 | 2,55                       | 7,65                      | 2,0                                  | 0,000053           | x     | 207,7     | 3,3            | 067UDB306BAARA         | QE/M06730/JM/14 |
| JN         | Absolute (Multi turn) | 2,45                 | 0,77                | 1,59                 | 2,55                       | 7,65                      | 2,0                                  | 0,000053           | x     | 207,7     | 3,3            | 067UDB306BAEGA         | QE/M06730/JN/14 |
| NA         | Resolver              | 3,50                 | 1,10                | 2,31                 | 3,70                       | 11,10                     | -                                    | 0,000075           | -     | 202,7     | 3,2            | 067UDC300BAARA         | QE/M06730/NA/14 |
| NB         | Absolute (Multi turn) | 3,50                 | 1,10                | 2,31                 | 3,70                       | 11,10                     | -                                    | 0,000075           | -     | 202,7     | 3,2            | 067UDC300BAEGA         | QE/M06730/NB/14 |
| NM         | Resolver              | 3,50                 | 1,10                | 2,31                 | 3,70                       | 11,10                     | 2,0                                  | 0,000075           | x     | 237,7     | 3,8            | 067UDC306BAARA         | QE/M06730/NM/14 |
| NN         | Absolute (Multi turn) | 3,50                 | 1,10                | 2,31                 | 3,70                       | 11,10                     | 2,0                                  | 0,000075           | x     | 237,7     | 3,8            | 067UDC306BAEGA         | QE/M06730/NN/14 |

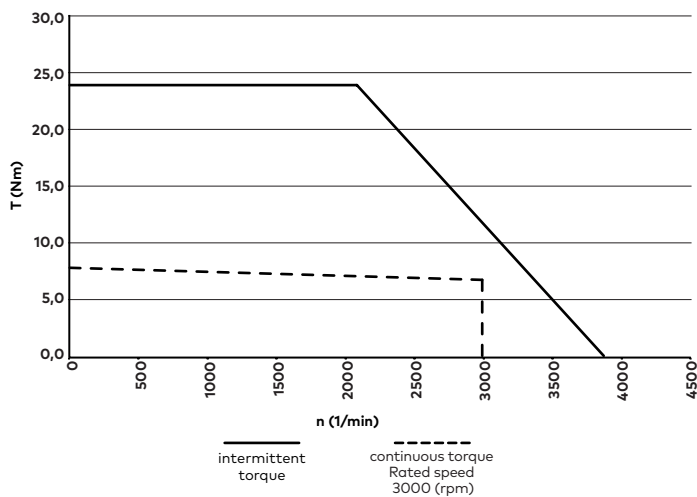
**QE/M06730/J\***

**QE/M06730/N\***


**Motor QE/M08930/\***

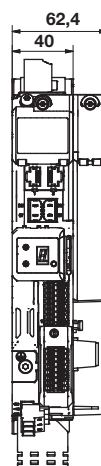
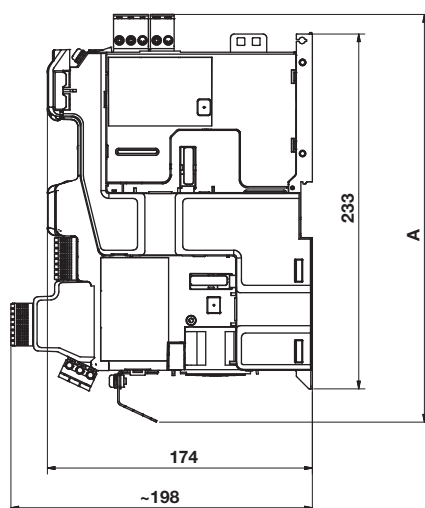
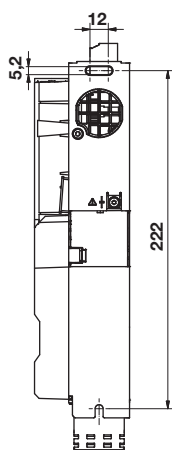
Dimensions in mm  
Projection/First angle



| Motor-code | Feedback system       | Rated torque<br>(Nm) | Rated power<br>(kW) | Stall current<br>(A) | Motor stall torque<br>(Nm) | Motor peak torque<br>(Nm) | Braking torque holding brake<br>(Nm) | Inertia<br>(kg m <sup>2</sup> ) | Brake | L<br>(mm) | Weight<br>(kg) | Nidec reference number | Model           |
|------------|-----------------------|----------------------|---------------------|----------------------|----------------------------|---------------------------|--------------------------------------|---------------------------------|-------|-----------|----------------|------------------------|-----------------|
| RA         | Resolver              | 6,90                 | 2,17                | 5,0                  | 8,0                        | 24,0                      | -                                    | 0,000234                        | -     | 197,8     | 5,5            | 089UDC300BAAEA         | QE/M08930/RA/19 |
| RB         | Absolute (Multi turn) | 6,90                 | 2,17                | 5,0                  | 8,0                        | 24,0                      | -                                    | 0,000234                        | -     | 207,8     | 4,9            | 089UDC300BAECA         | QE/M08930/RB/19 |
| RM         | Resolver              | 6,90                 | 2,17                | 5,0                  | 8,0                        | 24,0                      | 10,0                                 | 0,000234                        | x     | 237,9     | 6,8            | 089UDC306BAAEA         | QE/M08930/RM/19 |
| RN         | Absolute (Multi turn) | 6,90                 | 2,17                | 5,0                  | 8,0                        | 24,0                      | 10,0                                 | 0,000234                        | x     | 247,9     | 6,2            | 089UDC306BAECA         | QE/M08930/RN/19 |

**QE/M08930/R\***


- > 2 Compact drive frame sizes with maximum performance
- > Onboard Advanced Motion Controller for distributed 1.5 axis motion control
- > Integrated Dual Safe Torque Off - "SIL3 and PLe"
- > Option module flexibility
- > Drives available with EtherCAT, PROFINET, PROFIBUS, EtherNet/IP, DeviceNet & CANopen communications
- > Built-in RS485 communications
- > SD Card slot



| A     | B   | C   | Nidec reference number   | Standard model drive |
|-------|-----|-----|--------------------------|----------------------|
| ~ 268 | 233 | 222 | M751-01400030A10100AB110 | QE/D01400030         |
| ~ 313 | 278 | 267 | M751-02400105A10100AB110 | QE/D02400105         |

| Description                                                        | Line supply (VAC)                              | Voltage (V) | Output power (kW): | max. Power (kW) | Rated current (A) | max. Peak current (A) | max. output frequency (Hz) | Overload closed loop            | Overload open loop | Nidec reference number   | Standard model drive |
|--------------------------------------------------------------------|------------------------------------------------|-------------|--------------------|-----------------|-------------------|-----------------------|----------------------------|---------------------------------|--------------------|--------------------------|----------------------|
| Standard drive with internal Bus-system (for motor size □55 - 67)  | three-phase 380 ... 480 (±10%) at 45 ... 66 Hz | 400         | 0,75               | 6,5             | 3                 | 9                     | 599                        | 300% for 0,25 s or 200% for 4 s | 150% for 8 s       | M751-01400030A10100AB110 | QE/D01400030         |
| Standard drive with internal Bus-system (for motor size □89 - 115) | three-phase 380 ... 480 (±10%) at 45 ... 66 Hz | 400         | 4,0                | 8,7             | 10,5              | 31,5                  | 599                        | 300% for 0,25 s or 200% for 4 s | 150% for 8 s       | M751-02400105A10100AB110 | QE/D02400105         |

For further information please visit:

<http://acim.nidec.com/drives/control-techniques/downloads/user-guides-and-software/digitax-hd>

- > **Magnetically operated reed switch - Round style**
- > **Suitable for all cylinder ranges with magnetic piston**
- > **Switches can be mounted flush with the delivered special adaptor**
- > **LED indicator on LSU models**
- > **Alternative variants allow a wide range of application**



### Technical features

#### Operation:

M/50/LSU Normally open with LED (yellow)

#### Switching voltage (Ub):

10 ... 240 VAC/170 VDC

#### Switching voltage output:

Ub - 2,7 V

#### Switching current

(see graph overleaf):

0,18 A max.

#### Switching power:

10 W/10 VA max.

#### Contact resistance:

150 mΩ

#### Response time:

1,8 ms

#### Operating temperature:

-25 ... +80 °C (-13 ... +176 °F)

#### High temperature version:

+150 °C max.(+302 °F)

#### Protection rating (EN 60529):

IP66

#### Shock resistance:

50 g (during 11 ms)

#### Vibration resistance:

35 g (at 2000 Hz)

#### Cable type:

2 x 0,25: PVC, PUR or silicone

3 x 0,25 PVC

#### Cable length:

2, 5 or 10 m

#### Electromagnetic compatibility

according to:

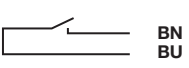
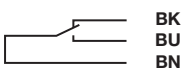
EN 60947-5-2

#### Materials:

Body: plastic

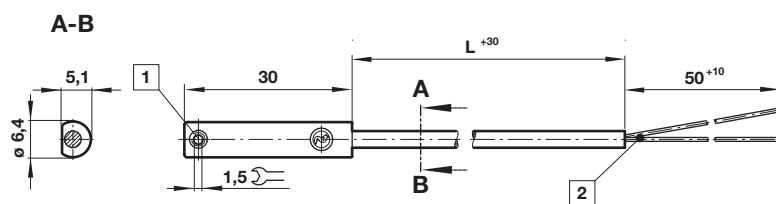
Cable: see table below

### Technical data - Reed switches - additional information see data sheet en 4.3.005

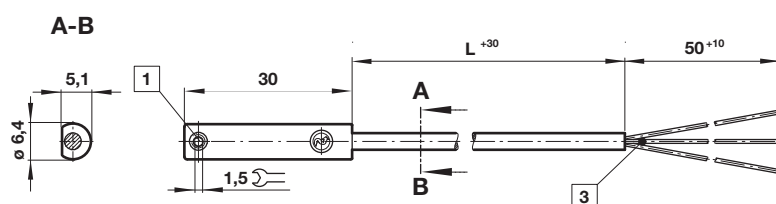
| Symbol                                                                              | Voltage        |            | Current maximum | Function | Operating temperature | LED          | Protection class | Plug  | Cable length | Cable type | Weight           | Model |                 |
|-------------------------------------------------------------------------------------|----------------|------------|-----------------|----------|-----------------------|--------------|------------------|-------|--------------|------------|------------------|-------|-----------------|
|                                                                                     | (VAC)          | (VDC)      | (mA)            |          | (°C)                  |              |                  |       | (m)          |            | (g)              |       |                 |
|  | ± BN           | 10 ... 240 | 10 ... 170      | 180      | Normally open         | -25 ... +80  | •                | IP 66 | —            | 2, 5 or 10 | PVC 2 x 0,25     | 37    | M/50/LSU/*V     |
|                                                                                     | ~ BU           | 10 ... 240 | 10 ... 170      | 180      | Normally open         | -25 ... +80  | •                | IP 66 | —            | 5          | PUR 2 x 0,25     | 37    | M/50/LSU/SU     |
|  | BN<br>BU       | 10 ... 240 | 10 ... 170      | 180      | Normally open         | -25 ... +150 | —                | IP 66 | —            | 2          | Silicon 2 x 0,25 | 37    | TM/50/RAU/2S    |
|  | BK<br>BU<br>BN | 10 ... 240 | 10 ... 170      | 180      | Changeover            | -25 ... +80  | —                | IP 66 | —            | 5          | PVC 3 x 0,25     | 37    | M/50/RAC/5V     |
|  | ± BN           | 10 ... 60  | 10 ... 60       | 180      | Normally open         | -25 ... +80  | •                | IP 66 | M8 x1        | 0,3        | PVC 3 x 0,25     | 16    | M/50/LSU/CP *1) |
|                                                                                     | ~ BK           | 10 ... 60  | 10 ... 60       | 180      | Normally open         | -25 ... +80  | •                | IP 66 | M12 x1       | 0,3        | PVC 3 x 0,25     | 16    | M/50/LSU/CC *1) |

\* Insert cable length; \*1) Plug-in connector see page 22

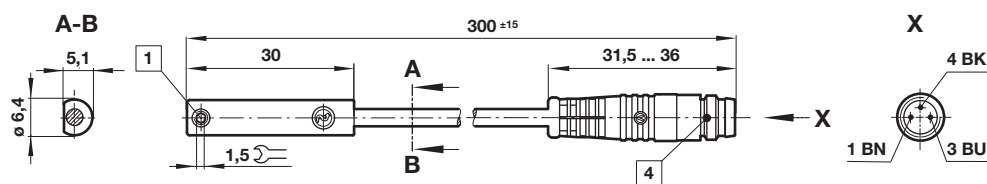
M/50/LSU/\*V, M/50/LSU/5U,  
TM/50/RAU/2S  
Cable length L = 2, 5 or 10 m



M/50/RAC/5V  
Cable length L = 5 m



M/50/LSU/CP  
M/50/LSU/CC



- 1 Fixing screw
- 2 + BN = brown; - BU = blue (output)
- 3 - BK = black; + BN = brown; - #BU = blue
- 4 Version CP: Plug M8 x 1, color code: BK = +; BN = -; BU = output  
Version CC: Plug M12 x 1, color code: BK = +; BN = -; BU = output

## Accessories

Plug-in connector cable with nut



| Outer cover  | Cable length (m) | Weight (kg) | Connector | Connector  |
|--------------|------------------|-------------|-----------|------------|
| PVC 3 x 0,25 | 5                | 0,18        | M8 x 1    | M/P73001/5 |
| PUR 3 x 0,25 | 5                | 0,18        | M8 x 1    | M/P73002/5 |
| PUR 3 x 0,34 | 5                | 0,21        | M12 x 1   | M/P34594/5 |

- > Magnetically operated solid state switch - round style
- > IO-Link version available
- > Suitable for all cylinder ranges with magnetic piston
- > Switches can be mounted flush in all profile cylinders
- > Reliable switching with a very fast response time
- > Particularly suited for use in high levels of vibration
- > LED indicator as standard
- > CE certified
- > UL listed





### Technical features

#### Operation:

M/50/EAP (PNP) open collector output with LED (yellow)

M/50/EAN (NPN) grounded emitter output with LED (yellow)

M/50/IOP (PNP) Easy IO-Link open collector output with LED (yellow)

#### Switching voltage (U<sub>b</sub>):

10 ... 30 VDC

#### Switching voltage output:

U<sub>b</sub> - 2 V

#### Inducted voltage:

0,5 V

#### Switching current (see graph overleaf):

100 mA max.

#### Switching power:

3,0 W max.

#### Response time:

< 0,5 ms for EAP switch

< = 1 ms for IOP switch

#### Operating frequency:

1 kHz

#### Protection rating (EN 60529):

IP67 (standard)

IP68 for type: M/50/EAP/5U

#### Operating temperature:

-40 ... +80 °C (-40 ... 176 °F)

(IP67 & IP68)

#### Cable type:

PVC 3 x 0,12 (standard)

PUR 3 x 0,14 (M/50/EAP/5U)

#### Cable length:

2, 5 and 10 m

#### Electromagnetic compatibility according to:

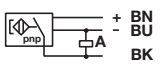
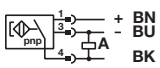
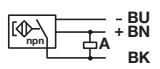
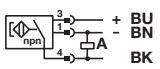
EN 60947-5-2

#### Materials:

Body: plastic

Cable: see table below

### Technical data - Solid state

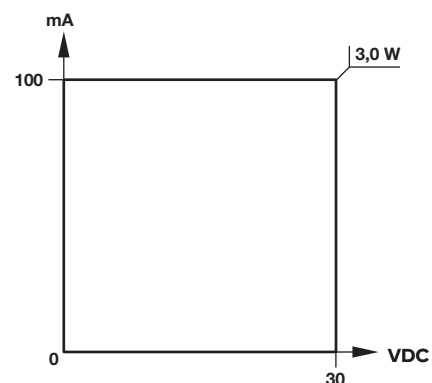
| Symbol                                                                              | Voltage (VDC) | Current maximum (mA) | Function | IO-Link *2) | Operating temperature (°C) | LED | Protection class | Plug   | Cable length (m) | Cable type   | Weight (g) | Model           |
|-------------------------------------------------------------------------------------|---------------|----------------------|----------|-------------|----------------------------|-----|------------------|--------|------------------|--------------|------------|-----------------|
|  | 10 ... 30     | 100                  | PNP      |             | -40 ... +80                | •   | IP67             | —      | 2, 5 or 10       | PVC 3 x 0,12 | 37         | M/50/EAP/*V     |
|                                                                                     | 10 ... 30     | 100                  | PNP      | •           | -40 ... +80                | •   | IP67             | —      | 5                | PVC 3 x 0,12 | 37         | M/50/IOP/5V     |
|                                                                                     | 10 ... 30     | 100                  | PNP      |             | -40 ... +80                | •   | IP68             | —      | 5                | PUR 3 x 0,14 | 37         | M/50/EAP/5U     |
|  | 10 ... 30     | 100                  | PNP      |             | -40 ... +80                | •   | IP67             | M8 x1  | 0,3              | PVC 3 x 0,14 | 16         | M/50/EAP/CP *1) |
|                                                                                     | 10 ... 30     | 100                  | PNP      | •           | -40 ... +80                | •   | IP67             | M8 x1  | 0,3              | PVC 3 x 0,14 | 16         | M/50/IOP/CP *1) |
|                                                                                     | 10 ... 30     | 100                  | PNP      |             | -40 ... +80                | •   | IP67             | M12 x1 | 0,3              | PVC 3 x 0,14 | 16         | M/50/EAP/CC *1) |
|  | 10 ... 30     | 100                  | NPN      |             | -40 ... +80                | •   | IP67             | —      | 2, 5 or 10       | PVC 3 x 0,12 | 37         | M/50/EAN/*V     |
|  | 10 ... 30     | 100                  | NPN      |             | -40 ... +80                | •   | IP67             | M8 x1  | 0,3              | PVC 3 x 0,14 | 16         | M/50/EAN/CP *1) |

\* Insert cable length; \*1) Plug-in connector below; Color code: BK = black, BN = brown, BU = blue

### IO-Link function \*2)

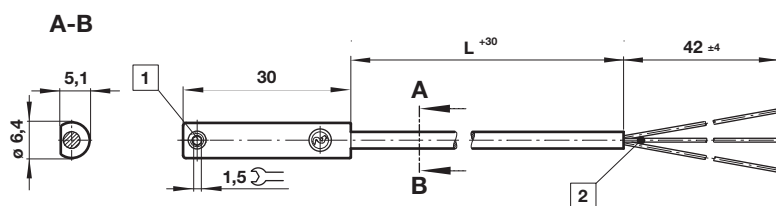
- Visual installation aid
- Counter
- Temperature diagnostic
- Power LED

### Switching current and switching voltage



## Dimensions

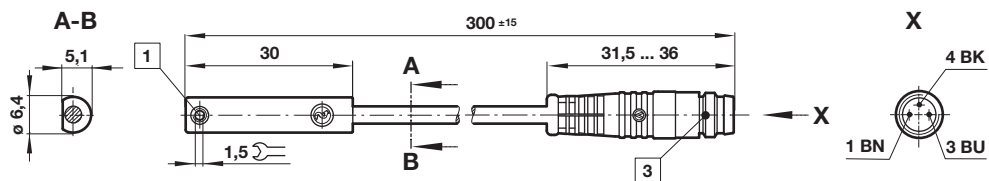
M/50/EAP/\*V,  
M/50/EAN/\*V  
M/50/IOP/5V  
Cable length L = 2, 5 or 10 m



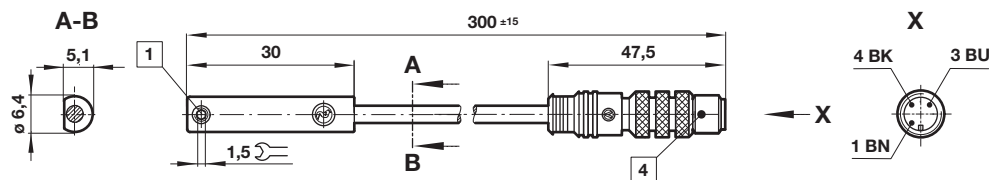
Dimensions in mm  
Projection/First angle



M/50/EAP/CP,  
M/50/EAN/CP  
M/50/IOP/CP



M/50/EAP/CC



- 1 Fixing screw
- 2 Color code: BK = black; BN = brown; BU = blue
- 3 Plug M8 x 1
- 4 Plug M12 x 1

## Accessories

### Plug-in connector cable with nut



| Outer cover  | Cable length (m) | Weight (kg) | Connector | Connector     |
|--------------|------------------|-------------|-----------|---------------|
| PVC 3 x 0,25 | 5                | 0,18        | M8 x 1    | M/P73001/5*1) |
| PUR 3 x 0,25 | 5                | 0,18        | M8 x 1    | M/P73002/5*1) |
| PVC 3 x 0,25 | 5                | 0,18        | M8 x 1    | M/P34615/5*2) |
| PUR 3 x 0,25 | 5                | 0,18        | M8 x 1    | M/34596/5*2)  |
| PUR 3 x 0,34 | 5                | 0,21        | M12 x 1   | M/P34594/5*1) |

\*1) Straight connector

\*2) 90 ° Connector

## Bus card

| Description       | SI-PROFINET RT V2                                                                 | SI-PROFIBUS                                                                       | SI-EtherNet/IP                                                                    | SI-EtherCAT                                                                        | SI-CANopen                                                                          | SI-DeviceNet                                                                        |
|-------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                   |  |  |  |  |  |  |
| <b>Color code</b> | Green                                                                             | Purple                                                                            | Cream                                                                             | Red                                                                                | White                                                                               | Grey                                                                                |
| <b>Model</b>      | QE/B18200/PN                                                                      | QE/B17500/PB                                                                      | QE/B17900/EN                                                                      | QE/B18000/EC                                                                       | QE/B17600/CO                                                                        | QE/B17700/DN                                                                        |

**Description** SI-I/O  
Extended I/O interface module to increase the number of analog and digital In- and Outputs on the drive.



**Color code** Orange  
**Model** QE/B17800/IO

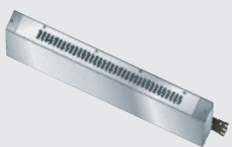
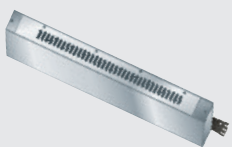
## Power cable

| Description         | Motor cable without brake                                                          |                                                                                    | Motor cable with brake                                                             |                                                                                    |
|---------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                     |  |  |  |  |
| <b>Cable length</b> | 5 m                                                                                | 10 m                                                                               | 5 m                                                                                | 10 m                                                                               |
| <b>Model</b>        | QE/C5402/08/5                                                                      | QE/C5402/08/10                                                                     | QE/C5402/18/5                                                                      | QE/C5402/18/10                                                                     |

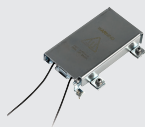
## Feedback cable

| Description         | Feedback cable resolver                                                             |                                                                                      | Feedback cable Multi Turn                                                            |                                                                                      |
|---------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                     |  |  |  |  |
| <b>Cable length</b> | 5 m                                                                                 | 10 m                                                                                 | 5 m                                                                                  | 10 m                                                                                 |
| <b>Model</b>        | QE/F5400/61/5                                                                       | QE/F5400/61/10                                                                       | QE/F5400/30/5                                                                        | QE/F5400/30/10                                                                       |

## Drive accessories

|                                                                                                                                                                                                                                                                 |                                                                                                                                    |                                                                                                                               |                       |                                                                                                                               |                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Multiple axis kit short</b><br><br><b>long</b><br><br>QE/A9500/1047      QE/A9500/1048 | <b>USB converter cable</b><br><br>QE/A4500/0096 | <b>KI compact display</b><br><br>QE/A20400 | <b>EMC filter for</b> | <b>QE/D01400030</b><br><br>QE/A4200/8744 | <b>QE/D02400105</b><br><br>QE/A4200/1644 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|

**Brake resistor for 50 W**      **100 W**



QE/A9500/1049      QE/A1220/2801

## Warning

These products should only be used where the values listed under **"Technical features/data"** are not exceeded.

Please refer to the corresponding catalogue page.

Before using the products in non-industrial applications, in life-support or other systems not included in the published instructions, please contact Norgren directly.

Misuse, wear, or malfunction can cause components to fail in a variety of ways.

System designers are strongly recommended to consider the failure modes of all component parts used and to take adequate safety precautions to prevent personal injury and damage to equipment in the event of such failure.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.