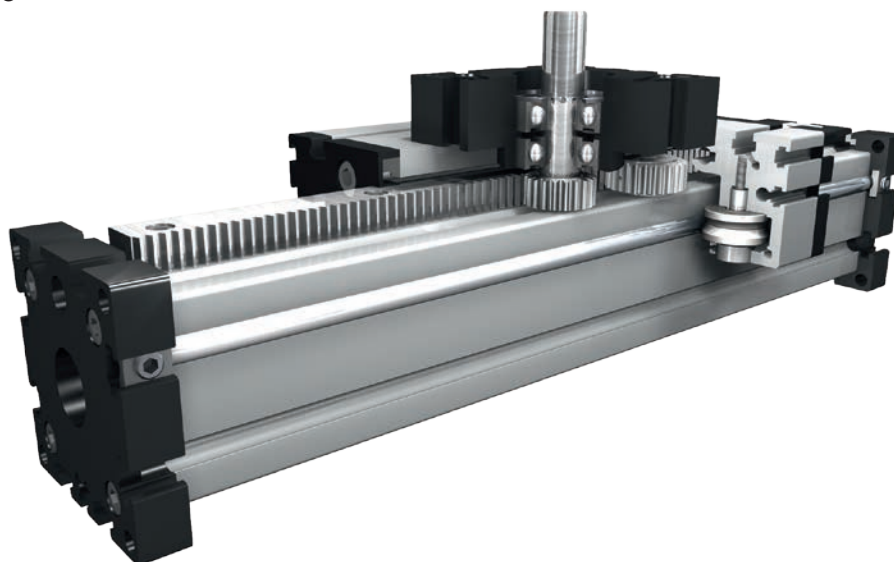


# Positioning system ELZQ 60, 80, 80S

Specifications

## Rack and pinion drive



4.1

### Function:

This unit consists of an aluminium square profile with integrated, hardened steel guide rods. The carriage, which has internal linear ball bearings that can be adjusted free of play, is driven along the guide rods by a high precision rack. The rack and pinion system is suitable for highly dynamic servo operation and ideal for lifting movements. The pinion has maintenance-free ball bearings. The rack is lubricated by a toothed felt wheel.

**Fitting position:** As required. Max. length without joints 6.000 mm.

**Carriage mounting:** By T-slots.

**Unit mounting:** By T-slots and holes in the bearing block, mounting sets.

**Rack:** Cf53; h6= hardened and ground; h7 = finely toothed. Repeatability: ± 0,1 mm.

| Forces and torques   | Size           | ELZQ 60 h6           |         | ELZQ 60 h7           |         | ELZQ 80 h6            |         | ELZQ 80 h7            |         | ELZQ 80S h6           |         | ELZQ 80S h7           |         |
|--|----------------|----------------------|---------|----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|
|  | Forces/Torques | static               | dynamic | static               | dynamic | static                | dynamic | static                | dynamic | static                | dynamic | static                | dynamic |
| $F_x$ (N)  |                | 1800                 | 1400    | 940                  | 780     | 1800                  | 1400    | 940                   | 780     | 1800                  | 1400    | 940                   | 780     |
| $F_y$ (N)  |                | 3000                 | 2000    | 3000                 | 2000    | 3000                  | 2000    | 3000                  | 2000    | 4600                  | 3600    | 4600                  | 3600    |
| $F_z$ (N)  |                | 1700                 | 1100    | 1700                 | 1100    | 1700                  | 1100    | 1700                  | 1100    | 3000                  | 1800    | 3000                  | 1800    |
| $M_x$ (Nm)   |                | 67                   | 43      | 67                   | 43      | 90                    | 55      | 90                    | 55      | 170                   | 140     | 170                   | 140     |
| $M_y$ (Nm)   |                | 90                   | 70      | 90                   | 70      | 110                   | 80      | 110                   | 80      | 270                   | 230     | 270                   | 230     |
| $M_z$ (Nm)   |                | 120                  | 100     | 120                  | 100     | 150                   | 120     | 150                   | 120     | 300                   | 220     | 300                   | 220     |
| <b>All forces and torques related to the following:</b>  |                |                      |         |                      |         |                       |         |                       |         |                       |         |                       |         |
| existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ |                |                      |         |                      |         |                       |         |                       |         |                       |         |                       |         |
| table values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$    |                |                      |         |                      |         |                       |         |                       |         |                       |         |                       |         |
| <b>Speed</b>   |                |                      |         |                      |         |                       |         |                       |         |                       |         |                       |         |
| (m/s) max  |                | 4                    |         | 4                    |         | 4                     |         | 4                     |         | 4                     |         | 4                     |         |
| <b>Geometrical moments of inertia of aluminium profile</b>   |                |                      |         |                      |         |                       |         |                       |         |                       |         |                       |         |
| $I_x$ mm <sup>4</sup>  |                | 6,79x10 <sup>5</sup> |         | 6,79x10 <sup>5</sup> |         | 18,99x10 <sup>5</sup> |         | 18,99x10 <sup>5</sup> |         | 18,99x10 <sup>5</sup> |         | 18,99x10 <sup>5</sup> |         |
| $I_y$ mm <sup>4</sup>  |                | 6,97x10 <sup>5</sup> |         | 6,97x10 <sup>5</sup> |         | 18,97x10 <sup>5</sup> |         | 18,97x10 <sup>5</sup> |         | 18,97x10 <sup>5</sup> |         | 18,97x10 <sup>5</sup> |         |
| E-Modulus N/mm <sup>2</sup>  |                | 70000                |         | 70000                |         | 70000                 |         | 70000                 |         | 70000                 |         | 70000                 |         |

For life-time calculation of rollers use our CD-ROM or homepage!

### Formula: ELZQ

Driving torque:

$$M_o = \frac{F \cdot P \cdot S_i}{2000 \cdot \pi} + M_{leer}$$

$$P_o = \frac{M_o \cdot n}{9550}$$

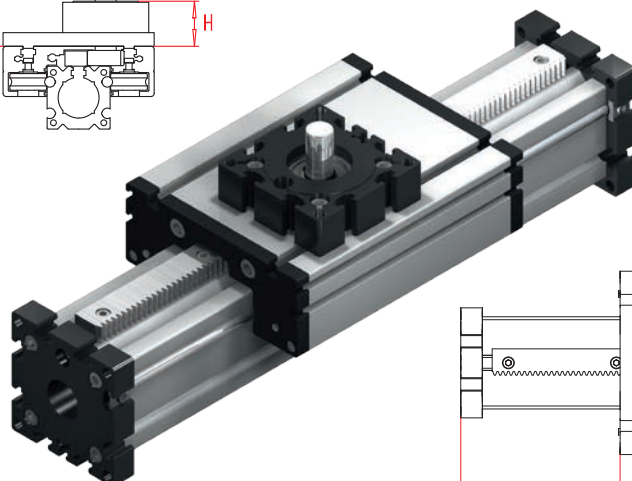
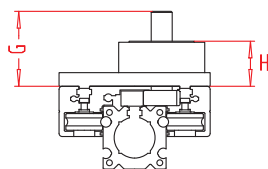
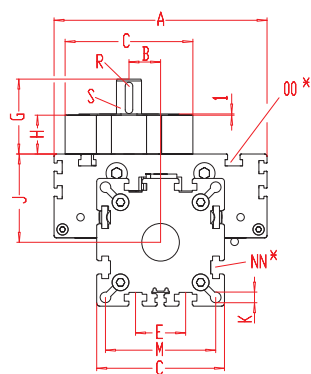
|            |                           |                      |
|------------|---------------------------|----------------------|
| F          | = force                   | (N)                  |
| P          | = pulley action perimeter | (mm)                 |
| $S_i$      | = safety factor 1,2 ... 2 |                      |
| $M_{leer}$ | = no-load torque          | (Nm)                 |
| n          | = rpm pulley              | (min <sup>-1</sup> ) |
| $M_o$      | = driving torque          | (Nm)                 |
| $P_o$      | = motor power             | (KW)                 |

$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

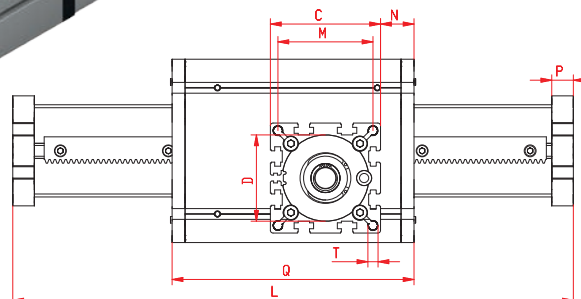
|   |                         |                      |
|---|-------------------------|----------------------|
| f | = deflection            | (mm)                 |
| F | = load                  | (N)                  |
| L | = free length           | (mm)                 |
| E | = elastic modulus 70000 | (N/mm <sup>2</sup> ) |
| I | = second moment of area | (mm <sup>4</sup> )   |

# Positioning system ELZQ 60, 80, 80S

Dimensions (mm)



Size 60 with mounting plate on carriage.



Increasing the carriage length will increase the basic length by the same amount.

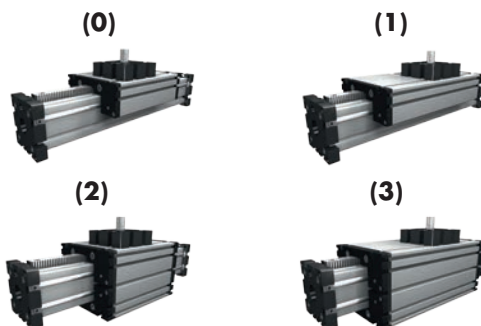
\*For slide nuts refer to chapter 2.2 page 2

| Size □   | Basic length L | A   | B    | C   | D Ø | E  | G    | H  | J  | K   | M  | N  | NN for | OO for | P  | Q   | T    | Basic weight | Weight per 100 mm |
|----------|----------------|-----|------|-----|-----|----|------|----|----|-----|----|----|--------|--------|----|-----|------|--------------|-------------------|
| ELZQ 60  | 230            | 144 | 25,5 | 82  | 62  | 30 | 71,5 | 42 | 49 | 8,5 | 69 | 32 | M 8    | M 8    | 16 | 194 | M 10 | 5,0 kg       | 0,68 kg           |
| ELZQ 80  | 260            | 170 | 25,5 | 102 | 80  | 40 | 60,5 | 31 | 70 | 8,5 | 88 | 25 | M 10   | M 10   | 20 | 214 | M 10 | 11,0 kg      | 1,19 kg           |
| ELZQ 80S | 280            | 190 | 25,5 | 102 | 80  | 40 | 60,5 | 31 | 71 | 8,5 | 88 | 25 | M 10   | M 8    | 20 | 234 | M 10 | 12,0 Kg      | 1,19 kg           |

**0 Choice of guide body profile:**

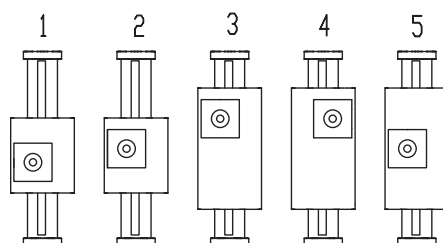
- (0) Standard
- (2) corrosion-protected guide rods and screws
- (4) expanded corrosion-protected version (depending on the availability of components)

**0 Choice of carriages:**



| Size | Version 1 |     | Version 2 |     | Version 3 |     |
|------|-----------|-----|-----------|-----|-----------|-----|
|      | Q         | L   | Q         | L   | Q         | L   |
| 60   | 338       | 374 | 210       | 246 | 354       | 390 |
| 80   | 384       | 430 | 230       | 276 | 400       | 446 |
| 80S  | 404       | 450 | 254       | 300 | 420       | 466 |

**1 Drive version:**



| Size □ | Shaft<br>ø h6 x length | Key    | Pinion  |       |
|--------|------------------------|--------|---------|-------|
|        |                        |        | mm/rev. | Modul |
| 60     | 20 x 29,5              | 6x6x25 | 100     | 1,6   |
| 80 (5) | 20 x 29,5              | 6x6x25 | 100     | 1,6   |

**0 Rack and pinion accuracy:**

- (0) h7 (standard)
- (1) h6 (hardened and ground, finely toothed)

**1500** Basic length + stroke = total length

**ELZQ 60 0 0 0 1 0 2 0 01500**

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

ELZQ 60 with standard body profile, standard carriage, position of drive 1, rack and pinion accuracy class h7, 1270 mm stroke

4.1

