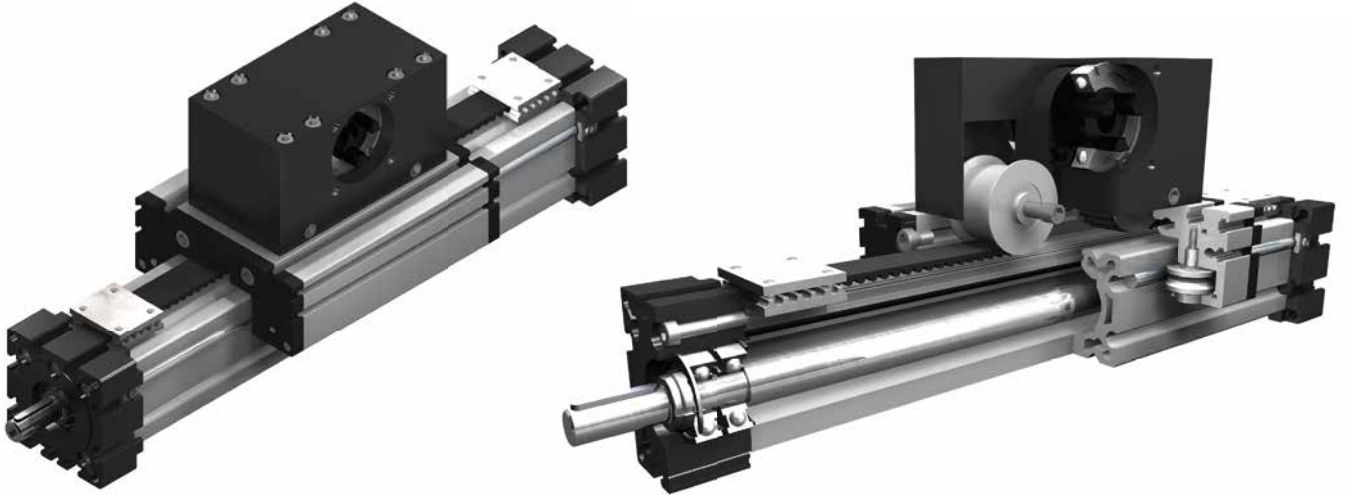


# Positioning system ELSD 40, 60, 60S, 80, 80S, 100

Belt drive with rotary shaft

Specifications



## Function:

Same as ELSZ, but with an additional rotary shaft, fitted within the aluminium body. One end can be driven by any suitable motor, and the other end is provided with a shaft with feather key and an axial tapped hole for fitting grippers or other components.

**Fitting position:** As required. Max. length 2.000 mm.

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

**Unit mounting:** By T-slots or tapped holes in the bearing blocks, mounting sets.

**Belt type:** HTD with steel reinforcement, no backlash when changing direction, repeatability  $\pm 0,1$  mm.

| Forces and torques   | Size           | ELSD 40  |         | ELSD 60              |         | ELSD 60 S            |         | ELSD 80               |         | ELSD 80 S             |         | ELSD 100             |         |
|--|----------------|--|---------|----------------------|---------|----------------------|---------|-----------------------|---------|-----------------------|---------|----------------------|---------|
|  | Forces/Torques | static   | dynamic | static               | dynamic | static               | dynamic | static                | dynamic | static                | dynamic | static               | dynamic |
| $F_x$ (N)  |                | 390  | 350     | 894                  | 800     | 894                  | 800     | 1900                  | 1800    | 1900                  | 1800    | 4000                 | 3800    |
| $F_y$ (N)  |                | 1200   | 700     | 3000                 | 2000    | 4100                 | 3100    | 3000                  | 2000    | 4600                  | 3600    | 8000                 | 6500    |
| $F_z$ (N)  |                | 900  | 650     | 1700                 | 1100    | 2160                 | 1600    | 1700                  | 1100    | 3000                  | 1800    | 3600                 | 2200    |
| $F_p$ (N)  |                | 50   |         | 150                  |         | 150                  |         | 250                   |         | 250                   |         | 400                  |         |
| $M_x$ (Nm)   |                | 25   | 20      | 67                   | 43      | 88                   | 65      | 90                    | 55      | 170                   | 140     | 300                  | 230     |
| $M_y$ (Nm)   |                | 32   | 18      | 90                   | 70      | 190                  | 140     | 110                   | 80      | 270                   | 230     | 400                  | 270     |
| $M_z$ (Nm)   |                | 35   | 25      | 120                  | 100     | 230                  | 170     | 150                   | 120     | 300                   | 220     | 750                  | 500     |
| $M_b$ (Nm)   |                | 5  |         | 10                   |         | 10                   |         | 20                    |         | 20                    |         | 30                   |         |
| <b>All forces and torques relate 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   |                |  |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| <b>No-load torque</b>                                      |                |  |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| Nm   |                | 0,7  |         | 0,9                  |         | 0,9                  |         | 1,1                   |         | 1,2                   |         | 1,5                  |         |
| Stiction torque $M_b$ (Nm)                                 |                | 0,2  |         | 0,4                  |         | 0,5                  |         | 0,6                   |         | 0,7                   |         | 0,8                  |         |
| <b>Speed</b>   |                |  |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| [m/s] max  |                | 4  |         | 5                    |         | 7                    |         | 6                     |         | 8                     |         | 8                    |         |
| <b>Tensile force</b>                                       |                |  |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| permanent (N)  |                | 390  |         | 900                  |         | 900                  |         | 1900                  |         | 1900                  |         | 4000                 |         |
| 0,2 s (N)  |                | 480  |         | 1000                 |         | 1000                 |         | 2090                  |         | 2090                  |         | 4300                 |         |
| <b>Geometrical moments of inertia of aluminium profile</b> |                |  |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| $I_x$ mm <sup>4</sup>                                      |                | 1,32x10 <sup>5</sup>   |         | 6,79x10 <sup>5</sup> |         | 6,79x10 <sup>5</sup> |         | 18,99x10 <sup>5</sup> |         | 18,99x10 <sup>5</sup> |         | 44,4x10 <sup>5</sup> |         |
| $I_y$ mm <sup>4</sup>                                      |                | 1,34x10 <sup>5</sup>   |         | 6,97x10 <sup>5</sup> |         | 6,97x10 <sup>5</sup> |         | 18,97x10 <sup>5</sup> |         | 18,97x10 <sup>5</sup> |         | 44,8x10 <sup>5</sup> |         |
| E-Modulus N/mm <sup>2</sup>                                |                | 70000  |         | 70000                |         | 70000                |         | 70000                 |         | 70000                 |         | 70000                |         |

For life-time calculation of rollers use our homepage.

Driving torque:

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

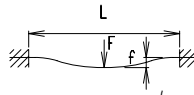
$$P_o = \frac{M_o \cdot n}{9550}$$

F = force (N)  
 P = pulley action perimeter (mm)  
 S<sub>i</sub> = safety factor 1,2 ... 2  
 M<sub>n</sub> = no-load torque (Nm)  
 n = rpm pulley (min<sup>-1</sup>)  
 M<sub>o</sub> = driving torque (Nm)  
 P<sub>o</sub> = motor power (KW)

Deflection:

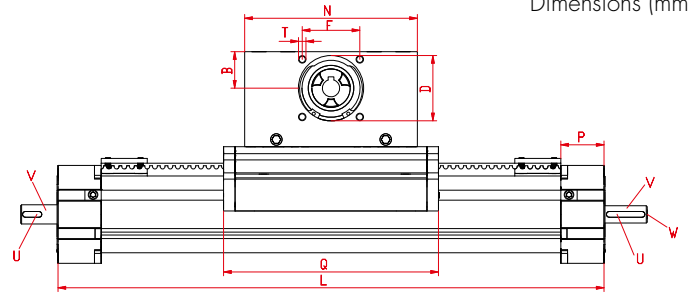
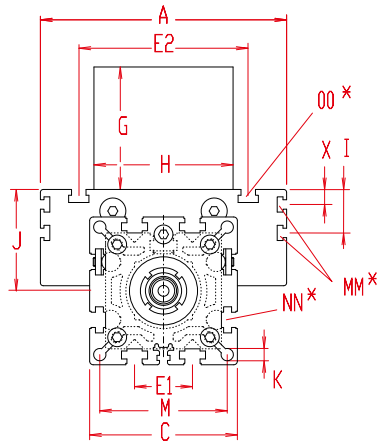
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

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 ELSD 40, 60, 60S, 80, 80S, 100

Dimensions (mm)



| Size □ | Shaft (drive end)       |         | Shaft (load end)        |         |            |
|--------|-------------------------|---------|-------------------------|---------|------------|
|        | Shaft ø h6 x length (V) | Key (U) | Shaft ø h6 x length (V) | Key (U) | Thread (W) |
| 40     | 10 x 20                 | 3x3x10  | 12 x 20                 | 4x4x10  | M 6 x 12   |
| 60 (S) | 14 x 25                 | 5x5x20  | 17 x 25                 | 5x5x20  | M 8 x 20   |
| 80 (S) | 18 x 30                 | 6x6x30  | 20 x 30                 | 6x6x20  | M 10 x 20  |
| 100    | 22 x 35                 | 6x6x30  | 25 x 35                 | 8x7x30  | M 12 x 25  |

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

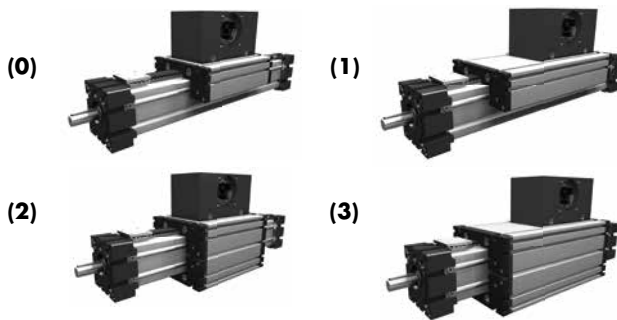
\*For slide nuts refer to chapter 2.2 page 2

| Size □   | Basic length L | A   | B  | C   | D <sub>-0,05</sub> | E1 | E2  | F  | G   | H   | I    | J  | K    | M   | MM for | N   | NN for | OO for | P  | Q   | T    | X    | Basic weight | Weight per 100 mm |
|----------|----------------|-----|----|-----|--------------------|----|-----|----|-----|-----|------|----|------|-----|--------|-----|--------|--------|----|-----|------|------|--------------|-------------------|
| ELSD 40  | 260            | 100 | 20 | 58  | 37                 | 25 | 66  | 32 | 65  | 60  | -    | 35 | 6,5  | 47  | -      | 110 | M 6    | M 6    | 25 | 142 | M 5  | -    | 2,4 kg       | 0,40 kg           |
| ELSD 60  | 320            | 144 | 30 | 82  | 47                 | 30 | 96  | 42 | 80  | 80  | -    | 49 | 8,5  | 69  | -      | 130 | M 8    | M 8    | 35 | 168 | M 6  | -    | 5,9 kg       | 0,87 kg           |
| ELSD 60S | 345            | 170 | 30 | 82  | 47                 | 30 | 108 | 42 | 80  | 80  | -    | 53 | 8,5  | 69  | -      | 130 | M 8    | M 8    | 35 | 194 | M 6  | -    | 6,9 kg       | 0,87 kg           |
| ELSD 80  | 415            | 170 | 39 | 102 | 68                 | 40 | 117 | 60 | 100 | 100 | 30,5 | 70 | 8,5  | 88  | M 6    | 180 | M 10   | M 10   | 45 | 214 | M 8  | 10,5 | 12,5 kg      | 1,30 kg           |
| ELSD 80S | 415            | 190 | 39 | 102 | 68                 | 40 | 126 | 60 | 100 | 100 | 30   | 71 | 8,5  | 88  | M 6    | 180 | M 10   | M 8    | 45 | 214 | M 8  | 12,5 | 14,0 kg      | 1,30 kg           |
| ELSD 100 | 585            | 230 | 60 | 130 | 90                 | 50 | 155 | 80 | 130 | 130 | 29   | 89 | 10,5 | 112 | M10    | 270 | M 10   | M 10   | 55 | 310 | M 10 | -    | 27,0 kg      | 1,70 kg           |

## 0 Choice of guide body profile:

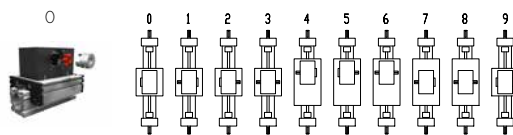
- (0) Standard
- (2) corrosion-protected guide rods and screws
- (4) expanded corrosion-protected version (depending on the availability of components)

## 0 Choice of carriages:



| Size | Version 1 |     | Version 2 |     | Version 3 |     |
|------|-----------|-----|-----------|-----|-----------|-----|
|      | Q         | L   | Q         | L   | Q         | L   |
| 40   | 237       | 355 | 160       | 276 | 253       | 371 |
| 60   | 303       | 453 | 184       | 336 | 319       | 469 |
| 60S  | 329       | 469 | 214       | 365 | 349       | 489 |
| 80   | 379       | 575 | 230       | 431 | 395       | 591 |
| 80S  | 399       | 595 | 245       | 450 | 419       | 615 |
| 100  | 535       | 810 | 326       | 601 | 551       | 826 |

## 0 Drive version:



The standard version is supplied without shaft. A shaft can be retrofitted by inserting it into the pulley bore and securing it with 2 locking rings or tension sets (size 100).

Version 9 is the same as 0, but with double sided coupling claw.

## Belt table

| Code No. | Size   | Belt | mm/rev. | Number of teeth |
|----------|--------|------|---------|-----------------|
| 0 3      | 40     | 5M15 | 100     | 20              |
| 0 4      | 60 (S) | 5M25 | 130     | 26              |
| 0 7      | 80 (S) | 8M30 | 192     | 24              |
| 0 9      | 100    | 8M50 | 256     | 32              |

## Shaft dimensions / Coupling claw

| Size   | Shaft ø h6 x length | Key    | Coupling |
|--------|---------------------|--------|----------|
| 40     | 10 x 27             | 3x3x25 | 9        |
| 60 (S) | 14 x 35             | 5x5x28 | 14       |
| 80 (S) | 18 x 45             | 6x6x40 | 19       |
| 100    | 22 x 45             | 6x6x40 | 24       |

Basic length + stroke = total length

ELSD 60 0 0 0 0 0 4 1 01500

For combination kits and connecting elements refer to chapter 2.2

Pos. 1 2 3 4 5 6 7

Sample ordering code:

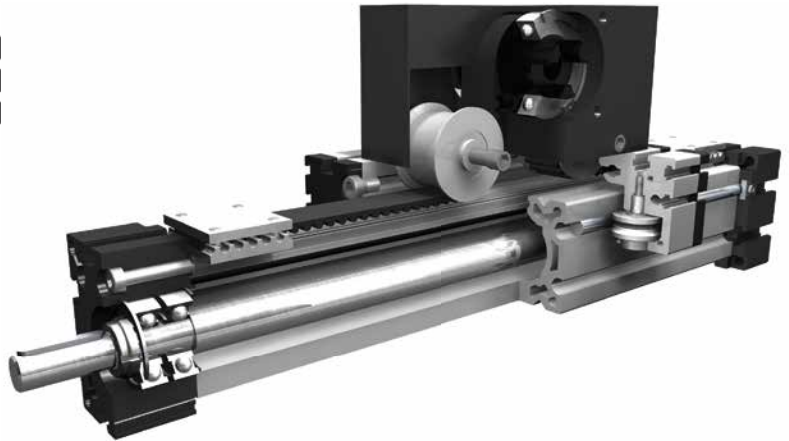
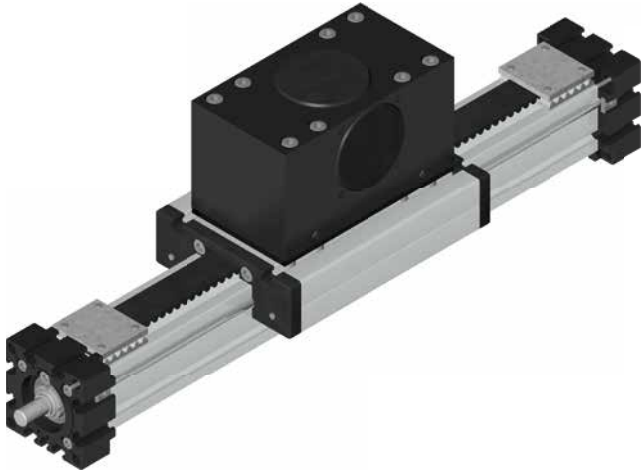
ELSD 60 with standard body profile, standard carriage and coupling claw on one side, 1180 mm stroke

# Positioning system ELSD 40, 60, 60S, 80, 80S, 100

Belt drive with widened belt and rotary shaft

Specifications

3.1



## Function:

Same as ELSZ, but with an additional rotary shaft, fitted within the aluminium body. One end can be driven by any suitable motor, and the other end is provided with a shaft with feather key and an axial tapped hole for fitting grippers or other components.

**Fitting position:** As required. Max. length 2.000 mm.

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

**Unit mounting:** By T-slots or tapped holes in the bearing blocks, mounting sets.

**Belt type:** HTD with steel reinforcement, no backlash when changing direction, repeatability  $\pm 0,1$  mm.

| Forces and torques   | Size           | ELSD 40              |         | ELSD 60              |         | ELSD 60 S            |         | ELSD 80               |         | ELSD 80 S             |         | ELSD 100             |         |
|--|----------------|----------------------|---------|----------------------|---------|----------------------|---------|-----------------------|---------|-----------------------|---------|----------------------|---------|
|  | Forces/Torques | static               | dynamic | static               | dynamic | static               | dynamic | static                | dynamic | static                | dynamic | static               | dynamic |
| $F_x$ (N)  |                | 894                  | 800     | 1900                 | 1800    | 1900                 | 1800    | 4000                  | 3800    | 4000                  | 3800    | 5900                 | 5750    |
| $F_y$ (N)  |                | 1200                 | 700     | 3000                 | 2000    | 4100                 | 3100    | 3000                  | 2000    | 4600                  | 3600    | 8000                 | 6500    |
| $F_z$ (N)  |                | 900                  | 650     | 1700                 | 1100    | 2160                 | 1600    | 1700                  | 1100    | 3000                  | 1800    | 3600                 | 2200    |
| $F_D$ (N)  |                | 50                   |         | 150                  |         | 150                  |         | 250                   |         | 250                   |         | 400                  |         |
| $M_x$ (Nm)   |                | 25                   | 20      | 67                   | 43      | 88                   | 65      | 90                    | 55      | 170                   | 140     | 300                  | 230     |
| $M_y$ (Nm)   |                | 32                   | 18      | 90                   | 70      | 190                  | 140     | 110                   | 80      | 270                   | 230     | 400                  | 270     |
| $M_z$ (Nm)   |                | 35                   | 25      | 120                  | 100     | 230                  | 170     | 150                   | 120     | 300                   | 220     | 750                  | 500     |
| $M_b$ (Nm)   |                | 5                    |         | 10                   |         | 10                   |         | 20                    |         | 20                    |         | 30                   |         |
| <b>All forces and torques relate 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>No-load torque</b>  |                |                      |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| Nm   |                | 0,7                  |         | 0,9                  |         | 0,9                  |         | 1,1                   |         | 1,2                   |         | 1,5                  |         |
| Stiction torque $M_b$ (Nm)   |                | 0,2                  |         | 0,4                  |         | 0,5                  |         | 0,6                   |         | 0,7                   |         | 0,8                  |         |
| <b>Speed</b>   |                |                      |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| (m/s) max  |                | 4                    |         | 5                    |         | 7                    |         | 6                     |         | 8                     |         | 8                    |         |
| <b>Tensile force</b>   |                |                      |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| permanent (N)  |                | 900                  |         | 1900                 |         | 1900                 |         | 4000                  |         | 4000                  |         | 5900                 |         |
| 0,2 s (N)  |                | 1000                 |         | 2090                 |         | 2090                 |         | 4300                  |         | 4300                  |         | 6350                 |         |
| <b>Geometrical moments of inertia of aluminium profile</b>   |                |                      |         |                      |         |                      |         |                       |         |                       |         |                      |         |
| $I_x$ mm <sup>4</sup>  |                | 1,32x10 <sup>5</sup> |         | 6,79x10 <sup>5</sup> |         | 6,79x10 <sup>5</sup> |         | 18,99x10 <sup>5</sup> |         | 18,99x10 <sup>5</sup> |         | 44,4x10 <sup>5</sup> |         |
| $I_y$ mm <sup>4</sup>  |                | 1,34x10 <sup>5</sup> |         | 6,97x10 <sup>5</sup> |         | 6,97x10 <sup>5</sup> |         | 18,97x10 <sup>5</sup> |         | 18,97x10 <sup>5</sup> |         | 44,8x10 <sup>5</sup> |         |
| E-Modulus N/mm <sup>2</sup>  |                | 70000                |         | 70000                |         | 70000                |         | 70000                 |         | 70000                 |         | 70000                |         |

For life-time calculation of rollers use our homepage.

Driving torque:

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

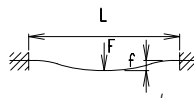
$$P_o = \frac{M_o \cdot n}{9550}$$

F = force (N)  
 P = pulley action perimeter (mm)  
 S<sub>i</sub> = safety factor 1,2 ... 2  
 M<sub>n</sub> = no-load torque (Nm)  
 n = rpm pulley (min<sup>-1</sup>)  
 M<sub>o</sub> = driving torque (Nm)  
 P<sub>o</sub> = motor power (KW)

Deflection:

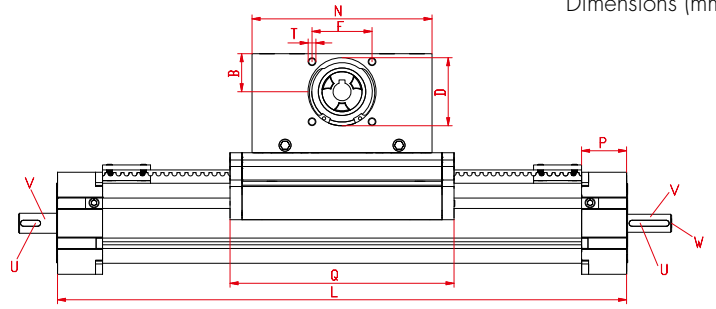
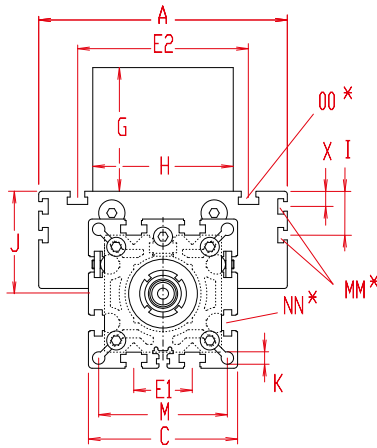
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

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 ELSD 40, 60, 60S, 80, 80S, 100

Dimensions (mm)



| Size □ | Shaft (drive end)       |         | Shaft (load end)        |         |            |
|--------|-------------------------|---------|-------------------------|---------|------------|
|        | Shaft ø h6 x length (V) | Key (U) | Shaft ø h6 x length (V) | Key (U) | Thread (W) |
| 40     | 10 x 20                 | 3x3x10  | 12 x 20                 | 4x4x10  | M 6 x 12   |
| 60 (S) | 14 x 25                 | 5x5x20  | 17 x 25                 | 5x5x20  | M 8 x 20   |
| 80 (S) | 18 x 30                 | 6x6x20  | 20 x 30                 | 6x6x20  | M 10 x 20  |
| 100    | 22 x 35                 | 6x6x30  | 25 x 35                 | 8x7x30  | M 12 x 25  |

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

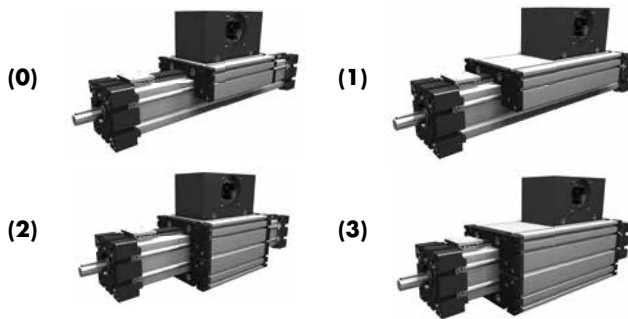
\*For slide-nuts refer to chapter 2.2 page 2

| Size □   | Basic length L | A   | B  | C   | D -0,05 | E1 | E2  | F   | G   | H   | I    | J  | K    | M   | MM for | N   | NN for | OO for | P  | Q   | T    | X    | Basic weight | Weight per 100 mm |
|----------|----------------|-----|----|-----|---------|----|-----|-----|-----|-----|------|----|------|-----|--------|-----|--------|--------|----|-----|------|------|--------------|-------------------|
| ELSD 40  | 286            | 100 | 30 | 58  | 47      | 25 | 66  | 42  | 83  | 80  | -    | 35 | 6,5  | 47  | -      | 130 | M 6    | M 6    | 25 | 164 | M 6  | -    | 2,7 kg       | 0,40 kg           |
| ELSD 60  | 395            | 144 | 39 | 82  | 68      | 30 | 96  | 60  | 105 | 100 | -    | 49 | 8,5  | 69  | -      | 180 | M 8    | M 8    | 35 | 214 | M 8  | -    | 6,5 kg       | 0,87 kg           |
| ELSD 60S | 395            | 170 | 39 | 82  | 68      | 30 | 108 | 60  | 105 | 100 | -    | 53 | 8,5  | 69  | -      | 180 | M 8    | M 8    | 35 | 214 | M 8  | -    | 7,5 kg       | 0,87 kg           |
| ELSD 80  | 510            | 170 | 60 | 102 | 90      | 40 | 117 | 80  | 140 | 130 | 30,5 | 70 | 8,5  | 88  | M 6    | 270 | M 10   | M 10   | 45 | 304 | M 10 | 10,5 | 13,7 kg      | 1,30 kg           |
| ELSD 80S | 510            | 190 | 60 | 102 | 90      | 40 | 126 | 80  | 140 | 130 | 30   | 71 | 8,5  | 88  | M 6    | 270 | M 10   | M 8    | 45 | 304 | M 10 | 12,5 | 15,2 kg      | 1,30 kg           |
| ELSD 100 | 625            | 230 | 62 | 130 | 110     | 50 | 155 | 100 | 143 | 160 | 29   | 89 | 10,5 | 112 | M10    | 310 | M 10   | M 10   | 55 | 350 | M 10 | -    | 33,4 kg      | 1,70 kg           |

### 0 Choice of guide body profile:

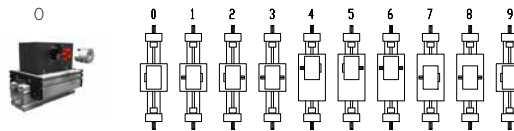
- (0) Standard
- (2) corrosion-protected guide rods and screws
- (4) expanded corrosion-protected version (depending on the availability of components)

### 0 Choice of carriages:



| Size | Version 1 |     | Version 2 |     | Version 3 |     |
|------|-----------|-----|-----------|-----|-----------|-----|
|      | Q         | L   | Q         | L   | Q         | L   |
| 40   | 257       | 381 | 180       | 302 | 273       | 397 |
| 60   | 353       | 534 | 230       | 411 | 369       | 550 |
| 60S  | 379       | 560 | 234       | 415 | 399       | 580 |
| 80   | 469       | 675 | 320       | 526 | 485       | 691 |
| 80S  | 489       | 695 | 324       | 530 | 509       | 715 |
| 100  | 575       | 850 | 366       | 641 | 591       | 866 |

### 0 Drive version:



The standard version is supplied without shaft. A shaft can be retrofitted by inserting it into the pulley bore and securing it with 2 locking rings or tension sets (size 80 + 100).

Version 9 is the same as 0, but with double sided coupling claw.

### Belt table

| Code No. | Size   | Belt | mm/rev. | Number of teeth |
|----------|--------|------|---------|-----------------|
| 0 4      | 40     | 5M25 | 130     | 26              |
| 0 7      | 60 (S) | 8M30 | 192     | 24              |
| 0 9      | 80 (S) | 8M50 | 256     | 32              |
| 1 0      | 100    | 8M70 | 304     | 38              |

### Shaft dimensions / Coupling claw

| Size   | Shaft ø h6 x length | Key    | Coupling |
|--------|---------------------|--------|----------|
| 40     | 14 x 35             | 5x5x28 | 14       |
| 60 (S) | 18 x 45             | 6x6x40 | 19       |
| 80 (S) | 22 x 45             | 6x6x40 | 24       |
| 100    | 30 x 55             | 8x7x40 | 28       |

Basic length + stroke = total length

ELSD 60 0 0 0 0 0 7 1 01500

Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

ELSD 60 with standard body profile, standard carriage and coupling claw on one side, 1146 mm stroke

