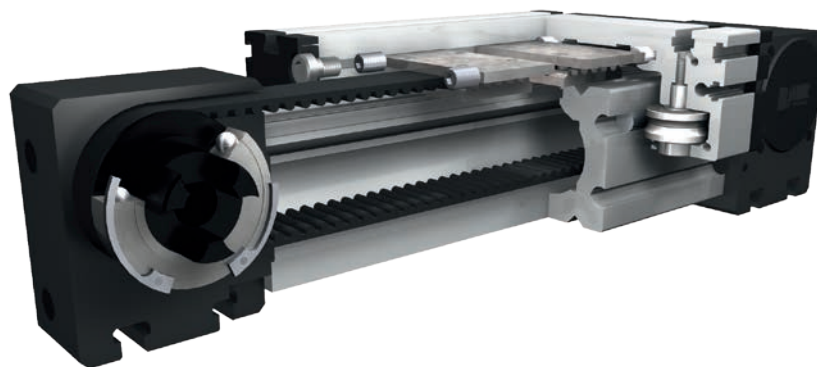


# Positioning system ELZ 30, 40, 60, 60S, 80, 80S, 100, 125

Belt drive

Specifications



3.1

## Function:

This linear 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 timing belt. The pulleys have maintenance-free ball bearings. Belt tension can be readjusted by a simple screw adjustment device in the carriage. This device can also be used for symmetrical adjustment of two or more linear units running parallel.

## Fitting position:

As required. Max. length 6.000 mm without joints.

## Carriage mounting:

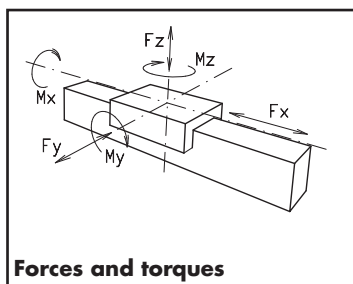
By T-slots.

## Unit mounting:

By T-slots or tapped holes in the bearing block, mounting sets.

## Belt type:

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



Forces and torques

| Size           | ELZ 30 |         | ELZ 40 |         | ELZ 60 |         | ELZ 60 S |         | ELZ 80 |         | ELZ 80 S |         | ELZ 100 |         | ELZ 125 |         |
|----------------|--------|---------|--------|---------|--------|---------|----------|---------|--------|---------|----------|---------|---------|---------|---------|---------|
| Forces/Torques | static | dynamic | static | dynamic | static | dynamic | static   | dynamic | static | dynamic | static   | dynamic | static  | dynamic | static  | dynamic |
| $F_x$ (N)      | 200    | 180     | 390    | 350     | 894    | 800     | 894      | 800     | 1900   | 1800    | 1900     | 1800    | 4000    | 3800    | 5900    | 5750    |
| $F_y$ (N)      | 90     | 60      | 1200   | 700     | 3000   | 2000    | 4100     | 3100    | 3000   | 2000    | 4600     | 3600    | 8000    | 6500    | 12000   | 9000    |
| $F_z$ (N)      | 90     | 60      | 900    | 650     | 1700   | 1100    | 2160     | 1600    | 1700   | 1100    | 3000     | 1800    | 3600    | 2200    | 6000    | 4500    |
| $M_x$ (Nm)     | 10     | 5       | 25     | 20      | 67     | 43      | 88       | 65      | 90     | 55      | 170      | 140     | 300     | 230     | 600     | 450     |
| $M_y$ (Nm)     | 13     | 6       | 32     | 18      | 90     | 70      | 190      | 140     | 110    | 80      | 270      | 230     | 400     | 270     | 750     | 600     |
| $M_z$ (Nm)     | 14     | 7       | 35     | 25      | 120    | 100     | 230      | 170     | 150    | 120     | 300      | 220     | 750     | 500     | 1350    | 1150    |

### All forces and torques relate to the following:

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

### No-load torque

| Nm | 0,2 | 0,3 | 0,6 | 0,7 | 0,9 | 1,2 | 1,4 | 1,8 |
|----|-----|-----|-----|-----|-----|-----|-----|-----|
|----|-----|-----|-----|-----|-----|-----|-----|-----|

### Speed

| (m/s) max | 2 | 4 | 5 | 7 | 6 | 8 | 10 | 10 |
|-----------|---|---|---|---|---|---|----|----|
|-----------|---|---|---|---|---|---|----|----|

### Tensile force

| permanent (N) | 200 | 390 | 900  | 900  | 1900 | 1900 | 4000 | 5900 |
|---------------|-----|-----|------|------|------|------|------|------|
| 0,2 s (N)     | 280 | 480 | 1000 | 1000 | 2090 | 2090 | 4300 | 6350 |

### Geometrical moments of inertia of aluminium profile

| $I_x$ mm <sup>4</sup>       | 4,09x10 <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> | 101,5x10 <sup>5</sup> |
|-----------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|----------------------|-----------------------|
| $I_y$ mm <sup>4</sup>       | 4,00x10 <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> | 101,5x10 <sup>5</sup> |
| E-Modulus N/mm <sup>2</sup> | 70000                | 70000                | 70000                | 70000                | 70000                 | 70000                 | 70000                | 70000                 |

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

## Formula: ELZ

Driving torque:

$$M_a = \frac{F \cdot P \cdot S_s}{2000 \cdot \pi} + M_{leer}$$

$$P_a = \frac{M_a \cdot n}{9550}$$

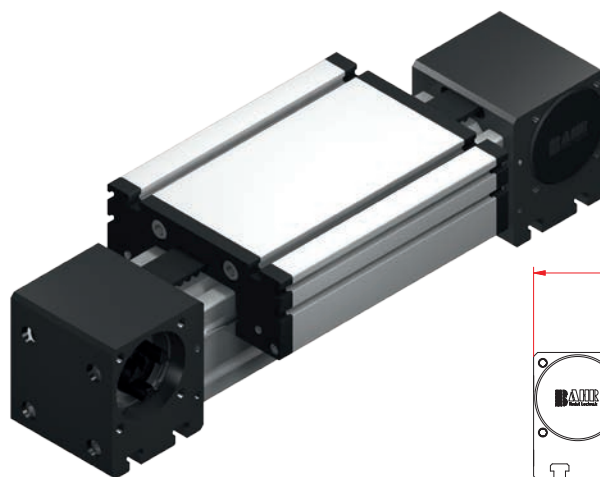
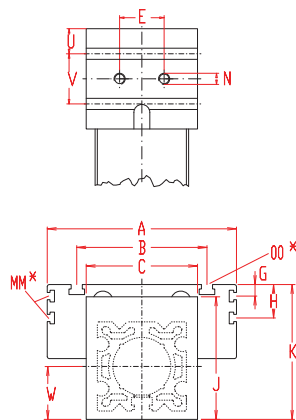
$F$  = force (N)  
 $P$  = pulley action perimeter (mm)  
 $S_s$  = safety factor 1,2 ... 2  
 $M_{leer}$  = no-load torque (Nm)  
 $n$  = rpm pulley (min<sup>-1</sup>)  
 $M_a$  = driving torque (Nm)  
 $P_a$  = motor power (KW)

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

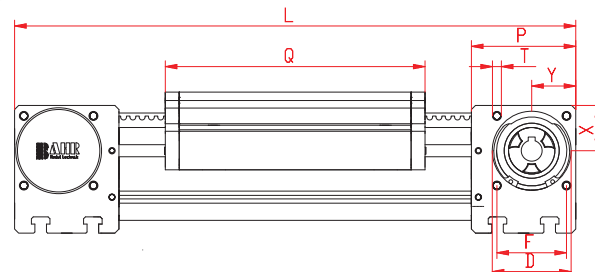
$f$  = deflection (mm)  
 $F$  = load (N)  
 $L$  = free length (mm)  
 $E$  = elastic modulus 70000 (N/mm<sup>2</sup>)  
 $I$  = second moment of area (mm<sup>4</sup>)

# Positioning system ELZ 30, 40, 60, 60S, 80, 80S, 100, 125

Dimensions (mm)



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   | E  | F   | G    | H  | J   | K   | MM for | N    | OO for | P   | Q   | T    | U    | V  | W  | X    | Y    | Basic weight | Weight per 100 mm |
|----------|----------------|-----|-----|-----|-----|----|-----|------|----|-----|-----|--------|------|--------|-----|-----|------|------|----|----|------|------|--------------|-------------------|
| ELZ 30   | 158            | 70  | 56  | 42  | 28  | 13 | 25  | -    | -  | 44  | 47  | -      | M 5  | M 6    | 36  | 82  | M 4  | 10   | 16 | 21 | 16   | 16   | 0,8 kg       | 0,13 kg           |
| ELZ 40   | 225            | 100 | 66  | 58  | 37  | 18 | 32  | -    | -  | 58  | 64  | -      | M 6  | M 6    | 49  | 122 | M 5  | 12,5 | 24 | 29 | 20,5 | 20,5 | 1,9 kg       | 0,24 kg           |
| ELZ 60   | 290            | 144 | 96  | 80  | 47  | 30 | 42  | -    | -  | 82  | 90  | -      | M 8  | M 8    | 59  | 168 | M 6  | 15   | 30 | 41 | 27   | 26   | 4,8 kg       | 0,62 kg           |
| ELZ 60 S | 315            | 170 | 108 | 80  | 47  | 30 | 42  | -    | -  | 82  | 94  | -      | M 8  | M 8    | 59  | 194 | M 6  | 15   | 30 | 41 | 27   | 26   | 5,8 kg       | 0,62 kg           |
| ELZ 80   | 375            | 170 | 117 | 100 | 68  | 40 | 60  | 10   | 30 | 110 | 121 | M 6    | M 10 | M 10   | 90  | 194 | M 8  | 22,5 | 45 | 51 | 39   | 38   | 10,0 kg      | 1,00 kg           |
| ELZ 80 S | 395            | 190 | 126 | 100 | 68  | 40 | 60  | 12,5 | 30 | 110 | 122 | M 6    | M 10 | M 8    | 90  | 214 | M 8  | 22,5 | 45 | 51 | 39   | 38   | 11,0 kg      | 1,00 kg           |
| ELZ 100  | 530            | 230 | 155 | 130 | 90  | 50 | 80  | -    | 29 | 135 | 154 | M 10   | M 12 | M 10   | 110 | 300 | M 10 | 23   | 64 | 65 | 50   | 50   | 24,0 kg      | 1,60 kg           |
| ELZ 125  | 625            | 295 | 200 | 160 | 110 | 60 | 100 | -    | 30 | 167 | 191 | M 10   | M 12 | M 12   | 130 | 365 | M 10 | 38   | 50 | 82 | 60   | 60   | 37,0 kg      | 2,10 kg           |

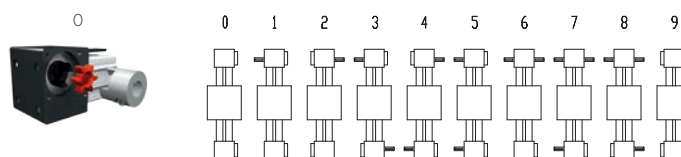
## 0 Choice of guide body profile:

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

## 0 Choice of carriages:



## 0 Drive version:



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

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 and 125).

## Belt table

| Code No. | Size   | Belt | mm/rev. | Number of teeth |
|----------|--------|------|---------|-----------------|
| 0 1      | 30     | 3M12 | 75      | 25              |
| 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              |
| 1 0      | 125    | 8M70 | 304     | 38              |

## Shaft dimensions / Coupling claw

| Size   | Shaft $\varnothing$ h6 x length | Key    | Coupling |
|--------|---------------------------------|--------|----------|
| 30     | 6 x 15                          | 2x2x12 | 7        |
| 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       |
| 125    | 30 x 55                         | 8x7x50 | 28       |

|      |    |   |   |   |   |   |   |   |       |
|------|----|---|---|---|---|---|---|---|-------|
| ELZ  | 40 | 1 | 0 | 0 | 0 | 0 | 3 | 1 | 01500 |
| Pos. | 1  | 2 | 3 | 4 | 5 | 6 | 7 |   |       |

Basic length + stroke = total length

For combination kits and connecting elements refer to chapter 2.2

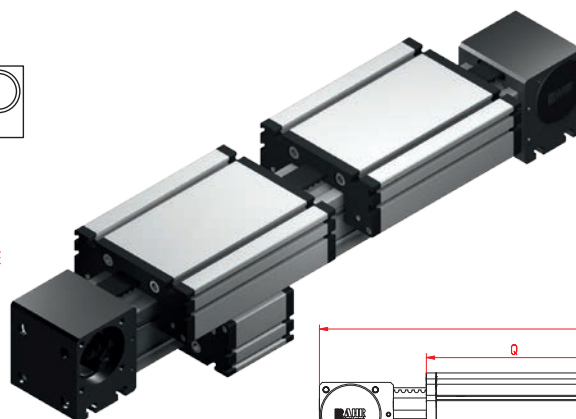
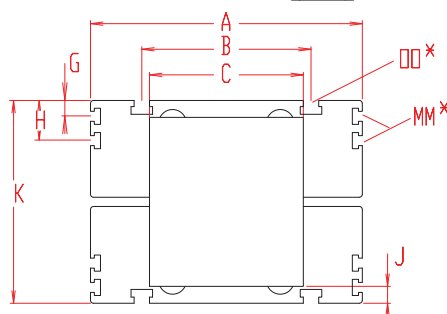
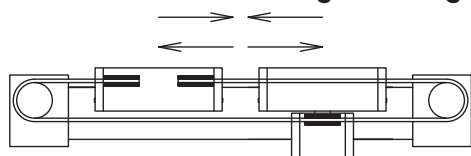
Sample ordering code:

ELZ 40 with standard body profile, standard carriage, coupling claw on one side, 1275 mm stroke.

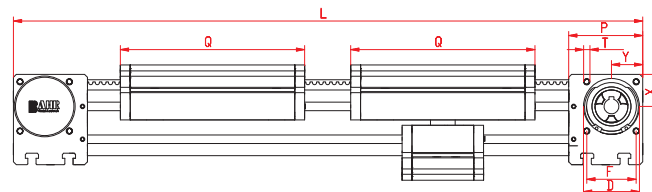
# Positioning system ELZ 30, 40, 60, 60S, 80, 80S, 100, 125

**Belt drive with two carriages moving in opposite directions**

Dimensions (mm)



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



\*For slide nuts refer to chapter 2.2 page 2

| Size<br>□ | Basic<br>length<br>L | A   | B   | C   | D   | F   | G    | H  | J    | K   | MM<br>for | OO<br>for | P   | Q   | T   | X    | Y    | Basic<br>weight | Weight<br>per<br>100 mm |
|-----------|----------------------|-----|-----|-----|-----|-----|------|----|------|-----|-----------|-----------|-----|-----|-----|------|------|-----------------|-------------------------|
| ELZ 30    | 250                  | 70  | 56  | 42  | 28  | 25  | -    | -  | 5    | 52  | -         | M 6       | 36  | 82  | M 4 | 16   | 16   | 1,2 kg          | 0,13 kg                 |
| ELZ 40    | 350                  | 100 | 66  | 58  | 37  | 32  | -    | -  | 6    | 70  | -         | M 6       | 49  | 122 | M 5 | 20,5 | 20,5 | 2,8 kg          | 0,24 kg                 |
| ELZ 60    | 460                  | 144 | 96  | 80  | 47  | 42  | -    | -  | 8    | 98  | -         | M 8       | 59  | 168 | M 6 | 27   | 26   | 7,4 kg          | 0,62 kg                 |
| ELZ 60S   | 510                  | 170 | 108 | 80  | 47  | 42  | -    | -  | 12   | 106 | -         | M 8       | 59  | 194 | M 6 | 27   | 26   | 7,4 kg          | 0,62 kg                 |
| ELZ 80    | 570                  | 170 | 117 | 100 | 68  | 60  | 10   | 30 | 19   | 140 | M 6       | M10       | 90  | 194 | M 8 | 39   | 39   | 15,0 kg         | 1,00 kg                 |
| ELZ 80S   | 610                  | 190 | 126 | 100 | 68  | 60  | 12,5 | 30 | 21   | 142 | M 6       | M 8       | 90  | 214 | M 8 | 39   | 39   | 17,0 kg         | 1,00 kg                 |
| ELZ 100   | 830                  | 230 | 155 | 130 | 90  | 80  | -    | 29 | 24   | 178 | M10       | M10       | 110 | 300 | M10 | 50   | 50   | 34,0 kg         | 1,60 kg                 |
| ELZ 125   | 990                  | 295 | 200 | 160 | 110 | 100 | -    | 30 | 25,5 | 216 | M10       | M12       | 130 | 365 | M10 | 60   | 60   | 53,5 kg         | 2,10 kg                 |

## 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)

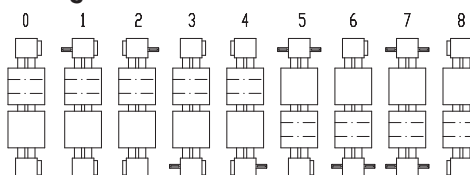
## Choice of carriages:



(1)



## Coupling - shaft mounting:



Version 8 is the same as 0, but with double sided coupling claw.

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 and 125).

## Belt table

| Code No. | Size   | Belt | mm/rev. | Number of teeth |
|----------|--------|------|---------|-----------------|
| 0 1      | 30     | 3M12 | 75      | 25              |
| 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              |
| 1 0      | 125    | 8M70 | 304     | 38              |

— Basic length + stroke = total length

## Shaft dimensions / Coupling claw

| Size   | Shaft<br>ø h6 x length | Key    | Coupling |
|--------|------------------------|--------|----------|
| 30     | 6 x 15                 | 2x2x12 | 7        |
| 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       |
| 125    | 30 x 55                | 8x7x50 | 28       |

ELZ 40 3 0 0 0 0 3 1 01500

Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

ELZ 40, right/left hand with standard body profile, standard carriage, coupling claw on one side, 1150 mm stroke.