

# Location of the headquarter in Luhden



**All profiles are produced in accordance with the medium EN 12020-2 standard:**

Linearity: 0,35 mm/m  
Max. torsion: 0,35 mm/m  
Angular torsion: 0,2 mm/40 mm  
Parallelity: 0,2 mm  
Alloy: EN AW 6063-T66  
Anodizing quality: E6 EV1, 25-40 µm  
other qualities by inquiry.

**Clean room classification:**

VDI 2083, class 4  
ISO 14644-1, class 6  
US Federal Standard  
209E, class 1.000  
QLZ, ELHZ and ELVZ

Mechanical efficiency, positioning and repeating accuracy are coordinated in an optimal way.

We offer the complete automation technology in a modular system together with a wide range of accessories.

Our positioning modules can be combined to all positioning duties. They are constructed by Computer-Aided-Design and so very user-oriented.

Industrie  
Forum  
Design  
Hannover



Design  
Award  
Winner  
2000



regarding explosion  
protection certificates  
**Ex II 2G EEx c IIB T4**  
**Ex II 3D T125°C**  
for the Positioning system  
ELZ 30 - 125  
by ATEX 95

**Fraunhofer**  
**TESTED  
DEVICE**  
Lineareinheit QLZ 80  
Report No. BA 0005-171

Hauseigener Teststand / Inhouse test stand



If you have any questions, please do not hesitate to contact our engineers. We offer a comprehensive customer service, including advisory service and presentations at your premises or in our company.

EDV-Arbeitsplatz / EDP workplace



## Product line overview

### Positioning system

#### EGT/EGK 30, 40, 60, 80

Mechanical system with plastic prismatic guides. System is driven by an integrated trapezoidal thread or ballscrew.

#### Repeating accuracy:

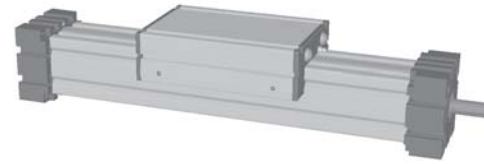
Trapezoidal thread:  $\pm 0,2$  mm

Ballscrew:  $\pm 0,025$  mm

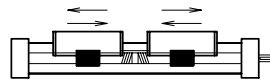
#### Velocity:

Trapezoidal thread: max. 0,5 m/sec

Ballscrew: max. 1 m/sec



Variation:



### Positioning system

#### EGTH/EGKH 40, 60, 80

Mechanical telescopic system with plastic prismatic guides. System is driven by an integrated trapezoidal thread or ballscrew. Result is a telescopic movement.

#### Repeating accuracy:

Trapezoidal thread:  $\pm 0,2$  mm

Ballscrew:  $\pm 0,025$  mm

#### Velocity:

Trapezoidal thread: max. 0,5 m/sec

Ballscrew: max. 1 m/sec



### Positioning system

#### EHT/EHK 40, 60, 80, 100, 125

Mechanical telescopic system with plastic prismatic guides. System is driven by an integrated trapezoidal thread or ballscrew. Result is a telescopic movement.

#### Repeating accuracy:

Trapezoidal thread:  $\pm 0,2$  mm

Ballscrew:  $\pm 0,025$  mm

#### Velocity:

Trapezoidal thread: max. 0,5 m/sec

Ballscrew: max. 1 m/sec



### Positioning system

#### ELT/ELK 30, 40, 60, 80, 80S, 100, 125

Mechanical system with roll-guidings outside of profile. System is driven by an integrated trapezoidal thread or ballscrew.

#### Repeating accuracy:

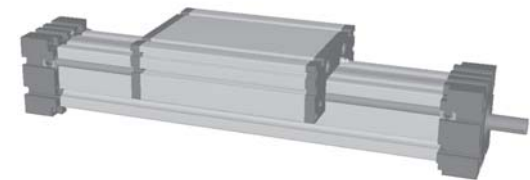
Trapezoidal thread:  $\pm 0,2$  mm

Ballscrew:  $\pm 0,025$  mm

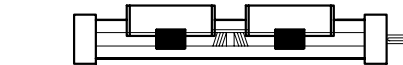
#### Velocity:

Trapezoidal thread: max. 0,5 m/sec

Ballscrew: max. 1 m/sec



Variation:



### Non driven positioning systems

#### ELR 30, 40, 60, 80, 80S, 100, 125

#### ELRZ 30, 40, 60, 80, 80S, 100, 125

#### ER 30, 40, 60, 80, 80S, 100, 125

Mechanical system with roll-guidings outside of profile.

#### E 40, 60, 80, 80S

Mechanical system with roll-guidings outside of profile.

#### UL 40, 60, 80

Mechanical system with roll-guidings inside of profile.

#### Velocity:

max. 10 m/sec

ELR  
ELRZ  
ER



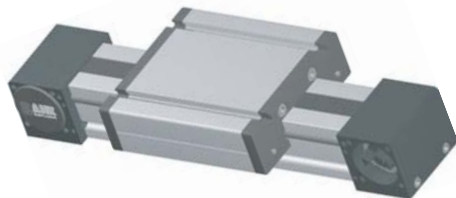
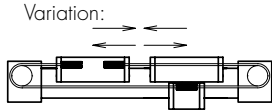
E



UL



## Product line overview



### Positioning system

#### ELZ/ELZex 30, 40, 60, 80, 80S, 100, 125

Mechanical system with roll-guidings outside of profile. System is belt driven.

ELZex like ELZ. The positioning system is suitable for use according to the intended purpose in potentially explosive areas (see ATEX 95 marking).

### Positioning system

#### MLZ 60, 80, 80S, 100

Mechanical system with roll-guidings outside of profile.

The system is driven by a belt that is guided inside of the profile.

### Repeating accuracy:

$\pm 0,1$  mm

### Velocity:

max. 10 m/sec (ELZex: max. 1m/sec, MLZ: max. 8 m/sec)

### Positioning system

#### ELZG 30, 40, 60, 80, 80S

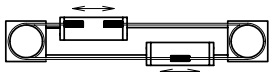
Mechanical system with 2 roll-guidings outside of profile. System is driven by one rotating timing belt. At each end of this belt a carriage is fixed. Result is two carriages moving in opposite direction over the complete length of leading profile.

### Repeating accuracy:

$\pm 0,1$  mm

### Velocity:

max. 10 m/sec



### Positioning system

#### ELZZ 60, 80, 80S, 100, 125

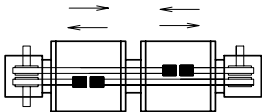
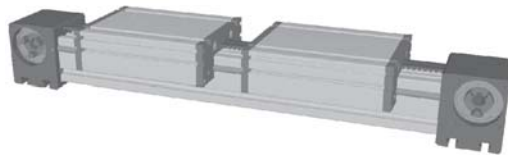
Same function as ELZ, but each carrier with separate drive. Parted pulleys are separately beared, so two parallel moving belts are connected each with one carriage.

### Repeating accuracy:

$\pm 0,1$  mm

### Velocity:

max. 5 m/sec



### Positioning system

#### ELSZ 30, 40, 60, 80, 80S, 100, 125

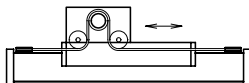
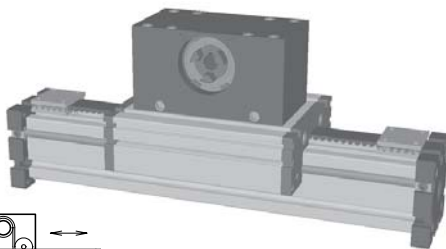
Same function as ELZ, but with driven carriage.

### Repeating accuracy:

$\pm 0,1$  mm

### Velocity:

max. 6 m/sec



### Positioning system

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

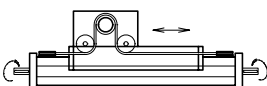
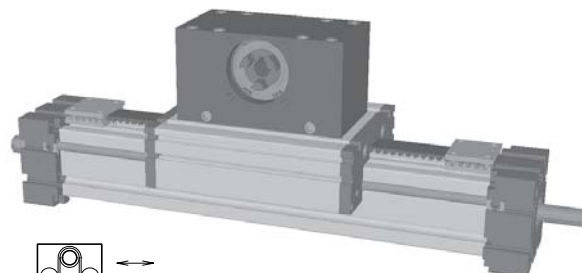
Same function as ELSZ. An additional turning shaft is integrated into the leading-profile. Grippers and other components can be adapted to the shaft.

### Repeating accuracy:

$\pm 0,1$  mm

### Velocity:

max. 6 m/sec



## Product line overview

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

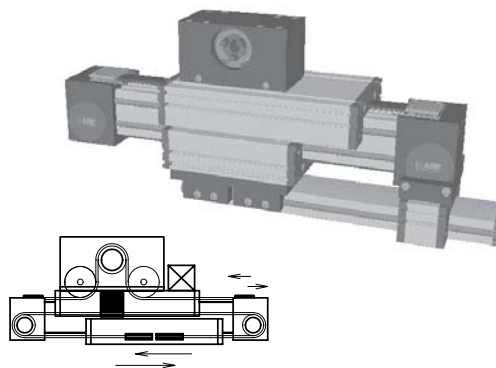
Same function as ELZ. Two carriages are moving in different directions. Result is a telescopic movement.

**Repeating accuracy:**

± 0,1 mm

**Velocity:**

max. 6 m/sec



### Positioning system ELHZ 60, 80, 80S, 100, 125

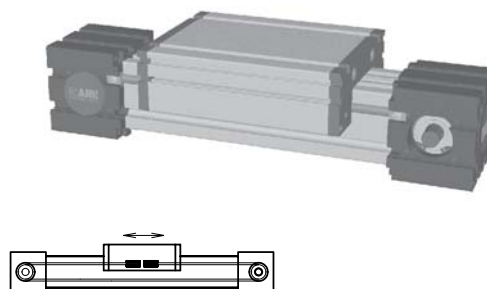
Mechanical system with roll-guidings outside of profile. System is driven by an internal belt. Position of shaft is horizontal to the carriage.

**Repeating accuracy:**

± 0,1 mm

**Velocity:**

max. 8 m/sec



### Positioning system ELVZ 60, 80, 80S, 100, 125

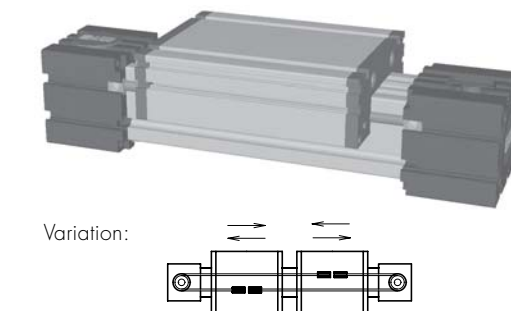
Mechanical system with roll-guidings outside of profile. System is driven by an internal belt. Position of shaft is vertical to carriage.

**Repeating accuracy:**

± 0,1 mm

**Velocity:**

max. 8 m/sec



### Positioning system ELFZ 80, 100, 125

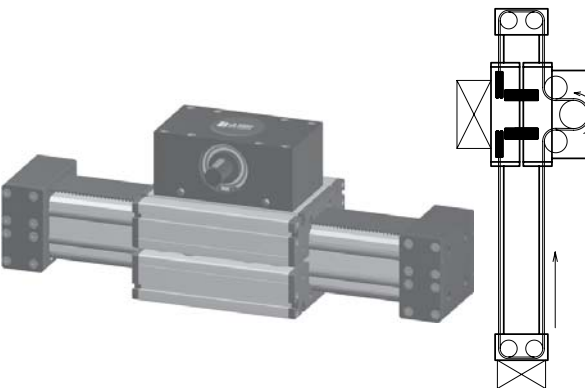
Special lifting system with roll-guidings outside of profile. System is driven by one rotating timing belt with one drive.

**Repeating accuracy:**

± 0,1 mm

**Velocity:**

max. 4 m/sec



### Positioning system ELZU 30, 40, 60, 80, 80S

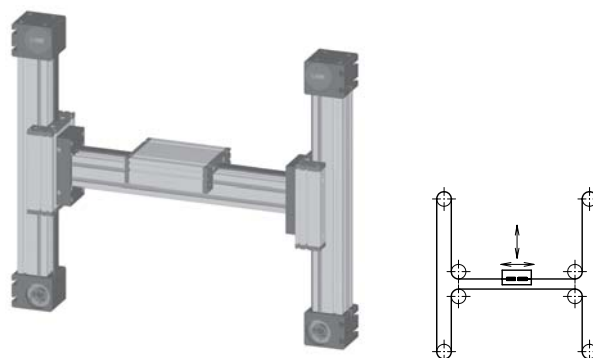
Surface portal, consisting of 2 Y-axes and 1 X-axis, driven by one rotating belt. This belt runs around different deflection pulleys. Positioning is achieved by two motors. The coordinate is diagonally to deflection points of Y-axes.

Advantage: Only small masses are moved, so that high acceleration can be realized.

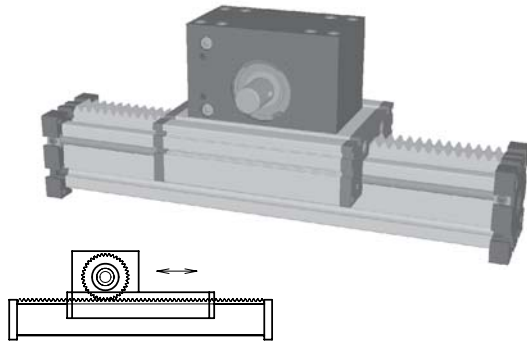
**Repeating accuracy:** ± 0,1 mm

**Velocity:** max. 6 m/sec

**Acceleration:** max. 20 m/sec<sup>2</sup>



## Product line overview



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

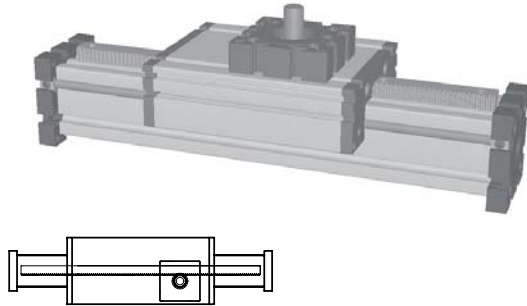
Same function as ELSZ. Onto the leading-profile a rack is mounted. A pinion gear is fitted to the carriage.

**Repeating accuracy:**

$\pm 0,2$  mm

**Velocity:**

max. 3 m/sec



### Positioning system ELZQ 60, 80, 80S

Special lifting unit with function as ELZA. High dynamic and accuracy is achieved by a precision rack and pinion.

**Repeating accuracy:**

$\pm 0,1$  mm

**Velocity:**

max. 3 m/sec



### Positioning system ELP 30, 40, 60

Mechanical system with double roll-guidings inside of profile. System is driven by an integrated linear motor.

**Repeating accuracy:**

$\pm 0,1$  mm

**Positioning accuracy:**

$\pm 0,1$  mm

**Velocity:**

max. 4 m/s



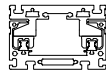
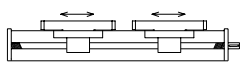
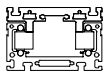
### Positioning system DLT/DLK 120, 160, 200

Mechanical system with double roll-guidings inside of profile. System is driven by an integrated trapezoidal thread or ballscrew.

**DL**

Variation:

**DS**



### Positioning system DST/DSK 120, 160, 200

Mechanical system with a double integrated ball rail inside of profile. System is driven by an integrated trapezoidal thread or ballscrew.

**Repeating accuracy:**

Trapezoidal thread:  $\pm 0,2$  mm

Ballscrew:  $\pm 0,025$  mm

**Velocity:**

max. 0,5 m/s

max. 1 m/s



### Positioning system DLR 120, 160, 200

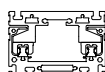
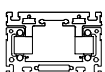
Mechanical system with double roll-guidings inside of profile.

### Positioning system DSR 120, 160, 200

Mechanical system with double roll-guidings inside of profile.

**DL**

**DS**



**Velocity:**

max. 6 m/sec

## Product line overview

### Positioning system DLZ 120, 160, 200

Mechanical system with roll-guidings inside of profile. System is driven by an internal belt.

### Positioning system DSZ 120, 160, 200

Mechanical system with a double integrated ball rail inside of profile. System is driven by an internal belt.

#### Repeating accuracy:

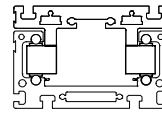
± 0,1 mm

#### Velocity:

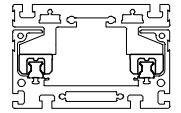
max. 6 m/sec



DL



DS



### Positioning system DLSZ 120, 160, 200

Mechanical system with roll-guidings inside of profile. Same funktion as DLZ but with driven carriage.

### Positioning system DSSZ 120, 160, 200

Mechanical system with a double integrated ball rail inside of profile. Same funktion as DLZ but with driven carriage.

#### Repeating accuracy:

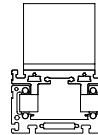
± 0,1 mm

#### Velocity:

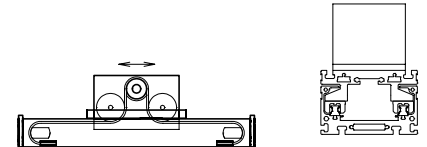
max. 6 m/sec



DL



DS



### Positioning system DLZT 120, 160, 200

Mechanical system with roll-guidings inside of profile and a double outside ball rail. Two carriages move in opposite direction. Result is a telescopic movement.

### Positioning system DLVZ 160

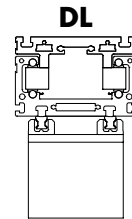
Mechanical system with roll-guidings inside of profile. System is driven by an internal belt. Position of shaft is vertical to carriage.

#### Repeating accuracy:

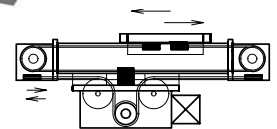
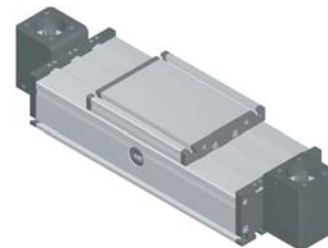
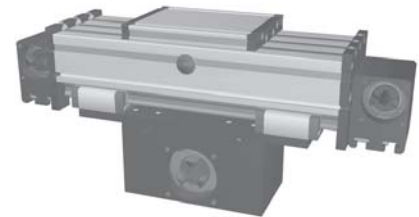
± 0,1 mm

#### Velocity:

max. 6 m/sec



DL



### Positioning system DLM/DLP 120, 160, 200

Mechanical system with double roll-guidings inside of profile. Driven by linear motor.

### Positioning system DSM/DSP 160, 200

Mechanical system with a double integrated ball rail inside of profile. Driven by linear motor.

#### Repeating accuracy:

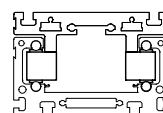
± 0,1 mm

#### Velocity:

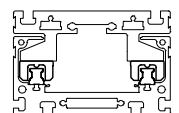
max. 8 m/sec



DL



DS



## Product line overview



### Positioning system QST/QSK 60, 80, 100

Mechanical system with a double integrated ball rail inside of profile. System is driven by an integrated trapezoidal thread or ballscrew.

#### Repeating accuracy:

Trapezoidal thread:  $\pm 0,2$  mm

Ballscrew:  $\pm 0,025$  mm

#### Velocity:

max. 0,5 m/s

max. 1 m/s



### Non-driven positioning system QSSR 60, 80, 100

Mechanical system with an integrated ball rail inside of profile.



### Positioning system QLZ 60, 80, 100

Mechanical system with roll-guidings inside of profile. System is belt driven.

### Positioning system QSZ 60, 80, 100

Mechanical system with an integrated ball rail inside of profile. System is driven by a timing belt.

This unit is suitable for cleanroom applications (Clean room classification: VDI 2083, class 4; ISO 14644-1, class 6; US Federal Standard 209E, class 1.000)

#### Repeating accuracy:

$\pm 0,1$  mm

#### Velocity:

max. 6 m/sec



### Positioning system QLR 60, 80, 100

Mechanical system with roll-guidings inside of profile.

### Non-driven positioning system QSR 60, 80, 100

Mechanical system with an integrated ball rail inside of profile.

#### Velocity:

max. 6 m/sec



### Positioning system QLSZ 60, 80, 100

Mechanical system with roll-guidings inside of profile. Same funktion as QLZ but with driven carriage.

### Positioning system QSSZ 60, 80, 100

Mechanical system with an integrated ball rail inside of profile. Same funktion as QLZ but with driven carriage.

#### Repeating accuracy:

$\pm 0,1$  mm

#### Velocity:

max. 6 m/sec



## Product line overview

### Positioning system DLZA 120, 160, 200

Rack and pinion system for high dynamic operations.

#### Repeating accuracy:

± 0,2 mm

#### Velocity:

max. 3 m/sec



### Positioning system ALLM 203, 204

Mechanical system with roll-guidings outside of profile.  
Driven by linear motor.

### Positioning system ALLZ 203, 204

Mechanical system with roll-guidings outside of profile.  
Belt driven

### Positioning system ALLR 203, 204

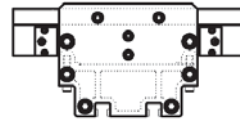
Mechanical system with roll-guidings outside of profile  
Same funktion as ALLM but without motor.

#### Repeating accuracy:

± 0,05mm

#### Velocity:

max. ± 0,05 bis 4.000 mm, ± 0,1 >4.000 mm



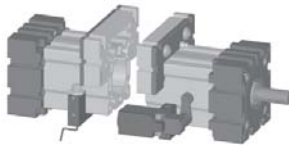
### Spare parts

Carriages, V-slides, wiper end plates, jointing plates for closed carriage, rollers, end plates, eccentrics, guide rods, cover bands, lubricants, ball- and trapezoidal screws, spindles, leading-nuts, belts, belt pulleys, plug-in shafts, belt adjusters.



### Accessories

Slide nuts, handwheels, positional indicators, spindle clamps, carrier clamps, plates, mounting blocks, switch holders, cable cover tubes, cable chains, switches, activating strips, motor-adapters, couplings, bevel gears, combination cubes, cover caps, gearboxes, keyed shafts, bellows, toothed pulleys, toothed belts.



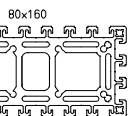
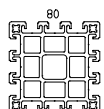
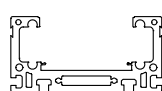
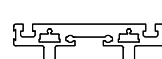
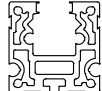
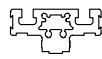
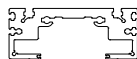
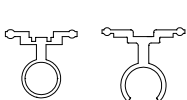
### Drives

Stepping motors, gears, control units, gearboxes.

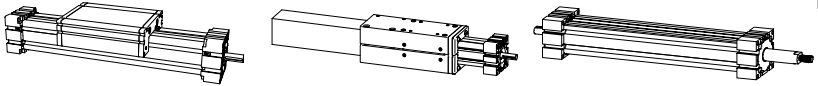
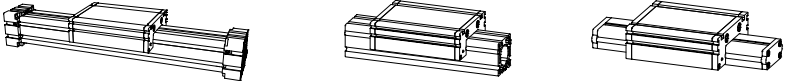
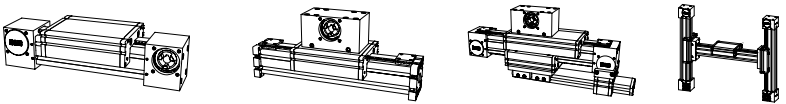

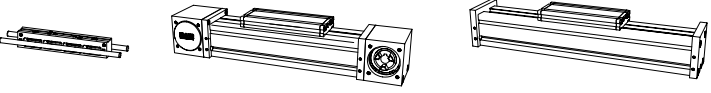
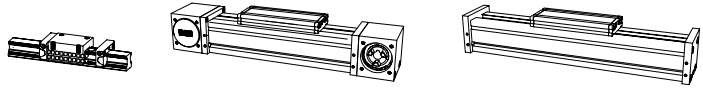
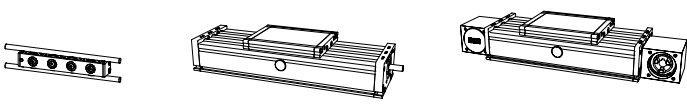
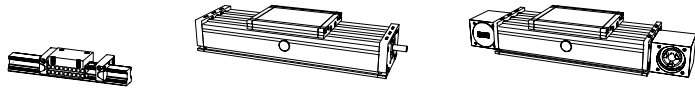

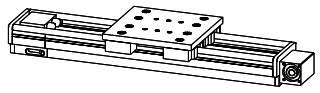


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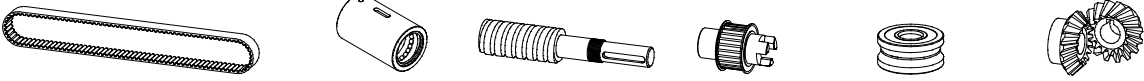
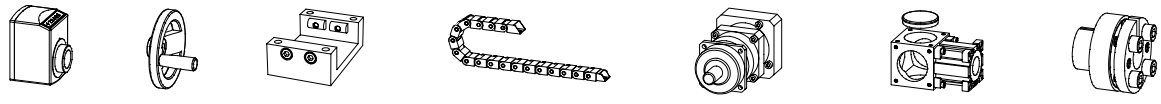
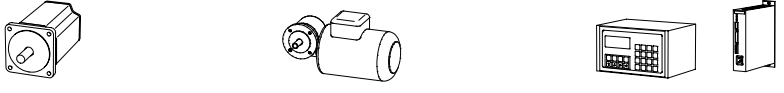
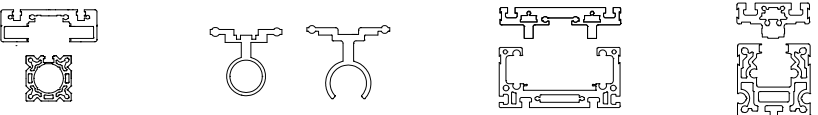
System profile specifications, service manual



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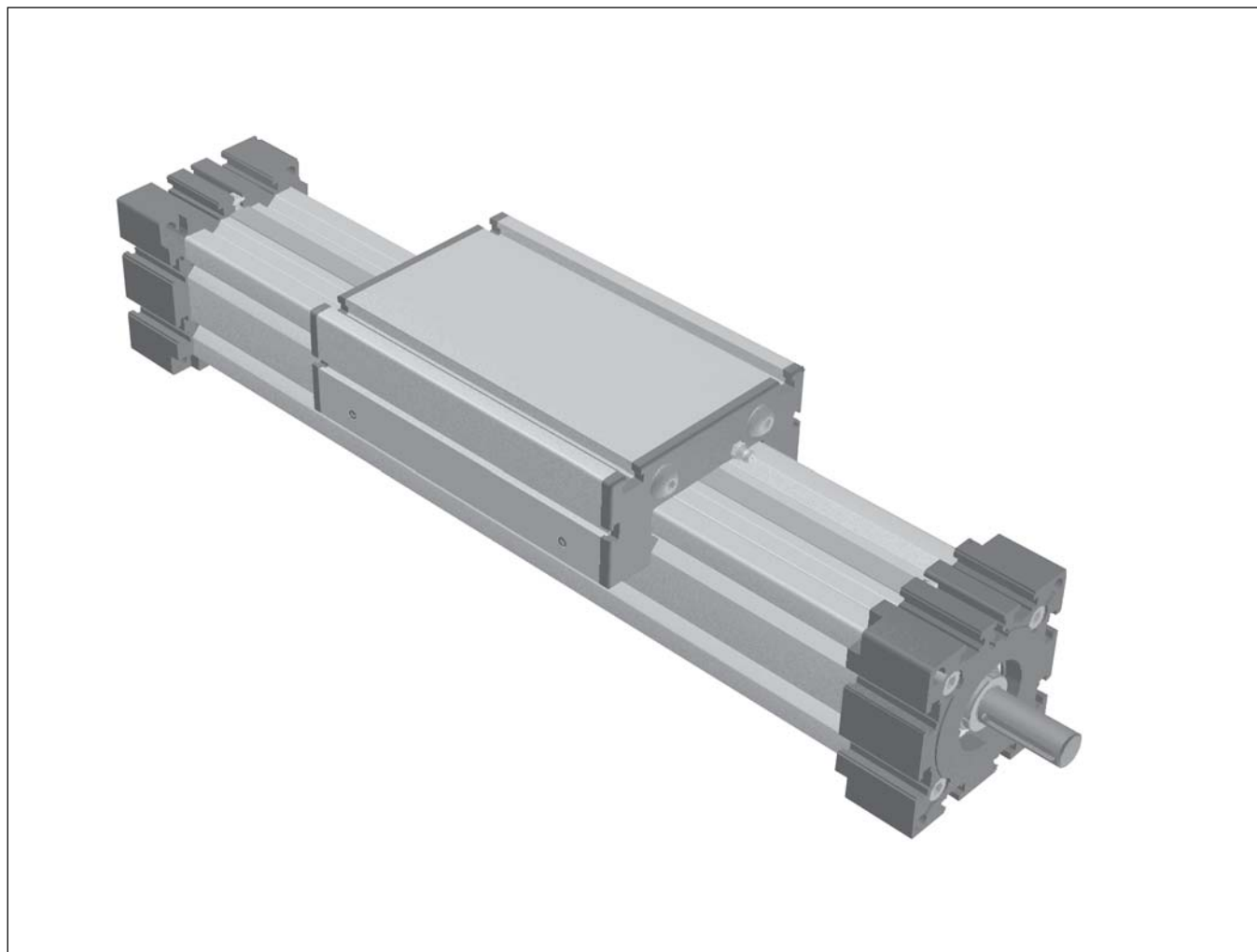
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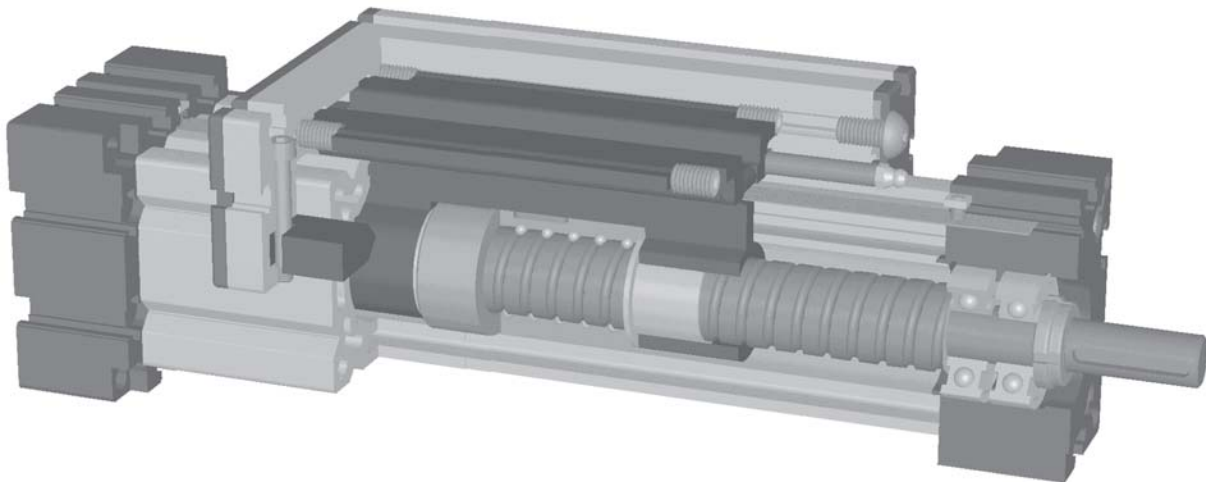


## Trapezoidal- or ballscrew spindle driven positioning systems EL and EG

# Positioning system EGT/EGK 30, 40, 60, 80

Specifications

## 1.1 Spindle driven with trapezoidal- or ballscrew spindle



### Function:

This unit consists of an aluminium square profile with lateral V-guides. The carriage, which is driven by means of a trapezoidal threaded spindle with lead screw, moves along the unit guided by V-slides that are adjustable free of play. Where two linear units are used in parallel or where two carriages are mounted on one unit, the leading-nut receiver can be used to adjust the symmetry of the carriages. The linear opening of the unit is sealed with a stainless steel cover band to make the unit splash-proof and dust-tight.

### Fitting position:

As required. Max. length 3.000 mm

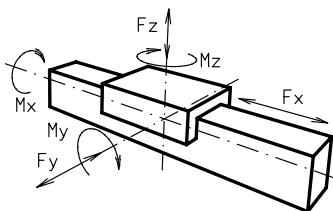
### Carriage mounting:

T-slots, tapped holes (size 40)

### Unit mounting:

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

Forces and torques	Size	EG 30		EG 40		EG 60		EG 80	
	Forces / Torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)		750	600	1500	1200	2500	2000	4200	3500
$F_y$ (N)		90	60	350	315	500	450	1000	900
$F_z$ (N)		90	60	500	450	750	675	1125	1000
$M_x$ (Nm)		10	5	20	18	33	30	82	75
$M_y$ (Nm)		13	6	44	40	77	70	220	200
$M_z$ (Nm)		14	7	33	30	55	50	165	150
<b>All forces and torques relate to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table									
<b>No-load torque</b>									
Trapezoidal thread	10x3	-	18x4	18x8	24x5	24x10	28x5	28x10	
(Nm)		0,4	-	0,70	0,70	0,50	0,80	0,80	1,0
Ballscrew	8x2,5	-	16x5	16x10	25x5	25x10	32x5	32x10	
(Nm)		0,25	-	0,40	0,60	0,40	0,70	0,80	1,0
<b>Geometrical moments of inertia of aluminium profile</b>									
$I_x$ mm <sup>4</sup>		4,09x10 <sup>4</sup>		1,35x10 <sup>5</sup>		5,65x10 <sup>5</sup>		19,14x10 <sup>5</sup>	
$I_y$ mm <sup>4</sup>		4,00x10 <sup>4</sup>		1,48x10 <sup>5</sup>		6,12x10 <sup>5</sup>		20,12x10 <sup>5</sup>	
Elastic-modulus N/mm <sup>2</sup>		70000		70000		70000		70000	



### Formula: EGT/K

Driving torque:

$$M_o = \frac{F \cdot P \cdot S \cdot w}{2000 \cdot \pi \cdot \mu} + M_{leer}$$

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

- F = force (N)
- P = thread pitch (mm)
- S = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm of screw (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $\mu$  = screw efficiency
- w = friction coefficient ~ 1,22
- $P_o$  = motor power (KW)

Efficiency of lead screws:

- All ballscrews: 0.900
- Tr 10x3 0.375
- Tr 18x4 0.399
- Tr 24x5 0.384
- Tr 28x5 0.349
- Tr 18x8 0.565
- Tr 24x10 0.550
- Tr 28x10 0.513

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

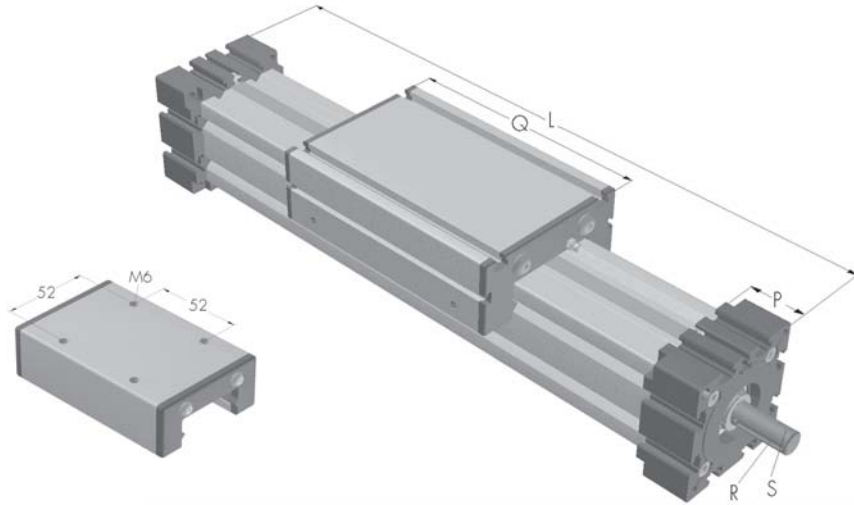
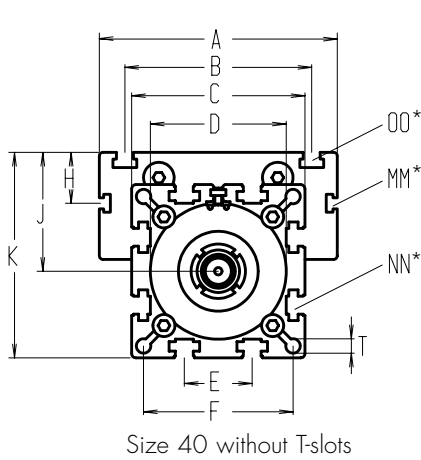


- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm<sup>2</sup>)
- I = second moment of area (mm<sup>4</sup>)

The diagram for critical speeds of lead screws refer to chapter 5.2 page 3

# Positioning system EGT/EGK 30, 40, 60, 80

Dimensions (mm)



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

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

Size □	Basic length L	A	B	C	D	E	F	H	J	K	MM for	NN for	OO for	P	Q	R	S Ø x length	T	Basic weight	Weight per 100 mm
EG 30	120	70	56	42	40x1	13	35	-	26	47	M 6	M 6	M 6	18	82	-	5x15	4,2	0,6 kg	0,16 kg
EG 40	170	70	-	58	48x1	18	47	-	35	64	M 6	M 6	M 6	25	118	3x3x25	10x27	6,5	1,3 kg	0,36 kg
EG 60	235	100	80	82	62x1	30	69	-	49	90	M 8	M 8	M 8	35	164	5x5x28	14x35	8,5	4,0 kg	0,67 kg
EG 80	285	140	110	102	80x1	40	88	30	70	121	M 6	M 10	M 10	45	193	6x6x40	18x45	8,5	6,7 kg	1,14 kg

**Spindle:**

**T** (T) Trapezoidal thread (K) Ballscrew

**Selection of screw:**

**1** (1) right hand (2) left hand (Ballscrew by inquiry)

**Choice of guide body profile:**

**0** (0) Standard (1) stainless guide rods (only size 30) (2) stainless guide rods and screws (only size 30)

**Choice of carriages:**



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length on request; the longer the carriage, the greater the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 12-16 mm. Thickness of jointing plate refer to chapter 1.2 page 6.

**Choice of journal:**

**0** (0) one shaft (locating bearing side) (1) one shaft (non-locating bearing side) (2) shaft on both sides

**Selection of screw:**

Size	Standard trapezoidal thread		Standard ballscrew	
	Standard	Multistart-screw	Standard	Multistart-screw
30	(0) Tr 10x3	(1) Tr 18x8	(0) Kg 8x2,5	(1) Kg 16x10
40	(0) Tr 18x4	(1) Tr 24x10	(0) Kg 16x5	(1) Kg 20x20 (2) Kg 25x10
60	(0) Tr 24x5	(1) Tr 28x10	(0) Kg 25x5	(1) Kg 25x25 (2) Kg 32x10
80	(0) Tr 28x5		(0) Kg 32x5	

**Ballscrew pitch accuracy:**

**0** (0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**End play of ball nut:**

**0** (0) 0,04 mm (Standard), (1)\* < 0,02 mm, (2)\* 2% apply prestress  
\* only in combination with **pitch accuracy (1) or (2)**

**Repeatability:**

± 0,2 mm Trapezoidal  
± 0,025 mm Ballscrew

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

**EG T 40 1 0 0 0 0 0 0 0 1500**  
Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

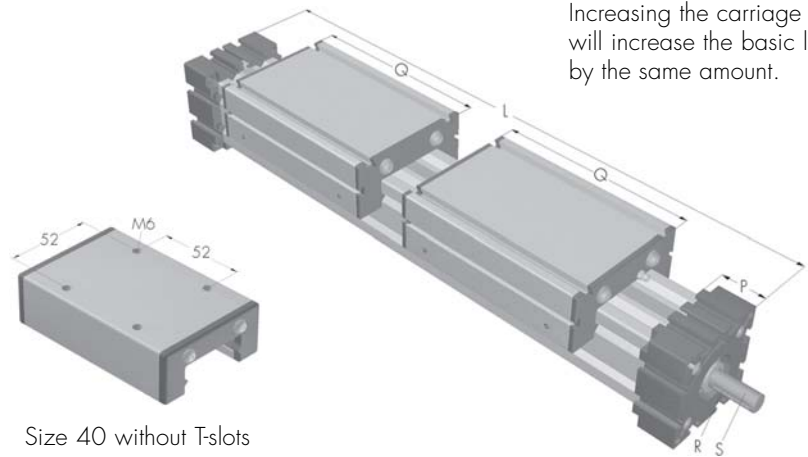
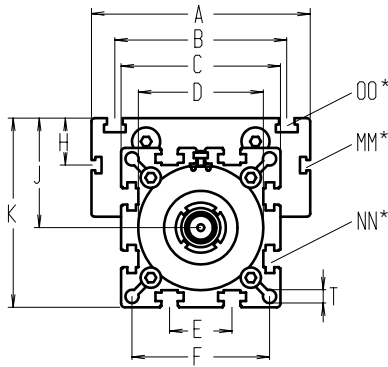
EGT40, trapezoidal right hand thread, standard body profile, top carriage, one shaft (locating bearing side), spindle 18x4, 1330 mm stroke

# Positioning system EGT/EGK 30, 40, 60, 80

Dimensions (mm)

with trapezoidal thread or ballscrew, right-hand and left-hand thread or divided spindles

1.1



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

Size 40 without T-slots

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

Size □	Basic length L	A	B	C	D	E	F	H	J	K	MM for	NN for	OO for	P	Q	R	S ∅ x length	T	Basic weight	Weight per 100 mm
EG 30	202	70	56	42	40x1	13	35	-	26	47	-	M 6	M 6	18	82	-	5x15	4,2	1,0 kg	0,16 kg
EG 40	290	70	-	58	48x1	18	47	-	35	64	-	M 6	M 6	25	118	3x3x25	10x27	6,5	2,5 kg	0,36 kg
EG 60	400	100	80	82	62x1	30	69	-	49	90	-	M 8	M 8	35	164	5x5x28	14x35	8,5	6,2 kg	0,67 kg
EG 80	480	140	110	102	80x1	40	88	30	70	121	M6	M 10	M 10	45	193	6x6x40	18x46	8,5	12,0 kg	1,14 kg

**T Spindle:**  
(T) Trapezoidal thread (K) Ballscrew

**3 Selection of screw:**  
(3) right - left hand (4) divided spindle

**0 Choice of guide body profile:**  
(0) Standard (1) stainless guide rods (only size 30) (2) stainless guide rods and screws (only size 30)

**Choice of carriages:**



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length on request; the longer the carriage, the greater the load capacity.



Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 24-32 mm. Thickness of jointing plate refer to chapter 1.2 page 6.

**0 Choice of journal:**  
(0) shaft right hand thread (1) shaft left hand thread (2) shaft on both sides

**0 Selection of screw:**

Size	Standard trapezoidal thread	Multistart-screw	Standard	Multistart-screw ballscrew
30	(0) Tr 10x3		(0) Kg 8x2,5*	
40	(0) Tr 18x4	(1) Tr 18x8	(0) Kg 16x5	(1) Kg 16x10*
60	(0) Tr 24x5	(1) Tr 24x10	(0) Kg 25x5	(1) Kg 20x20* / (2) 25x10*
80	(0) Tr 28x5	(1) Tr 28x10	(0) Kg 32x5	(1) Kg 25x25* / (2) 32x10*

**0 Ballscrew pitch accuracy:**  
(0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

\* = only for selection of divided spindle

**0 End play of ball nut:**  
(0) 0,04 mm (Standard), (1)\* < 0,02 mm, (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

**Repeatability:**  
± 0,2 mm Trapezoidal  
± 0,025 mm Ballscrew

**2200** Basic length + stroke = total length

EG	T	40	3	0	0	0	0	0	0	0	0	2200
Pos.	1	2	3	4	5	6	7					

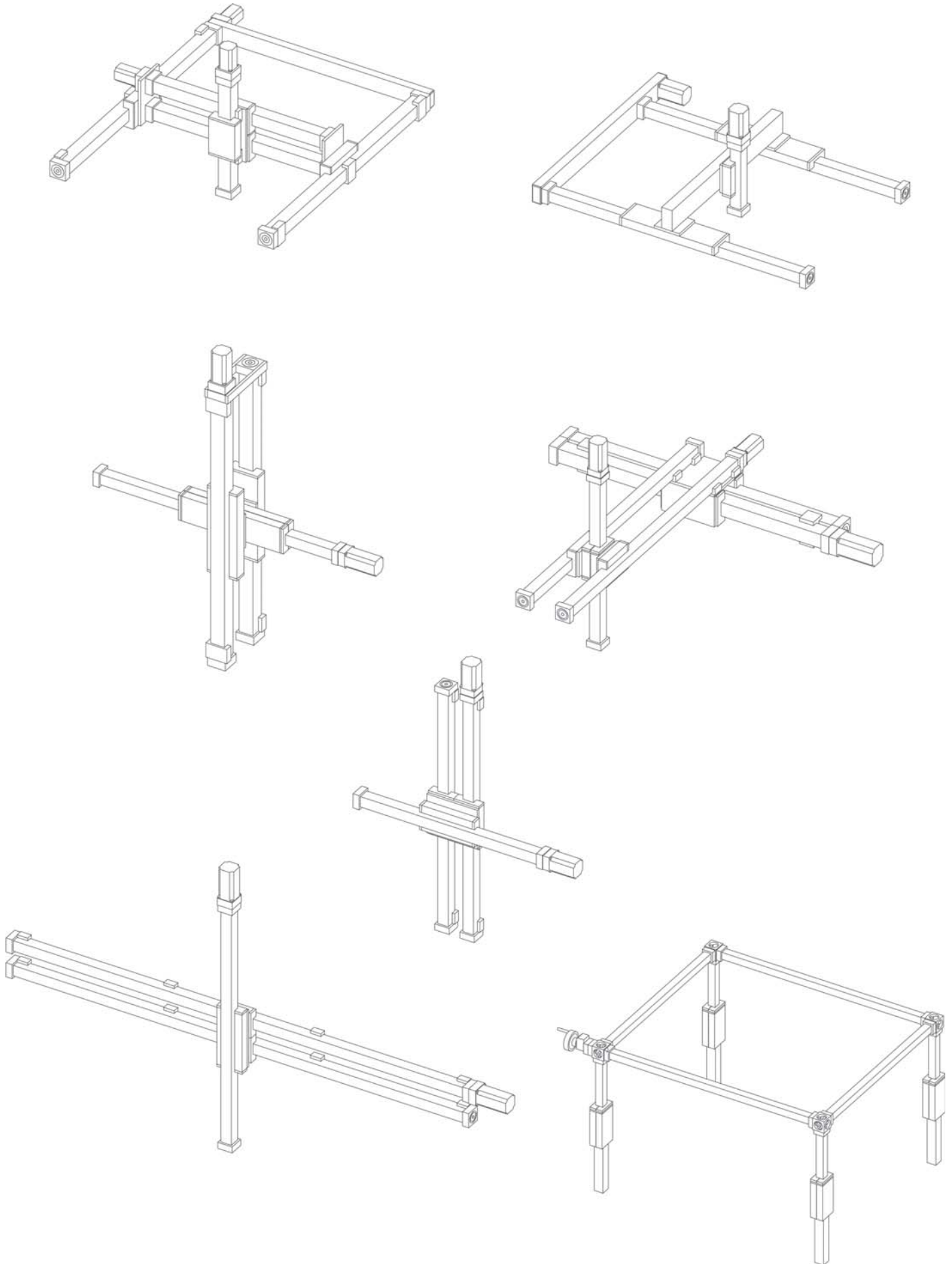
For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:  
EGT40, trapezoidal right - left hand thread, standard body profile, 2 top carriage, one shaft on right hand side, spindle 18x4, 1910 mm stroke

# Possible mounting styles

Spindle drives

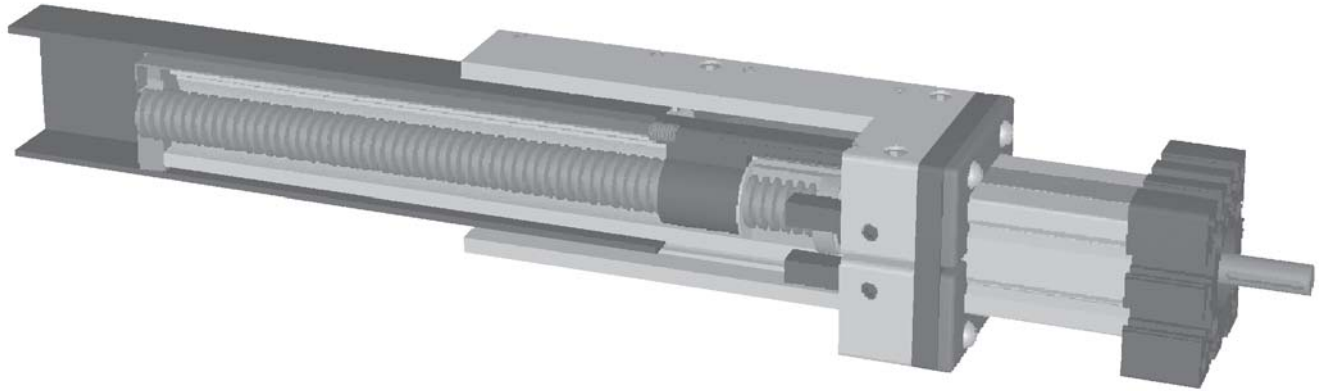
1.1



# Positioning system EGTH/EGKH 40, 60, 80

Specifications

## 1.1 Spindle driven with trapezoidal- or ballscrew spindle



### Function:

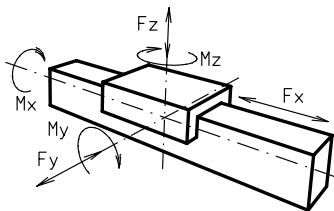
The rotary movement of the spindle is translated into a linear motion. Guiding profile and square tube are connected by a clamping block. The result is a telescopic movement.

**Fitting position:** As required. Max. length 3.000 mm

**Carriage mounting:** By T-slots and tapped holes

**Unit mounting:** By T-slots and tapped holes in the mounting surface.

Forces and torques	Size	EG(T/K)H 40		EG(T/K)H 60		EG(T/K)H 80	
	Forces / Torques	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)		1500	1200	2500	2000	4200	3500
$F_y$ (N)		350	315	500	450	1000	900
$F_z$ (N)		500	450	750	675	1125	1000
$M_x$ (Nm)		20	18	33	30	82	75
$M_y$ (Nm)		44	40	77	70	220	200
$M_z$ (Nm)		33	30	55	50	165	150
<b>All forces and torques relate to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table							
<b>No-load torque</b>							
Trapezoidal thread		18x4	18x8	24x5	24x10	28x5	28x10
(Nm)		0,70	0,70	0,50	0,80	0,80	1,0
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>		1,35x10 <sup>5</sup>		5,65x10 <sup>5</sup>		19,14x10 <sup>5</sup>	
$I_y$ mm <sup>4</sup>		1,48x10 <sup>5</sup>		6,12x10 <sup>5</sup>		20,12x10 <sup>5</sup>	
E-modulus N/mm <sup>2</sup>		70000		70000		70000	



### Formula: EGTH

Driving torque:

$$M_o = \frac{F \cdot P \cdot S \cdot w}{2000 \cdot \pi \cdot \mu} + M_{leer}$$

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

- F = force (N)
- P = thread pitch (mm)
- S = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm of screw (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $\mu$  = screw efficiency
- w = friction coefficient ~ 1,22
- $P_o$  = motor power (KW)

Efficiency of lead screws:

- All ballscrew 0.900
- Tr 18x4 0.399 Tr 18x8 0.565
- Tr 24x5 0.384 Tr 24x10 0.550
- Tr 28x5 0.349 Tr 28x10 0.513

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

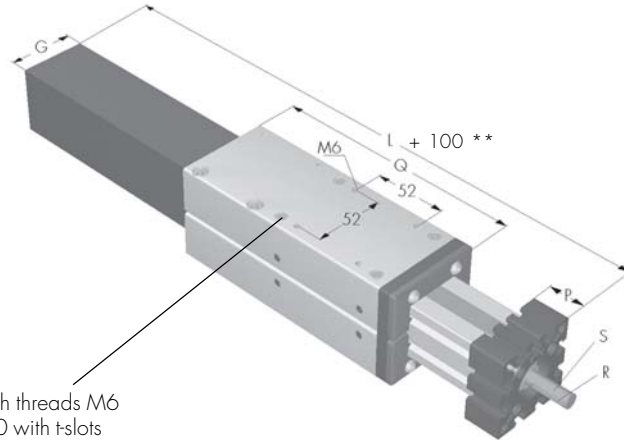
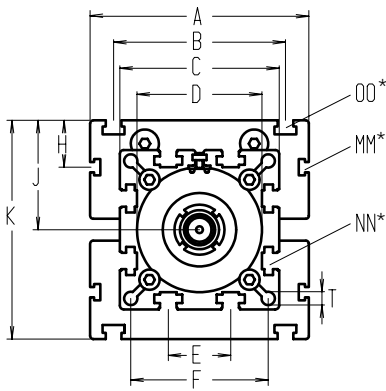
f = deflection (mm)  
 F = load (N)  
 L = free length (mm)  
 E = elastic modulus 70000 (N/mm<sup>2</sup>)  
 I = second moment of area (mm<sup>4</sup>)

The diagram for critical speeds of lead screws refer to chapter 5.2 page 3



# Positioning system EGTH /EGKH 40, 60, 80

Dimensions (mm)



Size 40 with threads M6  
Size 60/80 with t-slots

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

\*\* The basic length (minimum length) of the unit (L+100) includes a stroke of 100mm

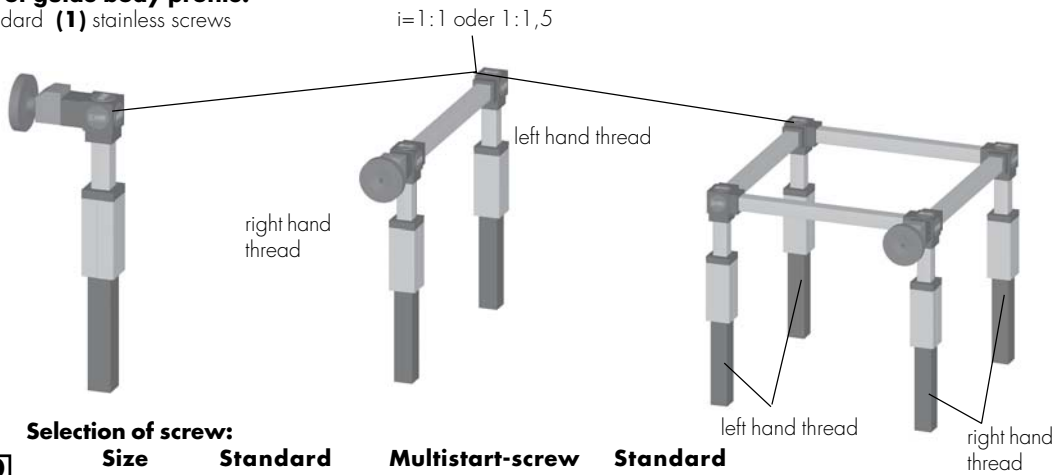
Size	Basic length L <sup>***</sup>	A	B	C	D	E	F	G	H	J	K	MM for	NN for	OO for	P	Q	R	S ∅ x length	T	Basic weight	Weight per 100 mm
EG H40	255	70	-	58	48x1	18	47	50	-	35	70	-	M 6	-	25	190	3x3x25	10x27	6,5	3,0 kg	0,44 kg
EG H60	345	100	80	82	62x1	30	69	70	-	49	98	-	M 8	M 8	35	250	5x5x28	14x35	8,5	7,0 kg	0,71 kg
EG H80	390	140	110	102	80x1	40	88	90	30	70	140	M 6	M 10	M 10	45	300	6x6x40	18x45	8,5	12,8 kg	1,35 kg

**Spindle:**

**T** (T) Trapezoidal thread (K) Ballscrew

**1** Selection of screw:  
(1) right hand (2) left hand

**0** Choice of guide body profile:  
(0) Standard (1) stainless screws



**Selection of screw:**

Size	Standard	Multistart-screw	Standard
	trapezoidal thread		ballscrew
40	(0) Tr 18x4	(1) Tr 18x8	(0) Kg 16x5
60	(0) Tr 24x5	(1) Tr 24x10	(0) Kg 25x5
80	(0) Tr 28x5	(1) Tr 28x10	(0) Kg 32x5

**0** Ballscrew pitch accuracy:  
(0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**0** End play of ball nut:  
(0) 0,04 mm (Standard), (1)\* < 0,02 mm, (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

**655** Basic length + stroke = total length

**Repeatability:**  
± 0,2 mm Trapezoidal  
± 0,025 mm Ballscrew

EG T H 40 1 0 0 0 0 0 0 0 0 0655  
Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

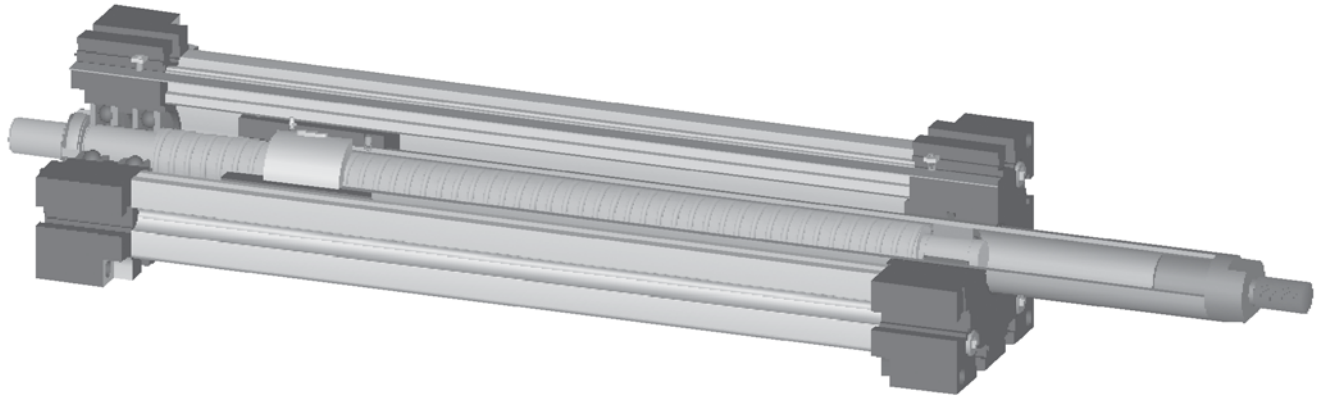
Sample ordering code:  
EGTH40, trapezoidal right hand thread, standard body profile, 500 mm stroke



# Positioning system EHT/EHK 40, 60, 80, 100, 125

Specifications

## 1.1 Spindle driven with trapezoidal- or ballscrew spindle



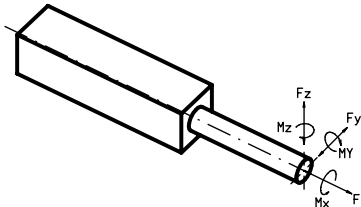
**Function:**

The rotary movement of the spindle is translated into a linear movement. The result is a telescopic movement.

**Fitting position:** As required. Max. length size 40 = 500 mm, size 60 = 1000 mm, size 80 and 100 = 1500 mm

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

Forces and torques	Size	EH 40		EH 60		EH 80		EH 100		EH 125	
	Forces / Torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)		800	550	1800	1200	2600	1500	3100	1900	6310	5050
$F_y$ (N)		50	27	130	80	210	140	300	175	640	400
$F_z$ (N)		50	27	130	80	210	140	300	175	640	400
$M_x$ (Nm)		12	8	20	11	27	16	34	20	43	25
$M_y$ (Nm)		25	13	95	60	190	110	290	180	738	600
$M_z$ (Nm)		25	13	95	60	190	110	290	180	738	600
<p><b>All forces and torques relate to the following:</b></p> <p>existing values <math>\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</math></p> <p>values of table</p>											
<b>No-load torque</b>											
Trapezoidal thread		10 x 3	18 x 4	18 x 8	24x5	24x10	32x6	32x12	40x7/40x14		
(Nm)		0,30	0,40	0,50	0,60	0,80	0,80	1,00	1,20/1,40		
Ballscrew		12 x 5	12x10	16 x 5	16 x 10	20 x 5	32x5	32x10	40x10/40x20		
(Nm)		0,20	0,40	0,20	0,40	0,40	0,60	0,80	1,00/1,20		
<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>	18,99x10 <sup>5</sup>	44,4x10 <sup>5</sup>	101,5x10 <sup>5</sup>					
$I_y$ mm <sup>4</sup>		1,34x10 <sup>5</sup>	6,97x10 <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					



**Formula: EHT/K**

Driving torque:

$$M_o = \frac{F \cdot P \cdot S \cdot w}{2000 \cdot \pi \cdot \mu} + M_{leer}$$

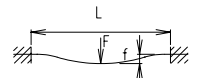
$$P_o = \frac{M_o \cdot n}{9550}$$

- F = force (N)
- P = thread pitch (mm)
- S = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm of screw (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $\mu$  = screw efficiency
- w = friction coefficient ~ 1,22
- $P_o$  = motor power (KW)

Efficiency of lead screws:

- All ballscrew 0.900
- Tr 18x4 0.399 Tr 18x8 0.565
- Tr 24x5 0.384 Tr 24x10 0.550
- Tr 28x5 0.349 Tr 28x10 0.513
- Tr 40x7 0.344 Tr 40x14 0.509

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



- 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>)

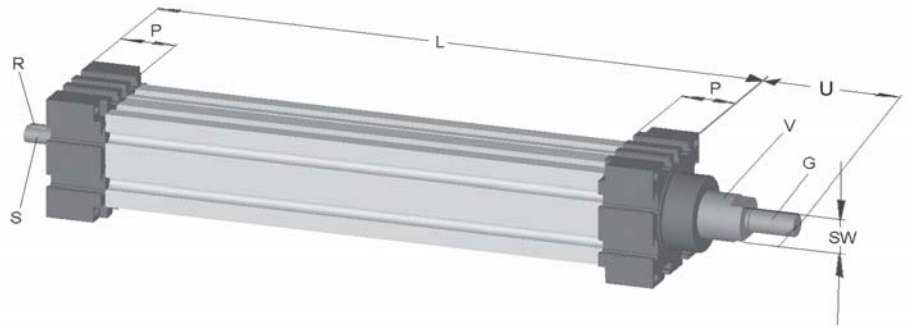
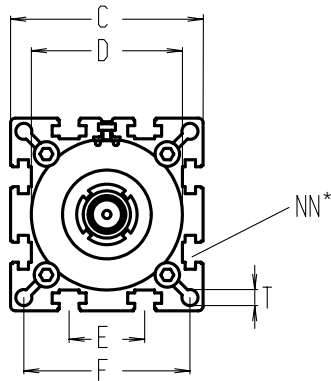
The diagram for critical speeds of lead screws refer to chapter 5.2 page 3



# Positioning system EHT/EHK 40, 60, 80, 100, 125

Dimensions (mm)

1.1



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

Size □	Basic length L	C	D	E	F	G ∅ x length	NN for	P	R	S ∅ x length	SW	T	U	V ∅	Basic weight	Weight per 100 mm
EH 40	125	58	48x1	18	47	M 12 x 1,25 x 24	M 6	25	2x2x22	6x27	17	6,5	54	20		
EH 60	170	82	62x1	30	69	M 16 x 1,5 x 32	M 8	35	3x3x25	10x27	27	8,5	77	30		
EH 80	180	102	80x1	40	88	M 20 x 1,5 x 40	M 10	45	5x5x28	14x35	30	8,5	100	40		
EH 100	250	130	110x1	50	112	M 30 x 2 x 45	M 10	55	6x6x40	22x45	46	10,5	105	50	6,5 kg	2,10 kg
EH 125	240	165	130x2	60	142	M 36 x 2 x 45	M 12	65	8x7x50	25x55	50	13	65	60	18,2 kg	3,20 kg

**K** Spindle:  
(T) Trapezoidal thread (K) Ballscrew

**1** Selection of screw:  
(1) right hand (2) left hand

**0** Choice of guide body profile:  
(0) Standard (1) stainless screws

Size	Standard		Multistart-screw	
	trapezoidal thread	ballscrew	trapezoidal thread	ballscrew
40	(0) Tr 10x3	(0) Kg 12x5	(1) Tr 18x8	(1) Kg 12x10
60	(0) Tr 18x4	(0) Kg 16x5	(1) Tr 24x10	(1) Kg 16x10
80	(0) Tr 24x5	(0) Kg 20x5	(1) Tr 28x10	(1) Kg 20x10
100	(0) Tr 28x5	(0) Kg 32x5	(1) Tr 40x14	(1) Kg 32x10
125	(0) Tr 40x7	(0) Kg 40x10		(1) Kg 40x20

**0** Ballscrew pitch accuracy:  
(0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**0** End play of ball nut:  
(0) 0,04 mm (Standard), (1)\* < 0,02 mm, (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

**680** Basic length + stroke = total length

**Repeatability:**  
± 0,2 mm Trapezoidal  
± 0,025 mm Ballscrew

EH	K	100	1	0	0	0	0	0	0	00680
Pos.	1	2	3	4	5	6	7			

Sample ordering code:  
EHK100, ballscrew right hand thread, standard body profile, spindle 32x5, 430 mm stroke

For combination kits and connecting elements refer to chapter 2.2

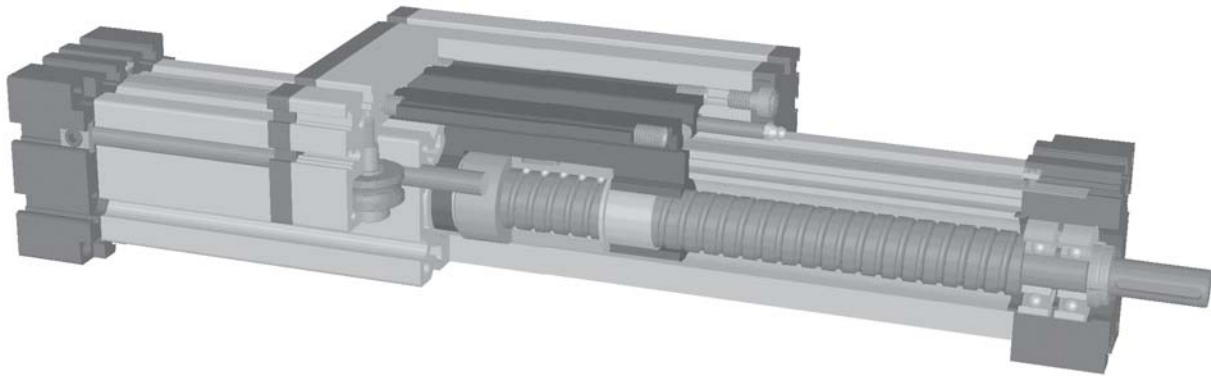


# Positioning system ELT/ELK 30, 40, 60, 60S, 80, 80S, 100, 125

Spindle driven with trapezoidal- or ballscrew spindle

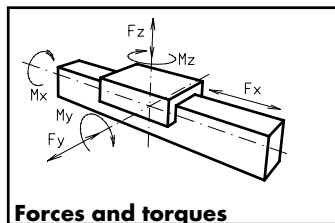
Specifications

1.1



**Function:**

This linear unit consists of an aluminium hollow section with integral, parallel ground and hardened steel guide rods. The carriage has play-adjustable ball-bearing rollers which engage with the guide rods. The rotating ballscrew causes linear motion of the ballnut, which is connected to the carriage. The slot necessary for this is covered by a stainless steel strip, making the unit dust- and splash-proof. Lateral adjustment of movement for parallel units, or when two carriages are mounted on one unit, is provided by the ballnut mounting.



**Fitting position:**  
**Carriage mounting:**  
**Unit mounting:**

As required, max. length 3.000 mm  
 By T-slots and tapped holes  
 By T-slots and tapped holes in the mounting surfaces.

**Forces and torques**

Size	EL 30		EL 40		EL 60		EL 60 S		EL 80		EL 80S		EL 100		EL 125	
	static	dyna.	static	dyna.	static	dyna.	static	dyna.	static	dyna.	static	dyna.	static	dyna.	static	dyna.
F <sub>x</sub> (N)	750	600	1500	1200	2500	2000	2500	2000	5000	4000	5000	4000	10000	8000	15000	12000
F <sub>y</sub> (N)	90	60	1200	700	3000	2000	4100	3100	3000	2000	4600	3600	8000	6500	12000	9000
F <sub>z</sub> (N)	90	60	900	650	1700	1100	2160	1600	1700	1100	3000	1800	3600	2200	6000	4500
M <sub>x</sub> (Nm)	12	10	25	20	67	43	88	65	90	55	170	140	300	230	600	450
M <sub>y</sub> (Nm)	12	10	32	18	90	70	190	140	110	80	270	230	400	270	750	600
M <sub>z</sub> (Nm)	15	12	35	25	120	100	230	170	150	120	300	220	750	500	1350	1150

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

existing values  $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$   
 values of table

**No-load torque**

	EL 30	EL 40	EL 60	EL 60 S	EL 80	EL 80S	EL 100	EL 125
Trapezoidal thread	10x3	18x4/18x8	24x5/24x10	24x5/24x10	28x5/28x10	28x5/28x10	32x6/32x12	40x7/40x14
(Nm)	0,3	0,4/0,5	0,6/0,8	0,6/0,8	0,8/1,0	0,8/1,0	0,9/1,1	1,2/1,4
Ballscrew	8x2,5	16x5/16x10	25x5/25x10	25x5/25x10	32x5/32x10	32x5/32x10	32x5/32x10	40x10/40x20
(Nm)	0,15	0,2/0,4	0,4/0,6	0,4/0,6	0,6/0,8	0,6/0,8	0,7/0,9	1,0/1,2

**Geometrical moments of inertia of aluminium profile**

	EL 30	EL 40	EL 60	EL 60 S	EL 80	EL 80S	EL 100	EL 125
I <sub>x</sub> 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 <sub>y</sub> 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: ELT/K**

Driving torque:

$$M_a = \frac{F \cdot p \cdot S}{2000 \cdot \pi \cdot \mu} + M_{leer}$$

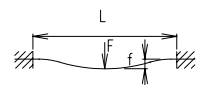
$$P_a = \frac{M_a \cdot n}{9550}$$

- F = force (N)
- P = thread pitch (mm)
- S<sub>1</sub> = safety factor 1,2 ... 2
- M<sub>leer</sub> = no-load torque (Nm)
- n = rpm of screw (min<sup>-1</sup>)
- M<sub>a</sub> = driving torque (Nm)
- μ = screw efficiency
- P<sub>a</sub> = motor power (KW)

Efficiency of lead screws:

All ballscrew	0.900
Tr 10x3	0.375
Tr 18x4	0.399
Tr 18x8	0.565
Tr 24x5	0.384
Tr 24x10	0.550
Tr 28x5	0.349
Tr 28x10	0.513
Tr 32x6	0.360
Tr 32x12	0.524
Tr 40x7	0.344
Tr 40x14	0.509

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



- 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>)

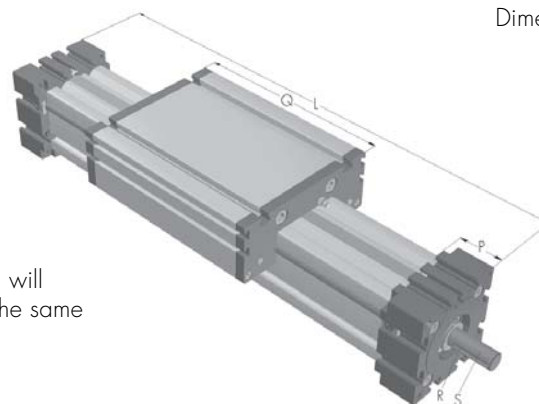
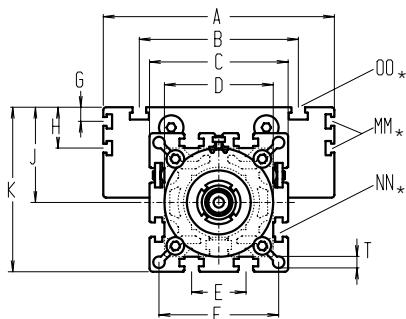
The diagram for critical speeds of lead screws refer to chapter 5.2 page 3



# Positioning system ELT/ELK 30, 40, 60, 60S, 80, 80S, 100, 125

Dimensions (mm)

1.1



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	NN for	OO for	P	Q	R	S ∅ x length	T	Basic weight	Weight per 100 mm
EL 30	120	70	56	42	40x1	13	35	-	-	26	47	-	M 6	M 6	18	82	-	5x15	4,2	0,7 kg	0,16 kg
EL 40	175	100	66	58	48x1	18	47	-	-	35	64	-	M 6	M 6	25	122	3x3x25	10x27	6,5	1,7 kg	0,37 kg
EL 60	245	144	96	82	62x1	30	69	-	-	49	90	-	M 8	M 8	35	168	5x5x28	14x35	8,5	5,1 kg	0,89 kg
EL 60S	270	170	108	82	62x1	30	69	-	-	49	94	-	M 8	M 8	35	194	5x5x28	14x35	8,5	5,1 kg	0,89 kg
EL 80	285	170	117	102	80x1	40	88	10	30	70	121	M 6	M 10	M 10	45	194	6x6x40	18x45	8,5	10,0 kg	1,48 kg
EL 80S	305	190	126	102	80x1	40	88	12,5	30	71	122	M 6	M 10	M 8	45	214	6x6x40	18x45	8,5	11,0 kg	1,48 kg
EL 100	410	230	155	130	110x1	50	112	-	29	89	154	M 10	M 10	M 10	55	300	6x6x40	22x45	10,5	19,0 kg	2,00 kg
EL 125	510	295	200	165	130x1	60	142	-	30	107,5	190	M 10	M 12	M 12	65	365	8x7x50	25x55	13,0	33,0 kg	2,89 kg

### Spindle:

**T** Trapezoidal thread **K** Ballscrew

### Selection of screw:

**1** (1) right hand (2) left hand (Ballscrew by inquiry)

### Choice of guide body profile:

**0** (0) Standard (1) stainless guide rod (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

### Choice of carriages:

**0** (0)



For standard carriage length see 'Q' in table. Non-standard length on request. The longer the carriage, the greater the load capacity.

**(1)**



Top and bottom carriages are rigidly joined, enabling higher loads to be applied. This increases the basic length by 12-24 mm. Thickness of jointing plate refer to chapter 1.2 page 6.

### Choice of journal:

**0** (0) one shaft (locating bearing side) (1) one shaft (non-locating bearing side) (2) shaft on both sides

### Selection of screw:

**0**

Size	Standard trapezoidal thread	Multistart-screw trapezoidal thread	Standard ballscrew	Multistart-screw ballscrew	
30	(0) Tr 10x3		(0) Kg 8x2,5		
40	(0) Tr 18x4	(1) Tr 18x8	(0) Kg 16x5	(1) Kg 16x10	(2) Kg 16x16
60	(0) Tr 24x5	(1) Tr 24x10	(0) Kg 25x5	(1) Kg 20x20	(2) Kg 25x10 (3) Kg 20x50
80	(0) Tr 28x5	(1) Tr 28x10	(0) Kg 32x5	(1) Kg 25x25	(2) Kg 32x10
100	(0) Tr 32x6	(1) Tr 32x12	(0) Kg 32x5	(1) Kg 32x10	(2) Kg 32x20 (3) Kg 32x32
125	(0) Tr 40x7	(1) Tr 40x14	(0) Kg 40x10	(1) Kg 40x20	(2) Kg 40x40

### Ballscrew pitch accuracy:

**0** (0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

### End play of ball nut:

**0** (0) 0,04 mm (Standard), (1)\* < 0,02 mm, (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

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

### Repeatability:

± 0,2 mm Trapezoidal  
± 0,025 mm Ballscrew

EL	T	40	1	0	0	0	0	0	0	0	0	0	1500
----	---	----	---	---	---	---	---	---	---	---	---	---	------

Pos. 1 2 3 4 5 6 7

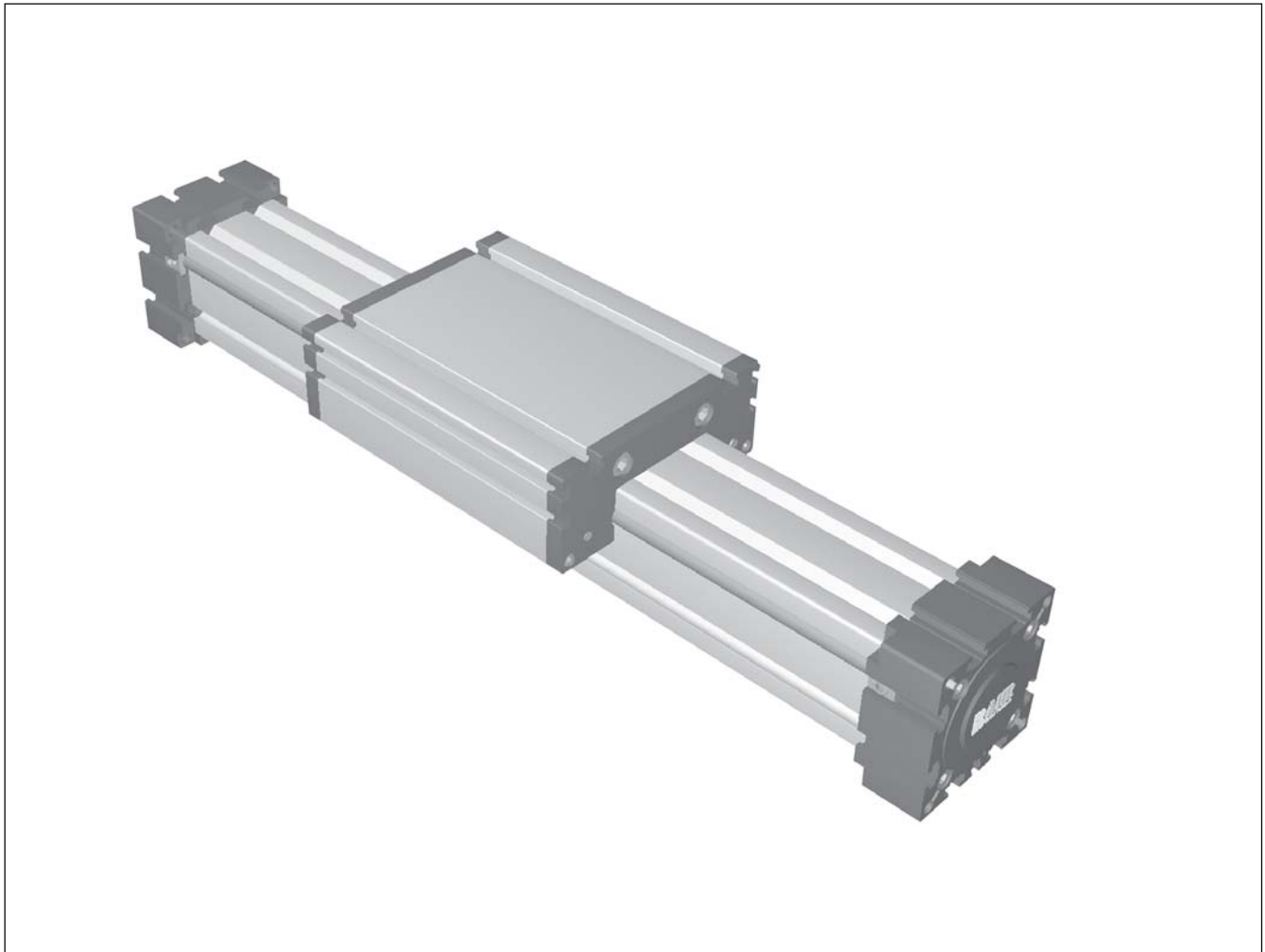
Sample ordering code:

ELT40, trapezoidal right hand thread, standard body profile, top carriage, one shaft (locating bearing side), spindle 18x4, 1325 mm stroke

For combination kits and connecting elements refer to chapter 2.2







Non driven  
positioning systems  
E / EL / UL

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

Roller guide unit without drive

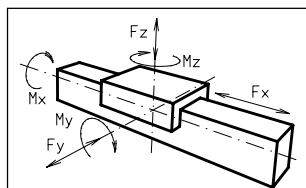
Specifications

2.1



## Function

This unit consists of an aluminium hollow section with integral, parallel ground and hardened steel guide rods. The carriage has play-adjustable ball bearing rollers which engage with the guide rods. Two bearing blocks without bearings are fitted. Actuation can be by pneumatic cylinder or other device, or the unit may be used as load-carrying linear slide.



Forces and torques

**Fitting position:**  
**Carriage connection:**  
**Unit mounting:**

As required, max. length 6.000 mm

By T-slots and tapped holes

By T-slots and tapped holes in the mounting surface, mounting sets.

Size	ELR 30		ELR 40		ELR 60		ELR 60 S		ELR 80		ELR 80S		ELR 100		ELR 125	
	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.
$F_x$ (N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$F_y$ (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  $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$

### No-load torque

max. (m/s)	3	4	5	5	6	8	10	10
------------	---	---	---	---	---	---	----	----

### 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>	10,2x10 <sup>6</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>	10,2x10 <sup>6</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: ELR

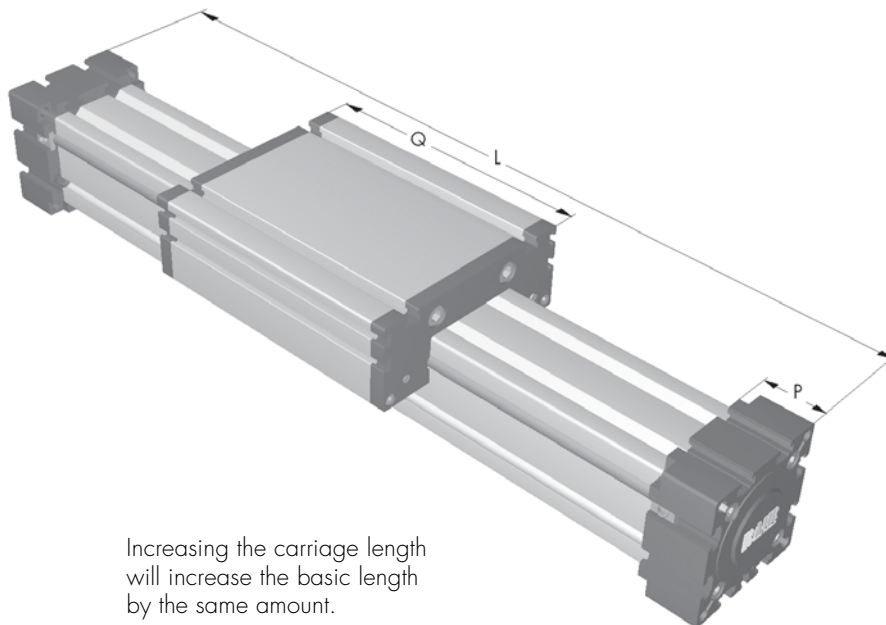
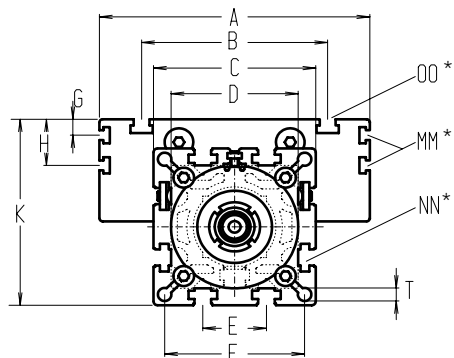
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

$f$  = 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 ELR 30, 40, 60, 60S, 80, 80S, 100, 125

Dimensions (mm)

2.1



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	K	MM for	NN for	OO for	P	Q	T	Basic weight	Weight per 100 mm
ELR 30	120	70	56	42	40x1	13	35	-	-	47	-	M 6	M 6	18	82	4,2	0,5 kg	0,12 kg
ELR 40	175	100	66	58	48x1	18	47	-	-	64	-	M 6	M 6	25	122	6,5	0,9 kg	0,23 kg
ELR 60	245	144	96	82	62x1	30	69	-	-	90	-	M 8	M 8	35	168	8,5	3,1 kg	0,61 kg
ELR 60S	265	170	108	82	62x1	30	69	-	-	94	-	M 8	M 8	35	194	8,5	4,1 kg	0,61 kg
ELR 80	285	170	117	102	80x1	40	88	10	30	121	M 6	M 10	M 10	45	194	8,5	5,3 kg	0,90 kg
ELR 80S	305	190	126	102	80x1	40	88	12,5	30	122	M 6	M 10	M 8	45	214	8,5	6,3 kg	0,90 kg
ELR 100	410	230	155	130	110x1	50	112	-	29	154	M 10	M 10	M 10	55	300	10,5	15,1 kg	1,50 kg
ELR 125	510	295	200	165	130x1	60	142	-	30	190	M 10	M 12	M 12	65	365	13	26,8 kg	2,05 kg

### Choice of guide body profile:

**0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

### Choice of carriages:



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length on request; the longer the carriage, the greater the load capacity.



Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 12-24 mm. Thickness of jointing plate refer to chapter 1.2 page 6.

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

ELR 40 0 0 0 0 0 0 0 0 01500  
Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

ELR 40, non driven system, standard body profile, standard carriage, 1325 mm stroke

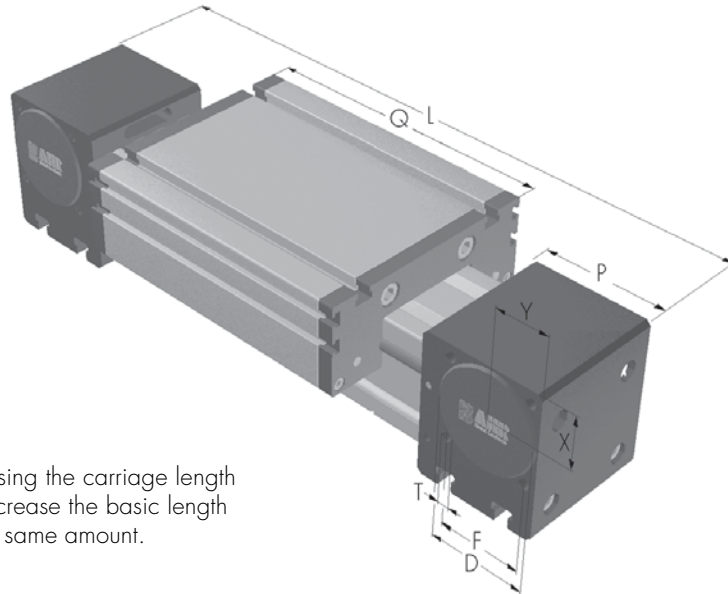
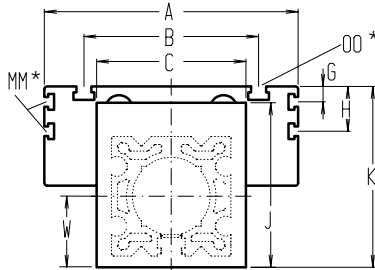
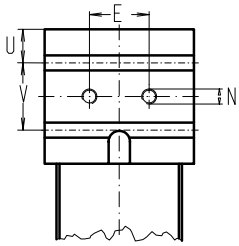


# Positioning system ELRZ 30, 40, 60, 60S, 80, 80S, 100, 125

Roller guide unit without drive

Dimensions (mm)

2.1



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
ELRZ 30	158	70	56	42	28	13	25	-	-	44	47	-	M 6	M 6	36	82	M 4	-	-	21	16	16	0,6 kg	0,13 kg
ELRZ 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	1,2 kg	0,23 kg
ELRZ 60	290	144	96	80	47	30	42	-	-	82	90	-	M 8	M 8	59	168	M 6	14	30	41	27	27	3,4 kg	0,61 kg
ELRZ 60S	315	170	108	80	47	30	42	-	-	82	94	-	M 8	M 8	59	194	M 6	14	30	41	27	27	4,4 kg	0,61 kg
ELRZ 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	6,7 kg	0,90 kg
ELRZ 80S	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	7,7 kg	0,90 kg
ELRZ 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	17,5 kg	1,50 kg
ELRZ 125	625	295	200	160	110	60	100	-	30	167	191	M 10	M 12	M 12	130	365	M 12	38	50	82	60	60	28,3 kg	2,05 kg

**Choice of guide body profile:**  
 (0) Standard  (1) stainless guide rods  (2) stainless guide rods and screws  (3) stainless guide rods, rollers and screws

**Choice of carriages:**



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length on request; the longer the carriage, the greater the load capacity.



Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 12-24 mm. Thickness of jointing plate refer to chapter 1.2 page 6.

**Application:**

This unit can be used as a load-carrying linear slide, or it may be fitted with a suitable pneumatic drive.

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

ELRZ 40 0 0 0 0 0 0 0 0 1500  
 Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

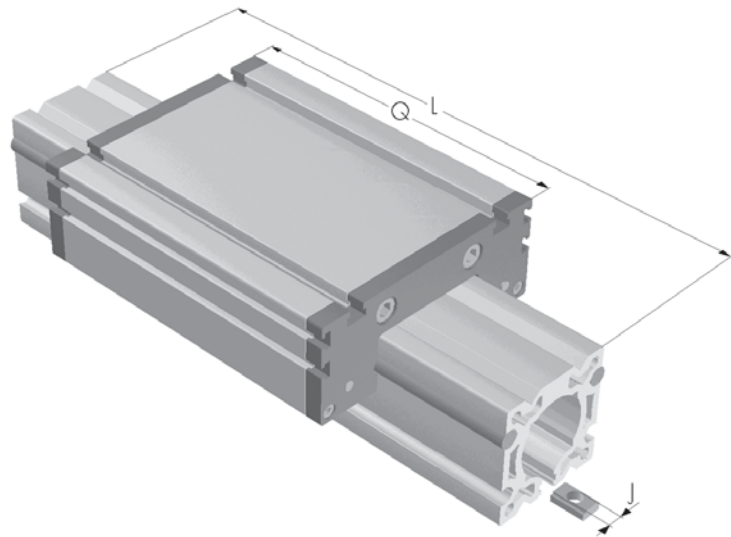
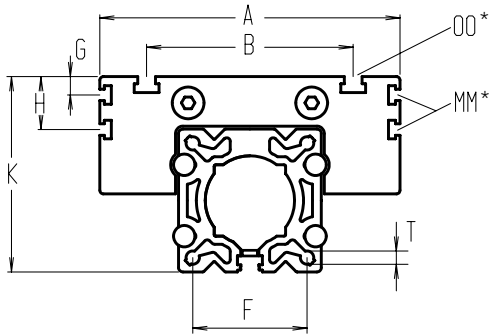
ELRZ 40, Non driven system, standard body profile, standard carriage, 1275 mm stroke



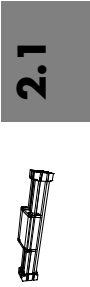
# Positioning system ER 30, 40, 60, 60S, 80, 80S, 100, 125

Roller guide unit without drive

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	F	G	H	J	K	MM for	OO for	Q	T	Basic weight	Weight per 100 mm
ER 30	82	70	56	23	-	-	M 6	41	-	M 6	82	M 4	0,5 kg	0,12 kg
ER 40	125	100	66	29	-	-	M 6 - M10	55	-	M 6	122	M 5	0,7 kg	0,23 kg
ER 60	170	144	96	48	-	-	M 6 - M10	79	-	M 8	168	M 6	2,4 kg	0,61 kg
ER 60S	200	170	108	48	-	-	M 6 - M10	83	-	M 8	194	M 6	3,4 kg	0,61 kg
ER 80	200	170	117	64	10	30	M 6 - M10	110	M 6	M 10	194	M 8	3,7 kg	0,90 kg
ER 80S	220	190	126	64	12,5	30	M 6 - M10	111	M 6	M 8	214	M 8	4,7 kg	0,90 kg
ER 100	300	230	155	80	-	29	M 10	139	M 10	M 10	300	M 10	10,8 kg	1,50 kg
ER 125	365	295	200	100	-	30	M 12	170	M 10	M 12	365	M 12	20,3 kg	2,05 kg

### Choice of guide body profile:

**0** (0) Standard **(1)** stainless guide rods **(2)** stainless guide rods and screws **(3)** stainless guide rods, rollers and screws

### Choice of carriages:

**0** (0)



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length on request; the longer the carriage, the greater the load capacity.

**(1)**



Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 12-24 mm. Thickness of jointing plate refer to chapter 1.2 page 6.

### Application:

This unit can be used as a load-carrying linear slide, or it may be fitted with a suitable pneumatic drive.

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

ER 40 0 0 0 0 0 0 0 0 1500  
Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

ER 40, Non driven system, standard body profile, standard carriage, 1375 mm stroke

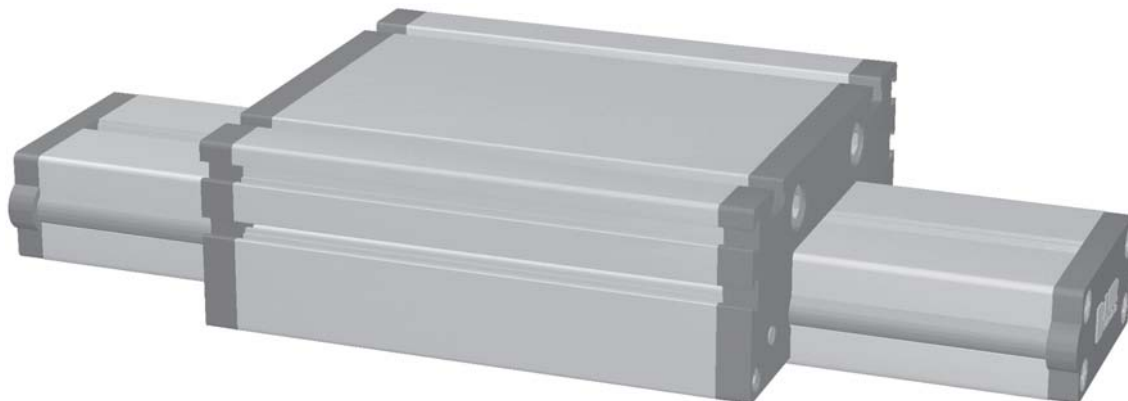


# Positioning system E 40, 60, 60S, 80, 80S

Roller guide unit without drive

Specifications

2.1



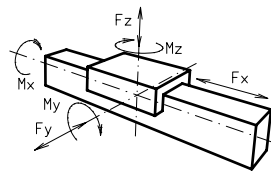
**Function:**

Very low building system achieved by an aluminium guide body with integrated, hardened steel guide rods. The carriage, which has internal linear ball bearings that can be adjusted free of play, moves along the body.

**Fitting position:** As required, max. length 6.000 mm.

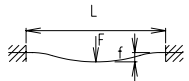
**Carriage connection:** By T-slots.

**Unit mounting:** By tapped holes in the mounting surface, bottom surface with T-slots.

Forces and torques	Size	E 40		E 60		E 60 S		E 80		E 80S	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
	$F_x$ (N)	-	-	-	-	-	-	-	-	-	-
	$F_y$ (N)	1200	700	3000	2000	4100	3100	3000	2000	4600	3600
	$F_z$ (N)	900	650	1700	1100	2160	1600	1700	1100	3000	1800
	$M_x$ (Nm)	25	20	67	43	88	65	90	55	170	140
	$M_y$ (Nm)	32	18	90	70	190	140	110	80	270	230
	$M_z$ (Nm)	35	25	120	100	230	170	150	120	300	220
<b>All forces and torques relate to the following:</b>											
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$											
<b>Speed</b>											
max. (m/s)		4		5		5		6		8	
<b>Geometrical moments of inertia of aluminium profile</b>											
$I_x$ mm <sup>4</sup>		0,157x10 <sup>5</sup>		1,71x10 <sup>5</sup>		1,71x10 <sup>5</sup>		2,8x10 <sup>5</sup>		2,8x10 <sup>5</sup>	
$I_y$ mm <sup>4</sup>		0,654x10 <sup>5</sup>		6,1x10 <sup>5</sup>		6,1x10 <sup>5</sup>		10,59x10 <sup>5</sup>		10,59x10 <sup>5</sup>	
E-Modulus N/mm <sup>2</sup>		70000		70000		70000		70000		70000	

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

**Formula: E**

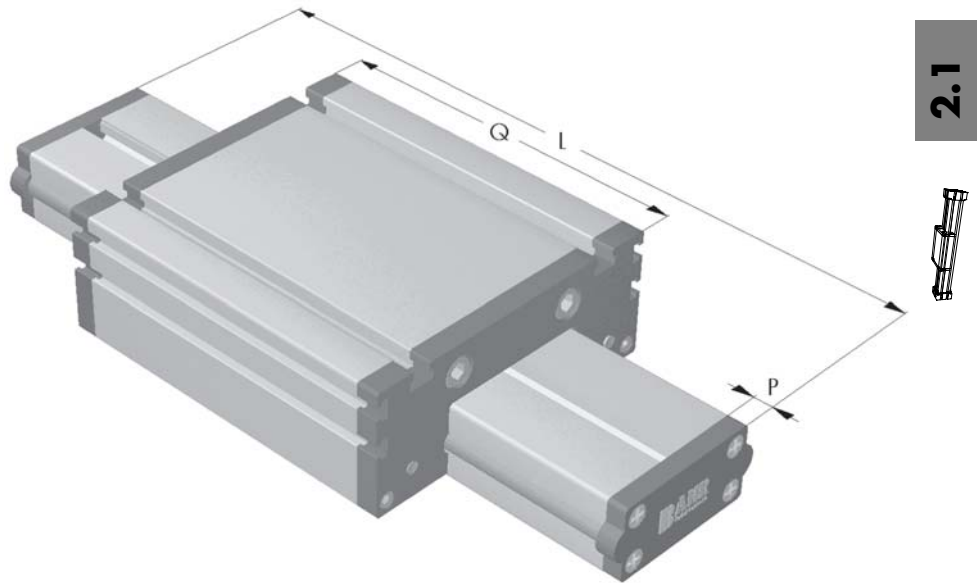
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$


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>)

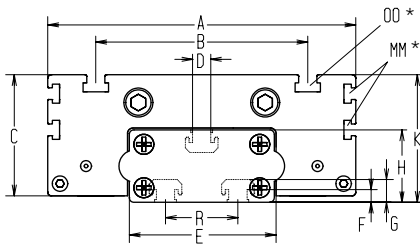
# Positioning system E 40, 60, 60S, 80, 80S

Dimensions (mm)

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



2.1



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

Size	Basic length L	A	B	C	D	E	F	G	H	K	MM for	OO for	P	Q	R	Basic weight	Weight per 100 mm
E 40	136	100	66	34,5	10	40	7	12,5	22	37	-	M 6	6	122	-	1,0 kg	0,13 kg
E 60	186	144	96	48,0	10	60	7	12,5	30	49	-	M 8	8	168	-	2,2 kg	0,20 kg
E 60S	212	170	108	48,0	10	60	7	12,5	30	53	-	M 8	8	194	-	3,2 kg	0,20 kg
E 80	215	170	117	66,5	10	80	7	12,5	40	70	M 6	M 10	10	194	40	3,4 kg	0,48 kg
E 80S	245	190	126	67,5	10	80	7	12,5	40	71	M 6	M 8	10	214	40	4,4 kg	0,48 kg

**Choice of guide body profile:**

- 0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

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

E 40 0 0 0 0 0 0 0 0 1500  
Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

E 40, non driven system, standard body profile, 1364 mm stroke

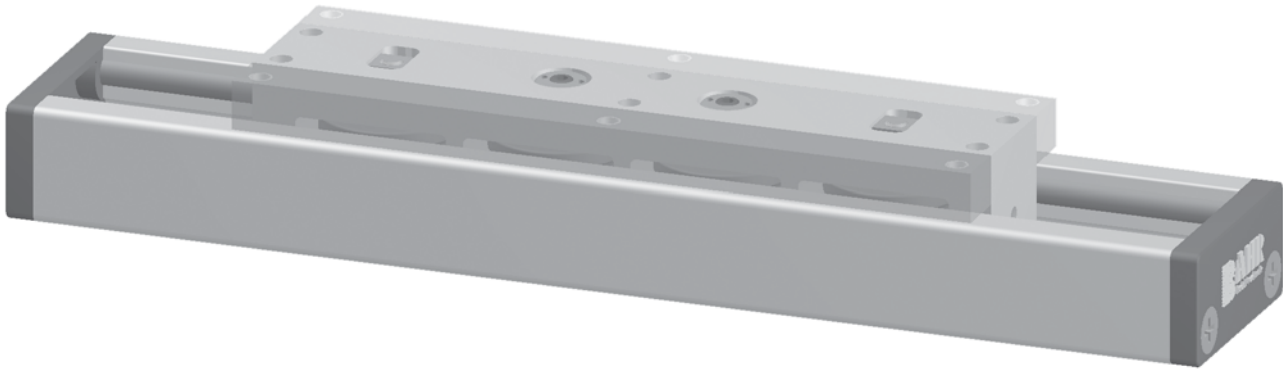


# Positioning system UL 40, 60, 80

Specifications

Roller guide unit without drive

2.1



**Function:**

Very low building roller system achieved by an aluminium guide body with integrated, hardened steel guide rods. The carriage, which has internal linear ball bearings that can be adjusted free of play, moves along the body.

**Fitting position:** As required, max. length 6.000 mm.

**Carriage connection:** By tapped holes

**Unit mounting:** Afterwards by holes or tapped holes

Forces and torques	Size	UL 40		UL 60		UL 80	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic
	F <sub>x</sub> (N)	-	-	-	-	-	-
	F <sub>y</sub> (N)	1200	700	3000	2000	3000	2000
	F <sub>z</sub> (N)	900	650	1700	1100	1700	1100
	M <sub>x</sub> (Nm)	25	20	67	43	90	55
	M <sub>y</sub> (Nm)	32	18	90	70	110	80
	M <sub>z</sub> (Nm)	35	25	120	100	150	120
	<b>All forces and torques relate to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table						
<b>Speed</b>							
	max. (m/s)	4		5		6	
<b>Geometrical moments of inertia of aluminium profile</b>							
	I <sub>x</sub> mm <sup>4</sup>	0,157x10 <sup>5</sup>		1,71x10 <sup>5</sup>		2,8x10 <sup>5</sup>	
	I <sub>y</sub> mm <sup>4</sup>	0,654x10 <sup>5</sup>		6,1x10 <sup>5</sup>		10,59x10 <sup>5</sup>	
	E-Modulus N/mm <sup>2</sup>	70000		70000		70000	

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


**Formula: UL**

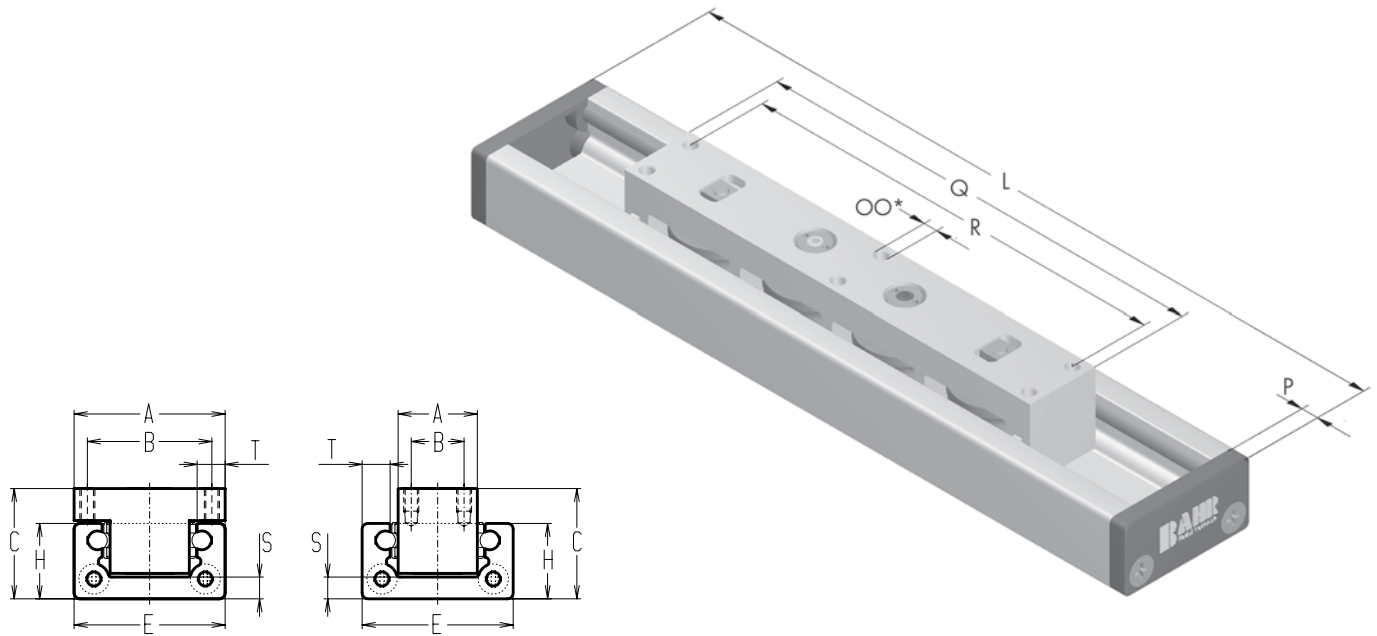
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

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 UL 40, 60, 80

Dimensions (mm)

2.1 



Size	Basic length L	A	B	C	E	H	OO for	P	Q	R	S	T	Basic weight	Weight per 100 mm
UL 40	160	40/20	31/13	33	40	22	M 5/M 5x8	6	146*	120	6,8	7,3	1,2 kg	0,13 kg
UL 60	215	60/29	48/20	43	60	30	M 6/M 6x10	8	194*	180	7,5	11	2,1 kg	0,20 kg
UL 80	285	80/42	66/28	58,5	80	40	M 8/M 8x12	10	260*	245	11,5	14,8	4,2 kg	0,48 kg

\* = the carriage is not available in different lengths

**0** Choice of guide body profile:  
**(0)** Standard **(1)** stainless guide rods **(2)** stainless guide rods and screws **(3)** stainless guide rods, rollers and screws

**0** Choice of carriage:  
**(0)** Standard **(1)** small carriage



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

UL 40 0 0 0 0 0 0 0 0 0 1500  
 Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

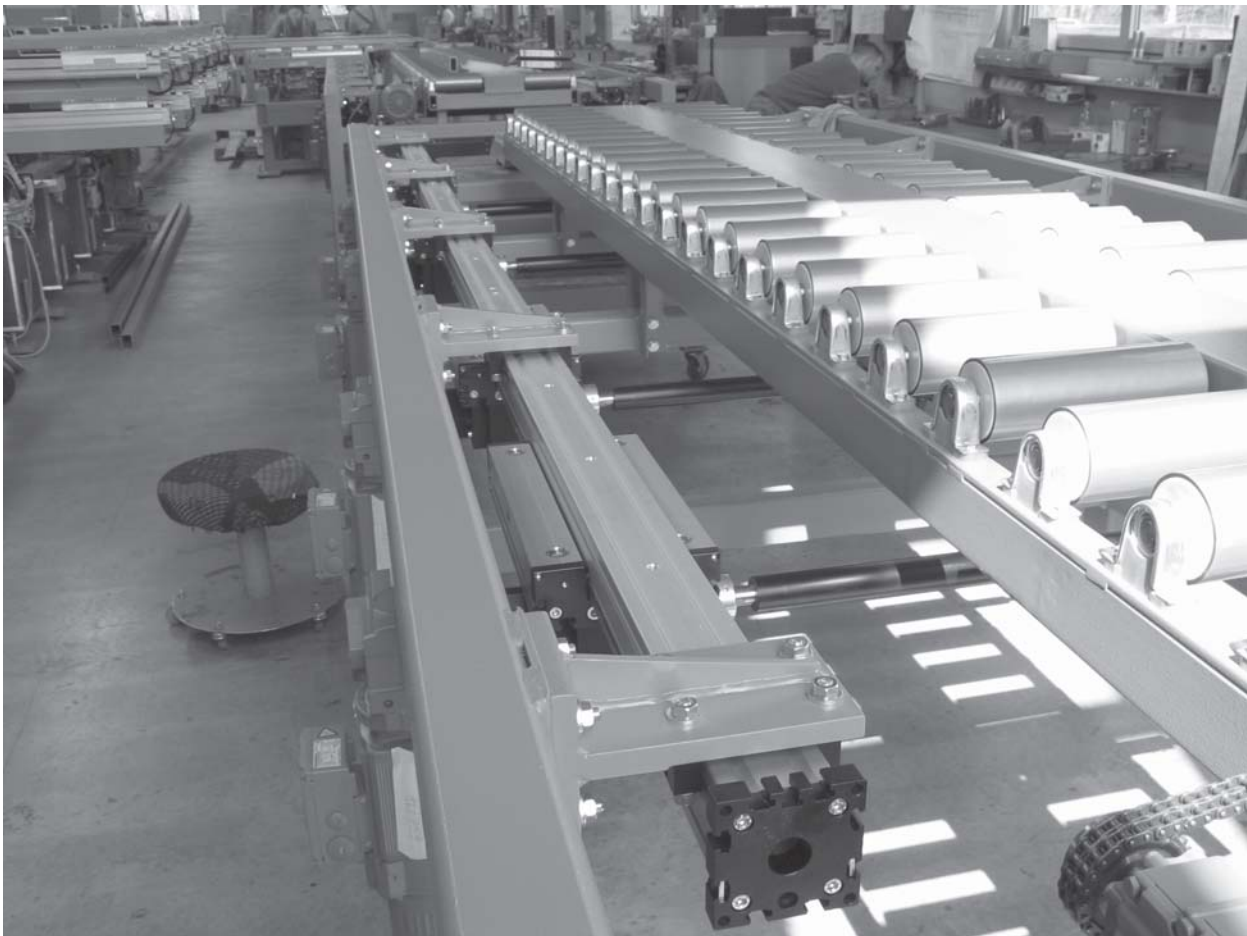
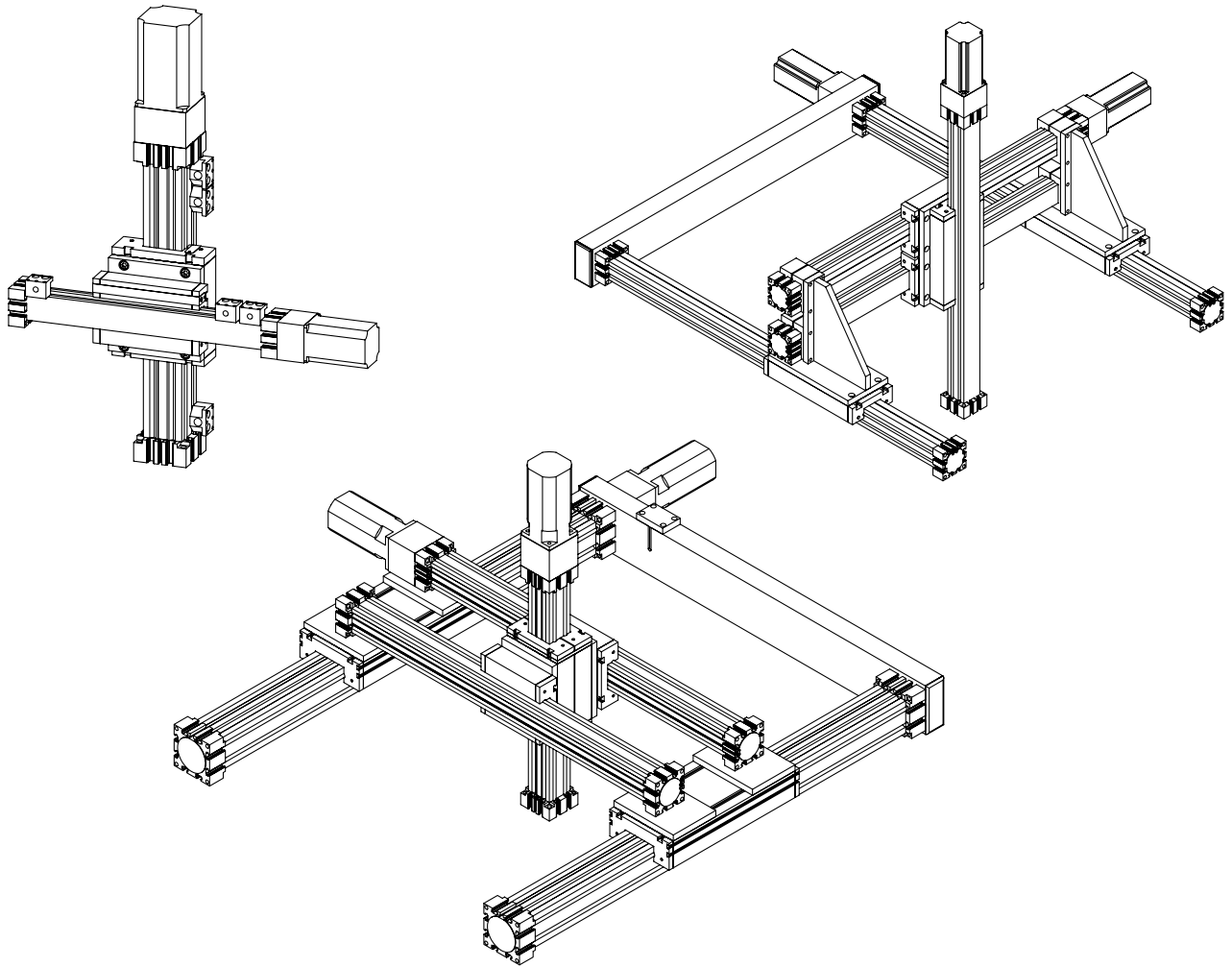
Sample ordering code:

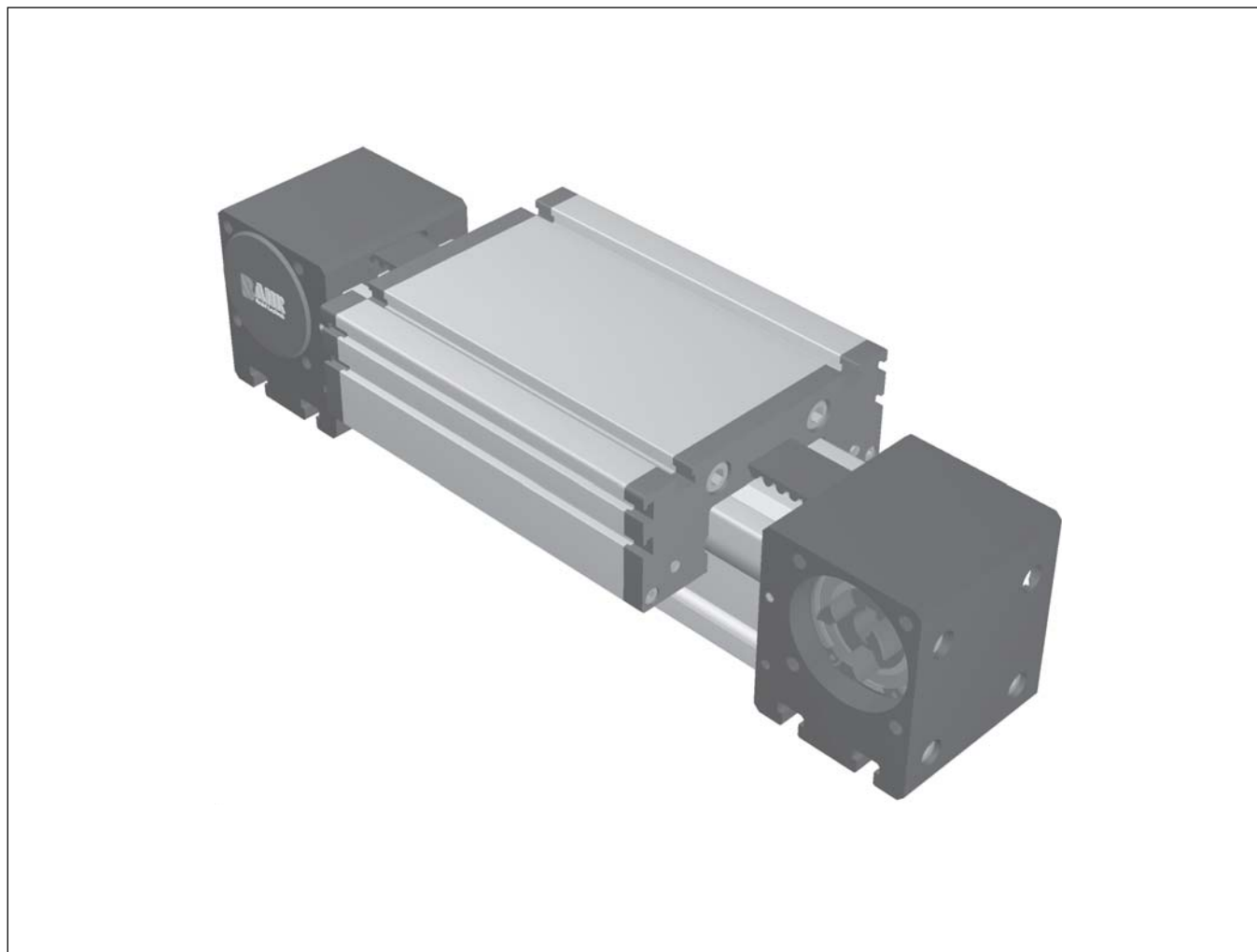
UL 40, non driven system, standard body profile, standard carriage (wide version), 1340 mm stroke



## Possible mounting styles

2.1





3.1



Belt driven

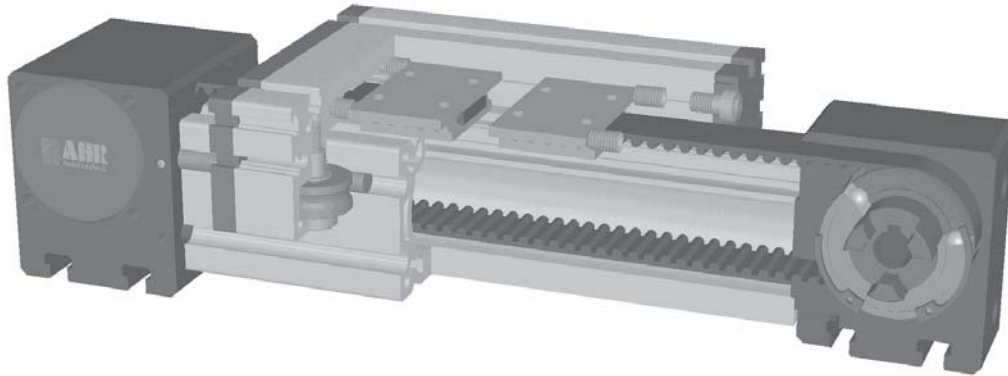
positioning systems

ELZ, ELZ<sub>ex</sub>, ELZG, ELZZ, ELSZ, ELSD,  
ELZT, ELHZ, ELVZ, ELFZ, ELZU, MLZ

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

Belt drive

Specifications

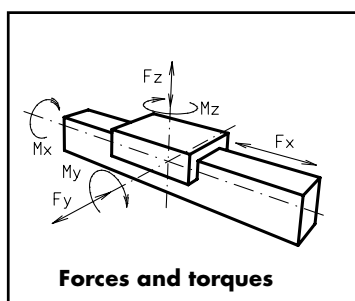


3.1



**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: ± 0,1 mm.

Size	ELZ 30		ELZ 40		ELZ 60		ELZ 60 S		ELZ 80		ELZ 80 S		ELZ 100		ELZ 125	
	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  $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$   
 values of table

No-load torque								
Nm	0,2	0,3	0,6	0,7	0,9	1,2	1,4	1,8
Speed								
(m/sec) max	2	4	5	7	6	8	10	10
Tensile force								
permanent (N)	200	390	900	900	1900	1900	4000	5900
0,2 sec (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**

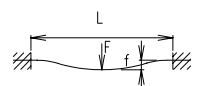
Driving torque:

$$M_o = \frac{F * P * S}{2000 * \pi} + M_{leer}$$

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = 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)

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

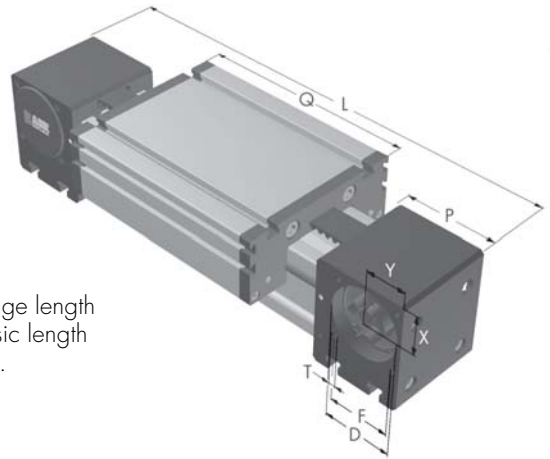
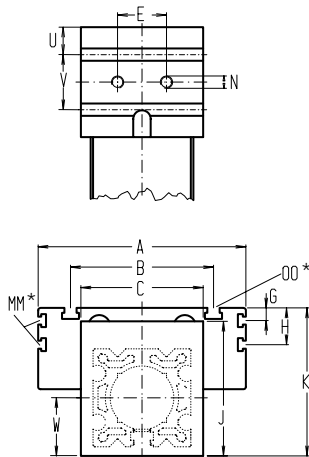


- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm<sup>2</sup>)
- I = second moment of area (mm<sup>4</sup>)



# 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	M 6	36	82	M 4	-	-	21	16	16	0,8 kg	0,13 kg
ELZ 40	225	100	66	58	37	18	32	-	-	58	64	M 6	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	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	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

**Choice of guide body profile:**  
**0** (0) Standard **(1)** stainless guide rods **(2)** stainless guide rods and screws **(3)** stainless guide rods, rollers and screws

**Choice of carriages:**

**0** (0)



For standard carriage length see 'Q' in table. Non-standard length on request. The longer the carriage, the higher the load capacity.

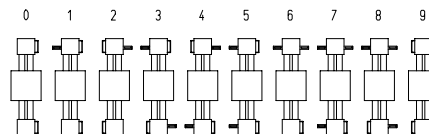
**(1)**



Top and bottom carriages are rigidly joined, enabling higher loads to be applied. This increases the basic length by 12 - 24 mm. Thickness of jointing plate refer to chapter 1.2 page 6.

**Coupling - shaft mounting:**

**0**



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 in the pulley bore and securing 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**

Size	Shaft ø h6 x length	Key
30	6 x 15	2x2x12
40	10 x 27	3x3x25
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x40

Basic length + stroke = total length

**ELZ 40 1 0 0 0 0 3 1 01500**

Pos. 1 2 3 4 5 6 7

Sample ordering code:

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



# Positioning system ELZ $\text{Ex}$ 40, 60, 60S, 80, 80S, 100, 125

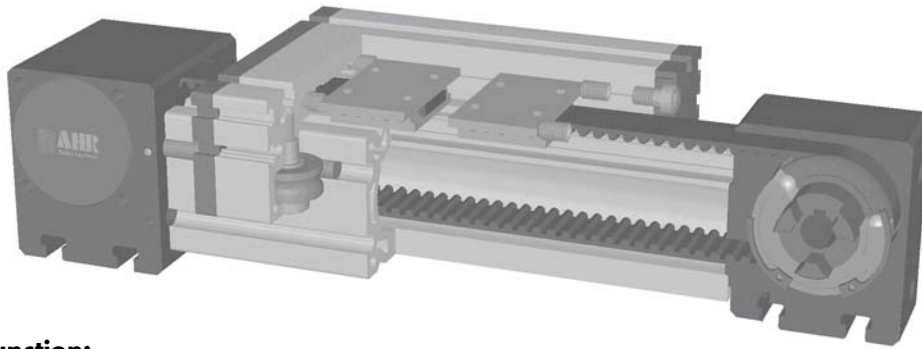
Belt drive

Specifications

**ATEX 95**

$\text{Ex}$  II 2G EEx c II B T4

$\text{Ex}$  II 3D EEx c T125°C



3.1

**Function:**

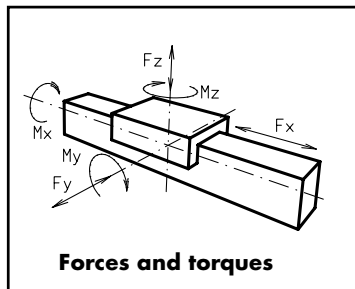
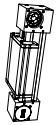
Like ELZ. The positioning system is suitable for use according to the intended purpose in potentially explosive areas (see ATEX 95 marking). An operating manual is included in the scope of delivery. The system is certified for the following areas:

**ATEX 95 II 2G EEx c IIB T4:**

All application areas except for underground mining. Gas atmosphere category 2, explosion protection category: protection due to secure construction (design security). Equipment group IIB. Temperature class T4=135°C

**ATEX 95 II 3D T125°C:**

All application areas except for underground mining. Dust atmosphere category 3. Maximum permissible surface temperature: 125°C.



- Fitting position:**
- Carriage mounting:**
- Unit mounting:**
- Belt type:**

As required, max. length without joints = 6,000 mm.  
 T-slots  
 By T-slots or tapped holes in the bearing block, mounting sets.  
 HTD with steel reinforcement, no backlash when changing direction, repeatability: ± 0,1 mm.

Size	ELZex 40		ELZex 60		ELZex 60 S		ELZex 80		ELZex 80 S		ELZex 100		ELZex 125	
	static	dynamic	static	dynamic	statisch	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)	178	142	312	250	312	250	1083	866	1083	866	1127	902	2067	1654
$F_y$ (N)	517	414	1330	1064	1910	1528	1584	1267	2219	1775	3100	2480	4980	3984
$F_z$ (N)	355	284	742	594	935	748	613	490	1052	842	1292	1034	2190	1752
$M_x$ (Nm)	12	10	36	29	52	41	36	29	67	54	101	81	220	176
$M_y$ (Nm)	13	11	39	32	66	53	39	32	87	70	136	109	280	224
$M_z$ (Nm)	19	15	70	56	137	110	100	81	182	146	326	260	636	509

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

$$\frac{\text{existing values } F_y}{\text{values of table } F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$$

**No-load torque**

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

**Speed**

(m/sec) max	1	1	1	1	1	1	1
-------------	---	---	---	---	---	---	---

**Tensile force**

permanent (N)	178	312	312	1083	1083	1127	2067
---------------	-----	-----	-----	------	------	------	------

**Geometrical moments of inertia of aluminium profile**

$I_x$ 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>	101,5x10 <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>	101,5x10 <sup>5</sup>
EModulus N/mm <sup>2</sup>	70000	70000	70000	70000	70000	70000	70000

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

**Formula: ELZex**

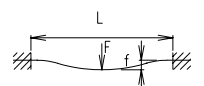
Driving torque:

$$M_o = \frac{F * P * S}{2000 * \pi} + M_{leer}$$

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = 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)

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

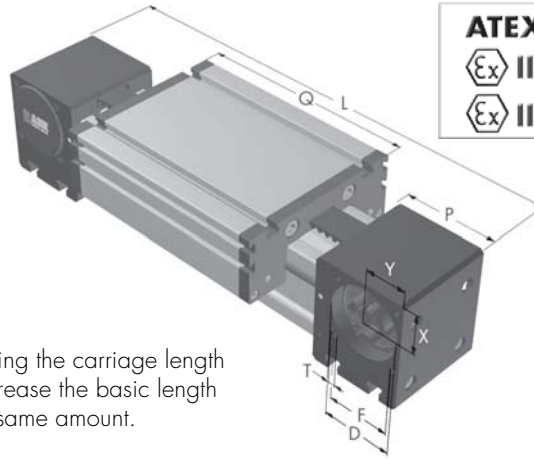
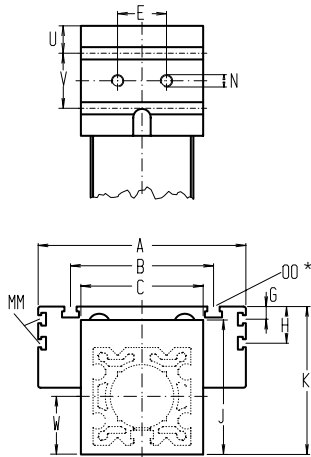


- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm<sup>2</sup>)
- I = second moment of area (mm<sup>4</sup>)



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

Dimensions (mm)



**ATEX 95**  
 II 2G EEx c II B T4  
 II 3D EEx c T125°C

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

**3.1**



\*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
ELZex 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
ELZex 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
ELZex 60 S	315	144	108	80	47	30	42	-	-	82	94	-	M 8	M 8	59	194	M 6	15	30	41	27	26	4,8 kg	0,62 kg
ELZex 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
ELZex 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
ELZex 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
ELZex 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

**Choice of guide body profile:**

- (0) Standard  (1) stainless guide rods  (2) stainless guide rods and screws

**Choice of carriages:**

(0)

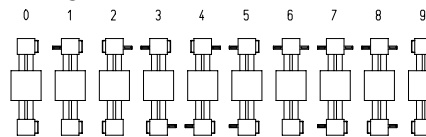


For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 16 - 24 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

**Coupling - shaft mounting:**

(0)



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 in the pulley bore and securing with 2 locking rings or tension sets (size 100 and 125).

**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
1 0	125	8M70	304	38

**Shaft dimensions**

Size	Shaft ø h6 x length	Key
40	10 x 27	3x3x25
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x40

Basic length + stroke = total length

ELZex 40 1 0 0 0 0 3 1 01500

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

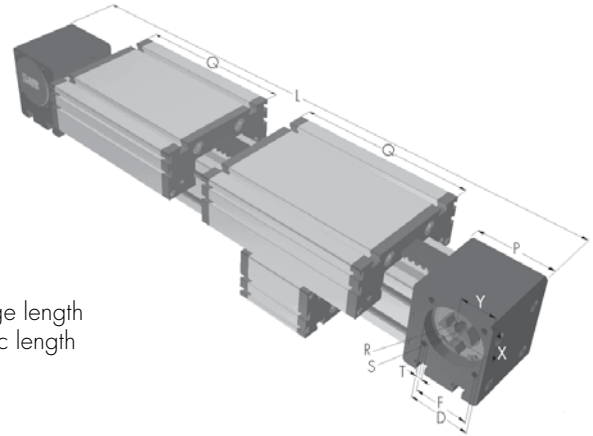
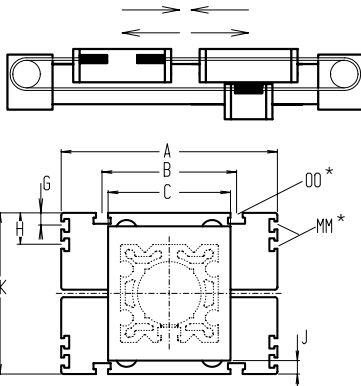
ELZex 40, standard body profile, standard carriage, coupling claw on one side, 1275 mm stroke.



# 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	Basic length L	A	B	C	D	F	G	H	J	K	MM for	OO for	P	Q	T	X	Y	Basic weight	Weight per 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	27	7,4 kg	0,62 kg
ELZ 60S	510	170	108	80	47	42	-	-	12	106	-	M 8	59	194	M 6	27	27	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** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws

### Choice of carriages:

- 0** (0)

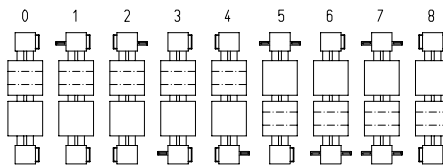


For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 24 - 48 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

### Coupling - shaft mounting:

- 0**



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 in the pulley bore and securing with 2 locking rings or tension sets (size 100 and 125).

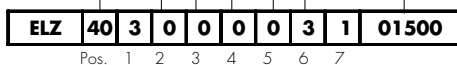
### Belt table

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

Size	Shaft ø h6 x length	Key
30	6 x 15	2x2x12
40	10 x 27	3x3x25
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x40

Basic length + stroke = total length



For combination kits and connecting elements refer to chapter 2.2

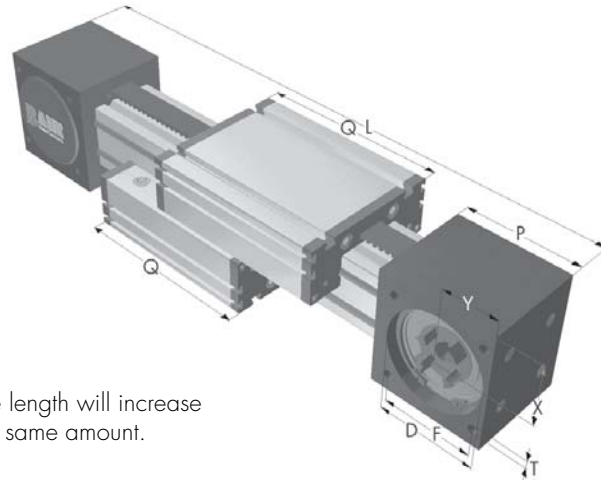
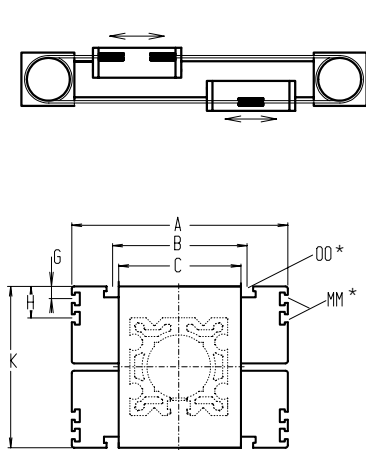
Sample ordering code:

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

# Positioning system ELZG 30, 40, 60, 60S, 80, 80S

Belt drive

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	F	G	H	K	MM for	OO for	P	Q	T	X	Y	Basic weight	Weight per 100 mm
ELZG 30	195	70	56	48	47	42	-	-	52	-	M 6	55	82	M 6	26	27	1,1 kg	0,13 kg
ELZG 40	265	100	66	60	55	55	-	-	70	-	M 6	70	122	M 6	35	33	4,0 kg	0,29 kg
ELZG 60	365	144	96	88	80	70	-	-	98	-	M 8	95	168	M 8	49	46	10,3 kg	0,65 kg
ELZG 60S	390	170	108	88	80	70	-	-	98	-	M 8	95	194	M 8	49	46		
ELZG 80	460	170	117	118	110	100	10	30	140	M 6	M 10	130	194	M 10	70	60	23,5 kg	1,15 kg
ELZG 80S	480	190	126	118	110	100	12,5	30	142	M 6	M 8	130	214	M 10	70	60	24,5 kg	1,15 kg

### Choice of guide body profile:

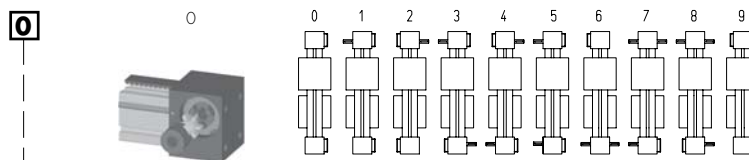
- 0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

### Choice of carriages:



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

### Coupling - shaft mounting:



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 in the pulley bore and securing with 2 locking rings or tension sets (size 80).

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
<b>0 1</b>	30	3M12	120	40
<b>0 3</b>	40	5M15	160	32
<b>0 4</b>	60 (S)	5M25	220	44
<b>0 7</b>	80 (S)	8M30	320	40

### Shaft dimensions

Size	Shaft ∅ h6 x length	Key
30	6 x 15	2x2x12
40	14 x 35	5x5x28
60 (S)	18 x 45	6x6x40
80 (S)	22 x 45	6x6x40

Basic length + stroke = total length

ELZG	40	1	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:

ELZG 40, standard body profile, standard carriage and coupling claw on one side , 1235 mm stroke.

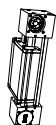
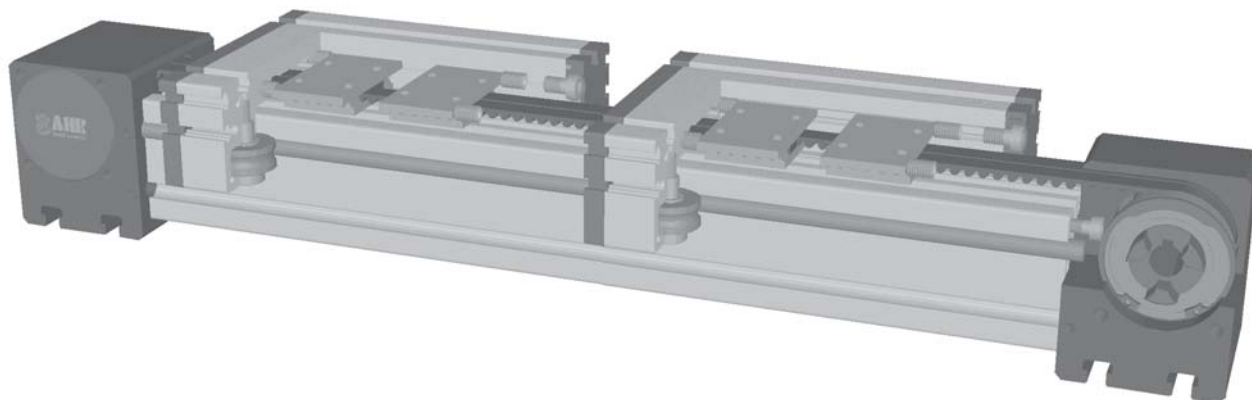


# Positioning system ELZZ 60, 60S, 80, 80S, 100, 125

Belt drive with two separately driven carriages

Specifications

3.1



**Function:**

Same functions as ELZ, but each carriage can be moved separately by its own drive. This unit has twin pulleys, which run on separate bearings, and two independent, parallel drive belts, one for each carriage.

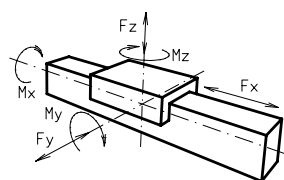
**Fitting position:** As required. Max. length 4.000 mm without joints.

**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 ± 0,1 mm.

Forces and torques	Size	ELZZ 60		ELZZ 60 S		ELZZ 80		ELZZ 80 S		ELZZ 100		ELZZ 125	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)		298	250	298	250	679	500	679	500	1210	1100	1900	1800
$F_y$ (N)		3000	2000	4100	3100	3000	2000	4600	3600	8000	6500	12000	9000
$F_z$ (N)		1700	1100	2160	1600	1700	1100	3000	2600	3600	2200	6000	4500
$M_x$ (Nm)		67	43	88	65	90	55	170	140	300	230	600	450
$M_y$ (Nm)		90	70	190	140	110	80	270	230	400	270	750	600
$M_z$ (Nm)		120	100	230	170	150	120	300	220	750	500	1350	1150
<b>All forces and torques relate to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table													
<b>No-load torque</b>													
Nm		0,6		0,7		0,9		1,2		1,4		1,8	
<b>Speed</b>													
(m/sec) max		5		5		6		8		10		10	
<b>Tensile force</b>													
permanent (N)		298		298		679		679		1210		1900	
0,2 sec (N)		333		333		746		746		1331		2090	
<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>		44,4x10 <sup>5</sup>		101,5x10 <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>		44,8x10 <sup>5</sup>		101,5x10 <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: ELZZ**

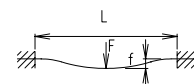
Driving torque:

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

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

- F = force (N)
- P = pulley action perimeter (mm)
- S<sub>i</sub> = safety factor 1,2 ... 2
- M<sub>leer</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)

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

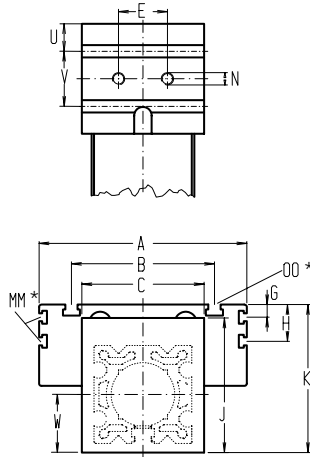


- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm<sup>2</sup>)
- I = second moment of area (mm<sup>4</sup>)

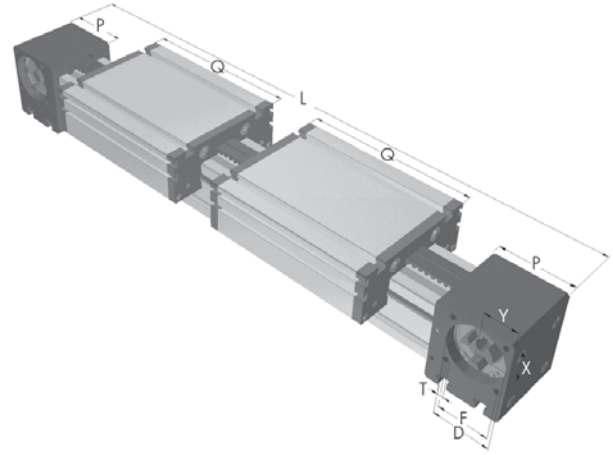


# Positioning system ELZZ 60, 60S, 80, 80S, 100, 125

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
ELZZ 60	460	144	96	80	47	30	42	-	-	82	90	-	M 8	M 8	59	168	M 6	14	30	41	27	26	7,4 kg	0,62 kg
ELZZ 60S	510	170	108	80	47	30	42	-	-	82	94	-	M 8	M 8	59	194	M 6	14	30	41	27	26	9,4 kg	0,62 kg
ELZZ 80	570	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	12,8 kg	1,00 kg
ELZZ 80S	610	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	14,8 kg	1,00 kg
ELZZ 100	830	230	155	130	90	50	80	-	29	135	154	M 10	M 12	M 10	110	300	M 10	64	50	65	50	50	33,0 kg	1,60 kg
ELZZ 125	990	295	200	160	110	60	100	-	30	167	191	M 10	M 12	M 12	130	365	M 10	38	50	82	60	60	52,0 kg	2,10 kg

### Choice of guide body profile:

**0** (0) Standard **(1)** stainless guide rods **(2)** stainless guide rods and screws **(3)** stainless guide rods, rollers and screws

### Choice of carriages:



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

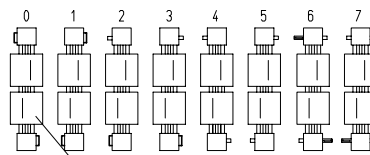


Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 32 - 48 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

### Coupling - shaft mounting:



The standard version is supplied without shaft.



connected with the left belt

- Coupling claw on one side
- Standard-shaft<sup>1</sup>
- Shaft one size smaller<sup>2</sup>

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
<b>0 2</b>	60 (S)	5M09	130	26
<b>0 5</b>	80 (S)	8M12	192	24
<b>0 6</b>	100	8M20	256	32
<b>0 7</b>	125	8M30	304	38

### Shaft dimensions

Size	Shaft ø h6 x length	Key
60 (S) <sup>1</sup>	14 x 35	5x5x28
60 (S) <sup>2</sup>	10 x 27	3x3x25
80 (S) <sup>1</sup>	18 x 45	6x6x40
80 (S) <sup>2</sup>	14 x 35	5x5x28
100 <sup>1</sup>	22 x 45	6x6x40
100 <sup>2</sup>	18 x 45	6x6x40
125 <sup>1</sup>	30 x 55	8x7x40
125 <sup>2</sup>	22 x 45	6x6x40

Basic length + stroke = total length

**ELZZ 60 4 0 0 0 0 2 1 01500**  
Pos. 1 2 3 4 5 6 7

Sample ordering code:

ELZZ 60 with standard body profile, standard carriage and coupling claw on one side, 1040 mm stroke

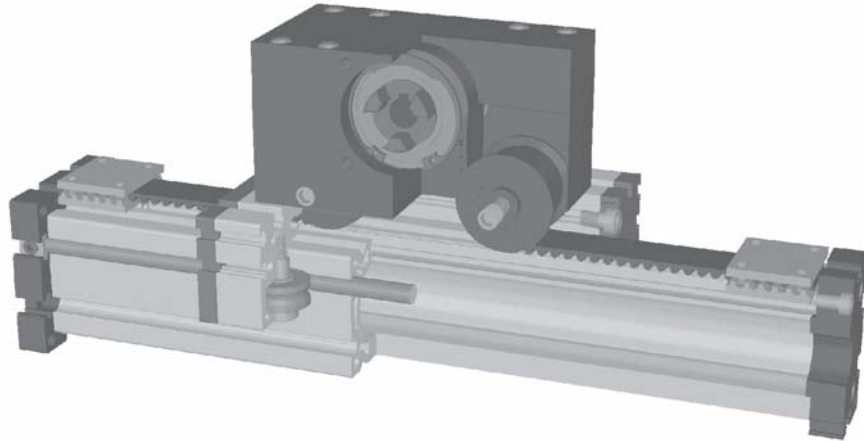
For combination kits and connecting elements refer to chapter 2.2



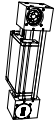
# Positioning system ELSZ 40, 60, 60S, 80, 80S, 100, 125

With standard belt

Specifications



3.1



**Function:**

This linear unit consists of an aluminium square profile with 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 pulley has maintenance-free ball bearings. Belt tension can be readjusted by a simple tensioning device in one of the end blocks. This device can also be used for symmetrical adjustment of two or more linear units running parallel.

**Fitting position:**

As required. Max. length without joints 6.000 mm.

**Carriage mounting:**

By T-slots.

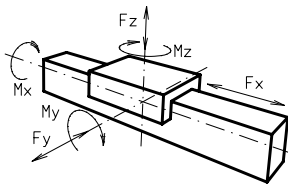
**Unit mounting:**

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

**Belt type:**

HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

Forces and torques	Size	ELSZ 40		ELSZ 60		ELSZ 60 S		ELSZ 80		ELSZ 80 S		ELSZ 100		ELSZ 125		
	Forces/Torques	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	
$F_x$ (N)		390	350	894	800	894	800	1900	1800	1900	1800	4000	3800	5900	5750	
$F_y$ (N)		1200	700	3000	2000	4100	3100	3000	2000	4600	3600	8000	6500	12000	9000	
$F_z$ (N)		900	650	1700	1100	2160	1600	1700	1100	3000	1800	3600	2200	6000	4500	
$M_x$ (Nm)		25	20	67	43	88	65	90	55	170	140	300	230	600	450	
$M_y$ (Nm)		32	18	90	70	190	140	110	80	270	230	400	270	750	600	
$M_z$ (Nm)		35	25	120	100	230	170	150	120	300	220	750	500	1350	1150	
<p><b>All forces and torques relate to the following:</b></p> <p>existing values <math>\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</math></p> <p>values of table</p>																
<b>No-load torque</b>																
Nm		0,7		0,9		0,9		1,1		1,2		1,5		1,8		
<b>Speed</b>																
(m/sec) max		4		5		7		6		8		8		10		
<b>Tensile force</b>																
permanent (N)		390		900		900		1900		1900		4000		5900		
0,2 sec (N)		480		1000		1000		2090		2090		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>		101,5x10 <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>		101,5x10 <sup>5</sup>		
E-Modulus N/mm <sup>2</sup>		70000		70000		70000		70000		70000		70000		70000		



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

**Formula: ELSZ**

Driving torque:

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

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

- F = force (N)
- P = pulley action perimeter (mm)
- S<sub>s</sub> = safety factor 1,2 ... 2
- M<sub>leer</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)

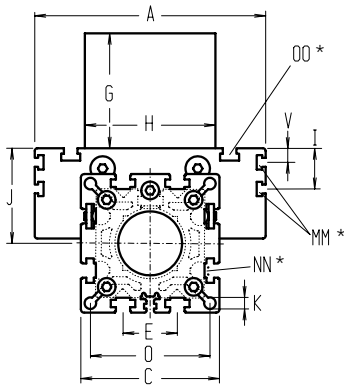
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

- 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>)

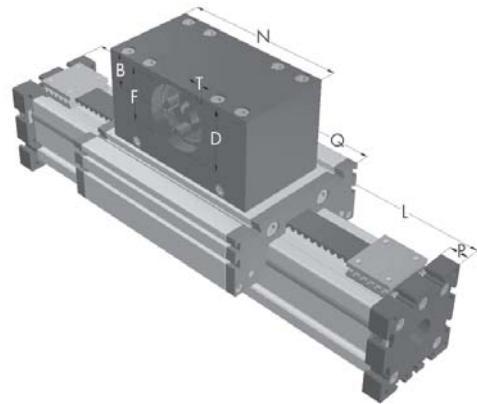


# Positioning system ELSZ 40, 60, 60S, 80, 80S, 100, 125

Dimensions (mm)



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



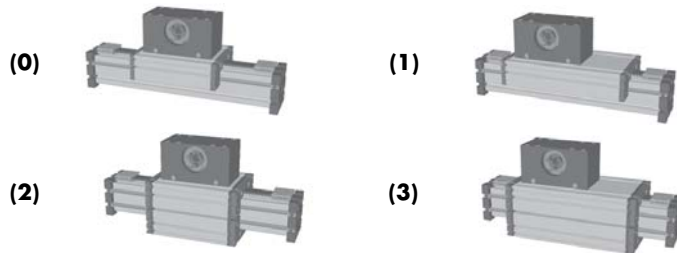
\*For slide-nuts refer to chapter 2.2 page 2

Size	Basic length L	A	B	C	D	E	F	G	H	I	J	K	MM for	N	NN for	O	OO for	P	Q	T	V	Basic weight	Weight per 100 mm
ELSZ 40	230	100	20	58	37	25	32	65	60	-	35	6,5	-	110	M 6	47	M 6	12	144	M 5	-	2,1 kg	0,24 kg
ELSZ 60	280	144	30	82	47	30	42	80	80	-	49	8,5	-	130	M 8	69	M 8	16	168	M 6	-	5,1 kg	0,62 kg
ELSZ 60S	305	170	30	82	47	30	42	80	80	-	53	8,5	-	130	M 8	69	M 8	16	194	M 6	-	6,1 kg	0,62 kg
ELSZ 80	360	170	39	102	68	40	60	100	100	30	70	8,5	M 6	180	M 10	88	M 10	20	214	M 8	10	11,0 kg	1,00 kg
ELSZ 80S	370	190	39	102	68	40	60	100	100	30	71	8,5	M 6	180	M 8	88	M 8	20	225	M 8	12,5	12,0 Kg	1,00 Kg
ELSZ 100	520	230	60	130	90	50	80	130	130	29	89	10,5	M 10	270	M 12	112	M 10	30	310	M 10	-	25,8 kg	1,60 kg
ELSZ 125	595	295	62	165	110	60	100	139	160	30	107,5	M 10	M 10	310	M 12	140	M 12	30	365	M 10	-	54,5 kg	1,94 kg

### Choice of guide body profile:

**0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

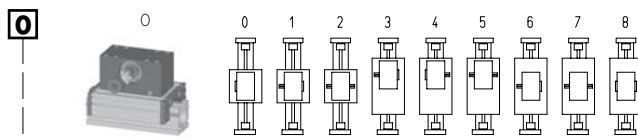
### Choice of carriages:



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 16 - 24 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

### Coupling - shaft mounting:



The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings or tension sets (size 100 + 125).

Version 8 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
1 0	125	8M70	304	38

### Shaft dimensions

Size	Shaft ø h6 x length	Key
40	10 x 27	3x3x25
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x40

Basic length + stroke = total length

ELSZ 60 0 0 0 0 0 4 1 01500

Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

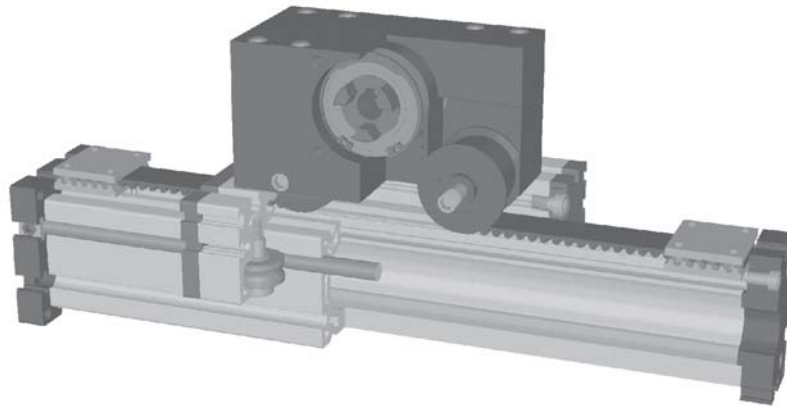
ELSZ 60 with standard body profile, standard carriage and coupling claw on one side, 1220 mm stroke.



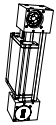
# Positioning system ELSZ 30, 40, 60, 60S, 80, 80S, 100, 125

With widened belt drive

Specifications

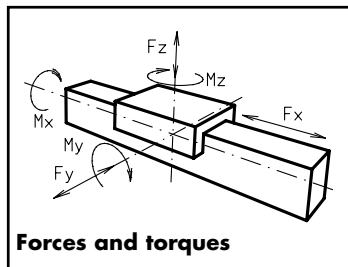


3.1



## Function:

This linear unit consists of an aluminium square profile with 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 pulley has maintenance-free ball bearings. Belt tension can be readjusted by a simple tensioning device in one of the end blocks. This device can also be used for symmetrical adjustment of two or more linear units running parallel.



**Fitting position:**  
**Carriage mounting:**  
**Unit mounting:**  
**Belt type:**

As required. Max. length without joints 6.000 mm.  
 By T-slots.  
 By T-slots or tapped holes in the bearing blocks, or mounting sets.  
 HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

Size	ELSZ 30		ELSZ 40		ELSZ 60		ELSZ 60 S		ELSZ 80		ELSZ 80 S		ELSZ 100		ELSZ 125	
	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.	static	dynam.
$F_x$ (N)	390	350	894	800	1900	1800	1900	1800	4000	3800	4000	3800	5900	5750	7900	7500
$F_y$ (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:**

$$\frac{\text{existing values}}{\text{values of table}} \cdot \frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$$

No-load torque								
Nm	0,5	0,7	0,9	0,9	1,2	1,2	1,5	1,8

Speed								
(m/sec) max	2	4	5	7	8	8	8	8

Tensile force								
permanent (N)	390	390	1 900	900	4000	4000	5900	7900
0,2 sec (N)	480	480	2090	1000	4300	4300	6350	8500

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: ELSZ

Driving torque:

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

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

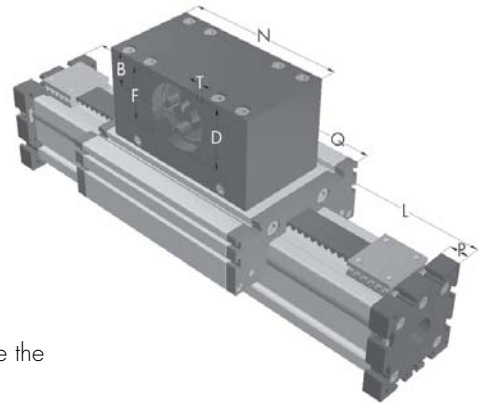
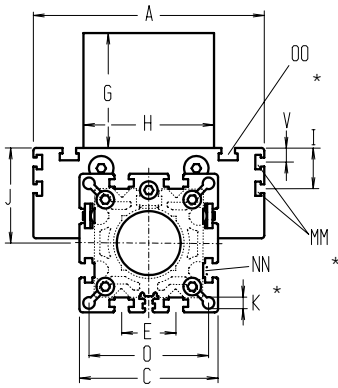
- F = force (N)
- P = pulley action perimeter (mm)
- $S_i$  = safety factor 1,2 ... 2
- $M_{\text{leer}}$  = no-load torque (Nm)
- n = rpm pulley (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $P_o$  = motor power (KW)

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

- 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 ELSZ 30, 40, 60, 60S, 80, 80S, 100, 125

Dimensions (mm)



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

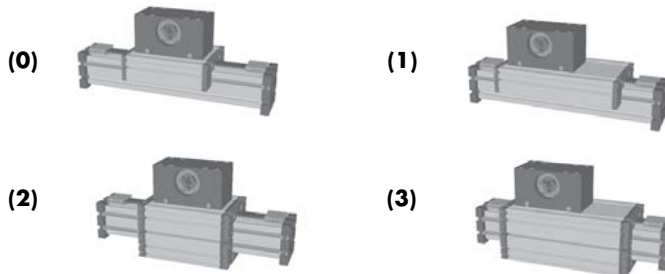
\*For slide-nuts refer to chapter 2.2 page 2

Size □	Basic length L	A	B	C	D	E	F	G	H	I	J	K	MM for	N	NN for	O	OO for	P	Q	T	V	Basic weight	Weight per 100 mm
ELSZ 30	210	70	20	42	37	13	32	55	60	-	26	4,2	-	110	M 6	35	M 6	12	128	M 5	-	1,5 kg	0,16 kg
ELSZ 40	250	100	30	58	47	25	42	83	80	-	35	6,5	-	130	M 6	47	M 6	12	164	M 6	-	2,7 kg	0,24 kg
ELSZ 60	330	144	39	82	68	30	60	105	100	-	49	8,5	-	180	M 8	69	M 8	16	220	M 8	-	6,3 kg	0,62 kg
ELSZ 60S	355	170	34	82	68	30	60	105	100	-	53	8,5	-	180	M 8	69	M 8	16	220	M 8	-	7,3 kg	0,62 kg
ELSZ 80	450	170	60	102	90	40	80	140	130	30	70	8,5	M 6	270	M 10	88	M 10	20	294	M 10	10	14,0 kg	1,00 kg
ELSZ 80S	450	190	60	102	90	40	80	139	130	30	71	8,5	M 6	270	M 8	88	M 8	20	315	M 10	12,5	15,0 Kg	1,00 Kg
ELSZ 100	540	230	62	130	110	50	100	143	160	29	89	10,5	M 10	310	M 12	112	M 10	30	350	M 10	-	31,0 kg	1,60 kg
ELSZ 125	595	295	62	165	110	60	100	139	180	30	107,5	M 10	M 10	310	M 12	140	M 12	30	365	M 10	-	57,4 kg	1,96 kg

### Choice of guide body profile:

**0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

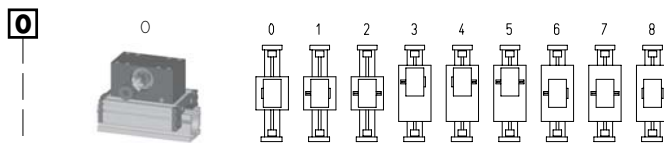
### Choice of carriages:



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 12 - 24 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

### 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 in the pulley bore and securing with 2 locking rings or tension sets (size 80 + 100).

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
0 3	30	5M15	100	20
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
1 4	125	8M100	304	38

### Shaft dimensions

Size	Shaft ø h6 x length	Key
30	10 x 27	3x3x25
40	14 x 35	5x5x28
60 (S)	18 x 45	6x6x40
80 (S)	22 x 45	6x6x40
100	30 x 55	8x7x40
125	40 x 55	12x8x50

Basic length + stroke = total length

ELSZ 60 0 0 0 0 0 7 1 01500

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

ELSZ 60 with standard body profile, standard carriage with widened belt and coupling claw on one side, 1170 mm stroke.

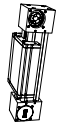
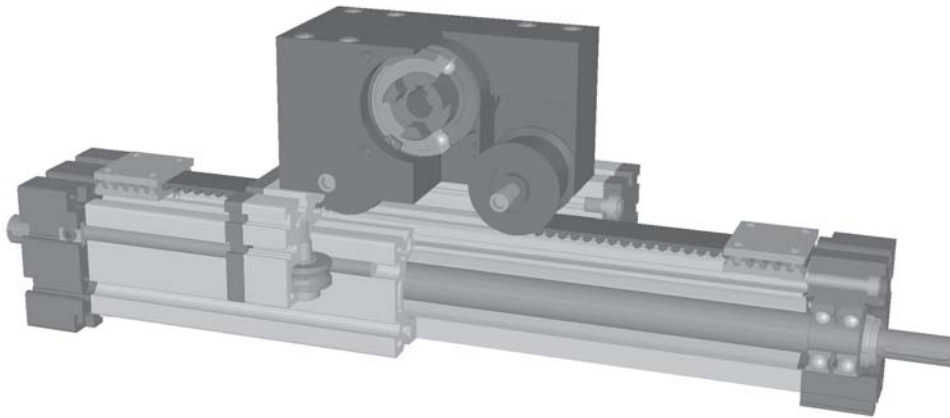


# Positioning system ELSD 40, 60, 60S, 80, 80S, 100

Belt drive with 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 ± 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 <sub>x</sub> (N)	390	350	894	800	894	800	1900	1800	1900	1800	4000	3800	
	F <sub>y</sub> (N)	1200	700	3000	2000	4100	3100	3000	2000	4600	3600	8000	6500	
	F <sub>z</sub> (N)	900	650	1700	1100	2160	1600	1700	1100	3000	1800	3600	2200	
	F <sub>d</sub> (N)		50		150		150		250		250		400	
	M <sub>x</sub> (Nm)	25	20	67	43	88	65	90	55	170	140	300	230	
	M <sub>y</sub> (Nm)	32	18	90	70	190	140	110	80	270	230	400	270	
	M <sub>z</sub> (Nm)	35	25	120	100	230	170	150	120	300	220	750	500	
	M <sub>g</sub> (Nm)		5		10		10		20		20		30	
	<b>All forces and torques relate to the following:</b> existing values $\frac{F_y}{F_{y,dyn}} + \frac{F_z}{F_{z,dyn}} + \frac{M_x}{M_{x,dyn}} + \frac{M_y}{M_{y,dyn}} + \frac{M_z}{M_{z,dyn}} \leq 1$ values of table													
	<b>No-load torque</b>													
Nm		0,7		0,9		0,9		1,1		1,2		1,5		
Stiction torque M <sub>g</sub> (Nm)		0,1		0,1		0,1		0,1		0,1		0,1		
<b>Speed</b>														
(m/sec) max		4		5		7		6		8		8		
<b>Tensile force</b>														
permanent (N)		390		900		900		1900		1900		4000		
0,2 sec (N)		480		1000		1000		2090		2090		4300		
<b>Geometrical moments of inertia of aluminium profile</b>														
I <sub>x</sub> 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 <sub>y</sub> 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 CD-ROM or homepage!

**Formula: ELSD**

Driving torque:

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

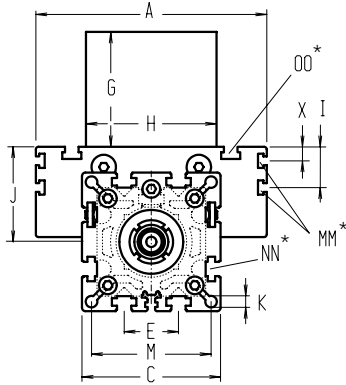
$$P_o = \frac{M_o \cdot n}{9550}$$

- F = force (N)
- P = pulley action perimeter (mm)
- S = safety factor 1,2 ... 2
- M<sub>leer</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)

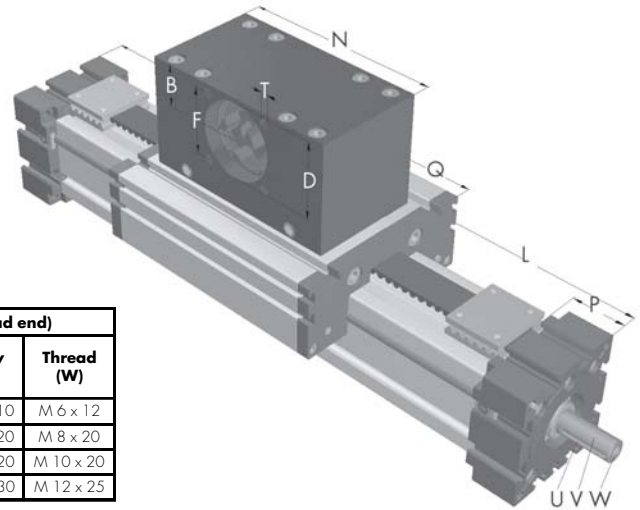
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

- 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>)





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



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

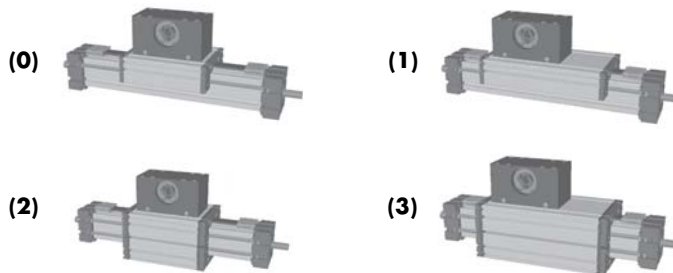
\*For slide-nuts refer to chapter 2.2 page 2

Size □	Basic length L	A	B	C	D	E	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	18	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	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	42	80	80	-	53	8,5	69	-	130	M 8	M 8	35	194	M 6	-	6,9 kg	0,87 kg
ELSD 80	410	170	39	102	68	40	60	100	100	30	70	8,5	88	M 6	180	M 10	M 10	45	214	M 8	10	12,5 kg	1,30 kg
ELSD 80S	420	190	39	102	68	40	60	100	100	30	71	8,5	88	M 6	180	M 10	M 8	45	224	M 8	12,5	14,0 kg	1,30 kg
ELSD 100	570	230	60	130	90	50	80	130	130	29	89	10,5	112	M10	270	M 10	M 10	55	310	M 10	-	27,0 kg	1,70 kg

**Choice of guide body profile:**

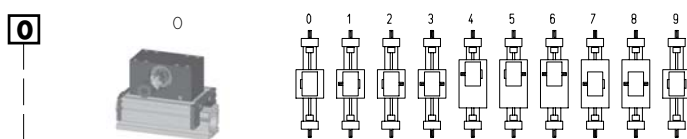
- 0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

**Choice of carriages:**



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

**Coupling - shaft mounting:**



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

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 16 - 20 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

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

**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**

Size	Shaft ∅ h6 x length	Key
40	10 x 27	3x3x25
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40

Basic length + stroke = total length

ELSD 60 0 0 0 0 0 4 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, 1180 mm stroke

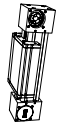
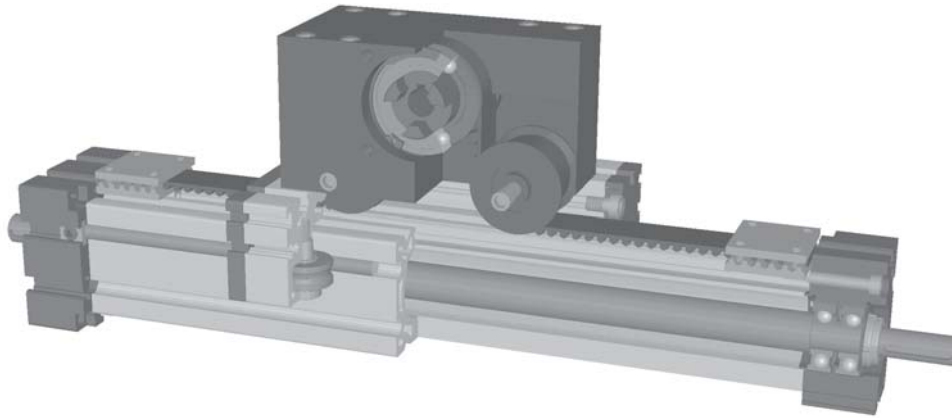


# Positioning system ELSD 40, 60, 60S, 80, 80S, 100

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.

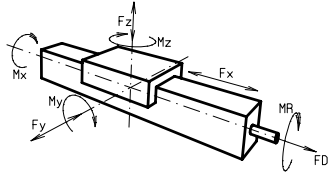
**Fitting position:** As required. Max. length 2.000 mm.

**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 ± 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
$M_k$ (Nm)		5		10		10		20		20		30	
<b>All forces and torques relate to the following:</b>													
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$													
values of table $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$													
<b>No-load torque</b>													
Nm		0,7		0,9		0,9		1,1		1,2		1,5	
Stiction torque $M_k$ (Nm)		0,1		0,1		0,1		0,1		0,1		0,1	
<b>Speed</b>													
(m/sec) max		4		5		7		6		8		8	
<b>Tensile force</b>													
permanent (N)		900		1900		900		4000		4000		5900	
0,2 sec (N)		1000		2090		1000		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 CD-ROM or homepage!

**Formula: ELSD**

Driving torque:

$$M_o = \frac{F * P * S}{2000 * \pi} + M_{leer}$$

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = 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)

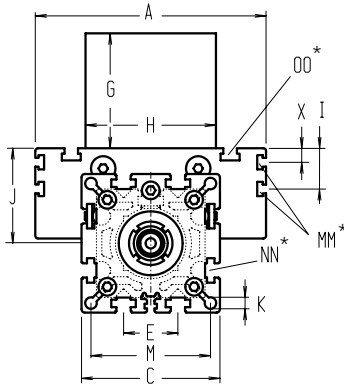
$$f = \frac{F * L^3}{E * I * 192}$$

- 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>)

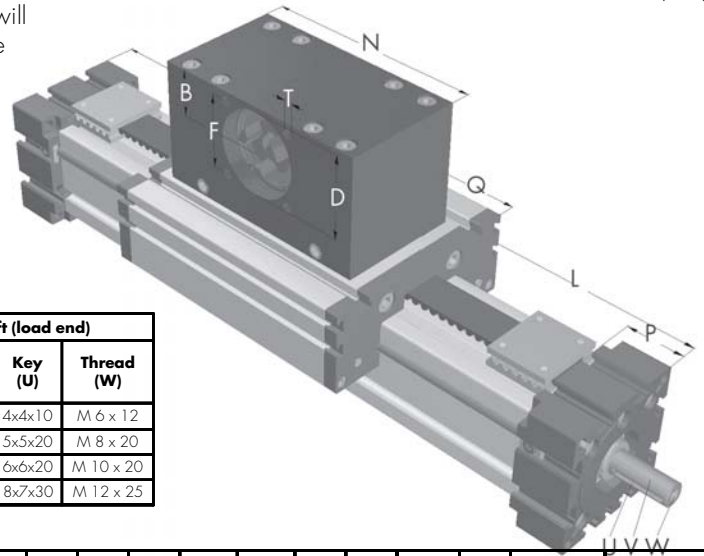


# Positioning system ELSD 40, 60, 60S, 80, 80S, 100

Dimensions (mm)



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



Size □	Shaft (drive end)			Shaft (load end)		
	Shaft ∅ h6 x length (V)	Key (U)	Shaft ∅ 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	

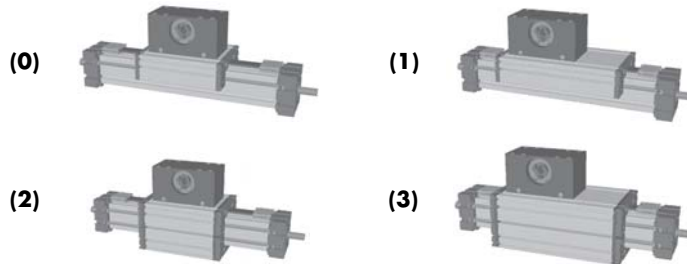
\*For slide-nuts refer to chapter 2.2 page 2

Size □	Basic length L	A	B	C	D	E	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	18	42	83	80	-	35	6,5	47	-	130	M 6	M 6	25	168	M 6	-	2,7 kg	0,40 kg
ELSD 60	354	144	39	82	68	30	60	105	100	-	49	8,5	69	-	180	M 8	M 8	35	218	M 8	-	6,5 kg	0,87 kg
ELSD 60S	379	170	39	82	68	30	60	105	100	-	53	8,5	69	-	180	M 8	M 8	35	204	M 8	-	7,5 kg	0,87 kg
ELSD 80	500	170	60	102	90	40	80	140	130	30	70	8,5	88	M 6	270	M 10	M 10	45	304	M 10	10	13,7 kg	1,30 kg
ELSD 80S	500	190	60	102	90	40	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	610	230	62	130	110	50	100	143	160	29	89	10,5	112	M10	310	M 10	M 10	55	350	M 10	-	33,4 kg	1,70 kg

### Choice of guide body profile:

- 0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

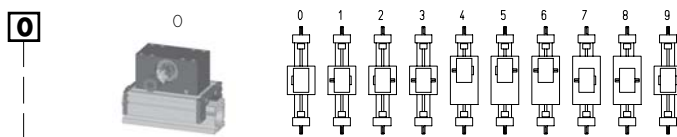
### Choice of carriages:



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 16 - 20 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

### Coupling - shaft mounting:



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 in the pulley bore and securing with 2 locking rings or tension sets (size 80 + 100).

### 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

Size	Shaft ∅ h6 x length	Key
40	14 x 35	5x5x28
60 (S)	18 x 45	6x6x40
80 (S)	22 x 45	6x6x40
100	30 x 55	8x7x40

Basic length + stroke = total length

ELSD	60	0	0	0	0	0	7	1	01500
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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

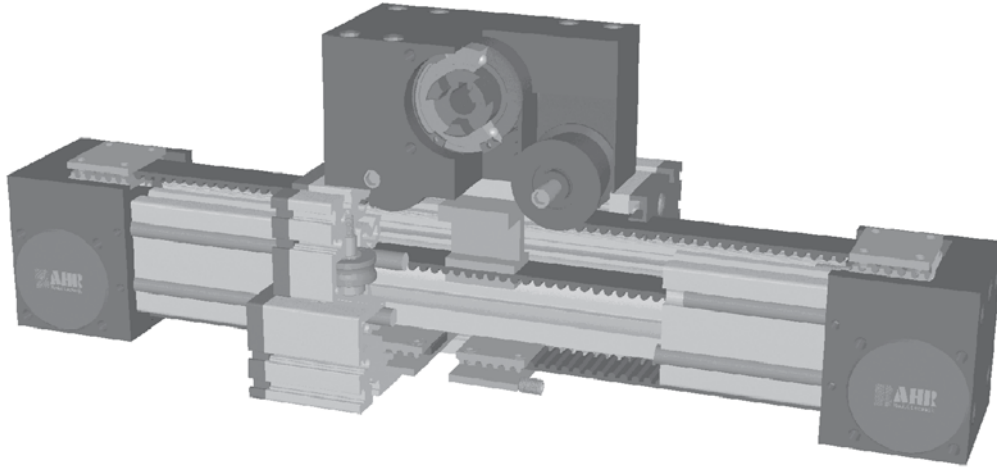
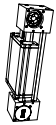


# Positioning system ELZT 40, 60, 60S, 80, 80S, 100

Telescopic belt drive

Specifications

3.1



**Function:**

This unit consists of an aluminium square profile with integrated, hardened steel guide rods. Two carriages, which have internal linear ball bearings that can be adjusted free of play, are driven along the guide rods in opposite directions by 2 belts. The pulleys include maintenance-free ball bearings. One belt is tensioned by a tensioning device within the carriage. The other timing belt is tensioned by a tensioning device within the bearing block. The carriage with the drive block (with motor) is screwed to the crosshead. A T-slot profile is screwed to the carriage as an extension arm which can be adjusted to any length (see functional diagram on page 3/20).

**Fitting position:** As required. Max. length 3.000 mm.

**Unit mounting:** By T-slots in the carriage, extension arm

**Belt type:** HTD with steel reinforcement, no backlash when changing direction, repeatability +/- 0,1 mm.

Forces and torques	Size	ELZT 40		ELZT 60		ELZT 60 S		ELZT 80		ELZT 80 S		ELZT 100	
	Forces/torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
	F <sub>x</sub> (N)	360	300	580	470	580	470	825	660	825	660	4000	3500
	F <sub>y</sub> (N)	1200	700	3000	2000	4100	3100	3000	2000	4600	3600	8000	6500
	F <sub>z</sub> (N)	900	650	1700	1100	2160	1600	1700	1100	3000	1800	3600	2200
	M <sub>x</sub> (Nm)	25	20	67	43	88	65	90	55	170	140	300	230
	M <sub>y</sub> (Nm)	32	18	90	70	190	140	110	80	270	230	400	270
	M <sub>z</sub> (Nm)	35	25	120	100	230	170	150	120	300	220	750	500
<b>All forces and torques relate to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table													
<b>No-load torque</b>													
Nm		0,9		1,1		1,1		1,3		1,2		2,4	
<b>Speed</b>													
(m/sec) max		4		5		7		6		8		8	
<b>Tensile force</b>													
permanent (N)		360		580		900		825		825		4000	
0,2 sec (N)		450		680		1000		1000		1000		4300	
<b>Geometrical moments of inertia of aluminium profile</b>													
I <sub>x</sub> 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 <sub>y</sub> 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>	
EModulus N/mm <sup>2</sup>		70000		70000		70000		70000		70000		70000	

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

**Formula: ELZT**

Driving torque:

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

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = safety factor 1,2 ... 2
- M<sub>leer</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)

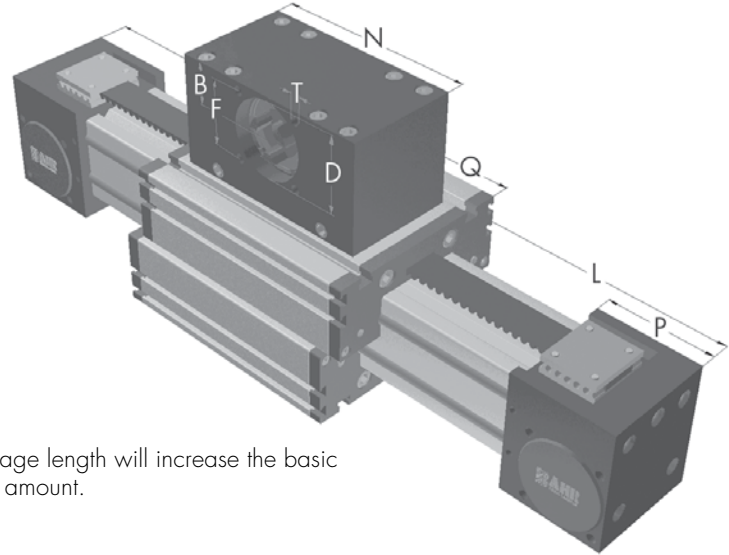
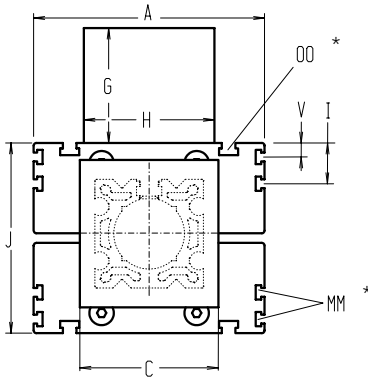
$$f = \frac{F \cdot l^3}{E \cdot I \cdot 192}$$

- 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 ELZT 40, 60, 60S, 80, 80S, 100

Dimensions (mm)



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

3.1



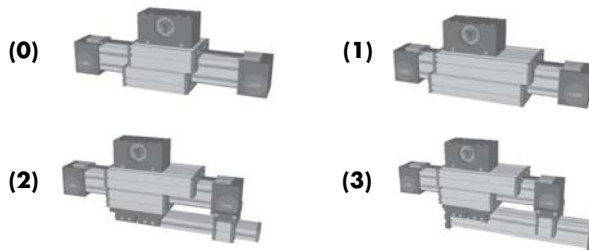
\*For slide-nuts refer to chapter 2.2 page 2

Size □	Basic length L	A	B	C	D	F	G	H	I	J	MM for	N	OO for	P	Q	T	V	Basic weight	Weight per 100 mm
ELZT 40	265	100	30	58	47	42	83	80	-	70	-	130	M 6	49	164	M 6	-	3,6 kg	0,31 kg
ELZT 60	345	144	39	80	68	60	105	100	-	98	-	180	M 8	59	218	M 8	-	9,1 kg	0,73 kg
ELZT 60S	370	144	39	80	68	60	105	100	-	106	-	180	M 8	59	220	M 8	-	10,1 kg	0,73 kg
ELZT 80	494	170	60	100	90	80	140	130	30	140	M 6	270	M 10	90	304	M 10	10	24,0 kg	1,14 kg
ELZT 80S	494	190	60	100	90	80	140	130	30	142	M 6	270	M 8	90	304	M 10	12,5	26,0 Kg	1,14 kg
ELZT 100	530	230	62	130	110	100	143	160	29	178	M 10	310	M 10	110	350	M 10	-	40,6 kg	1,95 kg

### Choice of guide body profile:

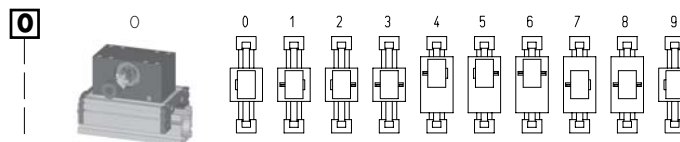
- 0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

### Choice of carriages:



The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.  
Increasing the carriage length will increase the basic length by the same amount.

### Coupling - shaft mounting



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 in the pulley bore and securing with 2 locking rings or tension sets (size 80 + 100).

### 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

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

Basic length + 1/2stroke = total length

ELZT 60 6 0 0 0 0 4 1 01500

Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

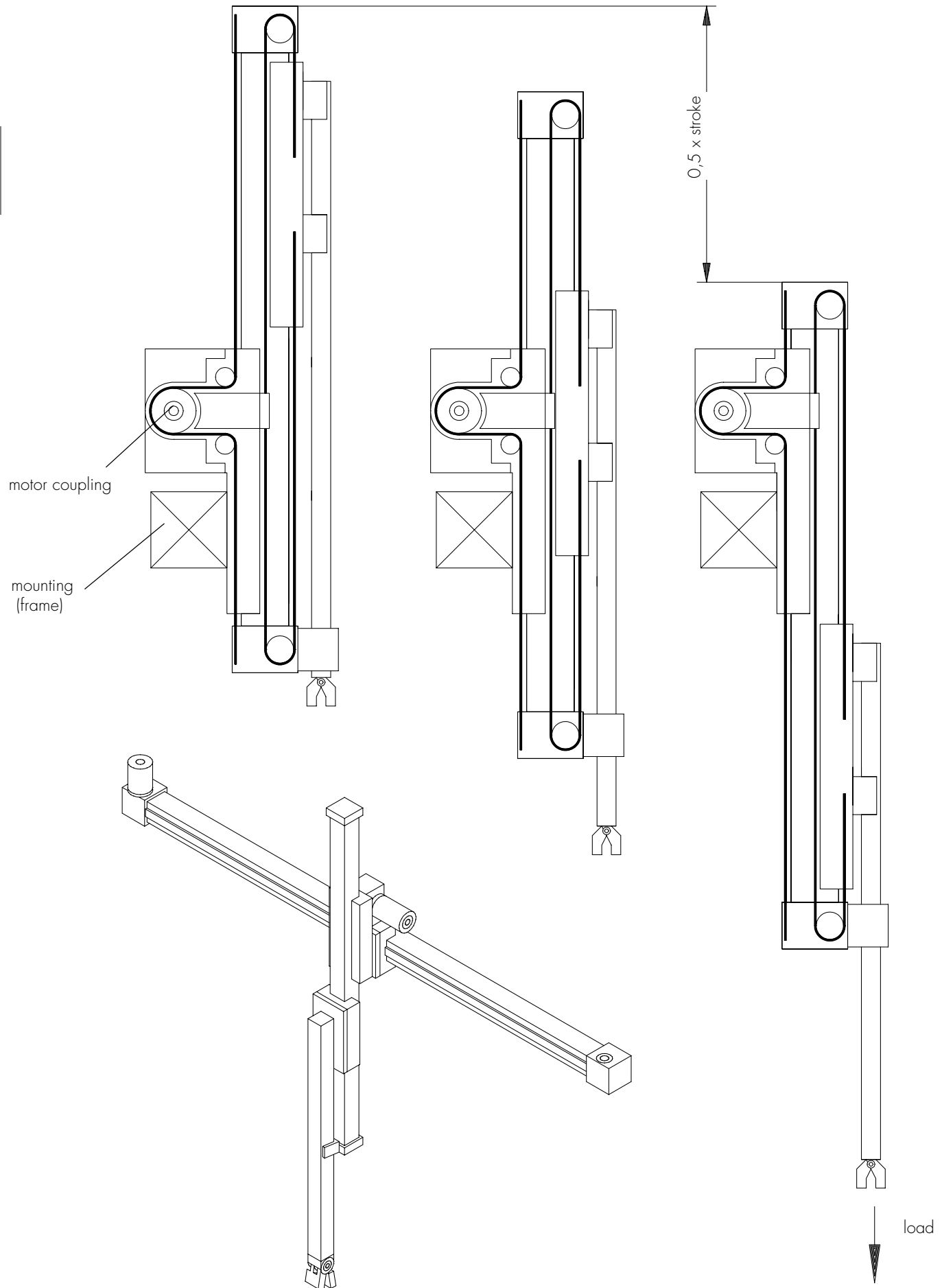
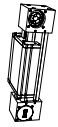
ELZT 60 with standard body profile, standard carriage and coupling claw on one side, 1155 mm stroke



# Function and possibilities of variation

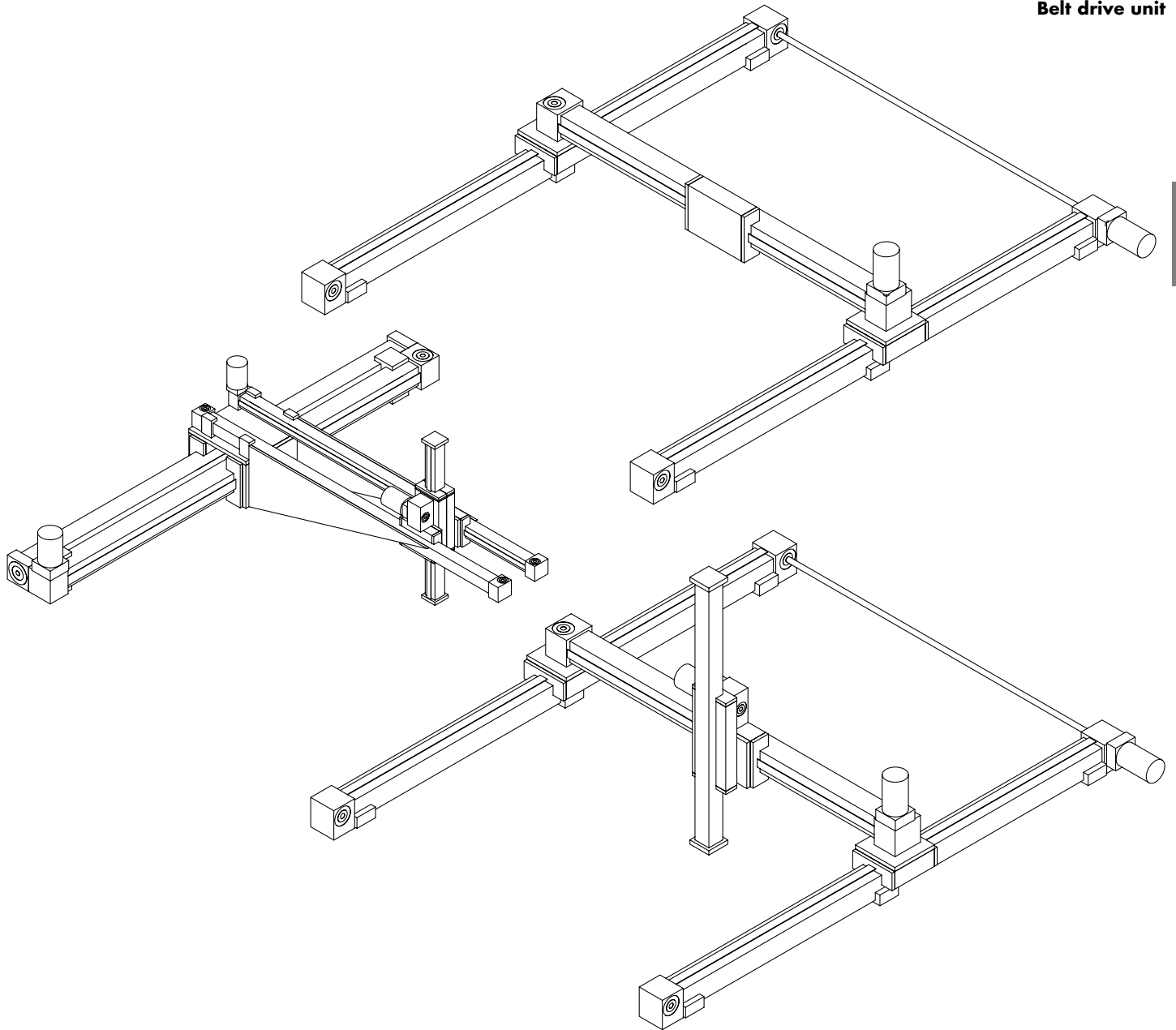
ELZT belt drive unit

3.1



## Possible mounting styles

Belt drive unit



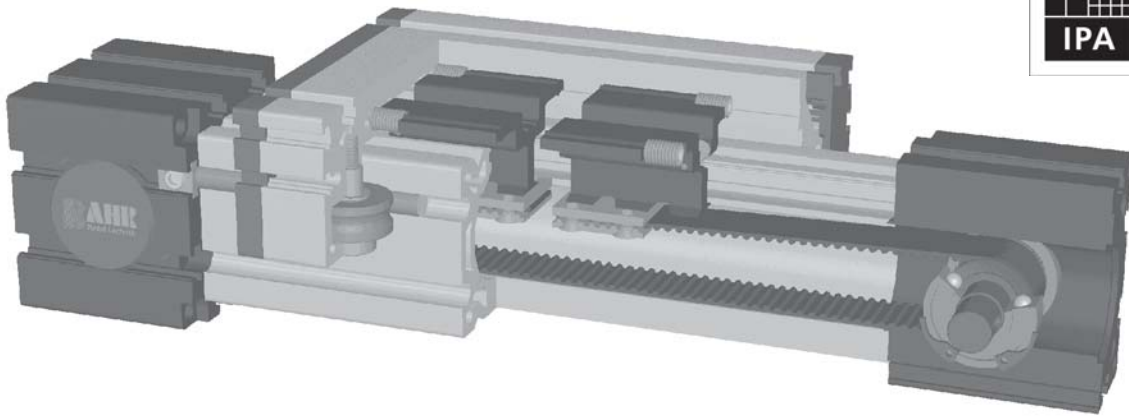
3.1



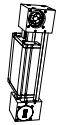
# Positioning system ELHZ 60, 60S, 80, 80S, 100, 125

Internal 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. Toothed pulley has 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.

This linear unit is suitable for application in clean rooms of clean-room classification 1.000 (corresponding to US Fed. Standard 209 E).

**Fitting position:** As required. Max. length 3.000 mm without joints.

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

**Unit mounting:** By tapped holes or tapped holes in the bearing block, mounting sets.

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

Forces and torques	Size	ELHZ 60		ELHZ 60 S		ELHZ 80		ELHZ 80 S		ELHZ 100		ELHZ 125	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)		700	580	700	580	1000	840	1000	840	3100	2600	5000	4950
$F_y$ (N)		3000	2000	4100	3100	3000	2000	4600	3600	8000	6500	12000	9000
$F_z$ (N)		1700	1100	2160	1600	1700	1100	3000	1800	3600	2200	6000	4500
$M_x$ (Nm)		67	43	88	65	90	55	170	140	300	230	600	450
$M_y$ (Nm)		90	70	190	140	110	80	270	230	400	270	750	600
$M_z$ (Nm)		120	100	230	170	150	120	300	220	750	500	1350	1150

**All forces and torques relate to the following:**  
 existing values  $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$   
 values of table

No-load torque							
Nm	0,5	0,5	0,8	1,2	1,2	1,6	

Speed							
(m/sec) max	3	4	4	4	5	6	

Tensile force							
permanent (N)	700	900	1000	1000	3100	5000	
0,2 sec (N)	800	1000	1150	1150	3400	5450	

Geometrical moments of inertia of aluminium profile							
$I_x$ mm <sup>4</sup>	$6,79 \times 10^5$	$6,79 \times 10^5$	$18,99 \times 10^5$	$18,99 \times 10^5$	$44,4 \times 10^5$	$101,5 \times 10^5$	
$I_y$ mm <sup>4</sup>	$6,97 \times 10^5$	$6,97 \times 10^5$	$18,97 \times 10^5$	$18,97 \times 10^5$	$44,8 \times 10^5$	$101,5 \times 10^5$	
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: ELHZ

Driving torque:

$$M_o = \frac{F * P * S_s}{2000 * \pi} + M_{leer}$$

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

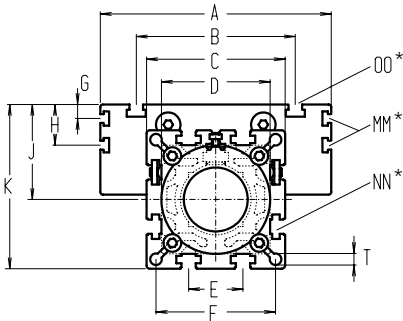
- F = force (N)
- P = pulley action perimeter (mm)
- S<sub>s</sub> = safety factor 1,2 ... 2
- M<sub>leer</sub> = no-load torque (Nm)
- n = rpm pulley (min<sup>-1</sup>)
- M<sub>o</sub> = driving torque (Nm)
- P<sub>o</sub> = motor power (KW)

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

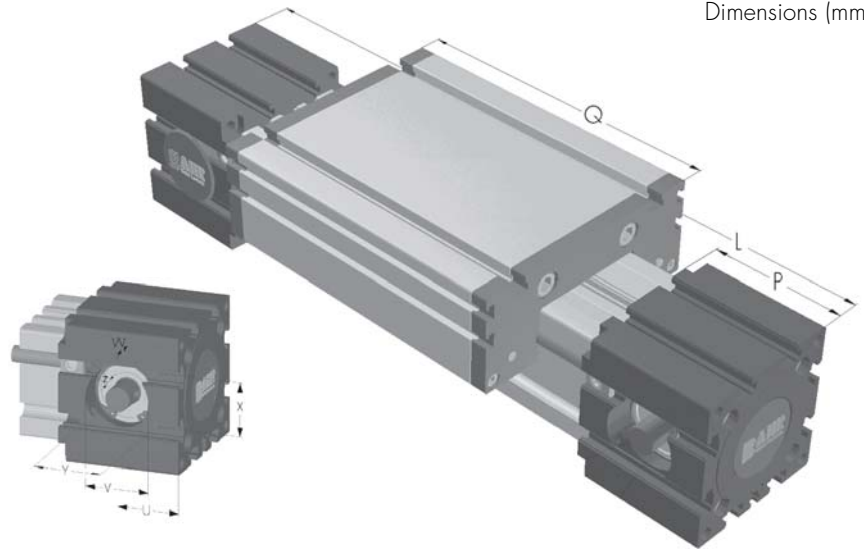
- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm<sup>2</sup>)
- I = second moment of area (mm<sup>4</sup>)

# Positioning system ELHZ 60, 60S, 80, 80S, 100, 125

Dimensions (mm)



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



3.1



\*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	NN for	OO for	P	Q	T	U	V	W	X	Y	Z	Basic weight	Weight per 100 mm
ELHZ 60	290	144	96	82	62x1	30	69	-	-	49	90	-	M 8	M 8	59	168	8,5	23	37	14	30	36	M 6	4,8 kg	0,62 kg
ELHZ 60S	315	170	108	82	62x1	30	69	-	-	49	94	-	M 8	M 8	59	194	8,5	23	37	14	30	36	M 6	5,8 kg	0,62 kg
ELHZ 80	375	170	117	102	80x1	40	88	10	30	70	121	M 6	M10	M10	90	194	8,5	38	47	18	40	50	M 8	10,0 kg	1,00 kg
ELHZ 80S	395	190	126	102	80x1	40	88	12,5	30	71	122	M 6	M10	M 8	90	214	8,5	38	47	18	40	50	M 8	11,0 kg	1,00 kg
ELHZ 100	530	230	155	130	110x1	50	112	-	29	89	154	M10	M10	M10	110	300	10,5	45	68	19	50	64	M10	24,0 kg	1,60 kg
ELHZ 125	625	295	200	165	130x2	60	142	-	30	107,5	190	M10	M10	M12	132	365	13,0	58	90	35	60	85	M10	37,0 kg	2,10 kg

**Choice of guide body profile:**

- 0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

**Choice of carriages:**

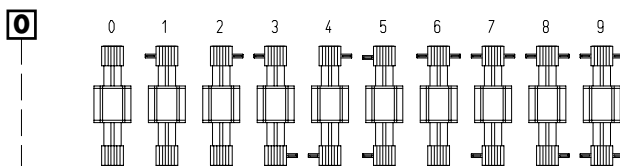


For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.



Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 16 - 24 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

**Selection of shaft mounting:**



The standard version 0 is supplied with 4 flush mounted shafts.

**Belt table**

Code No.	Size	Belt	mm/rev.	Number of teeth
0 4	60 (S)	5M25	80	16
0 4	80 (S)	5M25	110	22
0 9	100	8M50	144	18
0 9	125	8M50	192	24

**Shaft dimensions**

Size	Shaft ø h6 x length	Key
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x40

Basic length + stroke = total length

ELHZ	60	0	0	0	0	0	4	1	01500
Pos.	1	2	3	4	5	6	7		

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

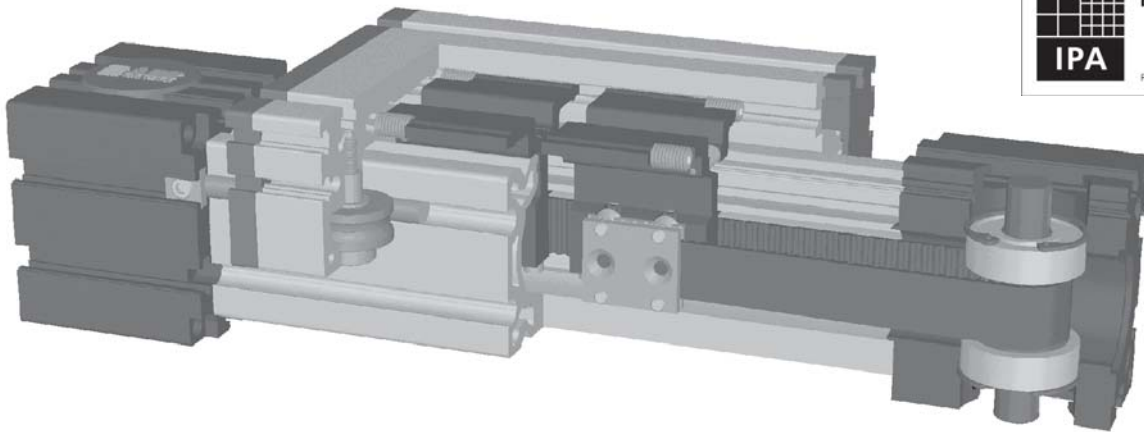
ELHZ 60, with standard body profile, standard carriage and 4 flush mounted shafts, 1210 mm stroke.



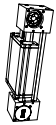
# Positioning system ELVZ 60, 60S, 80, 80S, 100, 125

Internal 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 toothed belt. Toothed pulley has 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. This linear unit is suitable for application in clean rooms of clean-room classification 1.000 (corresponding to US Fed. Standard 209 E).

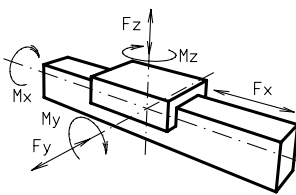
**Fitting position:** As required. Max. length 3.000 mm without joints.

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

**Unit mounting:** By tapped holes or tapped holes in the bearing block, mounting sets.

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

Forces and torques	Size	ELVZ 60		ELVZ 60 S		ELVZ 80		ELVZ 80 S		ELVZ 100		ELVZ 125	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)		700	580	700	580	1000	840	1000	840	3100	2600	5000	4950
$F_y$ (N)		3000	2000	4100	3100	3000	2000	4600	3600	8000	6500	12000	9000
$F_z$ (N)		1700	1100	2160	1600	1700	1100	3000	1800	3600	2200	6000	4500
$M_x$ (Nm)		67	43	88	65	90	55	170	140	300	230	600	450
$M_y$ (Nm)		90	70	190	140	110	80	270	230	400	270	750	600
$M_z$ (Nm)		120	100	230	170	150	120	300	220	750	500	1350	1150
<b>All forces and torques relate to the following:</b>													
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$													
values of table $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$													
<b>No-load torque</b>													
Nm		0,5	0,5	0,5	0,5	0,8	0,8	1,2	1,2	1,2	1,2	1,6	1,6
<b>Speed</b>													
(m/sec) max		3	3	4	4	4	4	4	4	5	5	6	6
<b>Tensile force</b>													
permanent (N)		700	700	900	900	1000	1000	1000	1000	3100	3100	5000	5000
0,2 sec (N)		800	800	1000	1000	1150	1150	1150	1150	3400	3400	5450	5450
<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>	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>	44,4x10 <sup>5</sup>	44,4x10 <sup>5</sup>	101,5x10 <sup>5</sup>	101,5x10 <sup>5</sup>
$I_y$ mm <sup>4</sup>		6,97x10 <sup>5</sup>	6,97x10 <sup>5</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>	44,8x10 <sup>5</sup>	44,8x10 <sup>5</sup>	101,5x10 <sup>5</sup>	101,5x10 <sup>5</sup>
E-Modulus N/mm <sup>2</sup>		70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000



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

**Formula: ELVZ**

Driving torque:

$$M_o = \frac{F * P * S}{2000 * \pi} + M_{leer}$$

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = 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)

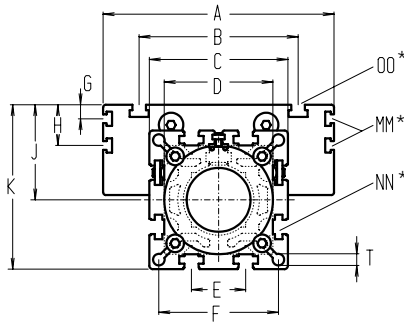
$$f = \frac{F * L^3}{E * I * 192}$$

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

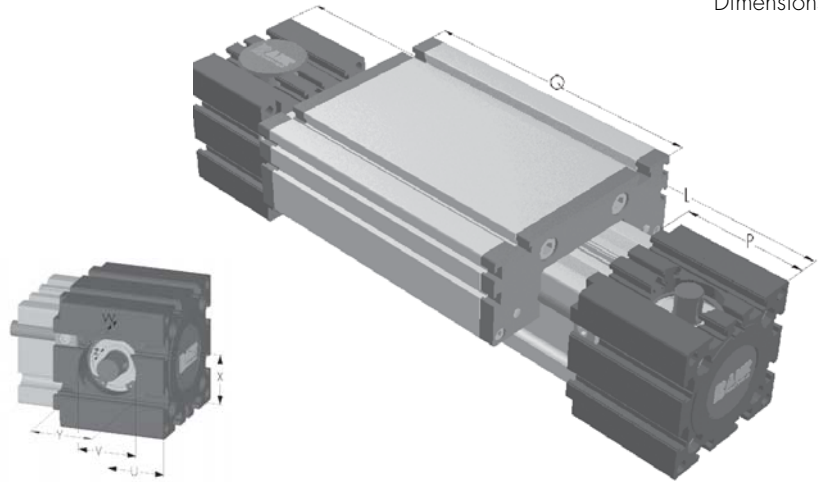


# Positioning system ELVZ 60, 60S, 80, 80S, 100, 125

Dimensions (mm)



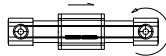
Increasing the carriage length will increase the basic length by the same amount



\*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	NN for	OO for	P	Q	T	U	V	W	X	Y	Z	Basic weight	Weight per 100 mm
ELVZ 60	290	144	96	82	62x1	30	69	-	-	49	90	-	M 8	M 8	59	168	8,5	23	37	14	30	36	M 6	4,8 kg	0,62 kg
ELVZ 60S	315	170	108	82	62x1	30	69	-	-	49	94	-	M 8	M 8	59	194	8,5	23	37	14	30	36	M 6	5,8 kg	0,62 kg
ELVZ 80	375	170	117	102	80x1	40	88	10	30	70	121	M 6	M10	M10	90	194	8,5	38	47	18	40	50	M 8	10,0 kg	1,00 kg
ELVZ 80S	395	190	126	102	80x1	40	88	12,5	30	71	122	M 6	M10	M 8	90	214	8,5	38	47	18	40	50	M 8	11,0 kg	1,00 kg
ELVZ 100	530	230	155	130	110x1	50	112	-	29	89	154	M10	M10	M10	110	300	10,5	45	68	19	50	64	M10	24,0 kg	1,60 kg
ELVZ 125	625	295	200	165	130x2	60	142	-	30	107,5	190	M10	M10	M12	132	365	13	58	90	35	60	85	M10	37,0 kg	2,10 kg

1 (1) Belt connection right



(2) Belt connection left



### Choice of guide body profile:

0 (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

### Choice of carriages:

0 (0)



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

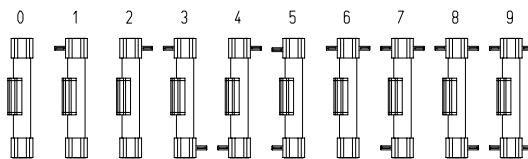
(1)



Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 16 - 24 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

### Selection of shaft mounting:

0



The standard version 0 is supplied with 4 flush mounted shafts.

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
0 4	60 (S)	5M25	80	16
0 4	80 (S)	5M25	110	22
0 9	100	8M50	144	18
0 9	125	8M50	192	24

### Shaft dimensions

Size	Shaft ø h6 x length	Key
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x40

Basic length + stroke = total length

ELVZ 60 1 0 0 0 0 4 1 01500

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

ELVZ 60 with belt connection right, standard body profile, standard carriage and 4 flush mounted shafts, 1210 mm stroke

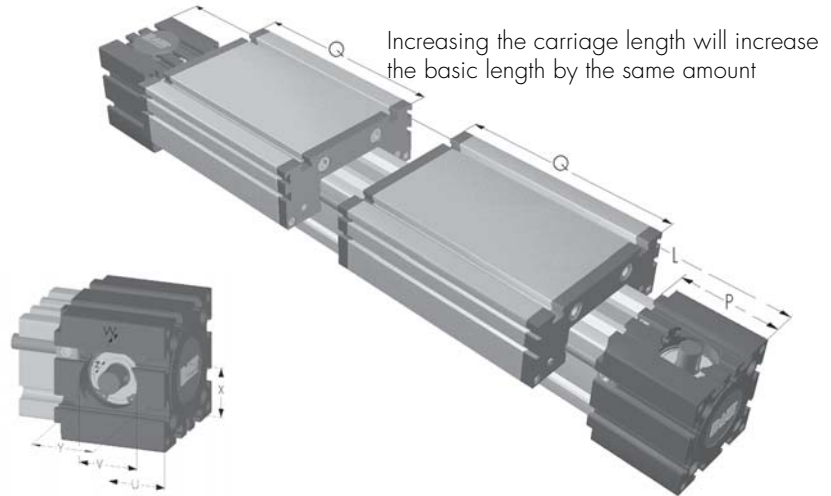
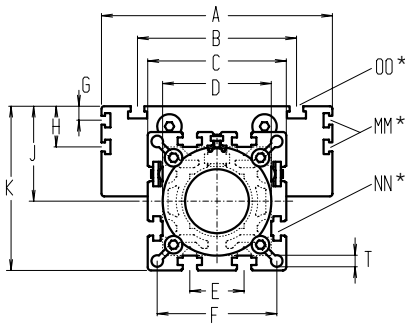
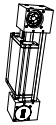


# Positioning system ELVZ 60, 60S, 80, 80S, 100, 125

Internal belt drive with two carriages moving in opposite directions

Dimensions (mm)

3.1



\*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	NN for	OO for	P	Q	T	U	V	W	X	Y	Z	Basic weight	Weight per 100 mm
ELVZ 60	460	144	96	82	62x1	30	69	-	-	49	90	-	M 8	M 8	59	168	8,5	24	37	14	30	36	M 6	6,5 kg	0,62 kg
ELVZ 60S	510	170	108	82	62x1	30	69	Ñ	-	49	94	-	M 8	M 8	59	194	8,5	24	37	14	30	36	M 6	8,5 kg	0,62 kg
ELVZ 80	570	170	117	102	80x1	40	88	10	30	70	121	M 6	M10	M10	90	194	8,5	38	47	18	40	50	M 8	13,0 kg	1,00 kg
ELVZ 80S	610	190	123	102	80x1	40	88	12,5	30	71	122	M 6	M10	M 8	90	214	8,5	38	47	18	40	50	M 8	15,0 kg	1,00 kg
ELVZ 100	830	230	155	130	110x1	50	112	-	29	89	154	M10	M10	M10	110	300	10,5	45	68	19	50	64	M10	31,0 kg	1,60 kg
ELVZ 125	990	295	200	165	130x2	60	142	-	30	107,5	190	M10	M10	M12	132	365	13	58	90	35	60	64	M10	50,5 kg	2,10 kg



**Choice of guide body profile:**

- 0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

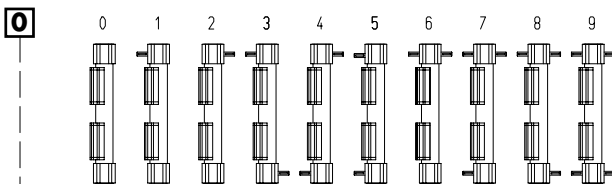
**Choice of carriages:**



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the higher the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 32 - 48 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

**Selection of shaft mounting:**



The standard version 0 is supplied with 4 flush mounted shafts.

**Belt table**

Code No.	Size	Belt	mm/rev.	Number of teeth
0 4	60 (S)	5M25	80	16
0 4	80 (S)	5M25	110	22
0 9	100	8M50	144	18
0 9	125	8M50	192	24

**Shaft dimensions**

Size	Shaft ø h6 x length	Key
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x40

Basic length + stroke = total length

ELVZ 60 7 0 0 0 0 4 1 01500  
Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

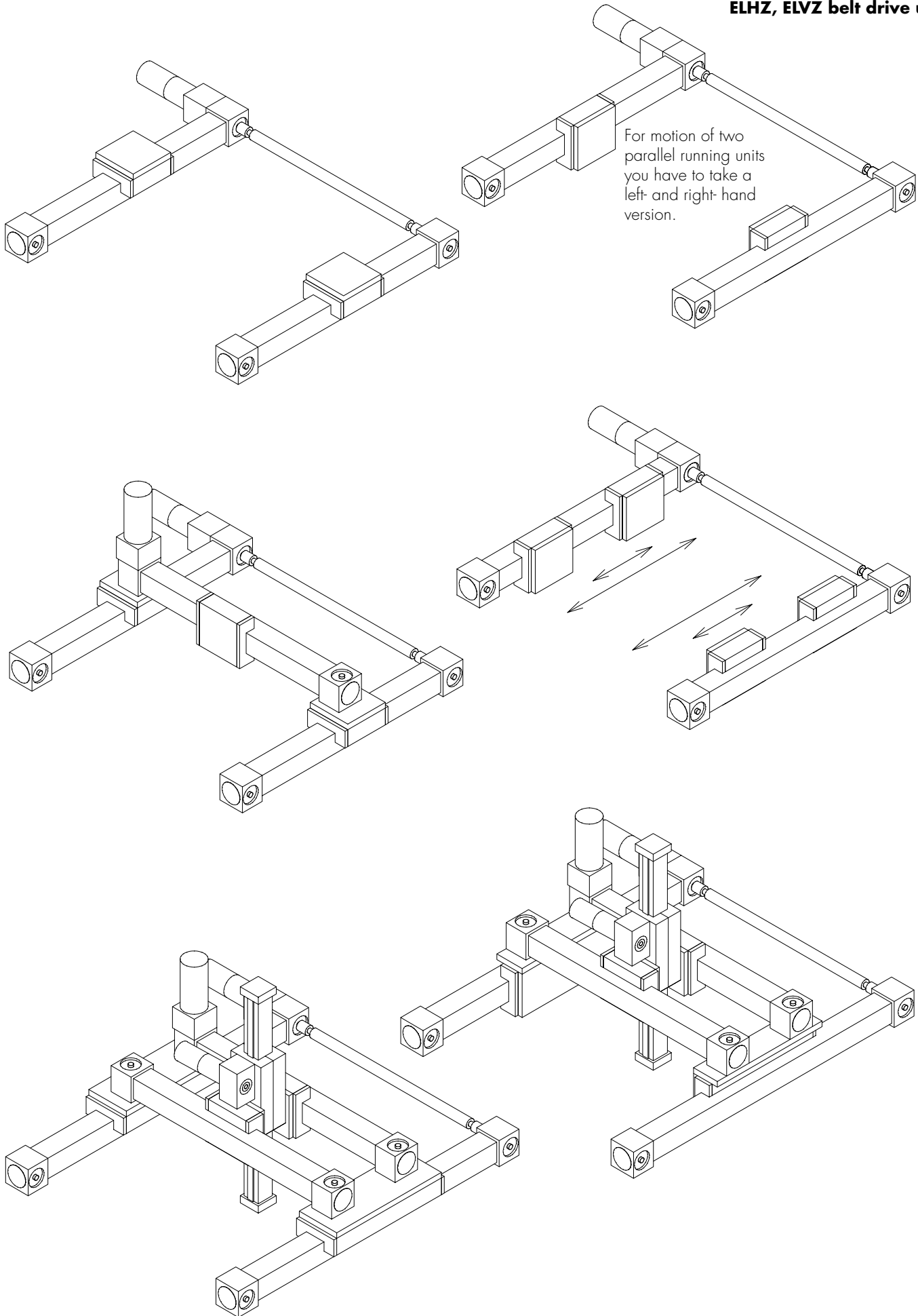
Sample ordering code:

ELVZ 60 right-/left-hand with belt connection right, standard body profile, standard carriage and 4 flush mounted shafts, 1040 mm stroke

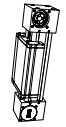


## Possible mounting styles

### ELHZ, ELVZ belt drive units



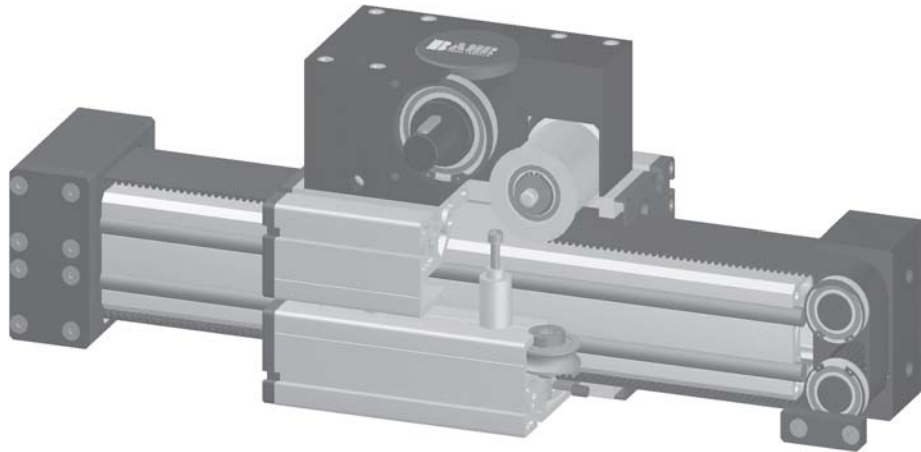
3.1



# Positioning system ELFZ 80, 100, 125

## Specifications

3.1



### Function:

This special lifting unit consists of an aluminium square profile with hardened steel guide rods. The carriages, which has internal linear ball bearings that can be adjusted free of play is driven along the guide rods by a timing belt. The rotating timing belt pulleys have maintenance-free ball bearings. One rotation of the drive pulley complies with linear 1/2 circumference of the drive pulley. Belt tension can be readjusted by a simple tensioning device in one of the carriages. This device can also be used for symmetrical adjustment of two or more linear units running parallel.

### Fitting position:

As required. Max. length without joints 6.000 mm.

### Carriage mounting:

By T-slots.

### Unit mounting:

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

### Belt type:

HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

Forces and torques	Size		ELFZ 80S		ELFZ 100		ELFZ 125	
	Forces/Torques		static	dynamic	static	dynamic	static	dynamic
	$F_x$ (N)		6200	5400	8700	7600	12000	10400
	$F_y$ (N)		9200	7200	16000	13000	24000	18000
	$F_z$ (N)		6000	3600	7200	4400	12000	9000
	$M_x$ (Nm)		340	280	600	460	1200	900
	$M_y$ (Nm)		540	460	800	540	1500	1200
	$M_z$ (Nm)		600	440	1500	1000	2700	2300
	<b>All forces and torques relate to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table							
<b>No-load torque</b>								
	Nm		1,5		2		2	
<b>Speed</b>								
	(m/sec) max		4		4		4	
<b>Drive torque</b>								
	max (Nm)		120		386		500	
<b>Geometrical moments of inertia of aluminium profile</b>								
	$I_x$ mm <sup>4</sup>		1,89x10 <sup>6</sup>		4,44x10 <sup>6</sup>		10,15x10 <sup>6</sup>	
	$I_y$ mm <sup>4</sup>		1,89x10 <sup>6</sup>		4,48x10 <sup>6</sup>		10,15x10 <sup>6</sup>	
	E-Modulus N/mm <sup>2</sup>		70000		70000		70000	

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

### Formula: ELFZ

Driving torque:

$$M_o = \frac{F \cdot P \cdot S}{2000 \cdot \pi \cdot 2} + M_{leer}$$

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

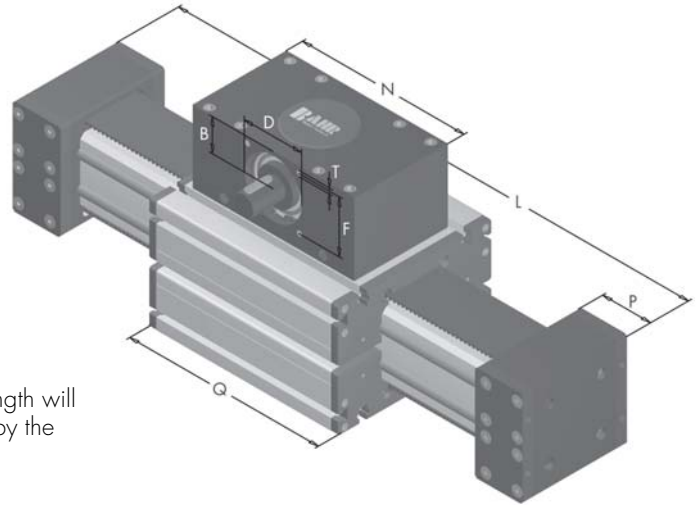
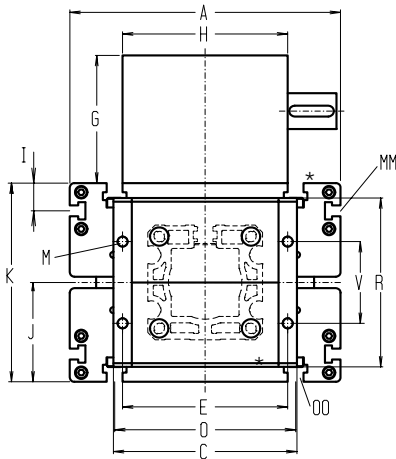
- F = force (N)
- P = pulley action perimeter (mm)
- S = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm pulley (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $P_o$  = motor power (KW)

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

- 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 ELFZ 80, 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	I	J	K	MM for	M	N	OO for	P	Q	T	V	Basic weight	Weight per 100 mm
ELFZ 80S	600	190	60	126	90	134	80	139	130	12,5	71	142	M6	M10	270	M 8	130	328	M10	70	51 kg	1,20 kg
ELFZ 100	530	230	62	170	110	150	100	143	160	29	89	178	M10	M10	310	M10	77	365	M10	80	69 kg	1,80 kg
ELFZ 125	560	295	62	200	110	180	100	139	180	30	107,5	215	M10	M12	310	M12	92	365	M10	89	87,5 kg	2,70 kg

### Choice of guide body profile:

- 0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

### Choice of carriages:

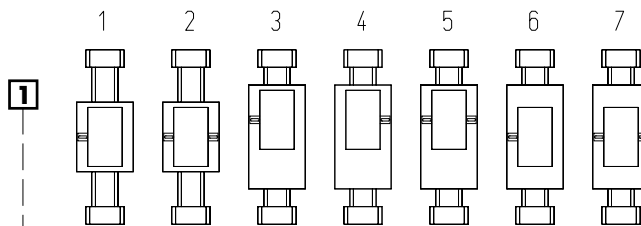
(0)



(1)



### Selection of shaft mounting:



### Belt table

Code No.	Size	Belt	mm/eqv.	linear	Number of teeth
0 4	80S	8M50	256	128	32
0 4	100	8M70	304	152	38
0 9	125	8M100	304	152	38

### Shaft dimensions

Size	Shaft ø h6 x length	Key
80	30 x 45	8x7x40
100	40 x 55	12x8x50
125	40 x 55	12x8x50

Basic length + stroke = total length

ELFZ 125 0 0 0 1 0 4 1 01500

Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

ELFZ 125 with standard body profile, standard carriage, shaft Pos. 1, 940 mm stroke

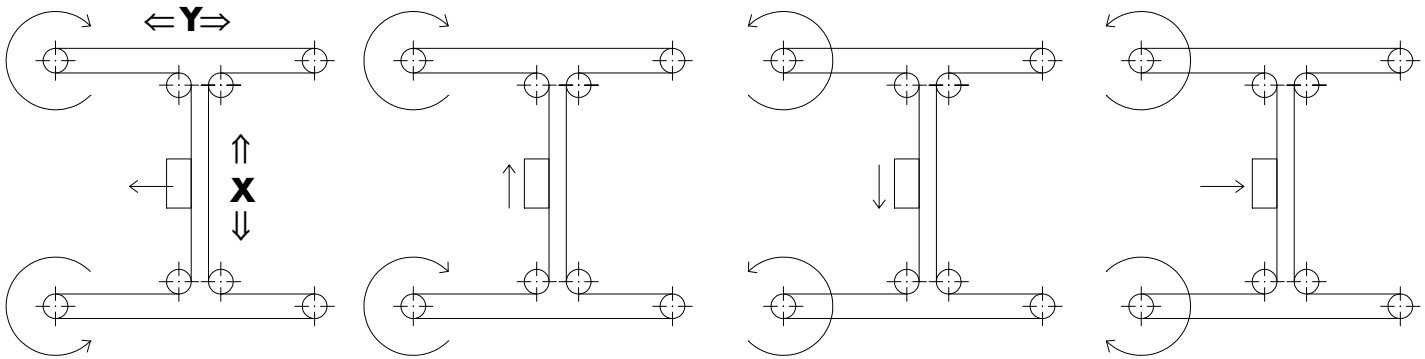
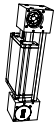


# Positioning system ELZU 30, 40, 60, 60S, 80, 80S, 100

Surface portal

Specifications

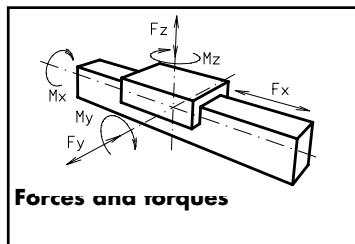
3.1



**Function:**

Surface portal, consisting of 2 Y-axes and 1 X-axis, driven by one rotating belt. This belt runs around different deflection pulleys. Positioning is achieved by two motors. The coordinate is diagonal to the deflection points of Y-axis.

Advantage: Only small weights are moved, thus enabling high accelerations to be achieved.



Forces and torques

- Fitting position:**
- Carriage mounting:**
- Unit mounting:**
- Belt type:**

As required. Max. length and width 3.000 mm.

By T-slots.

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

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

Size	ELZU 30		ELZU 40		ELZU 60		ELZU 60 S		ELZU 80		ELZU 80 S		ELZU 100	
	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
<b>Forces/Torques</b>														
F <sub>x</sub> (N)	200	180	390	350	894	800	894	800	1900	1800	1900	1800	4000	3800
F <sub>y</sub> (N)	90	60	1200	700	3000	2000	4100	3100	3000	2000	4600	3600	8000	6500
F <sub>z</sub> (N)	90	60	900	650	1700	1100	2160	1600	1700	1100	3000	1800	3600	2200
M <sub>x</sub> (Nm)	10	5	25	20	67	43	88	65	90	55	170	140	300	230
M <sub>y</sub> (Nm)	13	6	32	18	90	70	190	140	110	80	270	230	400	270
M <sub>z</sub> (Nm)	14	7	35	25	120	100	230	170	150	120	300	220	750	500
<b>All forces and torques relate to the following:</b>														
existing values $\frac{F_y}{F_{y,dyn}} + \frac{F_z}{F_{z,dyn}} + \frac{M_x}{M_{x,dyn}} + \frac{M_y}{M_{y,dyn}} + \frac{M_z}{M_{z,dyn}} \leq 1$														
<b>No-load torque</b>														
Nm	0,2		0,6		1,2		1,2		1,8		1,8		2,6	
<b>Speed</b>														
(m/sec) max	2		4		5		5		6		6		8	
<b>Tensile force</b>														
permanent (N)	200		390		900		900		1900		1900		3600	
0,2 sec (N)	280		480		1000		1000		2090		2090		4000	
<b>Geometrical moments of inertia of aluminium profile</b>														
I <sub>x</sub> 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>	
I <sub>y</sub> 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>	
E-Modul N/mm <sup>2</sup>	70000		70000		70000		70000		70000		70000		70000	

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

**Formula: ELZU**

Driving torque:

$$M_a = \frac{F * P * S}{2000 * \pi} + M_{leer}$$

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

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

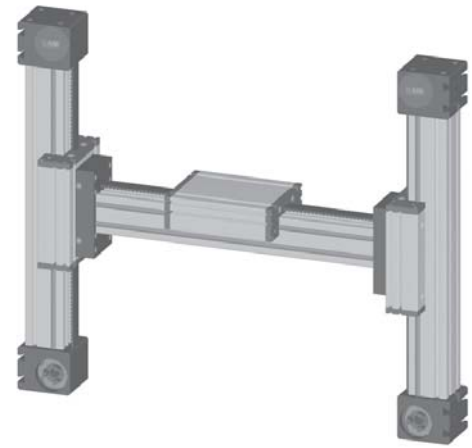
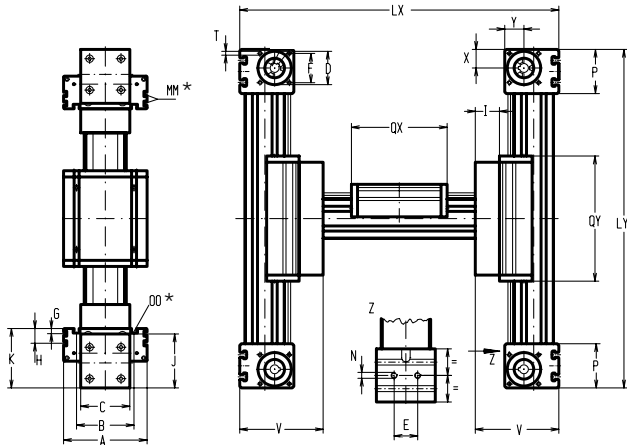
$$f = \frac{F * L^3}{E * I * 192}$$

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



# Positioning system ELZU 30, 40, 60, 60S, 80, 80S, 100

Dimensions (mm)



**3.1**

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

Size □	Basic length		A	B	C	D	E	F	G	H	I	J	K	MM for	N for	OO for	P	Qx	Qy	T	V	X	Y	Basic weight	Weight per 100 mm
	Lx	Ly																							
ELZU 30	240	210	70	56	42	28	13	25	-	-	27	44	47	-	M 5	M 6	36	82	126	M 5	74	16	16	6,3 kg	0,13 kg
ELZU 40	304	250	100	66	58	37	18	32	-	-	26	58	64	-	M 6	M 6	49	122	147	M 5	90	20,5	20,5	6,8 kg	0,24 kg
ELZU 60	426	330	144	96	80	47	30	42	-	-	33	82	90	-	M 8	M 8	59	168	208	M 6	123	27	26	14,7 kg	0,62 kg
ELZU 60S	450	330	170	108	80	47	30	42	-	-	33	82	94	-	M 8	M 8	59	194	210	M 6	127	27	26	17,7 kg	0,62 kg
ELZU 80	535	435	170	117	100	68	40	60	10	30	44	110	121	M 6	M 10	M 10	90	194	244	M 8	165	39	38	31,0 kg	1,00 kg
ELZU 80S	555	455	190	126	100	68	40	60	12,5	30	44	110	122	M 6	M 10	M 8	90	214	264	M 8	167	39	38	32,0 kg	1,00 kg
ELZU 100	758	590	230	155	130	90	50	80	-	29	69	135	154	M 10	M 12	M 10	110	300	360	M 10	223	50	50	47,3 kg	1,40 kg

**Choice of guide body profile:**  
**0** (0) Standard **(1)** stainless guide rods **(2)** stainless guide rods and screws **(3)** stainless guide rods, rollers and screws

**Choice of carriages:**

**0** **(0)** **(1)** **(2)**

For standard carriage length see Qx and Qy in table. The carriages can be delivered in any non-standard lengths upon request; the longer the carriage, the higher the load capacity.

The stainless carriages are rigidly joined, allowing higher loads to be applied. This increases the basic length by 12 - 24 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

**Selection of shaft mounting:**

**0** **(0)** **(1)** **(2)**

The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings.

**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

**Shaft dimensions**

Size	Shaft ø h6 x length	Key
30	6 x 15	2x2x12
40	10 x 27	3x3x25
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40

**X-Axis** Basic length + stroke = total length

**Y-Axes** Basic length + stroke = total length

ELZU 60 7 0 0 0 0 4 1 01500

ELZU 60 8 0 0 0 0 4 1 00700

Pos. 1 2 3 4 5 6 7

Sample ordering code:

ELZU 60 with standard body profile, standard carriage, coupling claw on one side, stroke X = 1074 / Y = 370 mm

For combination kits and connecting elements refer to chapter 2.2

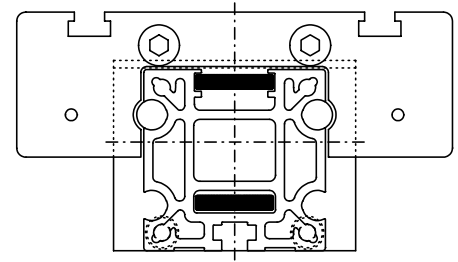
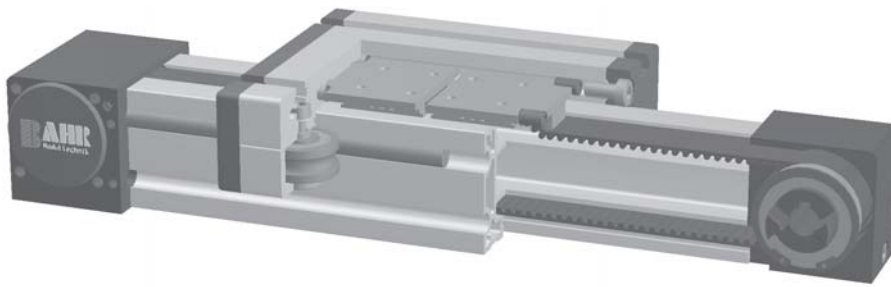


# Positioning system MLZ 60, 60S, 80, 80S, 100

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 advantage of this system is that the belt is guided within the profile, ensuring that the belt is always tight and thus enabling the system to be operated e.g. when lying on its side. 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: ± 0,1 mm.

Forces and torques	Size	MLZ 60		MLZ 60 S		MLZ 80		MLZ 80 S		MLZ 100	
	Forces/Torques	static	dynamic	statisch	dynamisch	static	dynamic	static	dynamic	static	dynamic
	F <sub>x</sub> (N)	894	800	894	800	1900	1800	1900	1800	4000	3800
	F <sub>y</sub> (N)	3000	2000	4100	3100	3000	2000	4600	3600	8000	6500
	F <sub>z</sub> (N)	1700	1100	2160	1600	1700	1100	3000	1800	3600	2200
	M <sub>x</sub> (Nm)	67	43	88	65	90	55	170	140	300	230
	M <sub>y</sub> (Nm)	90	70	190	140	110	80	270	230	400	270
	M <sub>z</sub> (Nm)	120	100	230	170	150	120	300	220	750	500
<b>All forces and torques relate to the following:</b>											
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$											
<b>No-load torque</b>											
Nm		0,6		0,7		0,9		1,2		1,4	
<b>Speed</b>											
(m/sec) max		5		7		6		8		10	
<b>Tensile force</b>											
permanent (N)		900		900		1900		1900		4000	
0,2 sec (N)		1000		1000		2090		2090		4300	
<b>Geometrical moments of inertia of aluminium profile</b>											
I <sub>x</sub> mm <sup>4</sup>		4,83x10 <sup>5</sup>		6,79x10 <sup>5</sup>		17,49x10 <sup>5</sup>		17,49x10 <sup>5</sup>		44,4x10 <sup>5</sup>	
I <sub>y</sub> mm <sup>4</sup>		5,03x10 <sup>5</sup>		6,97x10 <sup>5</sup>		18,02x10 <sup>5</sup>		18,02x10 <sup>5</sup>		44,8x10 <sup>5</sup>	
E-Modulus N/mm <sup>2</sup>		70000		70000		70000		70000		70000	

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

**Formula: MLZ**

Driving torque:

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

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = safety factor 1,2 ... 2
- M<sub>leer</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)

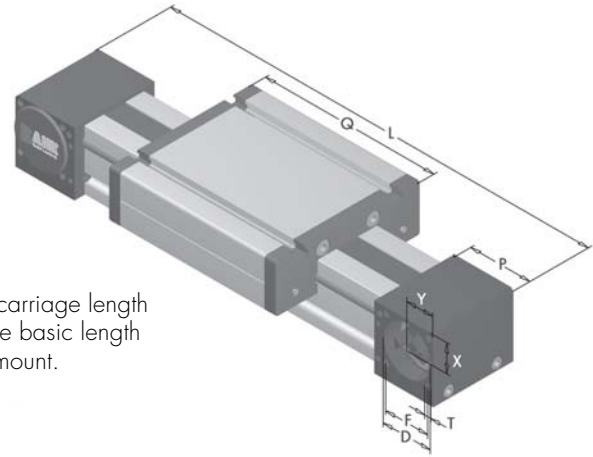
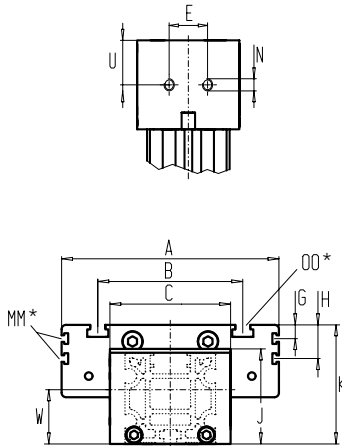
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

- 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 MLZ 60, 60S, 80, 80S, 100

Dimensions (mm)



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

**3.1**

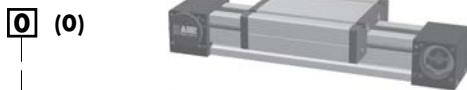
\*For slide-nuts refer to main catalogue chapter 2.2 page 2

Size □	Basic length L	A	B	C	D	E	F	G	H	J	K	MM for	N	OO for	P	Q	T	U	W	X	Y	Basic weight	Weight per 100 mm
MLZ 60	290	144	96	80	47	30	42	-	-	63	79	-	M 8	M 8	59	168	M 6	29,5	36	27	26	4,7 kg	0,6 kg
MLZ 60S	315	170	108	80	47	30	42	-	-	63	83	-	M 8	M 8	59	194	M 6	29,5	30	27	26	5,8 kg	0,62 kg
MLZ 80	375	170	117	100	68	40	60	10	30	93	110	M 6	M 10	M 10	90	194	M 8	47,5	40	45	40	9,6 kg	1,0 kg
MLZ 80 S	395	190	126	100	68	40	60	12,5	30	93	111	M 6	M 10	M 8	90	214	M 8	47,5	40	45	40	10,8 kg	1,0 kg
MLZ 100	530	230	155	130	90	110	80	-	29	120	139	M 10	M 12	M 10	110	300	M 10	55	50	49	50	22,5 kg	1,55 kg

**0 Choice of guide body profile:**

**(0)** Standard **(1)** stainless guide rods **(2)** stainless guide rods and screws **(3)** stainless guide rods, rollers and screws

**Choice of carriages:**

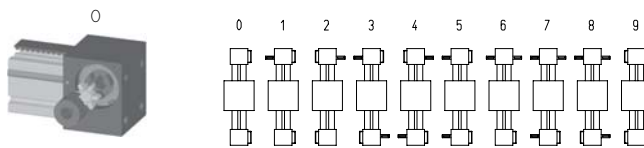


For standard carriage length see 'Q' in table. Non-standard length on request. The longer the carriage, the higher the load capacity.



Top and bottom carriages are rigidly joined, enabling higher loads to be applied. This increases the basic length by 16 - 20 mm. Thickness of jointing plate refer to main catalogue chapter 1.2 page 6.

**0 Coupling - shaft mounting:**



The standard version is supplied without shaft.

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

**Belt table**

Code No.	Size	Belt	mm/rev.	Number of teeth
<b>0 4</b>	60 (S)	5M25	130	26
<b>0 7</b>	80 (S)	8M30	176	22
<b>0 9</b>	100	8M50	224	28

**Shaft dimensions**

Size	Shaft ø h6 x length	Key
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40

Basic length + stroke = total length

**MLZ 60 1 0 0 0 0 4 1 01500**

Pos. 1 2 3 4 5 6 7

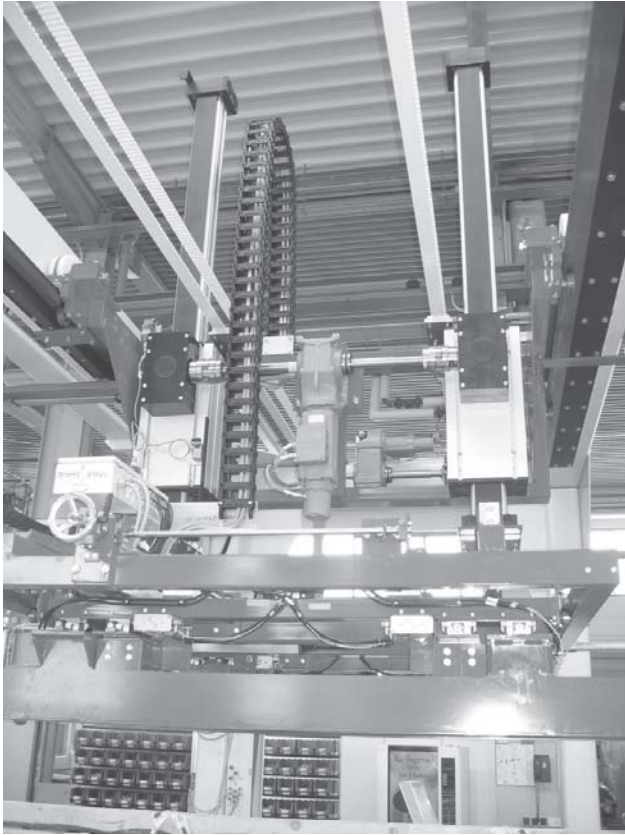
Sample ordering code:

MLZ 60 with standard body profile, standard carriage, coupling claw on one side, 1210 mm stroke.

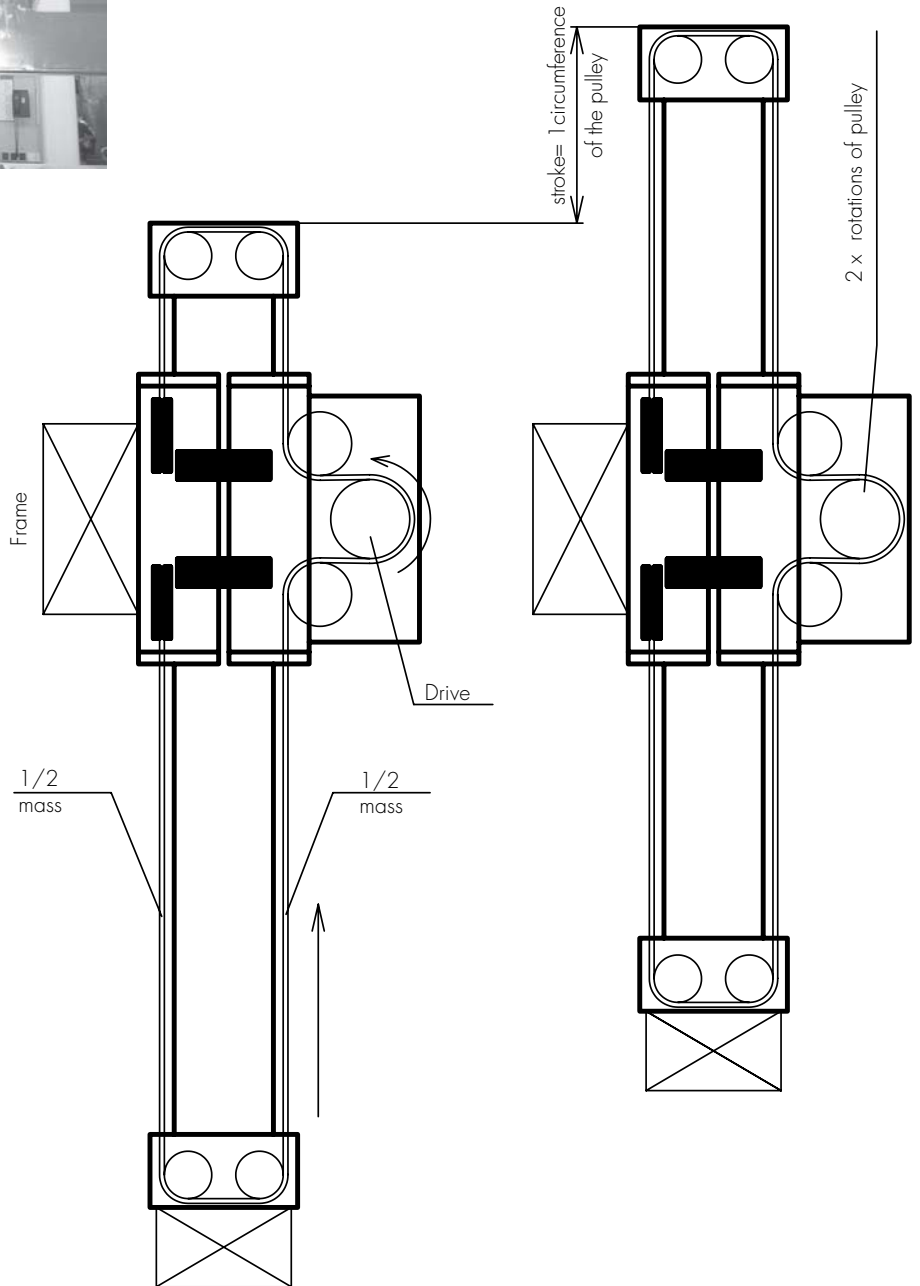


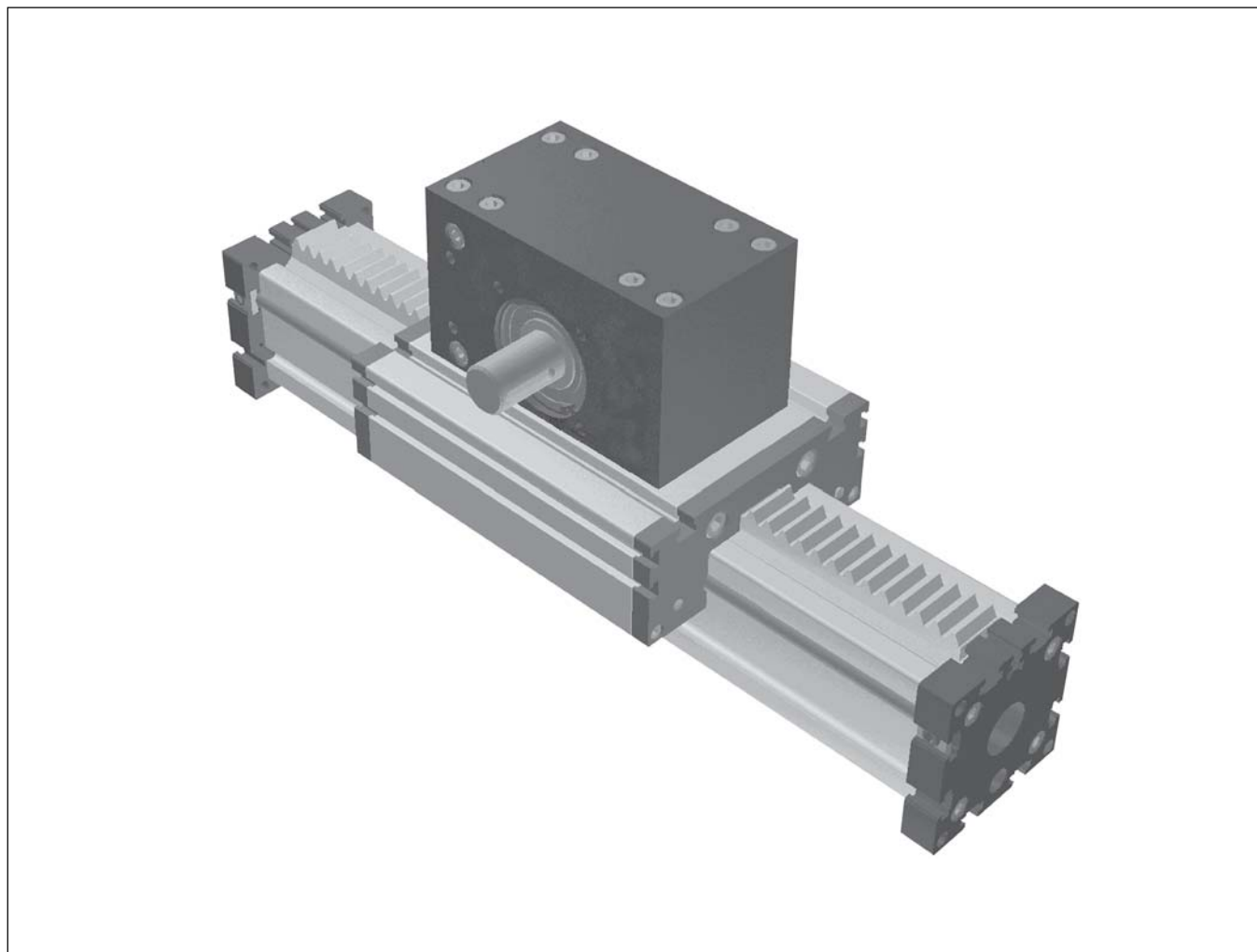
### Possible mounting styles

3.1



### Operational principle ELFZ





4.1

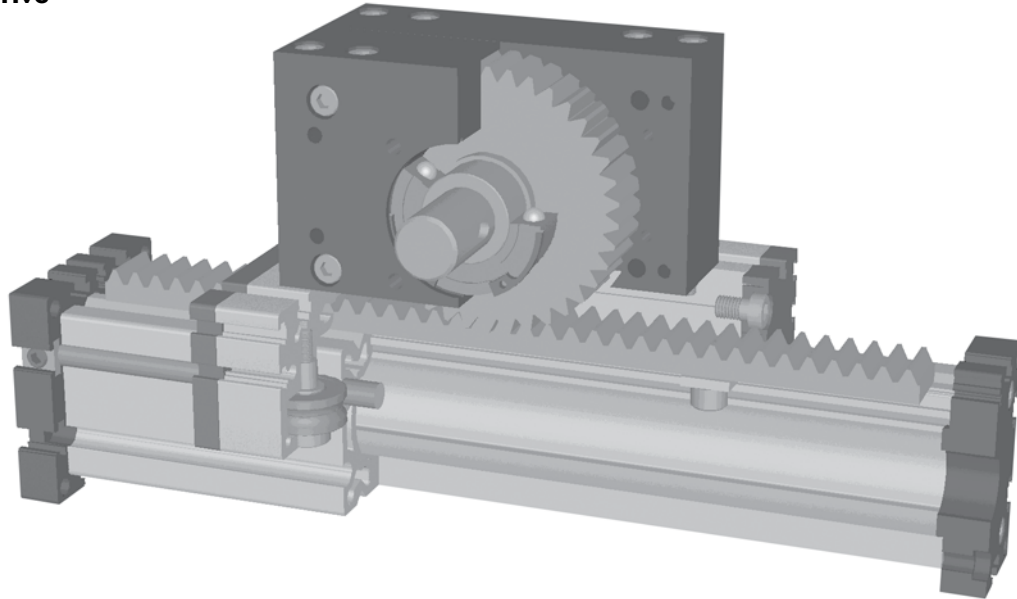


## Rack and pinion driven positioning systems ELZA, ELZQ

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

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 by a rack and pinion. The pinion is equipped with maintenance-free ball bearings.

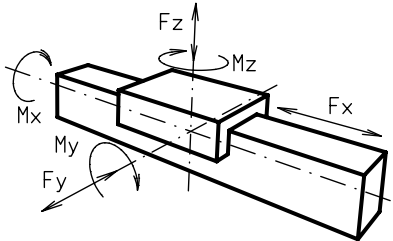
**Fitting position:** As required. Max. length without joints 6.000 mm.

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

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

**Rack:** C 45 or St 60 zinc coated, stainless steel on request. Repeatability: ± 0,2 mm.

Forces and torques	Size	ELZA 40		ELZA 60		ELZA 80		ELZA 80 S		ELZA 100	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)		900	750	1500	1200	2200	1800	2200	1800	2900	2500
$F_y$ (N)		1200	700	3000	2000	3000	2000	4600	3600	8000	6500
$F_z$ (N)		900	650	1700	1100	1700	1100	3000	1800	3600	2200
$M_x$ (Nm)		25	20	67	43	90	55	170	140	300	230
$M_y$ (Nm)		32	18	90	70	110	80	270	230	400	270
$M_z$ (Nm)		35	25	120	100	150	120	300	220	750	500
<b>All forces and torques related to the following:</b>											
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$											
values of table											
<b>Speed</b>											
(m/sec) max		2		2,5		3		3		3	
<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>		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>		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	



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

### Formula: ELZA

Driving torque:

$$M_o = \frac{F * P * S}{2000 * \pi} + M_{leer}$$

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

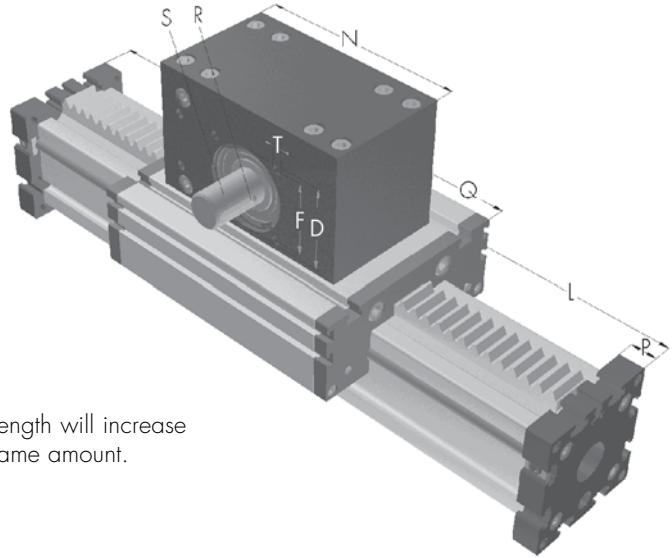
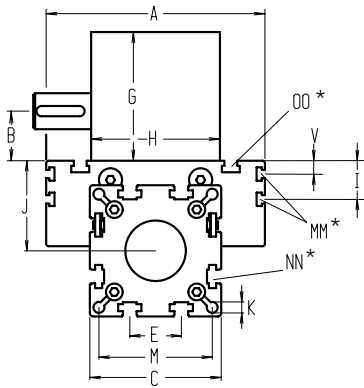
- F = force (N)
- P = pulley action perimeter (mm)
- S = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm pulley (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $P_o$  = motor power (KW)

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

- 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 ELZA 40, 60, 80, 80S, 100

Dimensions (mm)



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

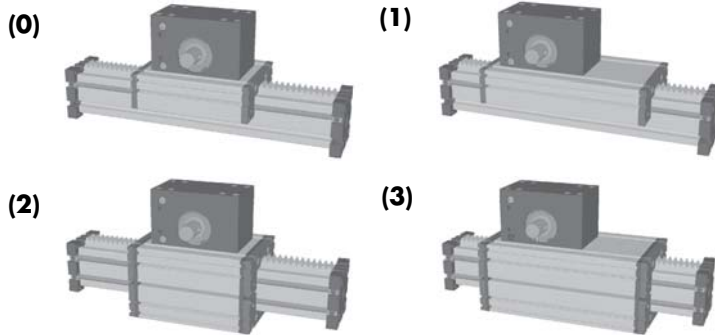
\*For slide-nuts refer to chapter 2.2 page 2

Size □	Basic length L	A	B	C	D	E	F	G	H	I	J	K	M	MM for	N	NN for	OO for	P	Q	T	V	Basic weight	Weight per 100 mm
ELZA 40	150	100	21,5	58	37	18	32	60	56	-	35	6,5	47	-	100	M 6	M 6	12	122	M 6	-	2,0 kg	0,35 kg
ELZA 60	205	144	28,0	82	47	30	42	75	63	-	49	8,5	69	-	130	M 8	M 8	16	168	M 6	-	5,3 kg	0,68 kg
ELZA 80	240	170	39,0	102	68	40	60	105	100	30	70	8,5	88	M 6	170	M 10	M 10	20	194	M 8	10	11,9 kg	1,19 kg
ELZA 80S	260	190	39,0	102	68	40	60	105	100	30	71	8,5	88	M 6	170	M 10	M 8	20	214	M 8	12,5	12,9 kg	1,19 kg
ELZA 100	360	230	55,3	130	90	50	80	155	120	29	89	10,5	112	M 10	240	M 10	M 10	30	300	M 10	-	24,0 kg	1,75 kg

### Choice of guide body profile:

**0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

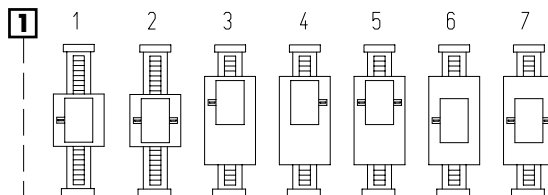
### Choice of carriages:



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the greater the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 16 - 20 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

### Selection of shaft mounting:



Size □	Shaft ø h6 x length	Key	Pinion	
			mm/rev.	Modul
40	14 x 30	5x5x28	188,5	1,5
60	18 x 30	6x6x28	251,6	2
80 (S)	28 x 40	8x7x35	358,0	3
100	28 x 40	8x7x35	508,9	3

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

ELZA	60	0	0	0	1	0	3	0	01500
Pos.	1	2	3	4	5	6	7		

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:  
ELZA 60 with standard body profile, standard carriage, standard shaft, 1295 mm stroke

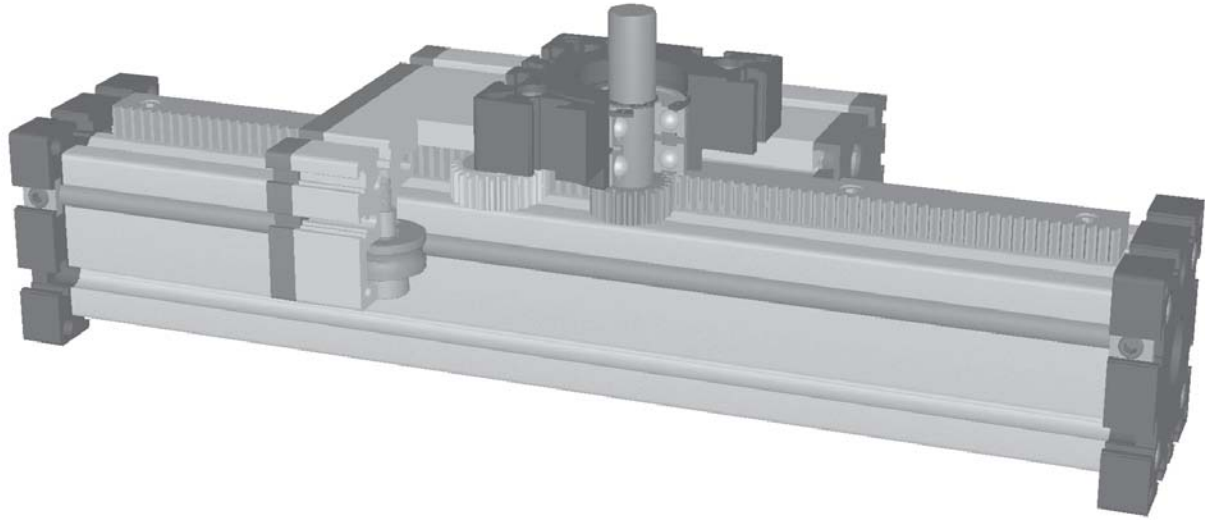


# Positioning system ELZQ 60, 80, 80S

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 $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table													
<b>Speed</b>													
(m/sec) 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:

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

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

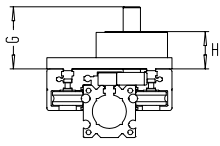
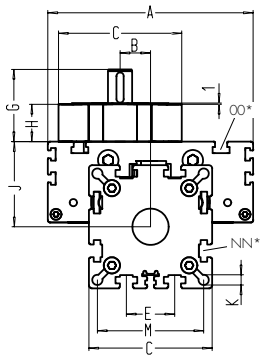
- F = force (N)
- P = pulley action perimeter (mm)
- $S_i$  = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm pulley (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $P_o$  = motor power (KW)

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

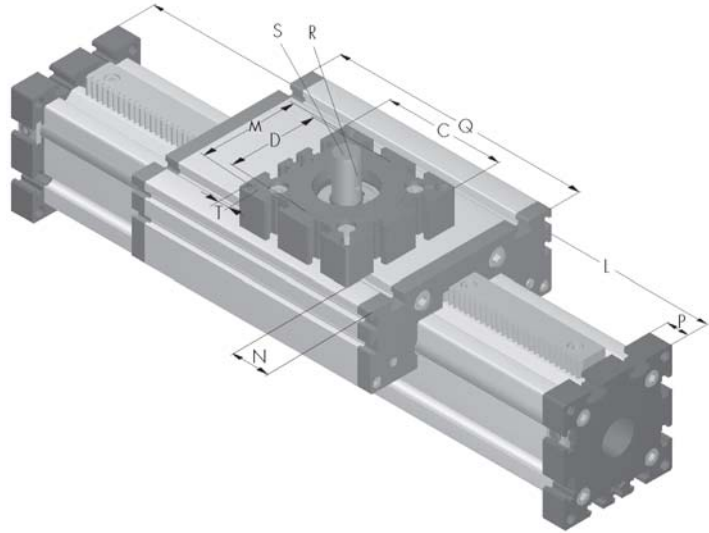
- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm<sup>2</sup>)
- I = second moment of area (mm<sup>4</sup>)

# 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	62,5	33	71	8,5	88	25	M 10	M 8	20	234	M 10	12,0 Kg	1,19 kg

### Choice of guide body profile:

**0** (0) Standard **(1)** stainless guide rods **(2)** stainless guide rods and screws **(3)** stainless guide rods, rollers and screws

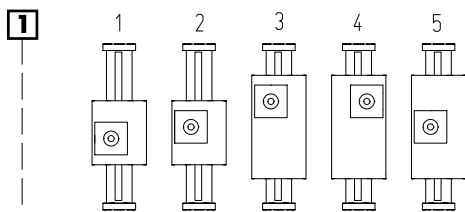
### Choice of carriages:



For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the greater the load capacity.

Top and bottom carriages are rigidly joined, thus enabling higher loads to be applied. This increases the basic length by 16 - 20 mm. For thickness of jointing plate refer to chapter 1.2 page 6.

### Position of drive:



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

### Rack and pinion accuracy

**0** (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
Pos.	1	2	3	4	5	6	7		

For combination kits and connecting elements refer to chapter 2.2

Sample ordering code:

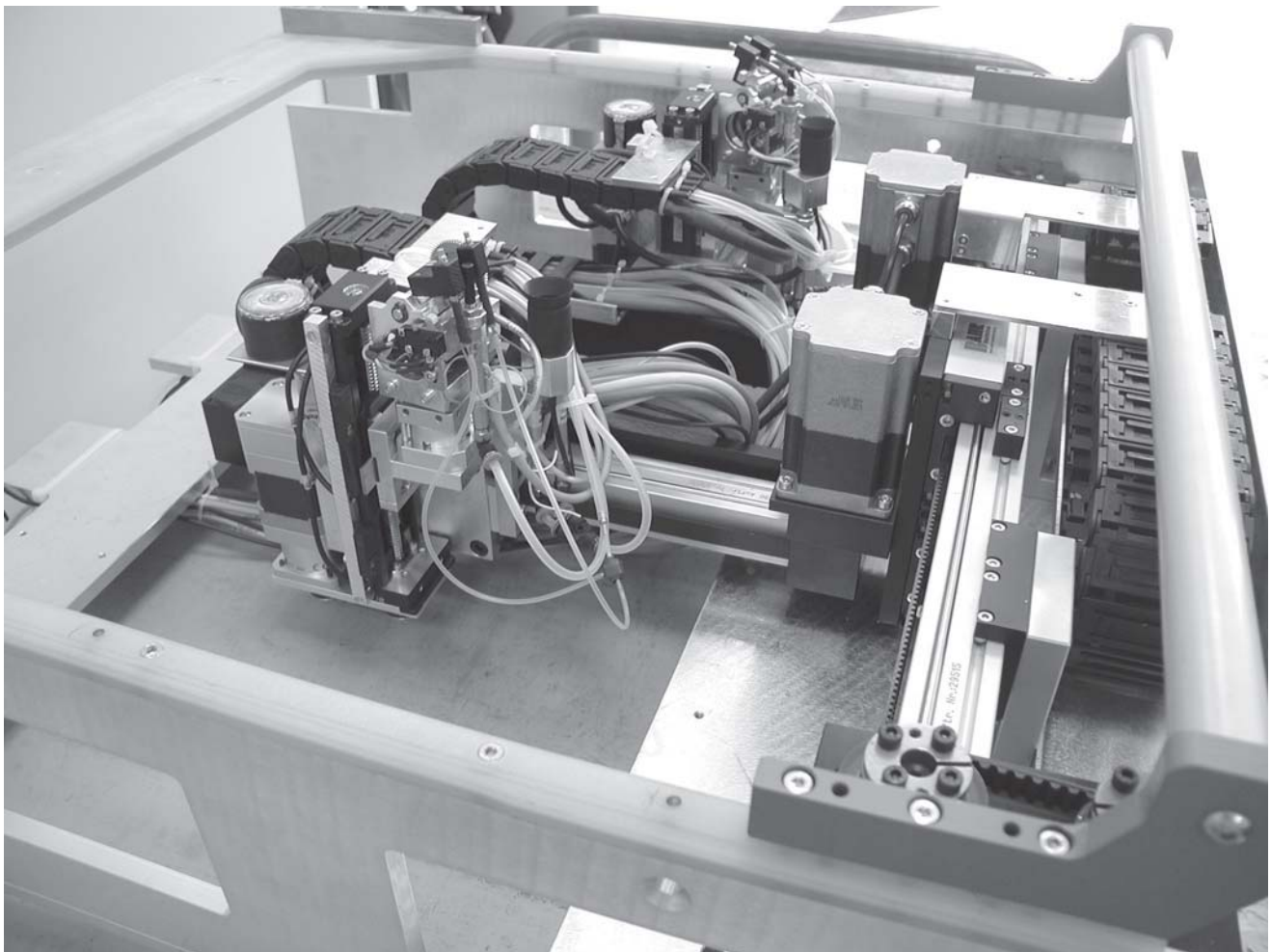
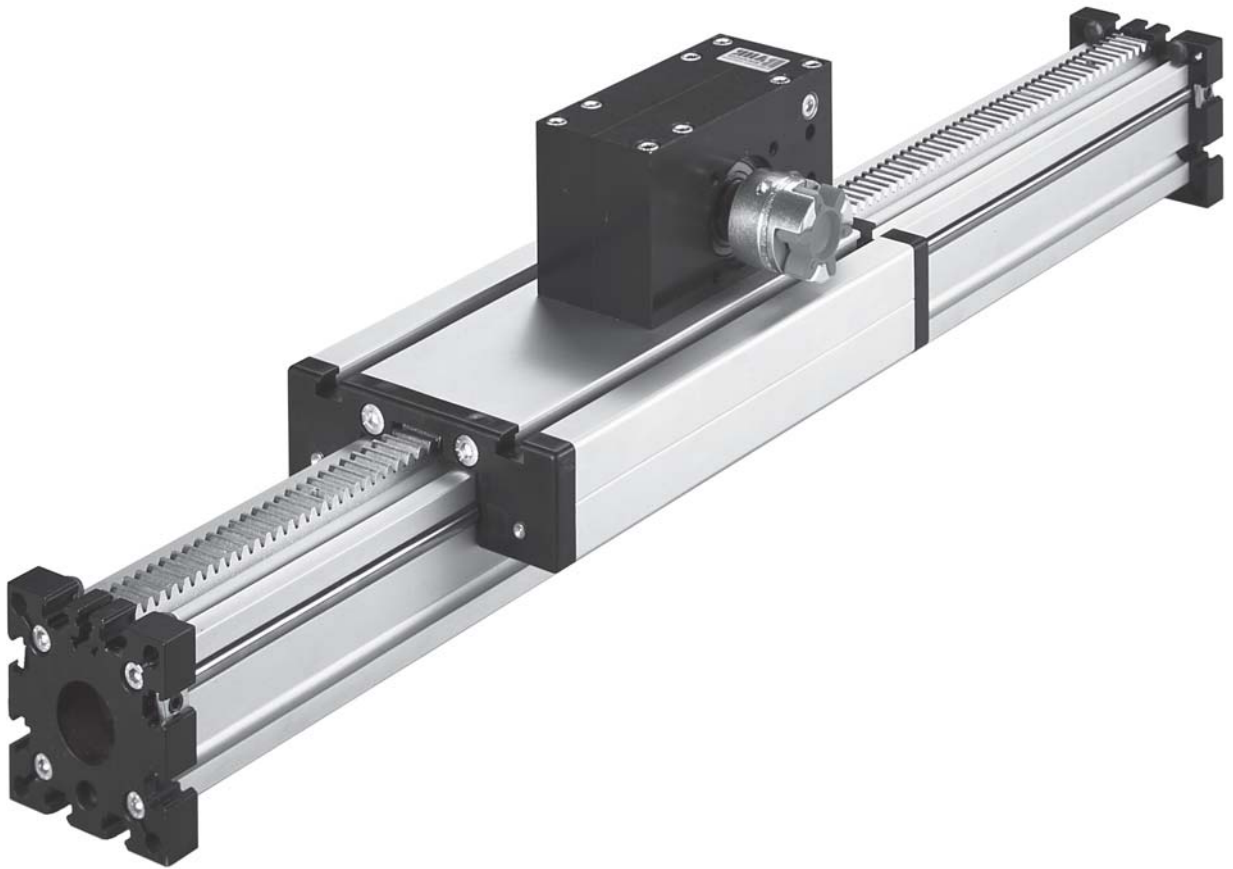
ELZQ 60 with standard body profile, standard carriage, position of drive 1, rack and pinion accuracy class h7, 1270 mm stroke

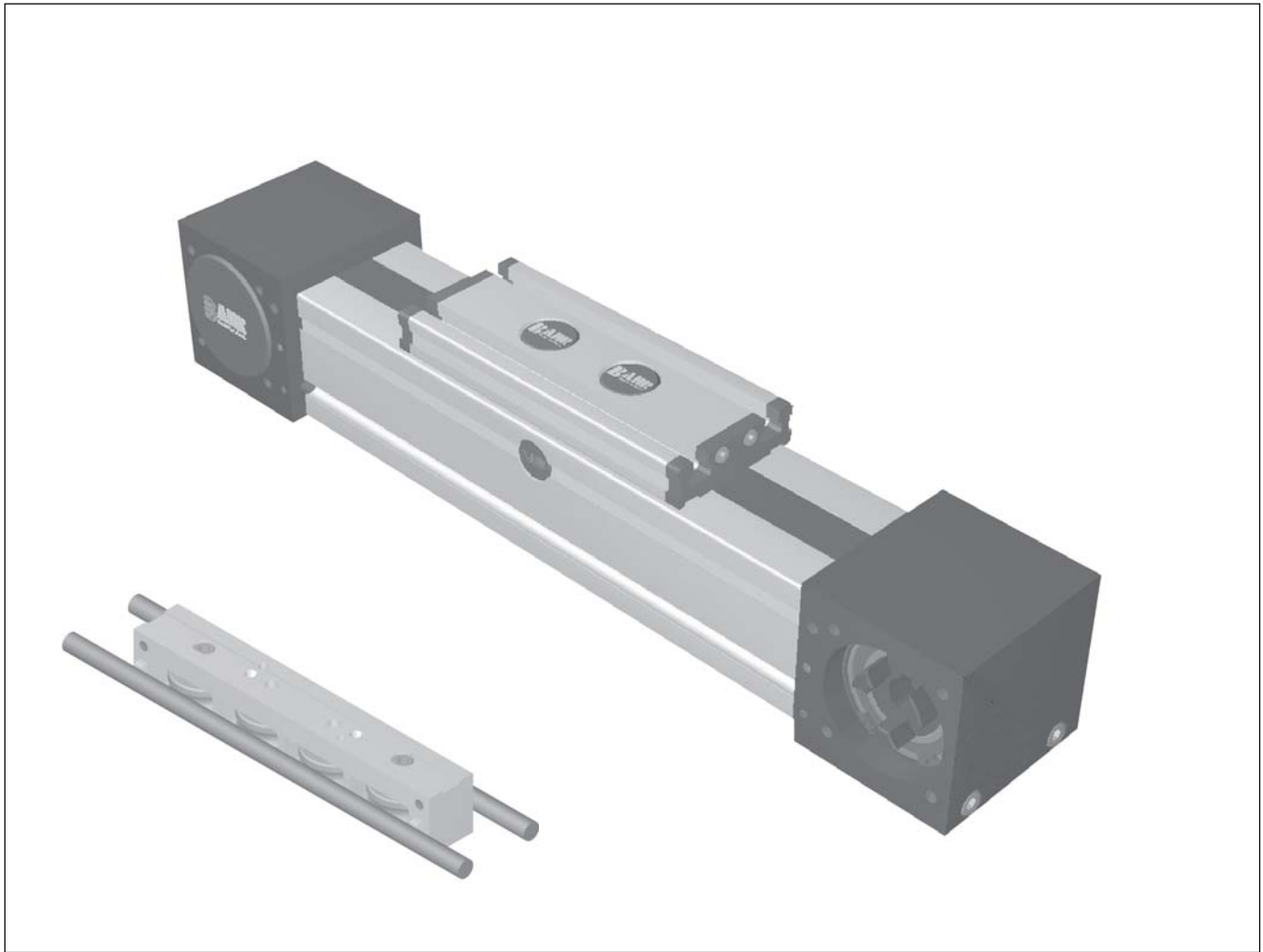
4.1



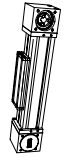
## Example for ELZA

4.1





5.1

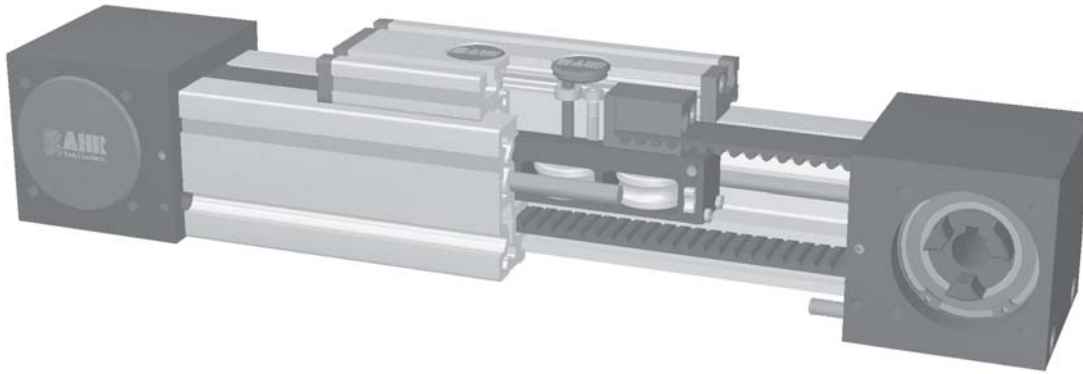


# Roller guide positioning systems QL

# Positioning system QLZ 60, 80, 100

Specifications

Belt drive



5.1

**Function:**

This unit consists of a square aluminium profile with an integrated roller guide. The carriage is driven by a timing belt. Each standard pulley includes one coupling claw on one side. 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. This linear unit is suitable for application in clean rooms of clean-room classification 1.000 (corresponding to US Fed. Standard 209 E).

**Fitting position:**

As required. Max. length 6.000 mm without joints.

**Carriage mounting:**

By T-slots.

**Unit mounting:**

By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

**Belt performance:**

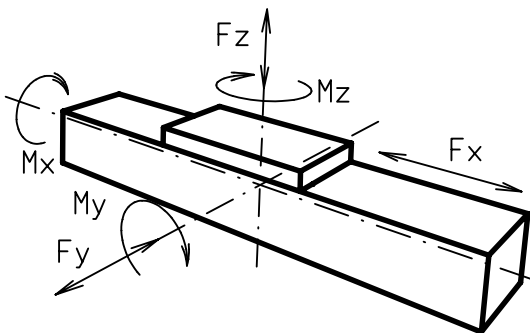
HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

**Carriage support:**

In the standard version, the carriage runs on 4 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.



**Forces and torques**



Size	60		80		100	
Forces/Torques	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)	894	800	1900	1800	4000	3800
$F_y$ (N)	600	500	1600	1240	1900	1500
$F_z$ (N)	900	650	1500	1200	2100	1700
$M_x$ (Nm)	15	10	50	40	85	60
$M_y$ (Nm)	60	50	100	80	140	110
$M_z$ (Nm)	40	30	75	60	110	90
<b>All forces and torques related to the following:</b>						
existing values	$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
values of table						
<b>No-load torque</b>						
Nm	0,6		0,8		1,2	
<b>Speed</b>						
(m/sec) max	4		6		7	
<b>Tensile force</b>						
permanent (N)	900		1900		4000	
0,2 sec (N)	1000		2090		4300	
<b>Geometrical moments of inertia of aluminium profile</b>						
$I_x$ mm <sup>4</sup>	4,3x10 <sup>5</sup>		16,5x10 <sup>5</sup>		43,0x10 <sup>5</sup>	
$I_y$ mm <sup>4</sup>	4,8x10 <sup>5</sup>		18,7x10 <sup>5</sup>		48,8x10 <sup>5</sup>	
Elastic modulus N/mm <sup>2</sup>	70000		70000		70000	

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

**Formula: QLZ**

Driving torque:

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

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = 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)

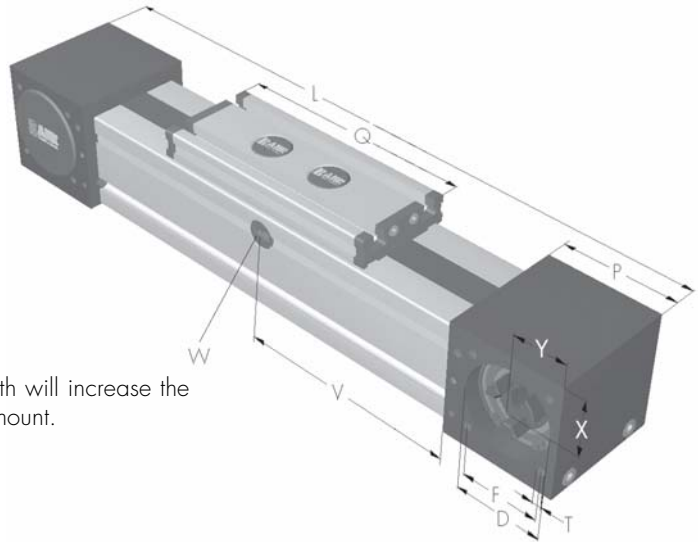
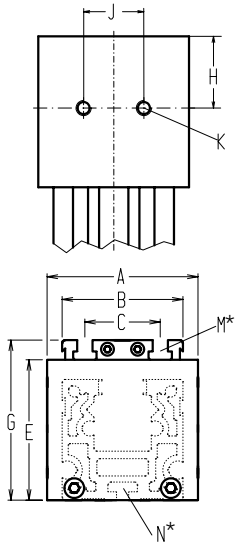
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

- 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 QLZ 60, 80, 100

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

$$V = Q + 100 \text{ mm}$$

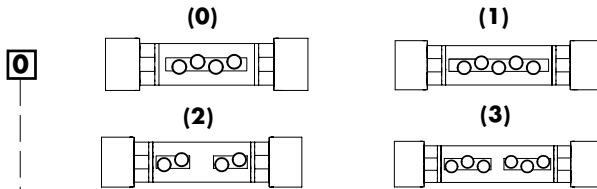
W = servicing position

Size	Basic length L	A	B	C	D	E	F	G	H	J	K	N for	M for	P	Q	T	X	Y	Basic weight	Weight per 100 mm
QLZ 60	280	80	60	36	47	63	42	79	29,5	30	M 8	M 5	M 6	59	152	M 6	27	26	3,2 Kg	0,39 kg
QLZ 80	390	100	80	50	68	93	60	106	47,5	40	M 10	M 6	M 8	90	196	M 8	45	40	9,6 Kg	0,78 Kg
QLZ 100	490	130	100	66	90	110	80	129	55	50	M 12	M 10	M 10	110	260	M 10	49	50	15,8 kg	1,45 Kg

5.1

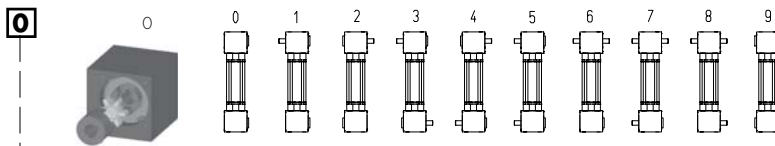
**Choice of guide body profile:**  
**0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

**Choice of carriages:**



Size	Version 0		Version 1		Version 2		Version 3	
	Q	L	Q	L	Q	L	Q	L
60	152	280	192	320	>232	>360	>232	>360
80	196	390	246	440	>296	>490	>296	>490
100	260	490	320	550	>388	>610	>388	>610

**Coupling - Selection of shaft mounting:**



Size	Shaft ø h6 x length	Key
60	14 x 35	5x5x28
80	18 x 45	6x6x40
100	22 x 45	6x6x40

9 is as 0, but with coupling claws on both sides. The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings or tension sets (size 100).

**Belt table**

Code No.	Size	Belt	Pulley	
			mm/rev.	Number of teeth
0 3	60	5M25	130	26
0 4	80	8M30	176	22
0 7	100	8M50	224	28

Basic length + stroke = total length

For additional accessories refer to chapter 2.2 – 4.2

QLZ 80 1 0 0 0 0 4 1 01500  
 Pos. 1 2 3 4 5 6 7

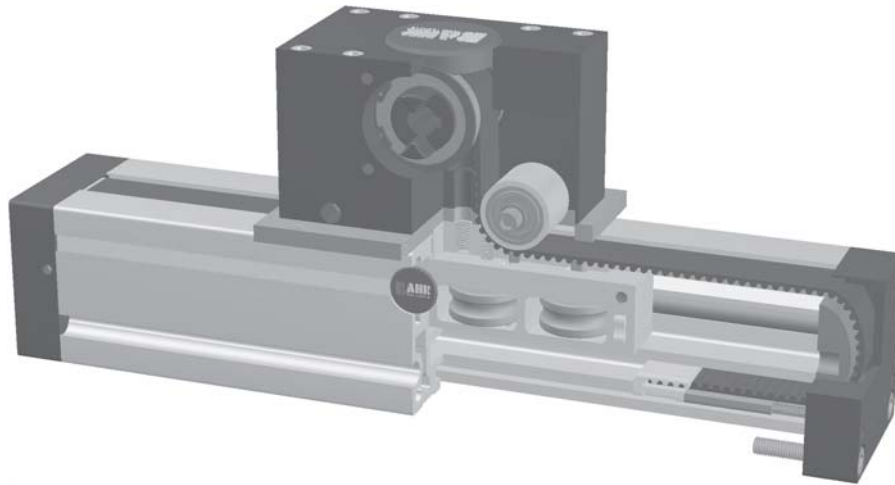
Sample ordering code:  
 QLZ80, standard body profile, standard carriage, coupling claw on one side, 1110 mm stroke



# Positioning system QLSZ 60, 80, 100

Specifications

Belt drive



5.1

**Function:**

This linear unit consists of an aluminium square profile with 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 pulley has maintenance-free ball bearings. Belt tension can be readjusted by a simple tensioning device in one of the end blocks. This device can also be used for symmetrical adjustment of two or more linear units running parallel.



**Fitting position:**

As required. Max. length without joints 3.000 mm.

**Carriage mounting:**

By T-slots.

**Unit mounting:**

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

**Belt type:**

HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

Forces and torques	Size	60		80		100	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic
	F <sub>x</sub> (N)			894	800		
	F <sub>y</sub> (N)			1600	1240		
	F <sub>z</sub> (N)			1500	1200		
	M <sub>x</sub> (Nm)			50	40		
	M <sub>y</sub> (Nm)			100	80		
	M <sub>z</sub> (Nm)			75	60		
<b>All forces and torques related to the following:</b>							
existing values		$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
values of table							
<b>No-load torque</b>							
Nm				0,8			
<b>Speed</b>							
{m/sec} max				6			
<b>Tensile force</b>							
permanent (N)				1900			
0,2 sec (N)				2090			
<b>Geometrical moments of inertia of aluminium profile</b>							
I <sub>x</sub> mm <sup>4</sup>				16,5x10 <sup>5</sup>			
I <sub>y</sub> mm <sup>4</sup>				18,7x10 <sup>5</sup>			
E-Modul N/mm <sup>2</sup>				70000			

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

**Formula: QLSZ**

Driving torque:

$$M_{\sigma} = \frac{F \cdot p \cdot S}{2000 \cdot \pi} + M_{leer}$$

$$P_{\sigma} = \frac{M_{\sigma} \cdot n}{9550}$$

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

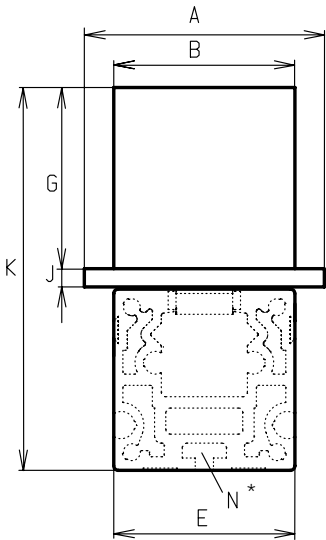
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

- 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>)

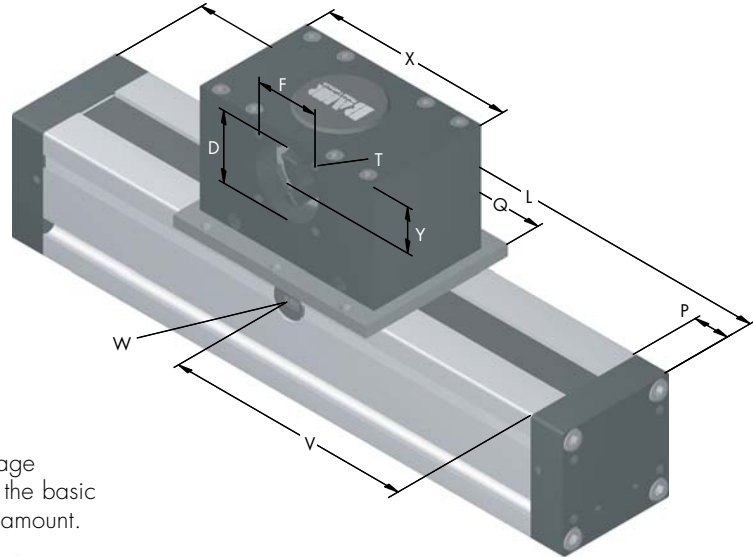


# Positioning system QLSZ 60, 80, 100

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

$V = Q + 100 \text{ mm}$

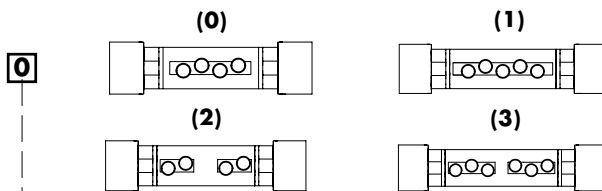
W = servicing position

Size □	Basic length L	A	B	D	E	F	G	J	K	N for	P	Q	T	X	Y	Basic weight	Weight per 100 mm
QLSZ 60																	
QLSZ 80	200	106	80	47	80	42	80	8	169	M 6	24	144	M 6	130	30	5,2 kg	0,78 kg
QLSZ 100																	

5.1

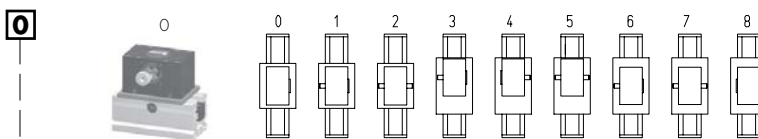
**0** Choice of guide body profile:  
**(0)** Standard **(1)** stainless guide rods **(2)** stainless guide rods and screws **(3)** stainless guide rods, rollers and screws

Choice of carriages:



Size	Version 0		Version 1		Version 2		Version 3	
	Q	L	Q	L	Q	L	Q	L
60								
80	144	200	194	240	>244	>290	>244	>290
100								

Coupling - Selection of shaft mounting:



Size	Shaft ø h6 x length	Key
60		
80	14 x 35	5x5x28
100		

8 is as 0, but with coupling claws on both sides. The standard version is supplied without shaft.  
 A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings:

Belt table

Code No.	Size	Belt	Pulley	
			mm/rev.	Number of teeth
0 7	80	5M25	130	26

Basic length + stroke = total length

For additional accessories refer to chapter 2.2 – 4.2

QLSZ 80 1 0 0 0 0 7 1 01500  
 Pos. 1 2 3 4 5 6 7

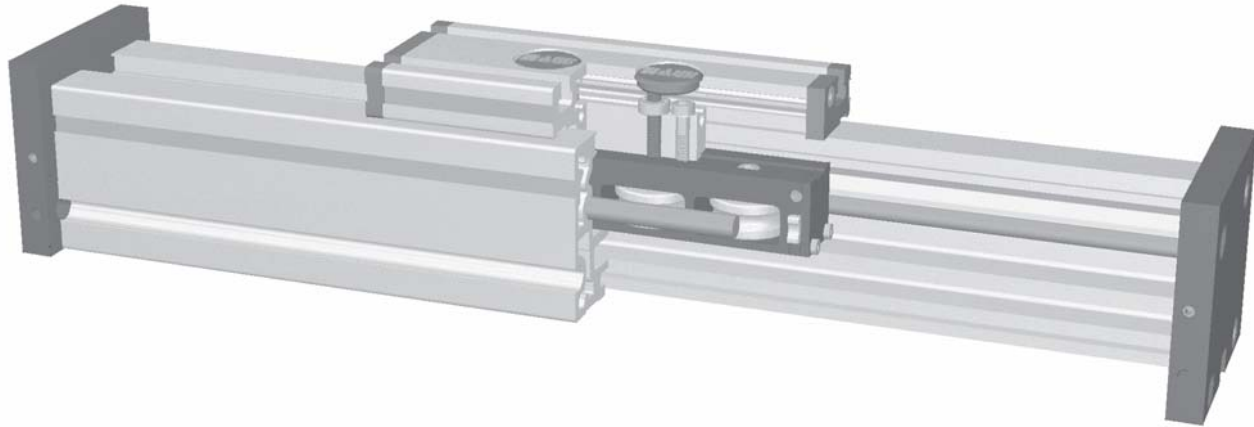
Sample ordering code:  
 QLSZ80, standard body profile, standard carriage, coupling claw on one side, 1300 mm stroke



# Positioning system QLR 60, 80, 100

Specifications

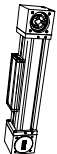
## Roller guide



5.1

### Function:

This unit consists of a square aluminium profile with an integrated roller guide. The carriage which has internal linear ball bearings that can be adjusted free of play moves along the guide body. This roller guide can be driven by a pneumatic cylinder or other additional drives or it serves as a load carrying slide unit.



### Fitting position:

As required. Max. length 6.000 mm without joints.

### Carriage mounting:

By T-slots.

### Unit mounting:

By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

### Carriage support:

In the standard version, the carriage runs on 4 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

Forces and torques	Size		60		80		100	
	Forces/torques		static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)	-	-	-	-	-	-	-	-
$F_y$ (N)	600	500	1600	1240	1900	1500		
$F_z$ (N)	900	650	1500	1200	2100	1700		
$M_x$ (Nm)	15	10	50	40	85	60		
$M_y$ (Nm)	60	50	100	80	140	110		
$M_z$ (Nm)	40	30	75	60	110	90		
<b>All forces and torques related to the following:</b>								
existing values			$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
values of table								
<b>Speed</b>								
(m/sec) max			4		6			
<b>Geometrical moments of inertia of aluminium profile</b>								
$I_x$ mm <sup>4</sup>			4,3x10 <sup>5</sup>		16,5x10 <sup>5</sup>		43,0x10 <sup>5</sup>	
$I_y$ mm <sup>4</sup>			4,8x10 <sup>5</sup>		18,7x10 <sup>5</sup>		48,8x10 <sup>5</sup>	
Elastic modulus N/mm <sup>2</sup>			70000		70000		70000	

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

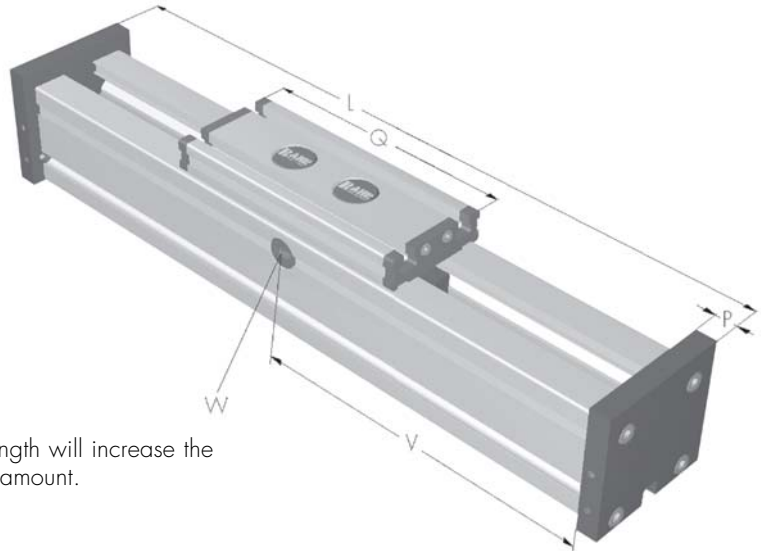
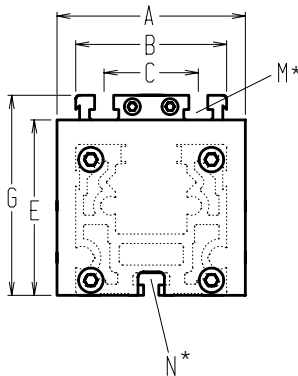
### Formula: QLR

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

$f$  = 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 QLR 60, 80, 100

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

$$V = Q + 100 \text{ mm}$$

W = servicing position

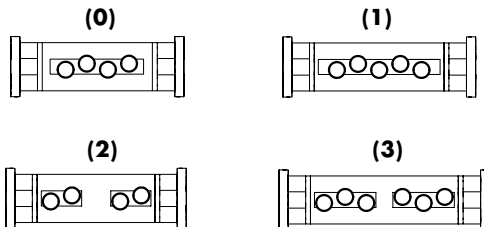
Size	Basic length L	A	B	C	E	G	N for	M for	P	Q	Basic weight	Weight per 100 mm
QLR 60	180	80	60	36	60	79	M 5	M 6	12	152	1,45 kg	0,36 kg
QLR 80	240	100	80	50	93	106	M 6	M 8	17	196	4,2 kg	0,75 kg
QLR 100	310	130	100	66	110	129	M 10	M 10	20	260	7,2 kg	1,42 kg

5.1

**Choice of body profile:**

**0** (0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

**Choice of carriages:**



Size	Version 0		Version 1		Version 2		Version 3	
	Q	L	Q	L	Q	L	Q	L
60	152	180	192	220	>232	>260	>232	>260
80	196	240	246	290	>296	>340	>296	>340
100	260	310	320	370	>388	>430	>388	>430

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

For additional accessories refer to chapter 2.2 – 4.2

QLR 80 0 0 0 0 0 0 0 0 0 1500

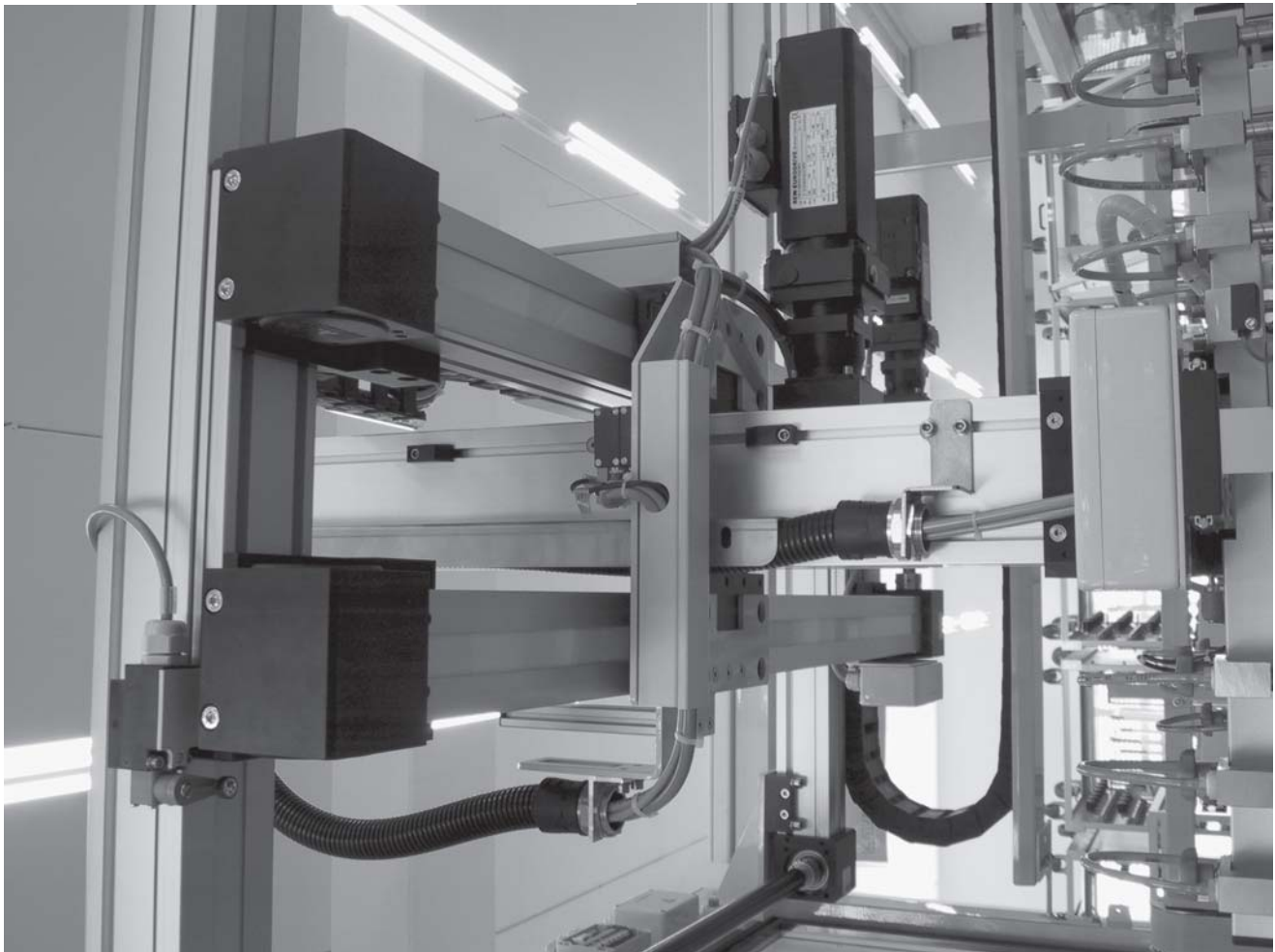
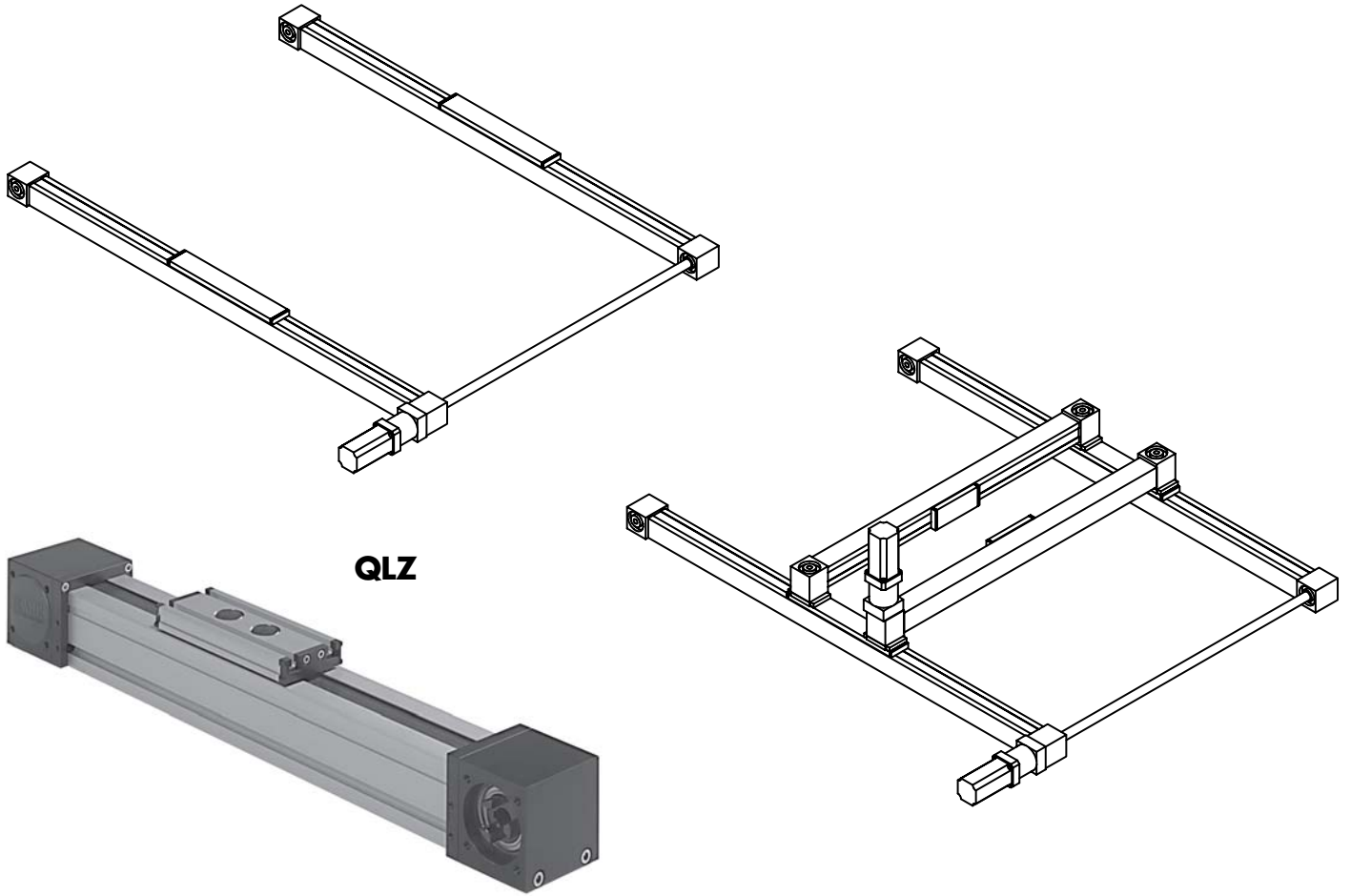
Sample ordering code:  
QLR80 with standard body profile, standard carriage and 1260 mm stroke

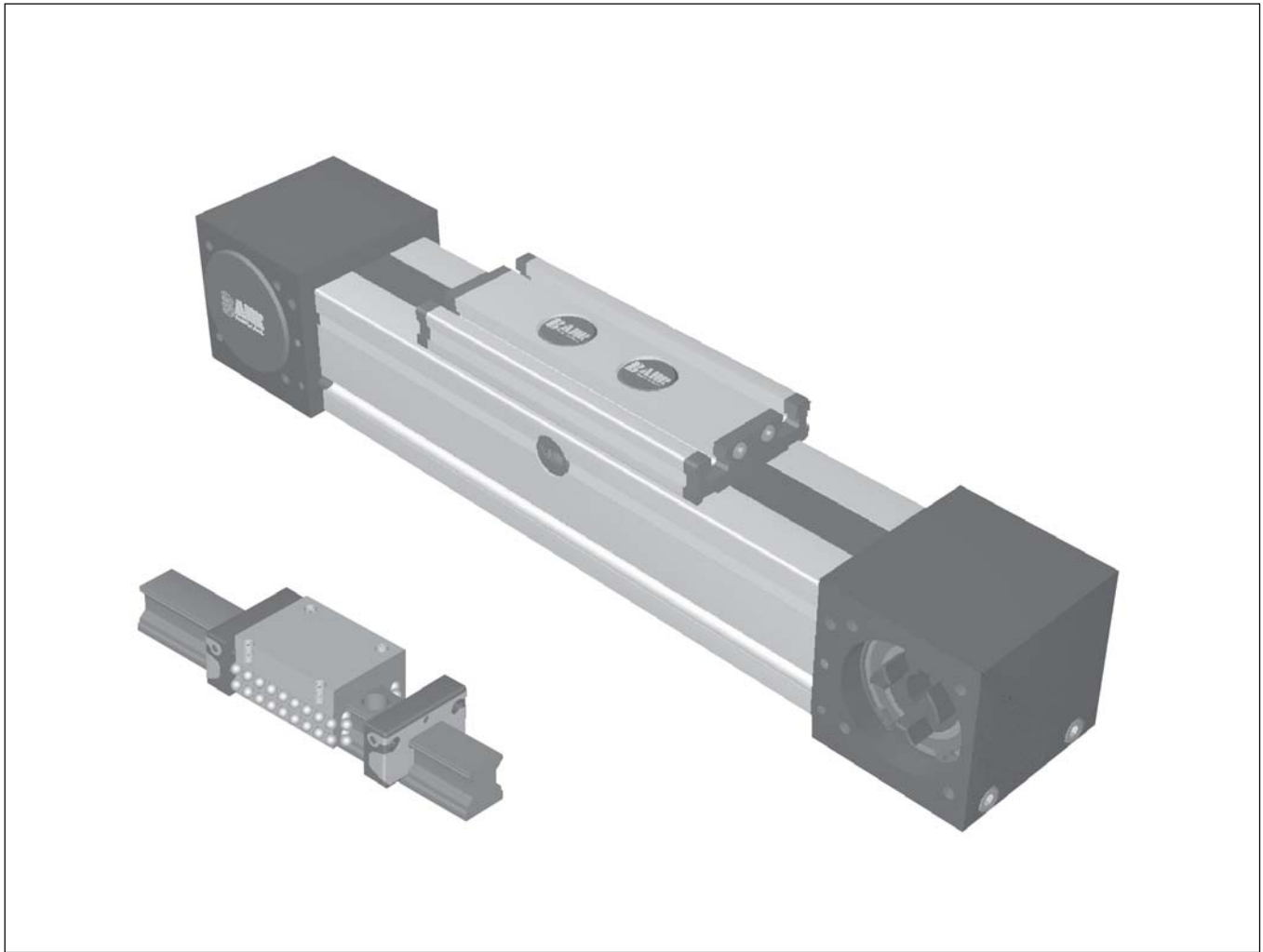


# Possible mounting styles

QL drives

5.1





6.1

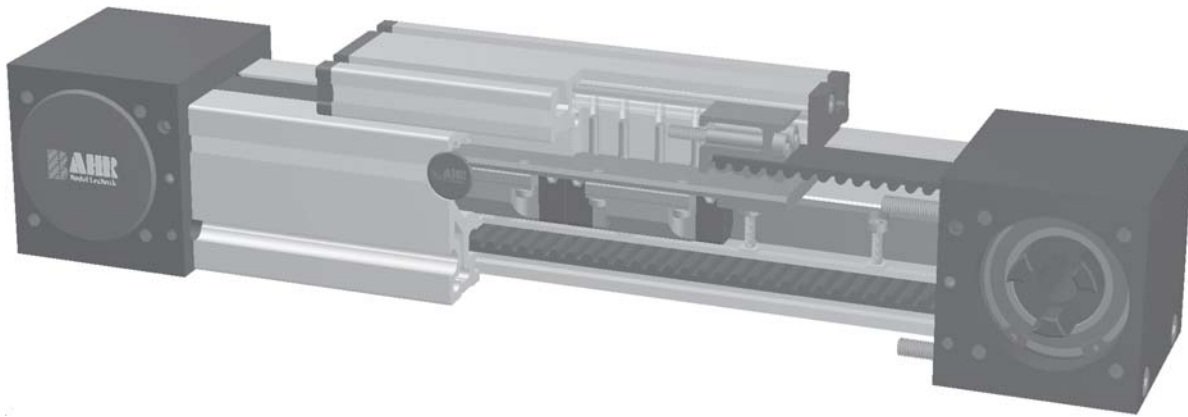


# Rail guide positioning systems QS

# Positioning system QSZ 60, 80, 100

Specifications

## Belt drive



### Function:

This unit consists of a square aluminium profile with an integrated ball rail. The carriage is moved by a belt drive. Each standard pulley includes one coupling claw on one side. 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.

6.1

### Fitting position:

As required. Max. length 6.000 mm without joints.

### Carriage mounting:

By T-slots.

### Unit mounting:

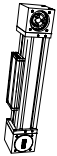
By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

### Belt performance:

HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

### Carriage support:

In the standard version, the carriage runs on two runner blocks which can be adjusted and serviced at a central servicing position. For longer carriages the number of runner blocks can be increased.



Forces and torques	Size	60		80		100	
	permitted dyn. Forces*	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km
$F_x$ (N)		894	800	1900	1800	4000	3800
$F_y$ (N)		1410	990	3570	2550	4080	2900
$F_z$ (N)		3520	2500	8500	6050	10300	7270
$M_x$ (Nm)		33	23	107	75	142	101
$M_y$ (Nm)		104	73	310	222	439	311
$M_z$ (Nm)		100	70	296	210	412	292
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$							
values of table							
<b>No-load torque</b>							
	Nm	1,0		1,4		1,8	
<b>Speed</b>							
	(m/sec) max	5		5		5	
<b>Tensile force</b>							
	permanent (N)	900		1900		4000	
	0,2 sec (N)	1000		2090		4300	
<b>Geometrical moments of inertia of aluminium profile</b>							
	$I_x$ mm <sup>4</sup>	4,3x10 <sup>5</sup>		16,5x10 <sup>5</sup>		43,0x10 <sup>5</sup>	
	$I_y$ mm <sup>4</sup>	4,8x10 <sup>5</sup>		18,7x10 <sup>5</sup>		48,8x10 <sup>5</sup>	
	Elastic modulus N/mm <sup>2</sup>	70000		70000		70000	

\* referred to life-time

### Formula: QSZ

Driving torque:

$$M_o = \frac{F \cdot p \cdot S}{2000 \cdot \pi} + M_{leer}$$

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

F = force (N)  
 P = pulley action perimeter (mm)  
 S = 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)

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>)

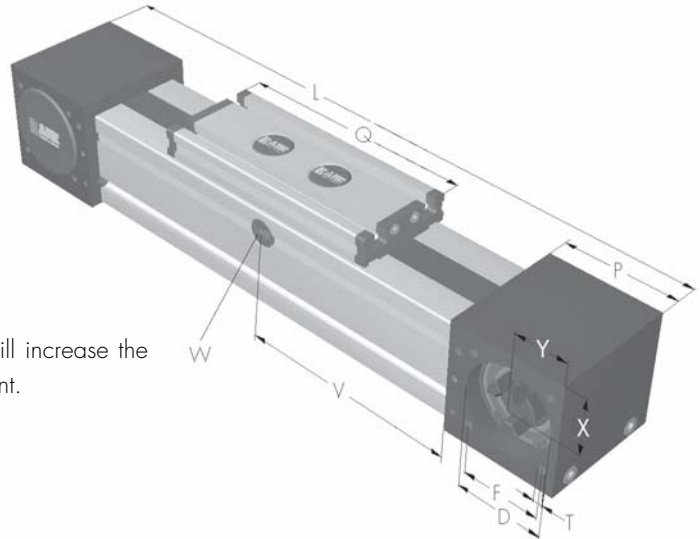
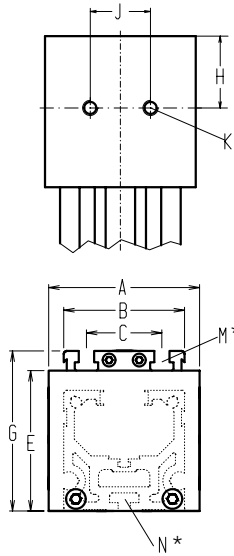
Nominal lifetime:

$$L = \left( \frac{C}{F} \right)^3 \times 10^5$$

L = Lifetime in meter  
 C = Dynamic load factor (N)  
 F = Middle load (N)

# Positioning system QSZ 60, 80, 100

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  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size	Basic length L	A	B	C	D	E	F	G	H	J	K	N for	M for	P	Q	T	X	Y	Basic weight	Weight per 100 mm
QSZ 60	300	80	60	36	47	63	42	79	29,5	30	M 8	M 5	M 6	59	177	M 6	27	26	3,5 kg	0,53 kg
QSZ 80	430	100	80	50	68	93	60	106	47,5	40	M 10	M 6	M 8	90	232	M 8	45	40	10,4 kg	1,02 kg
QSZ 100	510	130	100	66	90	110	80	129	55	50	M 12	M 10	M 10	110	268	M 10	49	50	15,9 kg	1,77 kg

6.1



### Choice of guide body profile:

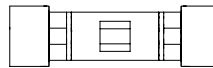
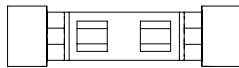
(0) Standard  (1) stainless screws

### Choice of carriages:

(0)

(0)

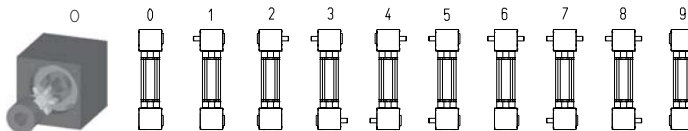
(1)



Size	Version 0		Version 1	
	Q	L	Q	L
60	177	300	152	280
80	232	430	196	390
100	268	510	260	500

### Coupling - Selection of shaft mounting:

(0)



Size	Shaft $\varnothing$ h6 x length	Key
60	14 x 35	5x5x28
80	18 x 45	6x6x40
100	22 x 45	6x6x40

9 is as 0, but with coupling claws on both sides. The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings.

### Belt table

Code No.	Size	Belt	Pulley	
			mm/rev.	Number of teeth
0 3	60	5M25	130	26
0 4	80	8M30	176	22
0 7	100	8M50	224	28

Basic length + stroke = total length

QSZ 80 1 0 0 0 0 4 1 01500  
Pos. 1 2 3 4 5 6 7

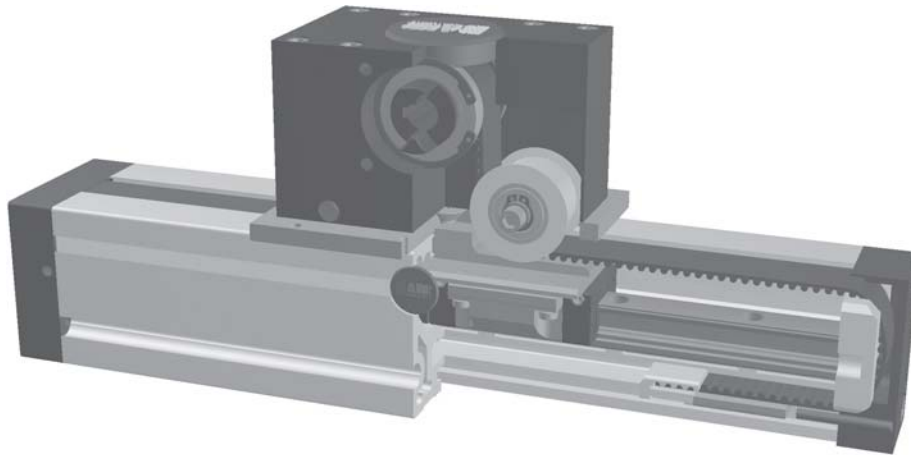
Sample ordering code:

QSZ80 with standard body profile, standard carriage, coupling claw on one side, 1070 mm stroke

For additional accessories refer to chapter 2.2 – 4.2

# Positioning system QSSZ 60, 80, 100

## Belt drive



### Function:

This linear unit consists of a square aluminium profile with integrated rail guidance. The carriage which has runner blocks is driven by a timing belt. Each standard pulley includes a coupling claw on one side and is equipped with 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 3.000 mm without joints.

### Carriage mounting:

By T-slots.

### Unit mounting:

By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

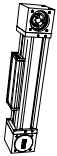
### Belt performance:

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

### Carriage support:

In the standard version, the carriage runs on 4 runner blocks which can be serviced at a central servicing position. For longer carriages the number of runner blocks can be increased.

6.1



Forces and torques	Size	60		80		100	
	permitted dyn. Forces*	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km
$F_x$ (N)		390	350	894	800	1900	1800
$F_y$ (N)		1410	990	3570	2550	4080	2900
$F_z$ (N)		3520	2500	8500	6050	10300	7270
$M_x$ (Nm)		33	23	107	75	142	101
$M_y$ (Nm)		104	73	310	222	439	311
$M_z$ (Nm)		100	70	296	210	412	292
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$							
values of table							
<b>No-load torque</b>							
Nm		1,0		1,4		1,8	
<b>Speed</b>							
(m/sec) max		5		5		5	
<b>Tensile force</b>							
permanent (N)		390		900		1900	
0,2 sec (N)		480		1000		2090	
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>		4,3x10 <sup>5</sup>		16,5x10 <sup>5</sup>		43,0x10 <sup>5</sup>	
$I_y$ mm <sup>4</sup>		4,8x10 <sup>5</sup>		18,7x10 <sup>5</sup>		48,8x10 <sup>5</sup>	
Elastic modulus N/mm <sup>2</sup>		70000		70000		70000	

\* referred to life-time

### Formula: QSSZ

Driving torque:

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

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = 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)

Deflection:

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

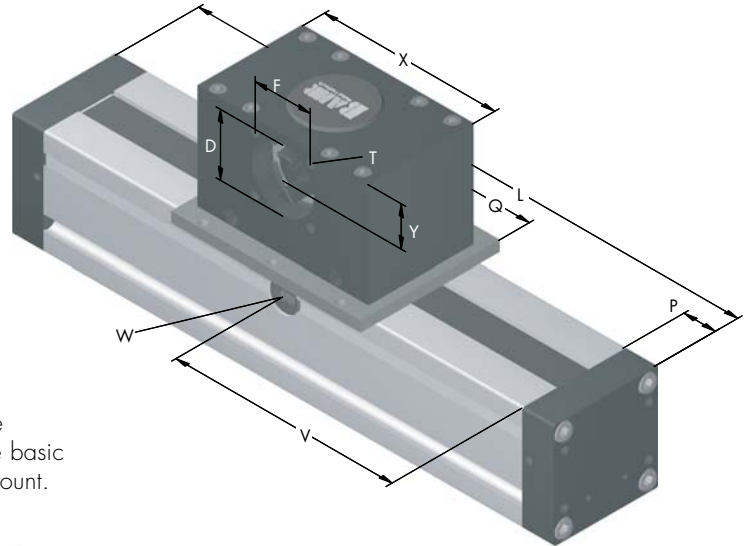
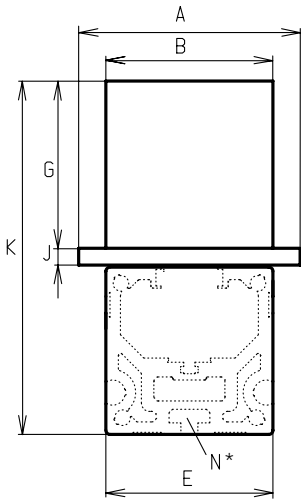
- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm<sup>2</sup>)
- I = second moment of area (mm<sup>4</sup>)

Nominal lifetime:

$$L = \left( \frac{C}{F} \right)^3 \times 10^5$$

- L = Lifetime in meter
- C = Dynamic load factor (N)
- F = Middle load (N)

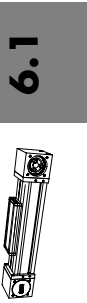
# Positioning system QSSZ 60, 80, 100



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

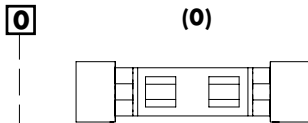
\*For slide-nuts refer to chapter 2.2 page 2       $V = Q + 100 \text{ mm}$        $W = \text{servicing position}$

Size	Basic length L	A	B	D	E	F	G	J	K	N for	P	Q	T	X	Y	Basic weight	Weight per 100 mm
QSSZ 60																	
QSSZ 80	200	106	80	47	80	42	80	8	169	M 6	24	144	M 6	130	30	5,7 kg	1,02 kg
QSSZ 100																	

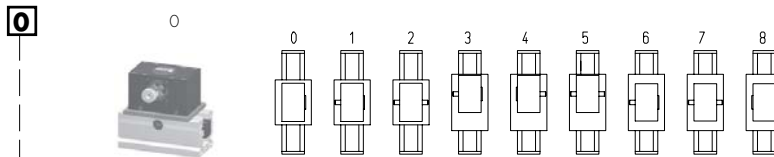


**Choice of guide body profile:**  
 (0) Standard  (1) stainless screws

**Choice of carriages:**



**Coupling - Selection of shaft mounting:**



Size	Shaft ø h6 x length	Key
60		
80	14 x 35	5x5x28
100		

8 is as 0, but with coupling claws on both sides. The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings.

**Belt table**

Code No.	Size	Belt	Pulley	
			mm/rev.	Number of teeth
0 7	80	5M25	130	26

Basic length + stroke = total length

QSSZ 80 1 0 0 0 0 7 1 01500  
 Pos. 1 2 3 4 5 6 7

For additional accessories refer to chapter 2.2 – 4.2

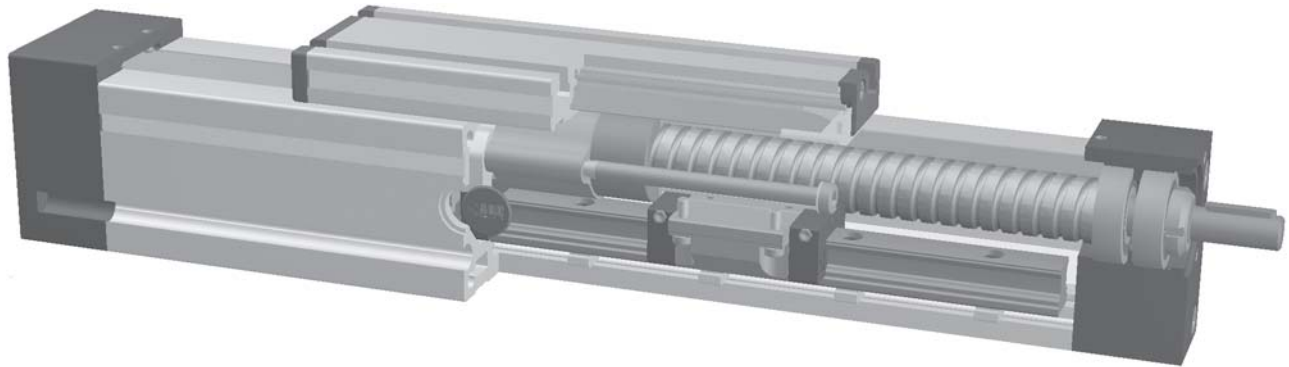
Sample ordering code:  
 QSSZ80, standard body profile, standard carriage, coupling claw on one side, 1300 mm stroke



# Positioning system QST/K 60, 80, 100

Specifications

## Spindel drives



6.1

### Function:

This unit consists of a square aluminium profile with an integrated ball rail. The carriage is driven by means of a rotating spindle with leading nut. The openings of the guide body are sealed by a stainless steel cover band to protect the drive from splash water and dust.

### Fitting position:

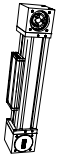
As required, max. length 3000mm

### Carriage connection:

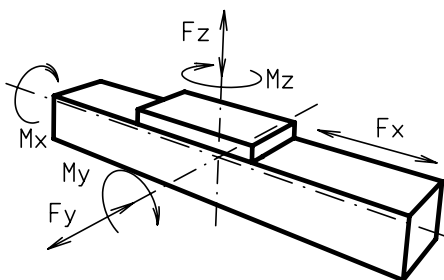
By T-slots

### Unit mounting:

By half round slots and tapped holes in the bearing blocks, mounting sets



Forces and torques	Size	QST/K 60		QST/K 80		QST/K 100	
	permitted dyn. Forces*	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km
$F_x$ (N)	900	800	2500	2000	5000	4000	
$F_y$ (N)	1415	1010	3570	2542	4082	2910	
$F_z$ (N)	3525	2510	8500	6050	10300	7360	
$M_x$ (Nm)	33	23	107	76	142	101	
$M_y$ (Nm)	190	143	604	430	838	597	
$M_z$ (Nm)	176	125	550	392	745	532	
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y,dyn}} + \frac{F_z}{F_{z,dyn}} + \frac{M_x}{M_{x,dyn}} + \frac{M_y}{M_{y,dyn}} + \frac{M_z}{M_{z,dyn}} \leq 1$							
<b>No-load torque</b>							
Trapezoidal	18x4/18x8	24x5/24x10		32x6/32x12			
Nm	0,6/0,7	0,6/0,8		1,5/1,7			
Ballscrew	16x5/16x10	25x5/20x20/25x10		32x5/32x10			
Nm	0,4/0,6	0,4/0,7/0,6		1,3/1,6			
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>	$4,3 \times 10^5$	$14,0 \times 10^5$		$43,0 \times 10^5$			
$I_y$ mm <sup>4</sup>	$4,8 \times 10^5$	$16,6 \times 10^5$		$48,8 \times 10^5$			
E-Modulus N/mm <sup>2</sup>	70000	70000		70000			



\* referred to life-time

### Formula: QST/K

Driving torque:

$$M_o = \frac{F \cdot p \cdot S_f}{2000 \cdot \pi \cdot \mu} + M_{leer}$$

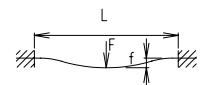
$$P_o = \frac{M_o \cdot n}{9550}$$

- F = force (N)
- P = thread pitch (mm)
- S<sub>f</sub> = safety factor 1,2 ... 2
- M<sub>leer</sub> = no-load torque (Nm)
- n = rpm of screw (min<sup>-1</sup>)
- M<sub>o</sub> = driving torque (Nm)
- μ = screw efficiency
- P<sub>o</sub> = motor power (KW)

Efficiency of lead screws:

- All ballscrew 0.900
- Tr 18x4 0,399
- Tr 18x8 0,565
- Tr 24x5 0,384
- Tr 24x10 0,550
- Tr 32x6 0,360
- Tr 32x12 0,524

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



- 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>)

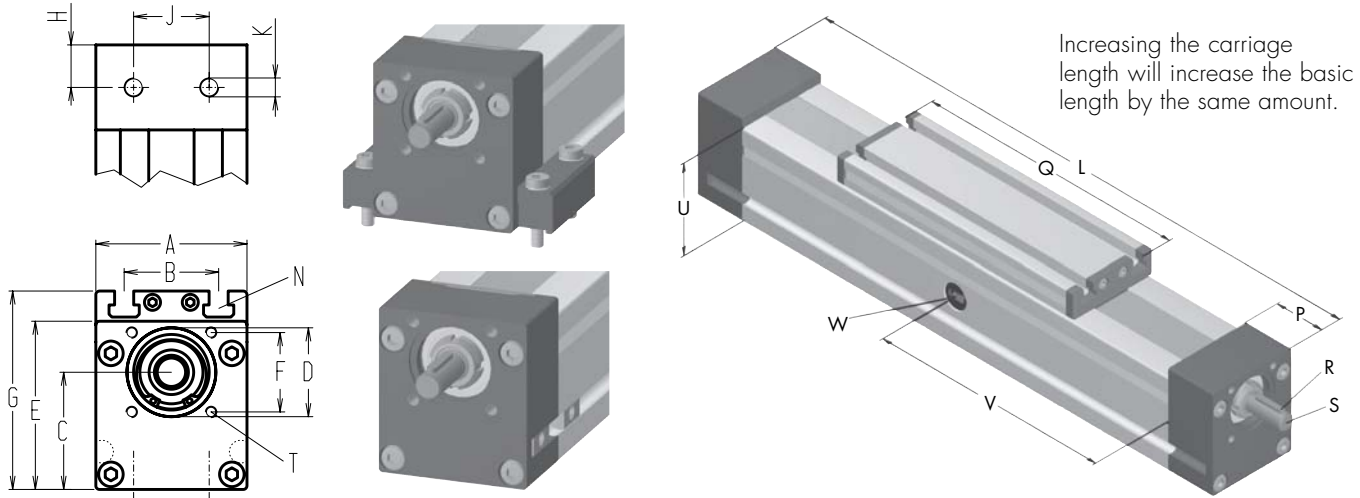
The diagram for critical speeds of lead screws refer to chapter 5.2 page 3

6.1 / 6



# Positioning system QST/K 60, 80, 100

Dimensions (mm)



\*For slide-nuts refer to main catalog chapter 2.2 page 2  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	Basic length L	A	B	C	D Ø	E	F □	G	H	J	K for	M for	P	Q	Shaft		T for	U	Basic weight	Weight per 100 mm
															R Key	S Ø x length				
QST/K 60	270	60	36	45	37	67	32	79	19	18	M6	M6	38	188	3x3x25	10h6x27	M5	60	4,1 kg	0,5 kg
QST/K 80	350	80	50	62	47	89	42	106	22,5	40	M10	M8	45	250	5x5x28	14h6x35	M6	80	7,5 kg	0,9 kg
QST/K 100	410	100	66	75	68	112	60	129	28,5	50	M10	M10	57	288	6x6x40	22h6x45	M8	100	14,8 kg	1,3 kg



6.1

**[K] Spindle:**  
(T) Trapezoidal thread (K) Ballscrew

**[1] Selection of screw:**  
(1) right hand (Standard) (2) left hand (Ballscrew by inquiry)

**[0] Choice of carriage**  
(0) (1)

Size	Carriage version 1	
	Q	Basic length L
60	255	350
80	336	436
100	383	510

**[0] Choice of journal:**  
(0) one shaft (locating bearing side) (1) one shaft (non-locating bearing side) (2) shaft on both sides

**[0] Selection of screw:**

Size	Standard trapezoidal thread		Standard ballscrew		Multistart-screw ballscrew	
	(0)	(1)	(0)	(1)	(0)	(2)
60	Tr 18x4	Tr 18x8	Kg 16x5	Kg 16x10	Kg 16x10	Kg 16x16
80	Tr 24x5	Tr 24x10	Kg 25x5	Kg 20x20	Kg 25x10	Kg 25x10
100	Tr 32x6	Tr 32x12	Kg 32x5	Kg 32x10	Kg 32x10	Kg 32x32 *

\* Basic- and Carriagelength (L and Q) increase over 47 mm

**[0] Ballscrew pitch accuracy:**  
(0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**[0] End play of ball nut:**  
(0) 0,04 mm (Standard) (1)\* < 0,02 mm (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

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

**QS K 80 1 0 0 0 0 0 0 0 1500**

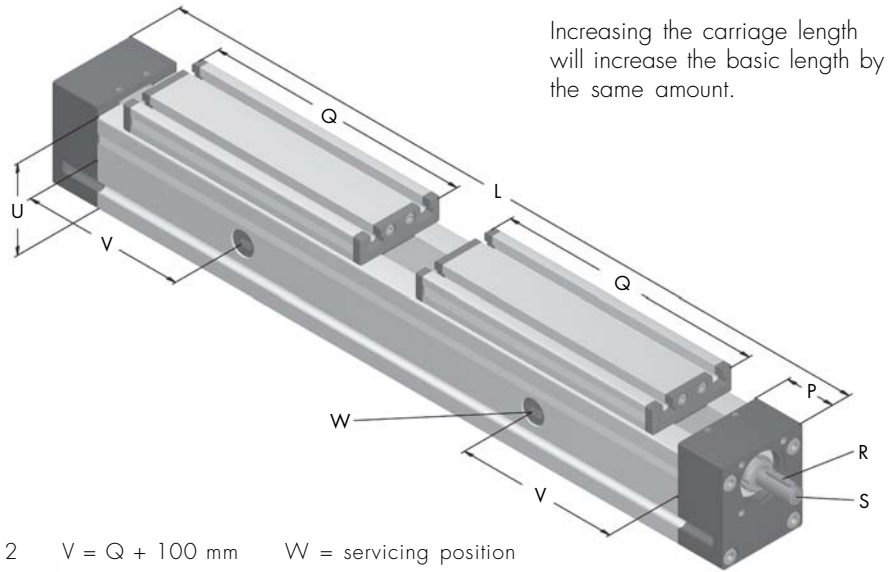
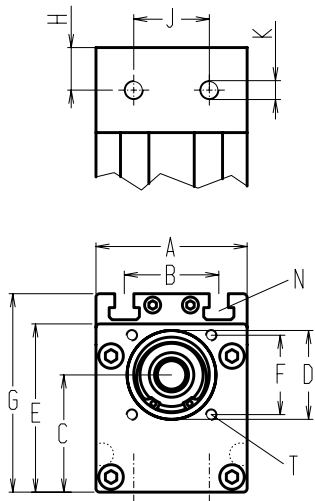
Pos. 1 2 3 4 5 6 7

Sample ordering code:  
QSK80, ballscrew right hand thread, standard carriage, one shaft (locating bearing side), spindle 25x5, 1150 mm stroke.



# Positioning system QST/K 60, 80, 100

Dimensions (mm)

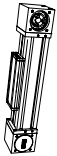


Increasing the carriage length will increase the basic length by the same amount.

\*For slide-nuts refer to main catalog chapter 2.2 page 2     $V = Q + 100 \text{ mm}$      $W = \text{servicing position}$

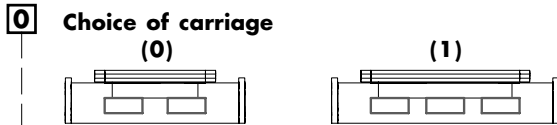
Size	Basic length L selection of screw		A	B	C	D ∅	E	F □	G	H	J	K for	M for	P	Q	Shaft		T for	U	Basic weight	Weight per 100 mm
	3	4														R Key	S ∅ x length				
QST/K 60	460	500	60	36	45	37	67	32	79	19	18	M6	M6	38	188	3x3x25	10h6x27	M5	60	5,4 kg	0,5 kg
QST/K 80	600	640	80	50	62	47	89	42	106	22,5	40	M10	M8	45	250	5x5x28	14h6x35	M6	80	9,8 kg	0,9 kg
QST/K 100	700	740	100	66	75	68	112	60	129	28,5	50	M10	M10	57	288	6x6x40	22h6x45	M8	100	18,6 kg	1,3 kg

6.1



**[K] Spindle:**  
(T) Trapezoidal thread (K) Ballscrew

**[3] Selection of screw:**  
(3) right - left hand (4) divided spindle



**[0] Choice of journal:**  
(0) shaft right hand thread (1) shaft left hand thread (2) shaft on both sides

Selection of screw:	Size	Standard	Multistart-screw	Carriage version 1																	
				Basic length L selection of spindle																	
Ballscrew right hand	60	(0) 16x5	(1) 16x10*	(2) 16x16*	<table border="1"> <thead> <tr> <th>Size</th> <th>Q</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>60</td> <td>255</td> <td>590</td> <td>630</td> </tr> <tr> <td>80</td> <td>336</td> <td>770</td> <td>810</td> </tr> <tr> <td>100</td> <td>383</td> <td>890</td> <td>930</td> </tr> </tbody> </table>	Size	Q	3	4	60	255	590	630	80	336	770	810	100	383	890	930
	Size	Q	3	4																	
	60	255	590	630																	
80	336	770	810																		
100	383	890	930																		
80	(0) 25x5	(1) 20x20*	(2) 25x10*																		
100	(0) 32x5	(1) 32x10*	(2) 25x25																		
Ballscrew left hand	upon request																				
Trapezoidal right hand thread	60	(0) 18x4	(1) 18x8																		
	80	(0) 24x5	(1) 24x10																		
	100	(0) 32x6	(1) 32x12																		
Trapezoidal left hand thread	60	(0) 18x4	(1) 18x8																		
	80	(0) 24x5	(1) 24x10																		
	100	(0) 32x6	(1) 32x12																		

\* = only for selection of divided spindle

**[0] Ballscrew pitch accuracy:**  
(0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**[0] End play of ball nut:**  
(0) 0,04 mm (Standard) (1)\* < 0,02 mm (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

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

**QS K 80 3 0 0 0 0 0 0 0 1500**

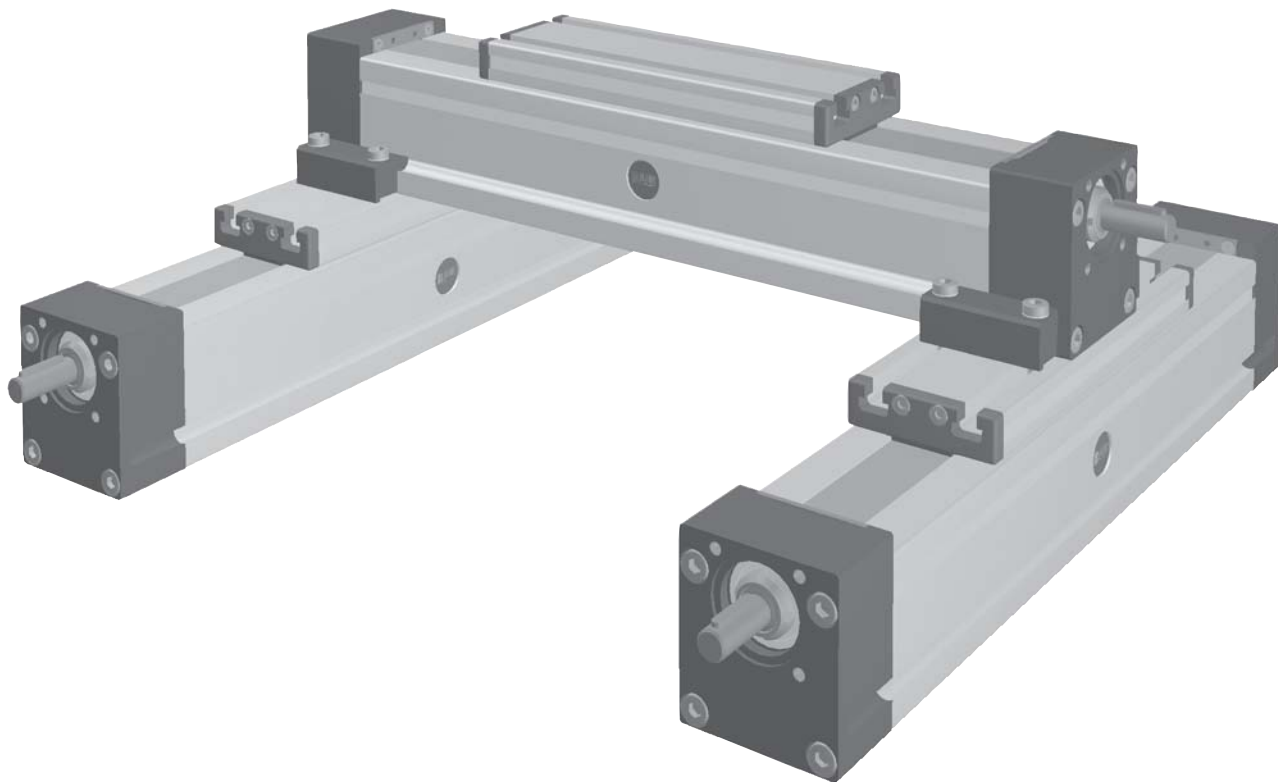
Pos. 1 2 3 4 5 6 7

Sample ordering code:

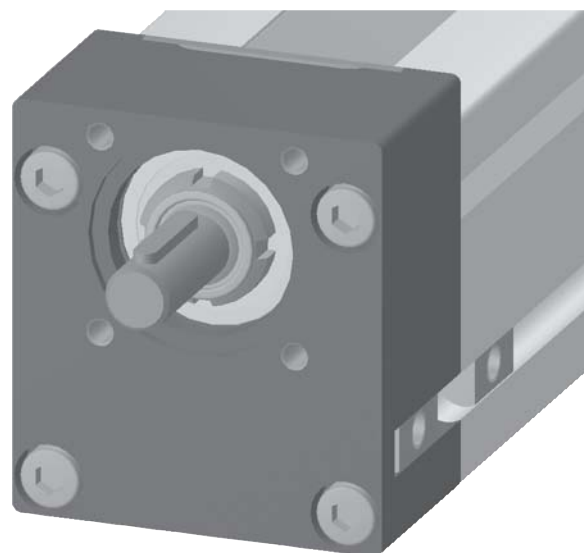
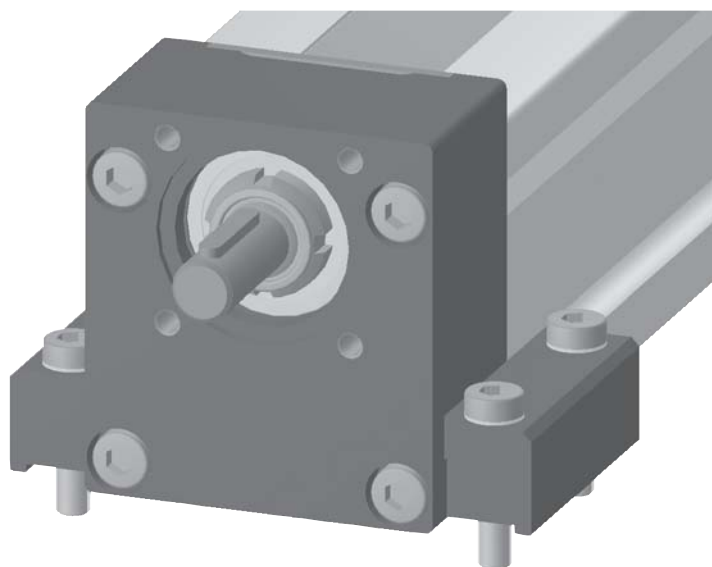
QSK80, ballscrew right - left hand thread, standard carriage, shaft on right hand thread, spindle 25x5, 860 mm stroke.



## Possible combinations and mounting styles QST/K



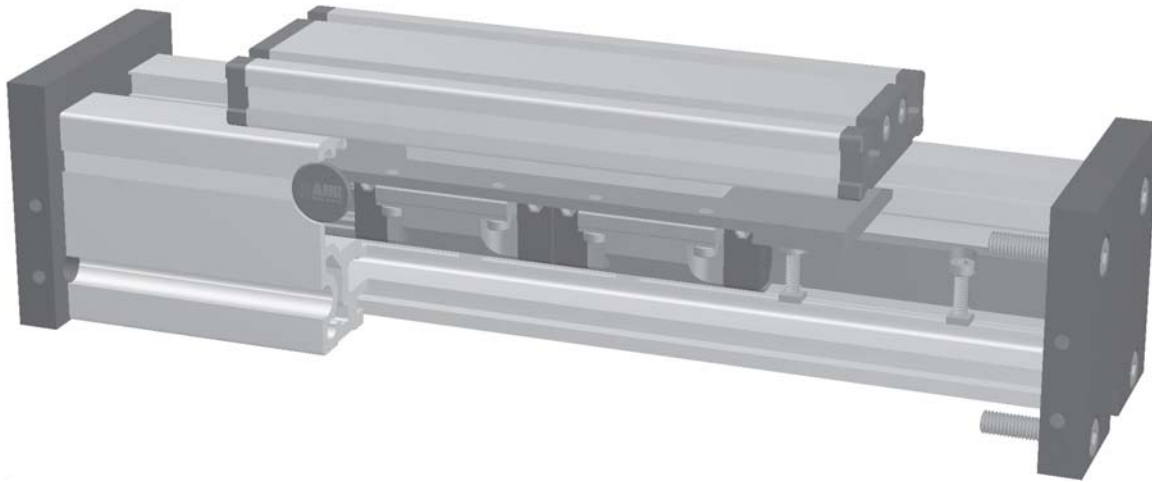
6.1



# Positioning system QSR 60, 80, 100

Specifications

## Rail guide



6.1

### Function:

This unit consists of a square aluminium profile with an integrated ball rail. This unit can be driven by a pneumatic cylinder or other additional drives or it serves as a load carrying slide unit.

### Fitting position:

As required. Max. length 6.000 mm without joints.

### Carriage mounting:

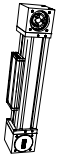
By T-slots.

### Unit mounting:

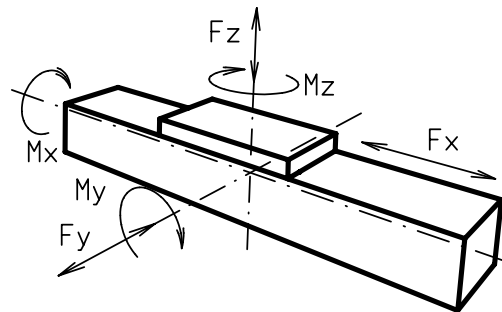
By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

### Carriage support:

In the standard version, the carriage runs on two runner blocks which can be adjusted and serviced at a central servicing position. For longer carriages the number of runner blocks can be increased.



Forces and torques	Size	60		80		100	
	permitted dyn. Forces*	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km
$F_x$ (N)	-	-	-	-	-	-	-
$F_y$ (N)	1410	990	3570	2550	4080	2900	
$F_z$ (N)	3520	2500	8500	6050	10300	7270	
$M_x$ (Nm)	33	23	107	75	142	101	
$M_y$ (Nm)	104	73	310	222	439	311	
$M_z$ (Nm)	100	70	296	210	412	292	
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$							
<b>Speed</b>							
(m/sec) max		5		5		5	
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>	4,3x10 <sup>5</sup>		16,5x10 <sup>5</sup>		43,0x10 <sup>5</sup>		
$I_y$ mm <sup>4</sup>	4,8x10 <sup>5</sup>		18,7x10 <sup>5</sup>		48,8x10 <sup>5</sup>		
Elastic modulus N/mm <sup>2</sup>	70000		70000		70000		



\* referred to life-time

### Formula: QSR

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>)

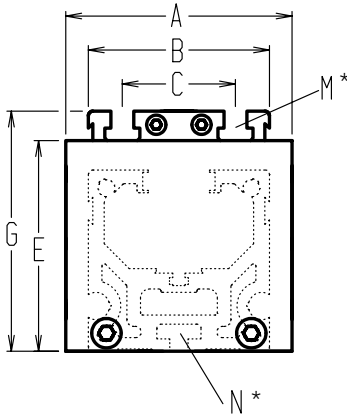
Nominal lifetime:

$$L = \left( \frac{C}{F} \right)^3 \times 10^5$$

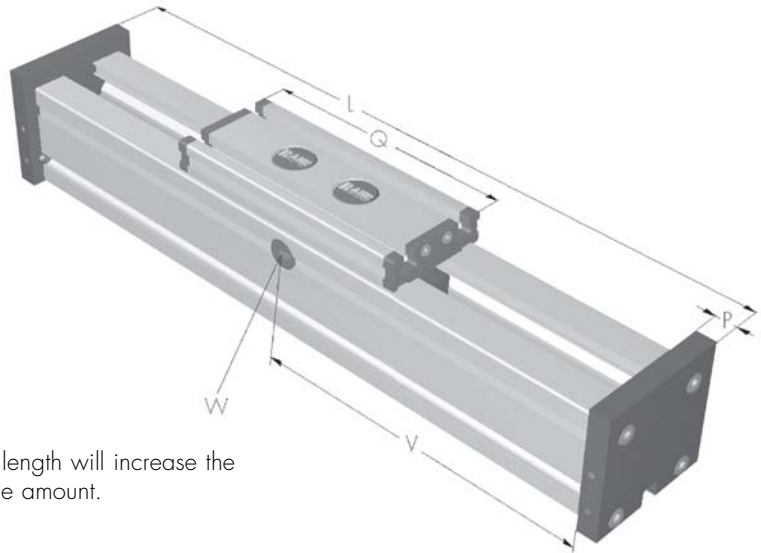
L = Lifetime in meter  
 C = Dynamic load factor (N)  
 F = Middle load (N)

# Positioning system QSR 60, 80, 100

Dimensions (mm)

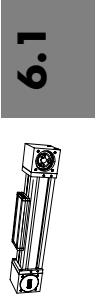


Increasing the carriage length will increase the basic length by the same amount.



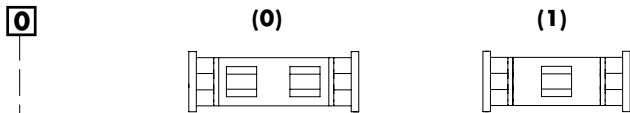
\*For slide-nuts refer to chapter 2.2 page 2       $V = Q + 100 \text{ mm}$        $W = \text{servicing position}$

Size □	Basic length L	A	B	C	E	G	N for	M for	P	Q	Basic weight	Weight per 100 mm
QSR 60	205	80	60	36	60	79	M 5	M 6	12	177	1,8 kg	0,50 kg
QSR 80	270	100	80	50	93	106	M 6	M 8	17	232	4,9 kg	0,96 kg
QSR 100	315	130	100	66	110	129	M 10	M 10	20	268	8,2 kg	1,71 kg



**Choice of guide body profile:**  
 (0) Standard  (1) stainless screws

**Choice of carriages:**



Size	Version 0		Version 1	
	Q	L	Q	L
60	177	205	152	180
80	232	270	196	240
100	268	315	260	310

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

QSR 80 0 0 0 0 0 0 0 0 0 1500  
 Pos. 1 2 3 4 5 6 7

Sample ordering code:  
 QSR80 with standard body profile, standard carriage and 1230 mm stroke

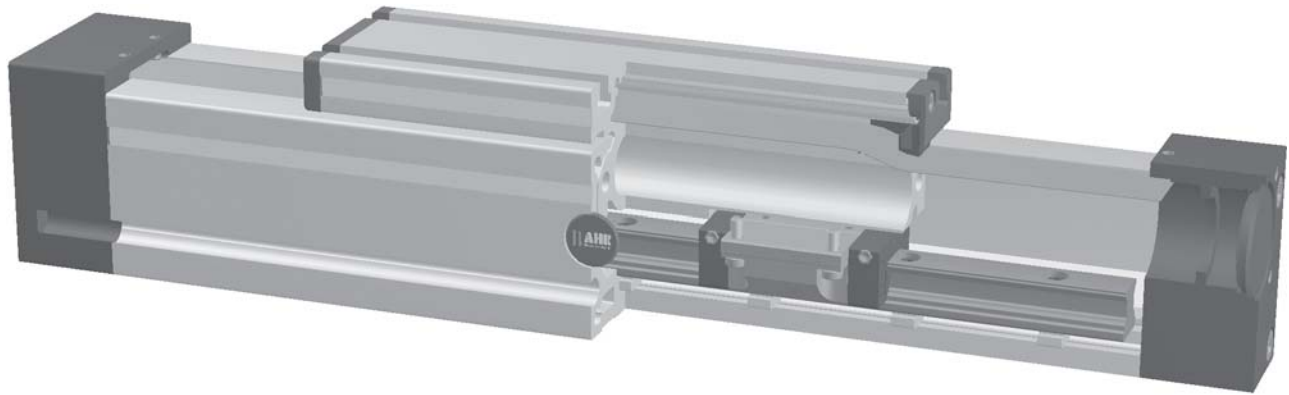
For additional accessories refer to chapter 2.2 – 4.2



# Positioning system QSSR 60, 80, 100

Specifications

## Rail guide



6.1

### Function:

This unit consists of a square aluminium profile with an integrated ball rail. The carriage is with leading nut and without drive. The openings of the guide body are covered by a stainless steel cover band to protect the system from splash water and dust.

### Fitting position:

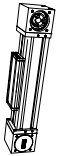
As required, max. length 6.000mm

### Carriage connection:

By T-slots

### Unit mounting:

By half round slots and tapped holes in the bearing blocks, mounting sets



Forces and torques	Size	QSSR 60		QSSR 80		QSSR 100	
	permitted dyn. Forces*	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km
	F <sub>y</sub> (N)	1415	1010	3570	2542	4082	2910
	F <sub>z</sub> (N)	3525	2510	8500	6050	10300	7360
	M <sub>x</sub> (Nm)	33	23	107	76	142	101
	M <sub>y</sub> (Nm)	190	143	604	430	838	597
	M <sub>z</sub> (Nm)	176	125	550	392	745	532
<b>All forces and torques related to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table							
<b>Geometrical moments of inertia of aluminium profile</b>							
I <sub>x</sub> mm <sup>4</sup>		4,3x10 <sup>5</sup>		14,0x10 <sup>5</sup>		43,0x10 <sup>5</sup>	
I <sub>y</sub> mm <sup>4</sup>		4,8x10 <sup>5</sup>		16,6x10 <sup>5</sup>		48,8x10 <sup>5</sup>	
E-Modulus N/mm <sup>2</sup>		70000		70000		70000	

\* referred to life-time

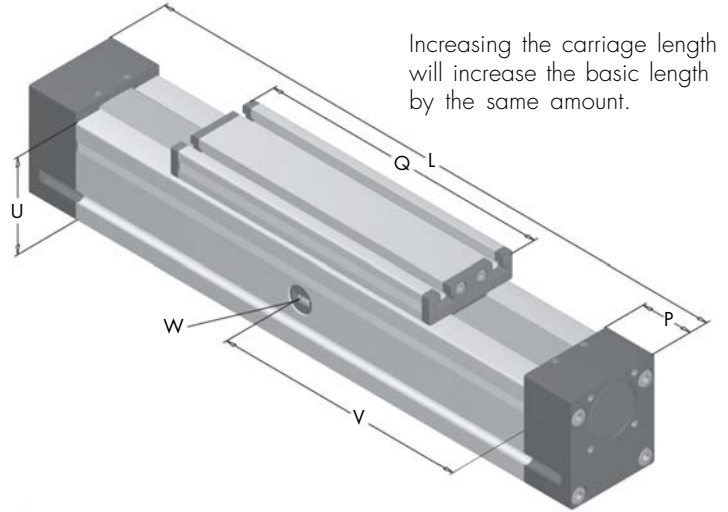
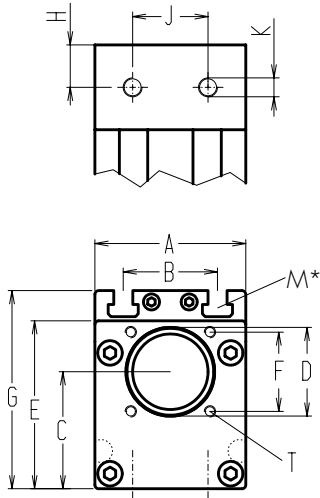
### Formula: QSSR

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

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 QSSR 60, 80, 100

Dimensions (mm)



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

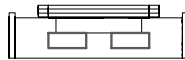
\*For slide-nuts refer to main catalogue chapter 2.2 page 2 V = Q + 100 mm W = servicing position

Size □	Basic length L	A	B	C	D Ø	E	F □	G	H	J	K for	M for	P	Q	T for	U	Basic weight	Weight per 100 mm
QSSR 60	270	60	36	45	37	67	32	79	19	18	M6	M6	38	188	M5	60	3,1 kg	0,3 kg
QSSR 80	350	80	50	62	47	89	42	106	22,5	40	M10	M8	45	250	M6	80	5,7 kg	0,8 kg
QSSR 100	410	100	66	75	68	112	60	129	28,5	50	M10	M10	57	288	M8	100	10,2 kg	1,2 kg

6.1



0 Choice of carriage (0)



(1)



Size	Carriage version 1	
	Q	Basic length L
60	255	350
80	336	436
100	383	510

1500

Basic length + stroke = total length

QSSR	80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1500
Pos.	1	2	3	4	5	6	7												

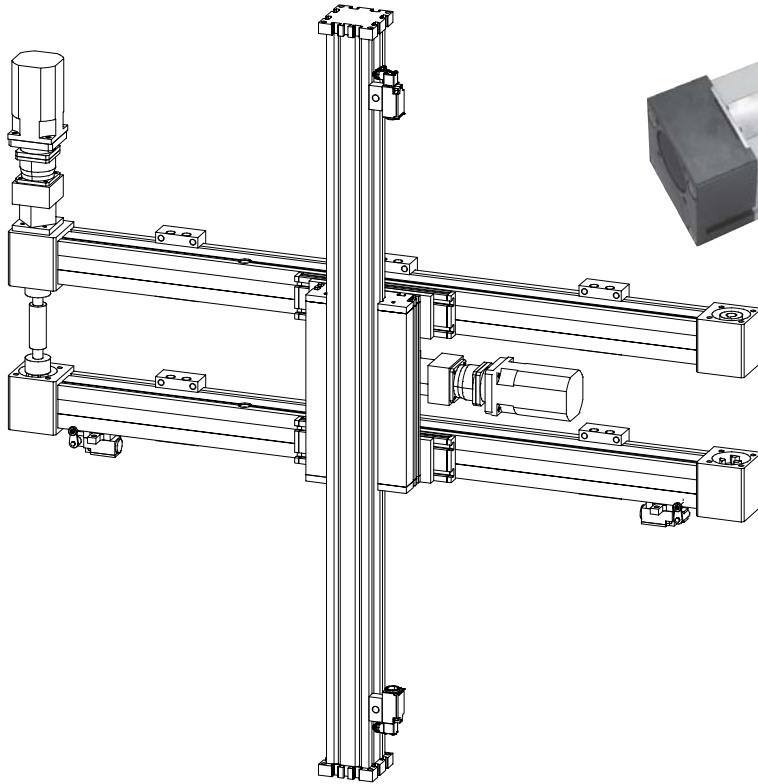
Sample ordering code:  
QSSR80, standard carriage, 1150 mm stroke.



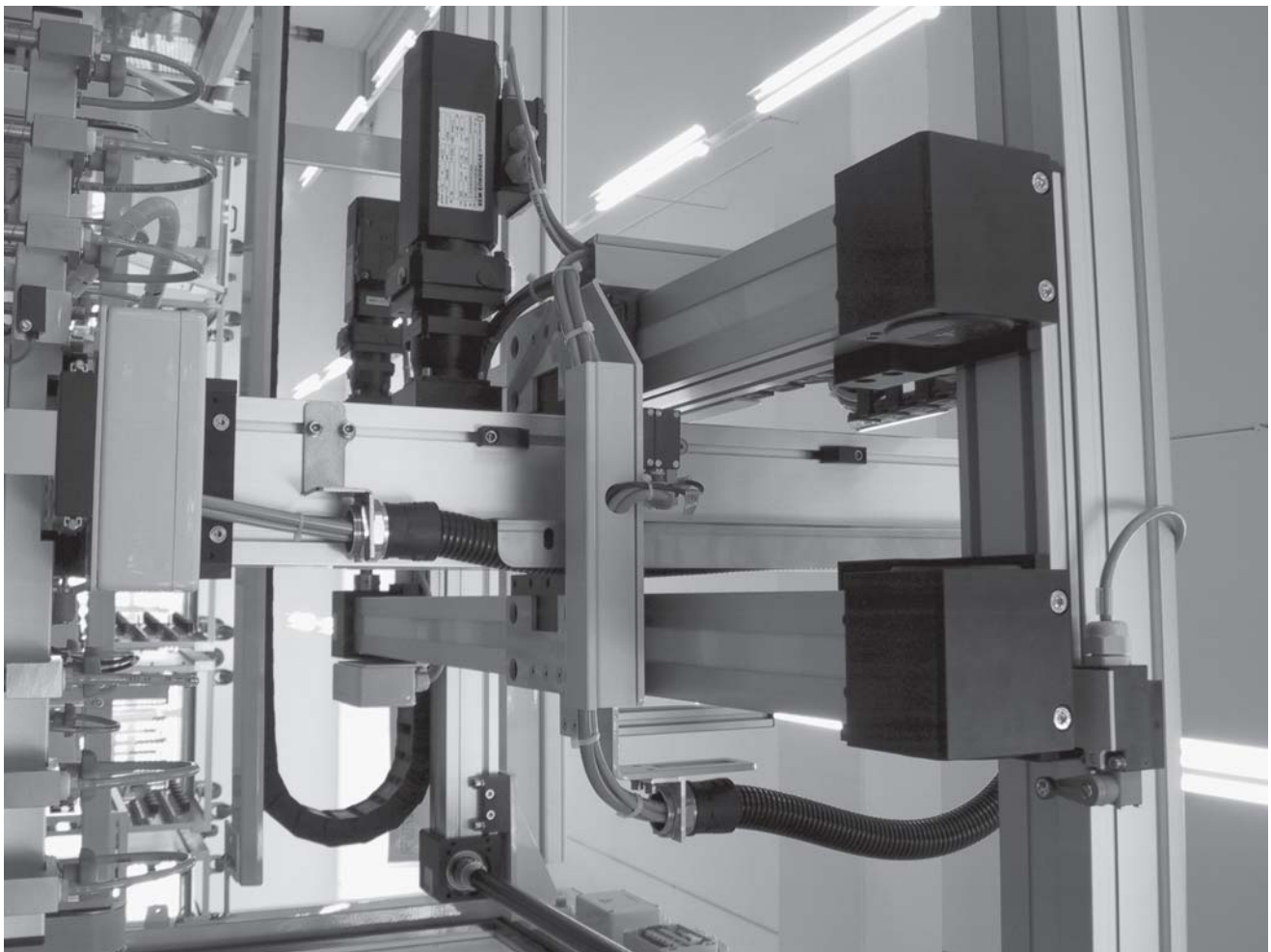
## Possible mounting styles

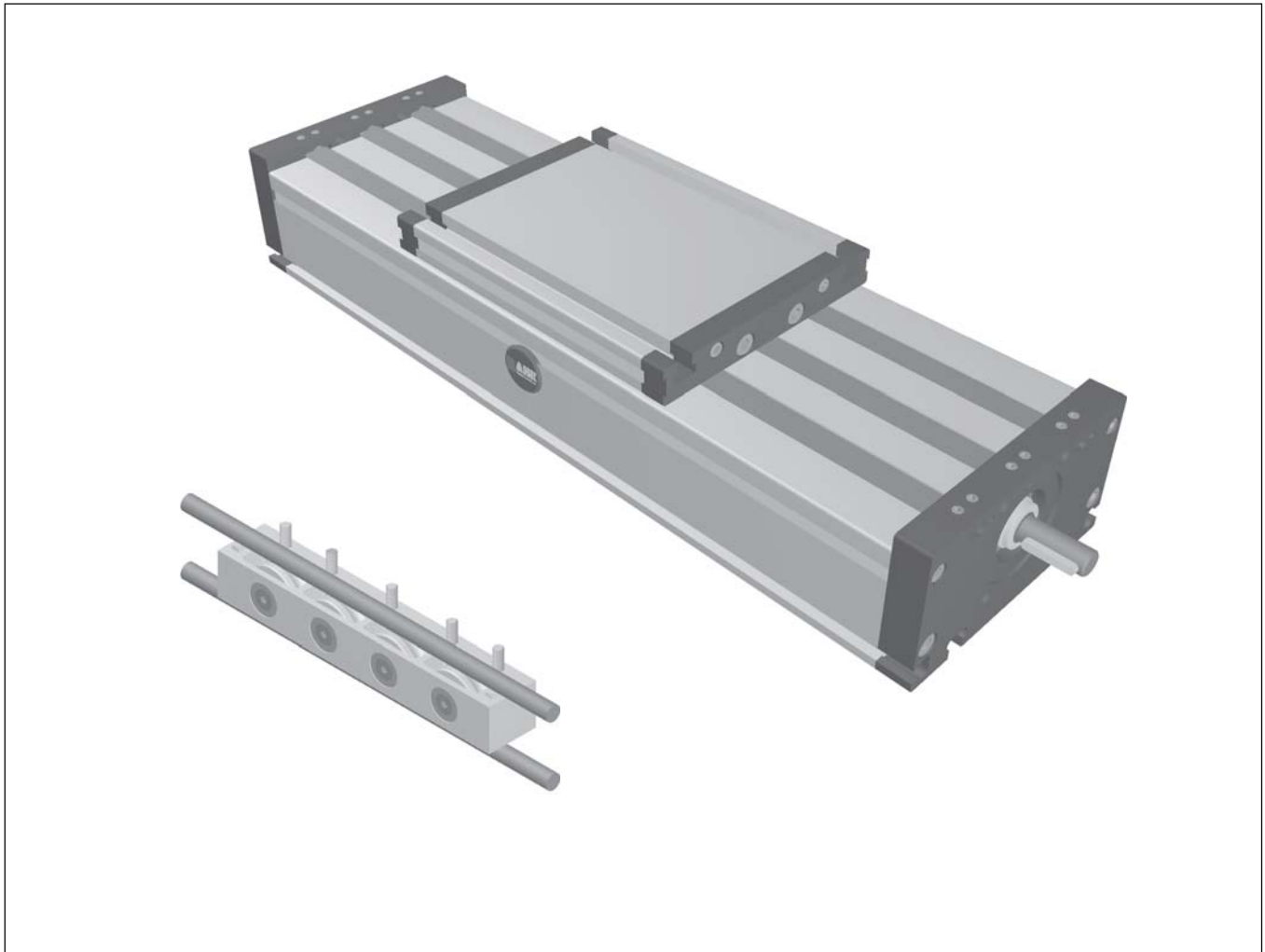
QS drives

QST/K 80



6.1





7.1

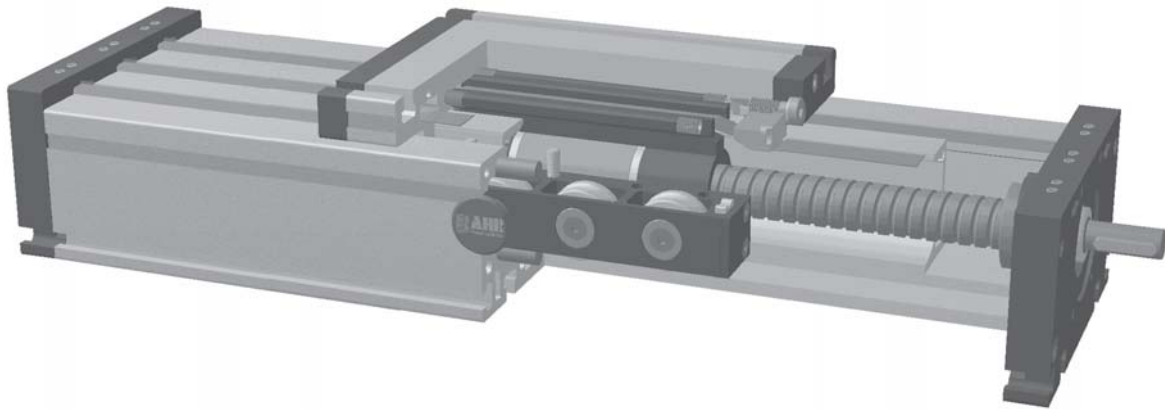


# Roller guide positioning systems DL

# Positioning system DLT/DLK 120, 160, 200

Specifications

## Spindle drives



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated roller guides. The carriage is driven by means of a rotating spindle with leading nut. Where two parallel linear units are used or where two carriages are mounted on one unit, the leading-nut receiver can be used to adjust the symmetry of the carriages. The openings of the guide body are sealed with 3 stainless steel cover bands to protect the drive from splash water and dust.

### Fitting position:

As required. Max. length 3.000 mm without joints.

### Carriage mounting:

By T-slots.

### Unit mounting:

By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

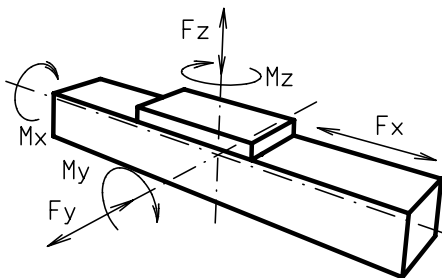
### Carriage support:

In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased. Repeatability ballscrew  $\pm 0,025$  mm, trapezoidal thread  $\pm 0,2$  mm.

7.1



Forces and torques	Size	120		160		200	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)	900	800	5000	4000	10000	8000	
$F_y$ (N)	1100	900	3000	2000	4400	3100	
$F_z$ (N)	1250	1000	3500	2800	4900	4400	
$M_x$ (Nm)	150	125	400	320	600	510	
$M_y$ (Nm)	140	120	360	300	560	480	
$M_z$ (Nm)	100	90	180	150	310	275	
<b>All forces and torques related to the following:</b>							
existing values		$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
values of table							
<b>No-load torque</b>							
Trapezoidal thread	18 x 4	18 x 8	24 x 5	24 x 10	32 x 6	32 x 12	
(Nm)	0,6	0,9	0,6	0,9	0,9	1,1	
Ballscrew	16 x 5	16 x 10	25 x 5	20 x 20	32 x 5	32 x 10	
(Nm)	0,5	0,8	0,5	0,8	0,7	0,9	
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>	6,6x10 <sup>5</sup>		22,2x10 <sup>5</sup>		63,8x10 <sup>5</sup>		
$I_y$ mm <sup>4</sup>	38,6x10 <sup>5</sup>		122,0x10 <sup>5</sup>		335,0x10 <sup>5</sup>		
Elastic modulus N/mm <sup>2</sup>	70000		70000		70000		



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

### Formula: DLT/K

Driving torque:

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

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

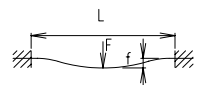
- F = force (N)
- P = thread pitch (mm)
- S = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm of screw (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $\mu$  = screw efficiency
- $P_o$  = motor power (KW)

Efficiency of lead screws:

All ballscrew 0.900

- Tr 18x4 0,399
- Tr 18x8 0,565
- Tr 24x5 0,384
- Tr 24x10 0,550
- Tr 32x6 0,360
- Tr 32x12 0,524

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



- 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>)

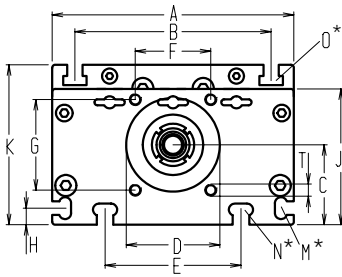
The diagram for critical speeds of lead screws refer to chapter 5.2 page 3

7.1 / 2

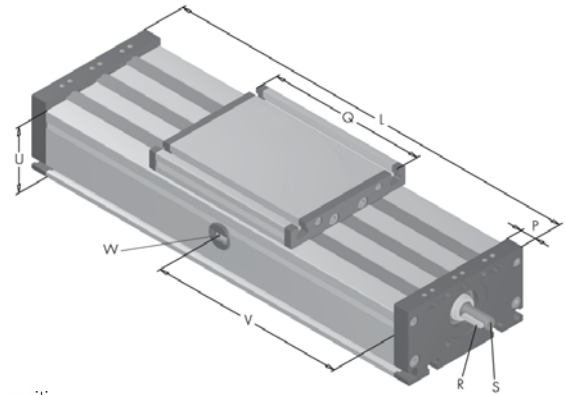


# Positioning system DLT/DLK 120, 160, 200

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  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	Basic length L	A	B	C	D	E	F	G	H	J	K	M for	N for	O for	P	Q	Shaft		T	U	Basic weight	Weight per 100 mm
																	R Key	S $\varnothing \times \text{length}$				
DL 120	200	120	96	39	47	78	42	42	10	68	79	M 5	M 6	M 6	15	156	3x3x25	10 h6 x 27	M 6	60	3,9 kg	0,92 kg
DL 160	260	160	130	53	62	90	50	60	11	90	106	M 6	M 8	M 8	20	200	5x5x28	14 h6 x 35	M 8	80	8,2 kg	1,96 kg
DL 200	320	200	160	66	68	140	60	60	15	110	129	M 8	M10	M10	20	270	6x6x40	22 h6 x 45	M 8	100	19,6 kg	2,82 kg

**Spindle:**

**T** (T) Trapezoidal thread (K) Ballscrew

**Selection of screw:**

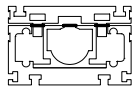
**1** (1) right hand (2) left hand (Ballscrew by inquiry)

**Choice of guide body profile:**

**0**

(0)

(3)



internal profile with cover bands



with bellows

**Stainless versions upon request.**

**Choice of carriages:**

**0**

(0)

(2)

(3)



Size	Version 0		Version 2		Version 3	
	Q	L	Q	L	Q	L
120	156	200	196	240	>236	>280
160	200	260	250	310	>300	>360
200	270	320	330	380	>410	>460

**Choice of journal:**

**0** (0) one shaft (locating bearing side) **1** one shaft (non-locating bearing side) **2** shaft on both sides

**Selection of screw:**

Ballscrew right hand	Size 120 160 200	Standard (0) 16x5 (0) 25x5 (0) 32x5	Multistart-screw (1) 16x10 (2) 16x16 (3) 20x20 (4) 25x5 (5) 25x10 (1) 20x20 (2) 25x10 (3) 25x25 (1) 32x10 (2) 32x20 (3) 32x32
Ballscrew left hand	upon request		

**0**

Trapezoidal right hand thread	120 160 200	(0) 18x4 (0) 24x5 (0) 32x6	(1) 18x8 (1) 24x10 (1) 32x12
Trapezoidal left hand thread	120 160 200	(0) 18x4 (0) 24x5 (0) 32x6	(1) 18x8 (1) 24x10 (1) 32x12

**Ballscrew pitch accuracy:**

**0** (0) 0,1 mm / 300 mm (Standard) **1** 0,05 mm / 300 mm **2** 0,025 mm / 300 mm

**End play of ball nut:**

**0** (0) 0,04 mm (Standard), **1**\* < 0,02 mm, **2**\* 2% apply prestress  
\* only in combination with **pitch accuracy (1) or (2)**

**Repeatability:**

± 0,2 mm Trapezoidal  
± 0,025 mm Ballscrew

**1500**

Basic length + stroke = total length

DL	T	160	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1500
Pos. 1 2 3 4 5 6 7																				

Sample ordering code:

DLT160, trapezoidal right hand thread, with internal profile and cover bands, standard carriage, one shaft (locating bearing side), spindle 24x5, 1240 mm stroke.



Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 - 4.2.

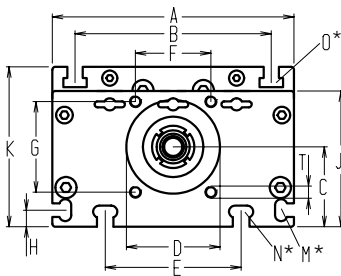
7.1



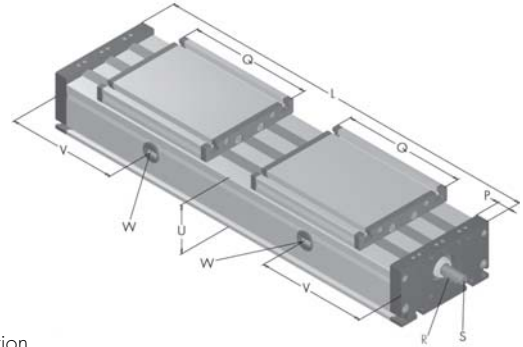
# Positioning system DLT/DLK 120, 160, 200

Dimensions (mm)

with trapezoidal thread or ballscrew, right-hand and left-hand thread or divided spindles



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



\*For slide-nuts refer to chapter 2.2 page 2  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	Basic length L	A	B	C	D	E	F	G	H	J	K	M for	N for	O for	P	Q	Shaft		T	U	Basic weight	Weight per 100 mm
																	R Key	S Ø x length				
DL 120	360	120	96	39	47	78	42	42	10	68	79	M 5	M 6	M 6	15	156	3x3x25	10 h6 x 27	M 6	60	5,1 kg	0,92 kg
DL 160	470	160	130	53	62	90	50	60	11	90	106	M 6	M 8	M 8	20	200	5x5x28	14 h6 x 35	M 8	80	12,0 kg	1,96 kg
DL 200	600	200	160	66	68	140	60	60	15	110	129	M 8	M10	M10	20	270	6x6x40	22 h6 x 45	M 8	100	27,1 kg	2,82 kg

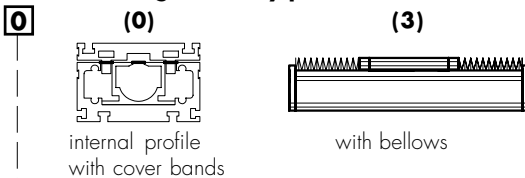
**Spindle:**

**T** (T) Trapezoidal thread (K) Ballscrew

**Selection of screw:**

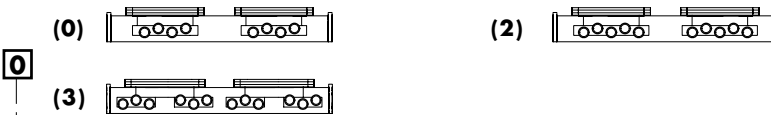
**3** (3) right - left hand (4) divided spindle

**Choice of guide body profile:**



Stainless versions upon request.

**Choice of carriages:**



Size	Version 0		Version 2		Version 3	
	Q	L	Q	L	Q	L
120	156	360	196	440	>236	>530
160	200	470	250	570	>300	>670
200	270	600	330	720	>410	>880

**Choice of journal:**

**0** (0) shaft right hand thread (1) shaft left hand thread (2) shaft on both sides

**Selection of screw:**

	Size	Standard	Multistart-screw
Ballscrew right hand	120	(0) 16x5	(1) 16x10* (2) 16x16* (3) 20x20* (4) 25x5* (5) 25x10*
	160	(0) 25x5	(1) 20x20* (2) 25x10* (3) 25x25*
	200	(0) 32x5	(1) 32x10* (2) 32x20* (3) 32x32*
Ballscrew left hand	upon request		

	Size	(0)	(1)
Trapezoidal right hand thread	120	(0) 18x4	(1) 18x8
	160	(0) 24x5	(1) 24x10
	200	(0) 32x6	(1) 32x12
Trapezoidal left hand thread	120	(0) 18x4	(1) 18x8
	160	(0) 24x5	(1) 24x10
	200	(0) 32x6	(1) 32x12

\* = only for selection of divided spindle

**Ballscrew pitch accuracy:**

**0** (0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**End play of ball nut:**

**0** (0) 0,04 mm (Standard), (1)\* < 0,02 mm, (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

**Repeatability:**

± 0,2 mm Trapezoidal  
± 0,025 mm Ballscrew

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

DL T 160 3 0 0 0 0 0 0 0 0 1500

Pos. 1 2 3 4 5 6 7

Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 – 4.2.



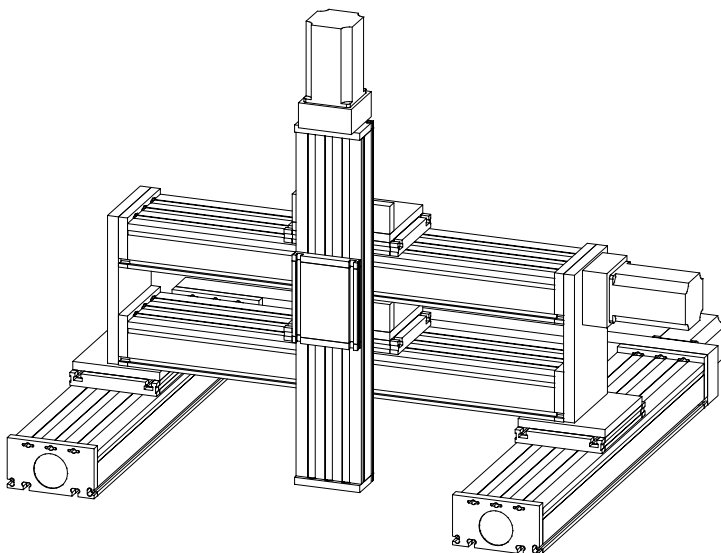
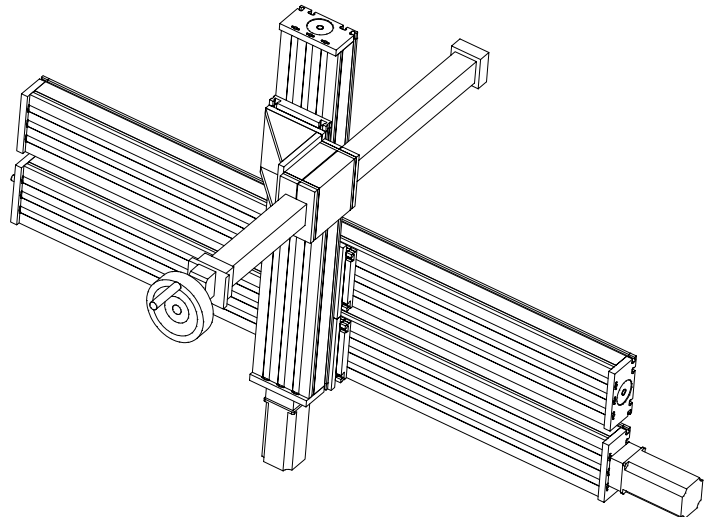
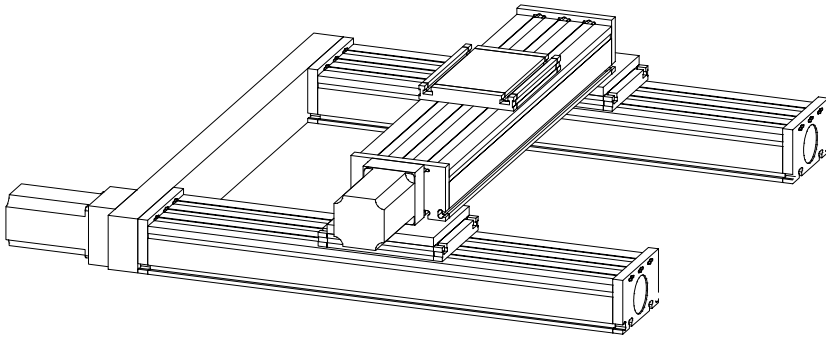
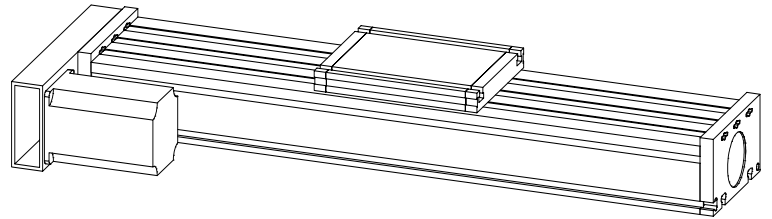
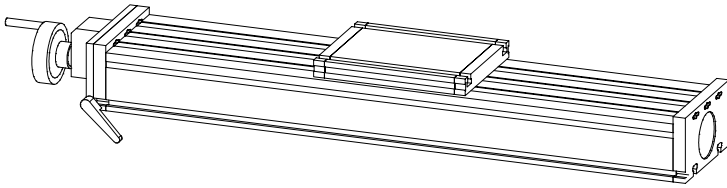
Sample ordering code:

DLT160, trapezoidal right - left hand thread, with internal profile and cover bands, standard carriage, shaft on the right hand side, spindle 24x5, 1030 mm stroke

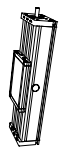


# Possible mounting styles

DL-spindle drives



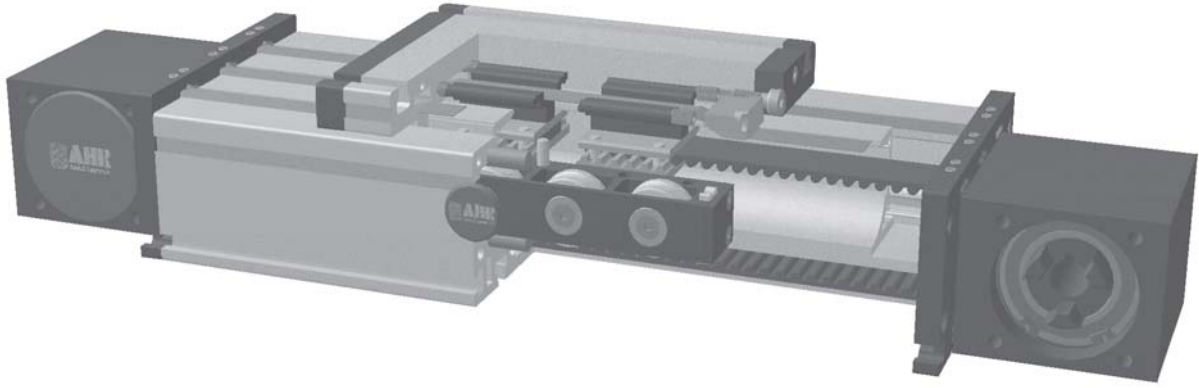
7.1



# Positioning system DLZ 120, 160, 200

Specifications

## Belt drive



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated roller guides. The carriage is moved by a belt drive. Each standard pulley has got one coupling claw on one side. 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. The openings of the guide body are sealed with 3 stainless steel cover bands to protect the guide from splash water and dust. Alternatively, the opening can also be covered with a bellow or can be delivered without cover bands.

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

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

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

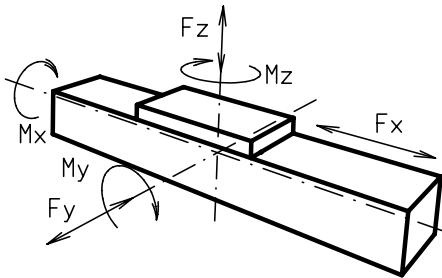
**Belt type:** HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

**Carriage support:** In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

7.1



Forces and torques	Size	120		160		200	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic
$F_x$ (N)		894	800	1900	1800	4000	3800
$F_y$ (N)		1100	900	3000	2000	4400	3100
$F_z$ (N)		1250	1000	3500	2800	4900	4400
$M_x$ (Nm)		150	125	400	320	600	510
$M_y$ (Nm)		140	120	360	300	560	480
$M_z$ (Nm)		100	90	180	150	310	275
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$							
values of table							
<b>No-load torque</b>							
Nm		1,2		1,5		1,8	
<b>Speed</b>							
(m/sec) max		4		6		8	
<b>Tensile force</b>							
permanent (N)		900		1900		4000	
0,2 sec (N)		1000		2090		4300	
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>		6,6x10 <sup>5</sup>		22,2x10 <sup>5</sup>		63,8x10 <sup>5</sup>	
$I_y$ mm <sup>4</sup>		38,6x10 <sup>5</sup>		122,0x10 <sup>5</sup>		335x10 <sup>5</sup>	
Elastic modulus N/mm <sup>2</sup>		70000		70000		70000	



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

### Formula: DLZ

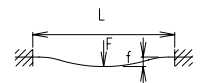
Driving torque:

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

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = 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)

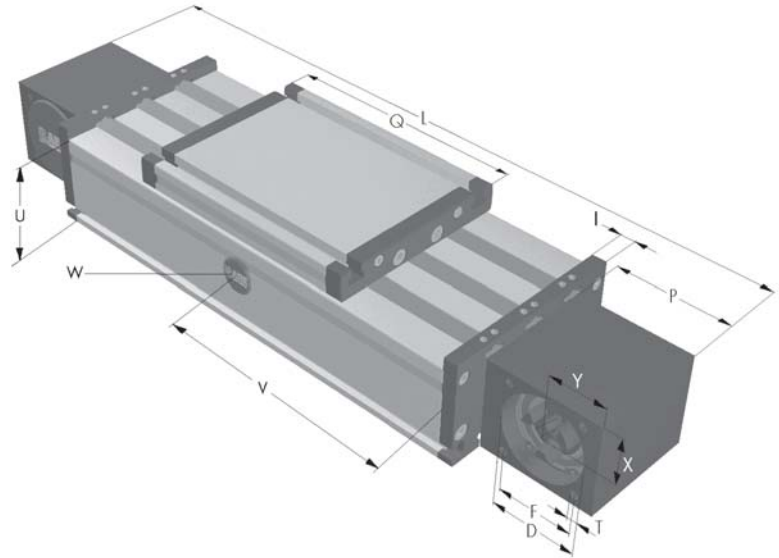
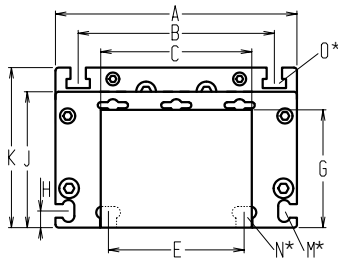
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



- 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 DLZ 120, 160, 200

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  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size	Basic length L	A	B	C	D	E	F	G	H	I	J	K	M for	N for	O for	P	Q	T	U	X	Y	Basic weight	Weight per 100 mm
DLZ 120	330	120	96	80	47	78	42	60	10	10	68	79	M 5	M 6	M 6	70	156	M 6	60	30	35	5,1 Kg	0,85 Kg
DLZ 160	440	160	130	100	68	90	60	78	11	12	90	106	M 6	M 8	M 8	95	200	M 8	80	39	45	13,0 kg	1,69 kg
DLZ 200	530	200	160	130	90	140	80	97	15	15	110	129	M 8	M10	M10	110	270	M10	100	49	50	23,4 kg	2,33 kg

7.1

### Choice of guide body profile:

(0) internal profile with cover bands  
 (1) internal profile without cover bands  
 (2) without internal profile and cover bands  
 (3) with bellows

Stainless versions upon request.

### Choice of carriage:

(0) (2)   
 (3)

Size	Version 0		Version 2		Version 3	
	Q	L	Q	L	Q	L
120	156	330	196	370	>236	>410
160	200	440	250	490	>300	>540
200	270	540	330	600	>410	>680

### Coupling - Selection of shaft mounting:

0 0 1 2 3 4 5 6 7 8 9

9 is as 0, but with coupling claws on both sides.  
The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings or tension sets (size 200).

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
0 4	120	5M25	130	26
0 7	160	8M30	176	22
0 9	160	8M50	176	22
0 9	200	8M50	224	28

### Shaft dimensions

Size	Shaft $\phi$ h6 x length	Key
120	14 x 35	5x5x28
160	18 x 45	6x6x40
160(8M50)	25 x 35	8x8x32
200	22 x 45	6x6x40

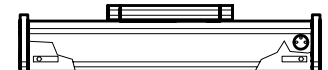
Basic length + stroke = total length

DLZ 160 1 0 0 0 0 7 1 01500  
Pos. 1 2 3 4 5 6 7

Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 - 4.2.

Sample ordering code:

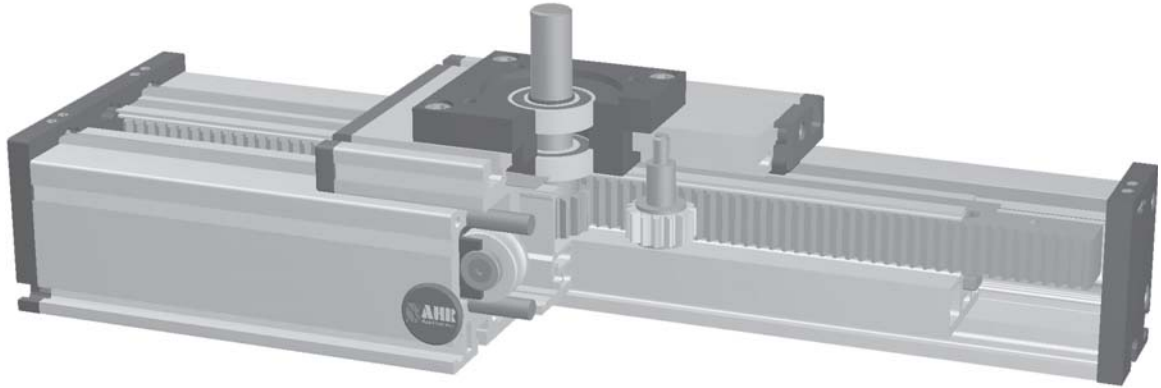
DLZ160 with internal profile and cover bands, standard carriage, coupling claw on one side, 1060 mm stroke.



# Positioning system DLZA 120, 160, 200

Specifications

## Rack and pinion drive



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated roller guides. 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 is equipped with maintenance-free ball bearings. The rack is lubricated by a toothed felt wheel.

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

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

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

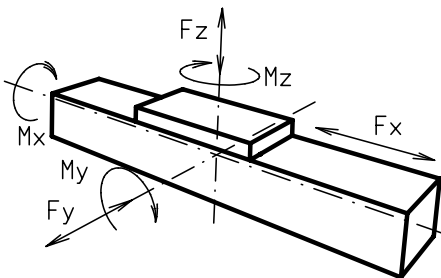
**Rack:** 6h23 Modul 2 (hardened and ground), repeatability ± 0,1 mm.

**Carriage support:** In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

7.1



Forces and torques	Size	120		160		200	
	Forces/Torques	statisch	dynam.	statisch	dynam.	statisch	dynam.
$F_x$ (N)				1900	1800		
$F_y$ (N)				3000	2000		
$F_z$ (N)				3500	2800		
$M_x$ (Nm)				400	320		
$M_y$ (Nm)				360	300		
$M_z$ (Nm)				180	150		
<b>All forces and torques related to the following:</b>							
existing values		$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
values of table							
<b>No-load torque</b>							
Nm				1,5			
<b>Speed</b>							
(m/sec) max				3			
<b>Tensile force</b>							
permanent (N)				1900			
0,2 sec (N)				2090			
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>				22,2x10 <sup>5</sup>			
$I_y$ mm <sup>4</sup>				122,0x10 <sup>5</sup>			
Elastic modulus N/mm <sup>2</sup>				70000			



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

### Formula: DLZA

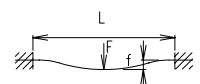
Driving torque:

$$M_o = \frac{F \cdot p \cdot S}{2000 \cdot \pi} + M_{leer}$$

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = 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)

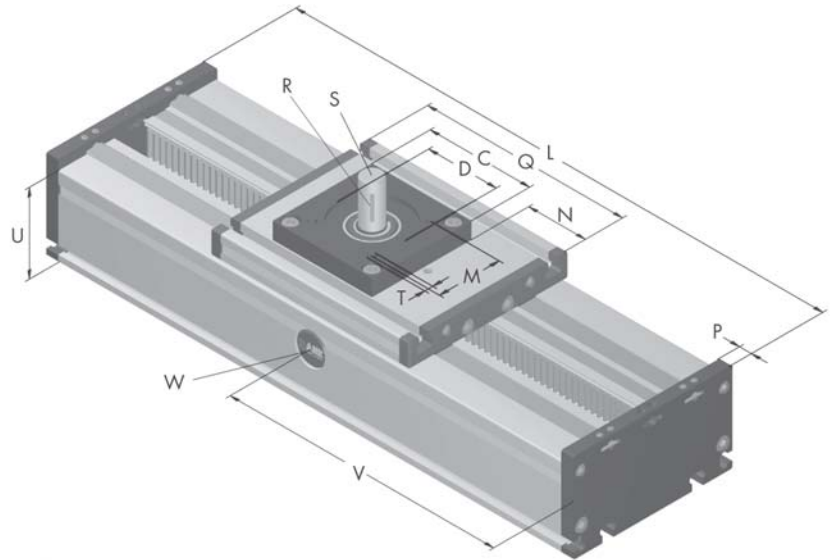
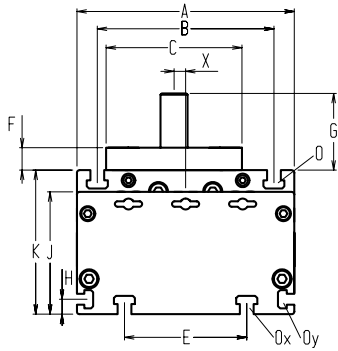
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



- 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 DLZA 120, 160, 200

Dimensions (mm)



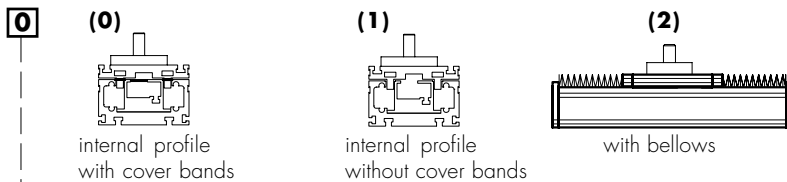
Increasing the carriage length will increase the basic length by the same amount.

\*For slide-nuts refer to chapter 2.2 page 2  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	Basic length L	A	B	C	D	E	F	G	H	J	K	M	N	O for	Ox for	Oy for	P	Q	T for	U	X	Basic weight	Weight per 100 mm	
DLZA 120																								
DLZA 160	240	160	130	100	68	90	16,5	56,5	11	90	106	60	59	M 8	M 8	M 6	12	200	M 8	80	8,5	13,0 kg	2,10 kg	
DLZA 200																								

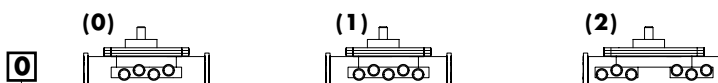
7.1

### Choice of guide body profile:



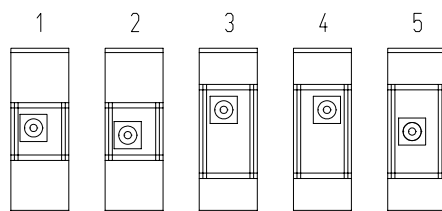
Stainless versions upon request.

### Choice of carriage:



Size □	Version 0		Version 1		Version 2	
	Q	L	Q	L	Q	L
120						
160	200	240	250	290	>300	>340
200						

### Position of drive:



### Shaft dimensions

Size □	Shaft $\varnothing h6 \times \text{length}$	Key	Pinion	
			mm/rev.	Modul
120				
160	20 x 40	6x6x35	100,53	2
200				

Basic length + stroke = total length

DLZA	160	1	0	0	1	0	0	1	01500
	Pos. 1	2	3	4	5	6	7		

Sample ordering code:

DLZA160 with internal profile and cover bands, standard carriage, 1260 mm stroke.

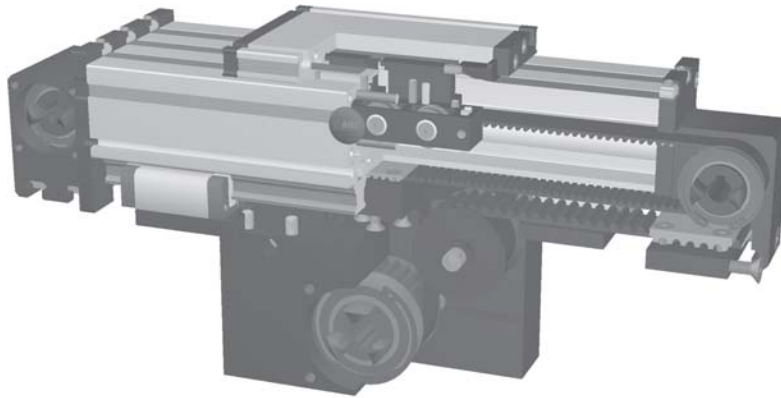
Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 – 4.2.



# Positioning system DLZT 120, 160, 200

Specifications

## Telescopic belt drive



### Function:

This unit consists of a rectangular aluminium section with internal guide rods and an outside rail guide. The rail guided carriage and the roller guided carriage are running in opposite directions. The pulleys include maintenance-free ball bearings. The belt is tensioned by a tensioning device in the carriage. The other fixed belt is tensioned by a simple device in the bearing blocks. The carriage with the drive block (with motor) is screwed to the crosshead. A T-slot profile is screwed to the carriage as an extension arm which can be adjusted to any length (see functional diagram on chapter 3.1 page 20).

7.1

**Fitting position:** As required. Max. length 3.000 mm.

**Unit mounting:** By T-slots in the carriage, extension arm

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

**Carriage support:** In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.



Forces and Torques	Size		120		160		200	
	Forces/Torques		static	dynamic	static	dynamic	static	dynamic
	$F_x$ (N)		825	660				
	$F_y$ (N)		1100	900				
	$F_z$ (N)		1250	1000				
	$M_x$ (Nm)		150	125				
	$M_y$ (Nm)		140	120				
	$M_z$ (Nm)		100	90				
	<b>All forces and torques related to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table							
<b>No-load torque</b> Nm <span style="margin-left: 150px;">6</span>								
<b>Speed</b> (m/sec) max <span style="margin-left: 150px;">4</span>								
<b>Tensile force</b> permanent (N) <span style="margin-left: 150px;">825</span> 0,2 sec (N) <span style="margin-left: 150px;">1000</span>								
<b>Geometrical moments of inertia of aluminium profile</b>								
$I_x$ mm <sup>4</sup>		6,6x10 <sup>5</sup>						
$I_y$ mm <sup>4</sup>		38,6x10 <sup>5</sup>						
Elastic modulus N/mm <sup>2</sup>		70000						

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

### Formula: DLZT

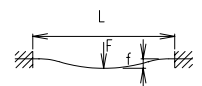
Driving torque:

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

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

$F$  = force (N)  
 $P$  = pulley action perimeter (mm)  
 $S$  = 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)

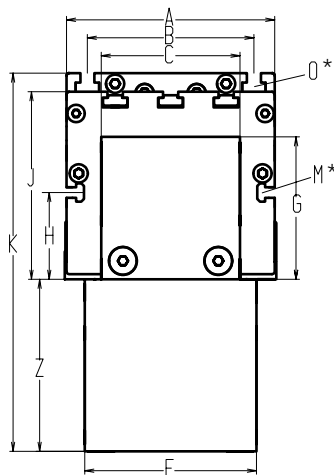
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



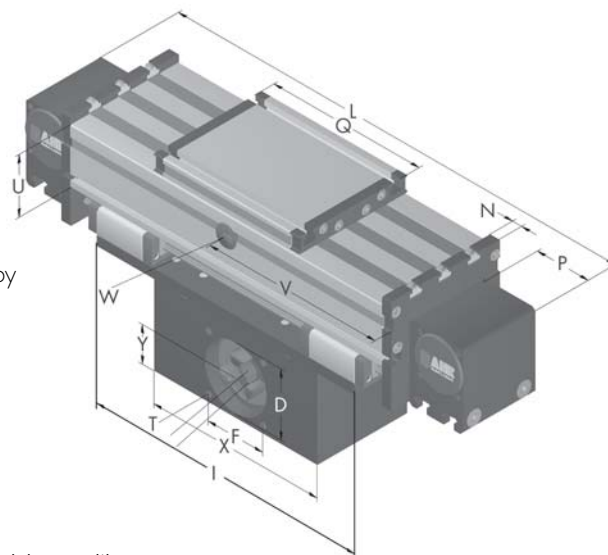
$f$  = deflection (mm)  
 $F$  = load (N)  
 $L$  = free length (mm)  
 $E$  = elastic modulus 70000 (N/mm<sup>2</sup>)  
 $I$  = second moment of area (mm<sup>4</sup>)

# Positioning system DLZT 120, 160, 200

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  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	Basic length L	A	B	C	D	E	F	G	H	I	J	K	M for	N	O for	P	Q	T	U	X	Y	Z	Basic weight	Weight per 100 mm
<b>DLZT 120</b>	460	120	96	80	68	100	60	82	50	284	108	218	M 5	10	M 6	59	156	M 8	60	180	39	100	15,8 kg	1,20 kg
<b>DLZT 160</b>																								
<b>DLZT 200</b>																								

7.1

### Choice of guide body profile:

**0** (0)



(1)

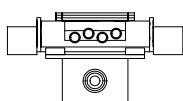


**Stainless versions upon request.**

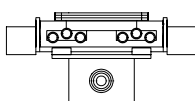
### Choice of carriages:

**0**

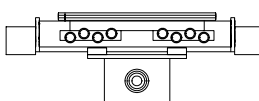
(0)



(1)



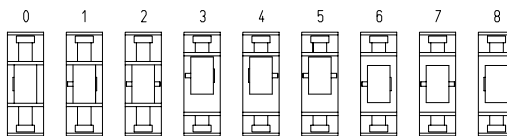
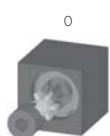
(2)



Size	Version 0		Version 1		Version 2	
	Q	L	Q	L	Q	L
<b>120</b>	156	460	>236	>540	>316	>620
<b>160</b>						
<b>200</b>						

### Coupling - Selection of shaft mounting:

**0**



9 is as 0, but with coupling claws on both sides. The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings or tension sets (size 200).

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
<b>0 7</b>	120	8M30	192	24

### Shaft dimensions

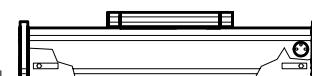
Size	Shaft $\varnothing$ h6 x length	Key
<b>120</b>	22 x 45	6x6x40
<b>160</b>		
<b>200</b>		

Basic length + stroke = total length

**DLZT 120 6 0 0 0 7 2 01500**

Pos. 1 2 3 4 5 6 7

Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 – 4.2.

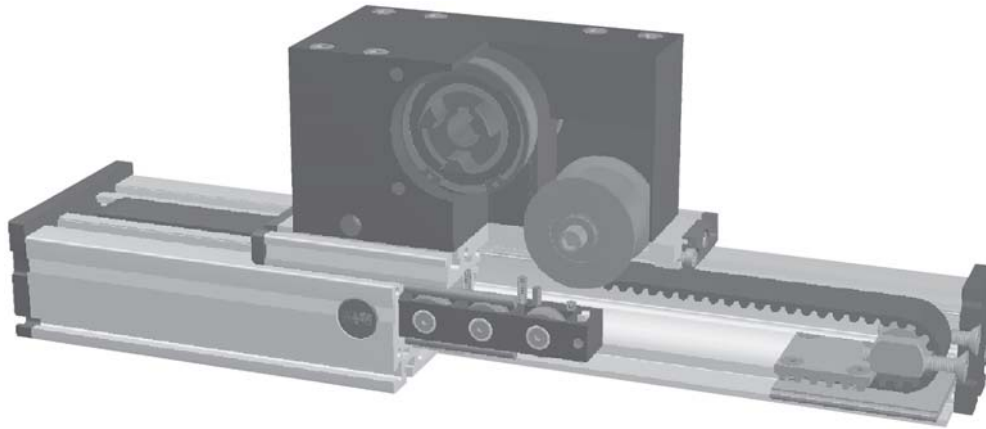


Sample ordering code:  
DLZT 120, standard body profile, standard carriage, coupling claw at one side, 1040 mm stroke.

# Positioning system DLSZ 120, 160, 200

Specifications

## Belt drive



### Function:

This linear unit consists of a rectangular aluminium profile with integrated, hardened steel guide rods. The carriage which has linear ball bearings that can be adjusted free of play is driven along the guide rods by a timing belt. Each standard pulley includes a coupling claw on one side and is equipped with 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 and mounting sets. The linear axis can be combined with any T-slot profile.

### Belt performance:

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

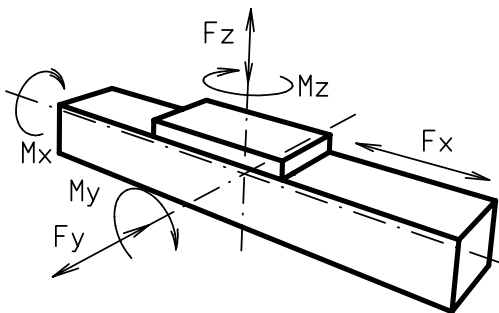
### Carriage support:

In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

7.1



### Forces and torques



Size	120		160		200	
	static	dynamic	static	dynamic	static	dynamic
<b>Forces/Torques</b>						
$F_x$ (N)	1900	1800	4000	3800	5900	5750
$F_y$ (N)	1100	900	3000	2000	4400	3100
$F_z$ (N)	1250	1000	3500	2800	4900	4400
$M_x$ (Nm)	150	125	400	320	600	510
$M_y$ (Nm)	140	120	360	300	560	480
$M_z$ (Nm)	100	90	180	150	310	275
<b>All forces and torques related to the following:</b>						
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$						
values of table						
<b>No-load torque</b>						
Nm	1,1		1,5		1,8	
<b>Speed</b>						
(m/sec) max	4		6		8	
<b>Tensile force</b>						
permanent (N)	1900		4000		5900	
0,2 sec (N)	2090		4300		6350	
<b>Geometrical moments of inertia of aluminium profile</b>						
$I_x$ mm <sup>4</sup>	$6,6 \times 10^5$		$2,22 \times 10^6$		$6,38 \times 10^6$	
$I_y$ mm <sup>4</sup>	$38,6 \times 10^5$		$12,20 \times 10^6$		$33,5 \times 10^6$	
Elastic modulus N/mm <sup>2</sup>	70000		70000		70000	

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

### Formula: DLSZ

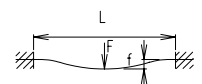
Driving torque:

$$M_o = \frac{F \cdot p \cdot S}{2000 \cdot \pi} + M_{leer}$$

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

- F = force (N)
- P = thread pitch (mm)
- S = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm of screw (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $P_o$  = motor power (KW)

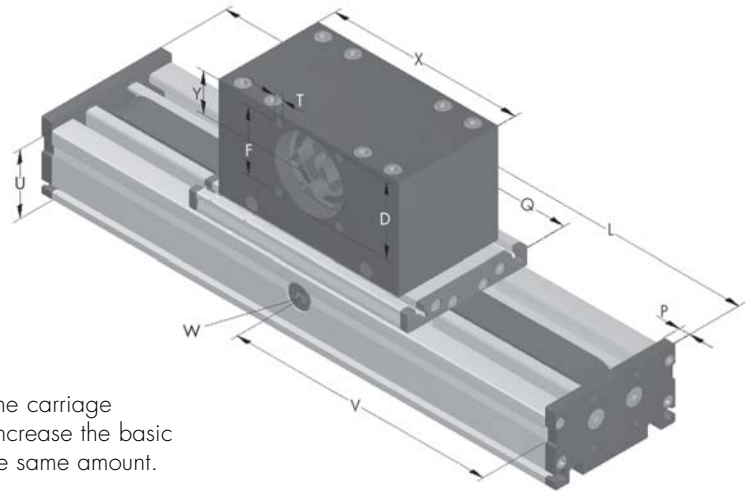
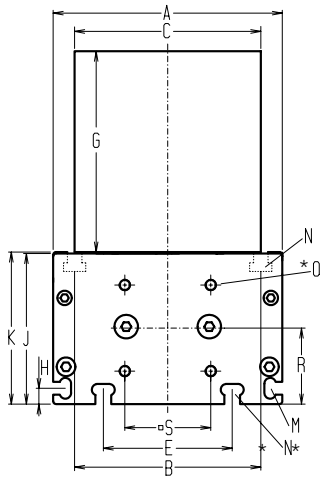
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



- 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 DLSZ 120, 160, 200

Dimensions (mm)



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

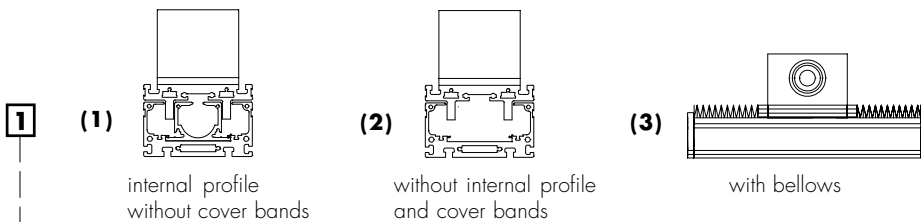
\*For slide-nuts refer to chapter 2.2 page 2

V = Q + 100 mm

W = servicing position

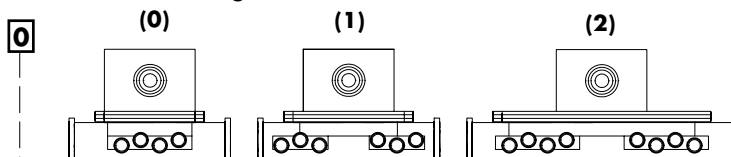
Size □	Basic length L	A	B	C	D	E	F	G	H	J	K	M for	N for	O for	P	Q	R	S	T	U	X	Y	Basic weight	Weight per 100 mm
DLSZ 120	230	120	96	100	68	78	60	100	10	78	79	M 5	M 6	M 6	10	200	39	42	M 8	60	180	39	12,0 kg	1,2 kg
DLSZ 160	330	160	130	130	90	90	80	130	11	105	106	M 6	M 8	M 8	12	290	53	60	M 10	80	270	60	27,0 kg	1,8 kg
DLSZ 200	380	200	160	160	110	140	100	145	15	128	129	M 8	M 10	M 10	15	340	69	95	M 10	100	310	62	53,0 kg	2,6 kg

### Choice of guide body profile:



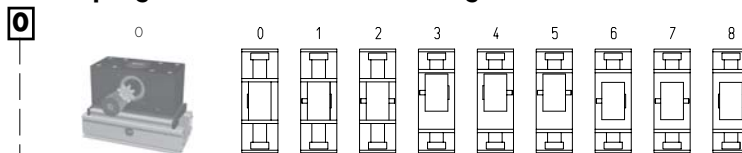
Stainless versions upon request.

### Choice of carriages:



Size	Version 0		Version 1		Version 2	
	Q	L	Q	L	Q	L
120	200	230	>280	>310	>360	>390
160	290	330	>390	>430	>490	>530
200	340	380	>480	>520	>610	>650

### Coupling - Selection of shaft mounting:



8 is as 0, but with coupling claws on both sides. The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings or tension sets (size 160 and 200).

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
0 7	120	8M30	192	24
0 9	160	8M50	256	32
1 0	200	8M70	304	38

### Shaft dimensions

Size	Shaft ø h6 x length	Key
120	18 x 45	6x6x40
160	22 x 45	6x6x40
200	30 x 55	8x7x44

Basic length + stroke = total length

DLSZ 120 1 1 0 0 0 7 2 01500  
Pos. 1 2 3 4 5 6 7

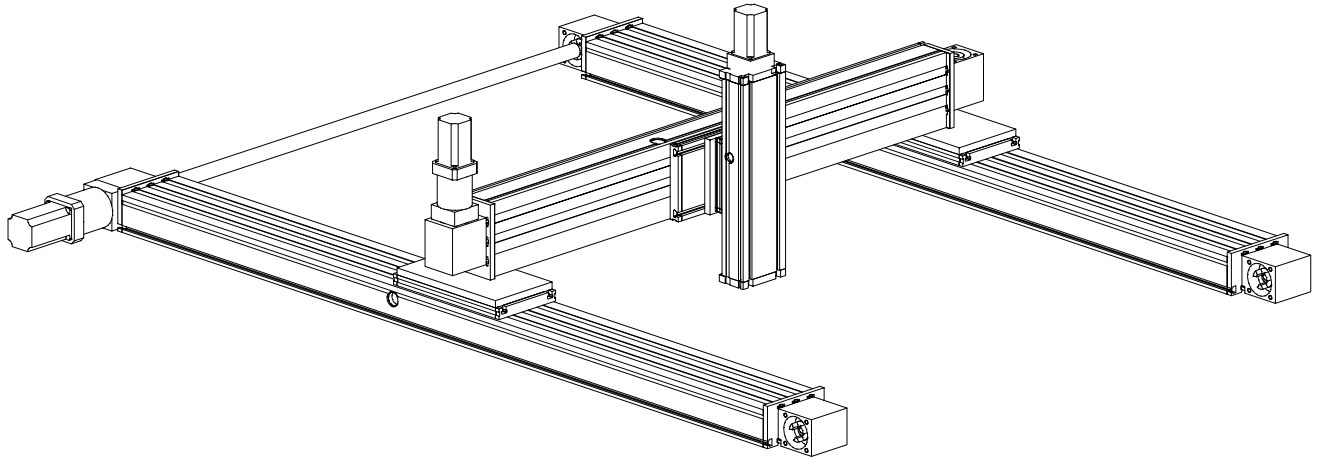
Sample ordering code:

DLSZ120, body profile with internal profile without cover bands, standard carriage, coupling claws on one side, 1270 mm stroke

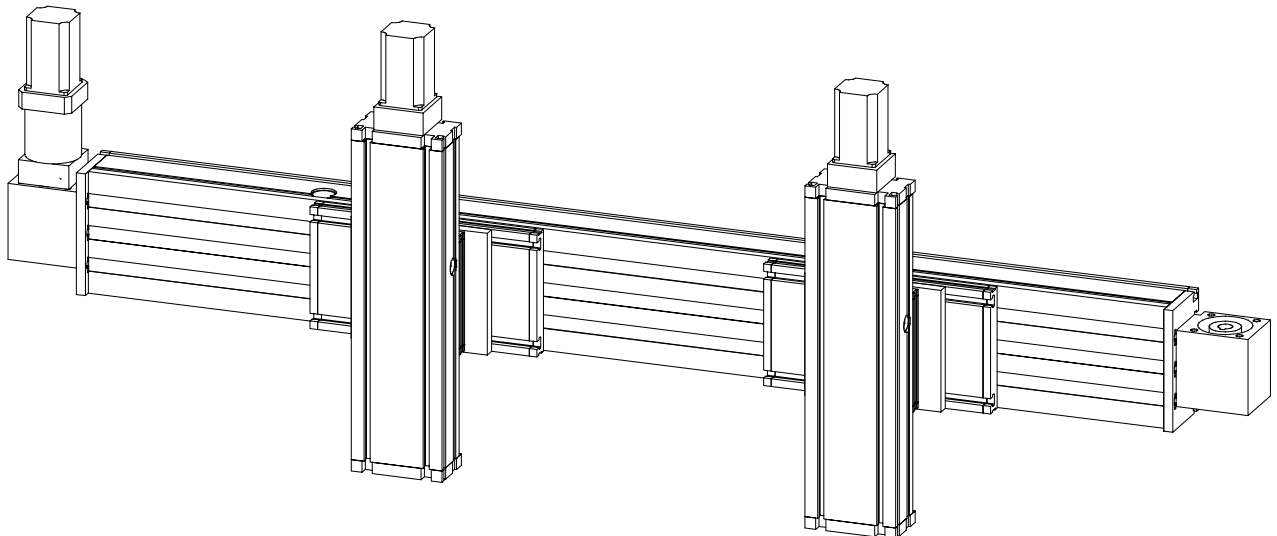
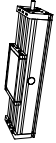


# Possible mounting styles

DL drives

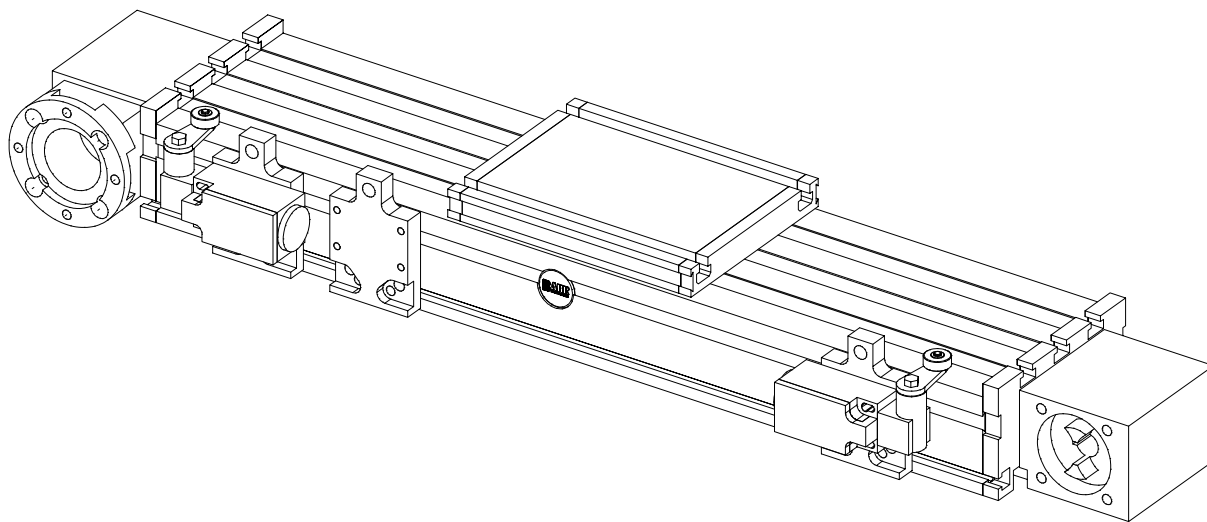


7.1

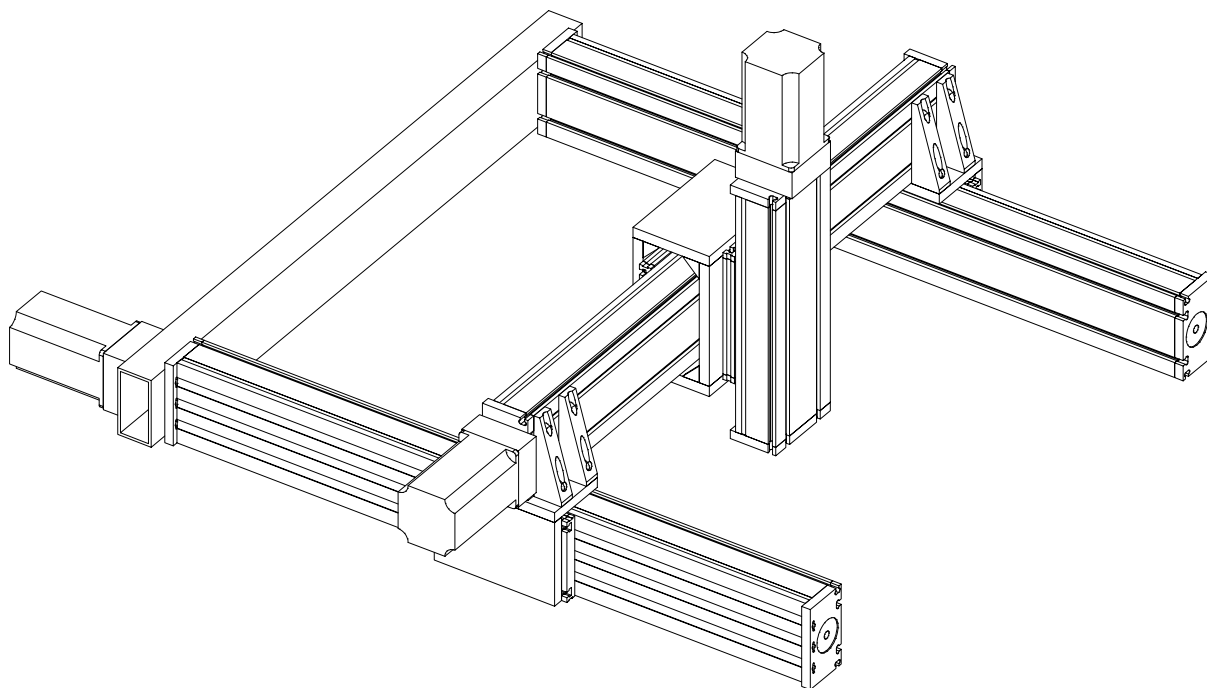


# Possible mounting styles

DL drives



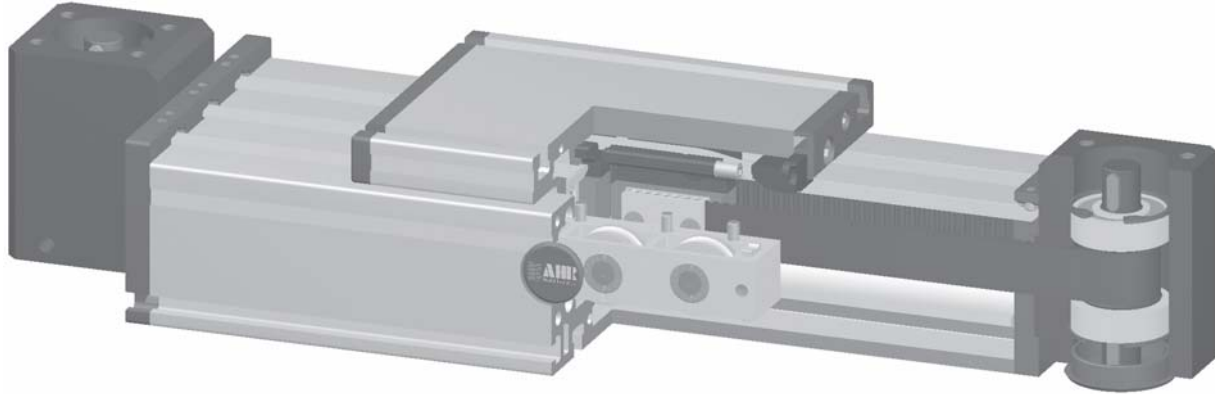
7.1



# Positioning system DLVZ 160

Specifications

## Internal belt drive



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated roller guides. The carriage is moved by a belt drive. 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. The openings of the guide body are sealed with 3 stainless steel cover bands to protect the guide from splash water and dust. Alternatively, the opening can also be covered with a bellow or can be delivered without cover bands.

**Fitting position:** As required. Max. length 3.000 mm without joints.

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

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

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

**Carriage support:** In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

7.1



Forces and torques	Size	DLVZ 120		DLVZ 160		DLVZ 200	
	Forces/Torques	static	dynamic	static	dynamic	static	dynamic
	$F_x$ (N)			1000	840		
	$F_y$ (N)			3000	2000		
	$F_z$ (N)			3500	2800		
	$M_x$ (Nm)			400	320		
	$M_y$ (Nm)			360	300		
	$M_z$ (Nm)			180	150		
	<b>All forces and torques relate to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table						
<b>No-load torque</b>							
	Nm			3,8			
<b>Speed</b>							
	(m/sec) max			4			
<b>Tensile force</b>							
	permanent (N)			1000			
	0,2 sec (N)			1150			
<b>Geometrical moments of inertia of aluminium profile</b>							
	$I_x$ mm <sup>4</sup>			22,2x10 <sup>5</sup>			
	$I_y$ mm <sup>4</sup>			122,0x10 <sup>5</sup>			
	E-Modulus N/mm <sup>2</sup>			70000			

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

### Formula: DLVZ

Driving torque:

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

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

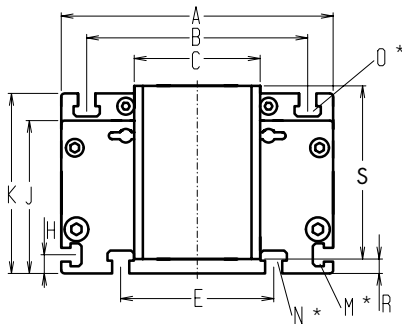
$F$  = force (N)  
 $P$  = pulley action perimeter (mm)  
 $S$  = safety factor 1,2 ... 2  
 $M_{leer}$  = no-load torque (Nm)  
 $n$  = rpm pulley (min<sup>-1</sup>)  
 $M_o$  = driving torque (Nm)  
 $P_o$  = motor power (KW)

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

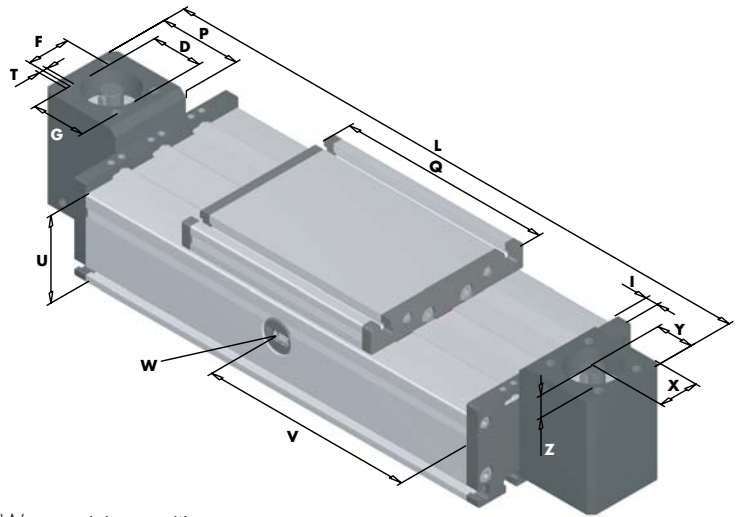
$f$  = deflection (mm)  
 $F$  = load (N)  
 $L$  = free length  
 $E$  = elastic modulus 70000 (N/mm<sup>2</sup>)  
 $I$  = second moment of area (mm<sup>4</sup>)

# Positioning system DLVZ 160

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      V = Q + 100 mm      W = servicing position

Baugröße □	Grundlänge L	A	B	C	D	E	F	G	H	J	K	M für	N für	O für	P	Q	R	S	T	U	X	Y	Z	Grundgewicht	Gewicht pro 100 mm
DLVZ 120																									
DLVZ 160	410	160	130	74	47	90	40	50	11	90	106	M6	M8	M8	76	200	8,5	102	M 8	80	37	35	18	11,23 kg	1,76 kg
DLVZ 200																									

1 (1) Belt connection right



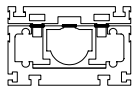
(2) Belt connection left



### Choice of guide body profile:

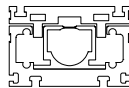
0

(0)



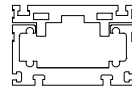
internal profile with cover bands

(1)



internal profile without cover bands

(2)



without internal profile and cover bands

(3)



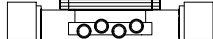
with bellows

Stainless versions upon request.

### Choice of carriages:

0

(0)



(2)



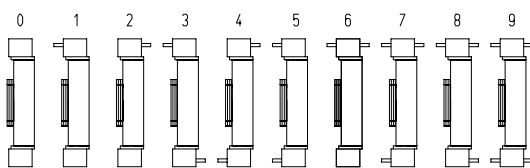
(3)



Size	Version 0		Version 2		Version 3	
	Q	L	Q	L	Q	L
120						
160	200	440	250	490	>300	>540
200						

### Selection of shaft mounting:

0



The standard version 0 is supplied with 4 flush mounted shafts.

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
0 4	120			
0 4	160	5M25	110	22
0 9	200			

### Shaft dimensions

Size	Shaft ø h6 x length	Key
120		
160	18 x 45	6x6x40
200		

Basic length + stroke = total length

DLVZ 160 1 0 0 0 0 4 1 01500

Pos. 1 2 3 4 5 6 7

For combination kits and connecting elements refer to main catalogue chapter 2.2

Sample ordering code:

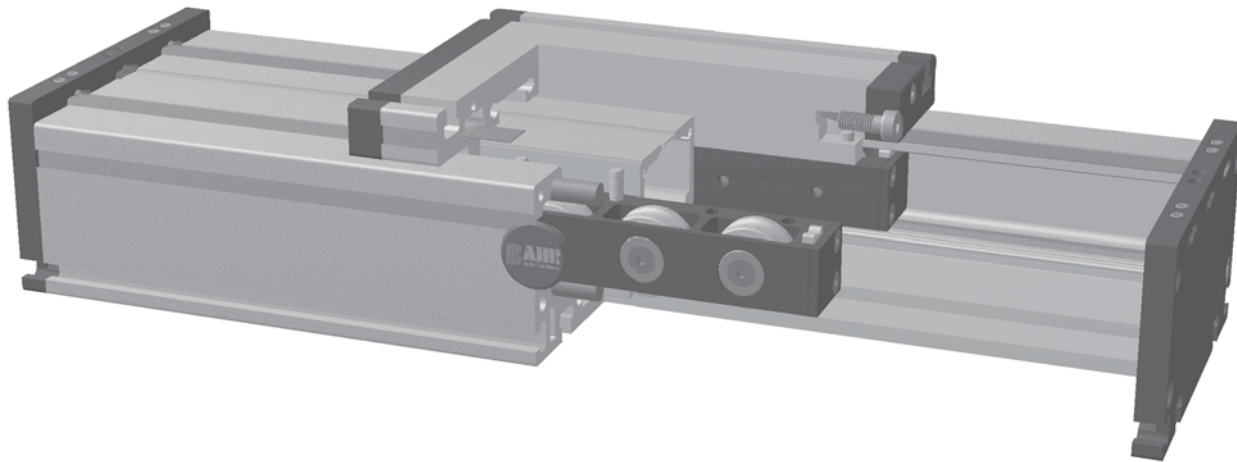
DLVZ 160 with belt connection right, internal profile with cover bands, standard carriage and 4 flush mounted shafts, 1090 mm stroke



# Positioning system DLR 120, 160, 200

Specifications

Roller unit without drive



**Function:**

This unit consists of a rectangular aluminium profile with 2 integrated roller guides. The openings of the guide body are sealed with 3 stainless steel cover bands to protect the guide from splash water and dust. Alternatively, the opening can also be covered with a bellow or can be delivered without cover bands. The roller guide can be either driven by an internal pneumatic cylinder or other additional drives or it serves as load carrying linear slide.

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

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

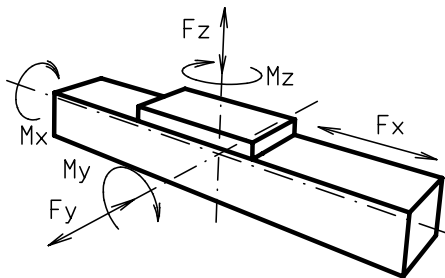
**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

**Carriage support:** In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

7.1



Forces and torques	Size	120		160		200	
	Forces/Torques	static	dynamic	statisch	dynam.	statisch	dynam.
$F_x$ (N)	-	-	-	-	-	-	-
$F_y$ (N)	1100	900	3000	2000	4400	3100	
$F_z$ (N)	1250	1000	3500	2800	4900	4400	
$M_x$ (Nm)	150	125	400	320	600	510	
$M_y$ (Nm)	140	120	360	300	560	480	
$M_z$ (Nm)	100	90	180	150	310	275	
<b>All forces and torques related to the following:</b>							
existing values		$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
values of table							
<b>Speed</b>							
(m/sec) max	4		6		8		
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>	6,6x10 <sup>5</sup>		22,2x10 <sup>5</sup>		63,8x10 <sup>5</sup>		
$I_y$ mm <sup>4</sup>	38,6x10 <sup>5</sup>		122,0x10 <sup>5</sup>		335,0x10 <sup>5</sup>		
Elastic modulus N/mm <sup>2</sup>	70000		70000		70000		

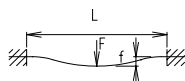


For life-time calculation of rollers use our CD-ROM or homepage!

**Formula: DLR**

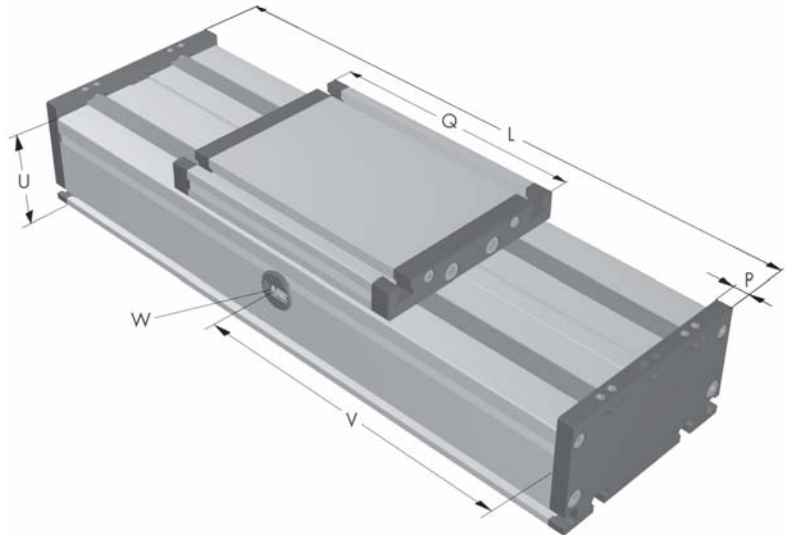
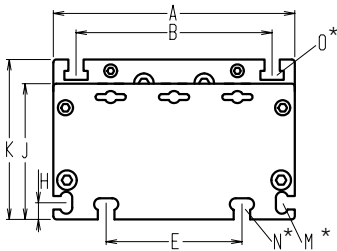
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

$f$  = 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 DLR 120, 160, 200

Dimensions (mm)



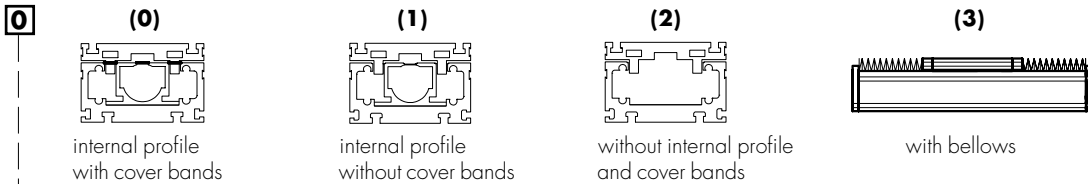
Increasing the carriage length will increase the basic length by the same amount.

\*For slide-nuts refer to chapter 2.2 page 2  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	Basic length L	A	B	E	H	J	K	M for	N for	O for	P	Q	U	Basic weight	Weight per 100 mm
DLR 120	200	120	96	78	10	68	79	M 5	M 6	M 6	10	156	60	3,2 kg	0,71 kg
DLR 160	240	160	130	90	11	90	106	M 6	M 8	M 8	12	200	80	6,9 kg	1,42 kg
DLR 200	320	200	160	140	15	110	129	M 8	M 10	M 10	15	270	100	11,4 kg	2,30 kg

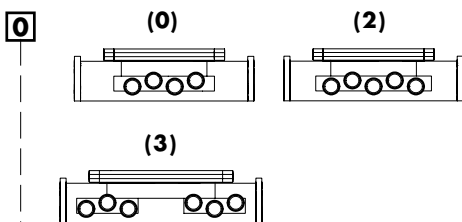
7.1

### Choice of guide body profile:



Stainless versions upon request.

### Arrangement of rollers:



Size	Version 0		Version 2		Version 3	
	Q	L	Q	L	Q	L
120	156	200	196	240	>236	>280
160	200	240	250	290	>300	>340
200	270	320	330	380	>410	>470

1500 Basic length + stroke = total length

DLR 160 0 0 0 0 0 0 0 0 0 1500  
Pos. 1 2 3 4 5 6 7

Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 – 4.2.

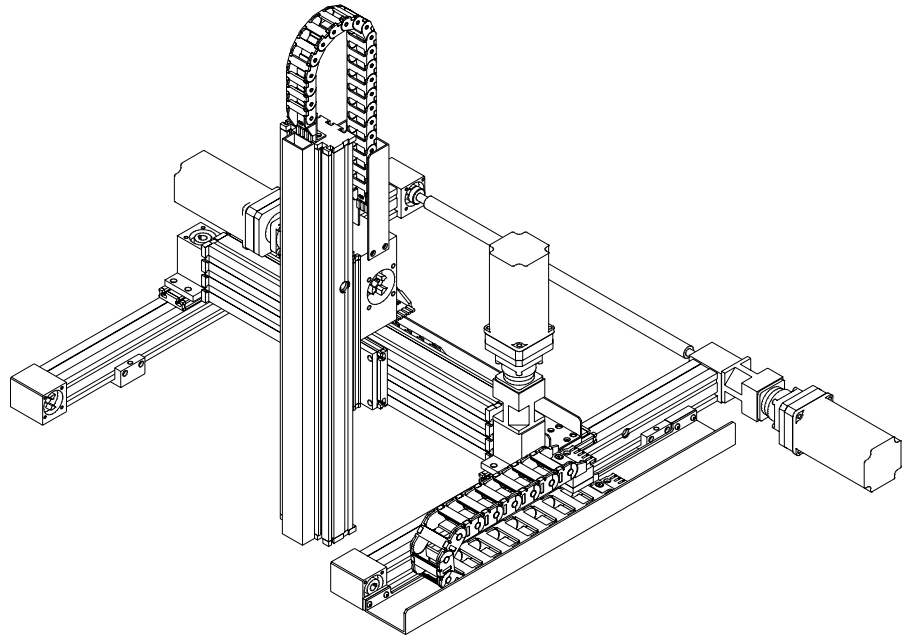


Sample ordering code:  
DLR160, with internal profile and cover bands, standard rollers, 1260 mm stroke.

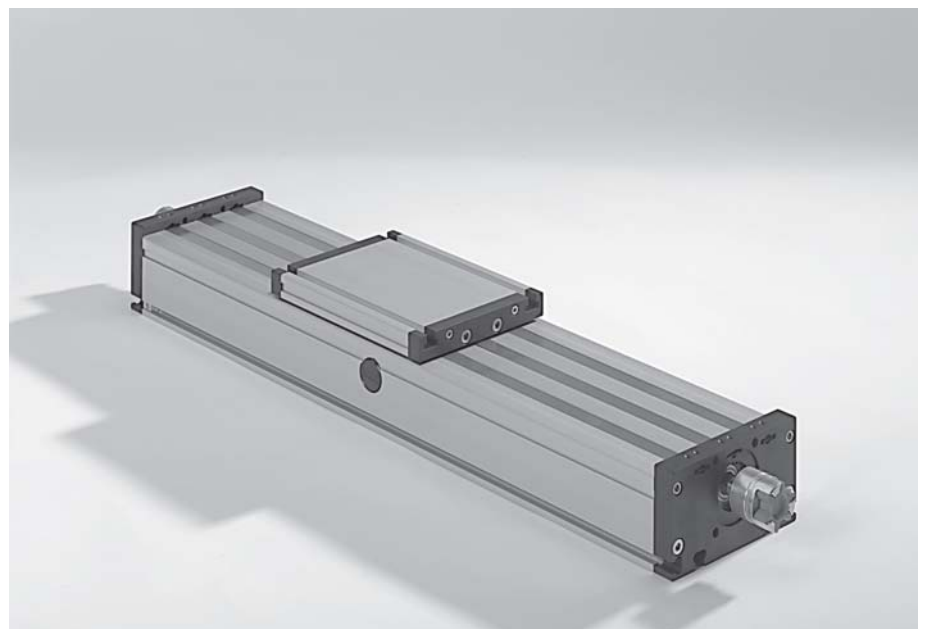
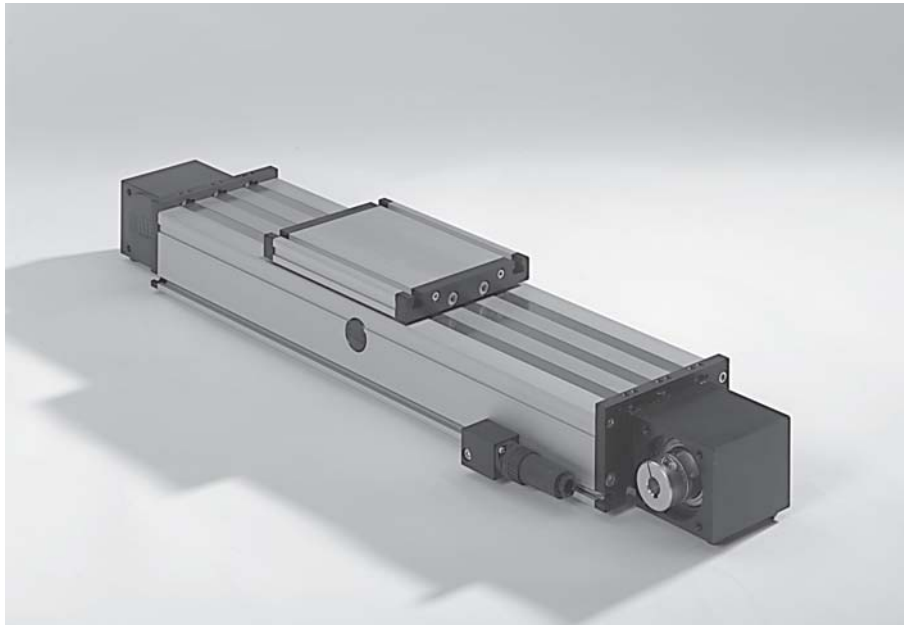
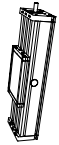


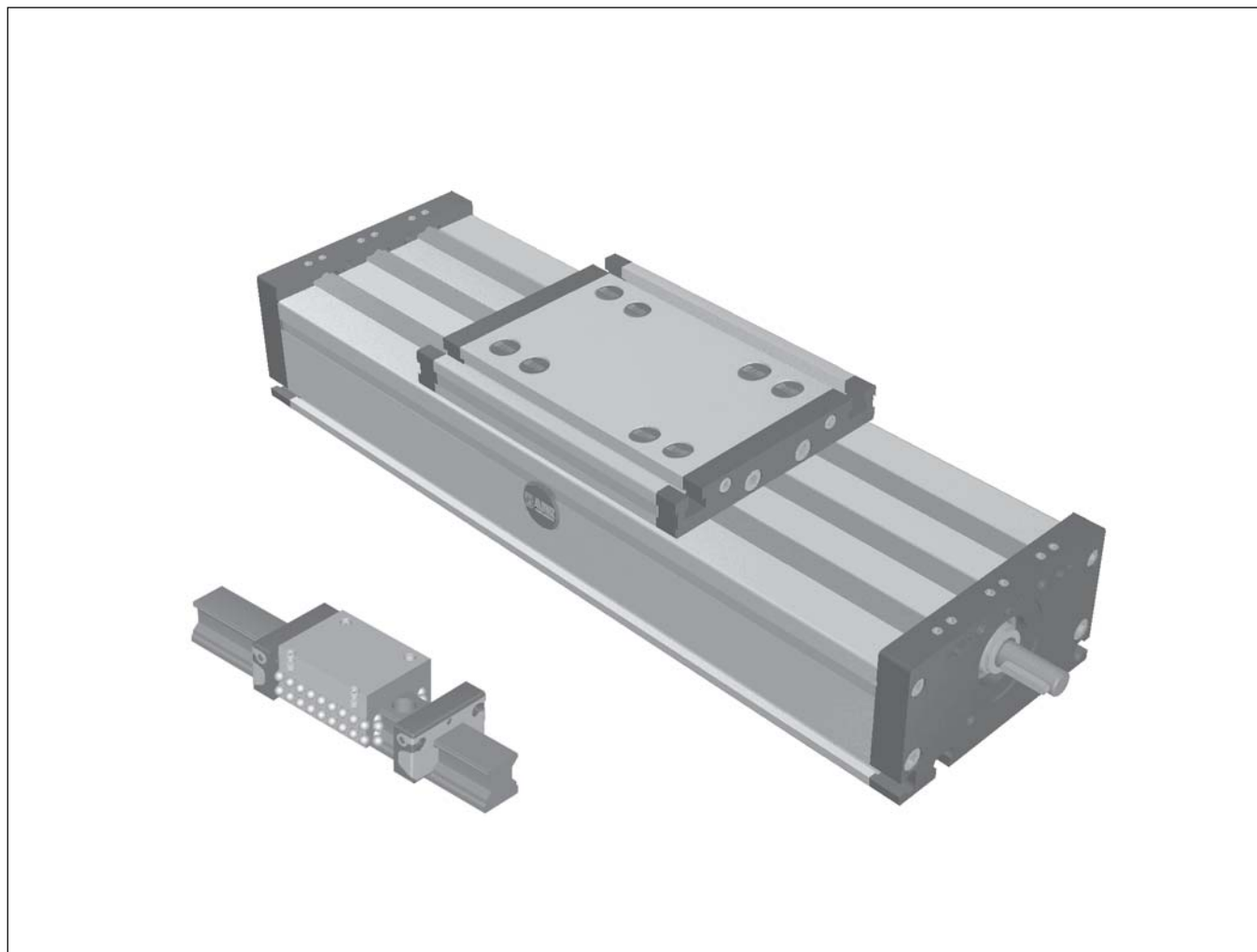
# Possible mounting styles

DL drives



7.1





8.1

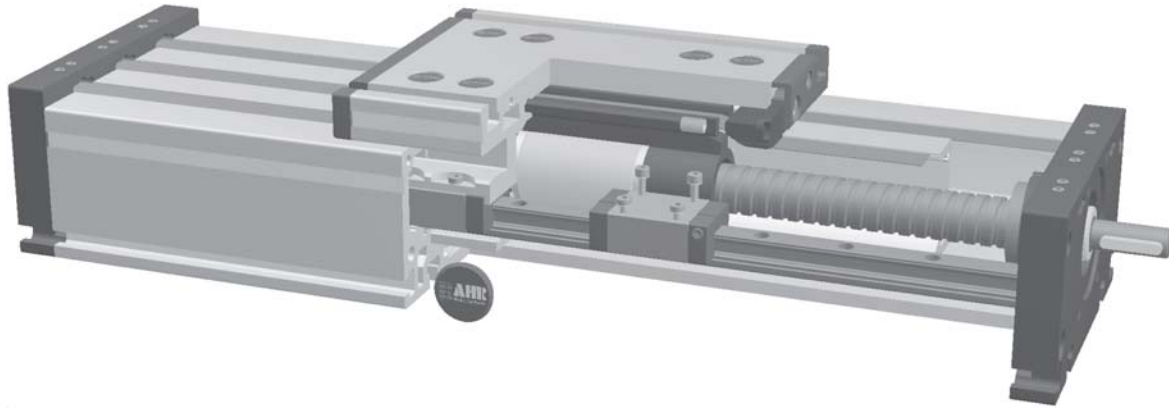


# Rail guide positioning systems DS

# Positioning system DST/DSK 120, 160, 200

Specifications

## Spindle drives



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated rail guidance. The carriage is driven by means of a rotating spindle with leading nut. Where two parallel linear units are used or where two carriages are mounted on one unit, the leading-nut receiver can be used to adjust the symmetry of the carriages. The openings of the guide body are sealed with 3 stainless steel cover bands to protect the drive from splash water and dust. Another option is to cover the opening with a bellows.

### Fitting position:

As required. Max. length 3.000 mm without joints.

### Carriage mounting:

By T-slots.

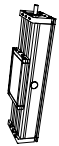
### Unit mounting:

By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

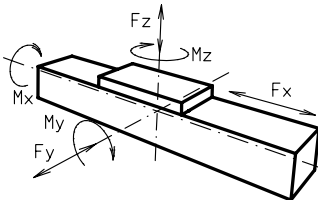
### Carriage support:

In the standard version, the carriage runs on 4 runner blocks which can be serviced at a central servicing position. For longer carriages the number of runner blocks can be increased.  
Repeatability: Ballscrew  $\pm 0,025$  mm, trapezoidal thread  $\pm 0,2$  mm.

8.1



### Forces and torques



Size	120		160		200		
<b>permitted dyn. Forces*</b>	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km	
$F_x$ (N)	900	800	5000	4000	10000	8000	
$F_y$ (N)	1776	1405	5570	3900	15600	11080	
$F_z$ (N)	2090	1650	7050	5020	20600	14600	
$M_x$ (Nm)	81	64	358	255	1285	915	
$M_y$ (Nm)	97	77	369	262	1375	980	
$M_z$ (Nm)	96	76	364	258	1345	960	
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$							
values of table							
<b>No-load torque</b>							
Trapezoidal thread	18 x 4	18 x 8	24 x 5	24 x 10	32 x 6	32 x 12	
(Nm)	0,8	1,1	1,0	1,3	1,5	1,7	
Ballscrew	16 x 5	16 x 10	25 x 5	20 x 20	32 x 5	32 x 10	32 x 20
(Nm)	0,7	1,0	1,0	1,2	1,3	1,6	1,7
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>	5,61x10 <sup>5</sup>		2,13x10 <sup>6</sup>		4,81 x10 <sup>6</sup>		
$I_y$ mm <sup>4</sup>	34,19x10 <sup>5</sup>		12,33x10 <sup>6</sup>		26,0 x10 <sup>6</sup>		
Elastic modulus N/mm <sup>2</sup>	70000		70000		70000		

\* referred to life-time

### Formula: DST/K

Driving torque:

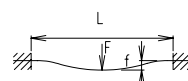
$$M_o = \frac{F \cdot p \cdot S}{2000 \cdot \pi \cdot \mu} + M_{leer}$$

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

F = force (N)  
 P = thread pitch (mm)  
 S = safety factor 1,2 ... 2  
 M<sub>leer</sub> = no-load torque (Nm)  
 n = rpm of screw (min<sup>-1</sup>)  
 M<sub>o</sub> = driving torque (Nm)  
 μ = screw efficiency  
 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 moduust 70000(N/mm<sup>2</sup>)  
 I = second moment of area (mm<sup>4</sup>)

Efficiency of lead

screws:  
 All ballscrew 0,900  
 Tr 24x5 0,384  
 Tr 24x10 0,550  
 Tr 32x6 0,360  
 Tr 32x12 0,524

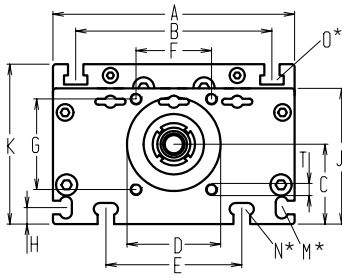
The diagram for critical speeds of lead screws refer to chapter 5.2 page 3

8.1 / 2

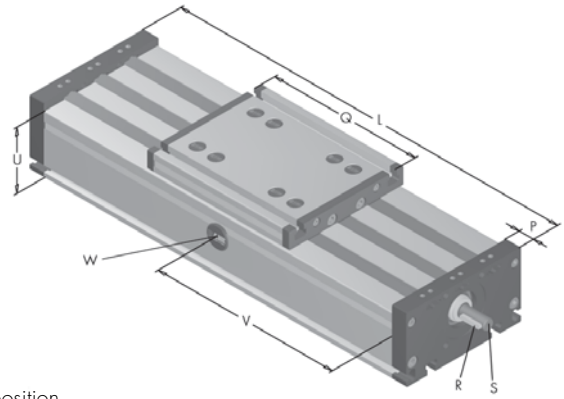


# Positioning system DST/DSK 120, 160, 200

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       $V = Q + 100 \text{ mm}$        $W = \text{servicing position}$

Size □	Basic length L	A	B	C	D	E	F	G	H	J	K	M for	N for	O for	P	Q	Shaft		T	U	Basic weight	Weight per 100 mm
																	R Key	S Ø x length				
DS 120	200	120	96	39	47	78	42	42	10	68	79	M 5	M 6	M 6	15	156	3x3x25	10 h6 x 27	M 6	60	3,9 kg	0,92 kg
DS 160	260	160	130	53	62	90	50	60	11	90	106	M 6	M 8	M 8	20	200	5x5x28	14 h6 x 35	M 8	80	7,2 kg	2,1 kg
DS 200	320	200	160	66	68	140	60	60	15	110	129	M 8	M 10	M 10	20	270	6x6x40	22 h6 x 45	M 8	100	19,4 kg	3,5 kg

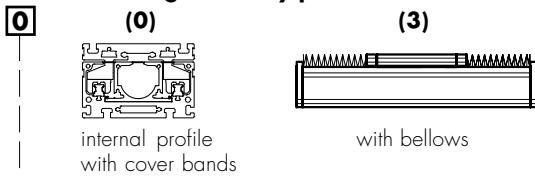
**Spindle:**

**T** (T) Trapezoidal thread (K) Ballscrew

**Selection of screw:**

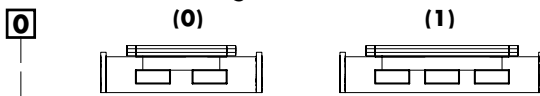
**1** (1) right hand (2) left hand (Ballscrew by inquiry)

**Choice of guide body profile:**



Stainless versions upon request.

**Choice of carriages:**



Size	Version 0		Version 1	
	Q	L	Q	L
120	156	200	156	200
160	200	260	>230	>290
200	270	320	>310	>360

**Choice of journal:**

**0** (0) one shaft (locating bearing side) (1) one shaft (non-locating bearing side) (2) shaft on both sides

**Selection of screw:**

	Size	Standard	Multistart-screw
Ballscrew right hand	120	(0) 16x5	(1) 10x10
	160	(0) 25x5	(1) 20x20 (2) 25x10 (3) 25x25
	200	(0) 32x5	(1) 32x10 (2) 32x20 (3) 32x32
Ballscrew left hand		upon request	

Trapezoidal right hand thread	120	(0) 18x4	(1) 18x8
	160	(0) 24x5	(1) 24x10
	200	(0) 32x6	(1) 32x12
Trapezoidal left hand thread	120	(0) 18x4	(1) 18x8
	160	(0) 24x5	(1) 24x10
	200	(0) 32x6	(1) 32x12

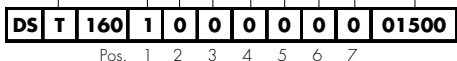
**Ballscrew pitch accuracy:**

**0** (0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**End play of ball nut:**

**0** (0) 0,04 mm (Standard) (1)\* < 0,02 mm (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

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



Sample ordering code:

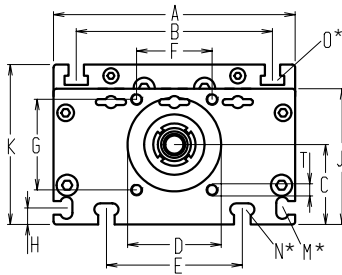
DST160, trapezoidal right hand thread, with internal profile and cover bands, standard carriage, one shaft (locating bearing side), spindle 24x5, 1240 mm stroke.



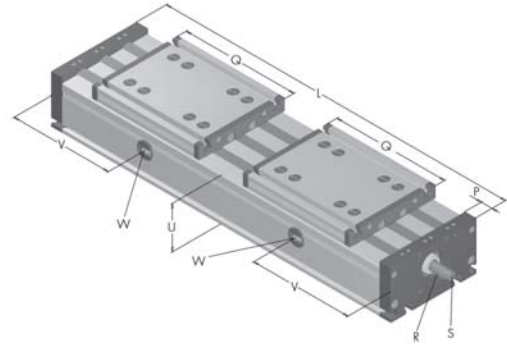
# Positioning system DST/DSK 120, 160, 200

Dimensions (mm)

with trapezoidal thread or ballscrew, right-hand and left-hand thread or divided spindles



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



\*For slide-nuts refer to chapter 2.2 page 2 V = Q + 100 mm W = servicing position

Size	Basic length L	A	B	C	D	E	F	G	H	J	K	M for	N for	O for	P	Q	Shaft		T	U	Basic weight	Weight per 100 mm
																	R Key	S Ø x length				
DS 120	360	120	96	39	47	78	42	42	10	68	79	M 5	M 6	M 6	15	156	3x3x25	10 h6 x 27	M 6	60	5,1 kg	0,92 kg
DS 160	470	160	130	53	62	90	50	60	11	90	106	M 6	M 8	M 8	20	200	5x5x28	14 h6 x 35	M 8	80	10,1 kg	2,1 kg
DS 200	590	200	160	66	68	140	60	60	15	110	129	M 8	M 10	M 10	20	270	6x6x40	22 h6 x 45	M 8	100	35,9 kg	3,5 kg

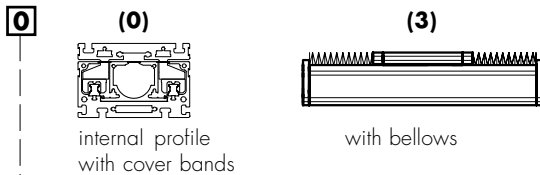
**Spindle:**

**T** (T) Trapezoidal thread (K) Ballscrew

**Selection of screw:**

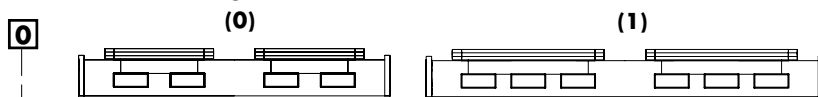
**3** (3) right - left hand (ballscrew by inquiry) (4) divided spindle

**Choice of guide body profile:**



Stainless versions upon request.

**Choice of carriages:**



Size	Version 0		Version 1	
	Q	L	Q	L
120	156	360	156	360
160	200	470	>230	>530
200	270	590	>310	>680

**Choice of journal:**

(0) shaft right hand thread (1) shaft left hand thread (2) shaft on both sides

**Selection of screw:**

	Size	Standard	Multistart-screw
Ballscrew right hand	120	(0) 25x5	(1) 20x20* (2) 25x10*
	160	(0) 32x5	(1) 32x10* (2) 32x20* (3) 32x32*
	200	upon request	
Ballscrew left hand	120	(0) 18x4	(1) 18x8
	160	(0) 24x5	(1) 24x10
	200	(0) 32x6	(1) 32x12
Trapezoidal right hand thread	120	(0) 18x4	(1) 18x8
	160	(0) 24x5	(1) 24x10
	200	(0) 32x6	(1) 32x12
Trapezoidal left hand thread	120	(0) 18x4	(1) 18x8
	160	(0) 24x5	(1) 24x10
	200	(0) 32x6	(1) 32x12

\* = only for selection of divided spindle

**Ballscrew pitch accuracy:**

(0) 0,1 mm / 300 mm (Standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**End play of ball nut:**

(0) 0,04 mm (Standard) (1)\* < 0,02 mm (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

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

**DST T 160 3 0 0 0 0 0 0 0 1500**  
Pos. 1 2 3 4 5 6 7

Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 - 4.2.



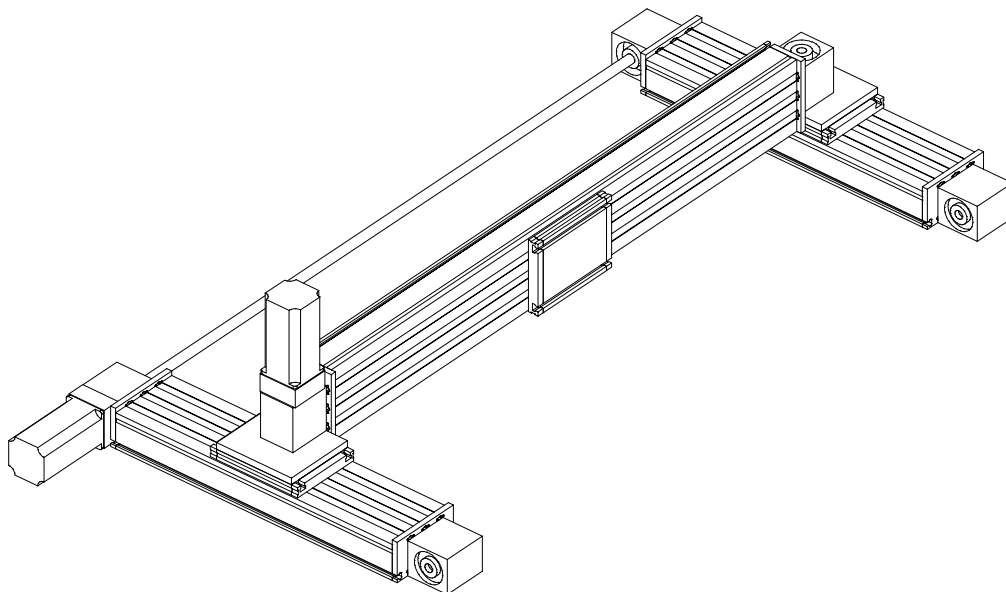
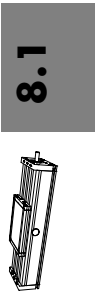
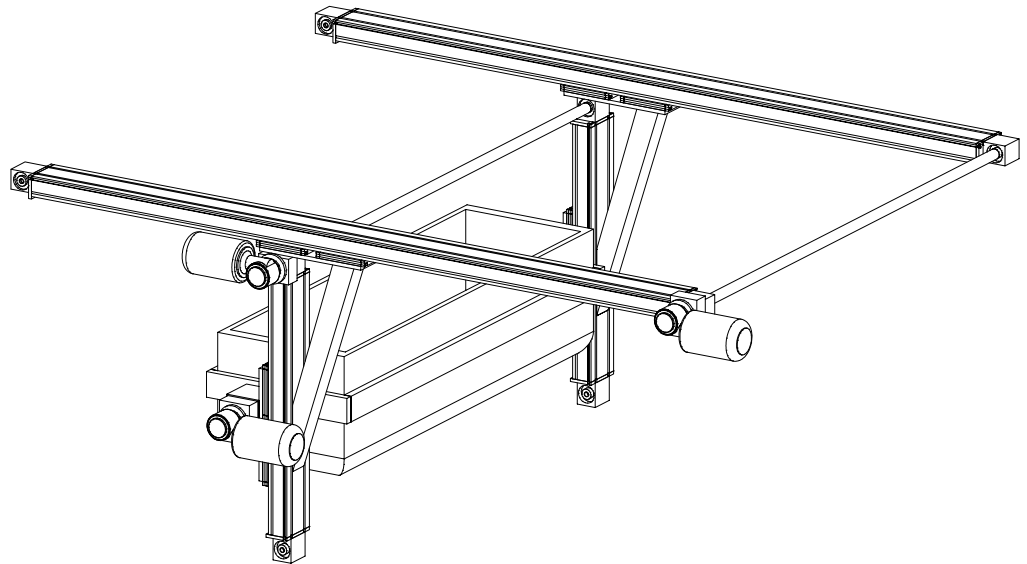
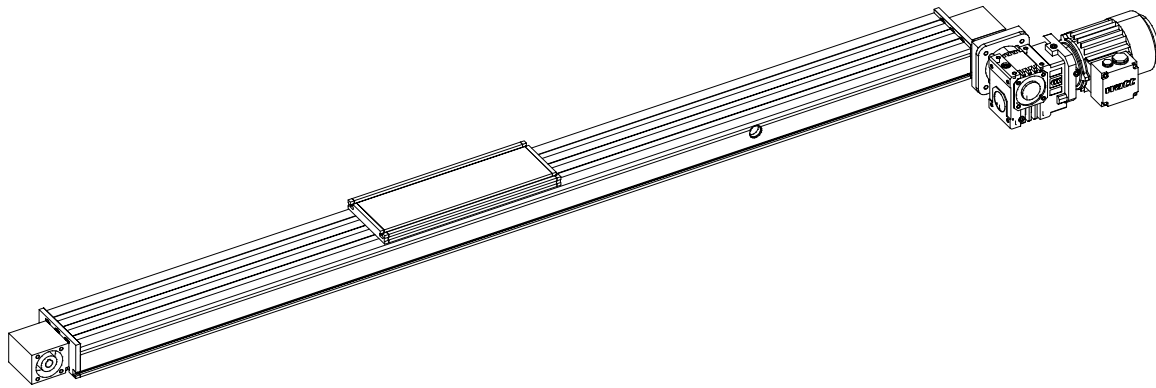
Sample ordering code:

DST160, trapezoidal right - left hand thread, with internal profile and cover bands, standard carriage, shaft on right hand thread, spindle 24x5, 1030 mm stroke.



## Possible mounting styles

DS-belt drives



# Positioning system DSZ 120, 160, 200

Specifications

## Belt drive



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated rail guidances. The carriage is moved by a belt drive. Each standard pulley has got one coupling claw on one side. 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. The openings of the guide body are sealed with 3 stainless steel cover bands to protect the guide from splash water and dust. Alternatively, the opening can also be covered with a bellow or can be delivered without cover bands.

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

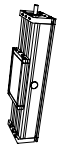
**Carriage mounting:** By T-slots.

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

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

**Carriage support:** In the standard version, the carriage runs on 4 runner blocks which can be serviced at a central servicing position. For longer carriages the number of runner blocks can be increased.

8.1



Forces and torques	Size	120		160		200	
	permitted dyn. Forces*	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km
$F_x$ (N)	894	800	1900	1800	4000	3800	
$F_y$ (N)	1776	1405	2236	1775	5155	4092	
$F_z$ (N)	2090	1650	5278	4189	11311	8977	
$M_x$ (Nm)	81	64	282	224	752	597	
$M_y$ (Nm)	97	77	283	225	813	646	
$M_z$ (Nm)	96	76	300	238	862	684	
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$							
values of table $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$							
<b>No-load torque</b>							
without cover bands	1,2		1,5		2,0		
with cover bands	1,6		2,1		2,9		
<b>Speed</b>							
(m/sec) max	5		5		5		
<b>Tensile force</b>							
permanent (N)	900		1900		4000		
0,2 sec (N)	1000		2090		4300		
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>	5,61x10 <sup>5</sup>		2,13x10 <sup>6</sup>		4,81 x10 <sup>6</sup>		
$I_y$ mm <sup>4</sup>	34,19x10 <sup>5</sup>		12,33x10 <sup>6</sup>		26,0 x10 <sup>6</sup>		
Elastic modulus N/mm <sup>2</sup>	70000		70000		70000		

\* referred to life-time

### Formula: DSZ

Driving torque:

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

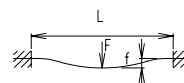
F = force (N)  
P = pulley action perimeter (mm)  
S<sub>s</sub> = safety factor 1,2 ... 2

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

M<sub>leer</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:

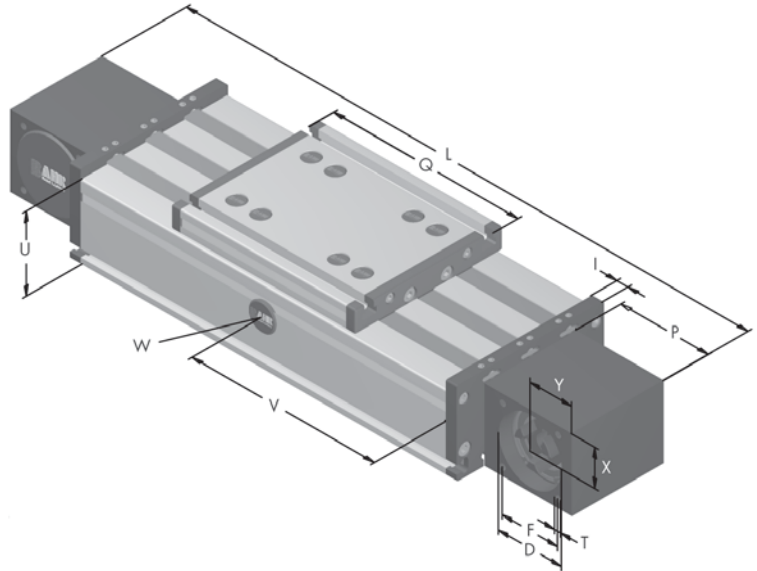
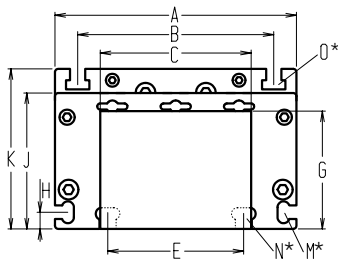
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



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

# Positioning system DSZ 120, 160, 200

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  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size	Basic length L	A	B	C	D	E	F	G	H	I	J	K	M for	N for	O for	P	Q	T	U	X	Y	Basic weight	Weight per 100 mm
DSZ 120	330	120	96	80	47	78	42	60	10	10	68	79	M 5	M 6	M 6	70	156	M 6	60	30	35	5,1 Kg	0,85 Kg
DSZ 160	440	160	130	100	68	90	60	78	11	12	90	106	M 6	M 8	M 8	95	200	M 8	80	39	45	12,0 kg	1,9 kg
DSZ 200	530	200	160	130	90	140	80	97	15	15	110	129	M 8	M 10	M 10	110	270	M 10	100	49	50	21,3 kg	2,9 kg

### Choice of guide body profile:

(0) internal profile with cover bands  
 (1) internal profile without cover bands  
 (2) without internal profile and cover bands  
 (3) with bellows

**Stainless versions upon request.**

### Choice of carriages:

(0)  (1)

Size	Version 0		Version 1	
	Q	L	Q	L
120	156	330	156	330
160	200	440	>230	>470
200	270	530	>310	>570

### Coupling - Selection of shaft mounting:

(0) 0 1 2 3 4 5 6 7 8 9

9 is as 0, but with coupling claws on both sides.  
The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings or tension sets (size 200).

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
0 4	120	5M25	130	26
0 7	160	8M30	176	22
0 9	160	8M50	176	22
0 9	200	8M50	224	28

### Shaft dimensions

Size	Shaft $\varnothing$ hó x length	Key
120(8M25)	10 x 35	5x5x28
160(8M30)	18 x 45	6x6x40
160(8M50)	25 x 35	8x8x32
200(8M50)	22 x 45	6x6x40

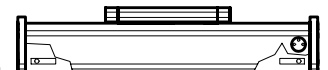
Basic length + stroke = total length

DSZ 160 1 0 0 0 0 7 1 01500

Sample ordering code:

DSZ160 with internal profile and cover bands, standard carriage, coupling claw on one side, 1060 mm stroke.

Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 - 4.2.

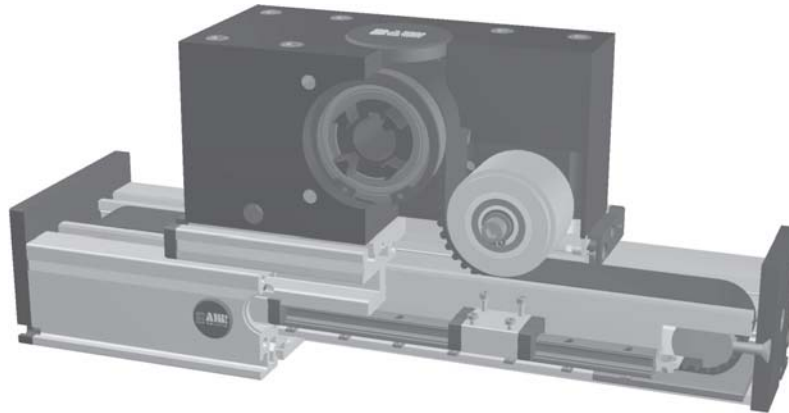


8.1

# Positioning system DSSZ 120, 160, 200

Specifications

## Belt drive



### Function:

This linear unit consists of a rectangular aluminium profile with integrated rail guidance. The carriage which has runner blocks is driven by a timing belt. Each standard pulley includes a coupling claw on one side and is equipped with 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 and mounting sets. The linear axis can be combined with any T-slot profile.

### Belt performance:

HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

### Carriage support:

In the standard version, the carriage runs on 4 runner blocks which can be serviced at a central servicing position. For longer carriages the number of runner blocks can be increased.

8.1



Forces and torques	Size	120		160		200	
	permitted dyn. Forces*	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km
$F_x$ (N)		1900	1800	4000	3800	5900	5750
$F_y$ (N)		1776	1405	2236	1775	15600	11080
$F_z$ (N)		2090	1650	5278	4189	20600	14600
$M_x$ (Nm)		81	64	282	224	1285	915
$M_y$ (Nm)		97	77	283	225	1375	980
$M_z$ (Nm)		96	76	300	238	1345	960
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y,dyn}} + \frac{F_z}{F_{z,dyn}} + \frac{M_x}{M_{x,dyn}} + \frac{M_y}{M_{y,dyn}} + \frac{M_z}{M_{z,dyn}} \leq 1$							
values of table							
<b>No-load torque</b>							
(Nm)		1,4		1,8		2,2	
<b>Speed</b>							
(m/sec) max		5		5		5	
<b>Tensile force</b>							
permanent (N)		1900		4000		5900	
0,2 sec (N)		2090		4300		6350	
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>		5,61x10 <sup>5</sup>		2,13x10 <sup>6</sup>		48,07 x10 <sup>5</sup>	
$I_y$ mm <sup>4</sup>		34,19x10 <sup>5</sup>		12,33x10 <sup>6</sup>		259,99 x10 <sup>5</sup>	
Elastic modulus N/mm <sup>2</sup>		70000		70000		70000	

\* referred to life-time

### Formula: DSSZ

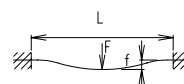
Driving torque:

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

F = force (N)  
 P = pulley action perimeter (mm)  
 S<sub>s</sub> = safety factor 1,2 ... 2  
 M<sub>leer</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:

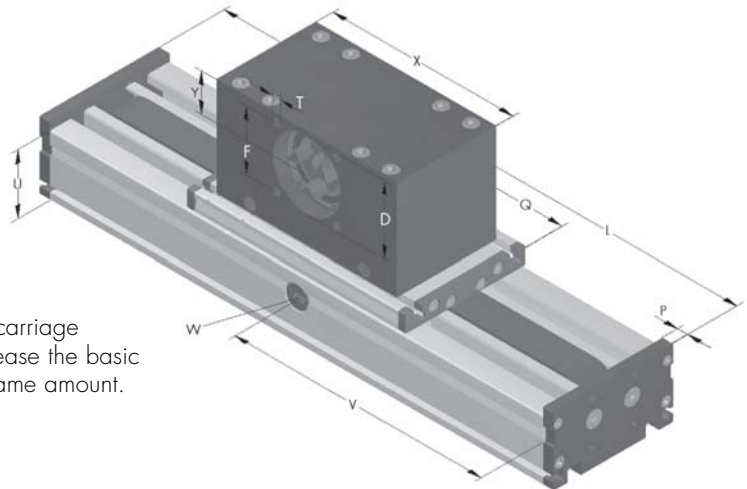
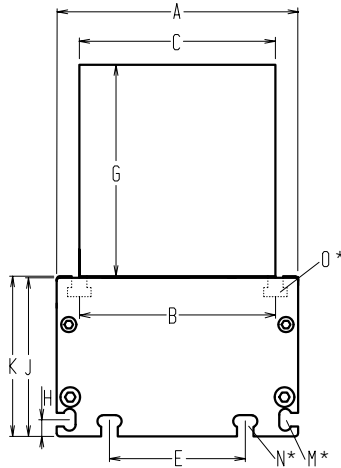
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



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 DSSZ 120, 160, 200

Dimensions (mm)

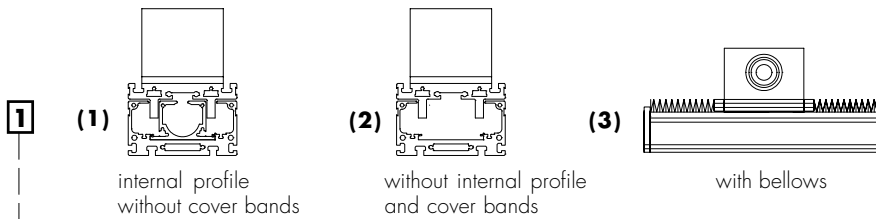


Increasing the carriage length will increase the basic length by the same amount.

\*For slide-nuts refer to chapter 2.2 page 2  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size	Basic length L	A	B	C	D	E	F	G	H	J	K	M for	N for	O for	P	Q	R	S	T	U	X	Y	Basic weight	Weight per 100 mm
DSSZ 120	230	120	96	100	68	78	60	100	10	78	79	M 5	M 6	M 6	10	200	39	42	M 8	60	180	39	12,0 kg	1,2 kg
DSSZ 160	330	160	130	130	90	90	80	140	11	105	106	M 6	M 8	M 8	12	290	53	60	M 10	80	270	60	27,8 kg	1,8 kg
DSSZ 200	380	200	160	160	110	140	100	145	15	128	129	M 8	M 10	M 10	15	340	69	95	M 10	100	310	62	53,0 kg	2,6 kg

### Choice of guide body profile:



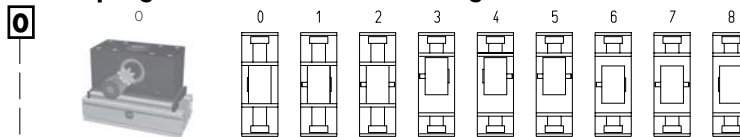
Stainless versions upon request.

### Choice of carriages:



Size	Version 0		Version 1	
	Q	L	Q	L
120	200	230	200	230
160	290	330	>370	>410
200	340	380	360	400

### Coupling - Selection of shaft mounting:



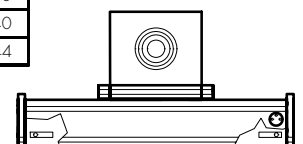
8 is as 0, but with coupling claws on both sides. The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings or tension sets (size 200).

### Belt table

Code No.	Size	Belt	mm/rev.	Number of teeth
0 7	120	8M30	192	24
0 9	160	8M50	256	32
1 0	200	8M70	304	38

### Shaft dimensions

Size	Shaft $\varnothing h6 \times \text{length}$	Key
120	18 x 45	6x6x40
160	22 x 45	6x6x40
200	30 x 55	8x7x44



Basic length + stroke = total length

DSSZ 160 1 1 0 0 0 9 2 01500  
Pos. 1 2 3 4 5 6 7

Sample ordering code:

DSSZ160, body profile with internal profile without cover bands, standard carriage, coupling claws on one side, 1170 mm stroke

Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 – 4.2.

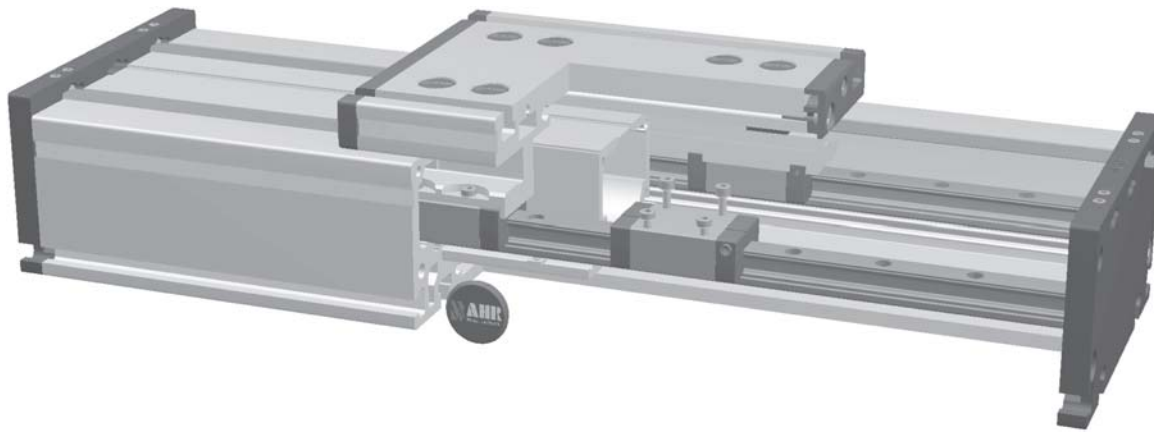
8.1



# Positioning system DSR 120, 160, 200

Specifications

## Roller unit without drive



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated rail guidances. The openings of the guide body are sealed with 3 stainless steel cover bands to protect the guide from splash water and dust. Alternatively, the opening can also be covered with a bellow or can be delivered without cover bands. The positioning system can be either driven by an internal pneumatic cylinder or other additional drives or it serves as load carrying linear slide.

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

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

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

**Carriage support:** In the standard version, the carriage runs on 4 runner blocks which can be adjusted and serviced at a central servicing position. For longer carriages the number of runner blocks can be increased.

8.1



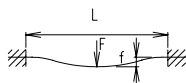
Forces and torques	Size	120		160		200	
	permitted dyn. Forces*	5000 km	10000 km	5000 km	10000 km	5000 km	10000 km
$F_x$ (N)		1776	1405	2236	1775	5155	4092
$F_z$ (N)		2090	1650	5278	4189	11311	8977
$M_x$ (Nm)		81	64	282	224	752	597
$M_y$ (Nm)		97	77	283	225	813	646
$M_z$ (Nm)		96	76	300	238	862	684
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$							
values of table							
<b>Speed</b>							
(m/sec) max		5		5		5	
<b>Geometrical moments of inertia of aluminium profile</b>							
$I_x$ mm <sup>4</sup>		5,61x10 <sup>5</sup>		2,13x10 <sup>6</sup>		4,81 x10 <sup>6</sup>	
$I_y$ mm <sup>4</sup>		34,19x10 <sup>5</sup>		12,33x10 <sup>6</sup>		26,0 x10 <sup>6</sup>	
Elastic modulus N/mm <sup>2</sup>		70000		70000		70000	

\* referred to life-time

### Formula: DSR

Deflection:

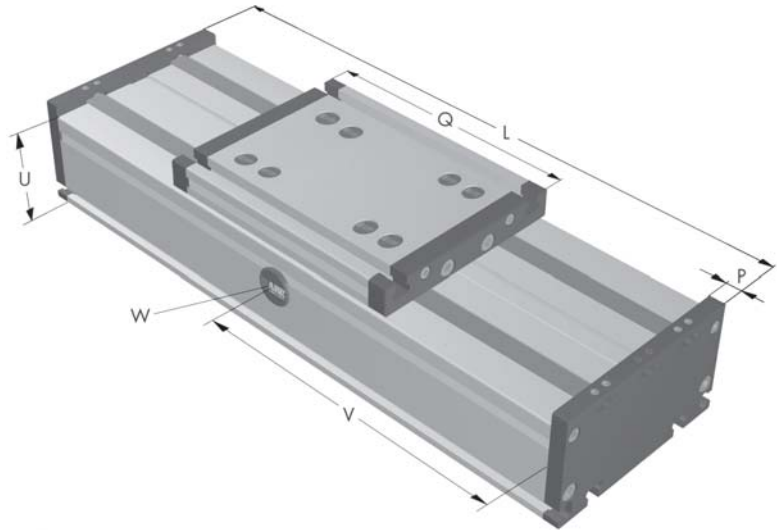
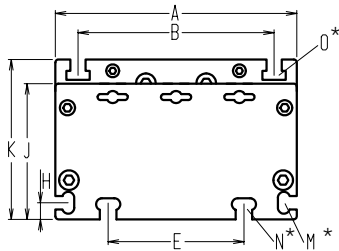
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



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 DSR 120, 160, 200

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  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	Basic length L	A	B	E	H	J	K	M for	N for	O for	P	Q	U	Basic weight	Weight per 100 mm
DSR 120	200	120	96	78	10	68	79	M 5	M 6	M 6	10	156	60	3,2 kg	0,71 kg
DSR 160	240	160	130	90	11	90	106	M 6	M 8	M 8	12	200	80	7,0 kg	1,5 kg
DSR 200	320	200	160	140	15	110	129	M 8	M 10	M 10	15	270	100	15,0 kg	2,9 kg

### Choice of guide body profile:

(0) internal profile with cover bands  
 (1) internal profile without cover bands  
 (2) without internal profile and cover bands  
 (3) with bellows

Stainless versions upon request.

### Choice of carriages:

(0)  (1)

Size	Version 0		Version 1	
	Q	L	Q	L
120	156	200	156	200
160	200	240	>230	>270
200	270	320	>310	>360

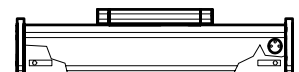
**1500** Basic length + stroke = total length

DSR 160 0 0 0 0 0 0 0 0 0 01500  
Pos. 1 2 3 4 5 6 7

Sample ordering code:

DSR160, with internal profile and cover bands, standard runner blocks, 1260 mm stroke.

Inductive proximity switch sets, which can be mounted inside of the square profile, are available as accessories. Coupling and a special plug are mounted from the outside. For additional accessories refer to chapter 2.2 – 4.2.

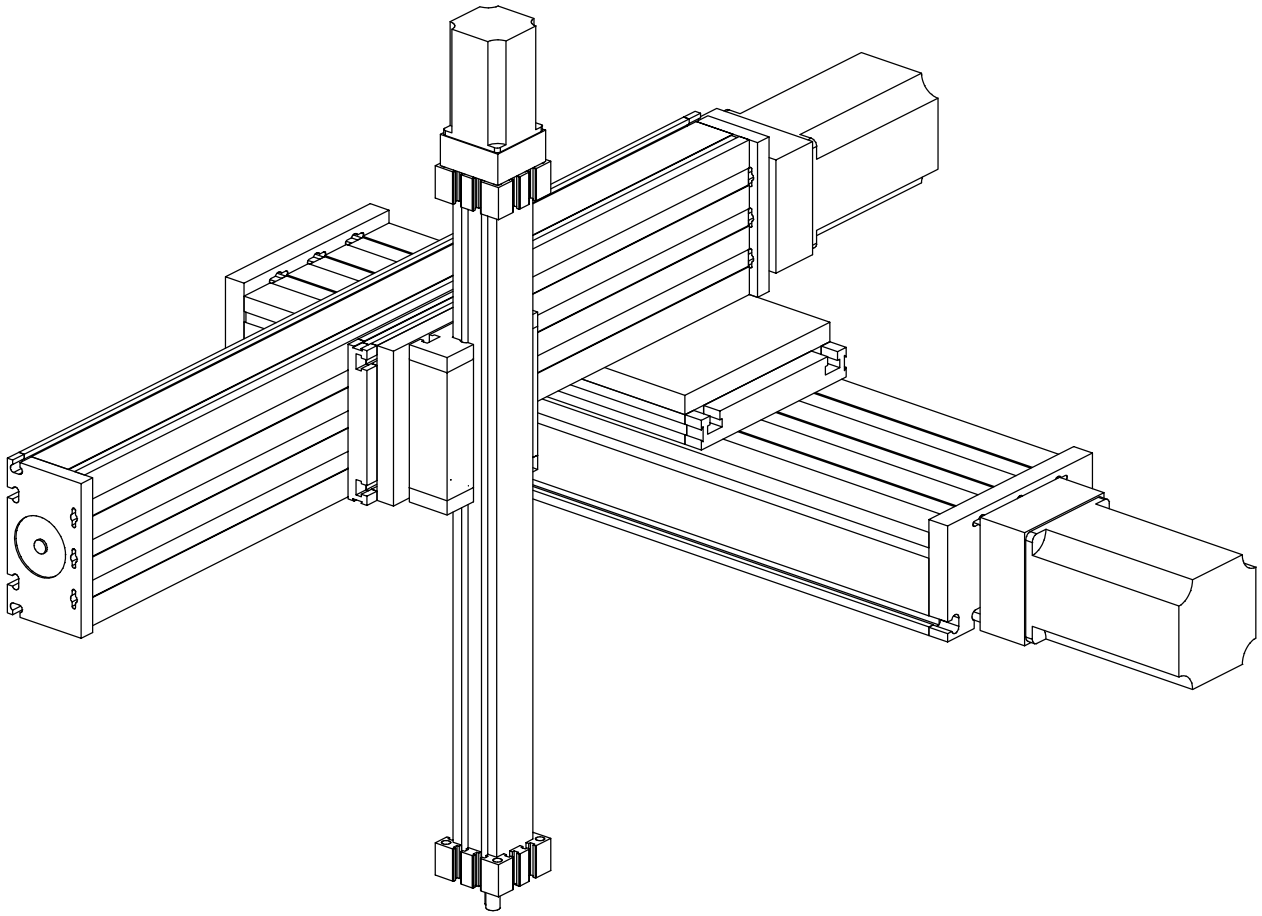


8.1



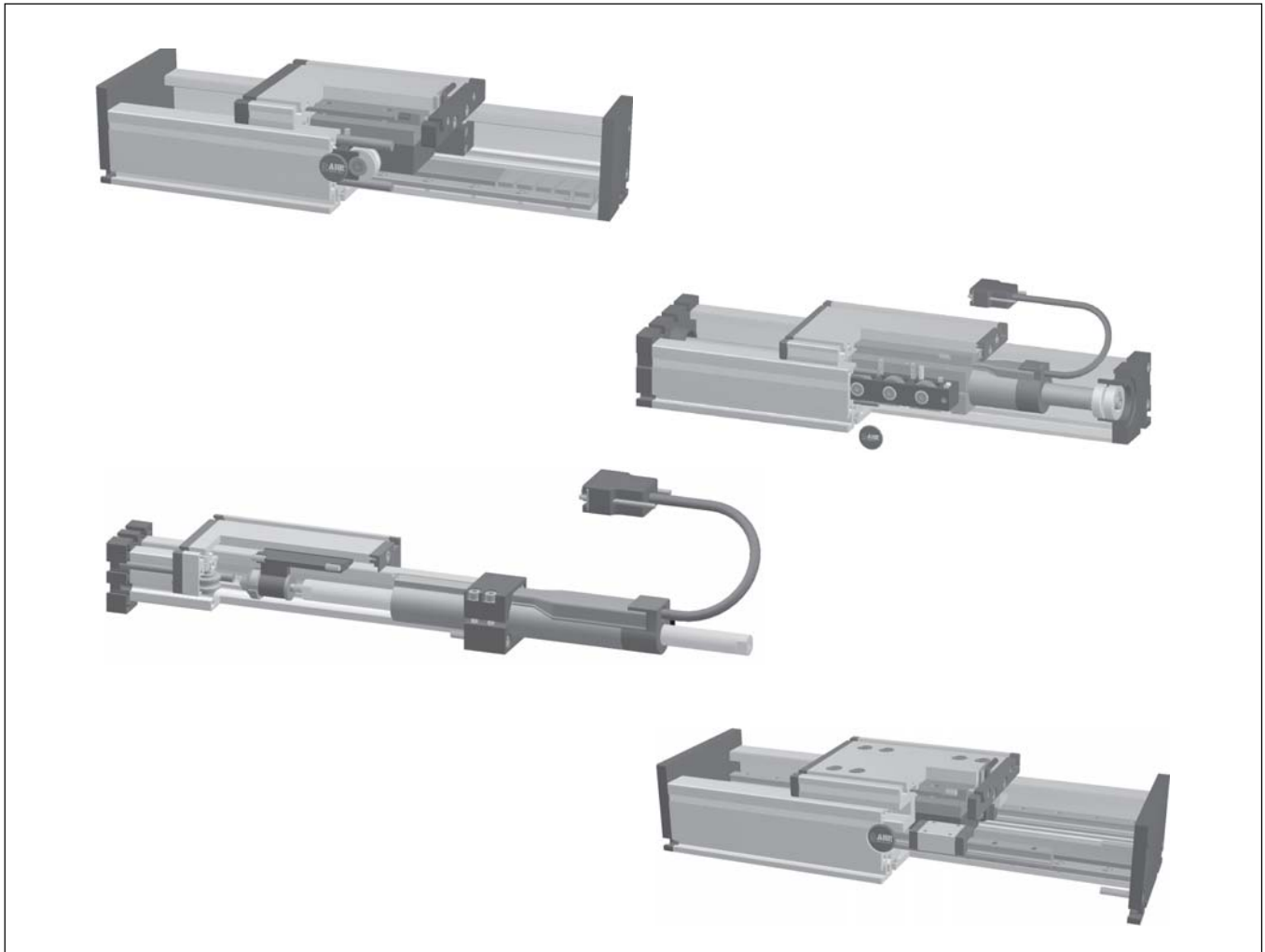
## Possible mounting styles

DS-units

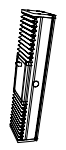


8.1





9.1



Roller guide  
positioning systems  
DLM, DLVM, DLP, ELP

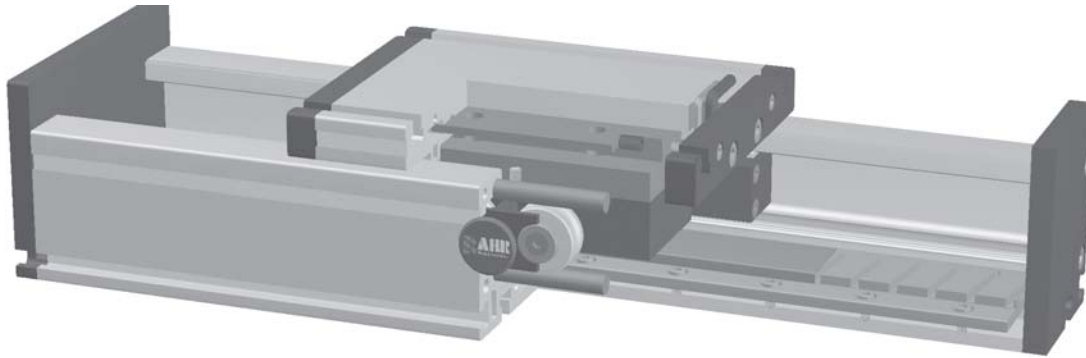
Rail guide  
positioning system  
DSM



# Positioning system DLM 120, 160, 200

Specifications

## Linear motor drive



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated roller guides. The linear-motor DLM unit is based on the principle of a linear, synchronous AC motor.

The guiding profile is fitted with permanent magnets as stator (secondary part). The carriage is fitted with the actuator (primary part). The magnetic attraction causes a force between carriage and guiding profile also in the absence of current. This force can be used for the initial tension of the bearings. Several carriages (primary parts) can be driven independently on one guiding profile.

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

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

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any Tslot profile.

**Carriage support:** In the standard version, the carriage runs on 10 or 12 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

Repeatability  $\pm 0,05$  mm. Repeated accuracy max.  $\pm 0,05$  bis 4.000 mm,  $\pm 0,1$  >4.000 mm.

Forces and torques	Size	120			160			200		
	Motor size	1	2	3	1	2	3	1	2	3
	<b>Forces/Torques dyn</b>									
	$F_z$ (N)	600	1200	1800	1200	1800	5500	3600	5500	11000
	$F_{zm}$ (N)	820	1640	2460	1590	8800	7030	5000	7500	13800
	$F_y$ (N)	700	700	470	1500	1000	450	3300	2200	1200
	$M_x$ (Nm)	180	90	60	280	190	130	600	400	220
	$M_y$ (Nm)	50	100	70	320	210	140	640	420	230
	$M_z$ (Nm)	22	33	50	90	100	120	200	170	210
	Number of rollers	10	12	12	12	12	12	12	12	12
<b>All forces and torques related to the following:</b>										
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_{zm}}{F_{zm_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1,5$										
<b>Motor specifications Fx</b>										
	Motor size	1	2	3	1	2	3	1	2	3
	Carriage weight (kg)	1,7	2,5	3,1	5,1	4,7	5,4	9,4	10,5	12,7
	Weight primary part (kg)	0,7	1,4	2,0	1,4	3,7	5,2	4,5	6,4	8,4
	permanent (N)	61	115	173	115	271	406	383	574	766
	Max. (N) (1 sek.)	162	323	485	323	607	911	868	1301	1735
<b>Moving force without current</b>										
	N	3	5	6	5	8	9	7	11	12
<b>Speed</b>										
	(m/sec) max	4			6			6		
<b>Geometrical moments of inertia of aluminium profile</b>										
	$I_x$ mm <sup>4</sup>	$6,6 \times 10^5$			$22,2 \times 10^5$			$63,8 \times 10^5$		
	$I_y$ mm <sup>4</sup>	$38,6 \times 10^5$			$122,0 \times 10^5$			$335,0 \times 10^5$		
	Elastic modulus N/mm <sup>2</sup>	70000			70000			70000		

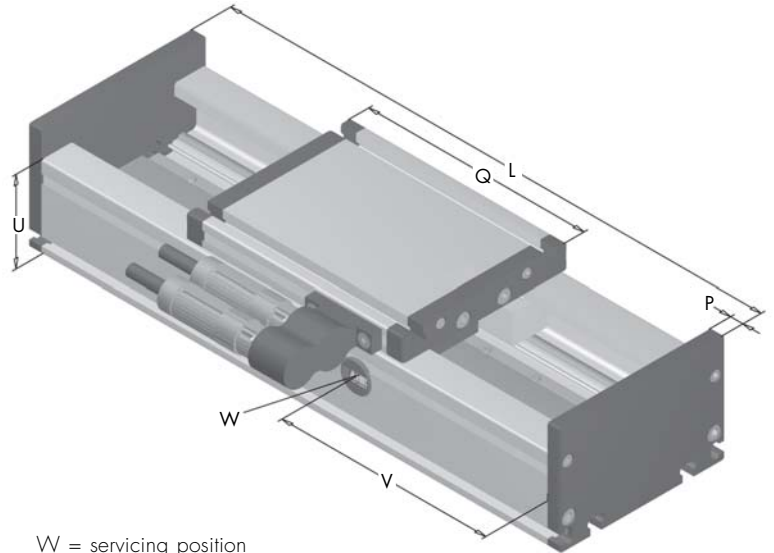
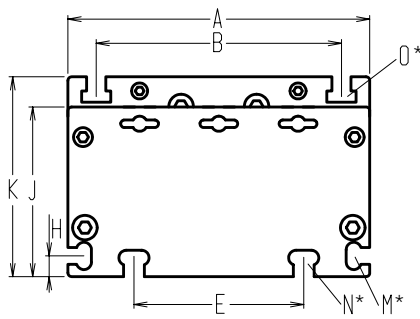
### Formula: DLM

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

$f$  = 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 DLM 120, 160, 200

Dimensions (mm)

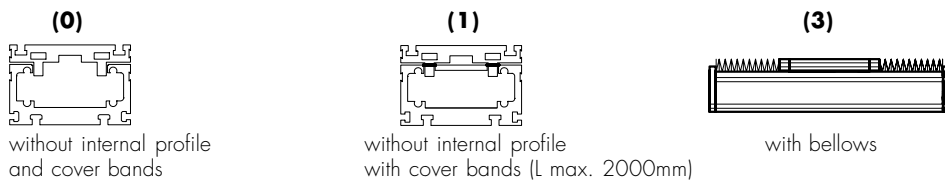


Increasing the carriage length will increase the basic length by the same amount.

\*For slide-nuts refer to chapter 2.2 page 2       $V = Q + 100 \text{ mm}$        $W = \text{servicing position}$

Size □	Basic length L	A	B	E	H	J	K	M for	N for	O for	P	U	Basic weight Motor size 1/2/3	Weight per 100 mm Motor size 1/2/3
<b>DLM 120</b>	Q + 30	120	96	78	10	68	79	M 5	M 6	M 6	10	60	5,2/7,2/9,2 Kg	1,0/1,0/1,0 Kg
<b>DLM 160</b>	Q + 30	160	130	90	11	90	106	M 6	M 8	M 8	12	80	12,6/15,6/20,7 Kg	1,6/2,0/2,0 Kg
<b>DLM 200</b>	Q + 35	200	160	140	15	110	129	M 8	M 10	M 10	15	100	26,9/30,5/37,9 Kg	2,6/2,6/2,6 Kg

**0 Choice of guide body profile:**



Stainless version upon request.

**1 Measurement system**

- (1) Measurement system LE100 5V Resolution 0.05
- (2) Measurement system LE100 24V Resolution 0.05
- (3) Hall sensor
- (4) Measurement system provided by customer

**1 Plug**



**1 Motor size**

- (1) Motor size 1 with  $Q_1$
  - (2) Motor size 2 with  $Q_2$
  - (3) Motor size 3 with  $Q_3$
  - (4) Supply with  $Q_1^*$
  - (5) Supply with  $Q_2^*$
  - (6) Supply with  $Q_3^*$
- \* = provided by customer

Dimensioning criteria for motor output						
	$l_p \leq$	$b_p \leq$	$h_{ps} \leq$	$Q_1$	$Q_2$	$Q_3$
<b>120</b>	Q - 70	55	38	196	276	372
<b>160</b>	Q - 70	71	50	316	360	461
<b>200</b>	Q - 70	85	62	410	444	610

$l_p$  = length primary part;  $b_p$  = width primary part;

$h_{ps}$  = height primary part + height secondary part + interspaces primary-/secondary part

For standard carriage length see 'Q' in table.  
Digital - controllers and linear - encoder refer to chapter 9.1 page 8 .

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

**DLM 160 0 0 1 1 0 0 1 01500**

Pos. 1 2 3 4 5 6 7

Sample ordering code:

DLM160, Bahr Modultechnik Linearmotor, standard body profile, Measurement system LE100 5V, Plug Pos. 1, motor size 1, 1154 mm stroke.



# Positioning system DLVM 200

Specifications

## Linear motor drive



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated roller guides. The linear-motor DLVM unit is based on the principle of a linear, synchronous AC motor.

The guiding profile is fitted with permanent magnets as stator (secondary part). The carriage is fitted with the actuator (primary part). The magnetic attraction causes a force between carriage and guiding profile also in the absence of current. This force can be used for the initial tension of the bearings. Several carriages (primary parts) can be driven independently on one guiding profile.

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

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

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

**Carriage support:** In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.  
Repeatability ± 0,05 mm. Repeated accuracy max. ± 0,05 bis 4.000 mm, ± 0,1 >4.000 mm.

Forces and torques		Size	200
		<b>Motor size</b>	3
		<b>Forces/Torques dyn</b>	
		$F_g$ (N)	11000
		$F_{zm}$ (N)	13800
		$F_y$ (N)	1200
		$M_x$ (Nm)	220
		$M_y$ (Nm)	230
		$M_z$ (Nm)	210
		Number of rollers	12
<b>All forces and torques related to the following:</b>			
existing values		$\frac{F_y}{F_{y_{dyn}}} + \frac{F_{zm}}{F_{zm_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1,5$	
values of table			
<b>Motor specifications Fx</b>			
Motor size		3	
Carriage weight (kg)		12,7	
Weight primary part (kg)		8,4	
permanent (N)		766	
Max. (N) (1 sek.)		1735	
<b>Moving force without current</b>			
N		12	
<b>Speed</b>			
(m/sec) max		6	
<b>Geometrical moments of inertia of aluminium profile</b>			
$I_x$ mm <sup>4</sup>		6,38x10 <sup>6</sup>	
$I_y$ mm <sup>4</sup>		33,5x10 <sup>6</sup>	
Elastic modulus N/mm <sup>2</sup>		70000	

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

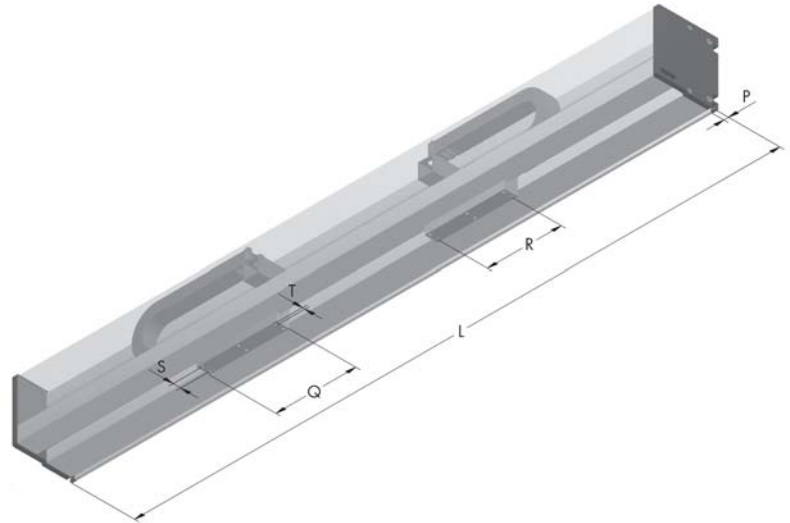
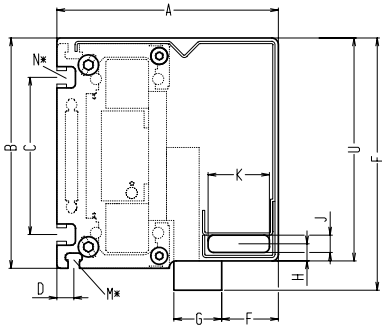
### Formula: DLVM

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

$f$  = 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 DLVM 200

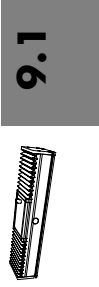
Dimensions (mm)



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	M for	N for	P	Q	R	S	T for	U	Basic weight	Weight per 100 mm
DLVM 200	602	197	205	140	15	224,5	50,5	42,5	15	15,5	54,5	M 8	M 10	15	567	240	25	M 8	198,5	39,4 kg	2,8 kg



9.1

**1500**

Basic length + stroke = total length

DLVM 200 0 0 0 0 0 0 1 01500

Pos. 1 2 3 4 5 6 7

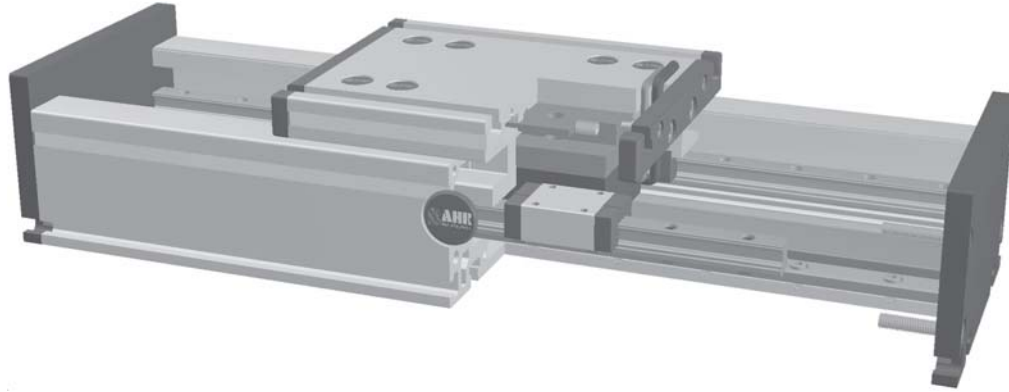
Sample ordering code:  
DLVM200, 898 mm stroke.



# Positioning system DSM 160, 200

Specifications

## Linear motor drive



### Function:

This unit consists of a rectangular aluminium profile with 2 integrated rail guidance. The linear-motor DSM unit is based on the principle of a linear, synchronous AC motor. The guiding profile is fitted with permanent magnets as stator (secondary part). The carriage is fitted with the actuator (primary part). The magnetic attraction causes a force between carriage and guiding profile also in the absence of current. This force can be used for the initial tension of the bearings. Several carriages (primary parts) can be driven independently on one guiding profile.

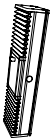
**Fitting position:** As required. Max. length 6.000 mm without joints.

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

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

**Carriage support:** In the standard version, the carriage runs on 4 runner blocks which can be serviced at a central servicing position. For longer carriages the number of runner blocks can be increased. Repeatability ± 0,05mm mm. Repeated accuracy max. ± 0,05mm bis 4.000 mm, ± 0,1 >4.000 mm.

9.1

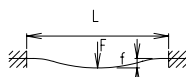


Forces and torques	Size	160			200		
	Motor size	1	2	3	1	2	3
	permitted dyn. Forces*	10000 km			10000 km		
	F <sub>a</sub> (N)	1200	1800	5500	3600	5500	11000
	F <sub>zm</sub> (N)	1590	2800	7030	4990	7640	13860
	F <sub>z</sub> (N)	1775	1775	3550	4092	4092	8184
	M <sub>x</sub> (Nm)	160	128	153	357	231	462
	M <sub>y</sub> (Nm)	373	351	532	769	556	1540
	M <sub>z</sub> (Nm)	222	261	328	585	654	906
Number of runner blocks	4	4	8	4	4	8	
<b>All forces and torques related to the following:</b>							
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_{zm}}{F_{zm_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1,5$ values of table							
<b>Motor specifications F<sub>x</sub></b>							
Motor size	1	2	3	1	2	3	
Carriage weight (kg)	4,8	5,3	7,1	10,9	11,4	16,9	
Weight primary part (kg)	1,4	3,7	5,2	4,5	6,4	8,4	
permanent (N)	115	271	406	383	574	766	
Max. (N) 1sec.	323	607	911	868	1301	1735	
<b>Moving force without current</b>							
N	30	30	60	40	40	80	
<b>Geometrical moments of inertia of aluminium profile</b>							
I <sub>x</sub> mm <sup>4</sup>	2,13 x 10 <sup>6</sup>			4,81 x 10 <sup>6</sup>			
I <sub>y</sub> mm <sup>4</sup>	12,3 x 10 <sup>6</sup>			26,0 x 10 <sup>6</sup>			
Elastic modulus N/mm <sup>2</sup>	70000			70000			

### Formula: DSM

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>)

Nominal lifetime:

$$L = \left( \frac{C}{F} \right)^3 \times 10^5$$

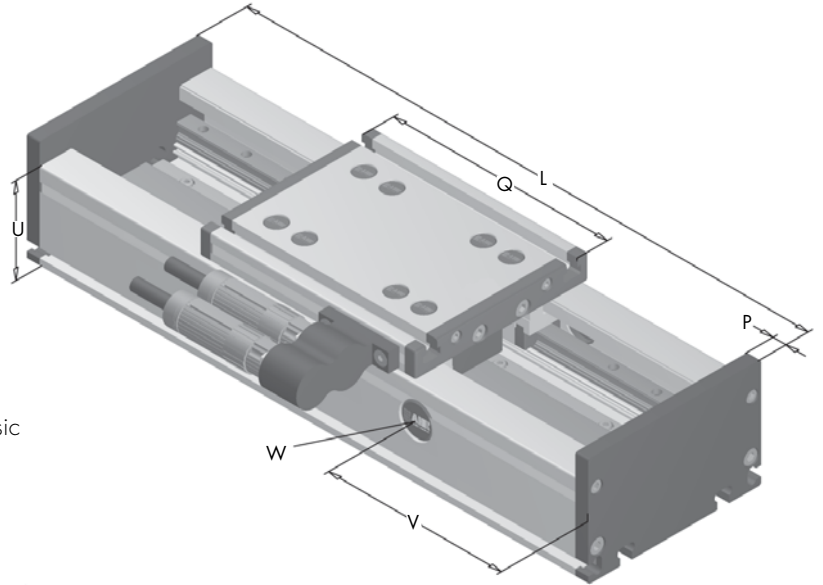
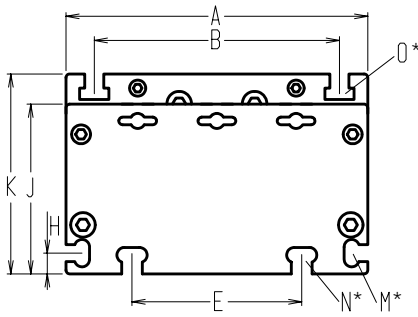
C = Dynamic load faktor (N)  
 F = Middle load (N)

\* referred to life-time



# Positioning system DSM 160, 200

Dimensions (mm)

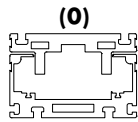


Increasing the carriage length will increase the basic length by the same amount.

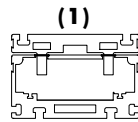
\*For slide-nuts refer to chapter 2.2 page 2  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	Basic length L	A	B	E	H	J	K	M for	N for	O for	P	U	Basic weight Motor size 1/2/3	Weight per 100 mm Motor size 1/2/3
DSM 160	Q + 30	160	130	90	11	90	106	M 6	M 8	M 8	12	80	12,4/16,7/22,6 kg	1,7/2,0/2,0 kg
DSM 200	Q + 35	200	160	140	15	110	129	M 8	M 10	M 10	15	100	30,0 /33,0 /44,2kg	3,1/3,1/3,1 kg

**0 Choice of guide body profile:**



without internal profile and cover bands



without internal profile with cover bands (L max. 2000mm)



with bellows

Stainless version upon request.

**1 Measurement system**

- (1) Measurement system LE100 5V Resolution 0.05
- (2) Measurement system LE100 24V Resolution 0.05
- (3) Hall sensor
- (4) Measurement system provided by customer

**1 Plug**

(1) Plug Pos. 1

(2) Plug Pos. 2

(3) open unconnected cable end



**1 Motor size**

- (1) Motor size 1 with  $Q_1$
  - (2) Motor size 2 with  $Q_2$
  - (3) Motor size 3 with  $Q_3$
  - (4) Supply with  $Q_1^*$
  - (5) Supply with  $Q_2^*$
  - (6) Supply with  $Q_3^*$
- \* = provided by customer

Dimensioning criteria for motor output						
	$l_p \leq$	$b_p \leq$	$h_{ps} \leq$	$Q_1$	$Q_2$	$Q_3$
160	Q - 70	71	50	316	360	461
200	Q - 70	85	62	410	444	610

$l_p$  = length primary part;  $b_p$  = width primary part;  
 $h_{ps}$  = height primary part + height secondary part + interspaces primary-/secondary part

For standard carriage length see 'Q' in table. The carriages can be delivered in any non-standard length upon request; the longer the carriage, the greater the load capacity. Digital - controllers and linear - encoder refer to chapter 9.1 page 8.

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

DSM	160	0	0	1	1	0	0	1	01500
	Pos. 1	2	3	4	5	6	7		

Sample ordering code:

DSM160, Bahr Modultechnik Linear motor, standard body profile, Measurement system LE100 5V, Plug Pos. 1, motor size 1, 1154 mm stroke



## Linear motor controller for DLM - DSM positioning system



### Linear Encoder LE100

Non-contact sensor unit with integrated analog signal output (sinus 1 Vss).

Forming an open linear measuring system if combined with magnetic strip and downstream interpolation electronics.

#### Features:

- + easy mounting
- + insensitive to dust, shavings, humidity
- + signal period 1000  $\mu\text{m}$  (analog)
- + output signals 1 Vss nominal
- + real-time data processing
- + used in combination with magnetic strip MB100

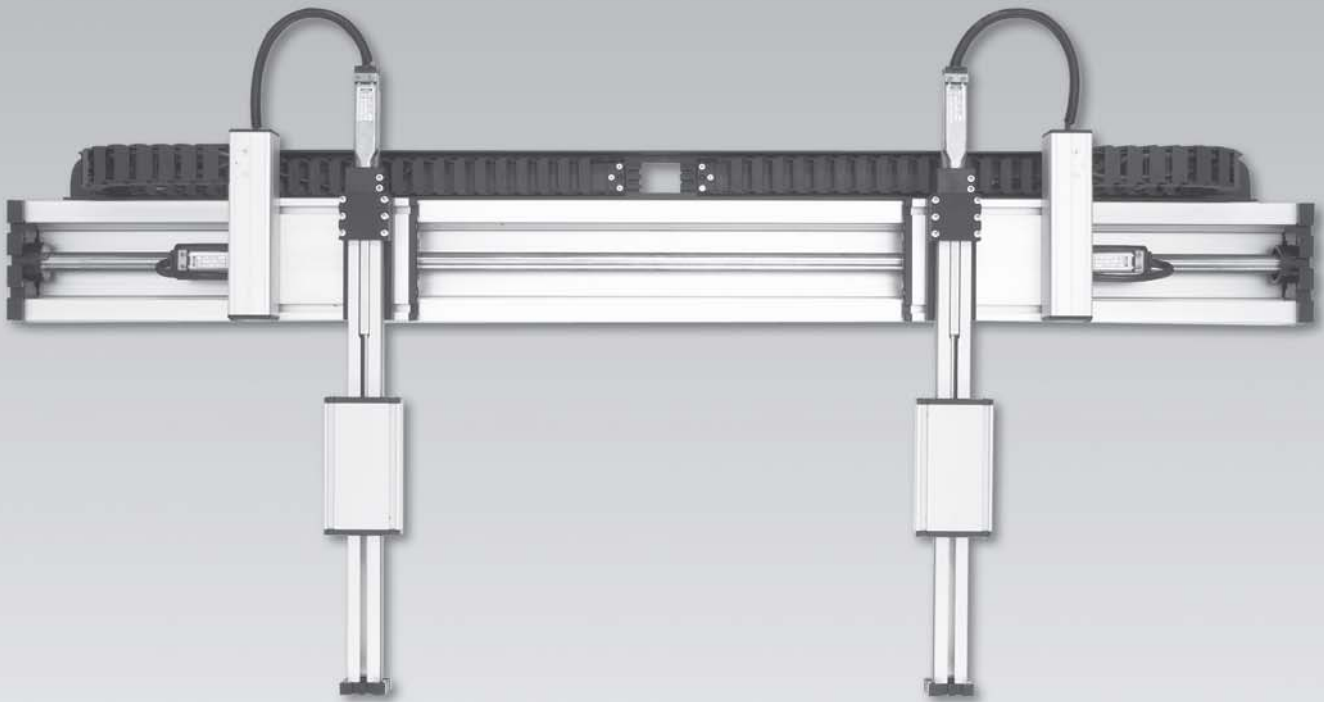
#### Specifications:

- |                                 |   |
|---------------------------------|---|
| + Supply voltage                | 12-24 V DC +/- 20% / 5V<br>optional 5 V DC +/- 5% |
| + Power consumption             | approx. 30 mA non-loaded                          |
| + Protection                    | reverse battery protection                        |
| + Connection                    | flying leads                                      |
| + Material of casing            | plastic   |
| + Output circuit                | line driver                                       |
| + Output signals                | sinusA, B, phase-shifted by 90°                   |
| + Output current                | lout max. 5 mA per signal path                    |
| + Signal size                   | approx. 1 Vss                                     |
| + Travel speed                  | max. 5m/s   |
| + System accuracy               | depending on interpolation<br>electronics         |
| + Gap strip/sensor              | 0,1 - 0,4 mm (without cover strip)                |
| + Working temperature           | 0....+50 °C                                       |
| + Storage temperature           | -20....+85°C                                      |
| + Interference protection class | 3, accord. to ICE 801                             |
| + Test mark                     | CE  |
| + System of protection          | IP 67 accord. to DIN VDE 0470                     |

9.1



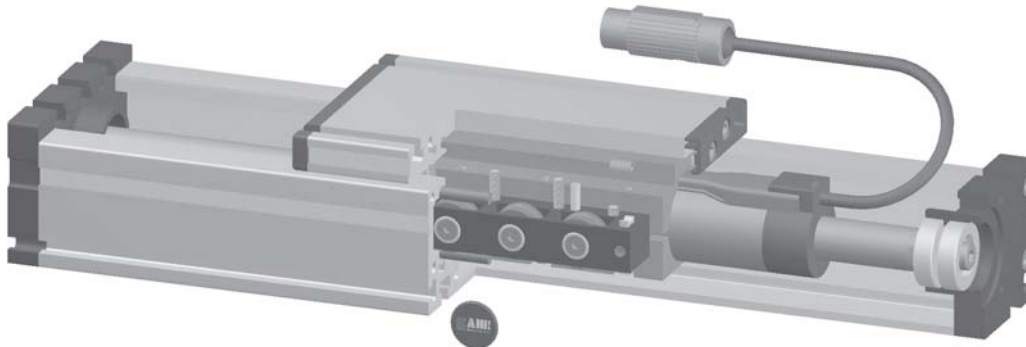
## Possible mounting styles



# Positioning system DLP 120, 160

Specifications

## Linear motor drive



### Function:

The unit consists of a rectangular aluminium profile with two integrated roller guides. The unit DLP is based on the principle of a linear motor. The stator rod (secondary part), which is mounted at the bearing blocks at the end of the unit, is fitted with permanent magnets. The actuator (primary part) is mounted under the carriage and drives the carriage directly. It has got an AC winding, a positioning transmitter and heat detectors against overcharge. Several carriages (primary parts) can be driven independently on one guiding profile.

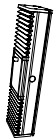
**Fitting position:** As required

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

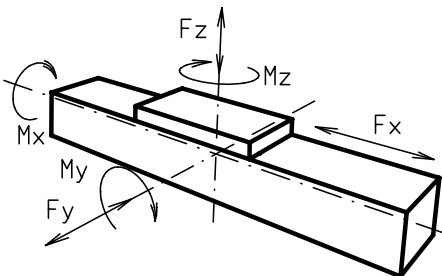
**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

**Carriage support:** In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. Repeatability and accuracy  $\pm 0,1$  mm.

9.1



Forces and torques	Size	120		160	
	Forces/Torques	static	dynamic	static	dynamic
$F_y$ (N)		1100	900	3000	2000
$F_z$ (N)		1250	1000	3500	2800
$M_x$ (Nm)		150	125	400	320
$M_y$ (Nm)		140	120	360	300
$M_z$ (Nm)		100	90	180	150
<b>All forces and torques related to the following:</b>					
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
values of table					
<b>Moving force without current</b>					
N	20				
Motor size	1	2	1		
Motor	P01-37x120	P01-37x240	P01-48x240		
<b>Speed</b>					
max. (m/sec)	4,0	3,1	1,8 / 3,1		
<b>Motor specifications</b> $F_x$ for					
permanent (N)	30	55	150		
Max. (N) (1 sek.)	160	204	580 / 345		
<b>Geometrical moments of inertia of aluminium profile</b>					
$I_x$ mm <sup>4</sup>	6,6x10 <sup>5</sup>		22,2x10 <sup>5</sup>		
$I_y$ mm <sup>4</sup>	38,6x10 <sup>5</sup>		122,8x10 <sup>5</sup>		
Elastic modulus N/mm <sup>2</sup>	70000		70000		



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

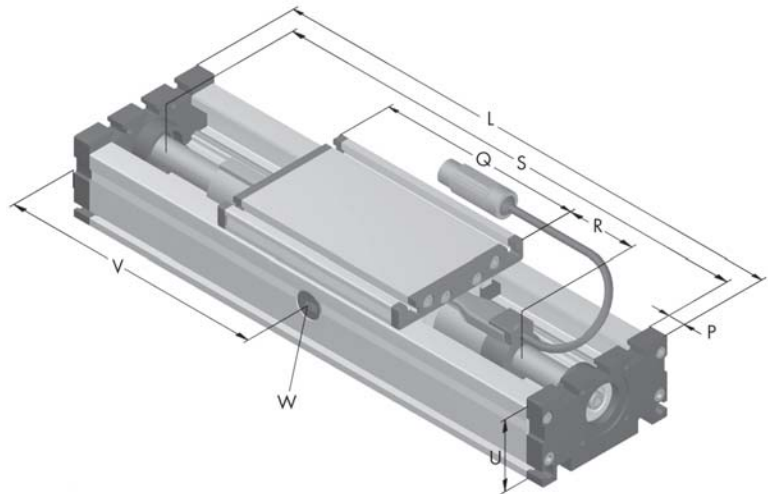
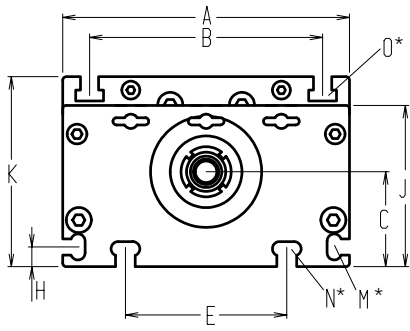
### Formula: DLP

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

$f$  = 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 DLP 120, 160

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  $V = Q + 100 \text{ mm}$   $W = \text{servicing position}$

Size □	A	B	C	E	H	J	K	M for	N for	O for	P	R	Q Motor size 1 / 2	U
DLP 120	120	96	39	78	10	68	79	M 5	M 6	M 6	29	71/191	156 / 156	60
DLP 160	160	130	53	90	11	90	106	M 6	M 8	M 8	30	89,5	200	80

**380+80** Stroke

Stainless version upon request.

Motor size

**1**

DLP 120	Motor size 1 (P01-37x120)									
Motor length	227									
Stroke S*	280+80	380+80	480+80	580+80	680+80	780+80	980+80	1180+80	1380+80	
Length L	651	751	851	951	1051	1151	1351	1551	1751	
Carriage weight with actuator (Kg)	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3	
Total weight (Kg)	8,2	9,1	9,9	10,8	11,7	12,6	14,4	16,1	17,9	
DLP 120	Motor size 2 (P01-37x240)									
Motor length	347									
Stroke S*	160+80	260+80	360+80	460+80	560+80	660+80	860+80	1060+80	1260+80	
Length L	651	751	851	951	1051	1151	1351	1551	1751	
Carriage weight with actuator (Kg)	3,4	3,4	3,4	3,4	3,4	3,4	3,4	3,4	3,4	
Total weight (Kg)	9,2	10,1	11,0	11,9	12,8	13,7	15,4	17,2	19,0	
DLP 160	Motor size 1 (P01-48x240)									
Motor length	290									
Stroke S*	180+80	300+80	390+80	480+80	600+80	690+80	900+80	1080+80	1290+80	
Length L	620	740	830	920	1040	1130	1340	1520	1730	
Carriage weight with actuator (Kg)	6,3	6,3	6,3	6,3	6,3	6,3	6,3	6,3	6,3	
Total weight (Kg)	17,9	20,9	21,5	23,1	25,2	26,8	30,5	33,6	37,2	

S\* = working way + overrun limit switcher  
80mm overrun with reduced force

For standard carriage length see 'Q' in table.

The carriages can be delivered in any non-standard length upon request; the longer the carriage, the greater the load capacity. Digital - controllers, linear - encoder and power supplies refer to chapter 9.1 page 14 - 16.

DLP 120 380+80 1

Pos. 1 2

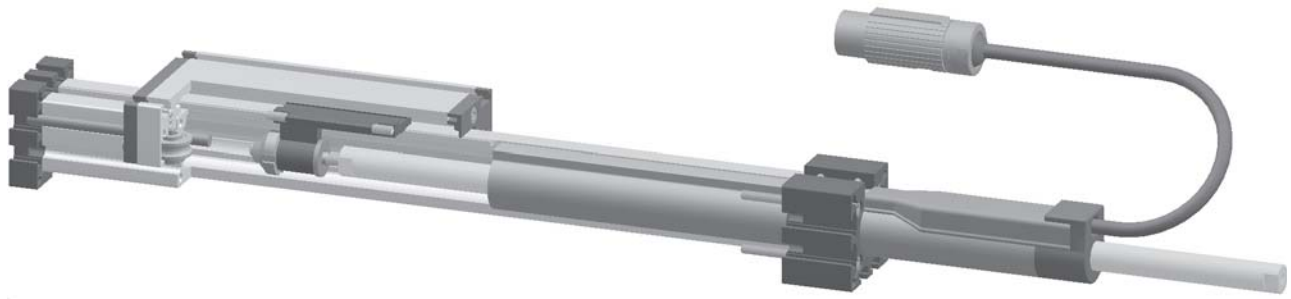
Sample ordering code:

DLP120, standard body profile, motor size 1, 380+80 mm stroke



# Positioning system ELP 30, 40, 60

Specifications



**Function:**

The unit consists of an aluminium square profile with integrated, hardened steel guide rods. The carriage consists of linear ball bearings, which can be adjusted free of play. The unit ELP is based on the principle of a linear motor. The actuator rod (secondary part), which is fitted with permanent magnets, drives the carriage directly. The stator (primary part) has got an AC winding, a positioning transmitter and heat detectors against overcharge. Several carriages can be driven independently on one guiding profile.

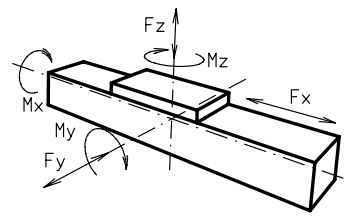
**Fitting position:** As required

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

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

**Carriage support:** Repeatability and accuracy ± 0,1 mm.

9.1



Size	30		40		60	
Forces / Torques	static	dynamic	static	dynamic	static	dynamic
F <sub>v</sub> (N)	90	60	1200	700	3000	2000
F <sub>z</sub> (N)	90	60	900	650	1700	1100
M <sub>x</sub> (Nm)	10	5	25	20	67	43
M <sub>y</sub> (Nm)	13	6	32	18	90	70
M <sub>z</sub> (Nm)	14	7	35	25	120	100
<b>All forces and torques related to the following:</b>						
existing values	$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
values of table						
<b>Moving force without current</b>						
N slider	5					
Moved mass (g) without rotor	176		520		1565	
Motor size	1	2	1	2	1	2
Motor type	P01-23x80	P01-23x160	P01-23x80	P01-23x160	P01-37x120	P01-37x240
<b>Speed</b>						
max. (m/s)	1,9	3,4	1,9	3,4	2,6	4,0
<b>Motor specifications F<sub>x</sub></b>						
permanent (N)	9	17	9	17	30	55
Max. (N)	44	60	44	60	160	204
<b>Geometrical moments of inertia of aluminium profile</b>						
I <sub>x</sub> mm <sup>4</sup>	4,09x10 <sup>4</sup>		1,32x10 <sup>5</sup>		6,79x10 <sup>5</sup>	
I <sub>y</sub> mm <sup>4</sup>	4,00x10 <sup>4</sup>		1,34x10 <sup>5</sup>		6,97x10 <sup>5</sup>	
Elastic modulus N/mm <sup>2</sup>	70000		70000		70000	

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

**Formula: ELP**

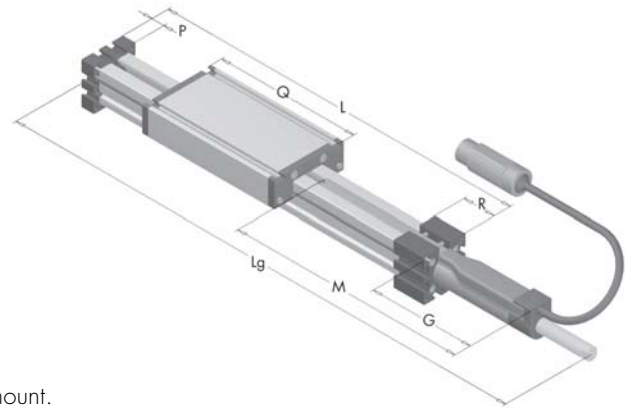
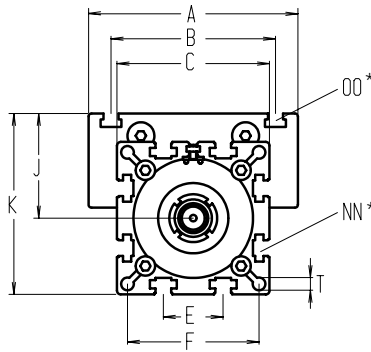
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

- 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 ELP 30, 40, 60

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 □	A	B	C	E	F	G	J	K	M Motor size 1 / 2	NN for	OO for	P	Q	R	T
ELP 30	70	56	42	13	35	98	26	47	177 / 257	M 6	M 6	12	82	25	4,2
ELP 40	100	66	58	18	47	98	35	64	177 / 257	M 6	M 6	12	122	40	6,5
ELP 60	144	96	82	30	69	98	49	90	227 / 347	M 8	M 8	16	168	60	8,5

**280+60** Stroke

**1** Motor size

ELP	30	280+60	1
Pos.	1	2	

Sample ordering code:

ELP 30 with standard body profile, motor size 1, 280+60 mm stroke.

ELP 30	(1) Motor size 1 (P01-23x80)						(2) Motor size 2 (P01-23x160)					
Stroke S*	150+60	210+60	280+60	440+60	620+60		130+60	200+60	360+60	540+60		
Length L	357	417	487	647	827		417	487	647	827		
Total length Lg	567	693	833	1153	1513		613	753	1073	1433		
Carriage weight with actuator (Kg)	0,4	0,5	0,5	0,6	0,8		0,5	0,5	0,6	0,8		
Total weight (Kg)	1,5	1,7	1,8	2,2	2,6		1,9	2,1	2,4	2,8		
ELP 40	(1) Motor size 1 (P01-23x80)						(2) Motor size 2 (P01-23x160)					
Stroke S*	150+60	210+60	280+60	440+60	620+60		130+60	200+60	360+60	540+60		
Length L	384	444	514	674	854		444	514	674	854		
Total length Lg	600	720	860	1180	1540		640	780	1100	1460		
Carriage weight with actuator (Kg)	0,7	0,8	0,9	1,0	1,2		0,8	0,9	1,0	1,2		
Total weight (Kg)	2,2	2,5	2,7	3,3	3,9		2,7	2,9	3,5	4,1		
ELP 60	(1) Motor size 1 (P01-37x120)									(2) Motor size 2 (P01-37x240)		
Stroke S*	280+80	380+80	480+80	580+80	680+80	780+80	980+80	1180+80	1380+80			
Length L	610	710	810	910	1010	1110	1310	1510	1710			
Total length Lg	941	1141	1341	1541	1741	1941	2341	2741	3141			
Carriage weight with rotor (Kg)	2,6	2,9	3,1	3,3	3,6	3,8	4,3	4,7	5,2			
Total weight (Kg)	6,7	7,3	8,0	8,6	9,3	10,0	11,3	12,6	13,9			
Stroke S*	160+80	260+80	360+80	460+80	560+80	660+80	860+80	1060+80	1260+80			
Length L	610	710	810	910	1010	1110	1310	1510	1710			
Total length Lg	821	1021	1221	1421	1621	1821	2221	2621	3021			
Carriage weight with actuator (Kg)	2,6	2,9	3,1	3,3	3,6	3,8	4,3	4,7	5,2			
Total weight (Kg)	7,3	8,0	8,6	9,3	9,9	10,6	11,9	13,2	14,5			

S\* = working way + overrun limit switcher (60/80mm overrun with reduced force)

For standard carriage length see 'Q' in table. Usage of shock absorber shorten the stroke by ELP 40 13,2 mm and by ELP 60 32,0 mm.

The carriages can be delivered in any non-standard length upon request; the longer the carriage, the greater the load capacity. Digital - controllers, linear - encoder an power supplies refer to chapter 9.1 page 14 - 16 .

For combination kits and connecting elements refer to chapter 2.2



# Linear motor controller for DLP - ELP positioning system



LinMot® comprises various families of servo-drives that are primarily designed for linear motion. For their actuation, highly integrated LinMot®-E servo controllers are available. LinMot®-E servo controllers include a power section for driving the motors as well as a control section with an integrated position controller. This allows the direct setting of positional setpoints or the calling up of stored motion profiles from an overlaid control system by means of simple analog or digital signals. Connection to the overlaid control system can also be made via a serial port or a field bus. The control section looks after all control and monitoring actions necessary for controlling the drives. LinMot®-E is a family of modular servo controllers that are derived from each other. The user can choose between units in various performance classes for up to four different, independently controllable motors. Linear motors from various LinMot families can be connected to the same controller as well as standard two-phase stepping motors and solenoids. LinMot® servo controllers are normally used as drive controllers. Using signals from an overlaid control system, the motors are driven to the positions required. This action can be combined with the use of integrated motion profile curve functions. This allows jumps in set points to be carried out in a non-jerky and gentle manner. Customised functions, complete sequential control or PLC functions can be integrated into the servo controller using application software. The configuration of the LinMot®-E servo controller is done on a menu basis using the windows-based LinMot® Talk PC-software. LinMot® Talk also assists the user when commissioning the drives: On-line measurements of motor data and movements made by the controller can be shown in graphical form and stored on a PC. LinMot®-E servo-controllers are available in two performance classes: Series 100 and Series 1000 for the control of one, two or three motors. Units of a particular performance class with different control interfaces have the same outside dimensions, but differ in respect to hardware and software.

## 9.1

### Interfaces

- Serial interface RS232
- Serial interface RS485
- PROFIBUS DP
- CANBUS



Power	Dimensions (lxbxhd)	Servo controller types		
3A/48V	70 x 175 x 120 (mm)	E x 00 - AT	E x 00 -MT	E x30 - DP
6A / 72V	90 x 295 x 179 (mm)	E x 000 - AT	E x 000 -MT	E x 000 -DP
Features				
Analog position command (0 - 10V)		X	X	
two point by trigger command		X	X	X
two profiles by trigger command		X	X	X
Command table			X	
Step, Direction			X	
Serial interface RS232		X	X	
Serial interface RS485		X	X	
Profibus DP				X
SERVOnet			X	
CAN BUS			X	
Synchronization to master shaft			X	X
Customized versions			X	X

Code No.	Name	Voltage/Current	Application
<b>E53170</b>	Servo Controller E100-AT	48 V / 3 A	for 1 motor
<b>E53176</b>	Servo Controller E100-MT	48 V / 3 A	for 1 motor
<b>E53182</b>	Servo Controller E130-DP	48 V / 3 A	for 1 motor
<b>E53171</b>	Servo Controller E200-AT	48 V / 3 A	for 2 motors
<b>E53177</b>	Servo Controller E200-MT	48 V / 3 A	for 2 motors
<b>E53183</b>	Servo Controller E230-DP	48 V / 3 A	for 2 Motors
<b>E53172</b>	Servo Controller E400-AT	48 V / 3 A	for 4 motors
<b>E53178</b>	Servo Controller E400-MT	48 V / 3 A	for 4 motors
<b>E53184</b>	Servo Controller E430-DP	48 V / 3 A	for 4 motors
<b>E53173</b>	Servo Controller E1000-AT	72 V / 6 A	for 1 motor
<b>E53179</b>	Servo Controller E1000-MT	72 V / 6 A	for 1 motor
<b>E53185</b>	Servo Controller E1030-DP	72 V / 6 A	for 1 motor
<b>E53193</b>	Servo Controller E1100-MT-HC	72 V / 15 A	für 1 Motor
<b>E53174</b>	Servo Controller E2000-AT	72 V / 6 A	for 2 motors
<b>E53180</b>	Servo Controller E2000-MT	72 V / 6 A	for 2 motors
<b>E53186</b>	Servo Controller E2030-DP	72 V / 6 A	for 2 motors
<b>E53175</b>	Servo Controller E4000-AT	72 V / 6 A	for 4 motors
<b>E53181</b>	Servo Controller E4000-MT	72 V / 6 A	for 4 motors
<b>E53187</b>	Servo Controller E4030-DP	72 V / 6 A	for 4 motors

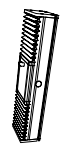
# Switch Mode Power Supplies S01

Data sheet



Switch Mode Power Supplies							
Code No.:	E53200	E53202	E53203	E53204	E53205	E53206	
Type	S01-24/150	S01-48/150	S01-48/300	S01-48/600	S01-72/300	S01-72/600	
Output voltage	24V		48 V		72 V		
Output power	150 W	150 W	300 W	600 W	300 W	600 W	
Input specifications							
Input voltage	V <sub>AC</sub>	93...123 / 187...264					
Input frequency	Hz	47...63					
Input current @ full load (230V)	A	1,7	1,7	3,3	6,4	3,3	6,4
Inrush current max.	A	3	3	5,4	10,5	5,4	10,5
Inrush current max.	A	70	70	70	80	70	80
Internal fuse	AT	4	4	6,3	12	6,3	12
Output specifications							
Output voltage Range	V <sub>DC</sub>	24...28		48...52		72...76	
Output current	V <sub>DC</sub>	6	3	6	8	4	8
Hold-up time @ full load	ms	30					
Overvoltage protection	% U <sub>out</sub>	140					
General Specifications							
Operating temperature range	-25°C...70°C						
Power reduction above 50°C	2% / °C						
Storage temperature range	-25°C...85°C						
Output voltage	95% rel. H max.						
Switching frequency	67kHz typ.						
Efficiency	>85%						
Output voltage indicator	LED						
Isolation input-output	3'000 VAC (1 Minute)						
Isolation input-case	2'000 VAC (1 Minute)						
Isolation output-case	500 VAC (1 Minute)						
Safety class (IEC 536)	Class 1						
Safety standards meets	IEC950; EN60950; CE sign for SELV						
Conducted EMI according to	CE sign for SELV; EN55011 class B; FCC-B						
Electromagnetic susceptibility EMC	EN61000-4-2 4kV / 8kV; EN61000-4-3 10V /m; EN61000-4-4 2kV EN61000-4-6 10V; EN61000-4-8 30A / m						
Case/safety class	Steel / IP20						
Mounting	on slide TS35, EN50022						

9.1



Dimensions refer to next page



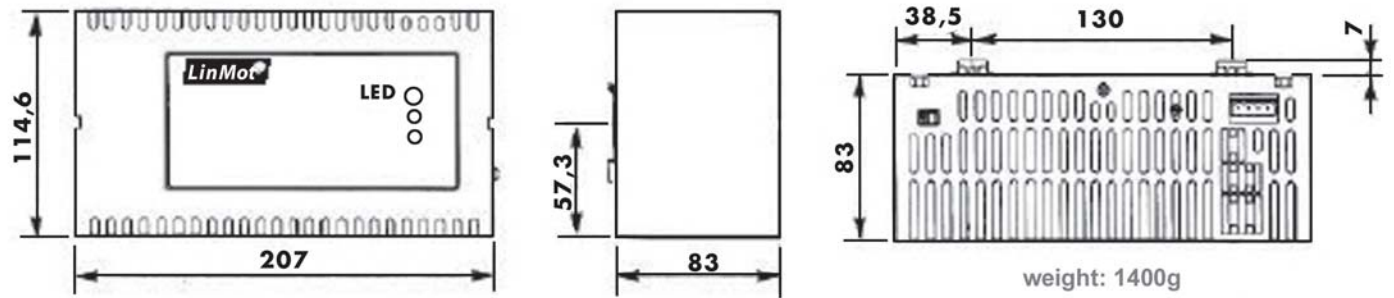
# Switch Mode Power Supplies S01

## Dimensions

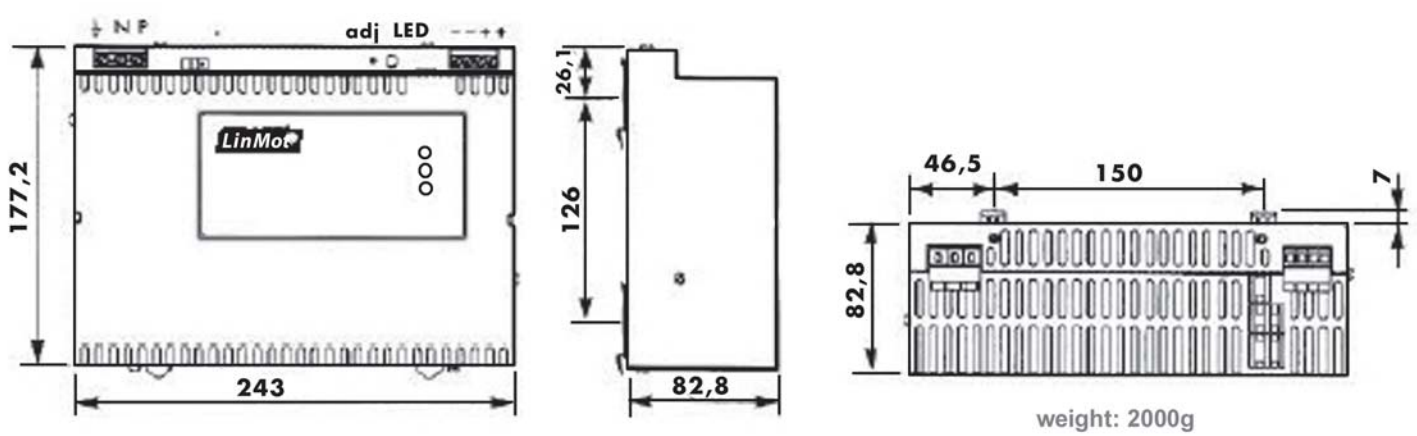
150W



300W

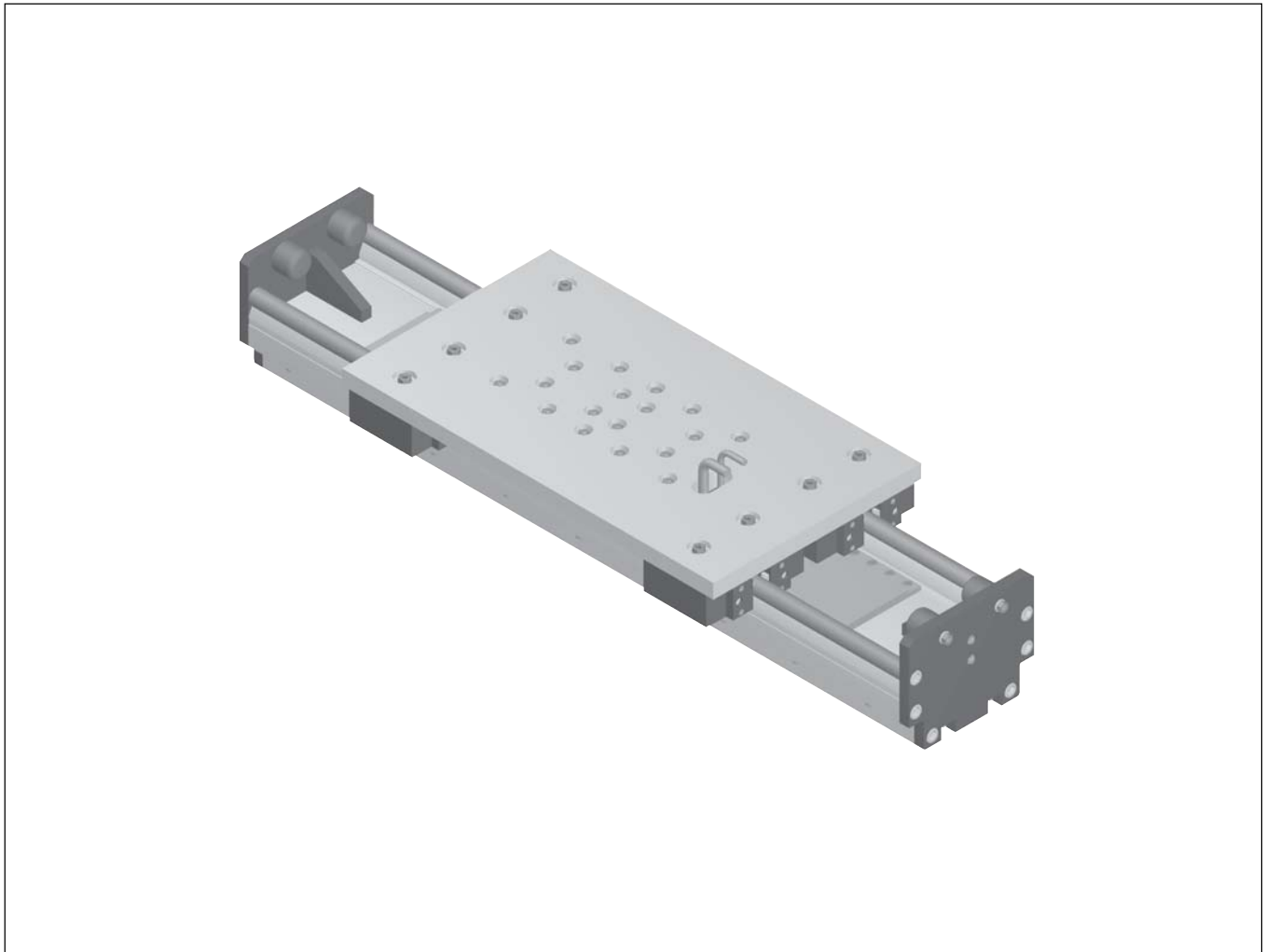


600W



9.1





## Roller guide positioning systems ALLM, ALLZ, ALLR

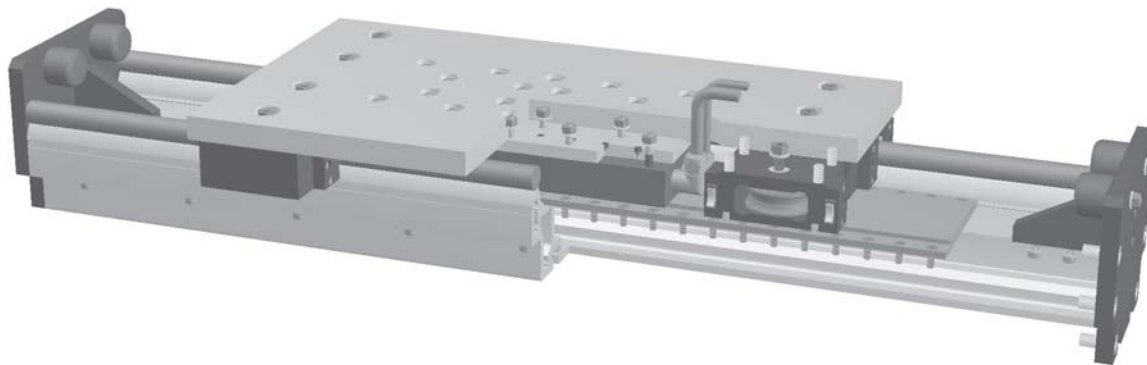
10.1



# Positioning system ALLM 203, 204

Specifications

## Linear motor drive



### Function:

This unit consists of an aluminium profile with hardened steel spindles mounted on top of the profil. The carriage, which has internal linear ball bearings that can be adjusted free of play, moves along the unit. The linear-motor ALLM unit is based on the principle of a linear, synchronous AC motor.

The guiding profile is fitted with permanent magnets as stator. The carriage is fitted with the actuator. The magnetic attraction causes a force between carriage and guiding profile also in the absence of current. This force can be used for the initial tension of the bearings. Several carriages can be driven independently on one guiding profile.

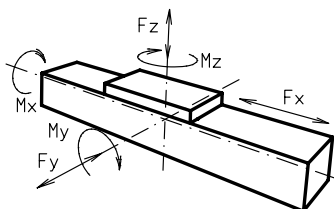
**Fitting position:** As required. Max. length 7.600 mm without joints.

**Carriage mounting:** By tapped holes.

**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

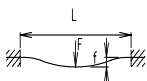
**Carriage support:** In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced. For longer carriages the number of rollers can be increased. Repeatability  $\pm 0,05$  mm.

Forces and torques	Size	ALLM 203		ALLM 204	
	Forces/Torques	static	dynamic	static	dynamic
$F_y$ (N)		23000	18400	30000	24000
$F_z$ (N)		11000	8800	16250	13000
$M_x$ (Nm)		1200	950	1870	1500
$M_y$ (Nm) Motor 1		3060	2450	5000	4000
$M_z$ (Nm) Motor 1		6250	5100	9500	7600
$M_y$ (Nm) Motor 2		4010	3210	6520	5220
$M_z$ (Nm) Motor 2		8340	6670	12180	9750
<b>All forces and torques related to the following:</b>					
existing values	$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$				
values of table					
<b>Transverse force without current</b>					
N	35		45		
Moved mass (g) without motor	43	48	55	62	
<b>Speed</b>					
Motor size / weight (kg)	1 / 17,2	2 / 25,5	1 / 17,2	2 / 25,5	
(m/sec) max	8	8	8	8	
<b>Thrust</b>					
permanent (N)	2600	3900	2600	3900	
Max. (N)	4000	6010	4000	6010	
<b>Geometrical moments of inertia of aluminium profile</b>					
$I_x$ mm <sup>4</sup>	2,26 x 10 <sup>7</sup>		2,98 x 10 <sup>7</sup>		
$I_y$ mm <sup>4</sup>	8,75 x 10 <sup>7</sup>		10,22 x 10 <sup>7</sup>		
Elastic modulus N/mm <sup>2</sup>	70000		70000		



### Formula: ALLM

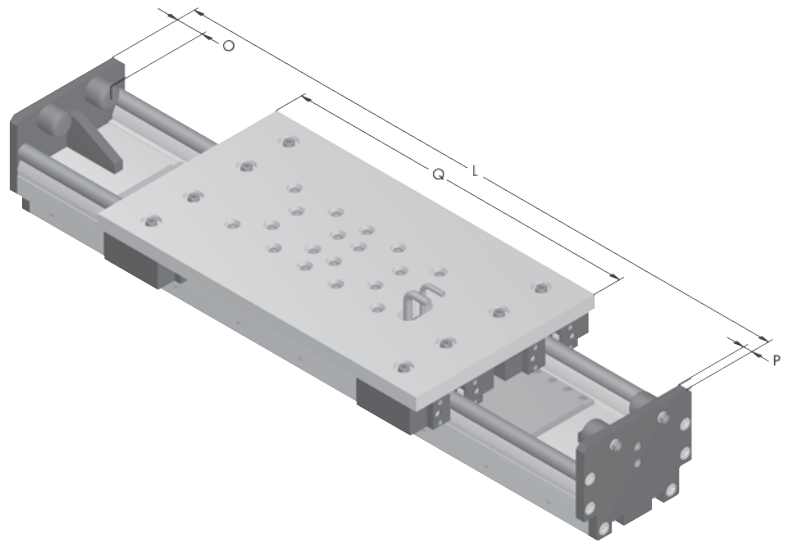
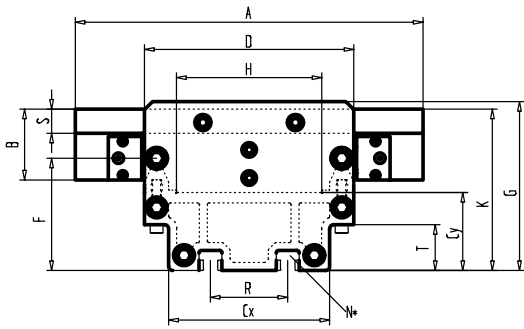
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



- 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 ALLM 203, 204

Dimensions (mm)



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

Size □	Basic length L motor size 1 / 2	A	B	Cx	Cy	D	F	G	H	K	N for	O	P	Q motor size 1 / 2	R	S	T	Basic weight motor size 1 / 2	Weight per 100 mm
ALLM 203	865/1050	432	88	200	97	260	139,6	210	180,5	200,5	M16	60	20	745/930	96	30	57	110 / 136 kg	5,6 kg
ALLM 204	925/1110	480	102,5	200	97	260	139,6	210	180,5	217,5	M16	60	20	805/990	96	30	57	136 / 163 kg	6,5 kg

**Guide rod size**

(3) Ø=30 (4) Ø=40

**Choice of guide body profile:**

(0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

**Motor size**

(0) Motor size 1 ( LMS-P 58-140 / 370 P -3st- S, weight 17,2 kg)  
 (1) Motor size 2 ( LMS-P 58-140 / 555 P -3st- S, weight 25,5 kg)

Basic length + stroke = total length

ALLM	20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2000
Pos.	1	2	3	4	5	6	7													

Sample ordering code:  
 ALLM203, guide rods 30 mm, standard body profile, motor size 1, 1135 mm stroke.

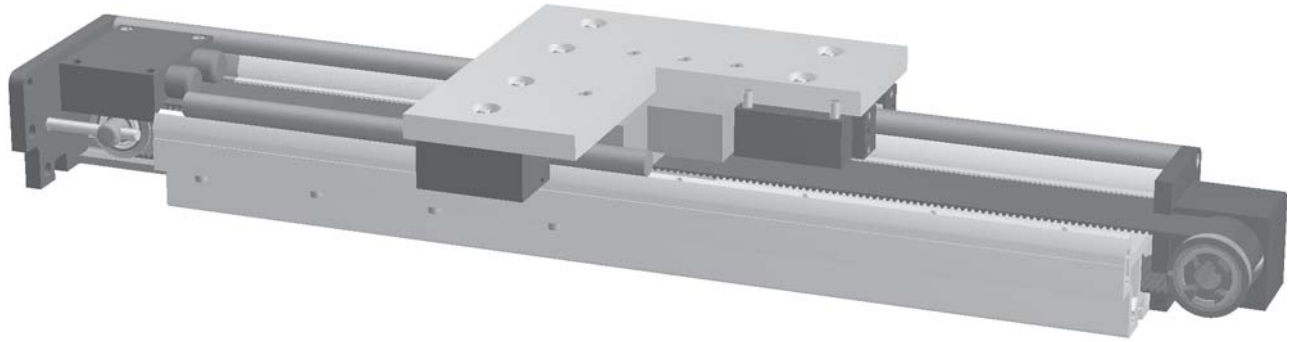
10.1



# Positioning system ALLZ 203, 204

Specifications

## Belt drive



### Function:

This unit consists of an aluminium profile with hardened steel guide rods mounted on top of the profil. 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. Opposite the driven side there is an integrated timing-belt tensioner which can be readjusted by 2 screws.

### Fitting position:

As required. Max. length 7.600 mm without joints.

### Carriage mounting:

By tapped holes.

### Unit mounting:

By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

### Carriage support:

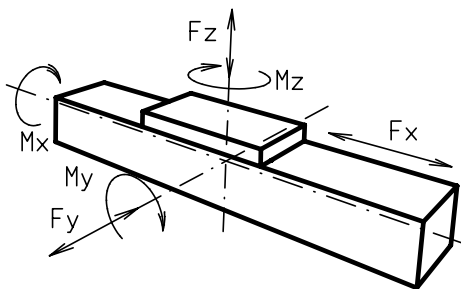
In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased. Repeatability ± 0,1.

### Belt type:

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

Size	ALLZ 203		ALLZ 204	
	static	dynamic	static	dynamic
<b>Forces/Torques</b>				
F <sub>z</sub> (N)	-	5610	-	5610
F <sub>y</sub> (N)	23000	18400	30000	24000
F <sub>x</sub> (N)	11000	8800	16200	13000
M <sub>x</sub> (Nm)	1180	950	1870	1500
M <sub>y</sub> (Nm)	1870	1500	3000	2400
M <sub>z</sub> (Nm)	3800	3100	5600	4500
<b>All forces and torques related to the following:</b>				
existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$				
values of table $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$				
<b>No-load torque</b>				
Nm	4		4	
<b>Speed</b>				
(m/sec) max	8		8	
<b>Geometrical moments of inertia of aluminium profile</b>				
I <sub>x</sub> mm <sup>4</sup>	2,26 x 10 <sup>7</sup>		2,98 x 10 <sup>7</sup>	
I <sub>y</sub> mm <sup>4</sup>	8,75 x 10 <sup>7</sup>		10,22 x 10 <sup>7</sup>	
Elastic modulus N/mm <sup>2</sup>	70000		70000	

### Forces and torques



10.1



### Formula: ALLZ

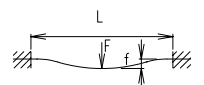
Driving torque:

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

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

- F = force (N)
- P = pulley action perimeter (mm)
- S = safety factor 1,2 ... 2
- M<sub>leer</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)

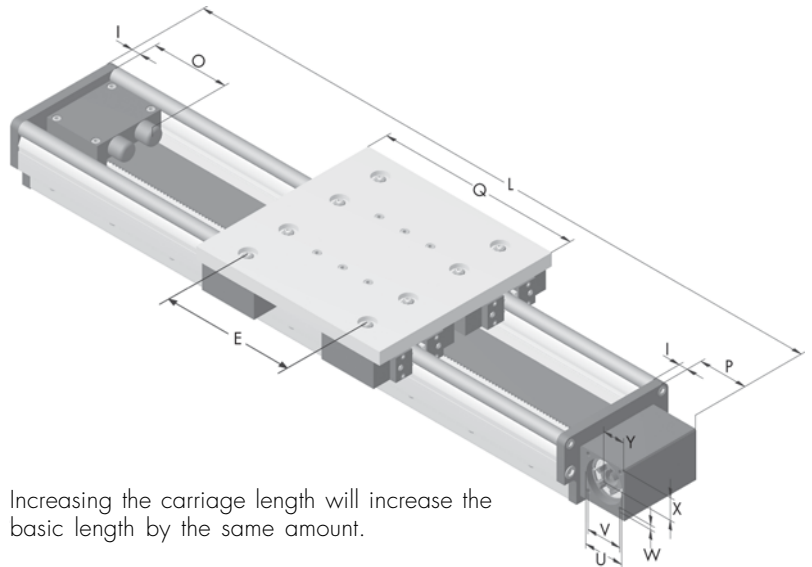
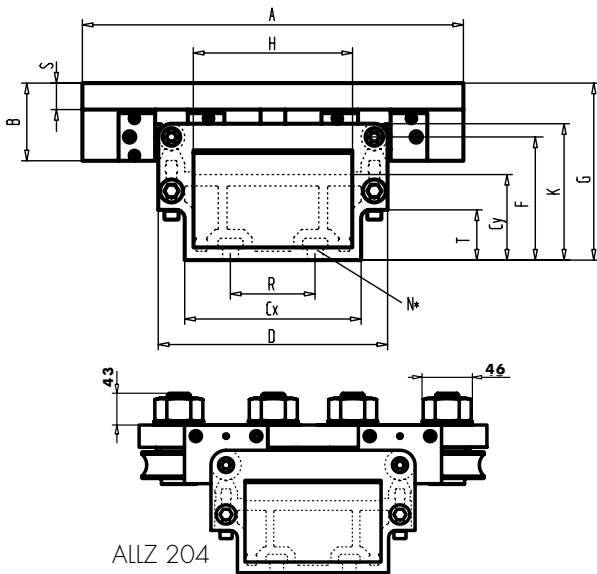
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$



- 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 ALLZ 203, 204

Dimensions (mm)



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

Size	Basic length L	A	B	Cx	Cy	D	E	F	G	H	I	J	K	N	O	P	Q	R	S	T	U	V	W	X	Y	Basic weight	Weight per 100 mm
ALLZ 203	792	432	88	200	97	260	300	140	200,5	180,5	20	14,5	154,5	M16	182	110	460	96	30	57	90	80	10	49,5	50	90 kg	4,0 kg
ALLZ 204	822	460	80	200	97	270	355	145	199	180,5	20	14,5	165	M16	182	110	490	96	30	57	90	80	10	49,5	50	92 kg	4,9 kg

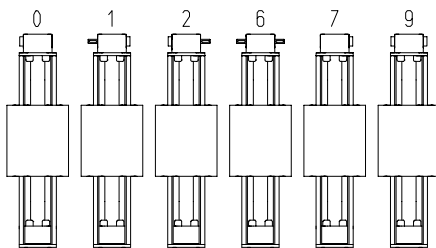
**Guide rod size**

(3) Ø=30 (4) Ø=40

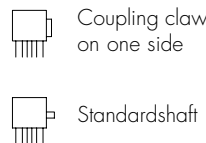
**Choice of guide body profile:**

(0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

**Coupling - shaft mounting:**



9 is as 0, but with coupling claws on both sides.



The standard version is supplied without shaft. A shaft can be retrofitted by inserting in the pulley bore and securing with 2 locking rings.

**Belt table**

Code No.	Belt	mm/rev.	Number of teeth
0 7	8M100	224	28

Size	Shaft ø h6 x length	Key
203	30 x 55	8x7x40
204	30 x 55	8x7x40

Basic length + stroke = total length

ALLZ 20 3 0 0 0 0 7 0 2000

Pos. 1 2 3 4 5 6 7

Sample ordering code:

ALLZ203, guide rods 30 mm, standard body profile, coupling claw on both side, toothed belt 8M100, 1208 mm stroke.

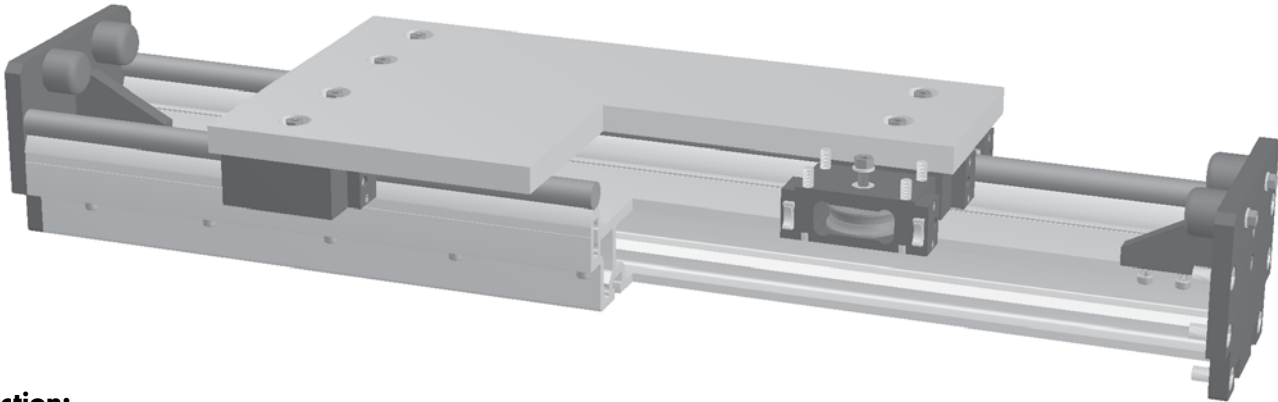
10.1



# Positioning system ALLR 203, 204

Specifications

## Roller guide unit without drive



### Function:

This unit consists of an aluminium profile with hardened steel spindles mounted on top of the profil. The carriage has internal linear ball bearings, that can be adjusted free of play. The unit is without drive.

### Fitting position:

As required. Max. length 7.600 mm without joints.

### Carriage mounting:

By tapped holes.

### Unit mounting:

By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

### Carriage support:

In the standard version, the carriage runs on 8 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

Forces and torques	Size	ALLR 203		ALLR 204	
	Forces/Torques	static	dynamic	static	dynamic
	$F_y$ (N)	23000	18400	30000	24000
	$F_z$ (N)	11000	8800	16250	13000
	$M_x$ (Nm)	1200	950	1870	1500
	$M_y$ (Nm)	1870	1500	3000	2400
	$M_z$ (Nm)	3800	3100	5600	4500
<b>All forces and torques related to the following:</b> existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ values of table					
<b>Geometrical moments of inertia of aluminium profile</b>					
$I_x$ mm <sup>4</sup>		2,26 x 10 <sup>7</sup>		2,98 x 10 <sup>7</sup>	
$I_y$ mm <sup>4</sup>		8,75 x 10 <sup>7</sup>		10,22 x 10 <sup>7</sup>	
Elastic modulus N/mm <sup>2</sup>		70000		70000	

10.1



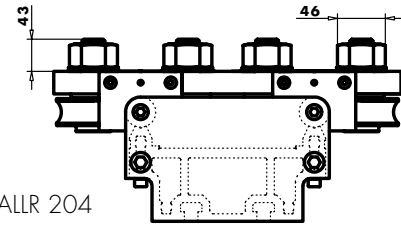
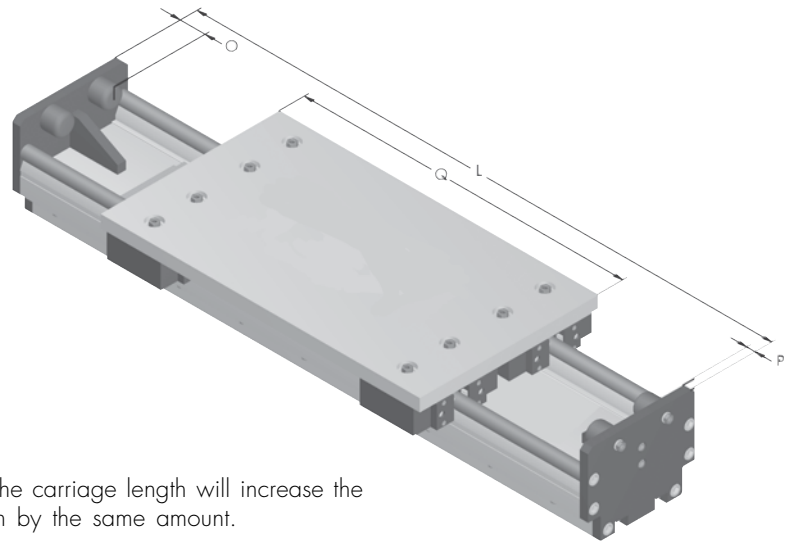
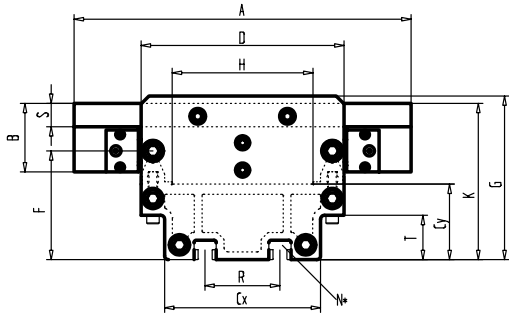
### Formula: ALLR

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

$f$  = 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 ALLR 203, 204

Dimensions (mm)



ALLR 204

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

Size	Basic length L	A	B	Cx	Cy	D	F	G	H	K	N for	O	P	Q	R	S	T	Basic weight	Weight per 100 mm
ALLR 203	580	432	88	200	97	260	139,6	210	180,5	200,5	M16	60	20	460	96	30	57	64 kg	3,9 kg
ALLR 204	610	480	102,5	200	97	260	139,6	210	180,5	217,5	M16	60	20	490	96	30	57	65 kg	4,8 kg

**Guide rod size**

(3) Ø=30 (4) Ø=40

**Choice of guide body profile:**

(0) Standard (1) stainless guide rods (2) stainless guide rods and screws (3) stainless guide rods, rollers and screws

ALLR20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2000
--------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	------

Pos. 1 2 3 4 5 6 7

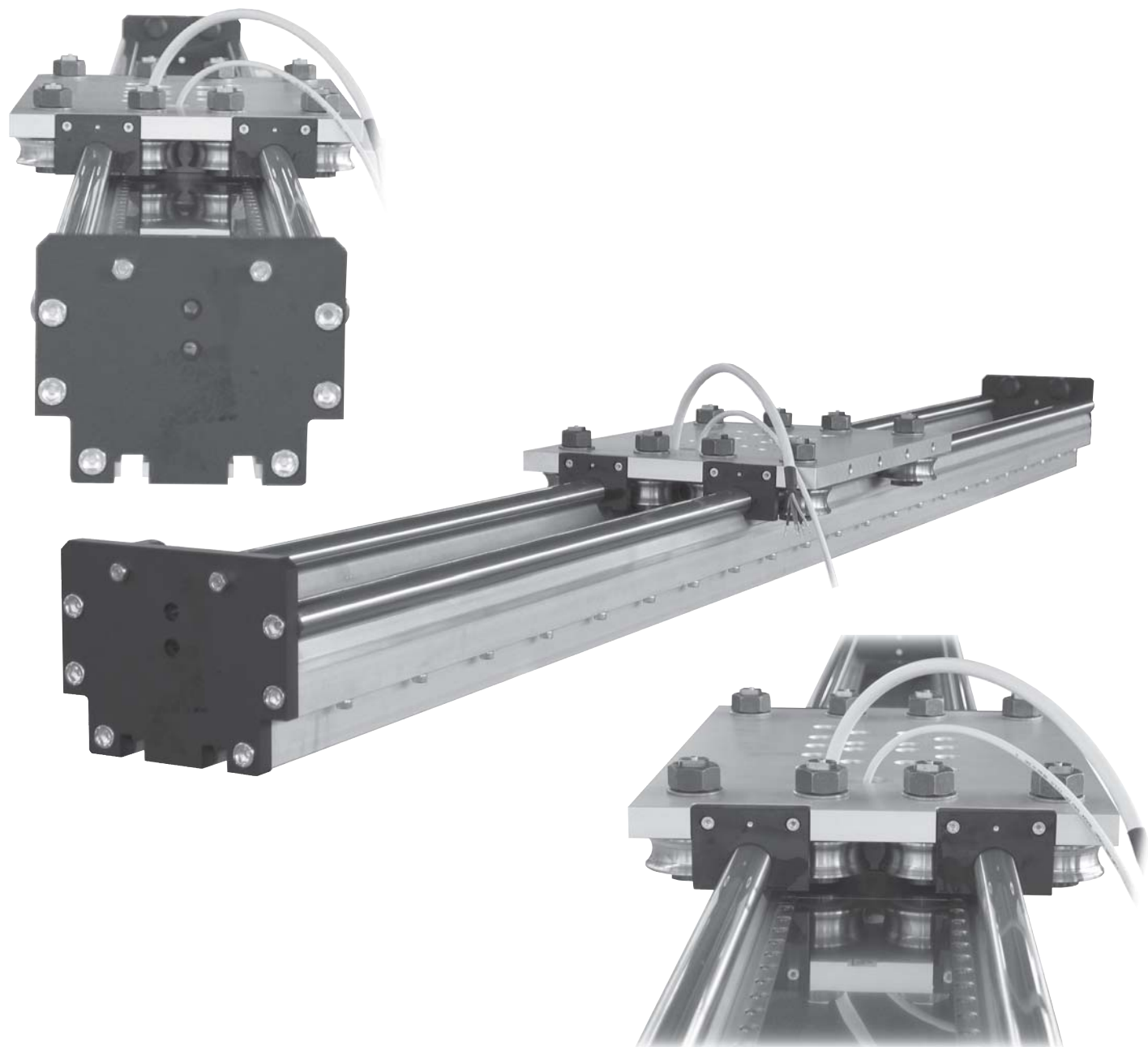
Basic length + stroke = total length

Sample ordering code:  
ALLR203, guide rods 30 mm, standard body profile, 1420 mm stroke.

10.1

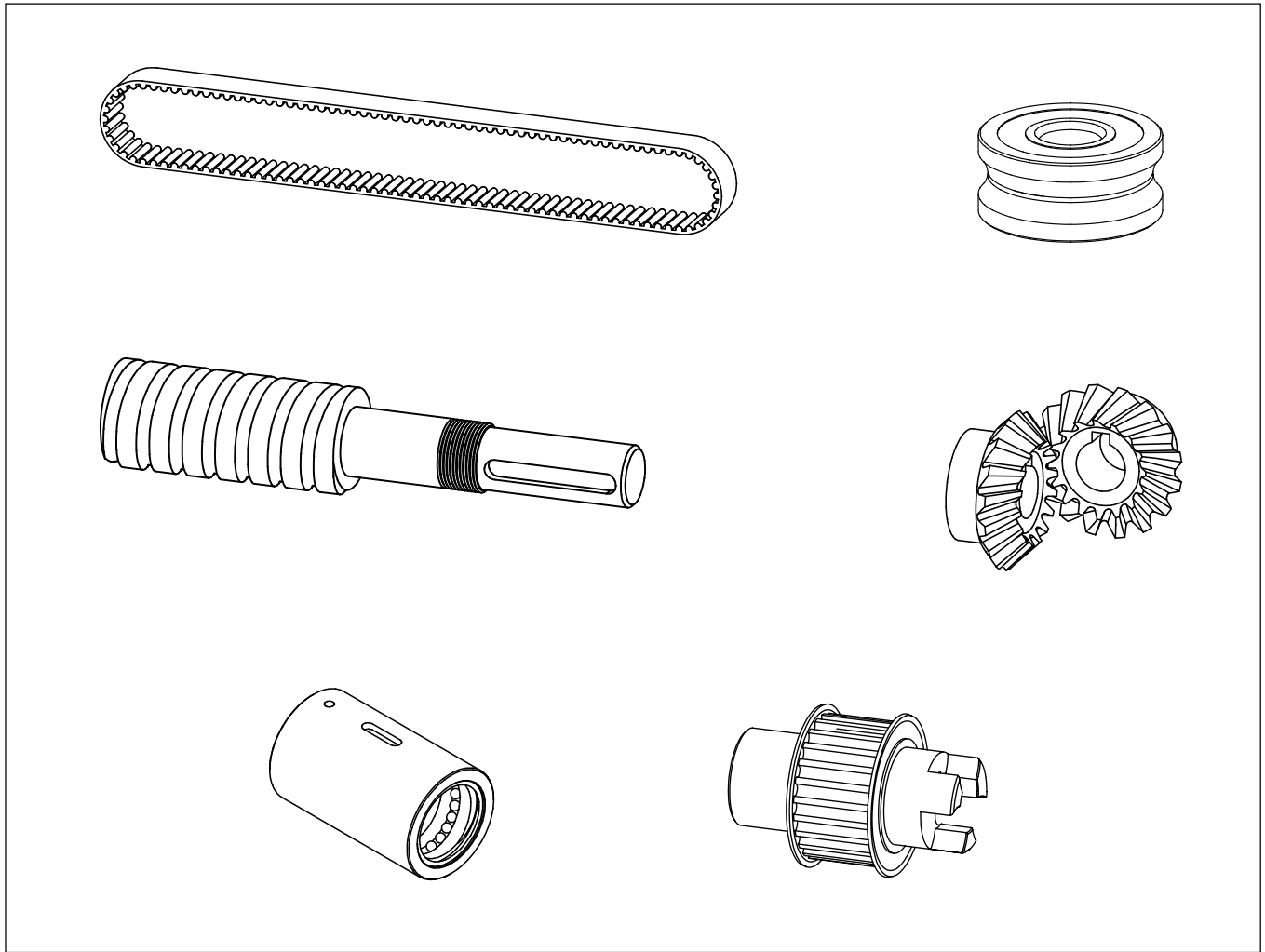


## Positioning system ALLM/Z 204



10.1





## Spare parts

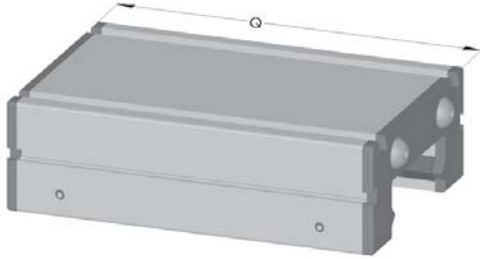


1.2

# Spare parts

## Carriage

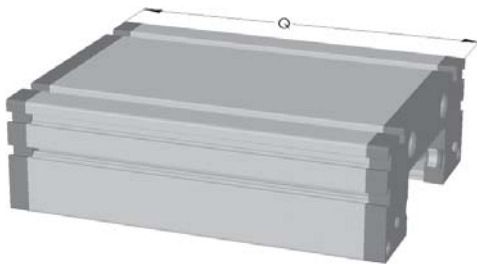
### Complete carriage EG



Additional complete carriage with V-slides and end plates.

Code-No.	Type	Q <sub>Standard</sub>	Q <sub>min.</sub>	Q <sub>max.</sub>
04532	EG 30	82	50	1000
04542	EG 40	118	80	1000
04562	EG 60	164	125	1000
04582	EG 80	193	150	1000

### Complete carriage EL



Additional complete carriage with rollers, eccentrics and wiper end plates for free rolling.

Temperature: Up to 100° C.

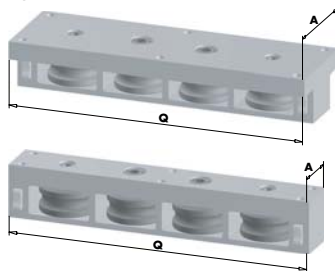
without Slider <sup>2)</sup>	Code-No.	Type	Q <sub>Standard</sub>	Q <sub>min.</sub>	Q <sub>max.</sub>
	04531	EL 30	82	50	3000
	04541	EL 40	122	80	3000
	04561	EL/ML 60	168	125	3000
	04581	EL/ML 80	194	150	3000
	04580	EL/ML 80S	214	190	3000
	04511	EL 100	300	200	2000
	04521	EL 125	365	250	2000

with Slider <sup>1)</sup>	Code-No.	Type	Q <sub>Standard</sub>	Q <sub>min.</sub>	Q <sub>max.</sub>
	045311	EL 30	82	50	3000
	045411	EL 40	122	80	3000
	045611	EL 60	168	125	3000
	045811	EL 80	194	150	3000
	045801	EL 80S	214	190	3000
	045111	EL 100	300	200	2000
	045211	EL 125	365	250	2000

1) ELT/K, ELVZ, ELHZ

2) ELZ, ELZT, ELZU, ELZA, ELZQ, ELP

### Complete carriage UL

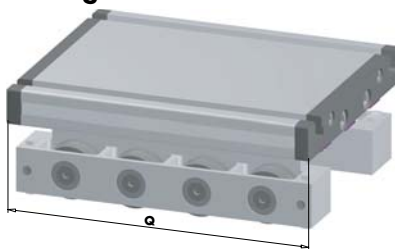


Carriage with rollers, eccentrics and end plates.

Temperature: Up to 100° C.

Code-No.	Type	A	Q
045471	UL 40	40	146
045472	UL 40	20	146
045671	UL 60	60	194
045672	UL 60	29	194
045871	UL 80	80	260
045872	UL 80	42	260

### Complete carriage DL



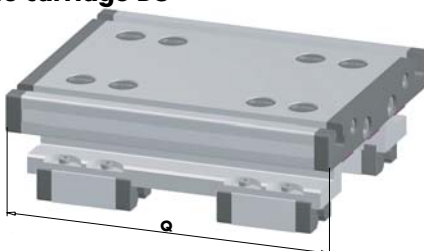
Standardcarriage with 2x4 rollers, eccentrics and end plates.

Temperature: Up to 100° C.

Different Versions by inquiry.

Code-No.	Type	Q <sub>Standard</sub>	Q <sub>max.</sub>
04591	DL 120	156	3000
04590	DL 160	200	3000
04592	DL 200	270	3000

### Complete carriage DS



Carriage with four runner blocks and end plates.

Temperature: Up to 100° C.

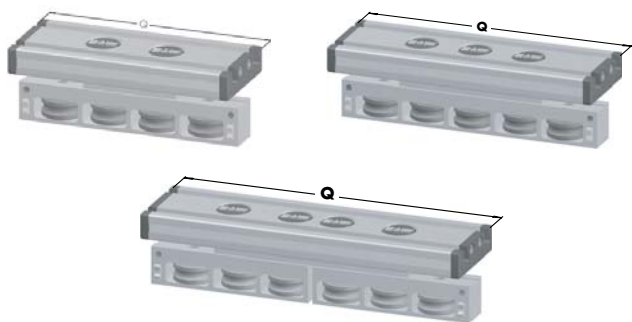
Code-No.	Type	Q <sub>Standard</sub>	Q <sub>max.</sub>
045710	DS 160	200	3000
045720	DS 200	270	3000

# Spare parts

## Carriage

### Carriage QL

Carriage with rollers, eccentrics and end plates.  
Temperature: Up to 100° C.



Code-No.	Type	Q <sub>Standard</sub>	Number of rollers
04593A	QL 60	152	4
04593B	QL 60	192	5
04593C	QL 60	232	6
04594A	QL 80	196	4
04594B	QL 80	246	5
04594C	QL 80	296	6
04595A	QL 100	260	4
04595B	QL 100	320	5
04595C	QL 100	388	6

### Carriage QS

Carriage with 2 runner blocks and end plates.  
Temperature: Up to 100° C.



Code-No.	Type	Q <sub>Standard</sub>	Number of Runnerblocks
04597A	QS 60	177	2
04597B	QS 60	177	3
04598A	QS 80	232	2
04598B	QS 80	232	3
04599A	QS 100	268	2
04599B	QS 100	268	3

### Carriage QST/K

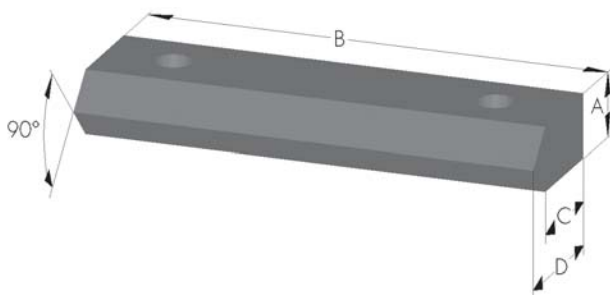
Carriage with 2 runner blocks and end plates without leading nut.  
Temperature: Up to 100° C.



Code-No.	Type	Q <sub>Standard</sub>	Q <sub>max</sub>
045974	QST/K 60	188	3000
045984	QST/K 80	250	3000
045997	QST/K 100	188	3000

### V-slide EG

Made of low-wear plastic with good sliding characteristics.  
2 pieces per carriage.



Code-No.	Type	A	B <sub>max</sub>	C	D
04233	30	9,3	1.000	-	17,6
04243	40	8	1.000	9	13
04263	60	10	1.000	16	21
04283	80	14	1.000	22	29

### Carriage ro

Standard roller.  
Stainless steel upon request



Code-No.	Type	Name
04000	EL 30	LFR 687-2Z
04001	EL 40 / DL 120 / QL 60	LFR 608-2Z
04002	EL/ML 60 / DL 160 / QL 80	LR 10/12
04039	DL 200 / QL 100	LFR 5302 KDD
04003	EL/ML 80	LR 12
04038	EL/ML 80S	LFR 5202-12 NPP
04004	EL 100	LFR 5204-16 NPP
04009	EL 125	LFR 5206-20 KDD



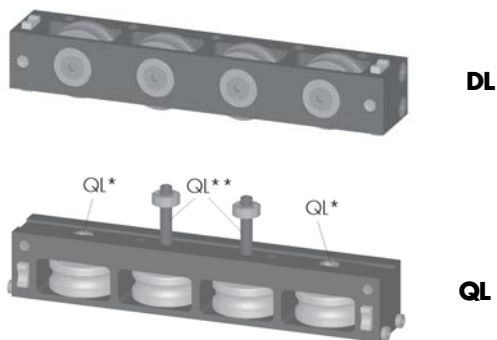
1.2

## Spare parts

### Carriage

#### Carriage roller block DL - QL

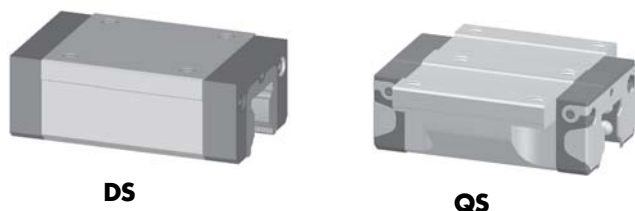
Made of aluminium, complete with rollers, eccentric and screws.



Code-No.	Type	Standard	By inquiry
04100	DL 120	4 rollers	3; 5; 2x3 rollers
04110	DL 160	4 rollers	3; 5; 2x3 rollers
04115	DL 200	4 rollers	3; 5; 2x3 rollers
04116	QL 60	4 rollers	5; 2x2; 2x3 rollers
04117	QL 80	4 rollers	5; 2x2; 2x3 rollers
04119	QL 100	4 rollers	5; 2x2; 2x3 rollers

\* for outward fixed roller  
\*\* for inner movable roller

#### Runner block for DS - QS



Code-No.	Type
04150	QS 60
04152	QS 80
04154	QS 100
04157	DS 160
04158	DS 200

#### Eccentric EL

Size 40, 60



Size 30, 80, 80S, 100, 125



Eccentric made of stainless steel with mounting accessories (Screw, spring washer).

Code-No.	Type	For roller
04050	EL 30	LFR 687-2Z
04051	EL 40	LFR 608-2Z
04052	EL/ML 60	LFR 5201 - KDD
04053	EL/ML 80	LFR 5201-12 - KDD
04049	EL/ML 80S	LFR 5202-12 - NPP
04054	EL 100	LFR 5204-16 - NPP
04055	EL 125	LFR 5206-20 - KDD

#### Eccentric DL - QL

Eccentric made of stainless steel with mounting set, screw and locking rings. The front side has an embossed marking to enable uniform adjustment of rollers.



Code-No.	Type	For roller
04057	DL 120	LFR 608-2Z
04058	DL 160	LFR 5201 - KDD
04059	DL 200	LR 5302 - KDD
06060	QL 60*	LFR 608-2Z
06061	QL 60**	LFR 608-2Z
06080	QL 80*	LFR 5201 - KDD
06081	QL 80**	LFR 5201 - KDD
06010	QL 100*	LR 5302 - KDD
06011	QL 100**	LR 5302 - KDD

\* for outward fixed roller  
\*\* for inner movable roller  
For arrangement of the different rollers see „carriage roller block“ above.

# Spare parts

Carriage

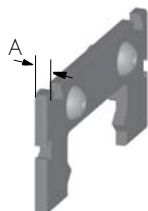
## Tool for eccentric adjustment



Fix tool			Adjust tool	
Type	Code-No.	Dimension	Code-No.	Dimension
EL 30	09020	SW 2	09030	LK 9,5 ø 1,5
EL 40	09021	SW 4	09022	SW 5
EL 60	09022	SW 5	09023	SW 6
EL 80	09022	SW 5	09031	LK 15 ø 2
EL 80S	09023	SW 6	09036	LK 20 ø 2
EL 100	09023	SW 6	09032	LK 24 ø 4
EL 125	09024	SW 8	09033	LK 32 ø 5

Fix tool			Adjust tool	
Type	Code-No.	Dimension	Code-No.	Dimension
DL 120	09025	SW 3	09034	LK 10,5 ø 1
DL 160	09021	SW 4	09031	LK 15 ø 2
DL 200	09023	SW 6	09036	LK 20 ø 2
QL 60	09038	LK 8 ø 2	09026	SW 2,5
	09021	SW 4	09022	SW 5
QL 80	09037	LK 10 ø 2	09025	SW 3
	09022	SW 5	09023	SW 6
QL 100	09035	LK 13 ø 3	09021	SW 4
	09023	SW 6	09036	LK 20 ø 2

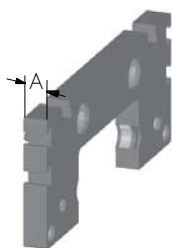
## End plates EG



Material ABS, for temperatures up to 100°C

Code-No.	Type	A
04241	EG 40	5
04261	EG 60	6
04281	EG 80	6

## Wiper end plate complete for EL



Material ABS, for temperatures up to 100°C

without slider <sup>2)</sup>		
Code-No.	Type	A
04230	EL 30	6
04240	EL 40	11
04260	EL 60	12
04280	EL 80	12
04288	EL 80S	12
04210	EL100	15
04220	EL125	15

with slider <sup>1)</sup>		
Code-No.	Type	A
04234	EL 30	6
04244	EL 40	11
04264	EL 60	12
04284	EL 80	12
04289	EL 80S	12
04214	EL100	15
04224	EL125	15

- 1) ELT/K, ELVZ, ELHZ  
2) ELZ, ELZT, ELZU, ELZA, ELZQ, ELP

## Slider inset for ELT / ELK Slider inset for DLT / DLK



By cover band replacement it is necessary to change the slide.

ELT / ELK	
Code-No.	Type
03132	EL 30
03142	EL 40
03162	EL 60

DLT / DLK	
Code-No.	Type
03164	120
03184	160
03114	200

## Wiper end plate DL / DS - QL / QS



DL / DS



QL / QS

Code-No.	Type	D	Material
04211	DL 120	8	ABS
04212	DL/DS 160	10	ABS
04213	DL 200	15	ABS
04267	QL/QS 60	6	ABS
04287	QL/QS 80	8	ABS
04217	QL/QS 100	10	ABS

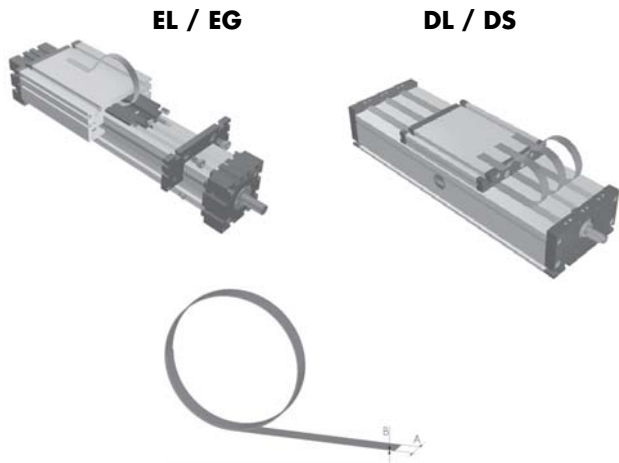


1.2

# Spare parts

guide body profile

## Cover band



Spring steel (stainless steel)

Code-No.	Type	A x B
01020....	EL/EG 30	8 x 0,15
01021....	EL/EG 40/60/80 DL 120	13,5 x 0,3
01026....	DL/DS 160	17,3 x 0,3
01022....	EL 100/125 DL/DS 200	22 x 0,3
01023	QST/K 60	24 x 0,3
01024	QST/K 80	32,3 x 0,3
01025	QST/K 100	38,5 x 0,3

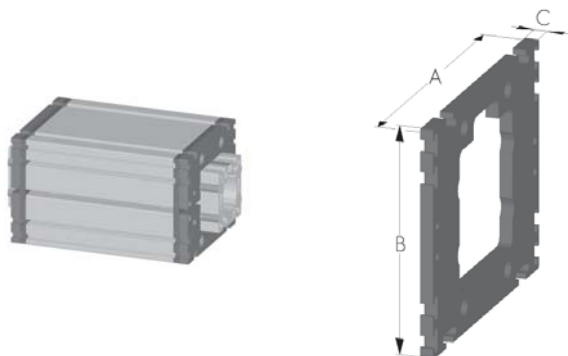
Code-No. length in mm

01026	2300
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Sample ordering code:

Cover band 17,3 x 0,3 2.300 mm long.

## Joining plate for closed carriage



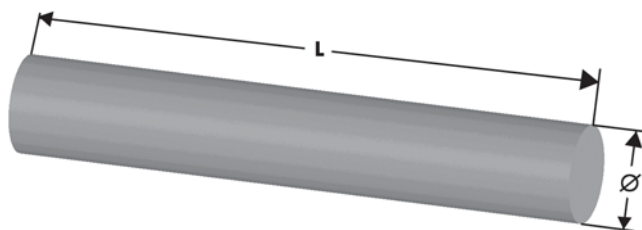
Aluminium plate with connection boring.

Code-No.	Type	A	B	C
03045	EG 40	70	70	8
03065	EG 60	100	98	8
03085	EG 80	140	140	8
03036	EL 30	70	52	6
03046	EL 40	100	70	8
03066	EL/ML 60	144	98	8
03086	EL/ML 80	170	140	8
03087	EL/ML 80S	190	142	10
03016	EL 100	230	180	8
03026	EL 125	295	215	12

## Guide rod



1.2



Code-No.	Type	Ø	Material	Hardness
04131....	EL/EG 30	5 <sub>h6</sub>	Cf 53	HRC 62
04132....	EL/EG 30	5 <sub>h6</sub>	x 90 CrMoV18	HRC 56
04141....	EL 40 DL 120 QL 60	6 <sub>h6</sub>	Cf 53	HRC 62
04142....	EL 40 DL 120 QL 60	6 <sub>h6</sub>	x 90 CrMoV18	HRC 56
04161....	EL 60 DL 160/200 QL 80/100	10 <sub>h6</sub>	Cf 53	HRC 62
04162....	EL 60 DL 160/200 QL 80/100	10 <sub>h6</sub>	x 90 CrMoV18	HRC 56
04181....	EL 80(S)	12 <sub>h6</sub>	Cf 53	HRC 62
04182....	EL 80(S)	12 <sub>h6</sub>	x 90 CrMoV18	HRC 56
04111....	EL 100	16 <sub>h6</sub>	Cf 53	HRC 62
04112....	EL 100	16 <sub>h6</sub>	x 90 CrMoV18	HRC 56
04113....	EL 125	20 <sub>h6</sub>	Cf 53	HRC 62
04114....	EL 125	20 <sub>h6</sub>	x 90 CrMoV18	HRC 56

Code-No. length in mm

04131	2000
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Sample ordering code:

Guiding rod steel ø 5 2.000 mm long.

# Spare parts

Spindle

## Trapezoidal spindle



Code-No.	Type	Pitch	Unit length L <sub>max</sub>
04609....	EL/EG 30	10x03 R	1.500 mm
04629....	EL/EG 30	10x03 L	1.500 mm
04600....	EL/EG 40	18x04 R	3.000 mm
04620....	EL/EG 40	18x04 L	3.000 mm
04640....	DL 120 / QS 60	18x04 R	3.000 mm
04650....	DL 120 / QS 60	18x04 L	3.000 mm
04601....	EL/EG 40	18x08 R	3.000 mm
04621....	EL/EG 40	18x08 L	3.000 mm
04641....	DL 120 / QS 60	18x08 R	3.000 mm
04651....	DL 120 / QS 60	18x08 L	3.000 mm
04602....	EL/EG 60	24x05 R	4.000 mm
04622....	EL/EG 60	24x05 L	3.000 mm
04642....	DL/DS 160 QS 80	24x05 R	4.000 mm
04652....	DL/DS 160 QS 80	24x05 L	3.000 mm
04603....	EL/EG 60	24x10 R	3.000 mm

Code-No.	Type	Pitch	Unit length L <sub>max</sub>
04623....	EL/EG 60	24x10 L	3.000 mm
04643....	DL/DS 160 / QS 80	24x10 R	3.000 mm
04643....	DL/DS 160 / QS 80	24x10 L	3.000 mm
04604....	EL/EG 80(S)	28x05 R	3.000 mm
04624....	EL/EG 80(S)	28x05 L	3.000 mm
04605....	EL/EG 80(S)	28x10 R	3.000 mm
04625....	EL/EG 80(S)	28x10 L	3.000 mm
04606....	EL / QS 100 DL/DS 200	32x06 R	4.500 mm
04626....	EL / QS 100 DL/DS 200	32x06 L	3.000 mm
04607....	EL / QS 100 DL/DS 200	32x12 R	3.000 mm
04627....	EL / QS 100 DL/DS 200	32x12 L	3.000 mm
04630....	EL 125	40x07 R	4.000 mm
04631....	EL 125	40x07 L	3.000 mm
04632....	EL 125	40x14 R	3.000 mm
04633....	EL 125	40x14 L	3.000 mm

Code-No. unit length in mm

04603	1000
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Sample ordering code:

Trapezoidal spindle Tr 24x10 right, unit length 1000 mm.

## Trapezoidal screw made of RG 7



Code-No.	Type	Pitch
04332	EL/EG 30	10x03 R
04333	EL/EG 30	10x03 L
04340	EL/EG 40 / DL 120 / QS 60	18x04 R
04341	EL/EG 40 / DL 120 / QS 60	18x04 L
04342	EL/EG 40 / DL 120 / QS 60	18x08 R
04343	EL/EG 40 / DL 120 / QS 60	18x08 L
04360	EL/EG 60 / DL/DS 160 QS 80	24x05 R
04361	EL/EG 60 / DL/DS 160 QS 80	24x05 L
04362	EL/EG 60 / DL/DS 160 QS 80	24x10 R
04363	EL/EG 60 / DL/DS 160 QS 80	24x10 L
04380	EL/EG 80(S)	28x05 R

Code-No.	Type	Pitch
04381	EL/EG 80(S)	28x05 L
04382	EL/EG 80(S)	28x10 R
04383	EL/EG 80(S)	28x10 L
04310	EL / QS 100 / DL/DS 200	32x06 R
04311	EL / QS 100 / DL/DS 200	32x06 L
04312	EL / QS 100 / DL/DS 200	32x12 R
04313	EL / QS 100 / DL/DS 200	32x12 L
04320	EL 125	40x07 R
04321	EL 125	40x07 L
04322	EL 125	40x14 R
04323	EL 125	40x14 L

1.2

# Spare parts

## Spindle

### Ballscrew spindle



Code-No.	Type	Pitch	Unit length L <sub>max</sub>
04610....	EL/EG 30	8x2,5 R	2.000 mm
04611....	EL/EG 40	16x05 R	3.000 mm
04661....	DL 120 / QS 60	16x05 R	3.000 mm
04612....	EL/EG 40	16x10 R	3.000 mm
04662....	DL 120 / QS 60	16x10 R	3.000 mm
04614....	EL/EG 60	25x05 R	3.000 mm
04615....	EL/EG 60	25x10 R	3.000 mm
04613....	EL/EG 60	20x20 R	3.000 mm
04663....	DL 120 / QS 80 DL/DS 160	20x20 R	3.000 mm
04631....	EL/EG 60	20x05 L	3.000 mm

Code-No.	Type	Pitch	Unit length L <sub>max</sub>
04664....	DL 120 DL/DS 160 QS 80	25x05R	3.000 mm
04665....	DL 120 DL/DS 160 QS 80	25x10 R	3.000 mm
04616....	EL/EG 80(S)	25x25 R	3.000 mm
04666....	DL 120 DL/DS 160	25x25 R	3.000 mm
04617....	EL/EG 80(S) EL/QS 100 DL/DS 200	32x05 R	3.000 mm
04684....	EL/EG 80(S) EL/QS 100 DL/DS 200	32x05 L	3.000 mm
04618....	EL/EG 80(S) EL/QS 100 DL/DS 200	32x10 R	3.000 mm
04683....	EL 100 DL/DS 200	32x20 R	3.000 mm
04619....	EL 100 DL/DS 200	32x32 R	3.000 mm
04634....	EL 125	40x10 R	3.000 mm
04635....	EL 125	40x20 R	3.000 mm
04636....	EL 125	40x40 R	3.000 mm

Code-Nr. unit length in mm

<b>04617</b>	1000
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Sample ordering code:  
Ballscrew spindle 32x05 right, unit length 1.000 mm.

### Ballscrew nut



Code-No.	Type	Pitch	first greasing	re-greasing*
04430	EL/EG 30	8x2,5 R	0,02 g	0,01 g
04440	EL/EG 40 DL 120 QS 60	16x05 R	4,0 g	1,3 g
04441	EL/EG 40 DL 120 QS 60	16x10 R	2,5 g	0,8 g
04442	DL 120 QS 60	16x16 R	2,0 g	0,6 g
04460	EL/EG 60 DL 120 DL/DS 160 QS 80	25x05 R	6,0 g	2,0 g
04461	EL/EG 60 DL 120 DL/DS 160 QS 80	25x10 R	8,0 g	2,6 g
04462	EL/EG 60 DL 120 DL/DS 160 QS 80	20x20 R	8,0 g	2,6 g

Code-No.	Type	Pitch	first greasing	re-greasing*
04463	EL/EG 60	20x05 L	5,0 g	2,0 g
04464	EL/EG 80(S) DL/DS 160	25x25 R	10,0 g	3,0 g
04480	EL/EG 80(S) EL/QS 100 DL/DS 200	32x05 R	8,0 g	3,0 g
04485	EL/EG 80(S) EL/QS 100 DL/DS 200	32x05 L	8,0 g	3,0 g
04481	EL/EG 80(S) EL/QS 100 DL/DS 200	32x10 R	11,0 g	4,0 g
04483	EL 100 DL/DS 200	32x20 R	11,8 g	4,0 g
04482	EL 100 DL/DS 200	32x32 R	12,6 g	4,0 g
04420	EL 125	40x10 R	25,0 g	8,3 g
04421	EL 125	40x20 R	29,0 g	9,6 g
04422	EL 125	40x40 R	34,0 g	011,3 g

\* after approx. 500 hours

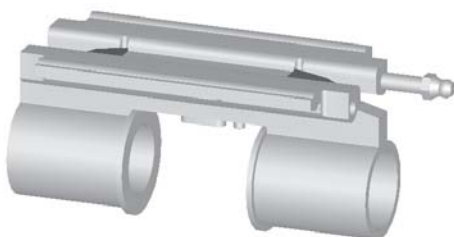


1.2

# Spare parts

Spindle

## Leading nut receiver



### For EL / EG units

#### Ballscrew

Code-No.	Type
03130	30
03140	40
03160	60
03180	80(S)
03110	100
03120	125

#### Trapezoidal

Code-No.	Type
03131	30
03141	40
03161	60
03181	80(S)
03111	100
03121	125

### For DL / DS units

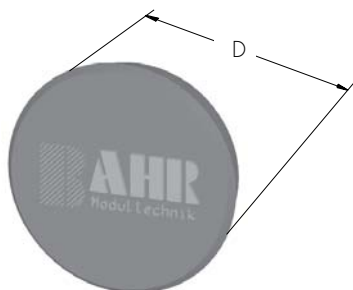
Code-No.	Type
03163	DL 120
03183	DL/DS 160
03113	DL 200

## Lubricants



Code-No.	Name
09001	Molydual, 1 litre
09002	SKF grease LGMT 2, spindle/bearing, 1 kg
09003	Steel oil gun for carriage rollers
09004	Steel grease gun for ballscrew
09009	regreasing adapter

## Cover caps



Code-No.	Type	D	Position
04206	QL/QS 60, DL 120	15	Servicing boring
04205	ELK 30	19	Bearing-block
	QL/QS 80		Servicing boring
	QL 60		Carriage
04235	ELZ 30	28	Bearing-block
	ELT/K 40		Bearing-block
	EGT/K 40		Bearing-block
	DL/DS 160		Servicing boring
	QL 80 - 100		Carriage
04245	ELZ 40, ELHZ 60, ELVZ 60	37	Bearing-block
			Carriage
04265	ELZ 60, ELHZ 80, ELVZ 80, DLZ 120, QLZ/QSZ 60	47	Bearing-block
04285	ELZ 80, ELHZ 100, ELVZ 100, DLZ/DSZ 160, QLZ/QSZ 80	68	Bearing-block
04215	ELZ 100, DLZ/DSZ 200, QLZ/QSZ 100	90	Bearing-block
04225	ELZ 125	110	Bearing-block



1.2

# Spare parts

## Toothed belt,

### Toothed belt

The maximum length of one belt is 60 m. You can use the maximum power range of belt only from -10 C° to +60 C°. For every increase of temperature of +10 C° you have to reduce capability of belt by 20%. For applications with more than 80 C° the humidity not be higher than 50%.



Code-No. length in mm

<b>00534</b>	5000
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Sample ordering code:

Belt HTD LL-5M 25 steel, 5 m long

PU-belt with steel reinforcement				
Code No.	Type	Standard belt	Code No.	Widened belt
00531	ELZ 30	HTD LL-3M12		
00532	ELZ 40	HTD LL-5M15		
00534	ELZ/ML 60	HTD LL-5M25		
00536	ELZ/ML 80(S)	HTD LL-8M30		
00538	ELZ 100	HTD LL-8M50		
00540	ELZ 125	HTD LL-8M70		
00531	ELZG 30	HTD LL-3M12		
00532	ELZG 40	HTD LL-5M15		
00534	ELZG 60	HTD LL-5M25		
00536	ELZG 80(S)	HTD LL-8M30		
00542	ELZZ 60	HTD LL-5M09		
00543	ELZZ 80	HTD LL-8M12		
00544	ELZZ 100	HTD LL-8M20		
00536	ELZZ 125	HTD LL-8M30		
00531	ELSZ 30	HTD LL-3M12	00532	HTD LL-5M15
00532	ELSZ 40	HTD LL-5M15	00534	HTD LL-5M25
00534	ELSZ 60	HTD LL-5M25	00536	HTD LL-8M30
00536	ELSZ 80(S)	HTD LL-8M30	00538	HTD LL-8M50
00538	ELSZ 100	HTD LL-8M50	00540	HTD LL-8M70
00540	ELSZ 125	HTD LL-8M70		
00532	ELSD 40	HTD LL-5M15	00534	HTD LL-5M25
00534	ELSD 60	HTD LL-5M25	00536	HTD LL-8M30
00536	ELSD 80(S)	HTD LL-8M30	00538	HTD LL-8M50
00538	ELSD 100	HTD LL-8M50	00540	HTD LL-8M70
		Main belt		Rotating belt
00534	ELZT 40	HTD LL-5M25	00532	HTD LL-5M15
00536	ELZT 60	HTD LL-8M30	00534	HTD LL-5M25
00538	ELZT 80(S)	HTD LL-8M50	00536	HTD LL-8M30
00540	ELZT 100	HTD LL-8M70	00538	HTD LL-8M50
00534	ELHZ 60	HTD LL-5M25		
00534	ELHZ 80(S)	HTD LL-5M25		
00538	ELHZ 100	HTD LL-8M50		
00545	ELHZ 125	HTD LL-8M50		

PU-belt with steel reinforcement				
Code No.	Type	Standard belt	Code No.	Widened belt
00534	ELVZ 60	HTD LL-5M25		
00534	ELVZ 80(S)	HTD LL-5M25		
00538	ELVZ 100/125	HTD LL-8M50		
00534	ELZW 60	HTD LL-5M25		
00536	ELZW 80(S)	HTD LL-8M30		
00538	ELZW 100	HTD LL-8M50		
00531	ELZU 30	HTD LL-3M12		
00532	ELZU 40	HTD LL-5M15		
00534	ELZU 60	HTD LL-5M25		
00536	ELZU 80(S)	HTD LL-8M30		
00534	DLZ 120	HTD LL-5M25		
00536	DLZ/DSZ 160	HTD LL-8M30		
00538	DLZ 200	HTD LL-8M50		
		Main belt		Rotating belt
00536	DLZT/DSZT 120	HTD LL-8M30	00534	HTD LL-5M25
00538	DLZT/DSZT 160	HTD LL-8M50	00536	HTD LL-8M30
00540	DLZT/DSZT 200	HTD LL-8M70	00538	HTD LL-8M50
00536	DLSZ/DSSZ 120	HTD LL-8M30		
00538	DLSZ/DSSZ 160	HTD LL-8M50		
00540	DLSZ/DSSZ 200	HTD LL-8M70		
00534	QLZ/QSZ 60	HTD LL-5M25		
00536	QLZ/QSZ 80	HTD LL-8M30		
00538	QLZ/QSZ 100	HTD LL-8M50		
00534	QLSZ/QSSZ 80	HTD LL-5M25		



1.2

# Spare parts

## Pulley

### Toothed pulleys



coupling claw on one side



coupling claws on both sides



shaft on one side



shaft on both sides

Pulley size 30-80 bronzed steel, size 100 hard-coated aluminium. Coupling claws compatible with Rotex GS system.

Size	Code No.		Code No.		Belt	Number of teeth	mm/rev.	Coupling Rotex
	Coupling claw on one side	Coupling claw on both sides	Shaft on one side	Shaft on both sides				
<b>ELZ / ELSZ with standard belt</b>								
<b>30</b>	04010	04020	04828	04829	3M12	25	75	7
<b>40</b>	04011	04021	04830	04831	5M15	20	100	9
<b>60</b>	04012	04022	04832	04833	5M25	26	130	14
<b>80(S)</b>	04013	04023	04834	04835	8M30	24	192	19
<b>100</b>	04014	04024	04836	04837	8M50	32	256	24
<b>125</b>	04015	04025	04838	04839	8M70	38	304	28
<b>ELSZ with widened belt</b>								
<b>30</b>	04011	04021	04830	04831	5M15	20	100	9
<b>40</b>	04012	04022	04832	04833	5M25	26	130	14
<b>60</b>	04013	04023	04834	04835	8M30	24	192	19
<b>80(S)</b>	04014	04024	04836	04837	8M50	32	256	24
<b>100</b>	04015	04025	04838	04839	8M70	38	304	28
<b>ELZG</b>								
<b>30</b>	04820	04821	04840	04841	3M12	40	120	7
<b>40</b>	04822	04823	04842	04843	5M15	32	160	9
<b>60</b>	04824	04825	04844	04845	5M25	44	220	14
<b>80(S)</b>	04826	04827	04846	04847	8M30	40	320	19
<b>ELSD with standard belt</b>								
<b>40</b>	04011	04021	04830	04831	5M15	20	100	9
<b>60</b>	04012	04022	04832	04833	5M25	26	130	14
<b>80(S)</b>	04013	04023	04834	04835	8M30	24	192	19
<b>100</b>	04014	04024	04836	04837	8M50	32	256	24
<b>ELSD with widened belt</b>								
<b>40</b>	04012	04022	04832	04833	5M25	26	130	14
<b>60</b>	04013	04023	04834	04835	8M30	24	192	19
<b>80(S)</b>	04014	04024	04836	04837	8M50	32	256	24
<b>100</b>	04015	04025	04838	04839	8M70	38	304	28
<b>ELZU</b>								
<b>30</b>	04010	04020	04828	04829	3M12	25	75	7
<b>40</b>	04011	04021	04830	04831	5M15	20	100	9
<b>60</b>	04012	04022	04832	04833	5M25	26	130	14
<b>80(S)</b>	04013	04023	04834	04835	8M30	24	192	19



1.2

# Spare parts

Pulley

## Toothed pulleys

Size	Code No.		Code No.		Belt	Number of teeth	mm/rev.	Coupling Rotex
	Coupling claw on one side	Coupling claw on both sides	Shaft on one side	Shaft on both sides				
<b>ELZT internal belt</b>								
<b>40</b>	04011				5M15	20	100	9
<b>60</b>	04012				5M25	26	130	14
<b>80(S)</b>	04013				8M30	24	192	19
<b>100</b>	04014				8M50	32	256	24
<b>ELZT external belt</b>								
<b>40</b>	04012	04022	04832	04833	5M25	26	130	14
<b>60</b>	04013	04023	04834	04835	8M30	24	192	19
<b>80(S)</b>	04014	04024	04836	04837	8M50	32	256	24
<b>100</b>	04015	04025	04838	04839	8M70	38	304	28
<b>DLZ / DSZ</b>								
<b>DLZ 120</b>	04012	04022	04832	04833	5M25	26	130	14
<b>DLZ / DSZ 160</b>	04852	04853	04848	04849	8M30	22	176	19
<b>DLZ/DSZ 200</b>	04854	04855	04850	04851	8M50	28	224	24
<b>DLZT / DSZT internal belt</b>								
<b>120</b>	04012				5M25	26	130	14
<b>DLZT / DSZT external belt</b>								
<b>120</b>	04013	04023	04834	04835	8M30	24	192	19
<b>QLZ / QSZ</b>								
<b>60</b>	04012	04022	04832	04833	5M25	26	130	14
<b>80</b>	04852	04853	04848	04849	8M30	22	176	19
<b>100</b>	04854	04855	04850	04851	8M50	28	224	24
<b>QLSZ / QSSZ</b>								
<b>80</b>	04852	04853	048	04849	8M30	22	176	19



1.2



two shafts short



one shaft long



two shafts long

Size	Code No.			Belt	Number of teeth	mm/rev.	Coupling Rotex
	Two shafts short	One shaft long	Two shafts long				
<b>ELHZ / ELVZ</b>							
<b>60</b>	04026	04860	04861	5M25	16	80	14
<b>80(S)</b>	04027	04862	04863	5M25	22	110	19
<b>100</b>	04028	04864	04865	8M50	18	114	24
<b>125</b>	04029	04866	04867	8M50	24	192	28

# Spare parts

## Toothed pulleys



Coupling claw on one side



Shaft on one side

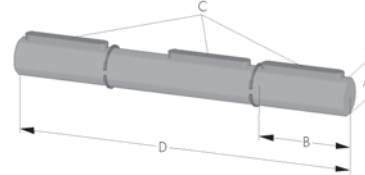
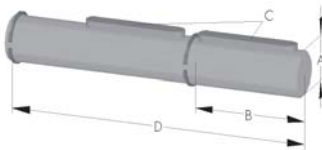


Shafts on both sides

Size	Code No.			Belt	Number of teeth	mm/rev.	Coupling Rotex
	Coupling claw on one side	Shaft on one side	Shaft on both sides				
<b>ELZZ</b>							
<b>60</b>	04856			5M09	26	130	14
<b>80(S)</b>	04857			8M12	24	192	19
<b>100</b>	04858			8M20	32	256	24
<b>125</b>	04859			8M30	38	304	28

## Plug-in shaft for pulleys

Plug-in shaft made of stainless steel, complete with key and locking rings for retrofitting.



Shaft on one side							Shaft on both sides						
Code-No.	Type	Size	A <sub>h7</sub>	B	C	D	Code-No.	Type	Size	A <sub>h7</sub>	B	C	D
<b>04030</b>	<b>ELZ/ELSZ</b>	<b>30</b>	6	15	2x2x12	57	<b>04040</b>	<b>ELZ/ELSZ</b>	<b>30</b>	6	15	2x2x12	72
<b>04031</b>	<b>ELZ/ELSZ</b>	<b>40</b>	10	27	3x3x25	85	<b>04041</b>	<b>ELZ/ELSZ</b>	<b>40</b>	10	27	3x3x25	112
<b>04032</b>	<b>ELZ/ELSZ QLZ/QSZ</b>	<b>60</b>	14	35	5x5x28	115	<b>04042</b>	<b>ELZ/ELSZ QLZ/QSZ</b>	<b>60</b>	14	35	5x5x28	150
	<b>DLZ/DSZ DLZT/DSZT</b>	<b>120</b>						<b>DLZ/DSZ DLZT/DSZT</b>	<b>120</b>				
<b>04033</b>	<b>ELZ/ELSZ QLZ/QSZ</b>	<b>80</b>	18	45	6x6x40	145	<b>04043</b>	<b>ELZ/ELSZ QLZ/QSZ</b>	<b>80</b>	18	45	6x6x40	190
	<b>DLZ/DSZ</b>	<b>160</b>						<b>DLZ/DSZ</b>	<b>160</b>				
	<b>DLSZ/DSSZ</b>	<b>120</b>						<b>DLSZ/DSSZ</b>	<b>120</b>				
<b>04034</b>	<b>ELZ/ELSZ</b>	<b>100</b>	22	45	6x6x40	175	<b>04044</b>	<b>ELZ/ELSZ</b>	<b>100</b>	22	45	6x6x40	220
	<b>DLSZ</b>	<b>160</b>						<b>DLSZ</b>	<b>160</b>				
<b>04035</b>	<b>ELZ</b>	<b>125</b>	30	45	8x7x40	215	<b>04045</b>	<b>ELZ</b>	<b>125</b>	30	45	8x7x40	270



**1.2**

## Tensioning set for sizes EL 100 - 125, DL 200, QL / QS 100



Code-No.	Type	Tension ring
<b>00472</b>	<b>EL 100 DL/DS 200 QL/QS 100</b>	22 x 32
<b>00479</b>	<b>E 125</b>	30 x 41

# Spare parts

## Belt adjusters

### Belt adjuster ELZ



Code-No.	Type	Material
04060	30	Zinc coated steel
04061	40	Zinc coated steel
04062	60	Zinc coated steel
04063	80(S)	Zinc coated steel
04064	100	Zinc coated steel
04065	125	Zinc coated steel

### Belt adjuster ELSZ



Code-No.	Type	Material
04071	30/40	Zinc coated steel
04076	30/40	Nickel faced steel
04072	60	Zinc coated steel
04077	60	Nickel faced steel
04073	80(S)	Zinc coated steel
04078	80(S)	Nickel faced steel
04074	100	Zinc coated steel
04079	100	Nickel faced steel
04075	125	Zinc coated steel
04070	125	Nickel faced steel

### Belt adjuster ELHZ



Code-No.	Type	Material
04080	60	Black anodized Al and zinc coated steel
04081	80(S)	Black anodized Al and zinc coated steel
04082	100	Black anodized Al and zinc coated steel
04083	125	Black anodized Al and zinc coated steel

### Belt adjuster ELVZ



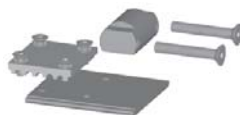
Code-No.	Type	Material
04090	60	Black anodized Al and zinc coated steel
04091	80(S)	Black anodized Al and zinc coated steel
04092	100	Black anodized Al and zinc coated steel
04093	125	Black anodized Al and zinc coated steel

### Belt adjuster

**DLZ  
DSZ**



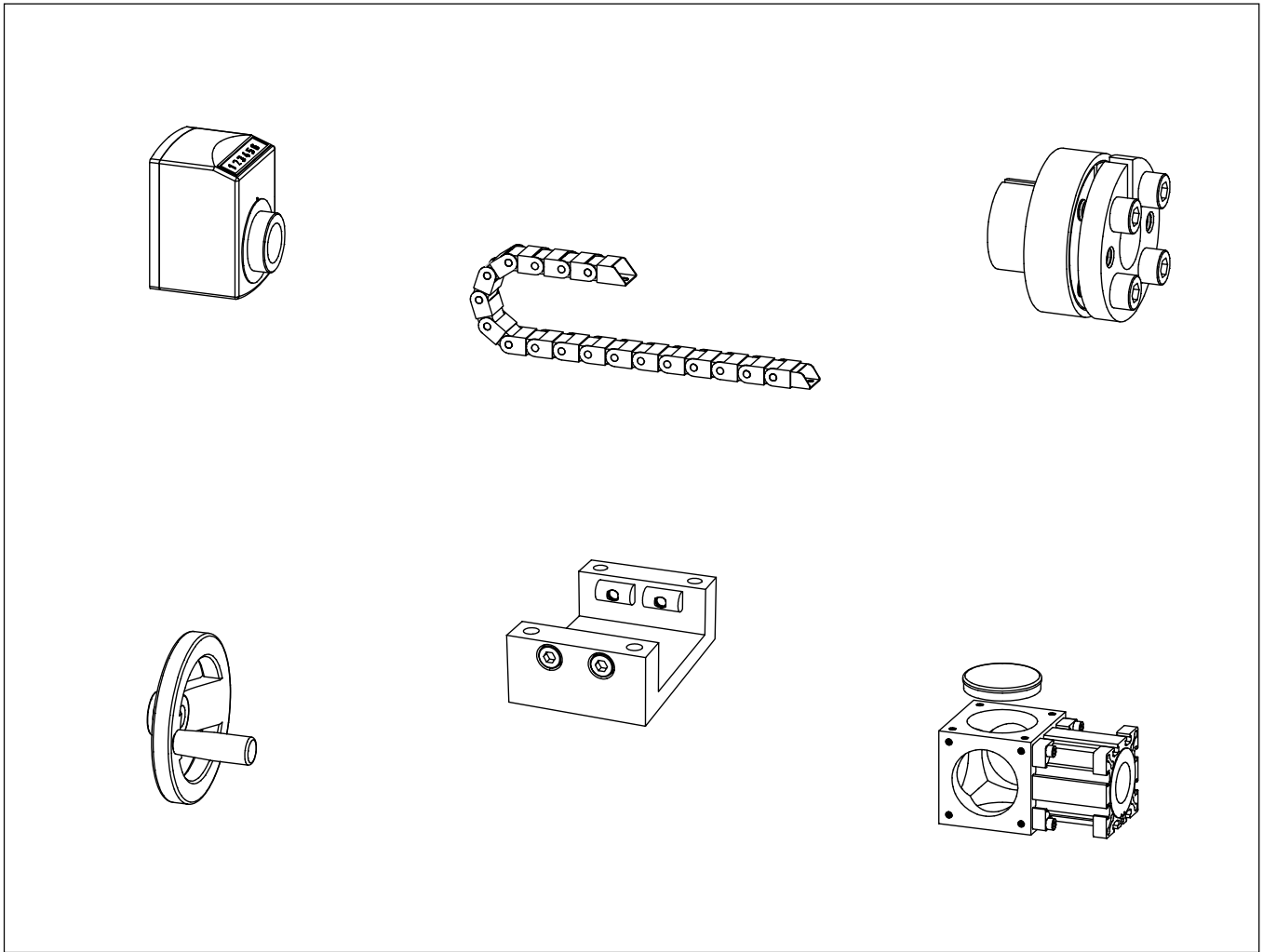
**DLSZ  
DSSZ**



**QLZ  
QSZ**



Code-No.	Type	Material
04084	DLZ 120	Nature anodized Al and zinc coated steel
04086	DLZ/DSZ 160	Nature anodized Al and zinc coated steel
04085	DLZ/DSZ 200	Nature anodized Al and zinc coated steel
04066	DLSZ 120	Zinc coated steel
04067	DLSZ/DSSZ 160	Zinc coated steel
04087	QLZ/QSZ 60	Nature anodized Al
04088	QLZ/QSZ 80	Nature anodized Al
04089	QLZ/QSZ 100	Nature anodized Al



## Accessories

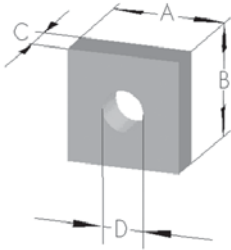


# Accessories

## Slide nuts

### Square nut

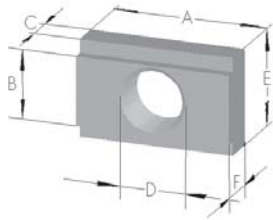
Slide nuts position refer to chapter 2.2 page 3  
Material: galvanized steel



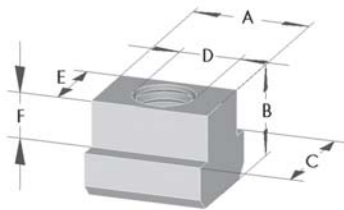
Code-No.	Type	A	B	C	D
02708	M 4	7	7	2,2	M 4
02710	M 5	8	8	2,7	M 5
02715	M 6	10	10	3,2	M 6
02714	M 8	13	13	4	M 8
02713	M 10	17	17	5	M 10
02721	M 10	25	20	8	M 10

### T-nut

Slide nuts position refer to chapter 2.2 page 3  
Material: galvanized steel



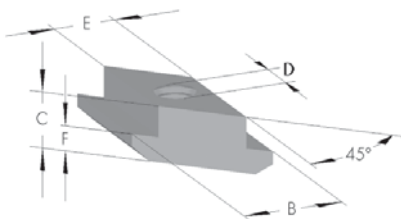
Code-No.	Type	A	B	C	D	E	F
02709	M 5	14	8,1	4,5	M 5	14	6
02716	M 6	14	8,1	4,5	M 6	14	6
02718	M 8	18	8,1	4,5	M 8	14	6
02719	M 10	22	8,1	4,5	M 10	14	6
02730	M 6	13	10	4	M 6	15	8
02731	M 8	13	10	4	M 8	15	8



Code-No.	Type	A	B	C	D	E	F
02734	M 5	10	8	10	M 5	6	4
02735	M 6	13	10	13	M 6	8	4
02736	M 8	15	12	15	M 8	10	6
02720	M 10	18	14	18	M 10	12	7
02722	M 12	22	16	22	M 12	14	8
02737	M 16	28	20	28	M 16	18	10

### Rhombus nut

Slide nuts position refer to chapter 2.2 page 3  
Material: galvanized steel



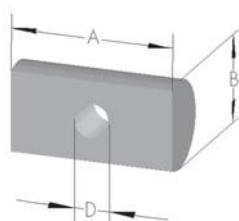
Code-No.	Type	B	C	D	E	F
02732	M 8	15	9	M 8	10	4,2
02733	M 6	15	9	M 6	10	4,2



2.2

### Half round nut

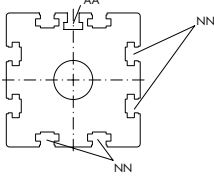
For guide body profile EL, QL / QS and for fastening of jointing and mounting blocks. Material: galvanized steel



Code-No.	Type	A	B	D
02724	M 3	28	5	2x M 3
02725	M 5	14	6	M 5
02726	M 6	18	10	M 6
02728	M 8	22	12	M 8
02729	M 8	22	16	M 8
02723	M 10	25	20	M 10

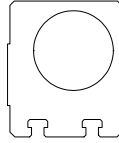
# T-nut allocation

## Bearing block profile EL



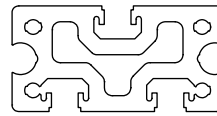
Size	T-slot nut slot AA Code Nr.	T-slot nut slot NN Code Nr.
30	02715	02715
40	02710	02715
60	02710	02718
80	02714	02719
80(S)	02714	02719
100	02714	02720
125	02736	02722

## Bearing block profile ELZ



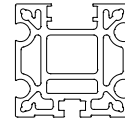
Size	T-slot nut slot M Code Nr.
40	02735
60	02731/02719
80(S)	02736
100	02720
125	02722

## Guide body profile E



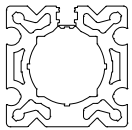
Size	T-slot nut slot CC Code Nr.
40	02730 / 02731
60	02730 / 02731
80	02730 / 02731

## Guide body profile ML



Size	T-slot nut slot N Code Nr.
60	02716/02718
80 (S)	02719
100	

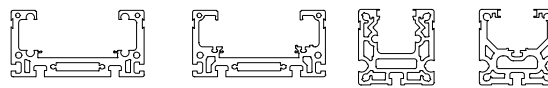
## Guide body profile EL / EG



Size	T-slot nut slot CC Code Nr.
EL 30	02715
EL/EG 40	02718
EL/EG 60	02718
EL/EG 80(S)	02718
EL 100	02721
EL 125	02721

## Guide body profile

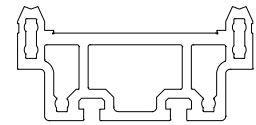
DL / DS / QL / QS



Size	T-slot nut slot N Code Nr.	T-slot nut slot M Code Nr.	T-slot nut slot T* Code Nr.
DL 120	02735	02734	-
DL/DS 160	02736	02735	02708
DL/DS 200	02720	02736	-
QL/QS 60	02734	-	02708
QL/QS 80	02735	-	02710
QL/QS 100	02720	-	02716

\* only for DS/QS guide body profile

## Guide body profile ALLM

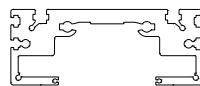


Size	T-slot nut slot N Code Nr.
200	02737

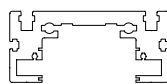
## Carriage profile EL / EG

Size	T-slot nut slot OO Code Nr.	T-slot nut slot MM Code Nr.
30	02715	-
40	02716/02709	-
60	02718	-
60S	02718	-
80	02718/02719	02715
80S	02736	02735
100	02720	02713
125	02722	02720

### EL/ML



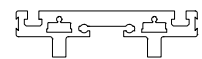
### EG



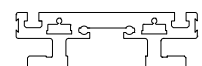
## Carriage profile DL / DS / QL / QS

Size	T-slot nut slot O Code Nr.	T-slot nut slot M Code Nr.
DL 120	02735	-
DL/DS 160	02736	-
DL/DS 200	02720	-
QL/QS 60	-	02735
QL / QS 80	-	02736
QL/QS 100	-	02720

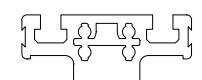
### DL



### DS



### QL/QS

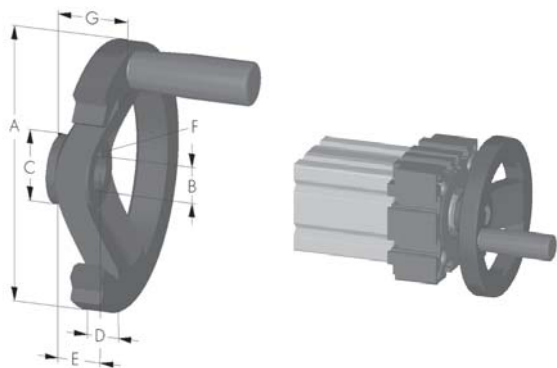


Slide nut dimensions refer to chapter 2.2 page 2

## Accessories

**Handwheel** with keyway and locking screw

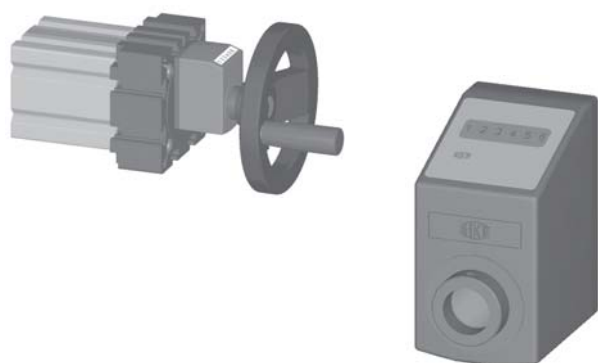
A plastic coated aluminium handwheel with a matt black finish. Equipped with a black handle.



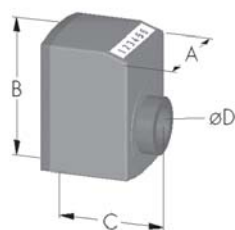
Code-No.	Type	A	B	C	D	E	F	G
00050	30	70	5	17	13	15	-	20
00100	40	100	10	29	14,5	17	3x3	30
00160	60	140	14	36	16,5	19	5x5	36
00200	80	200	18	42	20,5	24	6x6	45
00222	100	200	22	42	20,5	24	6x6	45

**Positional indicator EL / EG**

Shell made of polyamide orange. Ambient temperature 80°C. Any fitting position possible. Numeral height 6 mm. Accuracy of reading 0,1 mm.



Code No. 00265 - 00268  
electronical indicator



Code-No.	Size	AxBxC	D	type	pitch (mm)
00231..	30	33x47x31	6	SH	2,5 or 3
00232..	30	33x47x31	6	FH	2,5 or 3
00233..	30	33x47x31	6	SV	2,5 or 3
00234..	30	33x47x31	6	FV	2,5 or 3
00241..	40, 60, 80	48x67x51	12,17,20	SH	4 or 8
00242..	40, 60, 80	48x67x51	12,17,20	FH	4 or 8
00243..	40, 60, 80	48x67x51	12,17,20	SV	4 or 8
00244..	40, 60, 80	48x67x51	12,17,20	FV	4 or 8
00251..	40, 60, 80	48x67x51	12,17,20	SH	5 or 10
00252..	40, 60, 80	48x67x51	12,17,20	FH	5 or 10
00253..	40, 60, 80	48x67x51	12,17,20	SV	5 or 10
00254..	40, 60, 80	48x67x51	12,17,20	FV	5 or 10
00261..	100, 125	56x75x64	25,30	SH	6 or 12
00262..	100, 125	56x75x64	25,30	FH	6 or 12
00263..	100, 125	56x75x64	25,30	SV	6 or 12
00264..	100, 125	56x75x64	25,30	FV	6 or 12
00265..	40, 60, 80	48x87x71	12,17,20	SH	0,01 - 10
00266..	40, 60, 80	48x87x71	12,17,20	FH	0,01 - 10
00267..	40, 60, 80	48x87x71	12,17,20	SV	0,01 - 10
00268..	40, 60, 80	48x87x71	12,17,20	FV	0,01 - 10

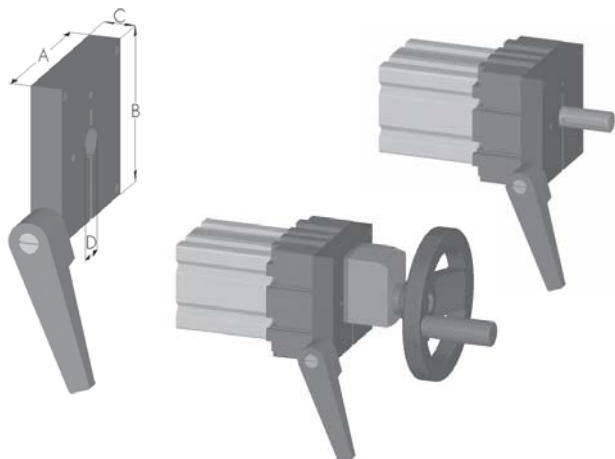
0024108

Sample ordering code: size 40, 8 mm pitch increasing horizontal.



**Spindle clamp EL / EG, DL / DS /QST/K**

Black anodized aluminium, steel hand lever.



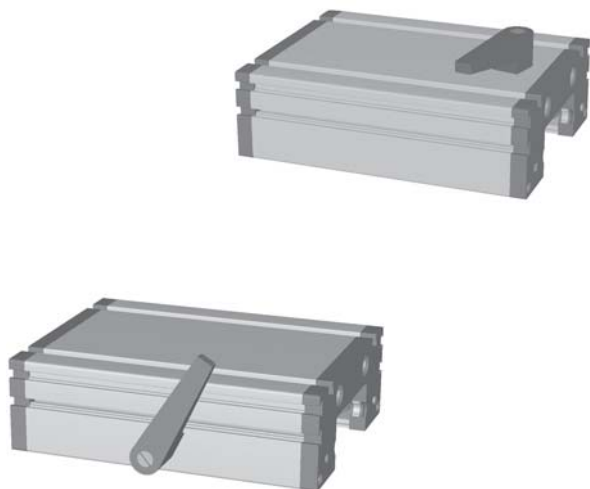
Code-No.	Type	A	B	C	D	Hand-lever
00291	EL/EG 30	43	50	10	6	M 6
00292	EL/EG 40	58	70	10	12	M 6
00293	EL/EG 60	80	80	15	17	M 8
00294	EL/EG 80	100	100	20	20	M10
00295	E 100	130	130	20	25	M10
00296	E 125	-	-	-	-	-
00283	DL 120	62	80	15	12	M 6
00284	DL/DS 160	80	90	20	17	M 8
00285	DL/DS 200 QST/K 100	90	99	20	25	M 10
00286	QST/K 80	80	90	20	?	M 8
00287	QST/K 60	62	80	15	?	M 6

# Accessories

## Clamp Mounting systems

### Carriage clamp EL / EG

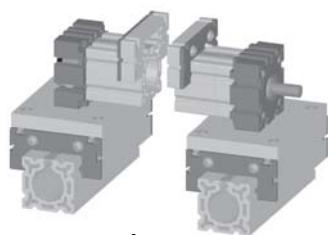
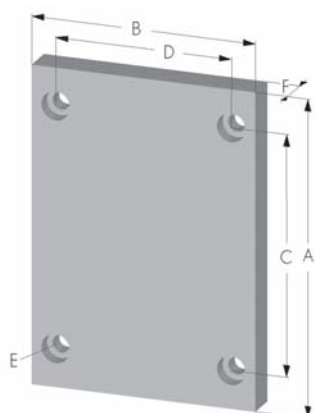
Carriage with carriage clam. Carriage length can be chosen as required. Depending on type of drive (spindle or belt) the position of clamp can be different. Dimensions by inquiry.



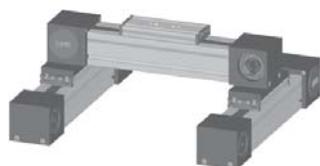
Code-No.	Type
00311	EG 30
00312	EG 40
00313	EG 60
00314	EG 80
00301	EL 30
00302	EL 40
00303	EL 60
00304	EL 80
00305	EL 100
00306	EL 125

### Assembly plate

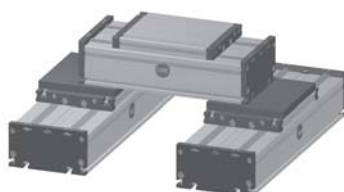
Assembly plate, anodized aluminium, enables various units to be assembled in a simple manner when combinations of linear units are to be used. Complete with screws and slide-nuts. Tapped holes can be made on request.



EL/EG



QL/QS



DL/DS

Code-No.	Type	A	B	C	D	E for	F
00940	EG 40	100	70	86	52	M 6	12
00960	EG 60	144	100	126	80	M 8	15
00980	EG 80	170	140	152	110	M10	15
00935	EL 30	70	70	56	56	M 6	10
00945	EL 40	100	100	84	66	M 6	12
00965	EL 60	144	144	126	96	M 8	15
00964	EL 60 S	170	170	152	108	M 8	15
00985	EL 80	170	170	152	117	M10	15
00984	EL 80 S	190	190	172	126	M 8	15
00915	EL 100	270	230	248	155	M10	20
00925	EL 125	335	295	285	200	M12	20
00966	DL120	140	120	122	96	M 6	12
00986	DL/DS 160	180	160	162	130	M 8	15
00916	DL/DS 200	240	200	218	168	M 10	20
00967	QL 60	140	60	122	36	M 6	12
00987	QL 80	180	80	162	50	M 8	15
00917	QL 100	240	100	218	66	M10	20
00926	QS 60	165	60	147	36	M6	12
00928	QS 80	216	80	198	50	M8	15
00911	QS 100	248	100	226	66	M10	20

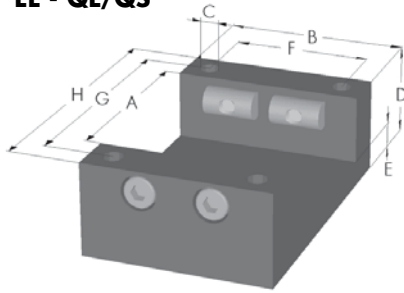


# Accessories

## Mounting systems

### Support and mounting block

#### EL - QL/QS



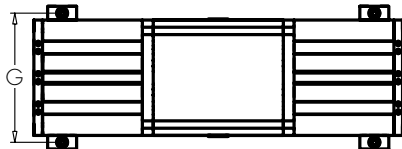
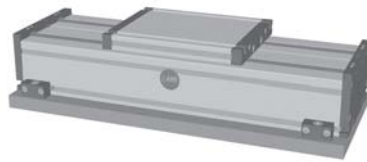
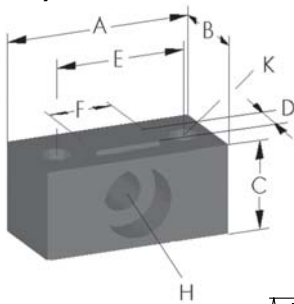
#### EG



The blocks can be retrofitted by half-round nuts (EL) or thread holes (EG). Black anodized aluminium, for mounting and for supporting long units. These components can be ready mounted on the units by us to customer's specification. Mounting can be clear or tapped holes and slide-nuts.

Code-No.	Type	A	B	C	D	E	F	G	H
03030	EL 30	30	30	4,2	18,0	6	1 hole	38	45
03040	EL 40	40	40	6,5	24,0	9		50	60
03043	EG 40	40	40	6,5	24,0	9		50	60
03060	EL 60(S) QL/QS 60	60	60	9,0	35,0	11		75	90
03063	EG 60	60	60	9,0	35,0	11		75	90
03080	EL 80(S) QL/QS 80	80	80	10,5	39,0	11	60	100	120
03083	EG 80	80	80	10,5	39,0	11	60	100	120
03010	EL/QL/QS-100	100	100	8,5	55,0	15	70	120	140
03020	EL125	125	125	11	67,5	20	85	150	170

#### DL/DS

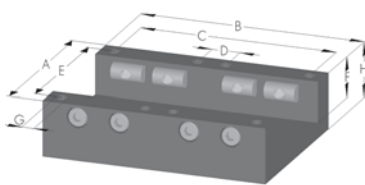


Code-No.	Type	A	B	C	D	E	F	G	H for	K for
03001	DL 120	34	17	14	6	22	10	134	M6	M5
03002	DL/DS 160	40	20	19	8	28	14	179	M8	M6
03003	DL/DS 200	50	30	24	10	34	18	224	M10	M8

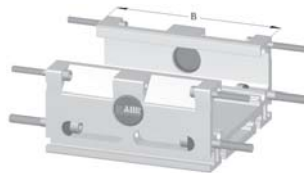
### Jointing block EL / QL - DL / DS

Anodized aluminium. For joining body profiles longer than standard.

#### EL - QL / QS



#### DL / DS



Code-No.	Type	A	B	C	D	E	F	G	H
03031	EL 30	48	60	30	1 hole	38	11,5	4,2	17,5
03041	EL 40	60	80	40		50	15	6,5	24
03061	EL 60 QL/QS 60	90	120	60		75	24	8,5	35
03081	EL 80 QL/QS 80	120	160	140	20	100	29	10,5	40
03011	EL 100 QL/QS 100	140	200	170	30	120	40	8,5	55
03021	EL125	170	250	210	40	150	47,5	11	67,5
03090	DL120	-	120	-	-	-	-	-	-
03091	DL/DS 160	-	160	-	-	-	-	-	-
03092	DL/DS 200	-	200	-	-	-	-	-	-

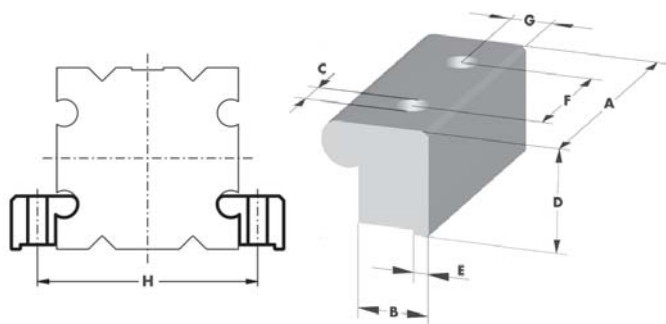
2.2

# Accessories

## Mounting systems

### Mounting profile EL / Q

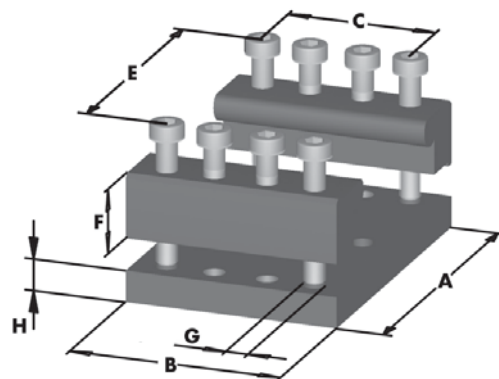
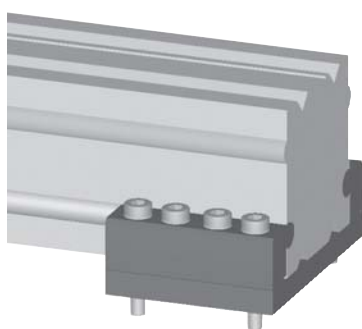
Black anodized aluminium, for mounting.  
Mounting can be clear or tapped holes. Pair (without screws)



Code-Nr.	Type	A	B	C	D	E	F	G	H
03019	EL/Q 100	80	21,5	10,5	30,5	4	40	12	120
03029	EL 125	100	27	13	40	6	50	15,5	149
03039	EL 30	24	11,5	5,5	10	3	12	6,5	41
03049	EL 40	32	15,5	6,5	13	4	16	9	54
03069	EL/Q 60	48	17,5	8,5	18	4	24	9,5	77
03089	EL/Q 80	64	19,5	8,5	23,5	4	32	11,5	97

### Mounting profile EL/Q

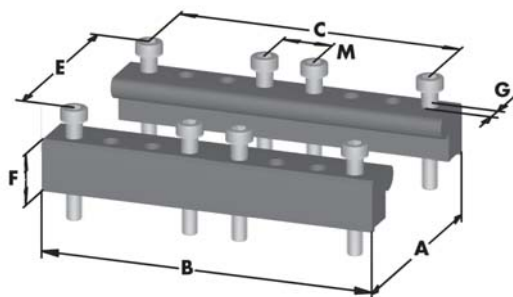
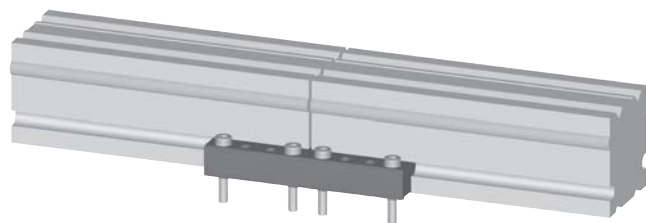
Black anodized aluminium, for mounting and for supporting long units. These components can be ready mounted on the units by us to customer's specification. Mounting can be clear or tapped holes and slide-nuts.



Code-No.	Type	A	B	C	E	F	G	H
030301	EL 30	54	30	20	38	10	4,2	6
030401	EL 40	72	40	26	50	13	6,4	9
030601	EL/Q 60	96	60	40	75	18	8,5	10,8
030801	EL 80/80S/Q80	120	80	60	100	23,5	10,5	10,8
030101	EL/Q 100	144	100	70	120	30,5	10,5	14,8
030201	EL 125	180	125	85	150	40	11	20

### Jointing profile EL/Q

Black anodized aluminium. For joining body profiles longer than standard.



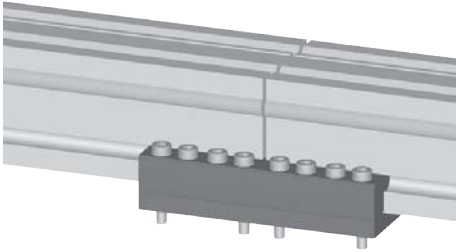
Code-No.	Type	A	B	C	E	F	G	M
030312	EL 30	54	60	50	38	10	4,2	10
030412	EL 40	72	80	66	50	13	6,4	14
030612	EL/Q 60	96	120	100	75	18	8,5	20
030812	EL 80/80S/Q80	120	160	140	100	23,5	10,5	20
030112	EL/Q 100	144	200	170	120	30,5	10,5	30
030212	EL 125	180	250	210	150	40	11	40



## Accessories

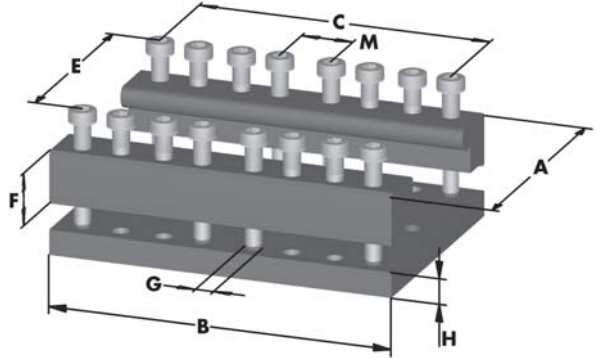
### Mounting systems

#### Joining profile EL/Q



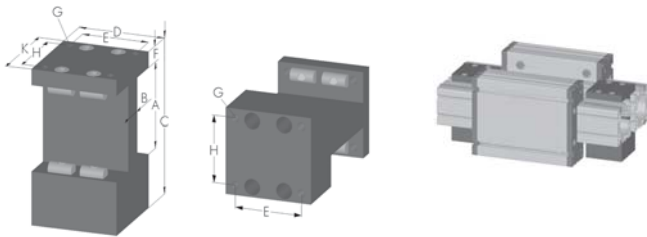
Black anodized aluminium, for joining and mounting supporting long units. These components can be ready mounted on the units by us to customer's specification. Mounting can be clear or tapped holes and slide-nuts.

Code-No.	Type	A	B	C	E	F	G	H	M
030311	EL 30	54	60	50	38	10	4,2	6	10
030411	EL 40	72	80	66	50	13	6,4	9	14
030611	EL/Q 60	96	120	100	75	18	8,5	10,8	20
030811	EL/Q 80/80S	120	160	140	100	23,5	10,5	10,8	20
030111	EL/Q 100	144	200	170	120	30,5	10,5	14,8	30
030211	EL 125	180	250	210	150	40	11	20	40



#### Parallel mounting block EL

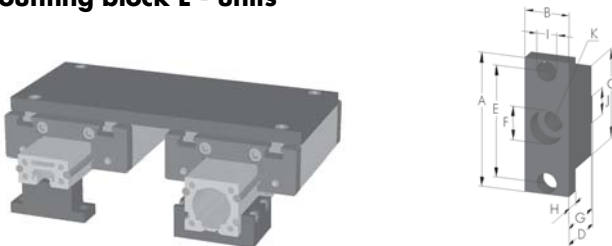
Black anodized aluminium. For parallel mounting of two units.



Code-No.	Type	A	B	C	D	E	F	G	H	K
03042	40	40	18	85	58	50	10	M 6	50	58
03062	60	60	22	123	70	54	15	M 8	54	70
03082	80	80	22	145	80	62	15	M 8	62	80
03084	80S	80	22	155	80	62	15	M 8	62	80
03012	100	100	30	200	110	90	20	M10	90	110
03022	125	125	40	253	135	115	22,5	M12	115	135

#### Mounting block E - units

Black anodized aluminium. Support and mounting block for E40, 60, 80. By using this mounting block you will reach the same level of heights as EL-units with support. Assembling by through holes (frame) and slide-nuts (unit).

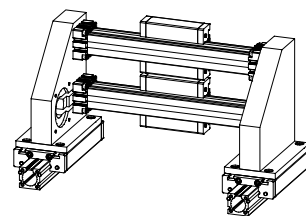
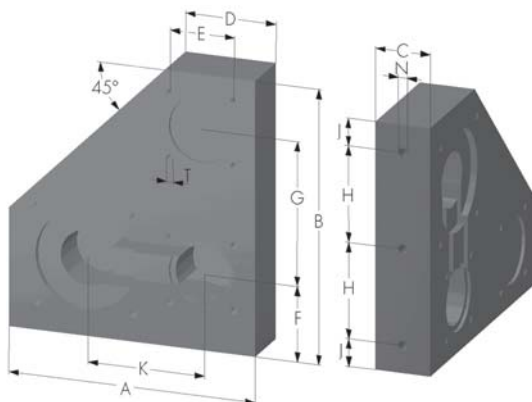


Code-No.	Type	A	B	C	D	E	Ø F	G	H	Ø I	J	Ø K
03048	E 40	60	20	40	28	50	15	27	8	6,6	12	9
03068	E 60	90	25	59	41,7	75	15	40,7	10	9	12	9
03088	E 80	120	30	78	51,8	100	15	50,8	15	10,5	12	9



#### Double mounting block with motor housing

Black anodized aluminium, including pulleys and belt for the drive. Ratio 1:1



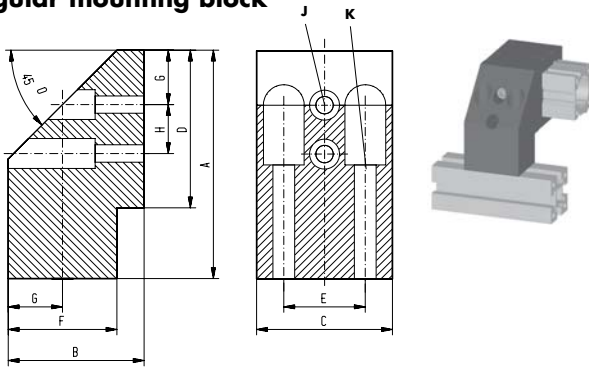
Code-No.	Type	A	B	C	D	E	F	G	H	J	K	N	T
03050	40	180	200	40	66	□ 47	55	105	70	20	85	M8	M6
03051	60	205	304	50	74	□ 68,6	80	164	87,5	15	125	M8	M8

# Accessories

## Mounting systems

### Angular mounting block

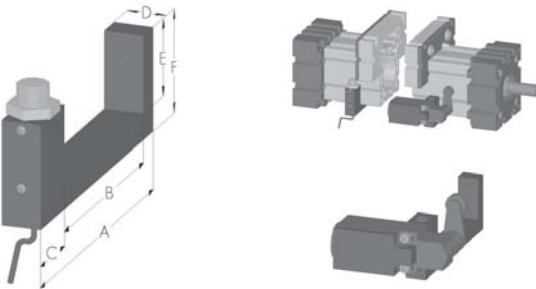
Black anodized aluminium.



Code-No.	Type	A	B	C	D	E	F	G	H	J ∅	K ∅
03055	40	84	50	50	58	30	40	20	18	6,4	8,4
03056	60	117	50	59	80	36	40	20	30	9	9

### Proximity / limit switch holder EG

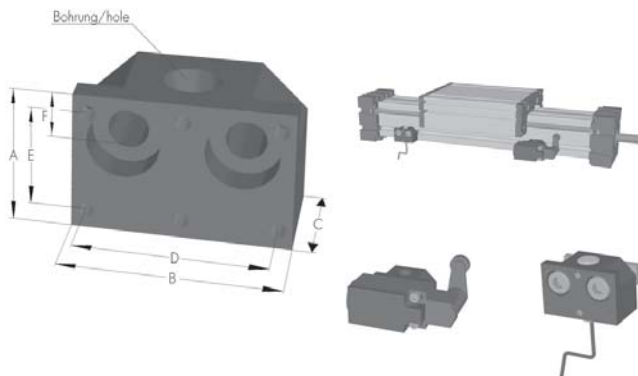
Black anodized aluminium bracket, fixed by grub screws. Position along the length of the units is adjustable. Fixing holes for proximity and limit switches are provided.



Code-Nr.	Type	A	B	C	D	E	F	Drill hole
01340	EG 40	72	40	24	15	19	28	8,2
01360	EG 60	92	60	24	15	26	35	12,2
01380	EG 80	114	81	24	15	30	40	12,2

### Proximity / limit switch holder EL

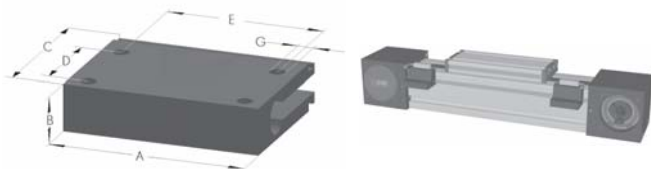
Black anodized aluminium bracket, fixed by screws into slide-nuts in the body T-slots, hence position axially adjustable. Fixing holes for proximity and limit switches are provided. Complete with screws and sliding nuts.



Code-No.	Type	A	B	C	D	E	F	Drill hole
01331	EL 30	12	30	12	-	-	6	8,2
01341	EL 40	28	32	25	26	22	8	8,2
01361	EL 60	30	40	25	32	22	11	12,2
01381	EL 80	30	45	25	39	22	10	12,2
01311	EL 100	40	55	20	49	22	12	12,2
01321	EL 125	45	60	25	52	22	12,5	12,2
01300	EL60-125	Reducing sleeve		∅ 12 to ∅ 8				

### Proximity / limit switch holder DL / DS - QL / QS

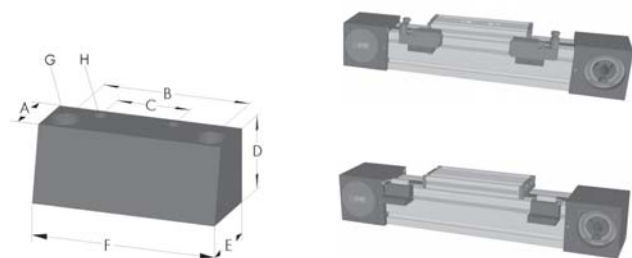
Black anodized aluminium bracket, fixed by screws into sliding nuts in the body T-slots, hence position self-centering and axially adjustable. Fixing holes for proximity and limit switches are provided.



Code-No.	Type	A	B	C	D	E	G
01320	DL/DS QL/QS	50	12	38	22	40	M4

### Mounting block for proximity switch DL / DS - QL / QS

Black anodized aluminium bracket. Mounting by fillister head screws with connection element code No. 01362. Fixing holes for proximity switches are provided.



Code-No.	Type	A	B	C	D	E	F	G for	H for
01324	DL/DS QL/QS	15,5	40	20	20	20	50	M4	M3

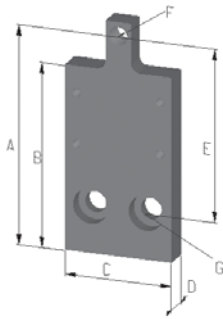


2.2

# Accessories

## Switches

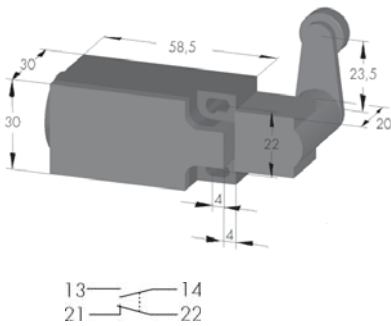
### Switch mounting plate



Black anodized aluminium bracket, fixed by screws into sliding nuts in the body T-slots, hence position self-centering and axially adjustable. Fixing holes for proximity and limit switches are provided.

Code-No.	Type	A	B	C	D	E	F	G for
01320-3	DL 120	70	59	50	12	56	M8x1	M 6
01320-33	QL/QS 60					61		M 5
01320-2	DL/DS 160	94	79	50	12	75	M8x1	M 8
01320-22	QL/QS 80					84		M 8
01320-1	DL/DS 200	115	101	50	12	77	M8x1	M 8
01320-11	QL/QS 100					78		M 8

### Limit switch



Fully insulated thermoplastic switch with adjustable operation lever. The operation device can be turned by 90°, the lever can be turned to engage by 360°.

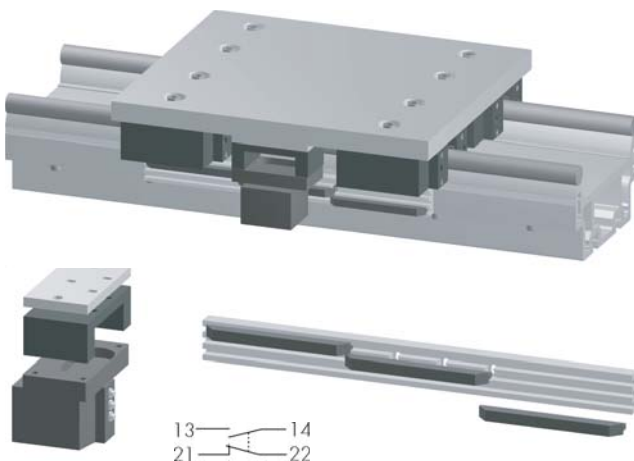
Max. voltage 380 V  
 Max. constant current 6 A  
 Max. current at make 16 A  
 Duty classification max.6000/h  
 Mechanical lifetime  $1 \times 10^7$   
 Operating repeatability  $\pm 0,01$   
 Transit time/snap switch ca. 10 ms  
 Protection class IP 65 (DIN 40050)  
 Working temperature -30° C to +80° C

Code-No.	choice
01101	standard
01102	PG13,5 connector
01101ex	Version ATEX

### Limit switch



2.2



3 electromechanical switches in a row.

Nominal voltage 250 V  
 Cont. current 6 A  
 Switch rate max.300/min.  
 Mech. Lifetime >30 Mio.  
 Repeatability  $\pm 0,01$  mm  
 Transit time/snap switch ca. 10 ms  
 Protection class IP 67 (DIN 60529)  
 Working temperature -5° C bis +80° C

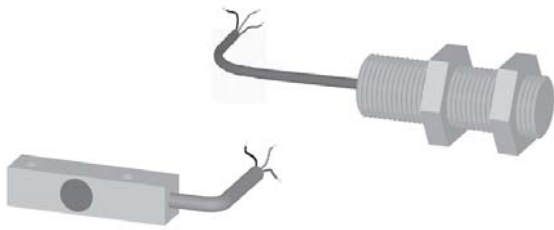
Code-No.	choice
01105	switch system *

\* consisting of 2 cam ledges and 3 cams

# Accessories

## Switches

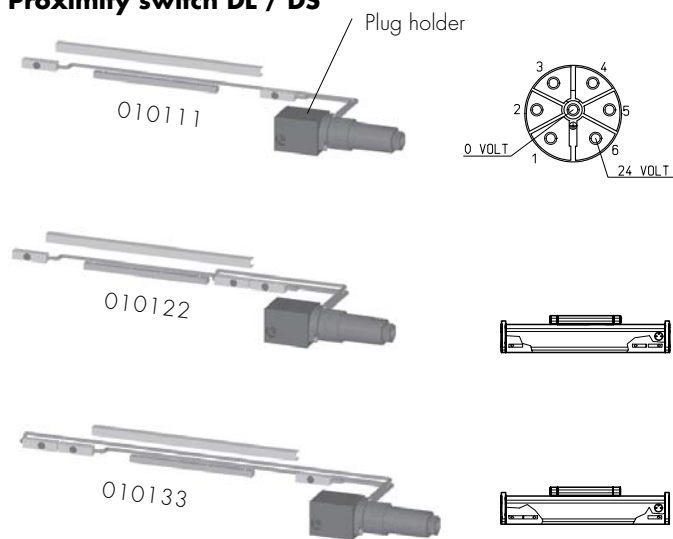
### Proximity switch



### Inductive proximity switch

Code-No.	Type	Switch distance	Voltage	Output-current	Switching-function	Protection class
01003	30, 40 M8	1 mm	10 - 30 V	200 mA	PNP brake contact	IP 67
01004	30, 40 M8	1 mm	10 - 30 V	200 mA	PNP make contact	IP 67
01001	60-125 M12	2 mm	10 - 30 V	200 mA	PNP brake contact	IP 67
01002	60-125 M12	2 mm	10 - 30 V	200 mA	PNP make contact	IP 67
010014	Q 8x8	2 mm	10 - 30 V	200 mA	PNP brake contact	IP 67
010013	Q 8x8	2 mm	10 - 30 V	200 mA	PNP make contact	IP 67

### Proximity switch DL / DS



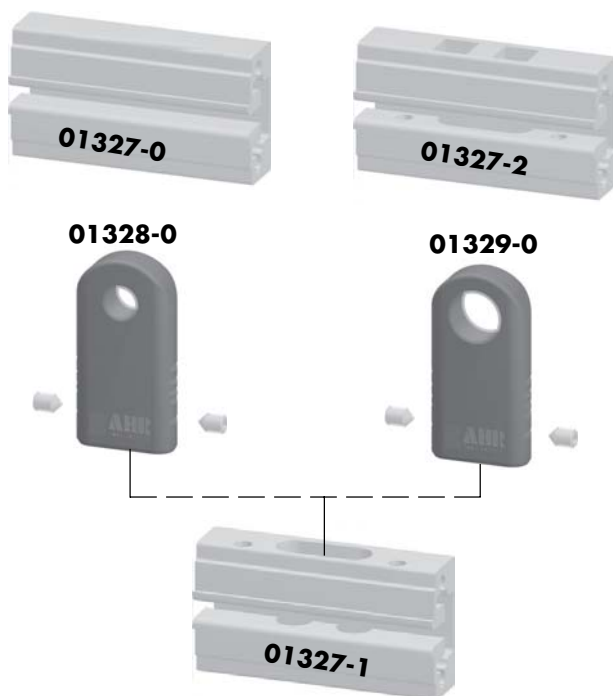
Inductive proximity switch, integrated in guide body profile DL. In standard version, limit switches are designed as break contacts, and reference switches are designed as make contacts

Code-No.	Type
010111	2 integrated inductive proximity switches as limit switch
010122	2 integrated inductive proximity switches as limit switch, 1 reference switch right
010133	2 integrated inductive proximity switches as limit switch, 1 reference switch left
01322	Plug holder right
01323	Plug holder left

Technical data for plug:  
Working temperature -40° / +90°  
Protection class IP65  
inflammability UL-standard 94V0

### Proximity / limit switch holder DL / DS / QL / QS

Proximity / limit switch holder for guide body profile DL./DS/QL/QS



Code-Nr.	Type
01327-0	Base holder for a limit switch
01327-1	Base holder for a proximity and a limit switch
01327-2	Base holder for a rectangular proximity and a limit switch
01328-0	plug in holder for a proximity switch M8x1
01329-0	plug in holder for a proximity switch M12x1

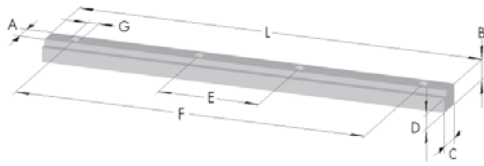
\* Edelstahlgewindestifte



# Accessories

Switches

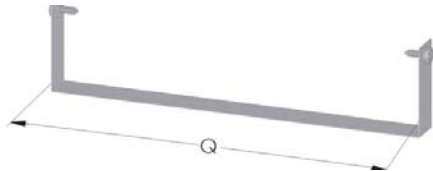
## Activating strip DL / DS



For internal proximity switches.

Code-No.	Type	A	B	C	D	E	F	G	L
04870	DL 120	2,9	8,5	7	5,9	46	99	3,5	120
04871	DL/DS 160	6	6	8	4,3	30	104	3,5	120
04872	DL /DS 200								

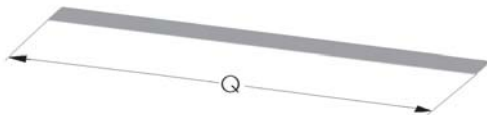
## Activating sheet EL / EG



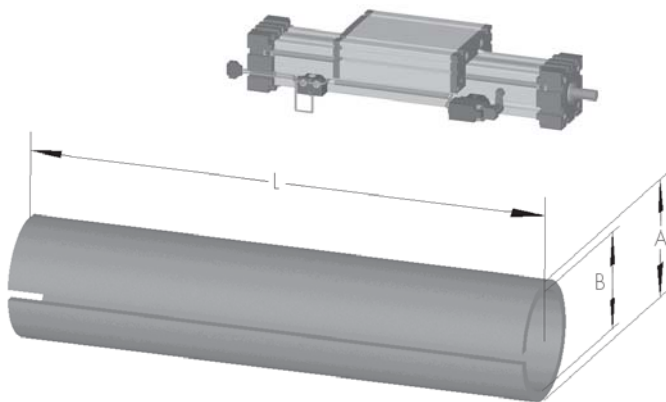
For external mounting proximity switches.

Code-No.	Type	Q
01000	EL 30	Carriage length
01005	EL 40	Carriage length
01006	EL 60	Carriage length
01011	EL 60S	Carriage length
01007	EL 80	Carriage length
01010	EL 80S	Carriage length
01008	EL 100	Carriage length
01009	EL 125	Carriage length
01018	DL 120	Carriage length
01017	DL/DS 160	Carriage length
01016	DL/DS 200	Carriage length
01030	QL/QS 60	Carriage length
01031	QL/QS 80	Carriage length
01032	QL/QS 100	Carriage length

## Activating sheet QL / QS - DL / DS



## Cable conduit EL / QS



Slotted plastic tube for cabling directly onto body of linear unit. The tube can simply be pressed into the semicircular groove in the body and will be securely retained there.

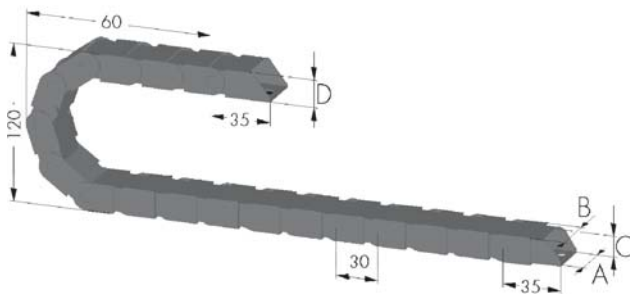
Code-No.	Type	A	B	L
02806	EL 40	6	4	max. 50m
02810	EL 60(S) / Q 60	10	7,5	max. 50m
02812	EL 80(S) / Q80	12	8,5	max. 50m
02816	EL 100 / Q 100	16	12	max. 50m
02820	EL 125	20	15	max. 50m

02816	1000
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Sample ordering code:  
Plastic tube for EL 100, 1000 mm long.



## Cable chain



Black plastic, one floating and one fixed galvanized mounting bracket. The inner face opens like a zip, enabling cable to be inserted easily.

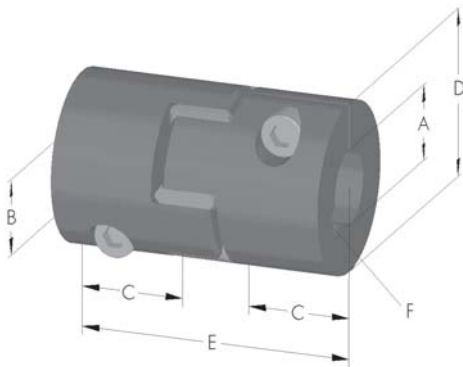
Code-No.	Type	Name	A	B	C	D
02115	15	Cable chain	25,5	15	18	23
02125	25	Cable chain	35,5	25	18	23
02138	38	Cable chain	48	38	18	23
02150	50	Cable chain	60	50	18	23
02116	15	fixing brackets (2 pieces)				
02126	25	fixing brackets (2 pieces)				
02139	38	fixing brackets (2 pieces)				
02151	50	fixing brackets (2 pieces)				

# Accessories

## Coupling

### Coupling

Torsionally elastic coupling with keyway and clamp. Light pre-load provides backlash-free torque transmission.



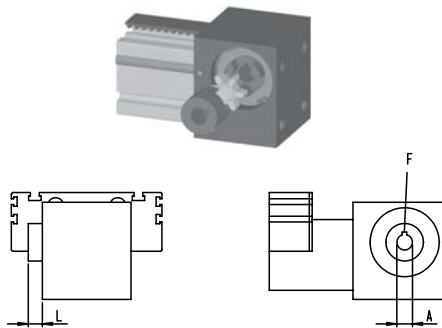
Code-No.	Type	ØA/B (min/max)	C	D	E	F	Torque
01400-	7	3 / 7	7	14	22	DIN-key	2 Nm
01401-	9	5 / 12	10	20	30		6 Nm
01410-	14	5 / 16	11	30	35		12 Nm
01420-	19	6 / 22	25	40	66		17 Nm
01430-	24	10 / 28	30	55	78		60 Nm
01440-	28	18 / 38	35	65	90		160 Nm
01450-	38	30 / 45	45	80	114	325 Nm	

**01401- 08 10**

Sample ordering code:  
Coupling type 9, ØA = 8 mm, ØB = 10 mm

### Coupling for toothed belt units

Torsionally elastic coupling with keyway and clamp. Light pre-load provides backlash-free torque transmission.



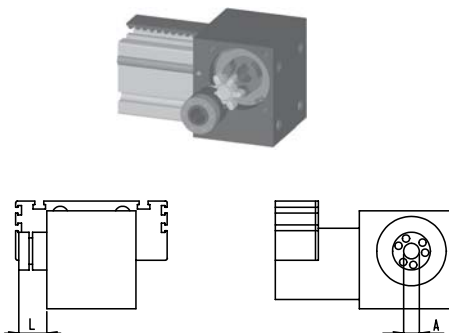
Code-No.	Type	Ø A (min/max)	L	Size	F	Torque
03400-	7	3 / 7	7	EL 30	DIN-key	2 Nm
03401-	9	5 / 12	10	EL 40		6 Nm
03410-	14	5 / 16	11	EL 60 DL 120 QL/QS 60		12 Nm
03420-	19	6 / 22	25	EL 80 (S) DL/DS 160 QL/QS 80		17 Nm
03430-	24	10 / 28	30	EL 100 QL/QS 100 DL 200		60 Nm
03440-	28	18 / 38	35	EL 125		160 Nm

**03410- 12**

Sample ordering code:  
Coupling type 14, ØA = 12 mm

### Coupling with tension ring

Coupling, to be clamped by tension ring.



Code-No.	Type	Ø A	L	Size	Torque
03501-	14	5, 10, 14	19	EL 60 DL 120 QL/QS 60	12 Nm
03510-	19	10, 14, 16, 19	25	EL 80 (S) DL/DS 160 QL/QS 80	17 Nm
03520-	24	19, 20, 22, 24	30	EL 100 QL/QS 100 DL 200	60 Nm
03530-	28	38	35	EL 125	160 Nm

**03510- 16**

Sample ordering code:  
Coupling type 19, ØA = 16 mm

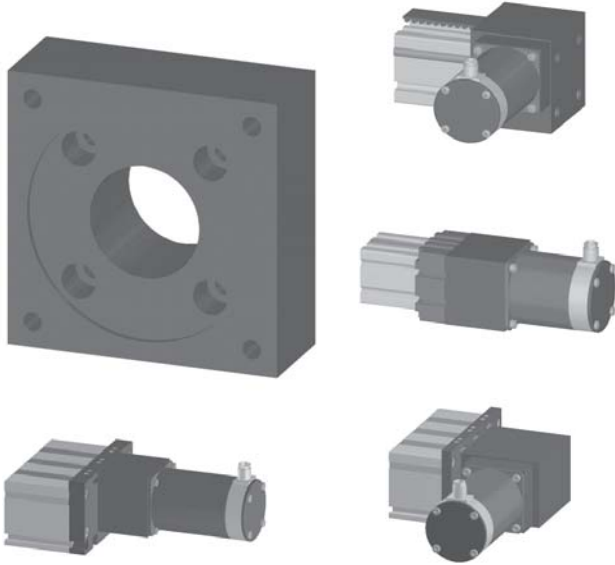


# Accessories

**Adapter  
Bellows**

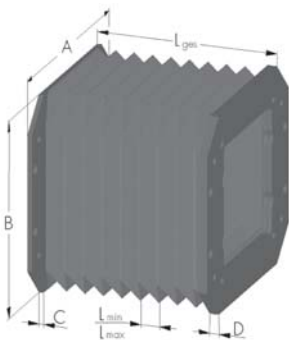
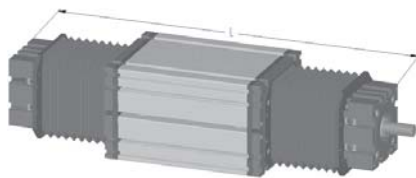
## Motor adapter

Black anodized aluminium, can be constructed for any motor. Simple assembly, accurate alignment.



Code-No.	Type
01531	EL/EG 30 spindle
01541	EL/EG 40 spindle
01561	EL/EG 60 / DL 120 spindle
01581	EL/EG 80(S) / DL/DS 160 / QS 80 spindle
01511	EL 100 spindle
01521	EL 125 spindle
01831	EL 30 belt-drive
01841	EL 40 belt-drive
01861	EL 60 / DL 120 / QL/QS 60 belt-drive
01881	EL 80 / DL/DS 160 / QL/QS 80 belt-drive
01811	EL100 / QL/QS 100 / DL/DS 200 belt-drive
01821	EL125 belt-drive

## Complete bellows EL / EG



Code-No.	Type	A	B	C	D	Fold	
						L <sub>min</sub>	L <sub>max</sub>
02940	EL/EG 40 spindle	73	69	5	10	3	15
02941	EL/EG 40 belt drive	73	75	5	10	3	15
02960	EL/EG 60 spindle	99	94	5	10	3	20
02961	EL/EG 60 belt drive	99	101	5	10	3	20
02980	EL/EG 80(S) spindle	130	124	5	10	3	25
02981	EL/EG 80(S) belt drive	130	138	5	10	3	25
02910	EL 100 spindle	165	155	5	10	3	30
02911	EL 100 belt drive	165	170	5	10	3	30

Bellow frame, zinc-plated plastic bellows with steel connection plates, max. 60° C.

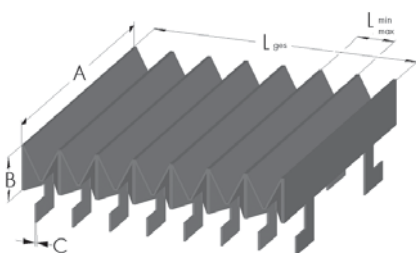
02980	500
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Sample ordering code: Size 80 spindle, unit length L = 500 mm.

Bellow ERA7815, max. 120°, bellow frame PVC.



## Complete bellows DL / DS



Code-No.	Type	A	B	C	Fold	
					L <sub>min</sub>	L <sub>max</sub>
02901	DL 120	120	19	1	4	22
02902	DL/DS160	160	24	1	4	31
02903	DL/DS 200	200	28	1	4	28

02902	500
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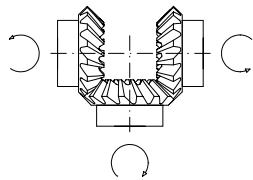
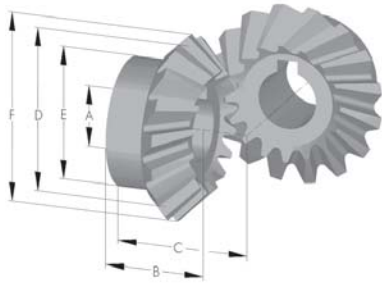
Sample ordering code: Size 160, unit length L = 500 mm.

2.2

# Accessories

Angular gear box

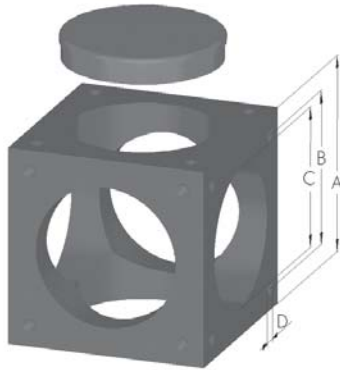
## Bevel gear pair EL / EG



C 45 steel, helical gear, with keyway.

Code-No.	Type	i	Modul	Number of teeth	A <sub>h7</sub>	B	C	D	E	F	max. rpm (min <sup>-1</sup> )
00631	30	1:1	1	22	5	15	22	22	19	23,5	250
00641	40	1:1	2	16	10	13	28	-	22	35	560
00642	40	1:1,5	1,5	16	10	17	30	24	20	27	560
				24		17,5	27	36	26	38	840
00661	60	1:1	2,5	16	14	18,5	33	-	30	43	750
00662	60	1:1,5	2	16	14	21	38	32	26	36	560
				24		23	35	48	35	51	840
00681	80	1:1	3	16	18	23	40	-	35	51,5	750
00682	80	1:1,5	3	16	18	28	54	48	40	53	560
				24		30	49	72	50	76	840
00611	100	1:1	4	16	22	35,5	54	-	45	69,7	750
00612	100	1:1,5	3	16	22	27,7	50	48	34	53	560
				24		31	44	72	38	76	840

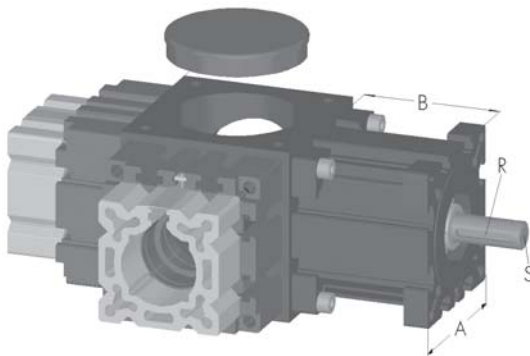
## Combination cube EL / EG Cover caps



Black anodized aluminium. Used for connecting modules at right angles or in line.

Combination cube					
Code-No.	Type	A	B	C	D
00830	30	52	35	40	M 4
00840	40	66	47	48	M 6
00860	60	92	69	62	M 8
00880	80	112	88	80	M 8
00810	100	148	112	110	M10
Cover caps					
01830	30	Black plastic. To cover empty cube sides.			
01840	40				
01860	60				
01880	80				
01810	100				

## Angular gear box EL / EG



Complete self-centering gear. Can easily be retrofitted to any EG or EL unit. Packed with grease for lubrication.

Code No.	Type	i	m	A	B	R	S Ø x l	Torque	max. rpm (min <sup>-1</sup> )
00731	30	1:1	1	42	37	2x2	5x15	2 Nm	250
00741	40	1:1	2	58	50	3x3	10x27	5 Nm	560
00742	40	1:1,5	1,5	58	50	3x3	10x27	5 Nm	560
									840
00761	60	1:1	2,5	82	70	5x5	14x35	15 Nm	750
00762	60	1:1,5	2	82	70	5x5	14x35	15 Nm	560
									840
00781	80	1:1	3	102	90	6x6	18x45	25 Nm	750
00782	80	1:1,5	3	102	90	6x6	18x45	25 Nm	560
									840
00711	100	1:1	4	130	110	6x6	22x45	30 Nm	750
00712	100	1:1,5	3	130	110	6x6	22x45	30 Nm	560
									840



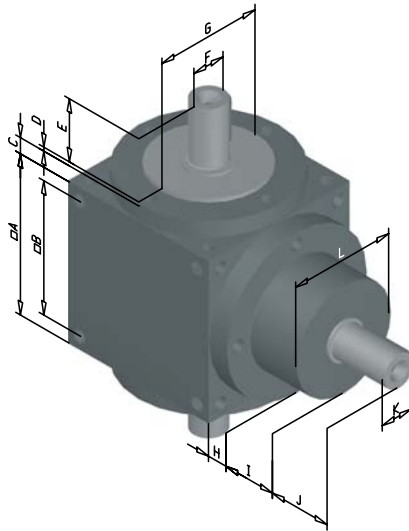
2.2



# Accessories

**Angular gear box  
Parallel transfer**

## Bevel gear box E / D / Q - series



Application for driving two parallel spindle units, one side with hollow shaft for the spindle unit, one side with journal for splined shaft, two sides with journal for splined shaft and motor, max. 3000 rpm.

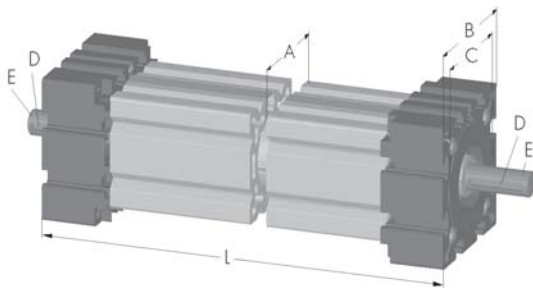
V065 = for Size E 40, 60 D 120, 160 Q 60, 80  
 V090 = for Size E 60, 80(S) D 160, 200 Q 80, 100  
 V120 = for Size E 80(S), 100, 125 D 160, 200 Q 80, 100

Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	i
00750	V065 - 1 Shaft	65	45	9,5	2	28	12 <sub>h7</sub>	44 <sub>h7</sub>	9,5	30	28	12 <sub>h6</sub>	44 <sub>h7</sub>	1:1
00751	V065 - 2 Shafts													/
00752	V090 - 1 Shaft	90	70	10	2	38	18 <sub>h6</sub>	60 <sub>h7</sub>	10	30	37	18 <sub>h6</sub>	60 <sub>h7</sub>	1:1
00753	V090 - 2 Shafts													/
00754	V120 - 1 Shaft	120	100	12	3	47	25 <sub>h6</sub>	80 <sub>h7</sub>	15	40	47	25 <sub>h6</sub>	80 <sub>h7</sub>	1:1
00755	V120 - 2 Shafts													/

**00751** Sample order code: Angular gear box size 60 with 2 journals

## Transmission unit EL / EG

A shaft carried on ball bearings in an aluminium hollow section can be used to transmit torque or as a joining element for combining parallel linear units or as an individual element in angular operation.



Code-No.	Type	A	B	C	D	E	L <sub>min</sub>	L <sub>max</sub>
01931	30	30	42	40 x 0,7	2 x 2	5 x 15	38	3.000
01932	30 no shaft	30	42	40 x 0,7	-	-	38	3.000
01941	40	40	58	48 x 1	3 x 3	10 x 27	50	6.000
01942	40 no shaft	40	58	48 x 1	-	-	50	6.000
01961	60	60	82	62 x 1	5 x 5	14 x 35	70	6.000
01962	60 no shaft	60	82	62 x 1	-	-	70	6.000
01981	80	80	102	80 x 1	6 x 6	18 x 45	90	6.000
01982	80 no shaft	80	102	80 x 1	-	-	90	6.000
01911	100	100	130	110 x 1	6 x 6	22 x 45	110	6.000
01912	100 no shaft	100	130	110 x 1	-	-	110	6.000

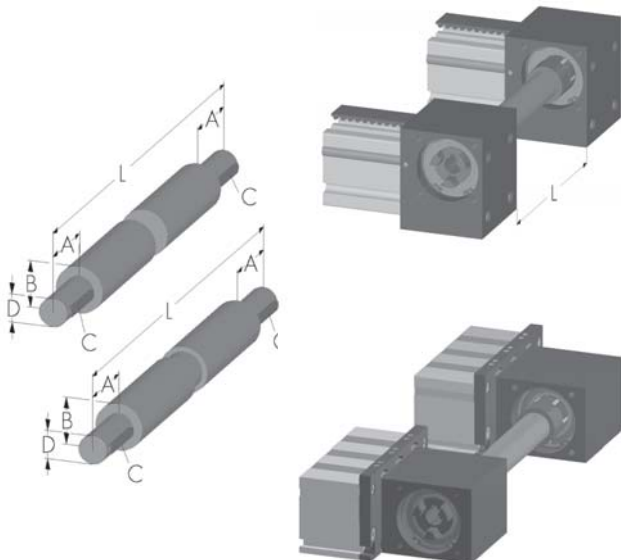
**01941** 0750 Sample order code:  
Size 40, length L = 750 mm

## Splined shaft EL / EG - DL / DS

Galvanized steel, for torque transfer between two parallel drives. Shafts longer than 1200 mm are hollow shafts with welded journals.



2.2

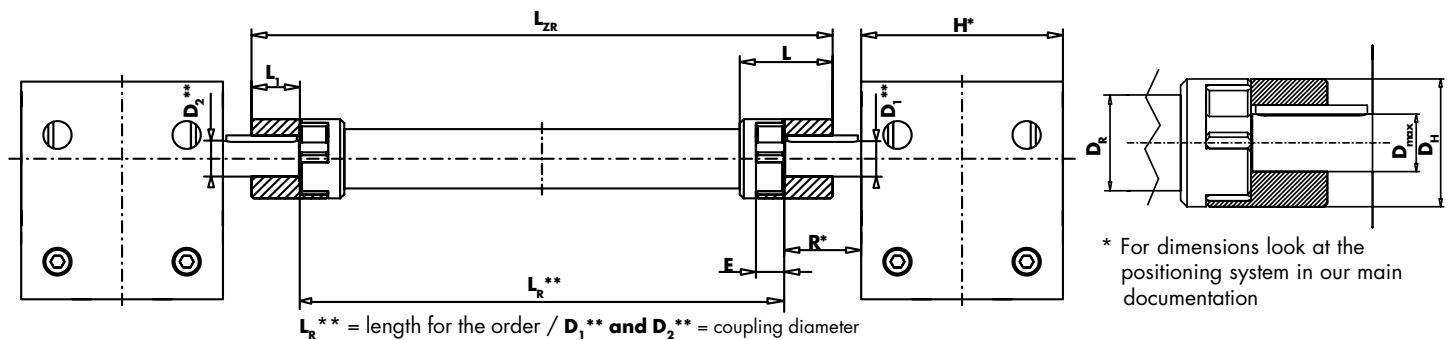


Code-No.	Type	A	B	C	D	L <sub>max</sub>
02230	EL/EG 30	15	12	2x2x12	6 <sub>h7</sub>	1.500
02240	EL/EG 40	27	20	3x3x25	10 <sub>h7</sub>	3.000
02260	EL/EG 60 QL/QS 60 DL 120	35	24	5x5x28	14 <sub>h7</sub>	3.000
02280	EL/EG 80 QL/QS 80 DL/DS 160	45	30	6x6x40	18 <sub>h7</sub>	3.000
02210	EL 100 QL/QS 100 DL/DS 200	55	40	6x6x50	22 <sub>h7</sub>	4.500
02220	EL 125	55	50	8x7x50	30 <sub>h7</sub>	5.000

**02240** 0500 Sample order code:  
Size 40, length L = 500 mm

## Accessories

### Synchronous transmission shaft Rotex® GS



Code-No.	Type of unit	Type	with / without keyway	D <sub>H</sub>	D <sub>max</sub>	D <sub>R</sub>	E	L <sub>ZRmin</sub>	L <sub>ZRmax</sub>	L	L <sub>1</sub>	T <sub>Kmax</sub>
02282	EL/EG 60 QL/QS 60-80 EL/EG 80 DL 120-160 DS 160	19	with	40	20	40	16	133	3.000	49,0	25	20 Nm
02283	EL/EG 60 QL/QS 60-80 EL/EG 80 DL 120-160 DS 160	19	without	40	20	40	16	133	3.000	49,0	25	20 Nm
02211	QL/QS 100 EL 100 DL/DS 200	24	with	55	28	50	18	157	3.500	59,0	30	60 Nm
02212	QL/QS 100 EL 100 DL/DS 200	24	without	55	28	50	18	157	3.500	59,0	30	60 Nm
02222	EL125	28	with	65	38	60	20	181	4.000	67,0	35	160 Nm
02223	EL125	28	without	65	38	60	20	181	4.000	67,0	35	160 Nm

- Synchronous transmission shaft made of seamless drawn aluminium tube
- Use with lifting machines, in handling units, robotic palletisers etc.
- Easy, radial coupling assembly because of split coupling hub
- Exchange of spider without displacing the drive and driven side
- Standard lengths are possible up to 4 m without intermediate bearing depending on speed and size
- Positive and frictionally engaged torque transmission
- Low mass moment of inertia due to use of aluminium
- Can be combined with other hub forms (clamping or clamping ring hubs)
- Finish bore according to ISO fit H7, keyway according to DIN 6885 sheet 1 - JS9

Sample ordering code:

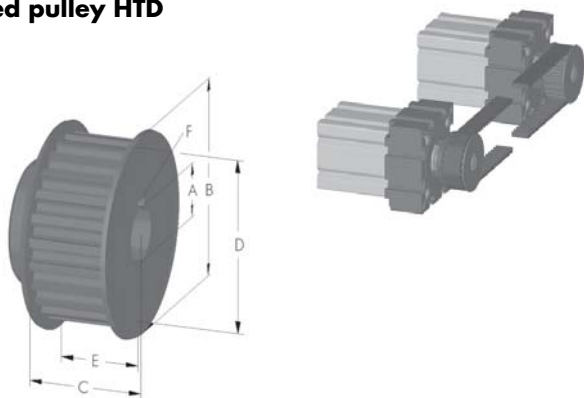
Code-No.	L <sub>r</sub>	D <sub>1</sub>	D <sub>2</sub>
02211	2000	22	22

Synchronous transmission shaft for EL/QL/QS 100 and DL/DS 200 with keyway, length 2000 mm, coupling diameter D<sub>1</sub>=22 / D<sub>2</sub>=22

# Accessories

**Belt Pulley Incremental encoder**

## Toothed pulley HTD



Material St 50, secured with key.

Code-No.	Type	A	B	C	D	E	F	Number of teeth	Spa-cing
00450	EL/EG 30	6	23	26	18,3	15	2x2	20	3x15
00451	EL/EG 40	10	36	26	30,7	15	3x3	20	5x15
00452	EL/EG 60 DL120	14	44	38	40,2	25	5x5	26	5x25
00453	EL/EG 80 DL/DS160	18	54	38	49,8	25	6x6	32	5x25
00454	EL100	22	66	48	61,1	38	6x6	24	8x30

## Toothed belt endless HTD



Code-No.	Type	Belt	Tensile force
00550	EL/EG 30	3M15	200 N
00551	EL/EG 40	5M15	390 N
00556	EL/EG 40	5M09	298 N
00552	EL/EG60	5M25	894 N
00553	EL/EG80	5M25	894 N
00554	EL100	8M30	1070 N
00555	EL100	8M20	980 N

**00551** 0700

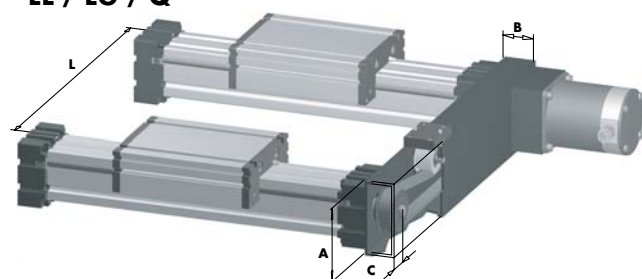
Sample order code:  
Belt 5M15 perimeter: 700 mm

## Parallel transfer unit for spindle drives

DL / DS



EL / EG / Q



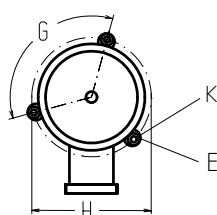
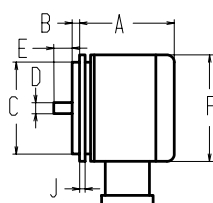
Black anodized aluminium tube with plastic end caps, pulleys fixed with keys or tension rings. Spindle centers are multiples of 5 or 8 mm, according to belt pitch.

Code-No.	Type	A	B	C	L <sub>max</sub>	Belt
T13030	EL/EG 30	50	25	25	1.200	5M-9
T13040	EL/EG 40	80	40	30	1.500	5M-15
T13060	EL/EG/Q 60	100	50	42	2.000	5M-25
T13061	DL 120	60	40		2.000	5M-25
T13080	EL/EG/Q 80	120	50	52	2.000	5M25
T13081	DL/DS 160	80	50		2.000	5M-25
T13010	EL/Q 100	160	80	66	3.000	8M-30
T13020	EL 125					

**T13060** 500

Sample ordering code: Center-distance of axis L = 500 mm  
For center-distances higher than 800mm  
you have to use an additional tensioning device code-number 04099.

## Incremental encoder



Eccentric for assembly

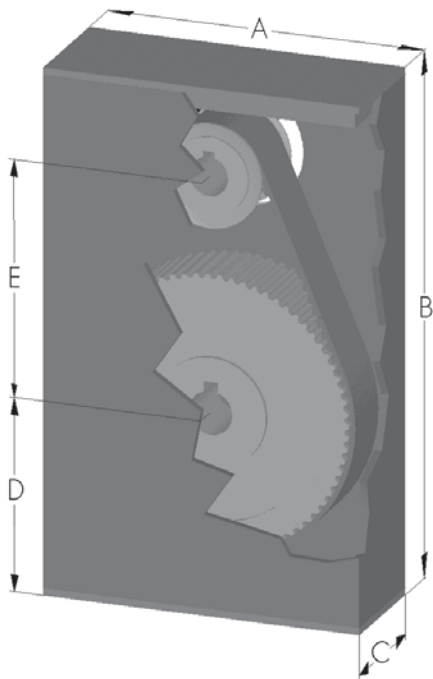
With flange and coupling, ready for assembly to any linear unit. 500 increments per revolution. Other resolutions on request.

Code-No.	A	B	C	D	E	F	G	H	J	K for
E 05500	57,5	4	50 <sub>h7</sub>	6 <sub>h9</sub>	10	58,5	120°	65	3	M3

# Accessories

## Toothed belt gear

### Toothed belt gear



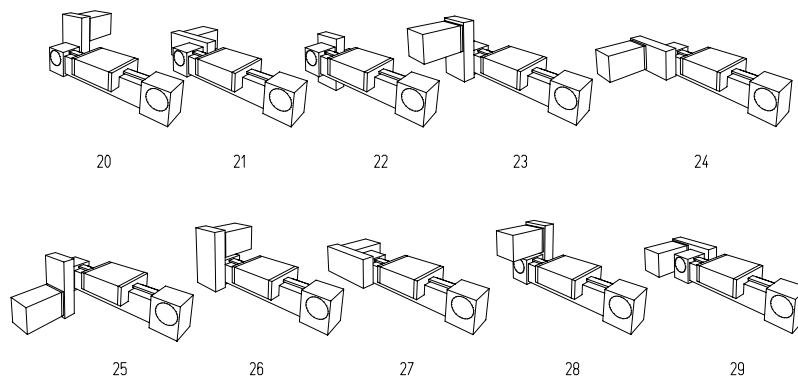
Rectangular aluminium tubular housing, ends covered with plastic end caps. Toothed pulley fitted to motor shaft with key or tension ring. Mounting can be adapted for any motor.

**Dimensions in the table are examples. In general dimensions depend on motor-shaft, flange and ratio.**

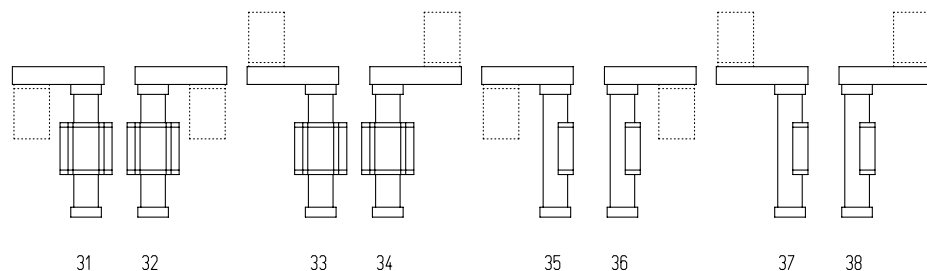
\*depends on motor shaft diameter

Code-No.	Type	A	B	C	D	E	Belt	Ratio *	Driving torque
T1-30-	30	60	117	30	22	60	3M15	1:1	max. 2 Nm
T1-40-	40	100	190	40	55	87	5M-15	2:1	max. 4 Nm
T1-60-	60	100	190	50	55	87	5M25	2,4:1	max. 8 Nm
T1-80-	80	120	220	54	54	107	5M25	3:1	max. 12 Nm
T1-10-	100	180	340	60	80	163	8M30	others on request	max. 20 Nm
T1-12-	125								

#### Motor mounting with belt reducing gear for belt driven units



#### Motor mounting with belt reducing gear for spindle drives



T1- 22 40- 2,4

Sample order code:  
Size 40, for belt drive units, motor mounting 22, ratio 2,4:1.

Motor mounting

Ratio

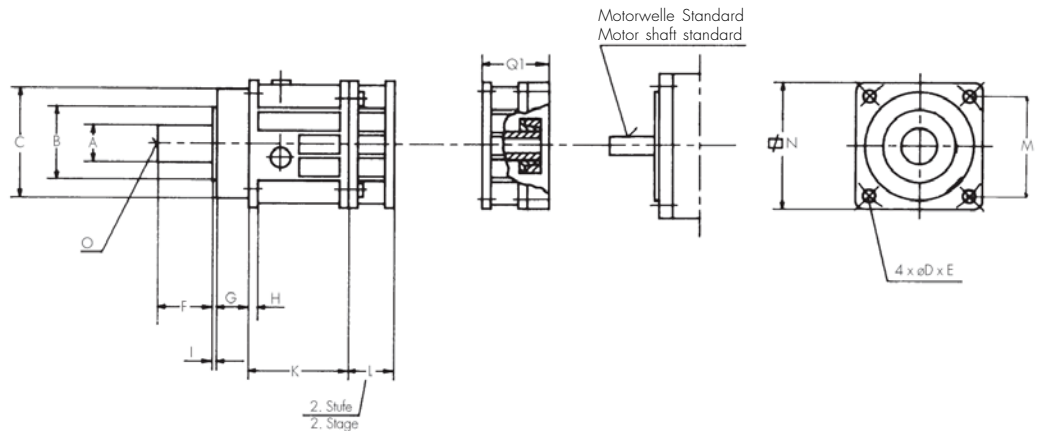


2.2

# Accessories

## Planetary gear box

### Planetary gear box, single- or two-stage for servo motors



Type	A <sub>kg</sub> <sup>***</sup>	B	C <sub>g6</sub>	D	E	F	G	H	I	K	L	M	N	O	Q <sup>**</sup>
<b>PSF 2</b>	16	35	60	5,5	68	28	18	6	2	49	24	48	61	M5x12,5	57 (11x23) (14x30) (19x40)
<b>PSF 3</b>	22	36	70	6,6	85	36	18	7	2	59	25	60	76	M8 x 19	57 (11x23) (14x30) (19x40) (24x50)
<b>PSF 5</b>	32	50	90	9	120	58	29	10	1	66,5	39	85	105	M12 x28	53,5 (≤24x50)

\*\* = in brackets; motor shaft diameter x length  
 \*\*\* = drive shaft a x f standard without keyway

Code-No.				Driving torque	Moment of inertia about input in kgcm <sup>2</sup>		Forces on output shaft at n <sub>2</sub> =300min <sup>-1</sup>		Input rpm	
			Type	T <sub>2</sub> max	for i=5	for i=9	radial	axial	N <sub>i</sub> max	Weight
<b>T10</b>	<b>11-</b>		<b>PSF 221</b>	55 Nm	0,461 (14)	0,450 (14)	1010 N	1000 N	6000 min <sup>-1</sup>	2,2 kg
<b>T10</b>	<b>12-</b>		<b>PSF 321</b>	110 Nm	0,553 (14)	0,482 (14)	1175 N	1100 N	6000 min <sup>-1</sup>	3,3 kg
<b>T10</b>	<b>13-</b>		<b>PSF 521</b>	300 Nm	2,485 (19)	2,187 (19)	6500 N	2500 N	4500 min <sup>-1</sup>	7,0 kg
<b>T10</b>	<b>14-</b>		<b>PSF 222</b>	55 Nm	0,454 (14)	0,437 (14)	1700 N	1700 N	6000 min <sup>-1</sup>	2,6 kg
<b>T10</b>	<b>15-</b>		<b>PSF 322</b>	110 Nm	0,474 (14)	0,440 (14)	1800 N	1880 N	6000 min <sup>-1</sup>	4,1 kg
<b>T10</b>	<b>16-</b>		<b>PSF 522</b>	300 Nm	2,244 (19)	2,043 (19)	7180 N	5400 N	4500 min <sup>-1</sup>	8,0 kg

( ) = Motor shaft diameter

#### Gear reduction:

Single stage: i= 3, 4, 5, 7, 10 (i=10, torque is reduced by 8%)  
 Two-stage: i= 16, 20, 25, 28, 35, 40, 49, 70, 100

#### Circumferential backlash:

α < 6 angular minutes } single-stage gear box  
 α < 3 angular minutes }  
 α < 10 angular minutes } two-stage gear box  
 α < 5 angular minutes }



2.2

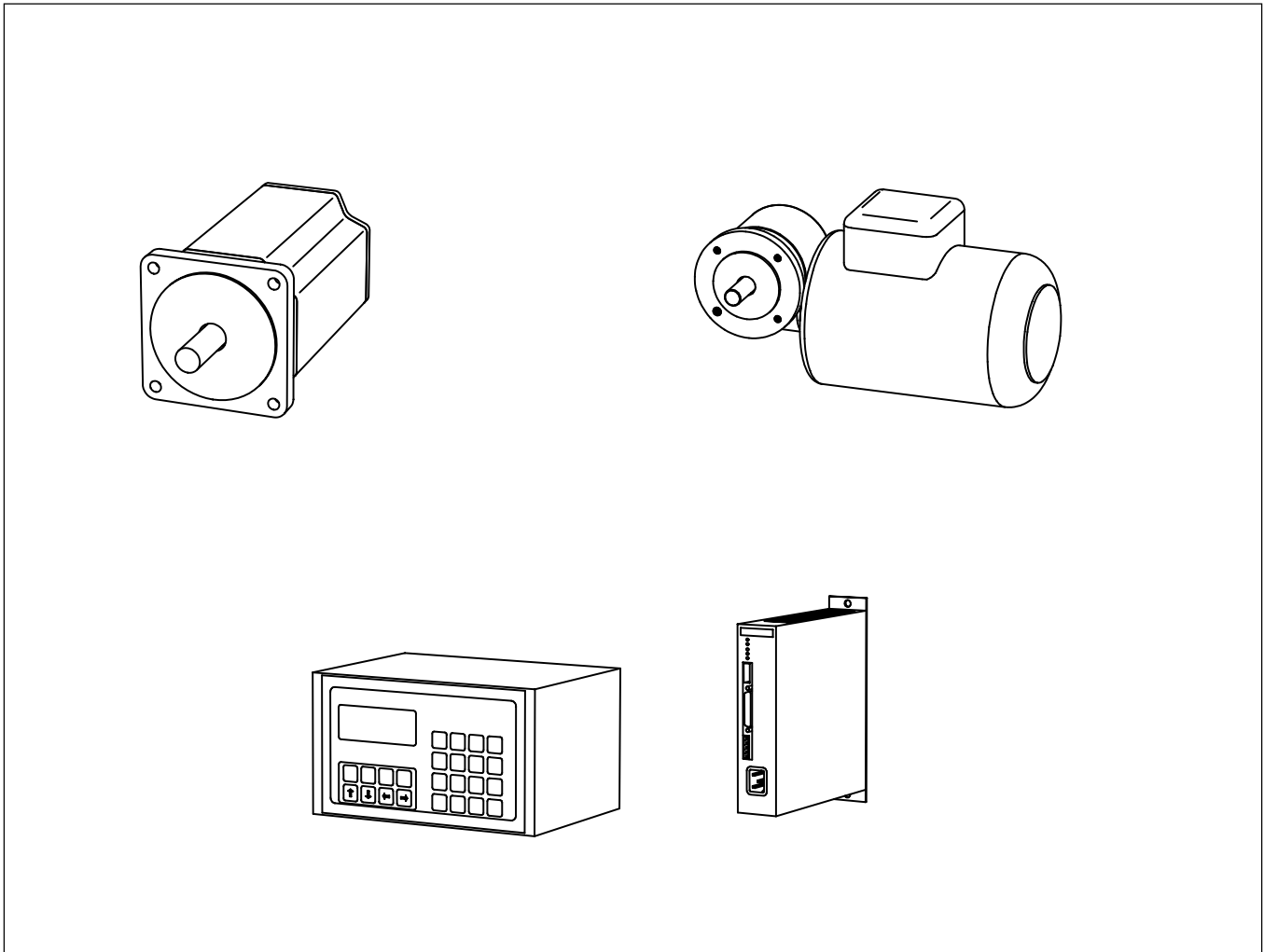
04

- 1
- 2
- 3
- 4

T10- 1 11- 04

Sample order code:  
 Type PSF 221 i=4 α < 6 angular minutes





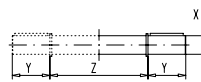
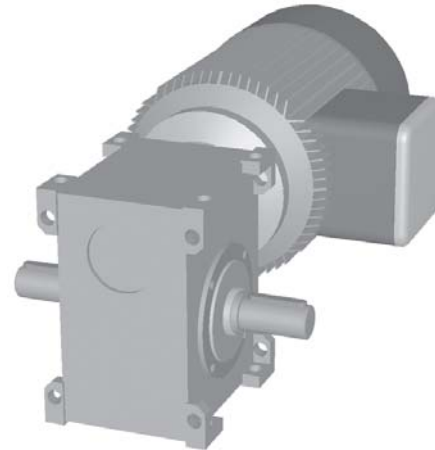
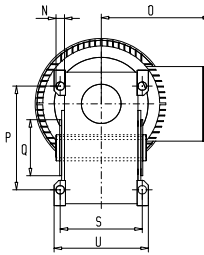
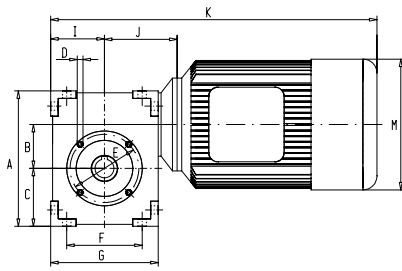
## Motors and control units



# Accessories

## Rotary current techniques 1 - 3

### AC worm gear motor



Code-No.	Power	Type	A	B	C	D	E	F	G	I	J	K	M	N	O	P	Q	S	U	X	Y	Z	
E 50040	180 W	MVU 35-63	118	35	52	M 6	55	70	102	51	71	312	124	7	108	85	45	72	84	14	30	90	
E 50041	370 W	MVU 35-71	118	35	52	M 6	55	70	102	51	71	332	139	7	116	85	45	72	84	14	30	90	
E 50042	180 W	MVU 47-63	145	47	62	M 6	73	80	114	57	77	324	124	9	108	110	60	85	100	20	40	104	
E 50043	370 W	MVU 47-71	145	47	62	M 6	73	80	114	57	77	344	139	9	116	110	60	85	100	20	40	104	
E 50044	180 W	MVU 60-71	180	60	75	M 8	85	94	140	70	92	372	139	9	116	134	70	104	120	25	50	128	
E 50045	550 W	MVU 60-80	180	60	75	M 8	85	94	140	70	92	396	157	9	124	134	70	104	120	25	50	128	
E 50046	750 W	MVU 85-80	245	85	105	M10	115	145	202	101	123	458	157	11	124	190	95	120	142	35	65	157	
E 50060	motor brake	up to size 71											+60										
E 50061	motor brake	up to size 80																					

Voltage/Frequency:  
230\400 V/50Hz  
System of protection: IP 55  
Insulation:  
Suitable for frequency converter operation.

Motor protection:  
With frequency converter operation, it is recommended to protect the motor by means of temperature probes built into the winding (posistors or thermal switches).  
This protection is dependent on the temperature and protects the motors against overheating of the winding both due to overload and due to frequently changing loads or insufficient cooling.

Brakes:  
The motors listed are also available with brake. The built-in spring-actuated single-disc brake is a safety brake that brakes by means of spring power when the voltage is disconnected. The DC voltage is generated by a rectifier in the terminal box of the motor. The motor may only be switched on in connection with the brake

Power	rpm	i	M <sub>permanent</sub>	M <sub>start</sub>	Type	Weight	Rated current
180 W	20 min <sup>-1</sup>	70:1	36 Nm	34 Nm	MVU 47-63	6,8 kg	0,6 A
	28 min <sup>-1</sup>	50:1	23 Nm	32 Nm	MVU 35-63	5,7 kg	
	35 min <sup>-1</sup>	40:1	24 Nm	27 Nm			
370 W	20 min <sup>-1</sup>	70:1	72 Nm	70 Nm	MVU 60-71	11,5 kg	1,2 A
	23 min <sup>-1</sup>	60:1	95 Nm	70 Nm			
	28 min <sup>-1</sup>	50:1	80 Nm	63 Nm			
	28 min <sup>-1</sup>	50:1	52 Nm	63 Nm	MVU 47-71	9,5 kg	
	35 min <sup>-1</sup>	40:1	50 Nm	55 Nm			
	47 min <sup>-1</sup>	30:1	52 Nm	45 Nm			
	56 min <sup>-1</sup>	25:1	45 Nm	42 Nm			
	70 min <sup>-1</sup>	20:1	38 Nm	36 Nm			
	93 min <sup>-1</sup>	15:1	30 Nm	32 Nm	MVU 35-71	8,2 kg	
	140 min <sup>-1</sup>	10:1	20 Nm	25 Nm			
	47 min <sup>-1</sup>	30:1	26 Nm	45 Nm			
	56 min <sup>-1</sup>	25:1	28 Nm	42 Nm			
70 min <sup>-1</sup>	20:1	30 Nm	36 Nm	MVU 70-80	17,5 kg		
93 min <sup>-1</sup>	15:1	26 Nm	32 Nm				
140 min <sup>-1</sup>	10:1	20 Nm	25 Nm				
20 min <sup>-1</sup>	70:1	116 Nm	140 Nm				
23 min <sup>-1</sup>	60:1	150 Nm	140 Nm				
750 W	28 min <sup>-1</sup>	50:1	163 Nm	126 Nm	MVU 60-80	15 kg	2 A
	35 min <sup>-1</sup>	40:1	110 Nm	110 Nm			
	47 min <sup>-1</sup>	30:1	108 Nm	90 Nm			
	56 min <sup>-1</sup>	25:1	95 Nm	84 Nm			
	70 min <sup>-1</sup>	20:1	80 Nm	72 Nm			
	93 min <sup>-1</sup>	15:1	60 Nm	63 Nm			
	140 min <sup>-1</sup>	10:1	40 Nm	50 Nm			

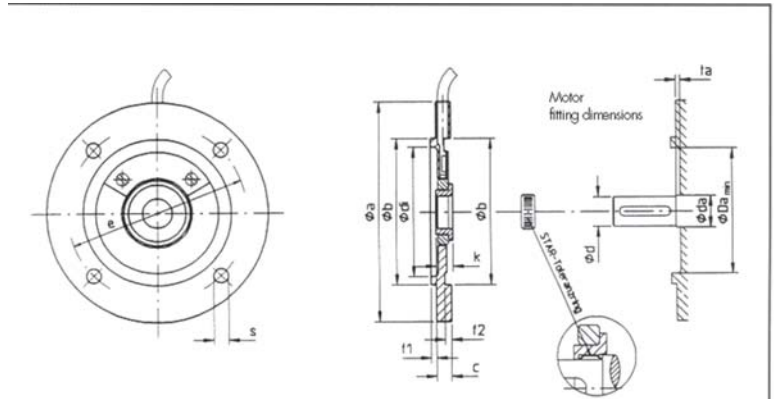


3.2

# Accessories

## Rotary current techniques 2 - 3

### Pulse generator



### Magnetic Pulse Generator

An "intelligent" intermediate flange has been developed which significantly simplifies the measurement of motor speed, direction of rotation and the connection with higher control systems. What has only been possible by complicated and expensive mounting into driving systems up to now can now be done in an easy and economical way - both in new and existing installations.

The magnetic pulse generator is designed as an intermediate flange which is simply installed between the motor and machine flange. This makes the integration of incremental position encoders into driving systems much easier - whether they are applied as positioning controllers, for speed measurement or e.g. for dosing control or synchronization control.

The advantages of the new magnetic pulse generator are:

1. Compact design: Depending on size the space required by the flange thickness in only 7, 12 or 15 mm.
2. Easy assembly: The flange with its sensors is directly fastened to the motor; the magnet ring is stuck onto the motor shaft.
3. Appropriate for all IEC flange motors, sizes 56 to 225.
4. Suitable for other flange connections as well, e.g. those of D.C. motors, hydraulic motors and compressed-air motors, pumps, etc.
5. No mechanical modifications are required for assembly.
6. A proven and precise measuring principle: two Hall sensors receive the signals for speed & direction of rotation. This ensures a precise measurement with no wearing parts or maintenance required.
7. A reasonably priced solution which is also suitable for economical retrofitting of existing drives.
8. Installation: between motor and machine flange; mechanical protection is thus guaranteed; system of protection IP 67.
9. Universal HTL signal for all usual evaluations (PNP, NPN, PNP-NPN, RS422).
10. The monitoring system can be located at a distance of up to 1.000m from the pulse generator.
11. The number of pulses can be duplicated or quadruplicated by means of a downstream electronic system.
12. SMD-type generator electronics: short-circuit-proof, protected against polarity reversal and provided with overvoltage protection; completely integrated in the flange.

a	b	c	d1	e	f1	f2	k	s
80	50	10	42	65	2.5	3	9	6
90	60	7	52	75	2.5	3	8	7
105	70	7	62	85	2.5	3	8	7
120	80	7	70	100	3	3.5	8	7
140	95	7	85	115	3	3.5	8	9
		10					11	
160	110	7	100	130	3.5	4	8	9
		10					11	
200	130	10	120	165	3.5	4	11	11
250	180	12	170	215	4	5	13	13
300	230	12	220	265	4	5	13	13
350	250	12	240	300	5	6	13	17

d x length	da	ta	Da
∅ 9 x 20	10	1	22
∅ 11 x 23	12	2	52
∅ 9 x 20	10	2	63
∅ 14 x 30	15	2	63
∅ 9 x 20	10	2	63
∅ 11 x 23	12	2	63
∅ 19 x 40	20	2	63
∅ 11 x 23	12	2	85
∅ 14 x 30	15	2	85
∅ 24 x 50	25	3	85
∅ 14 x 30	15	2	90
∅ 19 x 40	20	2	90
∅ 24 x 50	25	3	90
∅ 28 x 60	30	3	90
∅ 19 x 40	20	2	90
∅ 24 x 50	25	3	90
∅ 28 x 60	30	3	90
∅ 28 x 60	30	3	90
∅ 38 x 80	40	3	120
∅ 42 x 110	45	3	120
∅ 48 x 110	50	3	120

Flange	Shaft	deliverable number of pulses <sup>1</sup>																						
		1	2	4	5	6	7	8	9	10	11	12	15	16	20	25	30	40	50	80	100	200		
∅ 80	∅ 9	X	X	X	X	X	X	X																
∅ 90	∅ 11	X	X	X	X	X	X	X								X <sup>2</sup>								
∅ 105	∅ 9	X	X	X	X	X	X	X																
	∅ 14	X	X	X	X	X	X	X																
∅ 120	∅ 9	X	X	X	X	X	X	X																
	∅ 11	X	X	X	X	X	X	X																
	∅ 19	X	X	X	X	X	X	X																
∅ 140	∅ 11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	∅ 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	∅ 24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	∅ 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
∅ 160	∅ 19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	∅ 24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	∅ 28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	∅ 19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
∅ 200	∅ 24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	∅ 28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	∅ 38	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
∅ 300	∅ 42	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
∅ 350	∅ 48	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

<sup>1</sup> Further numbers available    <sup>2+3</sup> Additional price

Example for an order:

MIG 105 - 14 - 20

Flange diameter \_\_\_\_\_  
 Shaft diameter \_\_\_\_\_  
 Number of pulses \_\_\_\_\_

**Code-No.**  
**E 66020**





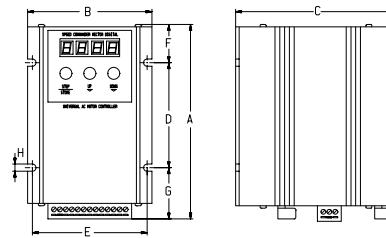
- Programmable relay and transistor output (NPN)
- Special U/f line for ventilator and pump operation
- Power range: 1.5 kW - 1x230 VAC / 22 kW- 3x400 VAC (on request)
- Integrated software for:
  - automatic PI-control (pressure, temperature, etc.)
  - positioning controllers
  - digital synchronization control
  - torque limiter
- Serial communication with PC or PLC
- Special software for PLC functions by inquiry

Characteristics

- Flexible software of the controller
- Simple operation due to menu-guided digital parameterization
- High starting torque (170%)
- Silent motor running due to high pulse frequency and vector modulation
- IxR compensation (Boost)
- Programmable ratio of voltage and frequency
- DC braking with static torque
- Safety functions against over- and undervoltage, overcurrent, short circuit, temperature rise (converter and motor)
- Optimum design with small assembly dimensions
- Multiple-motor operation possible
- Options:
  - serial interface RS232 / RS485
  - brake chopper and brake resistance
  - external display, etc.

TheSPEED Commander frequency inverters are used for speed regulation in 3 phase AC motors. It is an universal AC motor controller position setting, serial communication, time interval control and load control. These special programs can be set through the Speed Commander display.

- Vector modulation and 16-bit microprocessor
- Display for:
  - frequency, current, intermediate circuit voltage, parameter values, error messages
- Electrically isolated, PLC-compatible inputs for:
  - frequency control point
  - right-handed rotation
  - left-handed rotation
  - STOP (controlled braking)
  - OFF (dead motor binders)
  - STOP (DC brake)



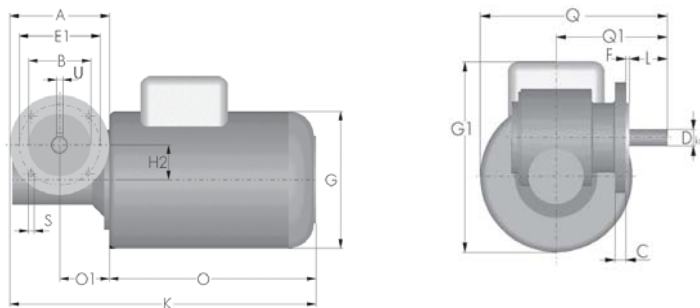
	<b>SC-750</b>	<b>SC-1500</b>
Power supply	1x 230 V ±10% / 50-60 Hz	
Max. motor Power (2- and 4-pole)	0,75 KW	1,5 KW
Output voltage	3x 0-230 V	3x 0-230 V
Output frequency	0-400 Hz	0-400 Hz
Nominal current	3x 4A	3x 7A
Overload capacity	150% für 30 s	150% für 30 s
max. current limit (TRIP)	3x 7,6 A	3x 14 A
Input current	ca. 8 A	ca. 15 A
max. heat loss	50 W	100 W
System of protection	IP 20	IP 20
A	163	298
B	104	104
C	133	133
D	90	140
E	96	96
F	30	86
G	43	72
H	6	6
<b>Code-No.</b>	<b>E 66010</b>	<b>E 66011</b>



# Accessories

**AC motor  
Stepping motor**

## AC worm gear motor



Protection class IP 54, 220/380 V, 50 Hz, from 90 to 1100 W.

Available with electronic disc brake.

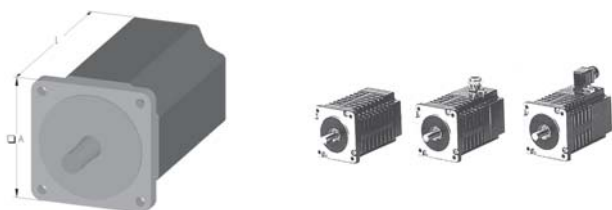
Speed 1400 rpm or 2800 rpm.

Reduction gearing options: 5:1, 7:1, 15:1, or 20:1.

Further options on request.

Code-No.	Power	A	B	C	D	E1	F	G	G1	H2	K	L	O	O1	Q	Q1	S	U
E 50001	90 W	140	95	8	18	115	3	112	158	9,6	319	40	168	81	166	116	10,5	6
E 50002	120 W	120	80	8	19	100	3	125	171	40	297	35	187	60	171	102	7	6
E 50003	180 W	120	80	8	19	100	3	125	171	40	297	35	187	60	171	102	7	6
E 50004	250 W	120	80	8	19	100	3	140	184	40	317	60	207	60	184	102	7	6
E 50005	370 W	120	80	8	19	100	3	140	184	40	317	60	207	60	184	102	7	6
E 50006	550 W	160	110	12	30	130	3,5	158	204	65	428	60	233	115	204	154	9	8
E 50007	750 W	160	110	12	30	130	3,5	158	204	65	428	60	233	115	204	154	9	8
E 50008	1100 W	160	110	12	30	130	3,5	178	228	65	469	60	274	115	228	154	9	8
E 50100	motor brake	l = lengthening (O)																

## Stepping motor with and without feedback control



The number of steps of a 3-phase stepping motor can be set to that of a 2-phase stepping motor (200/400 steps per revolution) or 500/1000 steps/revolution. The number of steps per revolution can be multiplied by 10 (to 2000, 4000, 5000 and 10000) using the micro step function.

\*Full-step mode with 200 steps per rev.  
half step mode with 400 steps per rev.

Code-No.	Type	Nominal voltage	I <sub>w</sub>	M <sub>l</sub> max.	n (M <sub>l</sub> max.)	□ A	Length	Shaft
<b>3-phase motor</b>								
E 52001	VRDM 368	130 V	2 A	1,5 Nm	300 min <sup>-1</sup>	57	116	8 x 21
E 52002	VRDM 368 with brake	130 V	2 A	1,5 Nm	300 min <sup>-1</sup>	57	150	8 x 21
E 52003	VRDM 397	130 V	4,4 A	2 Nm	200 min <sup>-1</sup>	85	110	12 x 30
E 52004	VRDM 397 with brake	130 V	4,4 A	2 Nm	200 min <sup>-1</sup>	85	157	12 x 30
E 52005	VRDM 3910	130 V	5 A	4 Nm	500 min <sup>-1</sup>	85	140	12 x 30
E 52006	VRDM 3910 with brake	130 V	5 A	4 Nm	500 min <sup>-1</sup>	85	187	12 x 30
E 52007	VRDM 3913	130 V	5 A	6 Nm	150 min <sup>-1</sup>	85	170	14 x 30
E 52008	VRDM 3913 with brake	130 V	5 A	6 Nm	150 min <sup>-1</sup>	85	217	14 x 30
E 52009	VRDM 31117	325 V	4,1 A	12 Nm	380 min <sup>-1</sup>	110	180	19 x 40
E 52010	VRDM 31117 with brake	325 V	4,1 A	12 Nm	380 min <sup>-1</sup>	110	233	19 x 40
E 52011	VRDM 31122	325 V	4,75 A	16,5 Nm	250 min <sup>-1</sup>	110	228	19 x 40
E 52012	VRDM 31122 with brake	325 V	4,75 A	16,5 Nm	250 min <sup>-1</sup>	110	281	19 x 40
<b>2-phase motor *</b>								
E 52030	56 / 2	30/60 V	2 A	0,7 Nm	300 min <sup>-1</sup>	56	94	6,35 x 21
E 52031	56 / 2 with brake	30/60 V	2 A	0,7 Nm	300 min <sup>-1</sup>	56	134	6,35 x 21
E 52032	87 / 2	60/120 V	5 A	3 Nm	300 min <sup>-1</sup>	86	112	10 x 31,5
E 52033	87 / 2 with brake	60/120 V	5 A	3 Nm	300 min <sup>-1</sup>	86	157	10 x 31,5
E 52034	87 / 3	60/120 V	5 A	4,5 Nm	300 min <sup>-1</sup>	86	144	10 x 31,5
E 52035	87 / 3 with brake	60/120 V	5 A	4,5 Nm	300 min <sup>-1</sup>	86	189	10 x 31,5
E 52036	PK 2913	30/60 V	5,6 A	6 Nm	300 min <sup>-1</sup>	85	126	14 x 34



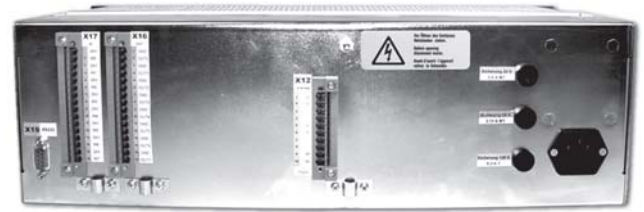
**3.2**



# Accessories

## 1-axis stepping motor controller

### Single-Axis Stepping Motor Controller MPM5111



- 19" rack (table top unit)
- from 230 VAC 500 W
- integrated operating terminal with LCD and numeric keypad
- programmable in accordance with ISO standards (DIN 66025)
- suitable for 3-phase stepping motor with max. 130 V/5.5 A
- highest-precision positioning through adjustable microstepping (up to 20,000 steps per revolution)
- optional emergency stop module
- optional automatic holding brake control
- optional additional inputs and outputs (IO-Plus)

#### Technical Data:

Power:	500 W
Height:	133 mm
Width:	485 mm (19")
Depth:	275 mm
Voltage:	230 VAC/50 Hz
Motor voltage:	130 V
Motor current:	max. 5.5 A (automatic current lowering at standstill)
Pulse frequency:	max. 28,800 Hz
Digital inputs:	8 for 24 V switching voltage
Digital outputs:	8 for 24 V switching voltage
External supply:	24 V/3.2 A (for auxiliary devices such as sensors)
Temperature range:	0° C to 50° C
Humidity:	max. 85% non-condensing
Weight:	approx. 9 kg
Class of protection:	IP 20 (DIN 40050)
Display:	2 lines of 16 characters
Keypad:	number keys, 4 function keys, arrow keys

The positioning controller MPM 5111 features these operating modes:

- **Automatic mode:**
  - Start of the specified run-off program
- **Setup mode:**
  - Programming of complex positioning operations for 1 axis (DIN 66025) with G-codes. A list of the available G-codes is found below in the command overview.
  - A program can have a maximum length of 100 lines.
  - Adjustment of parameters
- **Manual operation:**
  - Manual start of reference run
  - Manual operation of axis
  - Setting the 8 digital outputs
  - Status check of 8 digital inputs
- **Online operation (via PC):**
  - Direct execution of G-codes
  - Reading-out and storing of programs

#### The following parameters can be set by the user:

- Calibration (user units and machine units, 1 - 8,000,000 each)
- Reference run velocity (1 - 28,000 Hz)
- Manual run velocity (1 - 28,000 Hz)
- Positioning velocity (1 - 28,000 Hz)
- Acceleration, deceleration (1-64,000 Hz)
- Direction of reference run (1, -1)
- Reference run offset (-8,000,000 - +8,000,000)
- Number of input for limit switch and reference switch (-1 = not defined, 0-7)
- Number of the inputs for manual control (-1= not defined, 0-7)
- Number of the inputs for start and stop (-1= not defined, 0-7)
- Software limit switch (-8,000,000 - +8,000,000 increments)
- Reverse play compensation (0 - 8,000,000)

Code-No.	Type
E 72017	MPM 5111



3.2

# Accessories

## MCM continuous path controller



**Short description:**

**MCM Servo: motor control module for servo drives  
1 to 3 axes**

- 3 servo axes or mixed operation with 2 servo axes and one stepping-motor axis
- Path control: 2D and 3D interpolation
- Linear and circle interpolation, tangential control
- Position and speed control
- moments control
- Acceleration only once at the beginning, deceleration only once at the end
- Extremely fine movements of the motors; no bucking, no sputtering
- Continuous passage through any path section without "pause for thought"
- Constant path velocity with all shapes, also with individual calibration of the axes
- In path mode: variable grinding of ramps and contour
- Contouring error monitoring
- Electronic gear
- Analog output proportional to path velocity (application: laser performance control)
- Online operation via serial interface (V.24/RS 232) or (autonomous) offline operation from an EEPROM (subroutine technology)
- Command input, status and position request at any time (internal parallel operation)
- Comfortable PLC connection (inputs/outputs)
- Analog +/- 10V controller outputs and incremental encoder inputs
- 8 electrically isolated and 8 electrically isolated outputs (freely programmable)
- Complete commissioning software for adjusting the machine

**Power control:**

As combination with each standard servo drive with ± 10V reference!

Code-No.	Type
<b>E 75020</b>	MCM Servocontroller 2 Axes 19" plug-in rack
<b>E 75021</b>	MCM Servocontroller 3 Axes 19" plug-in rack
<b>E75023</b>	MCM Backplane

**Accessories:**

Code-No.	Type
<b>E 75022</b>	MCM-19" Rack incl. 220 Volt
<b>E 75024</b>	Airconditioner for all MCM sub-racks
<b>E75025</b>	Stop module incl. 24 Volt replay

**Short description:**

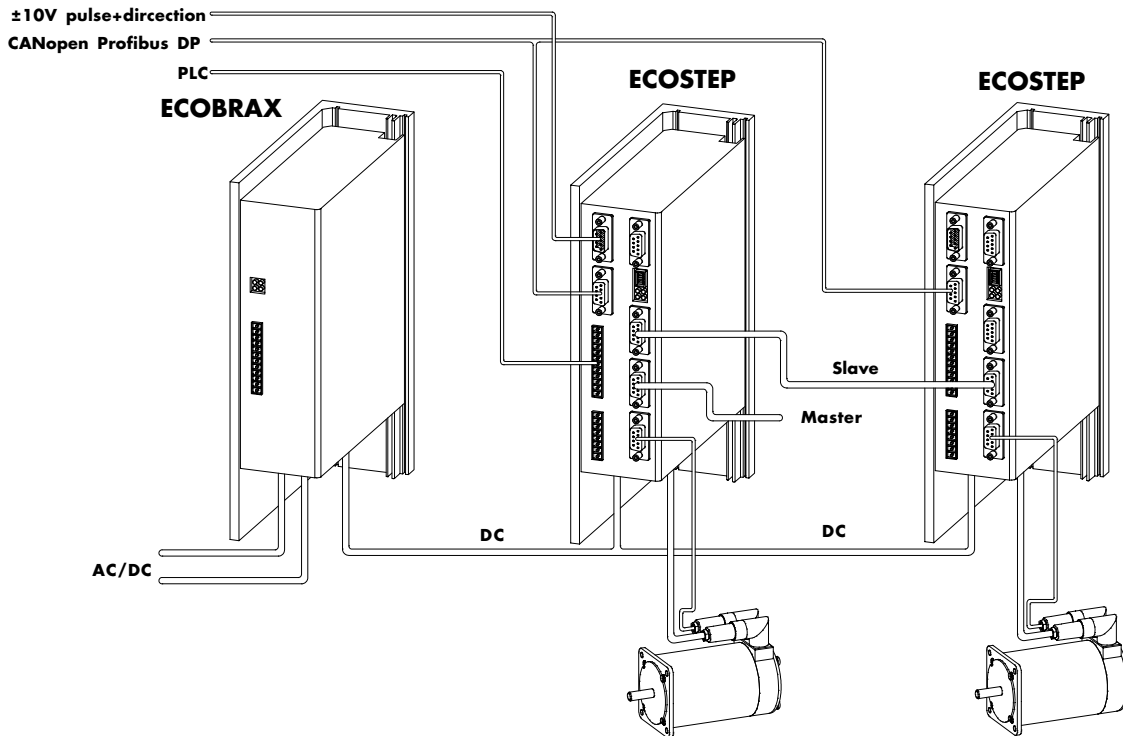
**MCM Step: motor control module for stepping motors  
1 to 6 axes**

- Independent control of all axes
- Path control: 2D- und 3D- Interpolation
- Linear/circular interpolation and tangential control
- 2D interpolation with independent third axis
- All path movements are calculated point by point
- Extremely fine movements of the motors; no bucking, no sputtering
- Programmable acceleration and braking ramps
- Continuous passage through any path section without "pause for thought"
- Acceleration only once at the beginning, deceleration only once at the end
- Online operation via serial interface (V.24/RS 232) or (autonomous) offline operation from an EEPROM (subroutine technology)
- Command input, status and position request at any time (internal parallel operation)
- Comfortable PLC connection (inputs/outputs)
- Pulse and direction outputs for all power drives
- 8 electrically isolated and 8 electrically isolated outputs (freely programmable)
- Input for incremental encoder with „electrical gear“ (e.g. for thread cutting)
- Freely programmable analog output (e.g. for rpm of spindle)

Code-No.	Type
<b>E 72030</b>	MCM Stepper motor controller 2 axes, 8 inputs ,8 outputs
<b>E 72031</b>	MCM Stepper motor controller 3 axes, 8 inputs ,8 outputs
<b>E 72032</b>	MCM Stepper motor contr. 3 axes, 28 inputs ,28 outputs
<b>E 72033</b>	MCM-Stepper motor contr. 4 axes, 28 inputs,28 outputs
<b>E 62001</b>	2-phase power-control 2,8 A, 70 V
<b>E 62002</b>	2-phase power-control 6 A, 70 V
<b>E 62003</b>	2-phases power-control 12 A, 70 V
<b>E 62010</b>	3-phase power-control 5,5 A, 120 V
<b>E 75026</b>	Sub-rack for MCM Step für E72030
<b>E75027</b>	Sub-rack for MCM Step für E72032



**ECOSTEP®: Profibus DP - programmable I/O's - CANopen-networks**



**ECOSTEP®** is a controller that regulates 2-phase stepping motors in closed current, velocity and position loop. The controller has the following features:

- \* ECOSTEP®: 200 UL/CSA certificate
- \* ECOSTEP® 100 AJ + PJ: UL/CSA certificate
- \* Simultaneous command input through Profibus DP or CAN, RS485 (PPI), RS232, Step & Direction and +/-10 V (13 bit)
- \* Overshot-free positioning mode due to adaptable velocity profiles
- \* Programmable electronic gear
- \* 8 digital inputs provide polling of 256 free connectable sequence tasks within 1 ms
- \* 2 free programmable output 24 V x 0.5 A
- \* Time variant control of holding brakes
- \* 32 bit trouble shooting performance with high safety level
- \* Interpolation via CANopen
- \* Joystick operation mode via +/-10 V analogous input

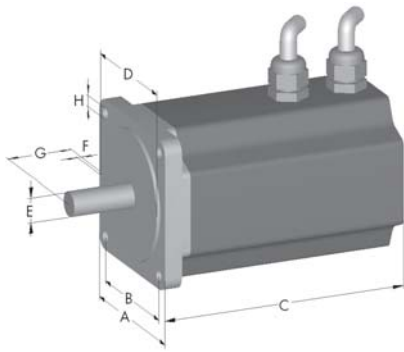


# Accessories

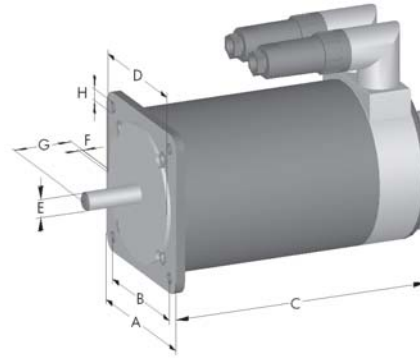
## Servo - steppingmotor techniques 2 - 4

Servo stepping-motor

Size 23



Size 34 - 42



Code-No.	Size	A	B	C	D	E	F	G	H	Static torque (Nm)	Axial load	Moment of inertia	Mass (kg)	intermediate circuit-voltage
E52 00	23 *	57	47,1	87	38,1	8,0	1,6	20,6	5,0	1,0	80	0,26 kg cm <sup>2</sup>	0,8	60 V
E52 01	23 *	57	47,1	109	38,1	8,0	1,6	20,6	5,0	1,8	80	0,46 kg cm <sup>2</sup>	1,4	90 V
E52 02	23 *	57	47,1	144	38,1	8,0	1,6	20,6	5,0	2,8	80	0,69 kg cm <sup>2</sup>	1,8	150 V
E52 03	34	86	69,6	114	73,0	12,0	1,6	30,5	5,5	3,5	180	1,4 kg cm <sup>2</sup>	2,5	170 V
E52 04	34	86	69,6	156	73,0	12,0	1,6	30,5	5,5	6	180	2,7 kg cm <sup>2</sup>	3,9	170 V
E52 05	34	86	69,6	195	73,0	12,0	1,6	30,5	5,5	8	180	4,0 kg cm <sup>2</sup>	5,7	170 V
E52 06	42	110	88,9	180	55,5	19,0	1,5	55,4	8,3	15	200	11,0 kg cm <sup>2</sup>	8,8	170 V

2 without brake

\* size 23 is delivered with a 2m open cable end

3 with brake

### Connection cable

Code-Nr.	Baugröße	Bezeichnung
E52270	23	Motor plug RSV 1.6 6-pole *
E52271	23	Motor plug RSV 1.6 9-pole **
E52233-03/-05/-10	23	Motor cable extension 3/5/10m
E52234-03/-05/-10	23	Motor/Brake cable extension 3/5/10m
E52235-03/-05/-10	23	Encoder cable extension 3/5/10m
E52229-03/-05/-10	34 -42	Brake cable 3/5/10m
E52230-03/-05/-10	34 -42	Motor cable with plug 3/5/10m
E52231-03/-05/-10	34 -42	Encoder cable with plug 3/5/10m

\* for extension of the cable end (motor size 23 without brake)

\*\* for extension of the cable end (motor size 23 with brake)

### Technical data Encoder

Selectivity	[Imp/U]	2000
Circuit voltage	U <sub>B</sub> [V]	5 (±10%)
Current consumption	I <sub>B</sub> [mA]	100
Signal specification	RS422	

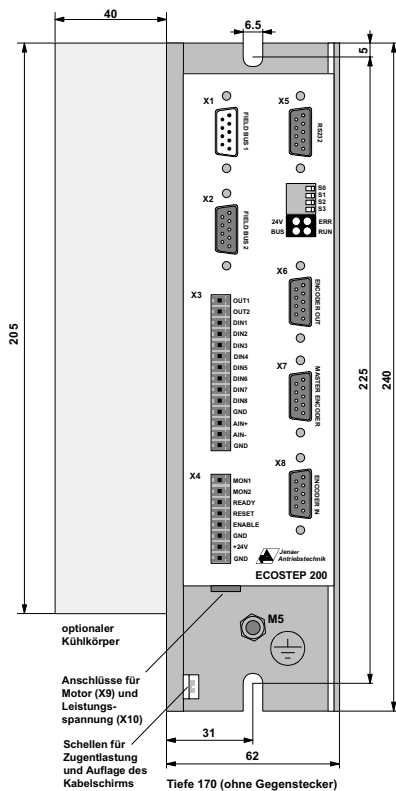
### Braking data

Size	Braking moment	Additional Motor length
23	1,5 Nm	32 mm
34 - 42	4,5 Nm	46 mm

E52 3 00

Sample ordering code:  
Size 23 with brake





optional dissipator  
Connections for motor (x9) and voltage (x10)  
Clips for strain relief and support of cable screen  
Depth 170 (without plug)

**ECOSTEP®**

A new positioning drive

- exceeds the features of AC servo motors
- considers the cost-effectiveness of stepper motors

**ECOSTEP®**

**The features**

- encoder commutated multi-pole synchronous motor
- significantly more favourable relation of torque to construction volume
- ultra-high dynamic brushless drive
- handels high load inertia even without gearbox
- torque range from 1 Nm up to 25 Nm
- motor sizes NEMA 23, 34 and 42
- optional holding brake full digital controlled drive
- positioning resolution up to 8000 PPR

**• ECOSTEP 200 a compact sized control unit for flexible system integration**

**Basic Functions**

- digital speed and positioning control providing position, velocity and torque limitation
- monitoring short circuit, voltage, encoder, tracking errors and  $i^2t$
- setting parameters by RS232/485 or CAN serial interface
- scalable analog monitors for any actual values
- intelligent control of a holding brake providing automatic voltage reduction
- evaluation of overtravel limit switches and home sensors for different indexation modes
- enabling powerstage and reset of error status by digital inputs
- indication of ready status by digital output

**Positioning Control by Fieldbus**

- command input by RS232/485 or CAN serial interface fieldbus
- programmable velocity profile

**Positioning Control by PLC Interface**

- up to 256 motion profiles including storability of position, velocity and acceleration
- selection of the profiles with digital inputs
- configurable feedback by up to 8 digital inputs

**Positioning with pulse and direction**

- scalable pulse and direction input meeting RS422 standard
- programmable maximum acceleration and velocity

**Master/Slave Positioning**

- programmable electronic gear and cam discs with master encoder input
- galvanically insulated output of the signals of the motor encoder as master for following drives

**Speed Controller with analog command**

- scalable speed command by
- analog +/- 10 V input, 10 bit resolution



Code-No.	Type	Rated voltage	Current	Selectivity	Dimensions (mm)	Weight	Interface
E 52250	ECO STEP	24-150 VDC	12 A	8000 Increments/revolution	240x62x170	1,8 kg	CAN open RS 232 pulse + direction ± 10 V 8 inputs 2 outputs
E52232	Fieldbus						

## Accessories

### Servo - steppingmotor techniques 4 - 4



#### ECOBRAХ

Intelligent rectifier up to 3.1 kVA with braking chopper

- Same dimensions as ECOSTEP0
- Power supply AC 18- 110 V ' 10A/20A 1/3-phase
- Protection until 20A T(inert)
- Braking resistor power 40 W cont./ 650 W peak
- Security: selftunable braking chopper

Why not direct power supply to AC 3x400V ?

That's a question of the driving power in use.

Between 50-700W the combination DC24Vx4A or DC 150Vx8A is more effective and less power consuming for the winding as DC 300V/0,3A or DC 600V/2A.

In addition, the ECOBRAX is very flexible and can be used for all ECOSTEPs. You can keep the ECOBRAX and just use another transformer to supply the best combination of voltage x current.

Code-No.	Type
<b>E 52251</b>	ECOBRAХ 200 - BA
<b>E 52252</b>	ECOBRAХ 200 - AA - 000 for E52261

#### Transformers for ECOBRAX



Although it is very convenient to use DC24V power supply for the small 23 motors, it is more useful for multi-axis applications to supply the small 23 motors with DC 60V/12A instead of DC 24/30A.

Thus, as soon as 2 or more servomotors are driven by one DC bus, the combination of 1 transformer + 1 ECOBRAX + X ECOSTEPs is more effective and less expensive than cycloconverting at each drive.

Code-No.	Type	Primary winding 50/60Hz	Secondary to ECOBRAX	Rated power	Dimensions mm	Weight
<b>E52260</b>	SV 60/24	230 V <sub>AC</sub>	60 V <sub>DC</sub>	300 VA	100x80x21	5 kg
<b>E52261</b>	TE500-42-230	230 V <sub>AC</sub>	42 V <sub>AC</sub>	500 VA	228x110x257	16 kg
<b>E52262</b>	TE500-85-230	230 V <sub>AC</sub>	85 V <sub>DC</sub>	500 VA	150x180x130	10 kg
<b>E52263</b>	TD1000-85-400	400 V <sub>AC</sub>	85 V <sub>AC</sub>	1000 VA		
<b>E52264</b>	TD1500-85-400	400 V <sub>AC</sub>	85 V <sub>AC</sub>	1500 VA		

Motor	Number	ECOBRAХ	Transformer
<b>23</b>	1 - 2		SV60/24 (*)
<b>23</b>	3 - 10	200-AA-000	TE500-42-230
<b>34</b>	1 - 2	200-BA-000	TE500-85-230
<b>34</b>	3 - 4	200-BA-000	TD1000-85-400
<b>42</b>	1	200-BA-000	TD500-85-400
<b>42</b>	2 - 3	200-BA-000	TD1000-85-400
<b>34/42</b>	> 4	200-BA-000	TD1500-85-400

(\*) In the SV 60/24 transformer the current is rectified. No ECOBRAX is required.

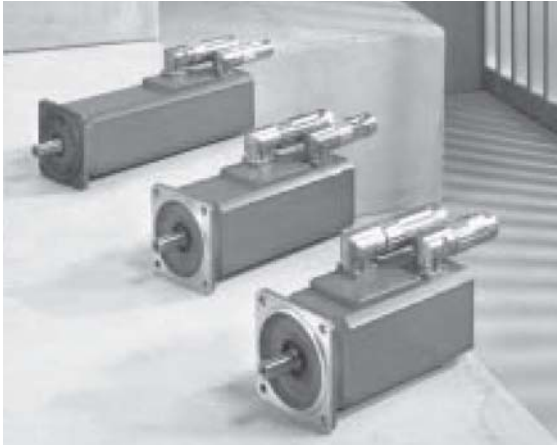


3.2

# Accessories

## Servo motor 1 - 2

### Servomotor



By using high-energy magnetic material NdFeB (size 4x: SmCo) it is possible to design small diameter disc motors. For this reason and due to a carefully optimized technical construction of the rotor, the motors have a low moment of inertia.

The stability of the magnetic material and the design of the magnetic field in the face of demagnetisation allow maximum currents of up to 4 times the rated current.

This results in a high acceleration capacity of the low-inertia three-phase AC servo drives.

Through the excitation of the permanent magnets, no Joule's heat losses occur in the rotor.

With three-phase AC-servomotors, Joule's heat losses occur only in the stator, which can then be directly drawn off via the housing.

These favourable cooling conditions allow high-capacity windings. Since all the Joule's heat losses are drawn off directly via the housing, the motors are designed at low cost with the enclosure type providing protection in accordance with IP 54 (optional: IP 65; size 4x: IP65 standard) and they are thus very resistant to liquids and dirt.

### Synchronous servo motors with 400V system voltage, $n_N$ 3000 [min<sup>-1</sup>]

Code-No.	Motor	$M_0$	$I_0$	$M_{DYN}$	$I_{max}$	$M_{OVR}$	$I_{OVR}$	$J_{mot}$	$J_{bmot}$	$M_{B1}$	$M_{B2}$	$W_{max1}$	$W_{max2}$	
		[Nm]	[A]	[Nm]	[A]	[Nm]	[A]	[10 <sup>-4</sup> kgm <sup>2</sup> ]	[Nm]	[kJ]				
E55	50	DFS56M	1	1.65	3.8	6.6	—	—	0.48	0.83	2.5	—	—	—
E55	51	DFS56L	2	2.4	7.6	9.6	—	—	0.83	1.18	2.5	—	—	—
E55	52	DFS56H	4	2.8	15.2	11.2	—	—	1.53	1.88	5	—	—	—
E55	53	CFM71S	5	3.3	16.5	13.2	7.3	4.8	4.89	6.65	10	5	14	20
E55	54	CFM71M	6.5	4.3	21.5	17.2	9.4	6.2	6.27	8.03	14	7	11	18
E55	55	CFM71L	9.5	6.2	31.4	25	13.8	9	9.02	10.8	14	10	11	14
E55	56	CFM90S	11	7.3	39.6	29	16	10.6	17.4	21.2	28	14	10	20
E55	57	CFM90M	14.5	10.1	52.2	40	21	14.6	22.3	26.1	40	20	4.5	15
E55	58	CFM90L	21	14.4	75.6	58	30.5	21	32.1	35.9	40	28	4.5	10
E55	59	CFM112S	23.5	15	82.3	60	34	22	68.4	84	55	28	18	36
E55	60	CFM112M	31	20.5	108.5	82	45	30	88.2	104	90	40	7	32
E55	61	CFM112L	45	30	157.5	120	65	44	128	143	90	55	7	18
E55	62	CFM112H	68	43	238.0	172	95	60	190	209	90	55	7	18

$M_0$	Stand still torque	Nm	$n_N$	nominal revolutions (1/min)
$I_0$	Stand still current	A	$M_{B1}$	Standard brake torque
$M_{DYN}$	Dynamic-torque	Nm	$M_{B2}$	Reduced brake torque
$I_{max}$	Max. current	A	$W_{max1}$	Max. possible brake moment during a maintenance interval
$M_{OVR}$	Max. torque with external cooling	Nm	$W_{max2}$	Max. possible brake moment during a maintenance interval
$I_{OVR}$	Max. current with external cooling	A		
$J_{mot}$	Inertia of masses	10 <sup>-4</sup> kgm <sup>2</sup>		
$J_{bmot}$	Inertia of masses with brakes	10 <sup>-4</sup> kgm <sup>2</sup>		



### 3.2

0 0 without brake  
1 1 with brake

E55 0 50

Sample order code:  
Motor DFS56M, 1,00 Nm for 400 V AC, without brake



# Accessories

## Servo motor 2 - 2

## Motor controller



MOVIDRIVE® MDX61B is the new generation of drive inverters from SEW. The new MOVIDRIVE® drive inverters of the B series convince with more basic functions, extended lower speed range, increased overload capacity and modular unit design.

As a result, AC drives with the latest digital inverter technology can now be used without restrictions in the power range from 0.55 to 132 kW . The integrated control functions and the possibility of expanding the system with technology and communication options is leading to drive systems that are designed for particularly high levels of efficiency in terms of their broad range of applications, project planning, startup and operation.

The Userpanel on the picture above is a option for the servo drive inverters, it belongs not standardly to the product!

Movidrive MDX61B Standard version	E55201	E55202	E55203	E55204
Movidrive MDX61B Application version *)	E55301	E55302	E55303	E55304
Size	Size 0	Size 1	Size 2	
<b>Input</b>				
Supply voltage $V_{mains}$	3 x AC 380 V -10% ... 3 x AC 500 V +10%			
Mains frequency $f_{mains}$	50 Hz ... 60Hz ±5%			
Rated supply current <sup>1)</sup> $I_{mains}$ (at $V_{mains} = 3 \times AC 400 V$ )	100% 125%	AC 3.6 A AC 4.5 A	AC 6.3 A AC 7.9 A	AC 11.3 A AC 14.1 A
<b>Output</b>				
Apparent output power <sup>2)</sup> (at $V_{mains} = 3 \times AC 380 V ... 500V$ )	$P_{rated}$	2.8 kVA	4.9 kVA	8.7 kVA
Rated output current (at $V_{mains} = 3 \times AC 400 V$ )	$I_N$	AC 4 A	AC 7 A	AC 12.5 A
Current limitation (Motor and regenerative)	$I_{max}$	200% $i_N$ , duration depending on capacity utilization		150% $i_N$ , duration depending on capacity utilization
Internal current limitation		$I_{max} = 0...150\%$ adjustable		$I_{max} = 0...150\%$ adjustable
Minimum permitted braking resistor value (4Q-operating)	$R_{Bwmin}$	68 Ohm	47 Ohm	22 Ohm
Output voltage $V_{out}$		Max. $V_{mains}$		
PWM-frequency $f_{PWM}$		Adjustable: 4/8/12/16 kHz		
Speed range / resolution $n_a/\Delta n_a$		-6000 ... 0... +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> across the entire range		
<b>General</b>				
Power loss at $S_N^{2)}$	$P_{Vmax}$	74 W	130 W	220 W
Cooling air consumption		9 m <sup>3</sup> /h		80 m <sup>3</sup> /h
Mass		2.8 kg	3.5 kg	6.6 kg
Dimensions $W \times H \times D$		95 x 317 x 260 mm		105 x 335 x 294 mm
Constant load Recomm. motor power	$P_{Mot}$	1.5 kW	3.0 kW	5.5 kW
Variable torque load or constant load without overload Recomm. motor power	$P_{Mot}$	2.2 kW	4.0 kW	7.5 kW
VFC operating mode ( $f_{PWM} = 4kHz$ ) Continuous output current = 125% (at $U_{mains} = 3 \times AC 400 V$ )	$I_N$ $I_b$	AC 5 A	AC 8.8 A	AC 15.6 A
CFC/Servo operating mode ( $f_{PWM} = 8kHz$ ) Continuous output current = 100%	$I_N$ $I_b$	AC 4 A	AC 7 A	AC 12.5 A

\*) Additional functions to standard (pre-parametized)

1) The rated mains currents and output currents must be 20% below the rated data at  $V_{mains} = 3 \times AC 500 V$

2) The performance data apply to  $f_{PWM} = 4 kHz$  (factory setting in VFC operating modes)



### 3.2

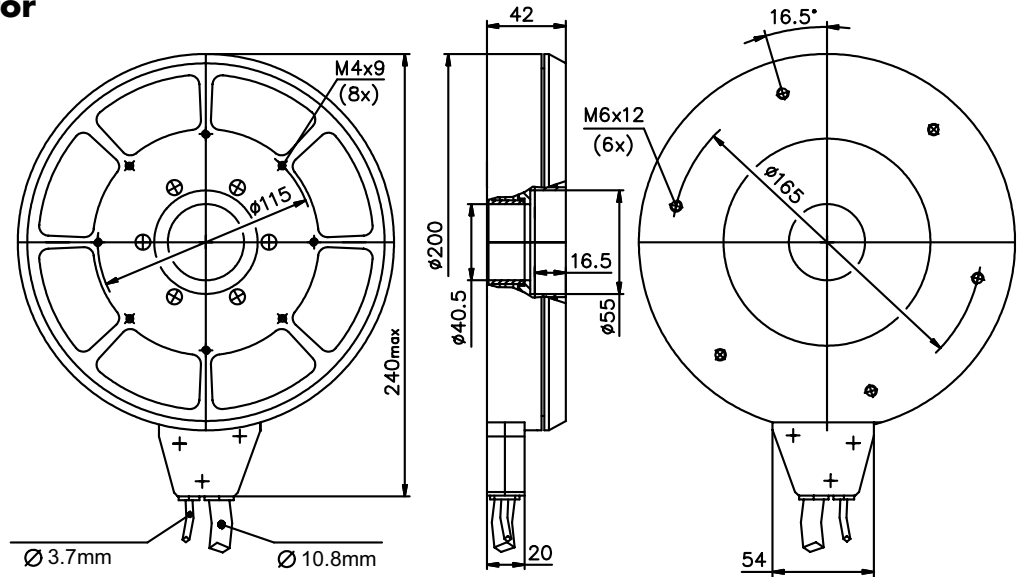


# Accessories

Rotary motor

## Rotary synchronous motor RSMR-T-24-145x25

Code-No.	Type
E52500	RSMR-T-24-145x25-GS
E52501	RSMR-T-24-145x25-GT



### FEATURES:

- Iron-core three-phase rotary synchronous motor with rare-earth magnets for high force density.
- Direct drive (no gear, no backlash), low profile (height 42 mm) with hollow shaft (Ø40 mm).
- Built-in precision ball bearing, sine optical encoder, thermistors for overheating protection.
- High precision, repeatability and resolution, low cogging, smooth movement.
- High motor stiffness and large bandwidth by position regulator with encoder feedback.

### APPLICATIONS:

Semiconductor manufacturing, pick and place machines, indexing tables.

### CONSTRUCTION:

Motor consist of a fixed lamination stack with windings (stator) and rotated steel ring with glued permanent magnets (rotor). Windings are encapsulated in thermally conductive epoxy. The smoothness of movement is achieved by sinusoidal commutation of motor phases currents.

### SPECIFICATION OF RSMR-T-24-145x25-

		GS	GT
Number of poles pairs 2P		17	17
Peak torque Mp (coil at 20°C)	Nm	45	45
Continuous torque Ma (coil at 120°C)	Nm	17	17
Bearing friction torque Mb	Nm	0.2	0.2
Cogging (detent) torque Mc	Nm	0,4	0,4
Peak current at Mp	Arms	14,0	24,2
Continuous current at Ma	Arms	5,1	8,7
Inductance L	mH	15.2	5.1
Resistance R	Ohm	2.9	0.96
Maximum velocity Np at 150 VDC and Mp	Rpm	214	412
Maximum velocity Na at 150 VDC and Ma	Rpm	393	701
Maximum velocity Nb at 150 VDC and Mb	Rpm	514	887
Maximum bearing velocity	Rpm	2000	2000
Rotor moment inertia	Kg·m <sup>2</sup>	0.01	0.01
Motor weight	Kg	7	7
Maximal user payload	Kg	25	25
Axial / radial runout	micron	20	20
Number of encoder lines		2048	2048
Position accuracy	arc.sec.	30	30
Repeatability	arc.sec.	2	2
Resolution	arc.sec.	0,5	0,5



3.2

E52500

Sample order code:  
RSMR-T24-145x25 GS

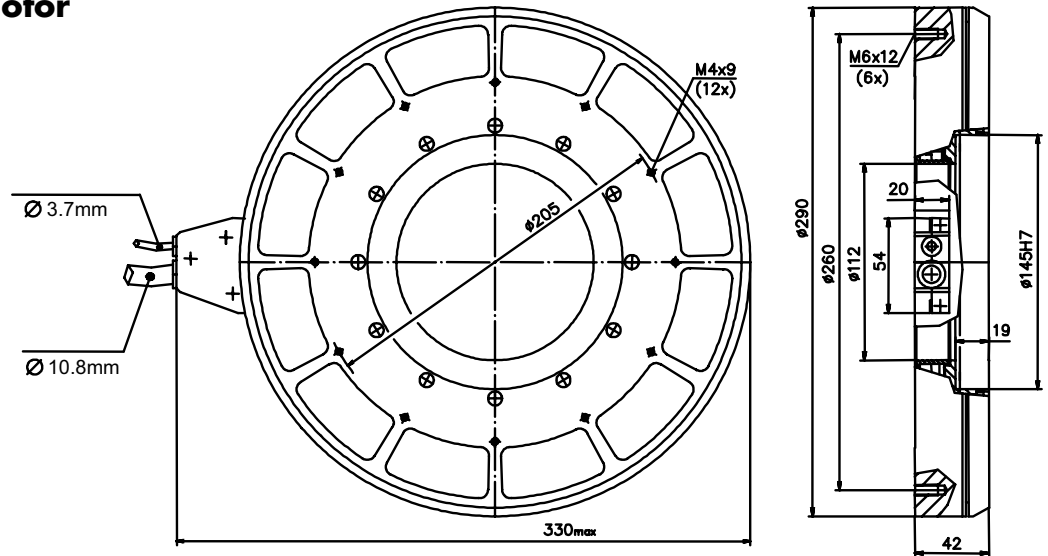
3.2 / 14



## Accessories

### Rotary motor

#### Rotary synchronous motor RSMR-T-24-237x25



Code-No.	Type
E52502	RSMR-T-24-237x25-GS
E52503	RSMR-T-24-237x25-GT

#### FEATURES:

- Iron-core three-phase rotary synchronous motor with rare-earth magnets for high force density.
- Direct drive (no gear, no backlash), low profile (height 42 mm) with hollow shaft (Ø112 mm).
- Built-in precision ball bearing, sine optical encoder, thermistors for overheating protection.
- High precision, repeatability and resolution, low cogging, smooth movement.
- High motor stiffness and large bandwidth by position regulator with encoder feedback.

#### APPLICATIONS:

Semiconductor manufacturing, pick and place machines, indexing tables.

#### CONSTRUCTION:

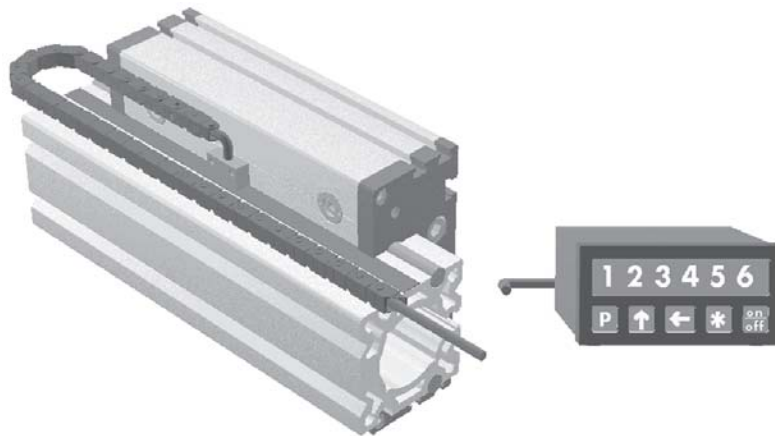
Motor consist of a fixed lamination stack with windings (stator) and rotated steel ring with glued permanent magnets (rotor). Windings are encapsulated in thermally conductive epoxy. The smoothness of movement is achieved by sinusoidal commutation of motor phases currents.

#### SPECIFICATION OF RSMR-T24-237x25-

		GS	GT
Number of poles pairs 2P		31	31
Peak torque $M_p$ (coil at 20°C)	Nm	111	111
Continuous torque $M_a$ (coil at 120°C)	Nm	42	42
Bearing friction torque $M_b$	Nm	0,3	0,3
Cogging (detent) torque $M_c$	Nm	0,8	0,8
Peak current at $M_p$	Arms	14,0	24,2
Continuous current at $M_a$	Arms	5,1	8,7
Inductance L	mH	22,9	7,6
Resistance R	Ohm	4,3	1,4
Maximum velocity $N_p$ at 310 VDC and $M_p$	Rpm	180	330
Maximum velocity $N_a$ at 310 VDC and $M_a$	Rpm	325	565
Maximum velocity $N_b$ at 310 VDC and $M_b$	Rpm	428	734
Maximum bearing velocity	Rpm	923	923
Rotor moment inertia	Kg·m <sup>2</sup>	0,07	0,07
Motor weight	Kg	10	10
Maximal user payload	Kg	65	65
Axial / radial runout	Micron	20	20
Number of encoder lines		5400	5400
Position accuracy	arc.sec.	30	30
Repeatability	arc.sec.	2	2
Resolution	arc.sec.	0,2	0,2

E52502

Sample order code:  
RSMR-T24-237x25 GS



**Electronic display MA 502**

The incremental electronic display MA01/1 for hodometry and goniometry is one component of the magnetic-tape length measuring system and can only be operated together with a magnetic sensor and the magnetic tape.  
The MA01/1 is available as 1-channel (to connect one sensor only) or as 2-channel version:

Features:

- integrated electronical evaluation
- front mounted keyboard with on/off key
- programmable parameters to adjust the MA01/1 to the specific setting of the machine
- "incremental measurement" function
- programmable last value memory
- direct input of reference / offset value
- option: external battery module power supply; automatic control of state of charge (see Accessories/Options)
- well readable LED display
- reference input

**Magnetic sensor MS500**

Compact magnetic sensor with integrated electronical evaluation and direct rectangular pulse output.  
Operation in connection with the magnetic SIKO tape (type MB).

Features:

- integrated electronical evaluation
- maximum resolution 0.05 mm (with quadruplex evaluation)
- accuracy of the magnetic system 0.1 mm
- online connection to other electronic counters (e.g. PLC or SIKO-MA ...)
- low-priced linear measurement
- simple mounting
- output in real time
- simple hodometry and goniometry
- pulse output is compatible to conventional incremental encoders
- suitable for high velocities

	<b>Electronic display MA01/1</b>	<b>Magnetic sensor MSK</b>
Power supply	24 V DC ± 20%; 230 V AC; 115 V AC	Mini-DIN 7-polig
Display range	12-stellige LCD Dotmatrix	-
Output signal	-	-
Output circuit	-	PP (Push-Pull) TTL (RS422)
Velocity	max. 5 m/s	< 10 m/s
Distance sensor/tape	-	0,1 -2,0 mm
System of protection	for complete system: IP 40 flush-type: IP 60	IP 67
Resolution	0,01 / 0,1 / 1 / 10 mm	0,05 mm optional: 0,25 mm (quadruplex evaluation) 0,025 mm
Repeating accuracy	± 1 Digit	-
Accuracy	± (0,05+0,01 × L)mm [L in m]	see following elektronik
<b>Code-No.</b>	<b>E 77070</b>	<b>E 77076</b>



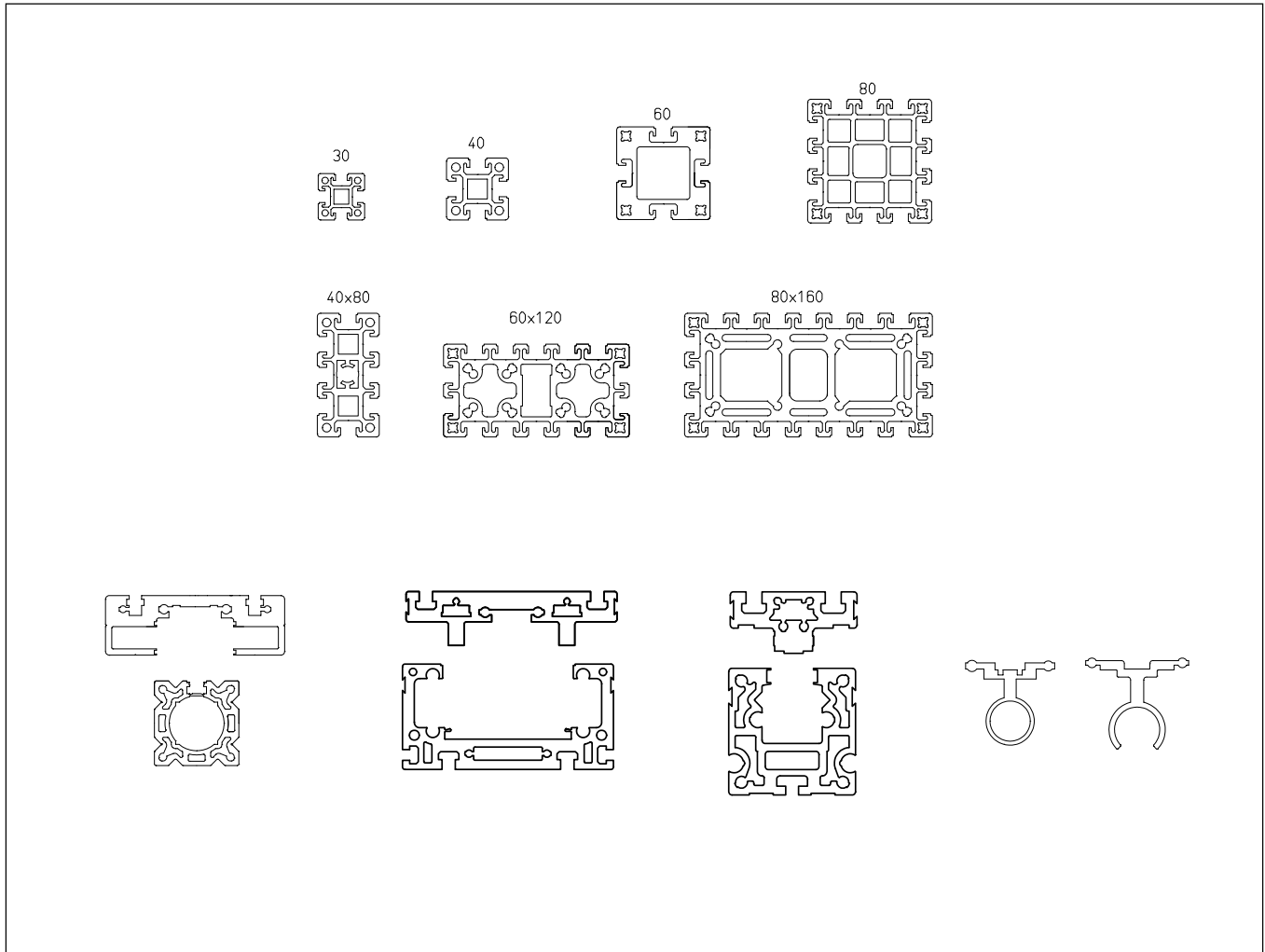
**3.2**

**Magnetic tape**

The magnetic tape consists of a strip polarised at defined intervals, which is firmly connected with a carrier tape. In addition, a magnetically conducting cover strip made of stainless steel is included in the scope of delivery.

- Simple mounting by a double-sided Scotch tape
- High resistance against external influences

<b>Code-No.</b>
<b>E 77077....</b>



## System profile



# System profiles

## Guide body profile

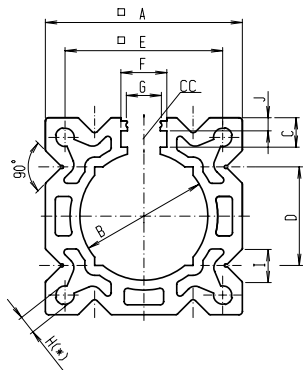
Dimensions (mm)

### Guide body profile EG 40, 60, 80

Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

CC = refer to chapter 2.2 page 2-3



Code-No. Length in mm

<b>40063</b>	2000
--------------	------

Ordering sample: Guide body profile EG 40, 2.000 mm long.

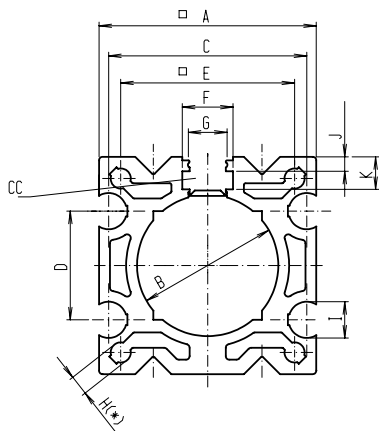
Code-No.	Type	A	B	C	D	E	F	G	H	*	I	J	K	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>40063</b>	<b>40</b>	40	29	-	20	29	14,2	10,1	4,7	M5	6	4	-	2,05	140.985	6.240	6.000
<b>40053</b>	<b>60</b>	60	39	9	30	48	14,2	10,1	5,6	M6	10	4	-	3,87	564.791	18.043	6.000
<b>40073</b>	<b>80</b>	80	50	9	40	64	14,2	10,1	7,5	M8	12	4	-	7,48	1.913.969	46.563	6.000

### Guide body profile EL 30, 40, 60(S), 80(S), 100, 125

Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

CC = refer to chapter 2.2 page 2-3



Code-No. Length in mm

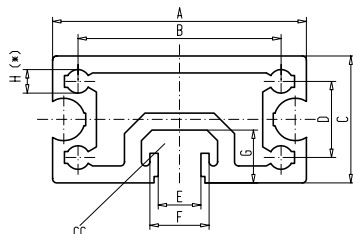
<b>40090</b>	2000
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Ordering sample: Body profile EL 30, 2.000 mm long.

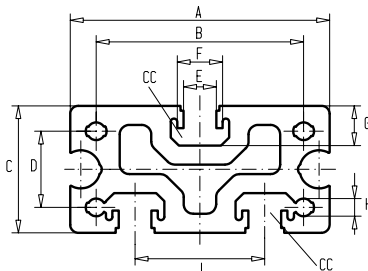
Code-No.	Type	A	B	C	D	E	F	G	H	*	I	J	K	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>40090</b>	<b>30</b>	30	21	27,8	13	23	10,5	6,4	3,7	M 4	5	2,3	5,5	1,08	42.464	2.636	3.000
<b>40060</b>	<b>40</b>	40	29	37,8	18	29	14,2	10,1	4,7	M 5	6	4	-	1,92	132.178	6.069	6.000
<b>40050</b>	<b>60(S)</b>	60	39	54,8	30	48	14,2	10,1	5,6	M 6	10	4	9	3,81	572.639	18.277	6.000
<b>40070</b>	<b>80(S)</b>	80	50	73,5	40	64	14	10	7,5	M 8	12	4	9	7,46	1.915.359	45.548	6.000
<b>40080</b>	<b>100</b>	100	60	92	50	80	26	17	9,4	M10	16	6,7	14,9	11,10	4.443.769	84.467	6.000
<b>40100</b>	<b>125</b>	125	80	117	60	100	26	17	11,3	M12	20	6,7	14,9	15,92	1,015x10 <sup>7</sup>	175.593	6.000

### Guide body profile E 40, 60, 80

40, 60



80



Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

CC = refer to chapter 2.2 page 2-3

Code-No. Length in mm

<b>40320</b>	<b>1000</b>
--------------	-------------

Sample ordering code:  
Guide body profile E 60, 1.000 mm long.

Code-No.	Type	A	B	C	D	E	F	G	H	*	J	m [kg/m]	I [mm <sup>4</sup> ]	L <sub>max.</sub>
<b>40310</b>	<b>40</b>	40	29	22	11	10,1	14	12,5	4,7	M 5	-	1,40	371	6.000
<b>40320</b>	<b>60</b>	60	48	30	18	10,1	14	12,5	5,6	M 6	-	2,16	154.487	6.000
<b>40077</b>	<b>80</b>	80	64	40	24	10,1	14	12,5	5,6	M 6	40	4,83	280.532	6.000

# System profiles

## Guide body profile

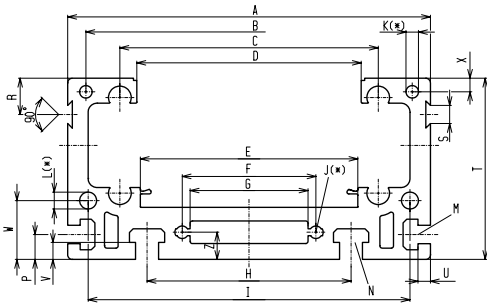
Dimensions (mm)

### Guide body profile DL 120, 160, 200

Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

N + M = refer to chapter 2.2 page 2-3



Code-No. Length in mm

<b>41101</b>	2000
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Sample ordering code: Guide body profile DL 160, 2.000 mm long

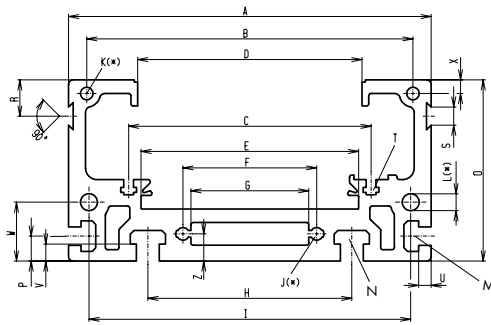
Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M for	N for	P	R	S	T	U	V	W	X	Z	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>41110</b>	<b>120</b>	120	109	86	76	72	48	42	78	106	5,6	4,7	5,6	M5	M6	10	16	8	60	5,5	5,5	21	4,5	8,5	5,61	669.493	17.185	6.000
<b>41101</b>	<b>160</b>	160	144	114	99	96	59	52	90	142	5,6	5,6	7,5	M6	M8	11	16	8	80	5,5	7,5	26	6	12	10,34	2.228.225	42.597	6.000
<b>41250</b>	<b>200</b>	200	128	137	119	111	91	80	140	162	9,4	7,5	9,4	M8	M10	15	12	8	100	7,5	9,4	28	9	13	19,55	6.387.482	94.929	6.000

### Guide body profile DS 160, 200

Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

N + M + T = refer to chapter 2.2 page 2-3



Type	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]
<b>120</b>		
<b>160</b>	2.132.874	40.751
<b>200</b>	2.234.346	58.956

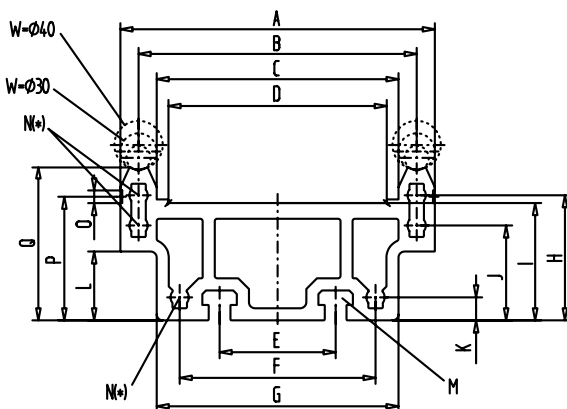
Code-No. Length in mm

<b>41106</b>	2000
--------------	------

Sample ordering code: Guide body profile DS 160, 2.000 mm long

Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M für	N für	O	P	R	S	T für	U	V	W	X	Z	kg/m	L <sub>max.</sub>
<b>41106</b>	<b>160</b>	160	144	107	99	96	59	52	90	142	5,5	5,5	7,5	M6	M8	80	11	16	8	M4	5,5	7,5	26	6	12	10,52	6.000
<b>41255</b>	<b>200</b>	200	178	133	119	111	91	80	140	162	9,4	7,5	9,4	M8	M10	100	15	12	8	M6	7,5	10	28	9	13	19,55	6.000

### Guide body profile ALL 203, 204



Code-No. Length in mm

<b>43000</b>	2000
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Sample ordering code: Guide body profile ALL 20x, 2.000 mm long

Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	W	kg/m	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>43000</b>	<b>ALL</b>	260	230	200	180,5	90	162	200	103,43	97	78,4	19	56,9	M16	M16	10,5	102,15	126,4	30/40	28,0	14.260.860	209.878	7.600



4.2

# System profiles

## Guide body profile

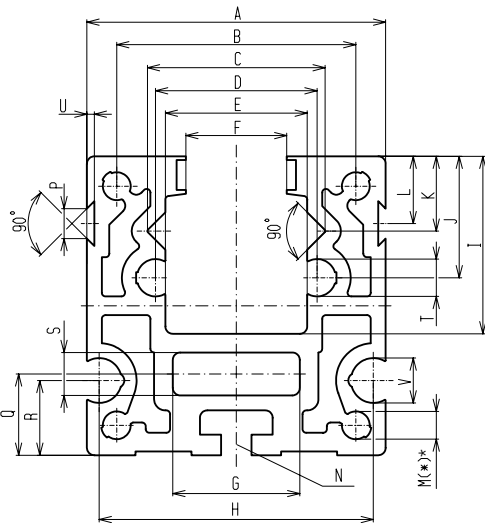
Dimensions (mm)

### Guide body profile QL 60, 80, 100

Material Al Mg Si 0,5 F25 6E EV1

(\*) = tapped threads

N = refer to chapter 2.2 page 2-3



Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N for	O	P	Q	R	S	T	U	V	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
41210	60	60	48	36,9	28,5	25,5	22	32	54,7	36	24	16	24	5,6	M5	M5	8	15,7	15	7,5	6	2	10	3,29	430.063	13.039	6.000
41200	80	80	64	47,6	43,3	38	27	34	73,4	47,5	32,5	20	18	7,5	M6	M6	8	21,8	20	11,5	10	2	12	7,05	1.658.518	38.127	6.000
41260	100	100	80	60	55,3	50	46	54	92	58,5	39	24	21	9,4	M10	M10	8	28	25	13	10	2	16	10,08	3.489.779	41.627	6.000

Code-No. Length in mm

41200	2000
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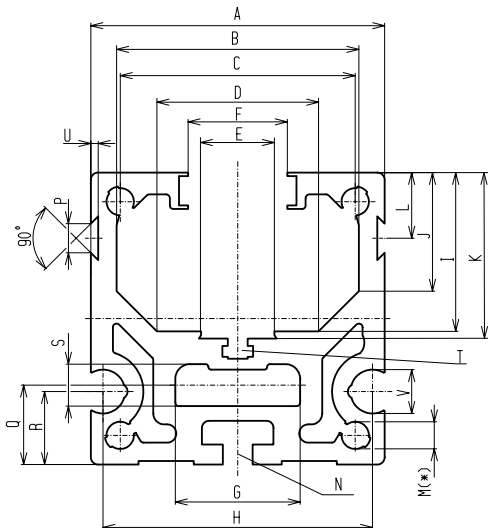
Sample ordering code: Guide body profile QL 80, 2.000 mm long.

### Guide body profile QS 60, 80, 100

Material Al Mg Si 0,5 F25 6E EV1

(\*) = tapped threads

N + T = refer to chapter 2.2 page 2-3



Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N for	P	Q	R	S	T	U	V	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
41214	60	60	49	48	27	15	22	27	56	33	22	35	16	5,5	M5	8	15	15	9,5	M4	2	10	3,76	437.969	12.251	6.000
41206	80	80	66	64	44	20	27	34	73,4	43,5	32,5	45,5	18	7,5	M6	8	20	20	11,5	M5	2	12	6,82	1.427.891	30.308	6.000
41262	100	100	80	80	52	23	44	54	92	52,5	38,5	54,5	21	9,4	M10	8	29	25	17	M6	2	16	10,55	3.186.639	53.735	6.000

Code-No. Length in mm

41214	2000
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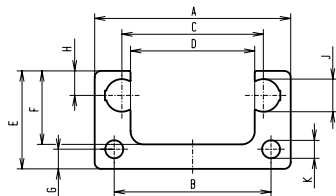
Sample ordering code: Guide body profile QS 60, 2.000 mm long.

# System profiles

## Guide body profile

Dimensions (mm)

### Guide body profile UL 40, 60, 80



Material Al Mg Si 0,5 F25 6E EV1  
 (\*) = tapped threads  
 N = refer to chapter 2.2 page 2-3

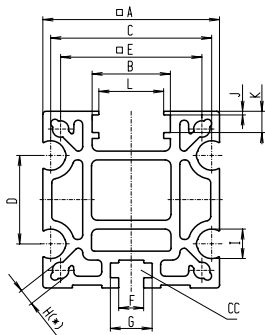
Code-No. Length in mm

<b>41340</b>	2000
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Sample ordering code: Guide body profile UL 40, 2.000 mm long.

Code-No.	Type	A	B	C	D	E	F	G	H	∅ J	∅ K	m [kg/m]	Ix [mm <sup>4</sup> ]	Iy [mm <sup>4</sup> ]	Wx [mm <sup>3</sup> ]	Wy [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>41340</b>	<b>40</b>	40	29	28,5	25,5	22	15,25	5,5	5	6	4,65	3,29	15.895	85.574	1.103	4.279	6.000
<b>41360</b>	<b>60</b>	60	48	43,3	38	30	22,5	6	7,5	10	5,5	7,05	56.053	362.776	2.811	12.093	6.000
<b>41380</b>	<b>80</b>	80	59	55,3	50,4	40	28,5	10,5	9	10	7,45	10,45	203.279	1.215.816	7.879	30.395	6.000

### Guide body profile ML 60, 80



Material Al Mg Si 0,5 F25 6E EV1  
 (\*) = tapped threads  
 CC = refer to chapter 2.2 page 2-3

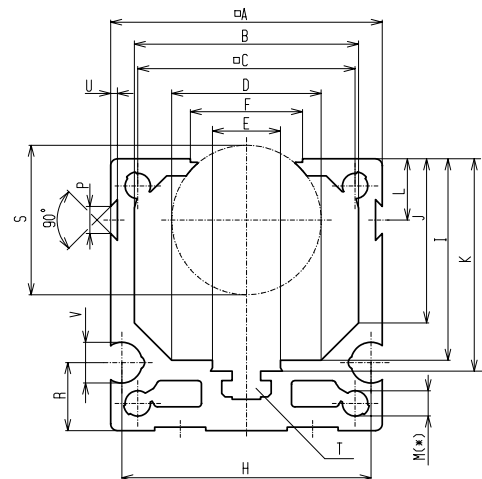
Code-No. Length in mm

<b>40058</b>	2000
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Sample ordering code: Guide body profile ML 60, 2.000 mm long.

Code-No.	Type	A	B	C	D	E	F	G	H	∅ I	J	K	L	m [kg/m]	Ix [mm <sup>4</sup> ]	Iy [mm <sup>4</sup> ]	Wx [mm <sup>3</sup> ]	Wy [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>40058</b>	<b>60</b>	60	26,6	54,7	30	48	8,5	14,2	5,55	10	1,2	7,2	22	3,53	483.425	502.399	15.313	16.777	6.000
<b>41230</b>	<b>80(S)</b>	80	32	73,4	40	64	10,1	14,2	7,45	12	1,0	9	27	7,23	1.749.353	1.802.191	42.002	45.055	6.000
<b>4....</b>	<b>100</b>																		

### Guide body profile QST/K 60, 80, 100



Material Al Mg Si 0,5 F25 6E EV1  
 (\*) = tapped threads  
 N + T = refer to chapter 2.2 page 2-3

Code-No.	Type	A	B	C	D	E	F	H	I	J	K	L	M	P	R	S	T for	V	m [kg/m]	Ix [mm <sup>4</sup> ]	Iy [mm <sup>4</sup> ]	Wx [mm <sup>3</sup> ]	Wy [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>41217</b>	<b>60</b>	60	49,5	48	36	15	25	54,7	47,3	36	49,3	16	5,6	8	15	34	M4	10	2,77	420.662	488.512	11.551	16.284	6.000
<b>41208</b>	<b>80</b>	80	66	64	44	20	33	73,4	59,3	48,3	62,5	18	7,5	8	20	44	M5	12	5,47	1.400.650	1.664.943	28.442	41.623	6.000
<b>41268</b>	<b>100</b>	100	80	80	53	23	40	92	79,5	60	81,5	21	9,4	8	25	58	M6	16	8,47	3.279.577	4.186.220	53.607	83.724	6.000

Code-No. Length in mm

<b>41208</b>	2000
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Sample ordering code: Guide body profile QST/K 80, 2.000 mm long.



4.2

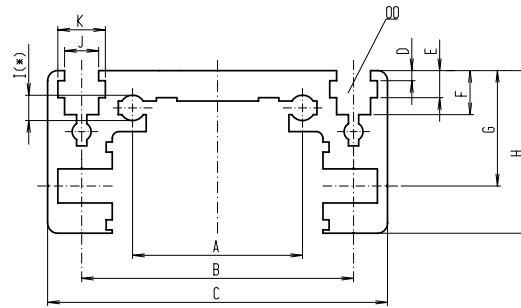
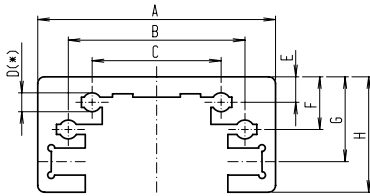


# System profiles

## Carriage profile

Dimensions (mm)

### Carriage profile EG 40, 60



Material Al Mg Si 0,5 F25 E6 EV1  
 (\*) = tapped threads  
 OO = refer to chapter 2.2 page 2-3

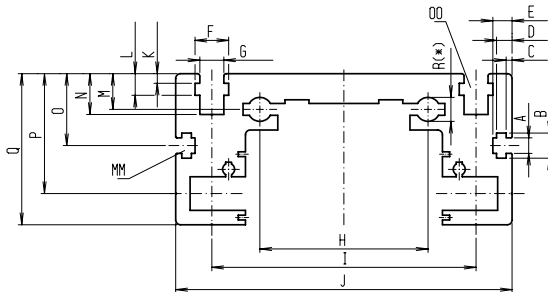
Code-No.	Type	A	B	C	D	E	F	G	H	I	*	J	K	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
40064	40	70	52	38	-	7,5	15,5	25	34	5,6	M6	-	-	2,64	103.977	4.767	3.000
40054	60	50	80	100	3	8	13	34	48	7,5	M8	10,1	14,2	4,68	374.930	12.846	3.000

Code-No. Length in mm

40064	2000
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Ordering sample: Carriage profile EG 40, 2.000 mm long.

### Carriage profile EG 80



Material Al Mg Si 0,5 F25 E6 EV1  
 (\*) = tapped threads  
 OO + MM = refer to chapter 2.2 page 2-3

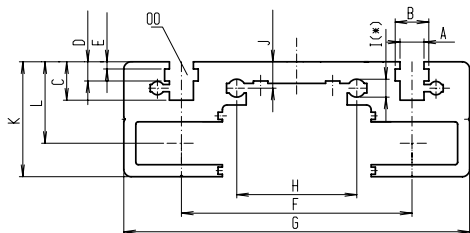
Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	*	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
40074	80	6,5	10,5	2,5	6,5	8	14,2	10,1	70	110	140	4	9	15	17	30	50	63	9,4	M10	9,44	1.142.725	28.847	3.000

Code-No. Length in mm

40074	2000
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Ordering sample: Carriage profile EG 80, 2.000 mm long.

### Carriage profile EL 30, 40, 60, 60S



Material Al Mg Si 0,5 F25 E6 EV1  
 (\*) = tapped threads  
 OO = refer to chapter 2.2 page 2-3

Code-No.	Type	A	B	C	D	E	F	G	H	I	*	J	K	L	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
40091	30	6,2	10,2	6	4,7	1,5	56	70	29	3,7	M4	5,2	25,5	19,4	1,78	30.681	1.834	3.000
40061	40	10,1	14,2	13	8	3	66	100	38	5,6	M6	7,5	34,5	26,3	3,49	130.426	6.122	3.000
40051	60	10,1	14,2	16	8	3	96	144	50	7,5	M8	11	48	34	7,61	573.694	18.922	3.000
40056	60S	10,1	15,5	13,5	18	7,5	108	170	50	7,5	M8	15	52	38	8,51	732.261	21.675	3.000

Code-No. Length in mm

40061	2000
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Ordering sample: Carriage profile EL 60, 2.000 mm long.

# System profiles

## Carriage profile

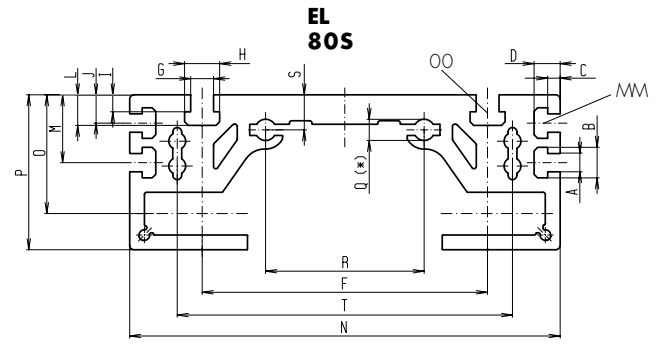
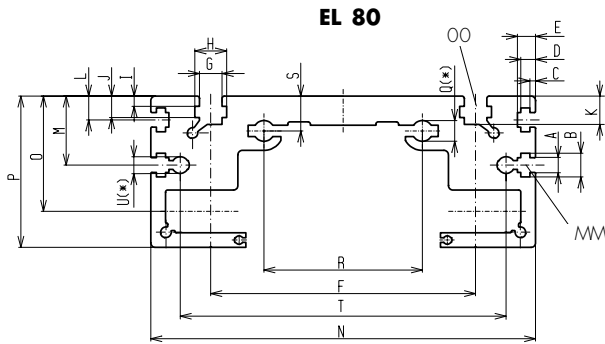
Dimensions (mm)

### Carriage profile EL 80, 80S

Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

00 + MM = refer to chapter 2.2 page 2-3



Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
40071	80	6,5	10,5	2,5	6,5	8	117	10,1	14	4,5	9,5	12,5	10,5	30,5	170	51	67	9,4	70	15,5	144	7,5	12,47	1.827.170	44.600	3.000
40069	80S	8,1	13,5	5,5	11,5	-	126	10,1	15,5	7,5	12,5	-	13,5	30	190	52,5	68,5	9,4	70	15,5	148	-	13,95	2.193.885	51.128	3.000

Code-No. Length in mm

40071	2000
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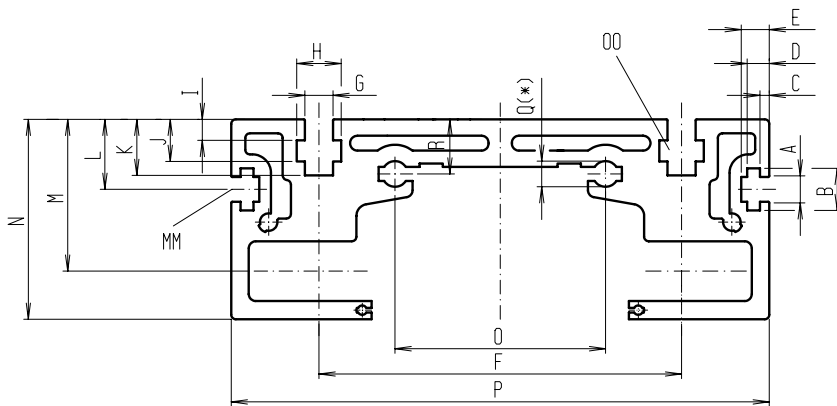
Ordering sample: Carriage profile EL 80, 2.000 mm long.

### Carriage profile EL 100, 125

Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

00 + MM = refer to chapter 2.2 page 2-3



Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	*	R	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
40081	100	10,3	17,2	4	9,5	12	155	12,2	19,2	9	18	24	30	65	85,5	90	230	11,3	M12	23,4	19,73	4.578.433	88.689	2.000
40101	125	12,2	19	9	17	17	200	14,4	23	10	18,5	26,5	30,4	79	102	110	295	11,3	M12	28	28,05	1,061 x 10 <sup>8</sup>	149.289	2.000

Code-No. Length in mm

40081	2000
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Ordering sample: Carriage profile EL 100, 2.000 mm long.



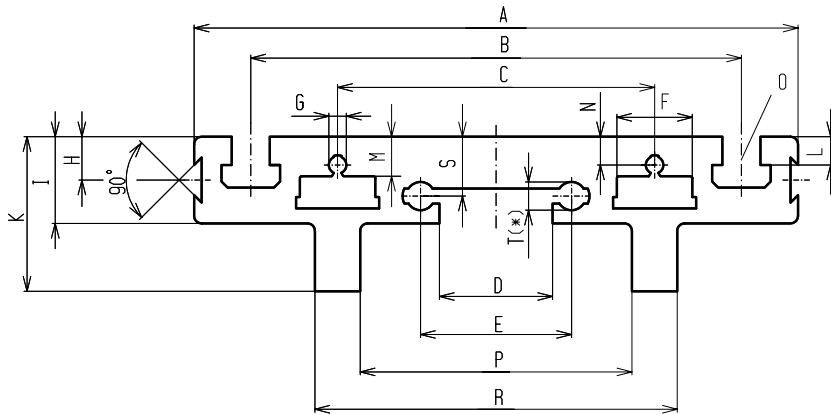
# System profiles

## Carriage profile

Dimensions (mm)

### Carriage profile DL 120, 160, 200

Material Al Mg Si 0,5 F25 E6 EV1  
 (\*) = tapped threads  
 O = refer to chapter 2.2 page 2-3



Code-No.	Type	A	B	C	D	E	F	G	H	I	K	L	M	N	O für	P	R	S	T	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
41111	120	120	96	64	22,5	30	14,8	5,5	8,5	17	29	5,5	6,1	9,4	M6	55	73	11	5,6	4,15	82.278	4.342	3.000
41104	160	160	130	84	30	40	20	4,7	11,5	23	41	7,5	7,5	10,5	M8	72	96	15,8	7,5	7,99	304.666	11.212	3.000
41251	200	200	160	101	36	46	25	7,5	8,5	26	47,5	8,5	8,5	11,5	M10	87,5	114,5	16	9,4	10,99	544.944	17.317	3.000

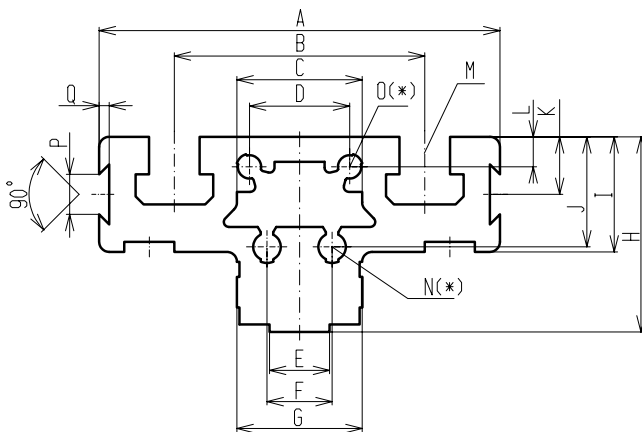
Code-No. Length in mm

41104	2000
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Sample ordering code: Carriage profile DL 160, 2.000 mm long.

### Carriage profile QL / QS 60, 80, 100

Material Al Mg Si 0,5 F25 E6 EV1  
 (\*) = tapped threads  
 M = refer to chapter 2.2 page 2-3



Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M for	N	O	P	Q	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
41211	60	60	36	16,5	10	8	10	19	28	17	16	8,56	6	M6	4,7	4,7	8	2	2,05	45.621	2.867	3.000
41201	80	80	50	25	20	12	13	25	39	23	22	11,5	6	M8	5,5	4,7	8	2	3,85	159.866	7.170	3.000
41261	100	100	66	39	26	14	26	39	41	26	22	13	10	M10	7,5	7,5	8	2	5,49	265.957	11.806	3.000

Code-No. Length in mm

41201	2000
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Sample ordering for: Carriage profile QL 80, 2000 long

4.2

# System profiles

## Carriage profile

Dimensions (mm)

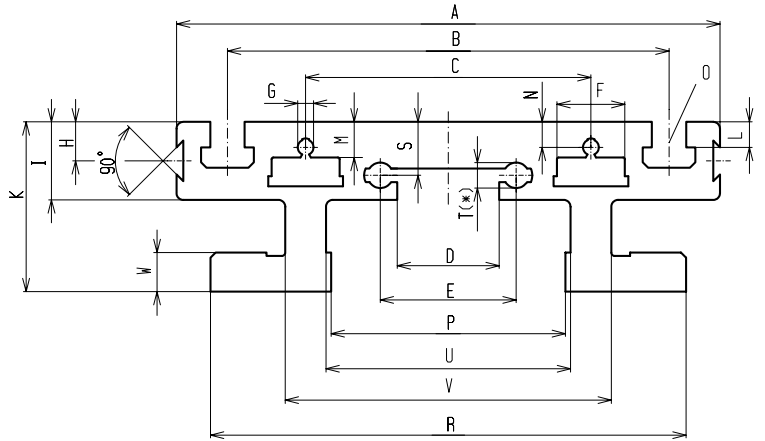
### Carriage profile DS 160, 200

Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

○ = refer to chapter 2.2 page 2-3

Type	Ix [mm <sup>4</sup> ]	Iy [mm <sup>4</sup> ]	Wx [mm <sup>3</sup> ]	Wy [mm <sup>3</sup> ]
160	890.177	8.981.338	29.686	112.267
200	2.328.783	22.253.783	64.324	222.538



Code-No. Length in mm

41107	2000
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Sample ordering code: Carriage profile DL 160, 2.000 mm long.

Code-No.	Type	A	B	C	D	E	F	G	H	I	K	L	M	N	O für	P	R	S	T	U	V	W	m [kg/m]	L <sub>max.</sub>
41107	160	160	130	84	30	40	20	4,7	11,5	23	41	7,5	7,5	10,5	M8	69	140	15,8	7,5	72	96	11,5	10,0	3.000
41256	200	200	160	101	36	46	25	7,5	8,5	26	47,5	8,5	8,5	11,5	M10	-	185	16	9,4	88,5	114,5	15,2	15,1	3.000

### Carriage profile QST/K 60, 80, 100

Material Al Mg Si 0,5 F25 E6 EV1

(\* ) = tapped threads

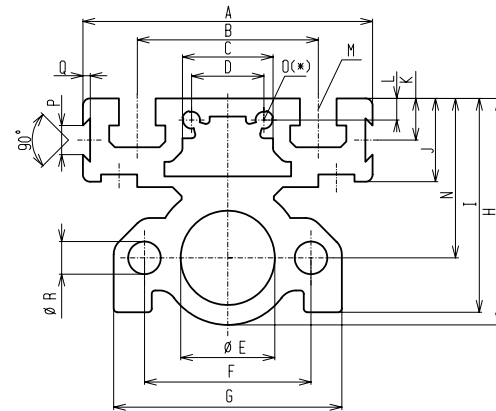
M = refer to chapter 2.2 page 2-3

Code-No. Length in mm

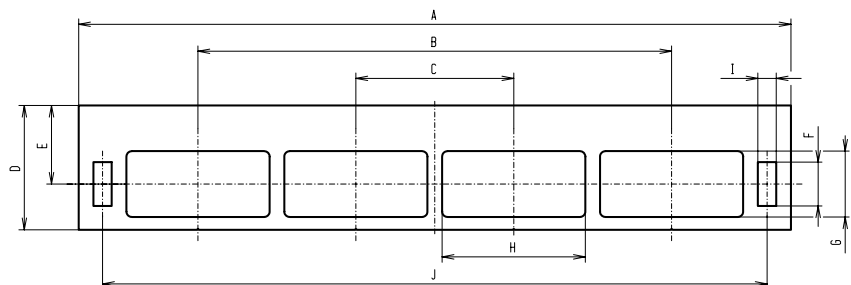
41207	2000
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Sample ordering for: Carriage profile QS 80, 2000 long

Code-No.	Type	A	B	C	D	∅ E	F	G	H	I	J	K	L	M for	N	O	P	Q	∅ R	m [kg/m]	Ix [mm <sup>4</sup> ]	Iy [mm <sup>4</sup> ]	Wx [mm <sup>3</sup> ]	Wy [mm <sup>3</sup> ]	L <sub>max.</sub>
41216	60	60	36	16,5	10	20	36	47	49	45,7	17	8,5	6	M6	34	4,7	8	2	6,5	3,34	275.807	302.516	10.587	10.084	3.000
41207	80	80	50	35	20	26	46	63	62,5	59	23	11,5	6	M8	44	4,7	8	2	9	5,47	1.400.650	1.664.943	28.442	41.624	3.000
41267	100	100	66	43	26	37	60	76	81	76,5	26	13	10	M10	54	7,5	8	2	10,5	8,53	2.159.263	2.506.325	49.951	50.126	3.000



### Rollerpack profile DL / QL / UL



Code-No.	Type	A	B	C	D	E	F	G	H	I	J	m [kg/m]	Ix [mm <sup>4</sup> ]	Iy [mm <sup>4</sup> ]	Wx [mm <sup>3</sup> ]	Wy [mm <sup>3</sup> ]	L <sub>max.</sub>
40340	DL120/QL60/UL40	146	93	31	26	17	9	13	28	4,5	133,5	6,1	151.694	4.528.611	670.695	62.035	3.000
40330	DL160/QL80/UL60	194	129	43	34	21,5	12	18	39	5	181	10,2	670.695	13.234.520	22.513	136.439	3.000
41253	DL200/QL100/UL80	260	177	59	45,5	28,5	12	22	53	5	245	18,23	1.505.075	42.178.112	58.128	324.447	3.000

Code-No. Length in mm

40340	2000
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Sample ordering for: Rollerpack profile DL 120, 2000 long



4.2



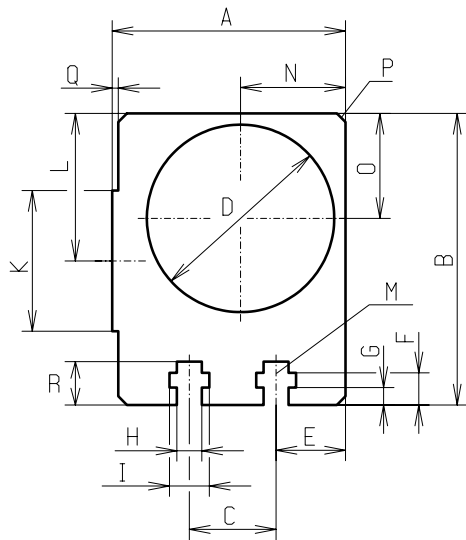
# System profiles

## Deflection- and bearing-block profile

Dimensions (mm)

### Deflection profile ELZ 40, 60(S), 80(S), 100, 125

Material Al Mg Si 0,5 F25  
M = refer to chapter 2.2 page 2-3



Code-No. Length in mm

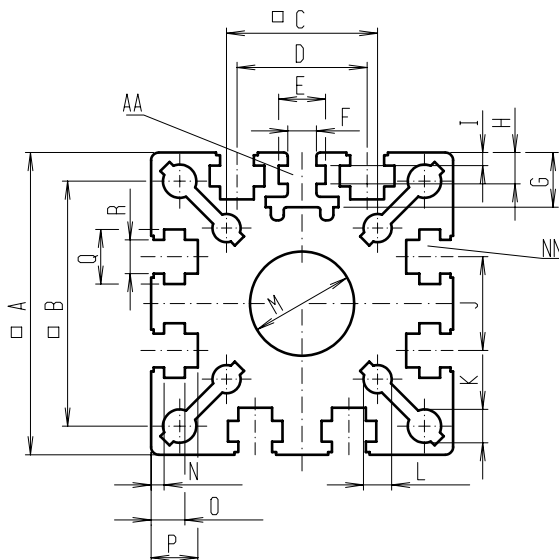
<b>40066</b>	2000
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Sample ordering for: Deflection profile ELZ 40, 2000 long

Code-No.	Type	A	B	C	D	E	F	G	H	I	K	L	N	O	P	Q	R	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>2</sup> ]	L <sub>max.</sub>
<b>40066</b>	<b>40</b>	50,5	58,5	24	35	12,5	11	5	8	13	30	29	20,5	20,5	2	1	-	4,468	521.906	16.157	6000
<b>41061</b>	<b>60(S)</b>	60,5	82,5	30	46	15	13,5	7,5	10,1	18	40	41	26	27	3	1	-	7,937	1.759.465	34.207	6000
<b>40076</b>	<b>80(S)</b>	94,5	112,5	45	66	24,5	14,5	7,8	10,1	16	51	61	40	41	3,5	2	-	16,933	5.538.470	110.830	6000
<b>40086</b>	<b>100</b>	115,5	137,5	64	88	25	16,5	9,3	12	19	61	72	52	52	4	3	-	23,045	11.872.090	197.137	6000
<b>41021</b>	<b>125</b>	136,5	170	50	108	40	18,5	10	14,4	23	81	87	62,5	62,5	7	3,5	25	32,978	24.733.260	346.510	3000

### Bearing-block profile EL 30, 40, 60(S), 80(S), 100

Material Al Mg Si 0,5 F25  
AA + NN = refer to chapter 2.2 page 2-3



Code-No. Length in mm

<b>40095</b>	2000
--------------	------

Sample ordering for: Bearing-block profile EL 30, 2000 long

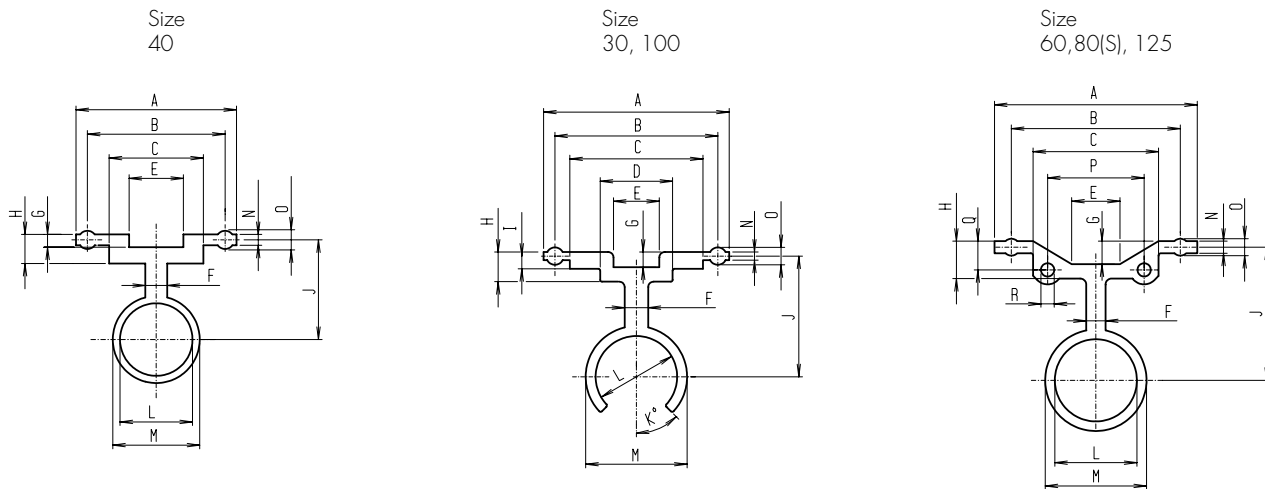
Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>2</sup> ]	L <sub>max.</sub>
<b>40095</b>	<b>30</b>	42	35,0	23	-	10,2	6,2	6,5	5,2	2	13	4,2	4,2	16	2	5,2	6	10,2	6,2	2,87	164.341	7.557	3.000
<b>40065</b>	<b>40</b>	59	47,0	29	25	9	5,5	11	6,5	3	18	6,4	5,3	19,8	3	7	9,5	10,5	6,5	5,5	547.637	18.200	3.000
<b>40055</b>	<b>60(S)</b>	84	68,6	48	30	9	5,5	13,3	7,5	4	30	8,4	6,4	29,7	3	9	12	14	8,5	12,71	2.717.601	63.433	3.000
<b>40075</b>	<b>80(S)</b>	103	-	-	40	9	5,5	12,7	7	3,5	40	8,4	-	29,7	4	10	11,5	18	10,5	22,87	7.465.445	143.347	3.000
<b>40085</b>	<b>100</b>	131	112	-	50	13,1	8,1	17	7,7	3,7	50	10,5	-	45	8	16	18	19,5	12	34,49	18.320.000	275.673	3.000
<b>40105</b>	<b>125</b>	167	-	-	60	16,5	10,2	23	23	8,5	60	-	-	60	11	22	24	25	14	66,91	52.193.580	645.704	3.000

# System profiles

## Lead-nut profile

Dimensions (mm)

**Lead-nut profile EL / EG 30, 40, 60(S), 80(S), 100, 125** Material Al Mg Si 0,5 F25



Code-No. Length in mm

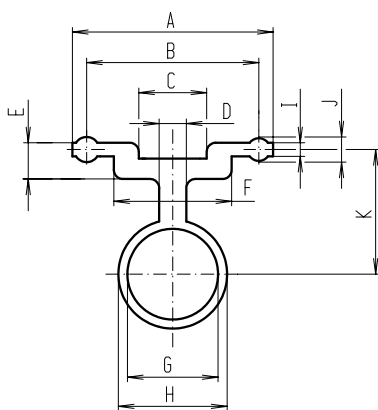
<b>40092</b>	2000
--------------	------

Sample ordering for: Lead-nut profile EL/EG 30, 2000 long

Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q [kg/m]	R [ø]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>40092</b>	<b>30</b>	33,0	29	-	19	9	5	2,1	5,6	-	20,8	30°	11,5	14	1,6	2,5	-	-	-	10.991	56.718	3.000
<b>40062</b>	<b>40</b>	44,0	38	26	-	15	6	3,6	8	-	27,5	-	20	24	3	4,5	-	-	-	63.269	2.310	3.000
<b>40052</b>	<b>60(S)</b>	58,6	50	40	-	15	8	4,5	9	-	38,0	-	28	34	4	6,5	30	6,5	5,5	246.017	6.603	3.000
<b>40072</b>	<b>80(S)</b>	83,7	70	52	-	20	8	9,5	15,5	-	55,1	-	34	42	5	7	40	11,9	5,5	764.172	15.494	3.000
<b>40082</b>	<b>100</b>	102,5	90	73,5	40	25	13	8,4	16,25	9,25	66,5	45°	45	56	4,5	9,6	-	-	-	1.311.636	22.138	3.000
<b>40102</b>	<b>125</b>	122,0	110	96	72	38	14	8,0	18	10	80	-	49,6	65	5	9	-	-	-	2.056.434	33.626	3.000

**Lead-nut profile DL 120, 160, 200 / DS 160**

Material Al Mg Si 0,5 F25



Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
<b>41113</b>	<b>120</b>	36	30	15	9	7,3	22	28	34	3	4,5	29	1,38	20.319	183	3.000
<b>41105</b>	<b>160</b>	48	40	19	12	9,3	29	29	39	4	6,5	37,3	2,49	320.882	9.723	3.000
<b>41254</b>	<b>200</b>	54	46	23,3	14	12,3	34	45	56	4,5	7	47	3,91	368.185	13.149	3.000

Code-No. Length in mm

<b>41113</b>	2000
--------------	------

Sample ordering for: Lead-nut profile DL 120, 2000 long



**4.2**

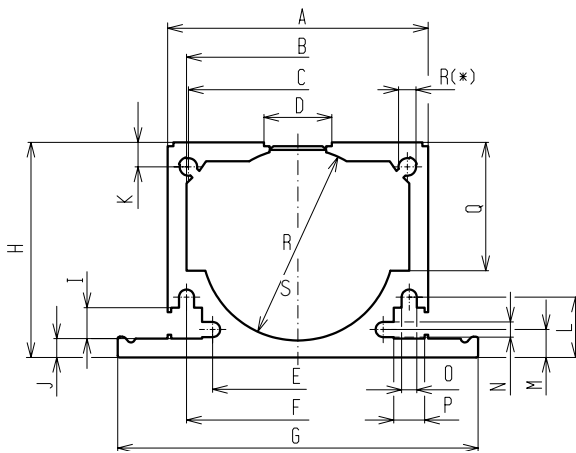
# System profiles

## Internal- and Mounting profiles

Dimensions (mm)

### Internal profile DL 120, 160, 200 / DS 160

Material Al Mg Si 0,5 F25 E6 EV1



(\* ) = tapped threads

Code-No.	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	m [kg/m]	I [mm <sup>4</sup> ]	W [mm <sup>3</sup> ]	L <sub>max.</sub>
41112	120	52	48	44	14	32,2	44	71,5	43	8,2	2,3	4	13,3	4,7	4	4	8,2	24,7	4,7	39	1,52	140.731	5.260	6.000
41103	160	69	59	58	18	45,2	59	95,5	57	8,3	5	6,5	16	7,4	4	4	8,3	34	4,7	51	3,73	580.441	16.868	6.000
41252	200	83	78	-	23	55,2	69	110,5	74	8,2	5	-	16	6,5	4	4	8,2	34	-	60	3,48	617.989	12.771	6.000

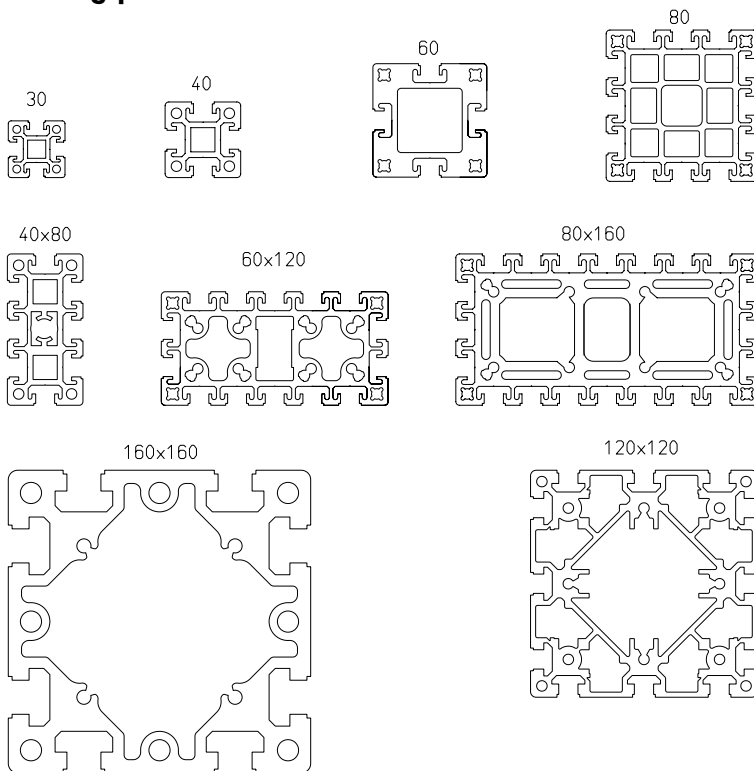
Code-No. Length in mm

41103	2000
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Sample ordering code: Internal profile DL 160, 2.000 mm long.

### Mounting profiles

Profiles for assembling complete machine frames. Frames and assemblies to customer's specification, made from profiles, can be supplied on request.



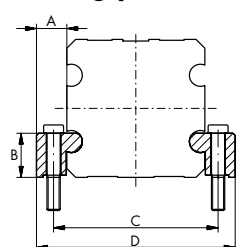
Code-No.	Type	Mass [kg/m]
05030	30	0,917
05040	40	1,780
05060	60	3,880
05048	40 x 80	3,340
05080	80	5,817
05061	60 x 120	7,500
05062	120 x 120	11,500
05081	80 x 160	12,096
05082	160 x 160	21,955

Code-No. Length in mm

05030	2000
-------	------

Sample ordering code: Mounting profile Type 30, 2.000 mm long.

### Mounting profiles

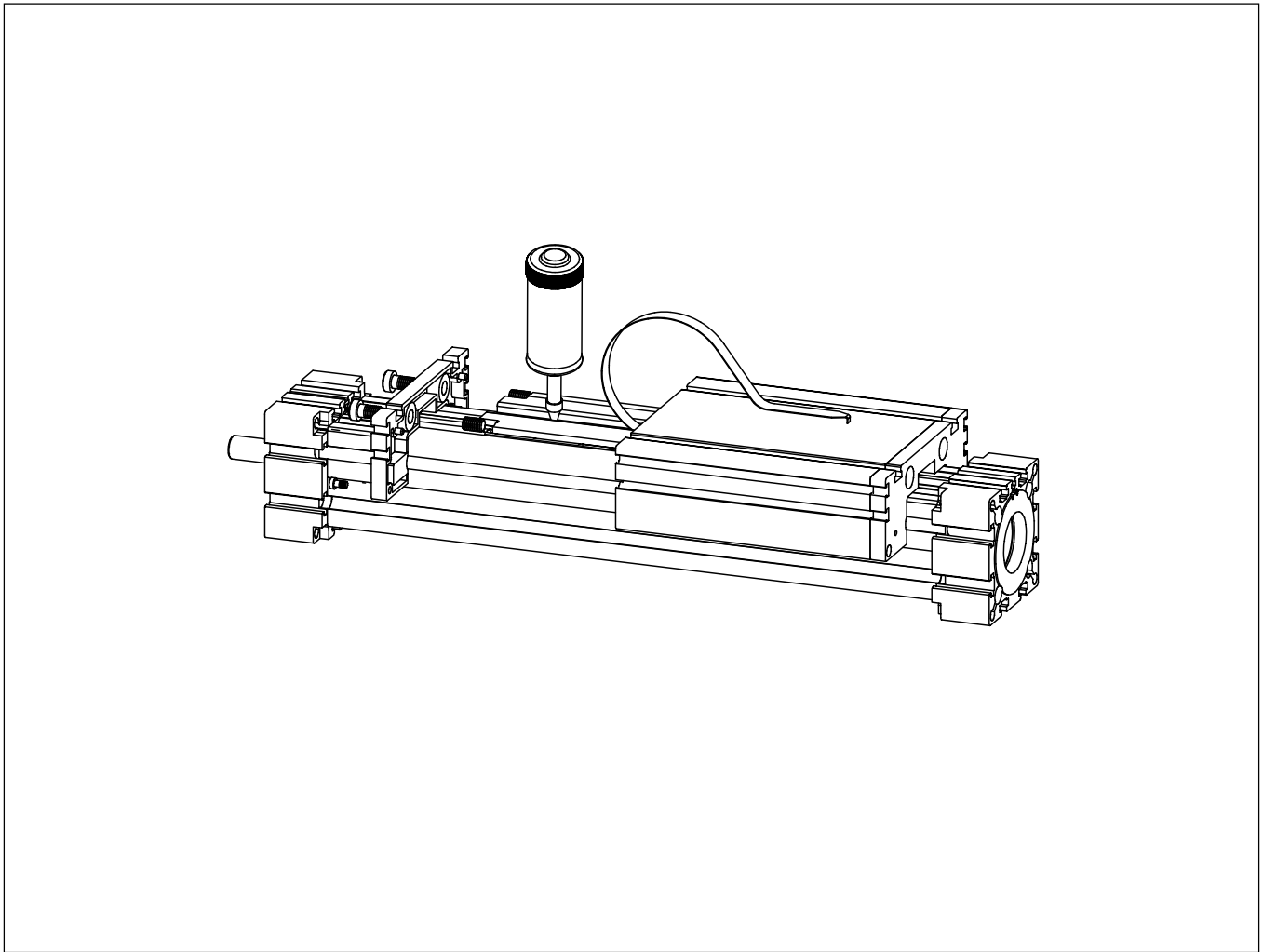


Code-Nr.	Type	A	B	C	D	m [kg/m]	L <sub>max.</sub>
40098	30	12	10	41	54	0,302	3.000
40068	40	16	13	54	72	0,53	3.000
40059	60	18	18	77	96	0,93	3.000
40079	80	20	23,5	97	120	1,37	3.000
40088	100	22	30,5	120	144	2,07	3.000
40108	125	27,5	40	149	180	3,39	3.000

Code-No. Length in mm

40059	2000
-------	------

Sample ordering code: Mounting profile Type 60, 2.000 mm long.



## Specifications Service manuals



# Specifications

## Calculation of max. acceleration

$$a = \frac{F}{m}$$

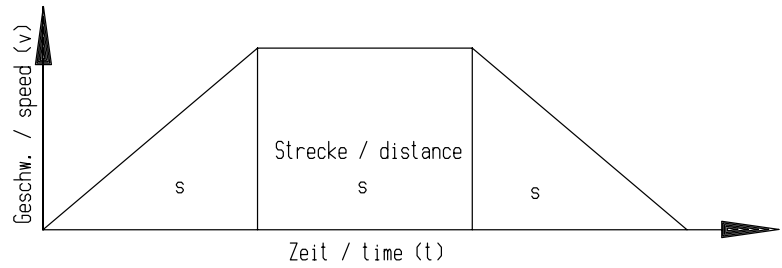
## Calculation of max. acceleration distance

$$s = \frac{v \times t}{2}$$

## Calculation of max. acceleration time

$$t = \frac{v}{a}$$

F= belt tension (N)  
 a= acceleration (m/s<sup>2</sup>)  
 m= mass (kg)  
 v= velocity (m/s)  
 s= distance (m)  
 t= time (s)



Type	t <sub>a</sub> > 0,2 s		t <sub>a</sub> < 0,2 s		Minimum length strength (N)	Belt size
	F <sub>max</sub> (N)	safty factor 1,5 (N)	F <sub>max</sub> (N)	safty factor 1,5 (N)		
ELZ 30	200	133	280	187		3 M 12
ELZZ 60	298	199	333	222	3690	5 M 09
ELZ, ELZT, ELSZ, ELZU, ELZG 40, ELSZ 30/40	390	266	480	320	6478	5 M 15
ELZ, ELZT, ELSZ, ELSZ, ELZU, ELZG 60, ELHZ, ELVZ 60 /80 DLZ 120 QLZ, QSZ 80 / QLSZ, QSSZ 80	894	596	1000	666	12013	5 M 25
ELZZ 80	679	452	746	498	3888	8 M 12
ELZZ 100	1210	801	1331	887	9700	8 M 20
ELZ, ELZT, ELSZ, ELSZ, ELZU, ELZG 80, DLZ, DSZ 160 / DLZT, DSZT, DLSZ 120 QLZ, QSZ 80	1900	1266	2090	1393	15400	8 M 30
ELHZ, ELVZ, ELZW 100	3840	2559	4128	2751	25632	8 M 48
ELZ, ELZT, ELSZ, ELSZ, ELZG 100, QLZ, QSZ 100 DLZ 200 / DLSZ, DSSZ 160	4000	2666	4300	2866	26700	8 M 50
ELZ 125	5900	3933	6350	4233	37380	8 M 70

## Weights

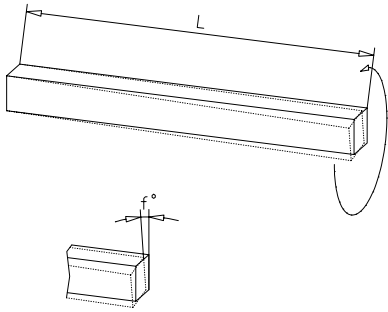
Sizes	Guide-body profile	Internal profile	guide rod	Belt	per pulley	Toothed rack	Standard carriage	Carriage profile	Coupling
30	1,07 kg/m	-	0,15 kg/m	0,037 kg/m	0,06 kg	-	0,176 kg	1,78 kg/m	0,007 kg
40	1,89 kg/m	-	0,22 kg/m	0,074 kg/m	0,14 kg	0,70 kg/m	0,520 kg	3,49 kg/m	0,010 kg
60	3,83 kg/m	-	0,61 kg/m	0,123 Kg/m	0,39 kg	0,81 kg/m	1,565 kg	7,49 kg/m	0,040 kg
80	7,40 kg/m	-	0,88 kg/m	0,256 kg/m	1,04 kg	1,13 kg/m	2,644 kg	12,79 kg/m	0,085 kg
80S	7,40 kg/m	-	0,88 kg/m	0,256 kg/m	1,04 kg	1,13 kg/m	3,520 kg	13,95 kg/m	0,085 kg
100	11,3 kg/m	-	1,58 kg/m	0,355 Kg/m	0,48 kg	2,75 kg/m	6,550 kg	19,98 kg/m	0,200 kg
125	15,54 kg/m	-	2,47 kg/m	0,480 kg/m	1,62 kg	-	12,100 kg	28,05 kg/m	0,395 kg
DL 120	5,61 kg/m	1,52 kg/m	0,22 kg/m	0,123 Kg/m	0,39 kg	-	1,100 kg	4,15 kg/m	0,040 kg
DL 160	10,34 kg/m	3,73 kg/m	0,61 kg/m	0,256 kg/m	0,86 kg	-	3,280 kg	7,99 kg/m	0,085 kg
DL 200	19,55 kg/m	3,48 kg/m	0,61 kg/m	0,355 Kg/m	0,688 kg	-	4,950 kg	10,99 kg/m	0,200 kg
DS 160	10,52 kg/m	3,48 kg/m	1,40 kg/m	0,256 kg/m	0,86 kg	-	2,250 kg	7,99 kg/m	0,085 kg
QL 60	3,29 kg/m	-	0,22 kg/m	0,123 Kg/m	0,39 kg	-	0,456 kg	2,05 kg/m	0,040 kg
QL 80	7,05 kg/m	-	0,61 kg/m	0,256 kg/m	1,04 kg	-	1,229 kg	3,85 kg/m	0,085 kg
QL 100	10,45 kg/m	-	0,61 kg/m	0,355 Kg/m	0,688 kg	-	2,920 kg	5,49 kg/m	0,200 kg
QS 60	3,79 kg/m	-	1,40 kg/m	0,123 Kg/m	0,39 kg	-	0,860 Kg	2,05 kg/m	0,040 kg
QS 80	6,82 kg/m	-	2,40 kg/m	0,256 kg/m	1,04 kg	-	2,339 kg	3,85 kg/m	0,085 kg
QS 100	10,55 kg/m	-	3,20 kg/m	0,355 Kg/m	0,688 kg	-	4,320 kg	5,49 kg/m	0,200 kg



5.2

# Specifications

## Calculation of torsional twist



$$f^\circ = L \times M_{t,max} \times I_p \quad \left[ \frac{^\circ \times Nm \times m}{Nm \times m} \right]$$

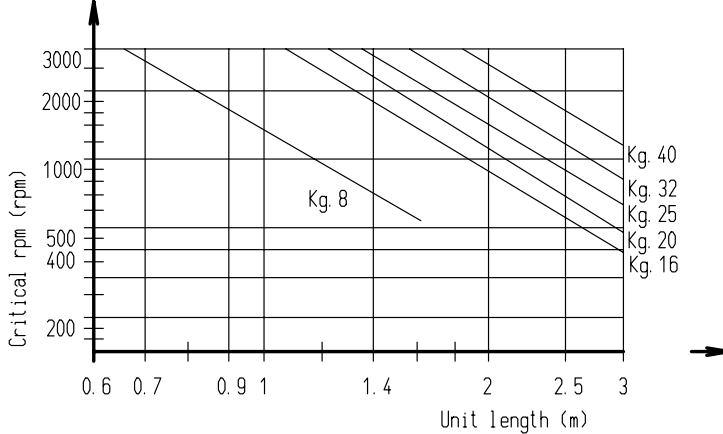
$f^\circ$  = max. twisting angle (°)  
 L = unit length  
 $M_{t,max}$  = max. torque (Nm)  
 $I_p$  = see table (°/Nm<sup>2</sup>)

Aluminium profiles  
 Stiffness F25 (250 N/mm<sup>2</sup>)  
 Thickness of anodizing coat 20 to 30 mm

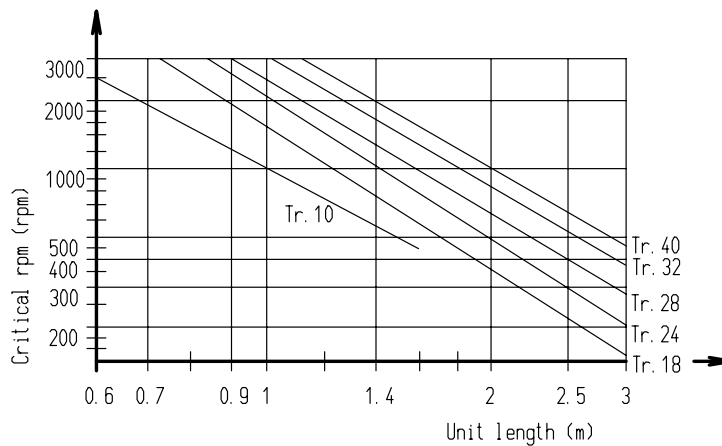
Size	$I_p$ Faktor	Size	$I_p$ Faktor	Size	$I_p$ Faktor
EL 30	0,49000 °/Nm x m	DL 120	0,03282 °/Nm x m	QL 60	0,02995 °/Nm x m
EL 40	0,18000 °/Nm x m	DL 160	0,01286 °/Nm x m	QL 80	0,01257 °/Nm x m
EG 40	0,14000 °/Nm x m	DL 200	0,00787 °/Nm x m	QL 100	0,00705 °/Nm x m
EL 60	0,05765 °/Nm x m	DS 160	0,01336 °/Nm x m	QS 60	0,03797 °/Nm x m
EG 60	0,04387 °/Nm x m			QS 80	0,01563 °/Nm x m
EL 80	0,01463 °/Nm x m			QS 100	0,00644 °/Nm x m
EG 80	0,01511 °/Nm x m				
EL 100	0,00492 °/Nm x m				
EL 125	0,00616 °/Nm x m				

## Diagram for maximum rpm of spindle units

### ballscrew units



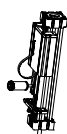
### trapezoidal units



$$n_{max} = \text{table value} \times 0,8$$



## Applications in use



5.2

# Service manual for EL units

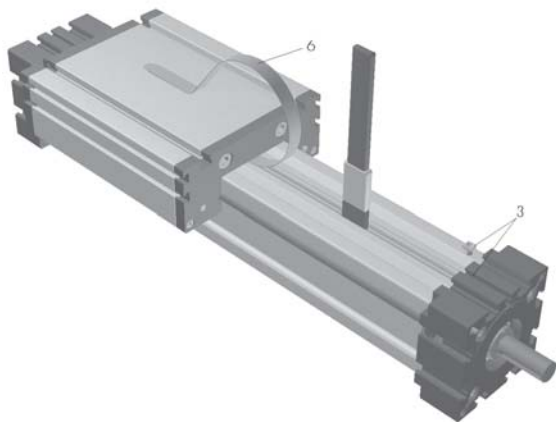


5.2

# Service manual for EL - units

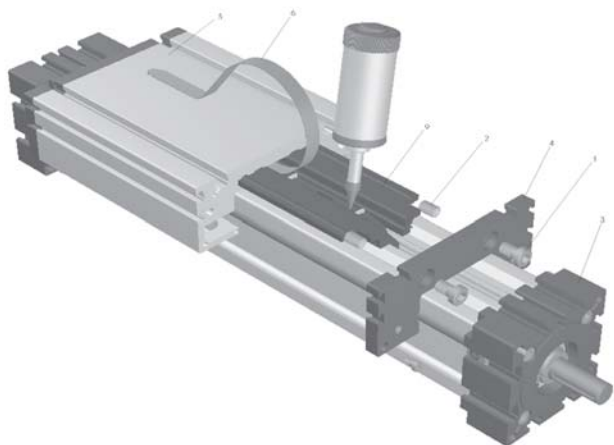
Lubrication

## Trapezoidal spindle, sizes EG / EL 30, 40



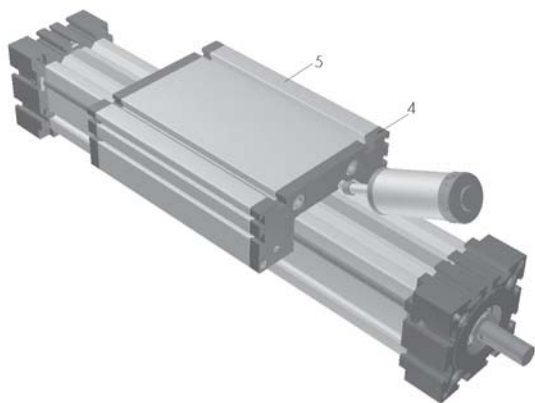
- Drive the carriage to one side
- To reach spindle, unscrew set screw (3)
- lift the coverband (6)
- Now grease spindle with a slim brush.

## Ball screw spindle, sizes EG / EL 30, 40



- Unscrew the cylindric screws (1) and push the wiper end plate (4) to the side.
- Unbend screws (2), push slide (5) to other side
- Unscrew the grub screws (3) and lift the coverband (6).
- Grease can be filled now with grease gun. For mass of greasing look at table below.

## Spindle, sizes EG 60, 80 / EL 60-125



Look at wiper end plate (4) of carriage (5) for greaser nipple.  
The ballscrew nut can be filled with grease gun.  
For mass of greasing look at table below.

Spindle greasing every 500-1000 working hours.

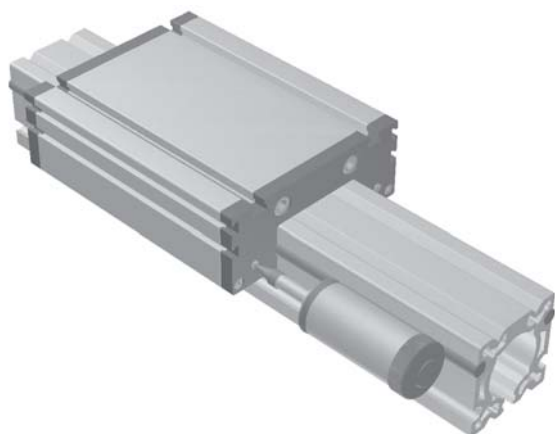
Type	Gewinde/Pitch	Nachfettung/Regreasing	Type	Gewinde/Pitch	Nachfettung/Regreasing
30	Kg 08 x 2,5	0,01 g	660	Kg 20 x 05	3,00 g
40	Kg 16 x 05	1,33 g	80	Kg 25 x 25	3,00 g
40	Kg 16 x 10	0,84 g	80/100	Kg 32 x 05	3,00 g
60	Kg 25 x 05	2,00 g	80/100	Kg 32 x 10	4,00 g
60	Kg 25 x 10	3,00 g	100	Kg 32 x 32	4,00 g
60	Kg 20 x 20	3,00 g	125	Kg 40 x 10	4,00 g



5.2

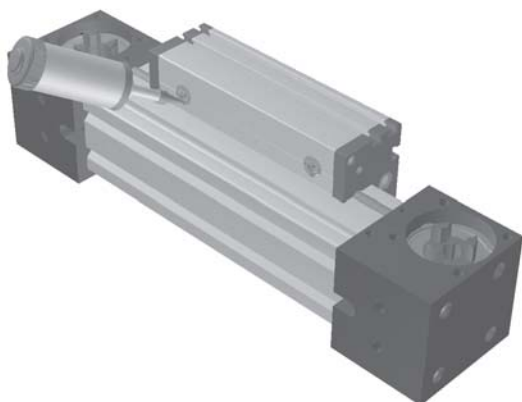
## Service manual for EL - units

### Guiding rods EL



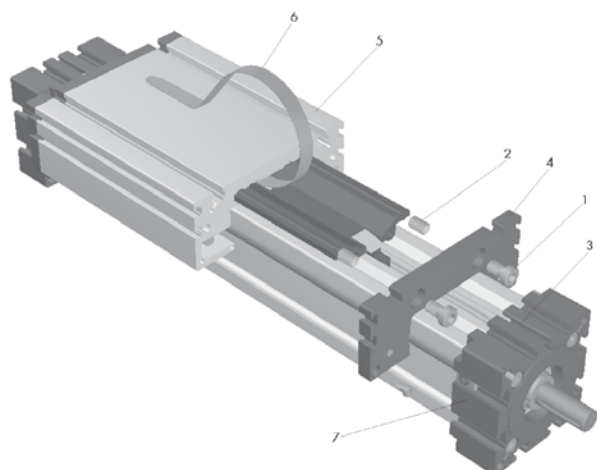
Rods will be greased by the strippers of carriage. There are 2 oil nipples in each wiper end plate (4), where the tanks for the strippers can be filled with an oil gun. Viscosity of oil: 200 mm<sup>2</sup>/s, T= 40° C. Interval of greasing depends on environmental conditions, min. once a month. Minimum stroke must be same than length of slide.

### Rollers size EL 100, 125



Rollers should be greased each 1.000 working hours or each 6 months with a grease gun. For greaser nipple look at the eccentric at carriage bottom. Use roller grease.

### Changing cover band EL 100, 125



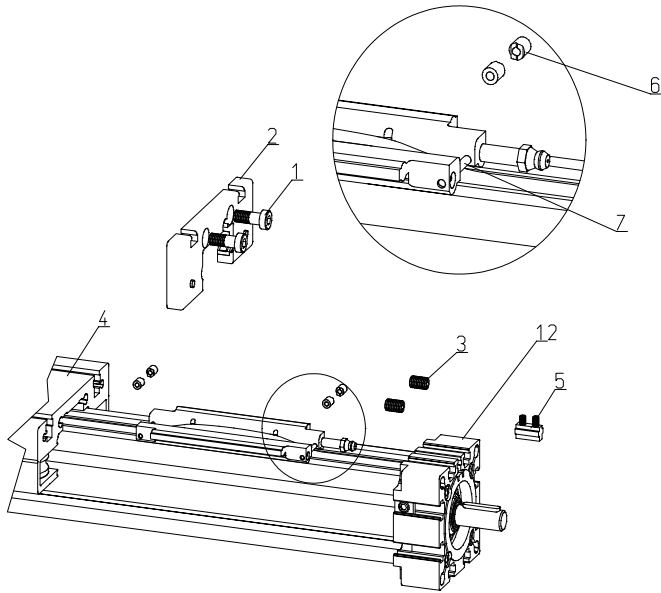
- Unscrew cylindric screws (1), push plastic wiper endplate (4) to one bearing-block (7),
- Unbend grub screws (2), push carriage (5) to other side
- Unscrew screws (3) and pull out the coverband (6), size 100/125 units have an additional cover-band leader(9), which is the guide for the cover-band.
- Mount the new coverband, fix the screws (3) at one side, tense the band with a pointed pliers and fix the screws (3),
- Fix the carriage by the grub screws (2) and mount the wiper end plate (4).



## Service manual for EL - units

### Changing cover band

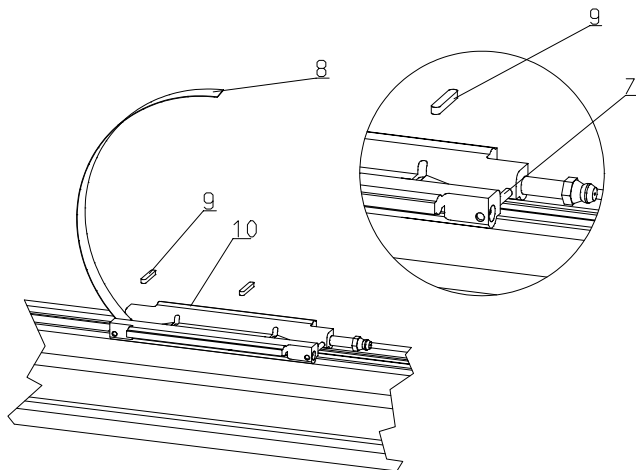
#### Changing cover-band and plastic guide roller against new slider system ELT / ELK 60, 80



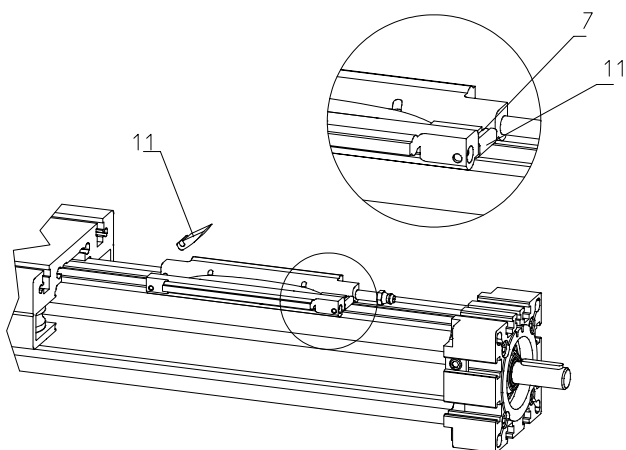
- Unscrew cylindric screws (1) and dismount cover cap (2) on one side of the carriage (4).
- Unscrew grub screws (3) on one side of the carriage (4).
- Destroy the plastic guide roller (6) with a cutting nipper.
- Be careful, don't destroy the hardened straight pin (7)

#### !!!Attention!!!! Plastic guide roller can crack!!!!

- Be sure that no fragments fall into the guiding-profile.



- Pull out cover-band (8) out of the leading-nut receiver (10).
- Dismount the plastic keys (9).
- Mount and push in the cover-band (8) again like before (under the hardened straight pins (7)).



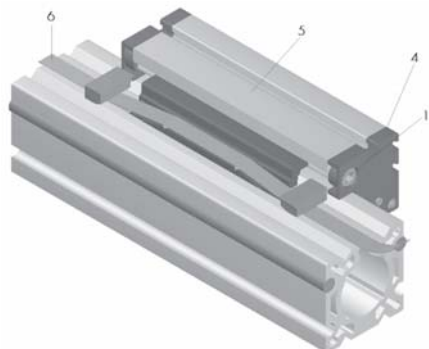
- Hook the plastic slider (11) under the straight pin (7) with the flat side to the middle of the carriage.
- Fix the cover-band (8) on one side with the grub screw clamping (5) at the bearing block (12).
- Tension the cover-band (8) from the opposite side of the unit and fix it with the grub screw clamping, too.



## Service manual for EL - units

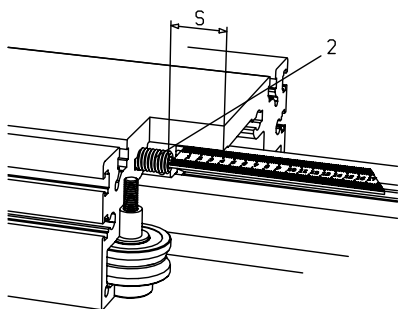
### Changing cover band

#### Changing cover band size EL / EG 30, 40



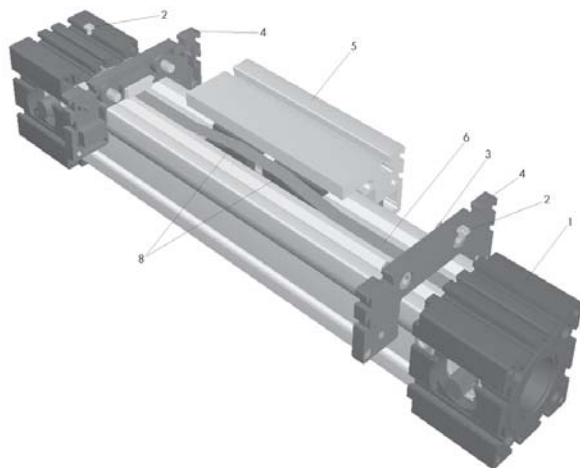
- Unscrew cylindric screws (1), push plastic wiper endplate (4) to the side,
- Unscrew screws (3) and pull out the coverband (6),
- Mount the new coverband, fix the screws (3) at one side, tense the band with a pointed pliers and fix the screws (3),
- Mount the wiper end plate (4).

#### Changing cover band ELVZ / ELHZ 100, 125



Same mounting as ELT/ELK. Important: Measure the distance "s" between the corner of carriage and the head of the grub screw for belt-tension!

#### Changing cover band ELHZ / ELVZ 60, 80



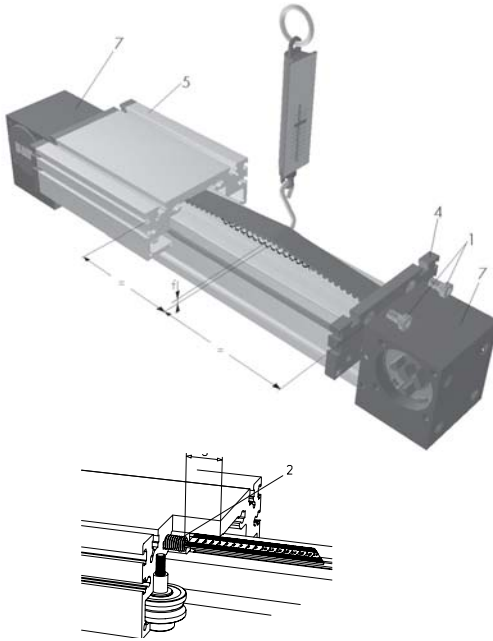
- Unscrew cylindric screws (1) on both sides of carriage (5)
- Push the wiper end plates (4) to the side,
- Unscrew the grub screws (2) and pull out the old coverband (6),
- Push the new coverband under both sliding block (8) in the carriage (5) and wiper end plates (4) into the bearing block (1)
- Fix the grub screw (3) on one side,
- Tense the coverband with a pointed pliers and fix the screws (3) on the opposite side.



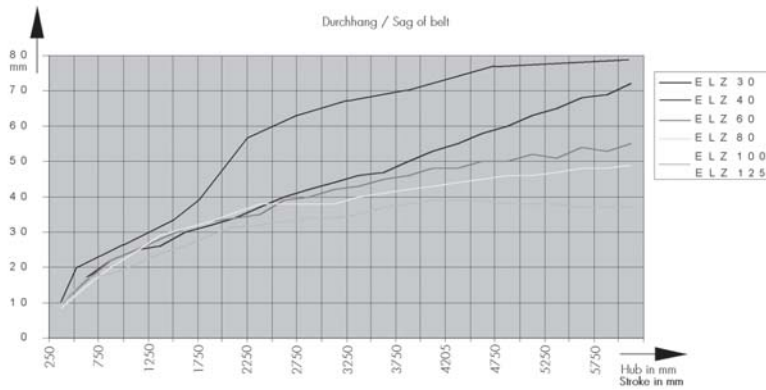
# Service manual for EL - units

**Belt**  
**Adjusting the rollers**

## Belt tension ELZ

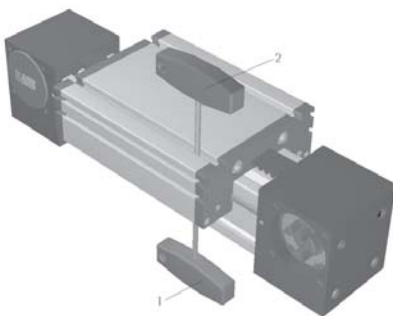


- Push the carriage (5) close to one bearing-block (7).
- Unscrew grub screws (2) of the wiper endplate (4) and push it to the other bearing-block (7).
- Pull the spring balance with force of table and measure the sag (f) of the belt. Compare the measured value with the table.
- Tense or release the belt by the grub screws (2).
- Both grub screws (2) must have the same distance between the corner of the carriage (5) and the head of the grub screw (2).
- The grub screws (2) have to be secured by bonding.
- Measure the distance (s) with a metal rule.
- Mount the wiper endplate (4).



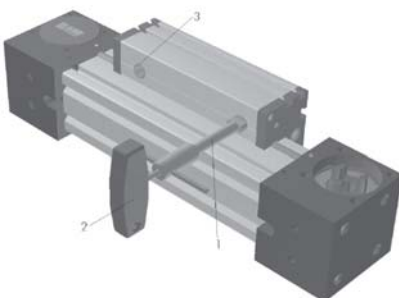
Baugröße / Size	Kraft / Force
<b>30</b>	20 N
<b>40</b>	20 N
<b>60</b>	30 N
<b>80</b>	50 N
<b>100</b>	50 N
<b>125</b>	50 N

## Adjusting the rollers, sizes EL 40, 60



- Fasten eccentric bolt with screw key (1)
- Unscrew screw with hexagon socket screw key (2) as far as eccentric bolt can be turned, upper surface is stamped, broken line of stamp (3) must coincide with drawing groove of slide
- Adjust at other side without initial tension
- Stamps must be in same position and eccentric bolt must be adjusted into right direction.

## Adjusting the rollers, sizes EL 30, 80, 100, 125



5.2

# Service manual for D and Q units

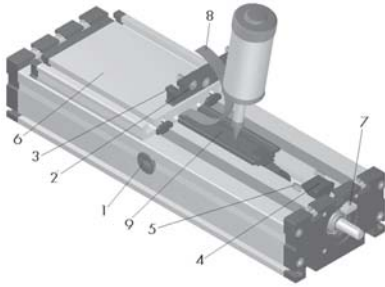


5.2

# Service manual for D - Q units

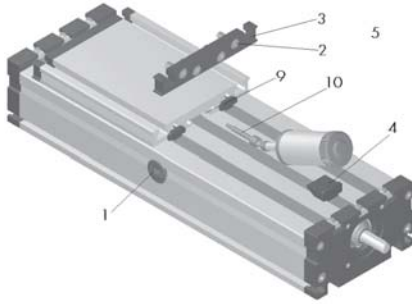
Lubrication

## Leading-nut, size DLT/DLK 120, 200



- Drive the carriage to the service position (1).
- Remove the fillister head screws (2) and dismount cover cap (3).
- Remove the middle slider (4).
- Insert the regreasing adapter (10) into the lubrication hole of the leading-nut receptacle (9).
- Regrease now with grease gun. For the quantity of grease see table below.

## Leading-nut, size DLT/DLK / DST/DSK 160



- Drive the carriage to the service position (1).
- Remove the fillister head screws (2) and dismount cover cap (3).
- Remove the middle slider (4) and unscrew set screws (5).
- Push carriage (6) to the side.
- Release the set screw (7) and remove it using the sliding nut.
- Pull out and lift the cover band (8), now the lubrication hole is visible in the leading-nut receptacle (9).
- Regrease with grease gun. For the quantity of grease see table below.

Spindle greasing every 500 - 1000 working hours.

Type	Gewinde/Pitch	Nachfettung/Regreasing	Type	Gewinde/Pitch	Nachfettung/Regreasing
<b>120</b>	Kg 16 x 05	1,33 g	<b>120/160</b>	Kg 25 x 25	3,00 g
<b>120</b>	Kg 16 x 10	0,84 g	<b>200</b>	Kg 32 x 05	3,00 g
<b>120</b>	Kg 16 x 16	1,00 g	<b>200</b>	Kg 32 x 10	4,00 g
<b>120/160</b>	Kg 20 x 20	3,00 g	<b>200</b>	Kg 32 x 20	4,00 g
<b>120/160</b>	Kg 25 x 05	2,00 g	<b>200</b>	Kg 32 x 32	4,00 g
<b>120/160</b>	Kg 25 x 10	3,00 g			

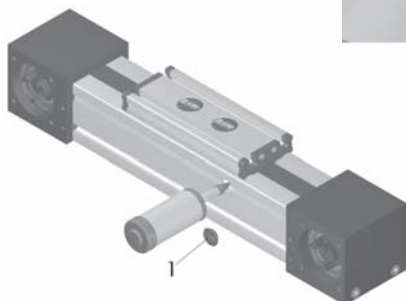
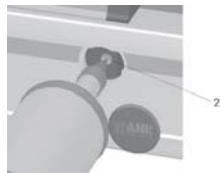
## Guiding rods DL 120, 160, 200 Runner blocks DS 160



Greasing is carried out through an oiled felt insert. The felt can be regreased through lubrication nipples attached laterally to the ends of the roller packs.

- Dismount cover cap (1)
- Drive the carriage through the service position until you can see the first lubricating nipple (2) in the lubrication hole.
- Regrease felt now with an oil gun.
- Move the carriage to the second lubricating nipple and regrease here as well.

## Guiding rods QL 60, 80, 100 Runner blocks QS 60, 80, 100



Oils with a viscosity of approx. 200 mm<sup>2</sup>/s at T=40°C are recommended. The required regreasing intervals depend on environmental conditions, the standard recommendation is once per month. To ensure a sufficient lubrication, the minimum stroke must equal the carriage length, so that sufficient greasing is achieved also in the final positions.

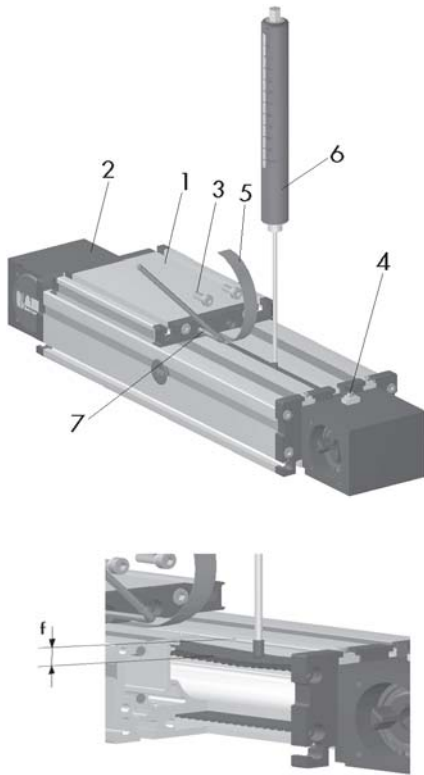


5.2

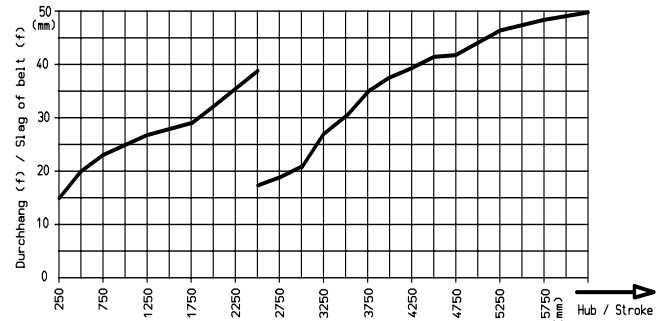
# Service manual for D - Q units

Belt and coverband

## Belt tension adjustment DLZ 120, 160, 200 / DSZ 160

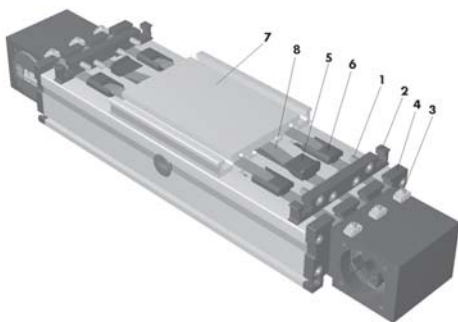


- Push the carriage (1) close to one bearing block (2).
- Remove fillister head screws (3).
- Unscrew set screws (4) for middle cover band (5) at the opposite bearing block.
- Pull cover band out of bearing block and turn it to the side.
- Use spring balance (6) to exert the applicable amount of force (see table) on the center of the belt and measure the sag (f).
- Compare the measured value with the diagram below, and tense or release belt as required by tightening or unscrewing the set screws (7).
- The set screws (7) must be bonded in place with screw locking device.
- Both screws (7) must be screwed in to exactly the same level. Check with sliding caliper.



Baugröße / Size	Hub / Stroke (mm)	Kraft / Force (N)
<b>120</b>	< 2500	20
	2500 - 6000	10
<b>160</b>	< 2500	20
	2500 - 6000	10
<b>200</b>	< 2500	40
	2500 - 6000	20

## Changing cover band DLZ 120, 160, 200 / DSZ 160



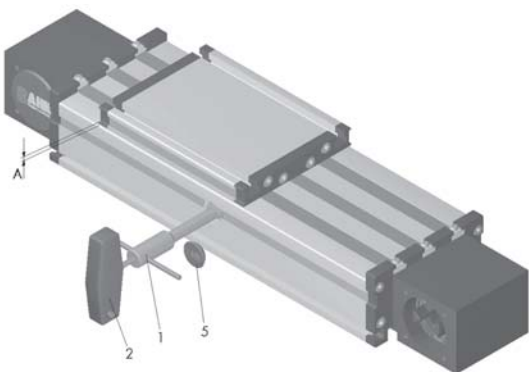
- Drive the carriage to servicing position
- Remove fillister head screws (1) and wiper end plate (2)
- Size 160: Unscrew set screws (3) at both bearing-block plates (4) and pull the cover band out of the bearing block
- Size 120: Unscrew set screws and remove them with T-nut
- Remove sliders (5) and (6) from both sides of the carriage (7)
- Pull the cover bands (8) out of the carriage
- Insert the new cover bands into the carriage (7)
- Thread the lateral sliders (6) onto the cover band and insert it into the carriage with middle slider (5)
- Size 160: Tighten cover bands on one side of the bearing block with set screws (3), tense cover band (8) at the other bearing block using pliers and tighten with set screws (3)
- Size 120: Insert T-nut together with set screw into the bearing block and tighten cover band with set screw.



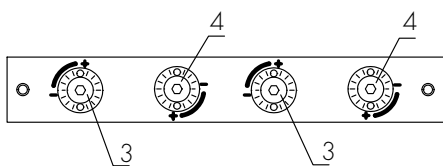
## Service manual for D - Q units

Eccentric bolt

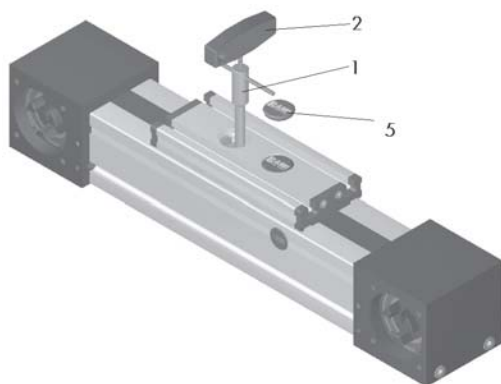
### Adjusting the rollers size DL 120, 160, 200



- Dismount cover cap (5) from servicing hole
- Fasten eccentric bolt with screw key (1)
- Release screws with hexagon socket screw key (2) until the eccentric bolt can be turned.
- Adjust the gap dimension (A) between carriage and guide body profile by turning the eccentric bolts (3). Turning towards + will increase the gap dimension.  
(DL120 approx. 1.8 mm, DL160 approx. 2.8 mm, DL120 approx. 3.0 mm).
- Turn the eccentric bolts (4) to adjust the carriage free of play by the touch (without initial tension)
- Ensure that the eccentric bolts are adjusted to the right.



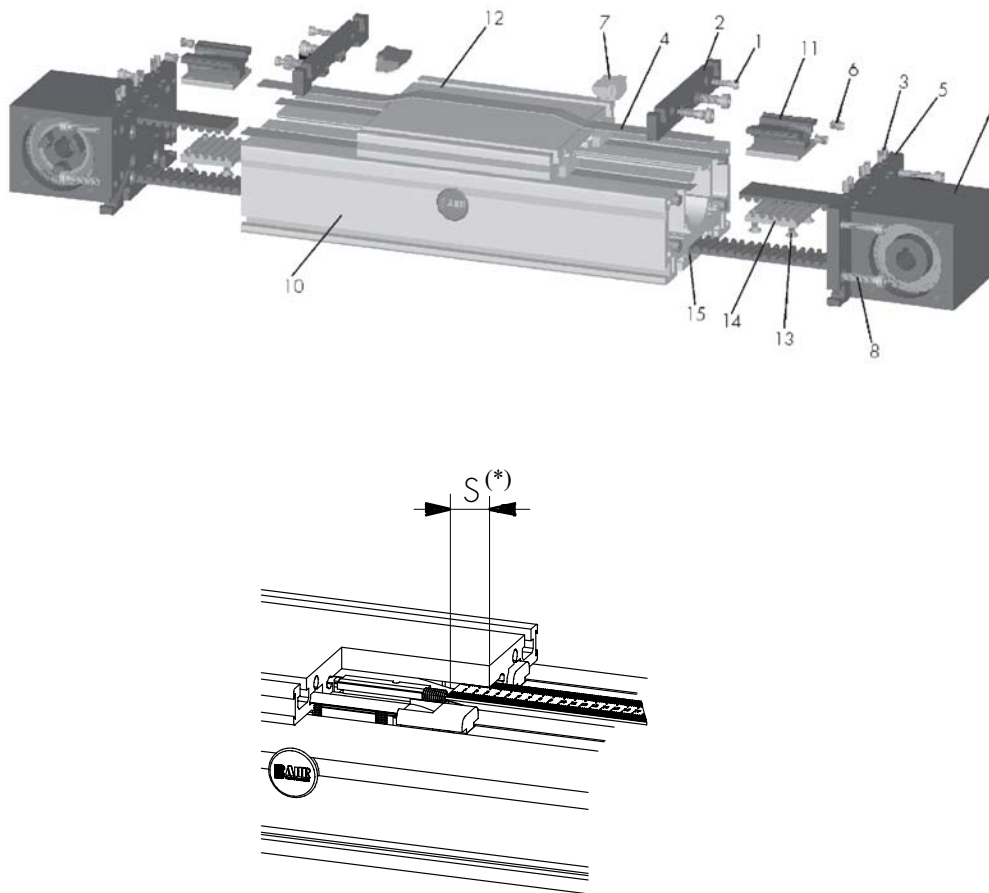
### Adjusting the rollers size QL 60, 80, 100



- Dismount cover cap (5) from servicing hole
- Fasten eccentric bolt with screw key (1)
- Release screws with hexagon socket screw key (2) until the eccentric bolt can be turned.
- Turn the eccentric bolts to adjust the carriage free of play (without initial tension)
- Ensure that the eccentric bolts are adjusted to the right.



5.2



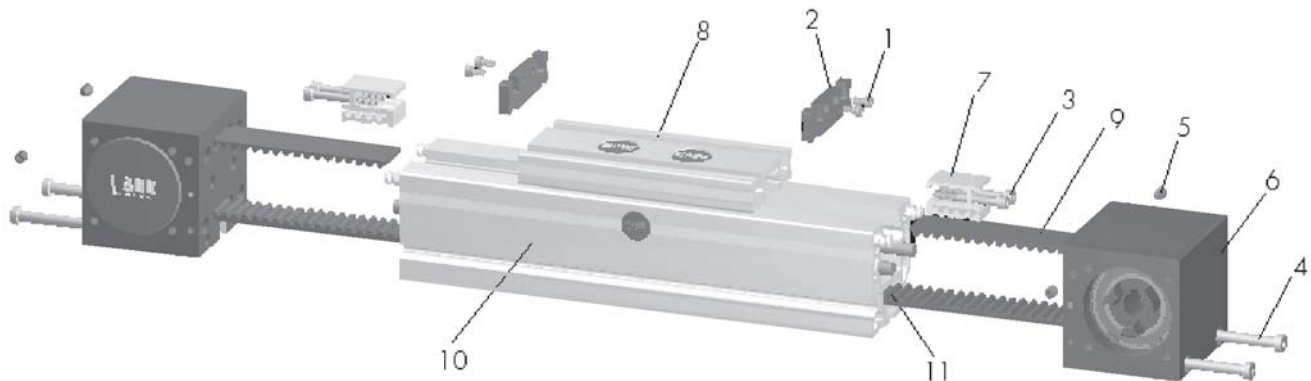
## Changing belt of DL / DS 120, 160, 200

- Unscrew cylindric screws (1) and dismount cover caps (2) on both sides of the carriage.
- Unscrew grub screws (3) on both sides of the unit and pull out the only the middle cover band (4) of the bearing-block plate (5).
- Measure the reach of grub screws „S“ (look at drawing) and make note of this value.
- Unscrew grub crews (6) on both sides of the carriage.
- Pull only the middle sliding blocks (7) out of the carriage.
- Unscrew cylindric screws (8) at the bearing-block plates (5) and dismount them completely with the bearing-blocks (9) at both ends of the unit.
- Pull out the belt-adjusters (11) completely with the belt out of the carriage (12) and the guiding-profile (10).
- Unscrew the countersunk head screws (13) and dismount the belt-adjuster (11, 14).

## Reconstruction of the unit in opposed order

- Shorten the new belt to the length of the old one.
- Push the belt with teeth side up to the carriage (10) into the slot of the guiding-profile (15) and push it with the ends through each bearing-block (8, 9).
- Mount the belt-adjusters (11, 14) by the countersunk head screws (13) and lock them again with glue.
- Push them again together with the belt into the guiding-profile (10) and then into the carriage (12).
- Mount the bearing-block plates (8) again together with the bearing-blocks (9) at the ends of the unit.
- Mount both belt-adjusters (11, 14) with consideration of the reach of the grub-screws „S“ and lock the grub screws (6) with glue.
- Pull the middle cover-band (4) through the carriage.
- Pull in the middle sliding blocks (7) into slot of the carriage.
- Mount the grub screws (3) on one side of the unit and tension the 3 cover-bands from the other side and fix them too by the grub-screws (3).





### Changing belt of QL/QS 60,80,100

- Unscrew cylindric screws (1) and dismount cover caps (2) on both sides of the carriage.
- Unscrew cylindric screws (3) on both sides of the carriage (8).
- Unscrew cylindric screws (4) and the grub screws (5) at the bearing-block (6) and dismount them completely at both ends of the unit.
- Pull out the belt-adjusters (7) completely with the belt out of the carriage (12) and the guiding-profile (10).
- Press the belt sideways out of both belt-adjusters (7).
- Pull the belt completely out of the bearing-blocks (6).

### Reconstruction of the unit in opposed order

- Shorten the new belt to the length of the old one.
- Push the belt with teeth side up to the carriage (8) into the slot of the guiding-profile (11) and push it with the ends through each bearing-block (6).
- Press the belt again into the belt-adjusters (7).
- Push them again together with the belt into the guiding-profile (10) and then into the carriage (8).
- Mount the bearing-blocks (6) again.
- Mount both belt-adjusters (7) and lock the cylindric screws (6) with glue.  
You have to tension the belt with dosed force and test the soft running of the pulleys by turning them.
- Mount the cover caps (2) again.



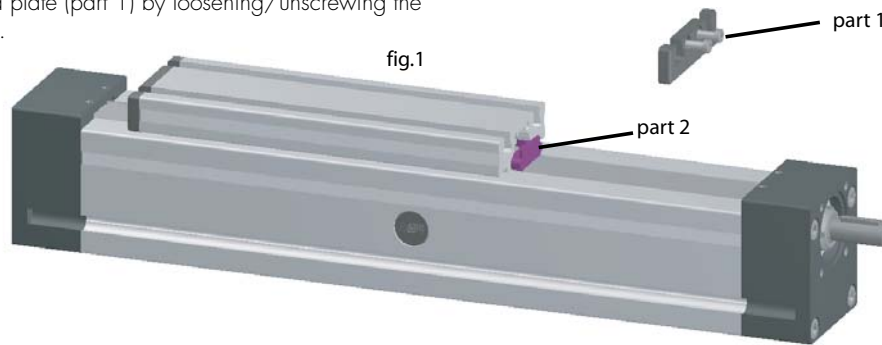
## Service manual for D - Q units

### Retrofitting of QST/K 60 and 80.

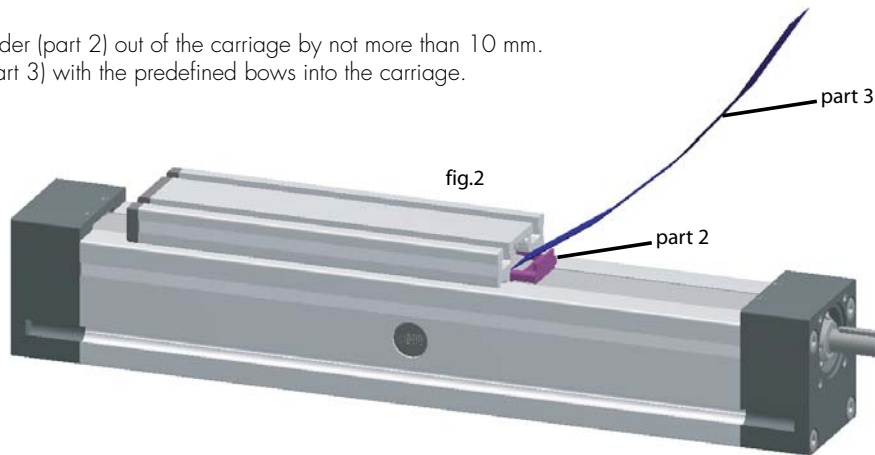
Our linear axes are constantly tested in fatigue tests in order to detect any weak points. These tests showed that in case of a loss of tension in the cover band, the stainless steel band on the lower side of the carriage will drag in the edge area. This can result in abrasion of black particles. Since we absolutely wanted to eliminate this visual weak point, we created a retrofitting kit which can be very easily installed.

The weakness is remedied by a teflon strip that is inserted between the lower side of the carriage and the upper side of the stainless steel sheet. The retrofitting can be realised very easily and quickly.

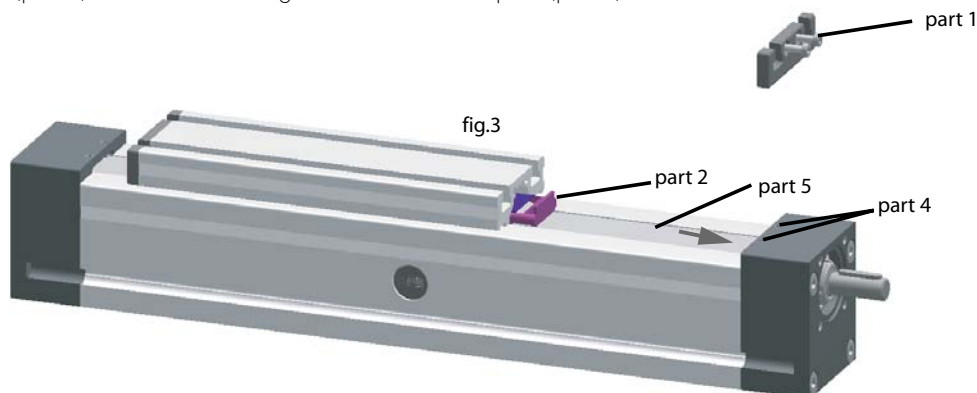
Remove one carriage end plate (part 1) by loosening/unscrewing the two cylinder head screws.



Pull the white plastic slider (part 2) out of the carriage by not more than 10 mm. Insert the teflon strip (part 3) with the predefined bows into the carriage.



Press the plastic slider (part 2) back into the carriage and fasten the end plate (part 1).

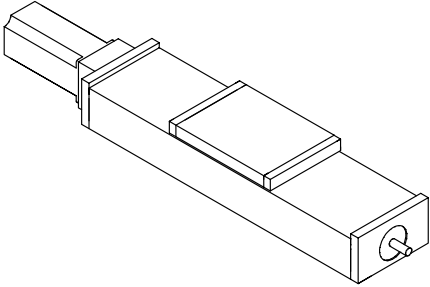
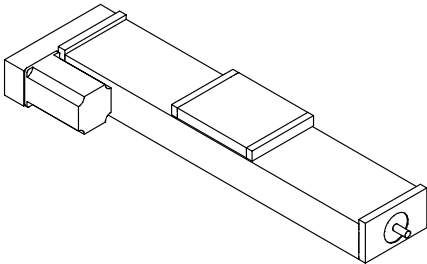
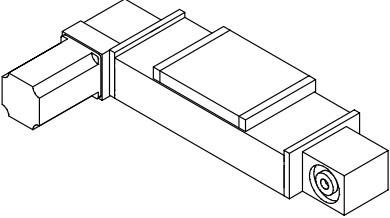
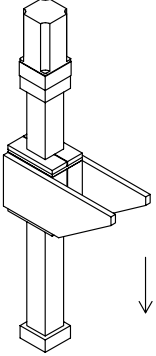
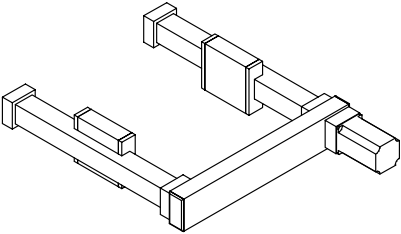
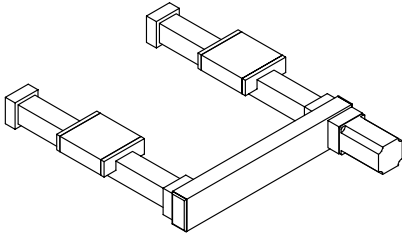
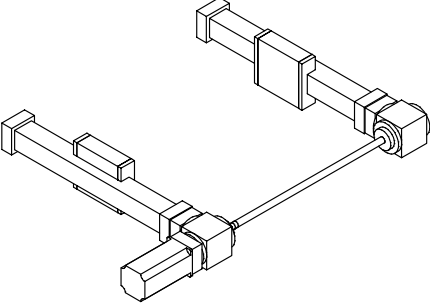


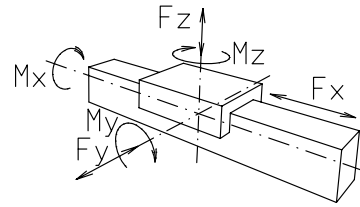
**If the cover band should lose its tension for any reason whatsoever, you should increase the tension following the procedure described below.**

Remove one carriage end plate on one side (see above, part 1); it is not important which side you choose. Then pull the white plastic slider (part 2) out of the carriage by not more than 10 mm. Loosen the setscrews (part 4) in the bearing block on the same side, slip the cover band using your fingers into the direction of the bearing block (part 5 in the direction of the arrow). Hold it with your fingers in tensioned position until the setscrews are fastened (part 4) and re-fasten the setscrews to the bearing block. Then push the plastic slider (part 2) back into the carriage and fasten the end plate (part 1).

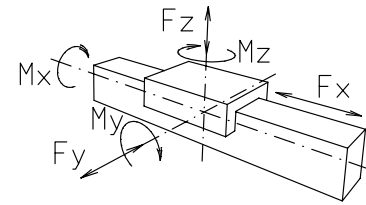




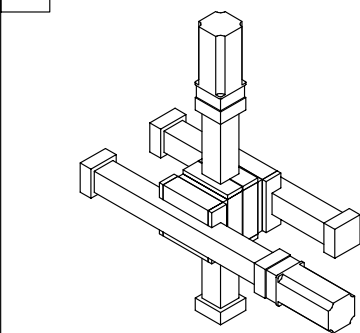
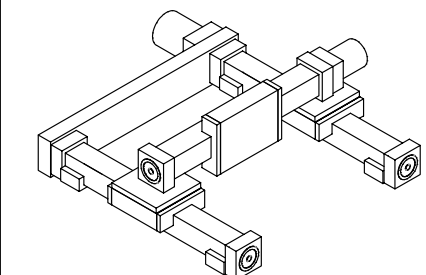
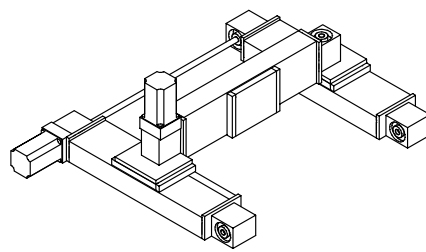
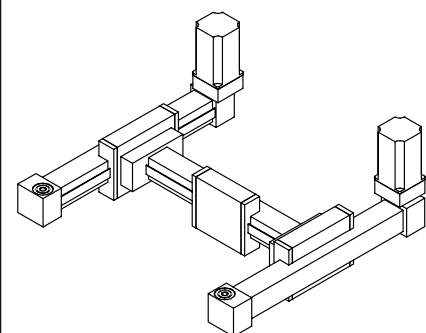
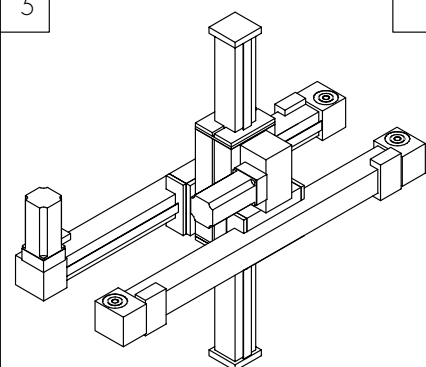
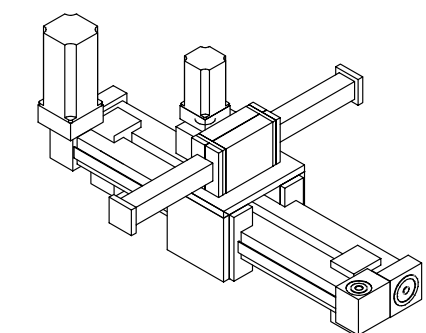
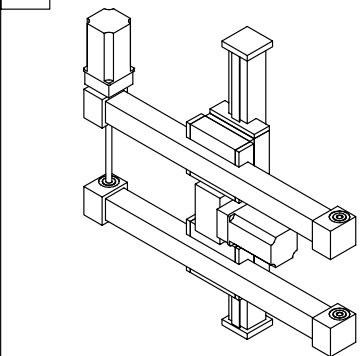
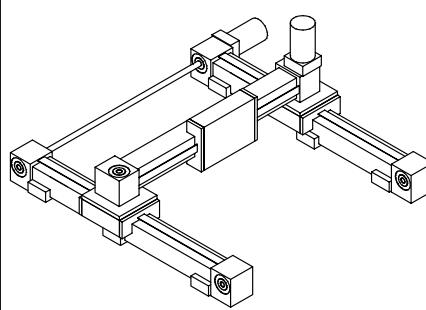
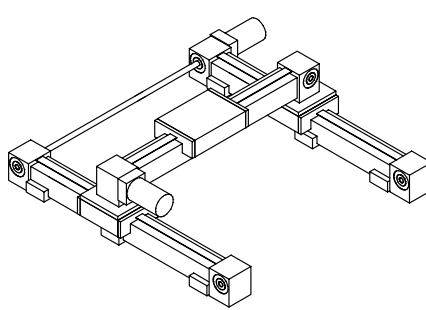
Anfrage 1-Achssystem/Inquiry 1-direction system			
Firma/Company		Name	
Tel/Fax		Zykluszeit/Cycle time	s
Hub/Stroke	mm   m	kg	<b>Motore, Steuerung/Motors, Controllers</b>
Genauigkeit/Repeatability	mm	Angebot/Offer ja <input type="checkbox"/> yes nein <input type="checkbox"/> no	
Geschwindigkeit/Velocity	m/s	Schrittmotor/Steppingmotor	<input type="checkbox"/>
Beschleunigung/Acceleration	m/s <sup>2</sup>	Servo	<input type="checkbox"/>
Horizontal	<input type="checkbox"/>	Drehstrom/AC	<input type="checkbox"/>
Vertikal	<input type="checkbox"/>	Gleichstrom/DC	<input type="checkbox"/>
1		2	3
			
			
			
			



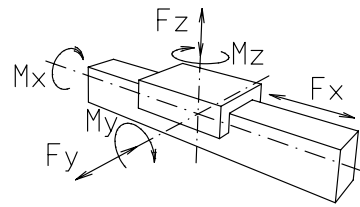
**Anfrage 2-Achssystem/Inquiry 2-direction system**



Firma/Company		Name			
Tel/Fax		Zykluszeit/Cycle time		s	
Masse/Mass		kg		<b>Motore, Steuerung/Motors, Controllers</b>	
Hub(mm)Stroke	a(m/s <sup>2</sup> )	v(m/s)	Angebot/Offer	ja <input type="checkbox"/> yes	nein <input type="checkbox"/> no
X			Schrittmotor/Steppingmotor	<input type="checkbox"/>	Kräfte/Forces
Y			Servo	<input type="checkbox"/>	X
Z			Drehstrom/AC	<input type="checkbox"/>	N
Drehachse/Rotation axis		1/min	Gleichstrom/DC	<input type="checkbox"/>	Momente/Torques
1			2		3
4			5		6
7			8		9



**Anfrage 3-Achssystem/Inquiry 3-direction system**



Firma/Company		Name	
Tel/Fax		Zykluszeit/Cycle time	s
Masse/Mass		<b>Motore, Steuerung/Motors, Controllers</b>	
Hub(mm)Stroke	a(m/s <sup>2</sup> )	v(m/s)	Angebot/Offer ja <input type="checkbox"/> yes nein <input type="checkbox"/> no
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

1	2	3
4	5	6
7	8	9



## Note

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5.2

## Note

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## Note

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5.2

# Lieferungs- und Zahlungsbedingungen

## § 1 Geltung der Bedingungen

(1) Die Lieferungen, Leistungen und Angebote des Lieferers erfolgen ausschließlich auf Grund dieser Geschäftsbedingungen. Diese gelten somit auch für alle künftigen Geschäftsbeziehungen, auch wenn sie nicht nochmals ausdrücklich vereinbart werden. Spätestens mit der Entgegennahme der Ware oder Leistung gelten diese Bedingungen als angenommen. Gegenbestätigungen des Bestellers unter Hinweis auf seine Geschäfts- bzw. Einkaufsbedingungen wird hiermit widersprochen.  
(2) Alle Vereinbarungen, die zwischen dem Lieferer und dem Besteller zwecks Ausführung dieses Vertrages getroffen werden, sind schriftlich niederzulegen.

## § 2 Angebot und Vertragsabschluss

(1) Die Angebote des Lieferers sind freibleibend und unverbindlich. Annahmeerklärungen und sämtliche Bestellungen bedürfen zur Rechtswirksamkeit der schriftlichen oder fernschriftlichen Bestätigung des Lieferers.  
(2) Die in den Katalogen und Angeboten angegebenen Leistungsmerkmale wie Abbildungen, Zeichnungen etc. sind nur als annähernd zu betrachten. Zeichnungen, Abbildungen, Maße, Gewichte oder sonstige Leistungsdaten sind nur verbindlich, wenn dies ausdrücklich schriftlich vereinbart wird. An Kostenvorschlägen, Zeichnungen und anderen Unterlagen (im Folgenden: Unterlagen) behält sich der Lieferer seine eigentums- und urheberrechtlichen Verwertungsrechte uneingeschränkt vor. Diese Unterlagen dürfen nur nach vorheriger Zustimmung des Lieferers Dritten zugänglich gemacht werden und sind, wenn der Auftrag dem Lieferer nicht erteilt wird, diesem auf Verlangen unverzüglich zurück zu geben.  
(3) Die Verkaufsstellen des Lieferers sind nicht befugt, mündliche Nebenabreden zu treffen oder mündliche Zusicherungen zu geben, die über den Inhalt des schriftlichen Vertrags hinausgehen.

## § 3 Preise

(1) Soweit nicht anders angegeben, hält sich der Lieferer an die in seinen Angeboten enthaltenen Preise 30 Tage ab deren Datum gebunden. Maßgebend sind ansonsten die in der Auftragsbestätigung des Lieferers genannten Preise zuzüglich der jeweiligen gesetzlichen Umsatzsteuer. Zusätzliche Lieferungen und Leistungen werden gesondert berechnet.  
(2) Die Preise verstehen sich, falls nicht anders vereinbart, **FOB** Lager Luhden, ausschließlich Verpackung. Die Verpackungsart untersteht dem Ermessen des Lieferers. Sie wird dem Besteller zum Selbstkostenpreis berechnet und nicht zurück genommen.

## § 4 Liefer- und Leistungszeit

(1) Liefertermine oder -fristen, die verbindlich oder unverbindlich vereinbart werden können, bedürfen der Schriftform.  
(2) Liefer- und Leistungsverzögerungen auf Grund höherer Gewalt und auf Grund von Ereignissen, die dem Lieferer die Lieferung nicht nur vorübergehend wesentlich erschweren oder unmöglich machen - hierzu gehören insbesondere Streik, Aussperrung, behördliche Anordnungen usw., auch wenn sie bei Lieferanten des Lieferers oder deren Unterlieferanten eintreten -, hat der Lieferer auch bei verbindlich vereinbarten Fristen und Terminen nicht zu vertreten. Sie berechtigen den Lieferer, die Lieferung bzw. Leistung um die Dauer der Behinderung zuzüglich einer angemessenen Anlaufzeit hinauszuschieben oder wegen des noch nicht erfüllten Teils ganz oder teilweise vom Vertrag zurückzutreten.  
(3) Wenn die Behinderung länger als drei Monate dauert, ist der Besteller nach angemessener Nachfristsetzung berechtigt, hinsichtlich des noch nicht erfüllten Teils vom Vertrag zurückzutreten. Verlängert sich die Lieferzeit oder wird der Lieferer von seiner Verpflichtung frei, so kann der Besteller hieraus keine Schadensersatzansprüche herleiten. Auf die genannten Umstände kann sich der Lieferer nur berufen, wenn er den Besteller unverzüglich benachrichtigt.  
(4) Sofern der Lieferer die Nichteinhaltung verbindlich zugesagter Fristen und Termine zu vertreten hat oder sich in Verzug befindet, hat der Besteller Anspruch auf eine Verzugsentschädigung in Höhe von 1/2% für jede vollendete Woche des Verzuges, insgesamt jedoch höchstens bis zu 5% des Rechnungswertes der vom Verzug betroffenen Lieferungen und Leistungen. Darüber hinausgehende Ansprüche sind ausgeschlossen, es sei denn, der Verzug beruht auf zumindest grober Fahrlässigkeit des Lieferers.  
(5) Der Lieferer ist zu Teillieferungen und Teilleistungen jederzeit berechtigt, es sei denn die Teillieferung oder Teilleistung ist für den Besteller nicht von Interesse.  
(6) Die Einhaltung der Liefer- und Leistungsverpflichtungen des Lieferers setzt die rechtzeitige und ordnungsgemäße Erfüllung der Verpflichtungen des Bestellers voraus.  
(7) Kommt der Besteller in Annahmeverzug, so ist der Lieferer berechtigt, Ersatz des ihm entstehenden Schadens zu verlangen; mit Eintritt des Annahmeverzugs geht die Gefahr der zufälligen Verschlechterung und des zufälligen Untergangs auf den Käufer über.

## § 5 Gefahrübergang

Die Gefahr geht auch bei frachtfreier Lieferung auf den Besteller über, sobald die Sendung an die den Transport ausführende Person übergeben worden ist oder zwecks Versendung das Lager des Lieferers verlassen hat. Wird der Versand auf Wunsch des Bestellers verzögert, geht die Gefahr mit der Meldung der Versandbereitschaft auf ihn über. Lagerkosten nach Gefahrübergang trägt der Besteller. Auf Wunsch und Kosten des Bestellers werden Lieferungen vom Lieferer gegen die üblichen Transportrisiken versichert.

## § 6 Rechte des Bestellers wegen Mängel

(1) Die Produkte werden frei von Fabrikations- und Materialmängeln geliefert; die Frist für die Geltendmachung der Mängelansprüche beträgt ein Jahr ab Lieferung der Produkte.  
(2) Werden Betriebs- oder Wartungsanweisungen des Lieferers nicht befolgt, Änderungen an den Produkten vorgenommen, Teile ausgewechselt oder Verbrauchsmaterialien verwendet, die nicht den Originalspezifikationen entsprechen, so entfallen Ansprüche wegen Mängel der Produkte, wenn der Besteller eine entsprechende substantiierte Behauptung, dass erst einer dieser Umstände den Mangel herbeigeführt hat, nicht wiederlegt.  
(3) Sachmängelansprüche des Bestellers setzen voraus, dass dieser der ihm nach § 377 HGB obliegenden Untersuchungs- und Rügeobliegenheiten ordnungsgemäß nachgekommen ist, ansonsten sind Beanstandungen unbeachtlich: Der Besteller muss der Kundendienstleitung des Lieferers Mängel unverzüglich, spätestens jedoch innerhalb einer Woche nach Eingang des Liefergegenstandes schriftlich mitteilen. Mängel, die auch bei sorgfältiger Prüfung innerhalb dieser Frist nicht entdeckt werden können, sind dem Lieferer unverzüglich nach Entdeckung schriftlich mitzuteilen.  
(4) Im Falle einer Mitteilung des Bestellers, dass die Produkte einen Mangel aufweisen, verlangt der Lieferer nach seiner Wahl und auf seine Kosten, dass:  
a) das mangelhafte Teil bzw. Gerät zur Reparatur und anschließender Rücksendung an den Lieferer geschickt wird;  
b) der Besteller das mangelhafte Teil bzw. Gerät bereithält und ein Service-Techniker des Lieferers zum Käufer geschickt wird, um die Reparatur vorzunehmen.  
Falls der Besteller verlangt, dass Nachbesserungsarbeiten an einem von ihm bestimmten Ort vorgenommen werden, kann der Lieferer diesem Verlangen entsprechen, wobei ausgetauschte Teile nicht berechnet werden, während Arbeitszeit und Reisekosten zu den Standardsätzen des Lieferers zu bezahlen sind.  
(5) Schlägt die Nachbesserung nach angemessener Frist fehl, kann der Besteller nach seiner Wahl Herabsetzung der Vergütung verlangen oder vom Vertrag zurücktreten.  
(6) Eine Haftung für normale Abnutzung ist ausgeschlossen.  
(7) Ansprüche wegen Mängel gegen den Lieferer stehen nur dem unmittelbaren Besteller zu und sind nicht abtretbar.

## § 7 Ersatzteile

Der Lieferer wird für die Dauer von fünf Jahren ab Auslieferung einer Maschine Ersatzteile für dieselbe zu den jeweils gültigen Ersatzteilpreisen liefern.

## § 8 Eigentumsvorbehalt

(1) Bis zur Erfüllung aller Forderungen (einschließlich sämtlicher Saldoforderungen aus Kontokorrent), die dem Lieferer aus jedem Rechtsgrund gegen den Besteller jetzt oder künftig zustehen, werden dem Lieferer die folgenden Sicherheiten gewährt, die er auf Verlangen nach seiner Wahl freigeben wird, soweit ihr Wert die Forderungen nachhaltig um mehr als 20% übersteigt.  
(2) Die Ware bleibt Eigentum des Lieferers. Verarbeitung oder Umbildung erfolgen stets für den Lieferer als Hersteller, jedoch ohne Verpflichtung für ihn. Erlischt das (Mit-)Eigentum des Lieferers durch Verbindung, so wird bereits jetzt vereinbart, dass das (Mit-)Eigentum des Bestellers an der einheitlichen Sache wertanteilmäßig (Rechnungswert) auf den Lieferer übergeht. Der Besteller verwahrt das (Mit-)Eigentum des Lieferers unentgeltlich. Ware, an der dem Lieferer (Mit-)Eigentum zusteht, wird im Folgenden als Vorbehaltsware bezeichnet.  
(3) Der Besteller ist berechtigt, die Vorbehaltsware im ordnungsgemäßen Geschäftsverkehr zu verarbeiten und zu veräußern, solange er nicht in Verzug ist. Verpfändungen oder Sicherungsübereignungen sind unzulässig. Die aus dem Weiterverkauf oder einem sonstigen Rechtsgrund (Versicherung, unerlaubte Handlung) bezüglich der Vorbehaltsware entstehenden Forderungen (einschließlich sämtlicher Saldoforderungen aus Kontokorrent) tritt der Besteller bereits jetzt sicherungshalber in vollem Umfang an den Lieferer ab. Der Lieferer ermächtigt ihn wiederum, die an den Lieferer abgetretenen Forderungen für dessen Rechnung im eigenen Namen einzuziehen. Diese Einziehungsermächtigung kann nur widerrufen werden, wenn der Besteller seinen Zahlungsverpflichtungen nicht ordnungsgemäß nachkommt.  
(4) Bei Zugriffen Dritter auf die Vorbehaltsware, insbesondere Pfändungen, wird der Besteller auf das Eigentum des Lieferers hinweisen und diesen unverzüglich benachrichtigen, damit der Lieferer seine Eigentumsrechte durchsetzen kann. Soweit der Dritte nicht in der Lage ist, dem Lieferer die in diesem Zusammenhang entstehenden gerichtlich oder außergerichtlichen Kosten zu erstatten, haftet hierfür der Besteller.  
(5) Bei vertragswidrigem Verhalten des Bestellers - insbesondere Zahlungsverzug - ist der Lieferer berechtigt, vom Vertrag zurückzutreten und die Vorbehaltsware herauszuverlangen.

## § 9 Zahlung

(1) Soweit nicht anders vereinbart, sind die Rechnungen des Lieferers 30 Tage nach Rechnungsstellung ohne Abzug zahlbar.  
Der Lieferer ist berechtigt, trotz anders lautender Bestimmungen des Bestellers Zahlungen zunächst auf dessen ältere Schulden anzurechnen, und wird den Besteller über die Art der erfolgten Verrechnung informieren. Sind bereits Kosten und Zinsen entstanden, so ist der Lieferer berechtigt, die Zahlung zunächst auf die Kosten, dann auf die Zinsen und zuletzt auf die Hauptleistung anzurechnen.  
(2) Eine Zahlung gilt erst dann als erfolgt, wenn der Lieferer über den Betrag verfügen kann. Im Falle von Schecks gilt die Zahlung erst als erfolgt, wenn der Scheck eingelöst wird.  
(3) Gerät der Besteller in Verzug, so ist der Lieferer berechtigt, von dem betreffenden Zeitpunkt ab Zinsen in Höhe von 8 Prozentpunkten über dem Basiszinssatz als pauschalen Schadensersatz zu verlangen. Sie sind dann niedriger anzusetzen, wenn der Besteller eine geringere Belastung nachweist; der Nachweis eines höheren Schadens durch den Lieferer ist zulässig.  
(4) Wenn dem Lieferer Umstände bekannt werden, die die Kreditwürdigkeit des Bestellers in Frage stellen, insbesondere einen Scheck nicht einlöst oder seine Zahlungen einstellt, oder wenn dem Lieferer andere Umstände bekannt werden, die die Kreditwürdigkeit des Bestellers in Frage stellen, so ist der Lieferer berechtigt, die gesamte Restschuld fällig zu stellen, auch wenn er Schecks angenommen hat. Der Lieferer ist in diesem Falle außerdem berechtigt, Vorauszahlungen oder Sicherheitsleistungen zu verlangen.  
(5) Der Besteller ist zur Aufrechnung, Zurückbehaltung oder Minderung, auch wenn Mängelrügen oder Gegenansprüche geltend gemacht werden, nur berechtigt, wenn die Gegenansprüche rechtskräftig festgestellt worden oder unstreitig sind. Zur Zurückbehaltung ist der Besteller jedoch auch wegen Gegenansprüchen aus demselben Vertragsverhältnis berechtigt.

## § 10 Konstruktionsänderungen

Der Lieferer behält sich das Recht vor, jederzeit Konstruktionsänderungen vorzunehmen; er ist jedoch nicht verpflichtet, derartige Änderungen auch an bereits ausgelieferten Produkten vorzunehmen.

## § 11 Patente

(1) Der Lieferer wird den Besteller und dessen Abnehmer wegen Ansprüchen aus Verletzungen von Urheberrechten, Marken oder Patenten freistellen, es sei denn, der Entwurf eines Liefergegenstandes stammt vom Käufer. Die Freistellungsverpflichtung des Lieferers ist betragsmäßig auf den vorhersehbaren Schaden begrenzt. Zusätzliche Voraussetzung für die Freistellung ist, dass dem Lieferer die Führung von Rechtsstreiten überlassen wird und dass die behauptete Rechtsverletzung ausschließlich der Bauweise der Liefergegenstände des Lieferers ohne Verbindung oder Gebrauch mit anderen Produkten zuzurechnen ist.  
(2) Der Lieferer hat wahrheitsgemäß das Recht, sich von den in Abs. 1 übernommenen Verpflichtungen dadurch zu befreien, dass er entweder  
a) die erforderlichen Lizenzen bezüglich der angeblich verletzten Patente beschafft oder  
b) dem Besteller einen geänderten Liefergegenstand bzw. Teile davon zur Verfügung stellt, die im Falle des Austausches gegen den verletzenden Liefergegenstand bzw. dessen Teil den Verletzungsvorwurf bezüglich des Liefergegenstandes beseitigen.

## § 12 Geheimhaltung

Falls nicht ausdrücklich schriftlich etwas anderes vereinbart ist, gelten die dem Lieferer im Zusammenhang mit Bestellungen unterbreiteten Informationen nicht als vertraulich.

## § 13 Haftung

(1) Schadensersatzansprüche sind unabhängig von der Art der Pflichtverletzung, einschließlich unerlaubter Handlungen, ausgeschlossen, soweit nicht vorsätzliches oder grob fahrlässiges Handeln vorliegt.  
(2) Bei Verletzung wesentlicher Vertragspflichten haftet der Lieferer für jede Fahrlässigkeit, jedoch nur bis zur Höhe des vorhersehbaren Schadens. Ansprüche auf entgangenen Gewinn, ersparte Aufwendungen, aus Schadensersatzansprüchen Dritter sowie auf sonstige mittelbare und Folgeschäden können nicht verlangt werden, es sei denn, ein vom Lieferer garantiertes Beschaffenheitsmerkmal bezweckt gerade, den Besteller gegen solche Schäden abzusichern.  
(3) Die Haftungsbeschränkungen und -ausschlüsse in den Absätzen 1 und 2 gelten nicht für Ansprüche, die wegen arglistigen Verhaltens des Lieferers entstanden sind, sowie bei einer Haftung für garantierte Beschaffenheitsmerkmale, für Ansprüche nach dem Produkthaftungsgesetz sowie Schäden aus der Verletzung des Lebens, des Körpers oder der Gesundheit.  
(4) Soweit die Haftung des Lieferers ausgeschlossen oder beschränkt ist, gilt dies auch für Angestellte, Arbeitnehmer, Vertreter und Erfüllungsgehilfen des Lieferers.

## § 14 Anwendbares Recht, Gerichtsstand, Datenschutz, Teilnichtigkeit

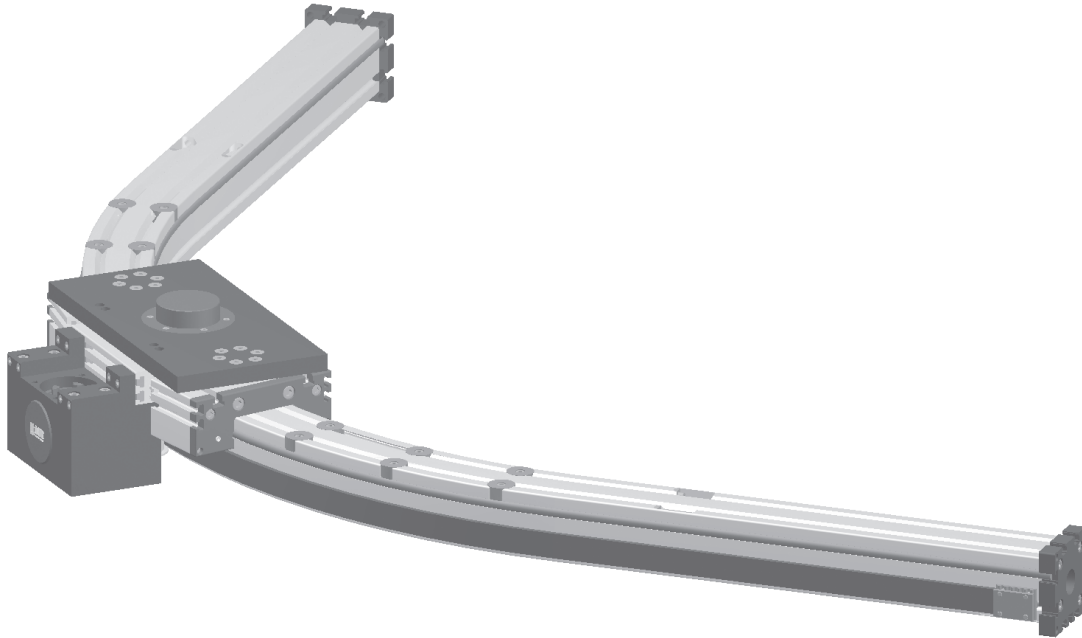
(1) Für diese Geschäftsbedingungen und die gesamten Rechtsbeziehungen zwischen Lieferer und Besteller gilt das Recht der Bundesrepublik Deutschland. Die Bestimmungen des UN-Kaufrechts finden keine Anwendung.  
(2) Soweit der Besteller Kaufmann, juristische Person des öffentlichen Rechts oder öffentlich-rechtliches Sondervermögen ist, ist Minden ausschließlicher Gerichtsstand für alle sich aus dem Vertragsverhältnis unmittelbar oder mittelbar ergebenden Streitigkeiten.  
(3) Der Besteller wird gemäß § 33 Bundesdatenschutzgesetz (BDSG) darauf hingewiesen, dass seine Daten von dem Lieferer gespeichert werden. Die Verarbeitung der Daten erfolgt unter Beachtung des Bundesdatenschutzgesetzes sowie des Teledienstedatenschutzgesetzes.  
(4) Sollte eine Bestimmung in diesen Geschäftsbedingungen oder eine Bestimmung im Rahmen sonstiger Vereinbarungen unwirksam sein oder werden, so wird hiervon die Wirksamkeit aller sonstigen Bestimmungen oder Vereinbarungen nicht berührt.

(Auszug aus dem Bundesdatenschutzgesetz) gem. § 26 BDSG, informieren wir Sie, daß wir unsere Buchhaltung über eine EDV-Anlage führen und in diesem Zusammenhang auch die Daten Ihrer Firma speichern. Diese Daten stammen nur aus unseren geschäftlichem Geschäftsbeziehungen und sind daher gemäß § 23 BDSG zulässigerweise gespeichert.

Fassung vom April 2004



## Positioning system ELBZ R800



### Function:

This linear unit consists of a curved aluminium square profile with hardened steel guide rods. The smallest radius amounts to 800 mm. 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 pulley has maintenance-free ball bearings. Belt tension can be readjusted by a simple tensioning device in one of the end blocks. This device can also be used for symmetrical adjustment of two or more linear units running parallel.

### Fitting position:

As required.

### Carriage mounting:

Special drilling

### Unit mounting:

By T-slots or tapped holes in the profile nut, or mounting sets.

### Belt type:

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

### Formula: ELBZ

Driving torque:

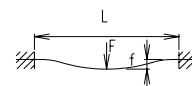
$$M_o = \frac{F \cdot p \cdot S}{2000 \cdot \pi} + M_{leer}$$

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

F = force  
 P = pulley action perimeter  
 S = safety factor 1,2 ... 2  
 $M_{leer}$  = no-load torque  
 n = rpm pulley  
 $M_o$  = driving torque  
 $P_o$  = motor power

f =  
 (N)  
 (mm)

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



(Nm)  
 (min<sup>-1</sup>)  
 (Nm)  
 (KW)

f = deflection

F = load

L = free length

E = elastic modulus 70000

I = second moment of area

(mm)

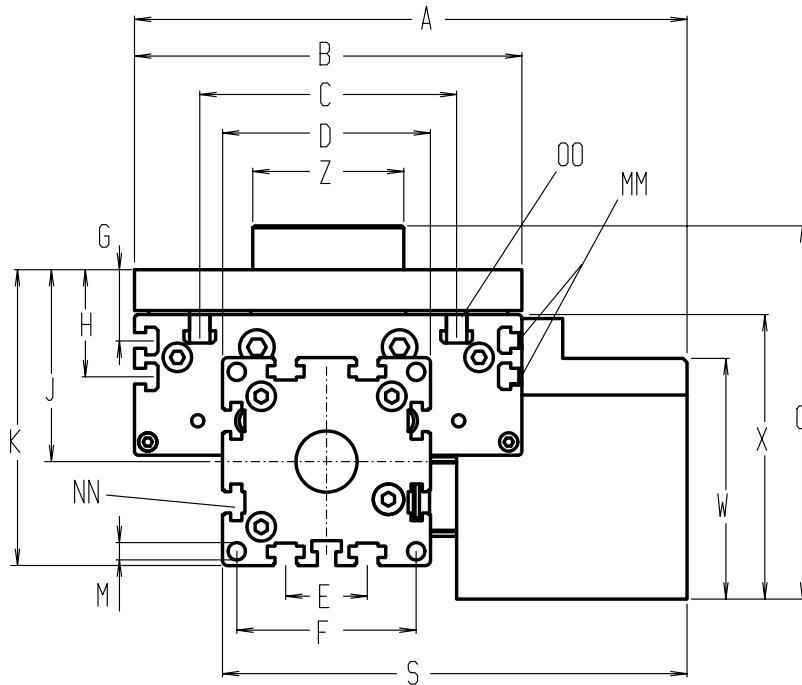
(N)

(mm)

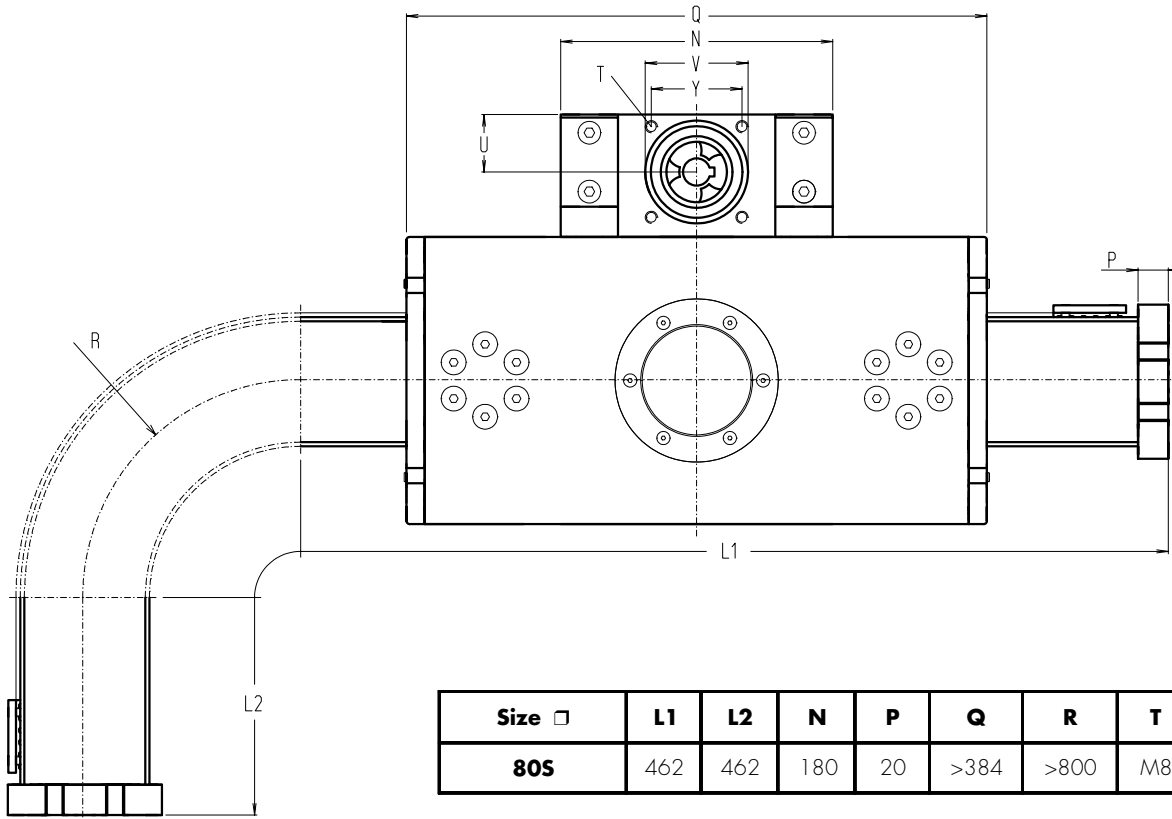
(N/mm<sup>2</sup>)

(mm<sup>4</sup>)

# Positioning system ELBZ R800

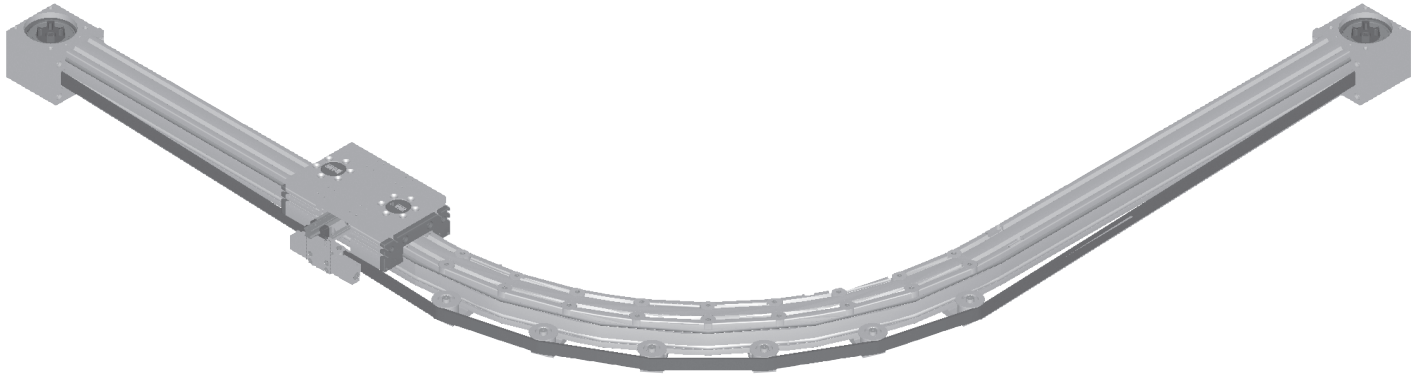


Size □	A	B	C	D	E	F	G	H	J	K	M	O	S	MM for	NN for	W	X	Z
<b>80S</b>	271	190	126	102	40	88	34,5	52	94	145	8,5	183	228	M6	M10	118	137,5	74



Size □	L1	L2	N	P	Q	R	T	U	V	Y
<b>80S</b>	462	462	180	20	>384	>800	M8	38	68	60

## Positioning system ELBZU80S



### Function:

This linear unit consists of a curved aluminium square profile with hardened steel guide rods. The smallest radius amounts to 800 mm. 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. This device can also be used for symmetrical adjustment of two or more linear units running parallel.

### Fitting position:

As required.

### Carriage mounting:

Special drilling

### Unit mounting:

By T-slots or tapped holes in the profile nut, or mounting sets.

### Belt type:

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

### Formula: ELBZU

Driving torque:

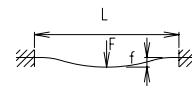
$$M_o = \frac{F \cdot p \cdot S}{2000 \cdot \pi} + M_{leer}$$

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

F = force  
 P = pulley action perimeter  
 S = safety factor 1,2 ... 2  
 $M_{leer}$  = no-load torque  
 n = rpm pulley  
 $M_o$  = driving torque  
 $P_o$  = motor power

f =  
 (N)  
 (mm)

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



(Nm)  
 (min<sup>-1</sup>)  
 (Nm)  
 (KW)

f = deflection

F = load

L = free length

E = elastic modulus 70000

I = Tsecond moment of area

(mm)

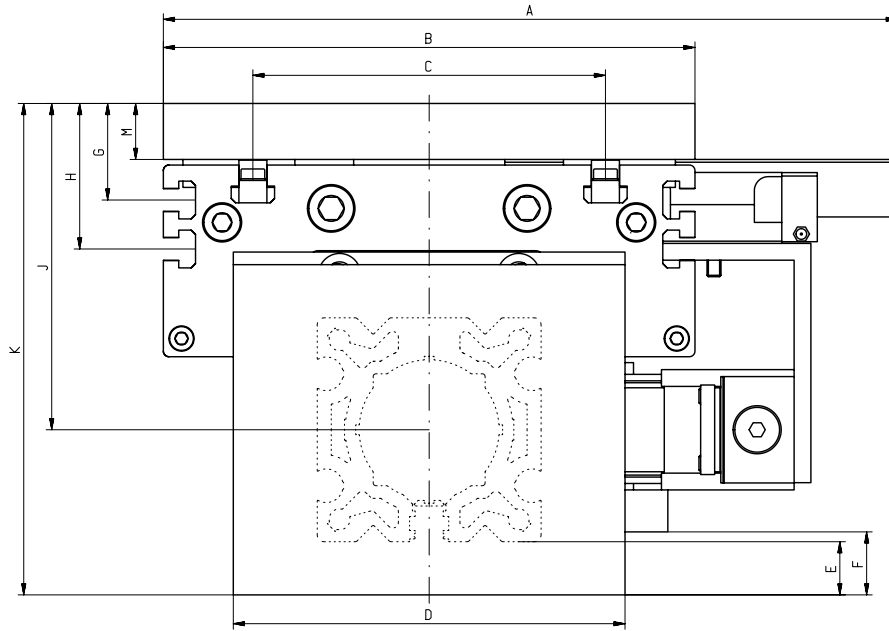
(N)

(mm)

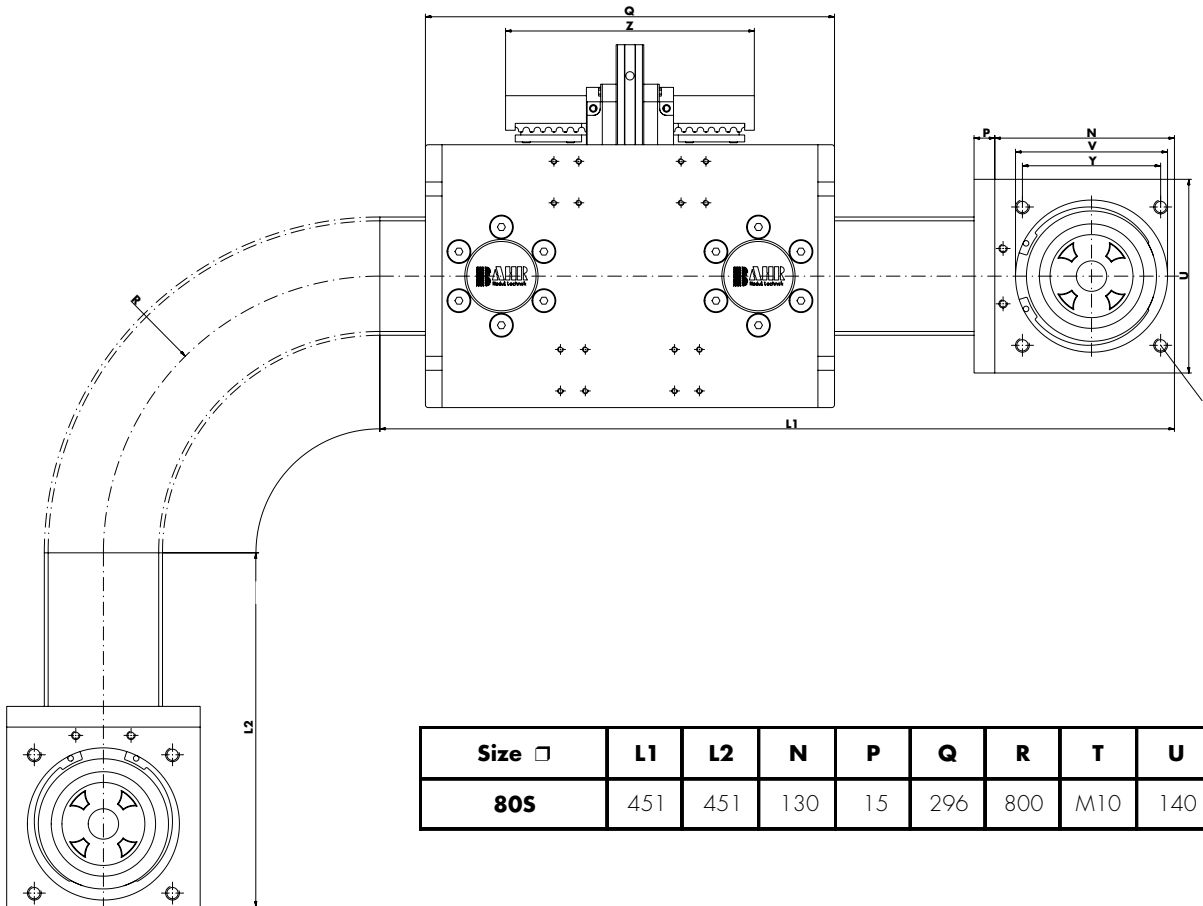
(N/mm<sup>2</sup>)

(mm<sup>4</sup>)

# Positioning system ELBZU80S



Size □	A	B	C	D	E	F	G	H	J	K	M	MM for	NN for
<b>80S</b>	266	190	126	140	19	22,5	34,5	52	116,5	175,6	20	M6	M10



Size □	L1	L2	N	P	Q	R	T	U	V	Y	Z
<b>80S</b>	451	451	130	15	296	800	M10	140	110	100	180