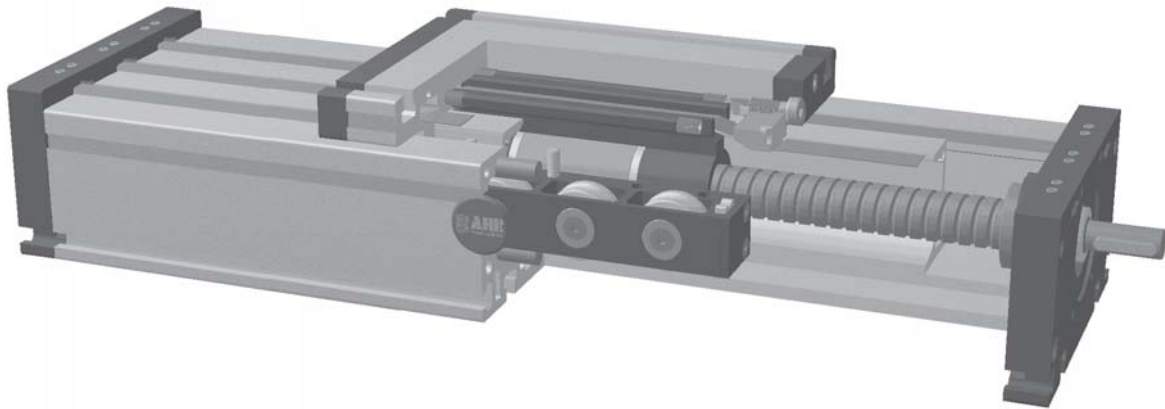


# Positioning system DLT/DLK 120, 160, 200

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.

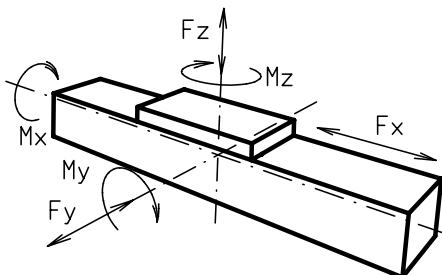
### Carriage support:

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:

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

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

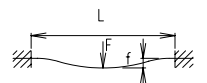
- F = force (N)
- P = thread pitch (mm)
- S = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm of screw (min<sup>-1</sup>)
- $M_o$  = driving torque (Nm)
- $\mu$  = screw efficiency
- $P_o$  = motor power (KW)

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>)

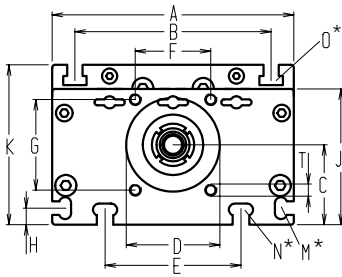
The diagram for critical speeds of lead screws refer to chapter 5.2 page 3

7.1 / 2

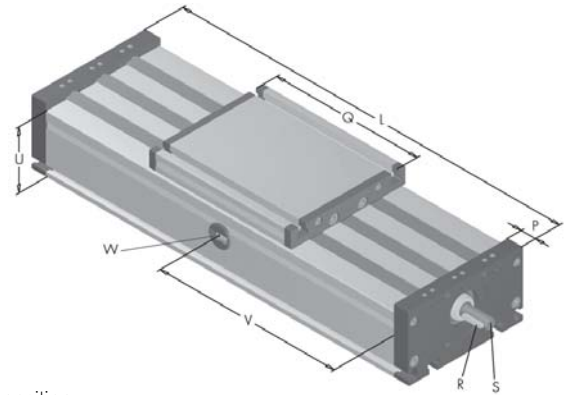


# Positioning system DLT/DLK 120, 160, 200

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

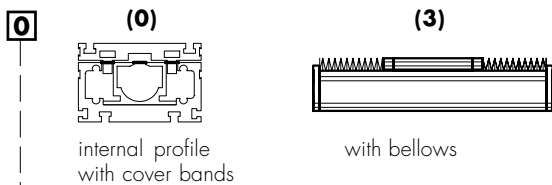
**Spindle:**

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

**Selection of screw:**

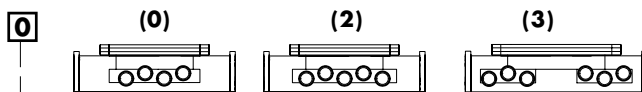
**1** (1) right hand (2) left hand (Ballscrew by inquiry)

**Choice of guide body profile:**



Stainless versions upon request.

**Choice of carriages:**



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	Standard	Multistart-screw
	120	<b>0</b> 16x5	<b>1</b> 16x10 <b>2</b> 16x16 <b>3</b> 20x20 <b>4</b> 25x5 <b>5</b> 25x10
	160	<b>0</b> 25x5	<b>1</b> 20x20 <b>2</b> 25x10 <b>3</b> 25x25
	200	<b>0</b> 32x5	<b>1</b> 32x10 <b>2</b> 32x20 <b>3</b> 32x32
Ballscrew left hand	upon request		

<b>0</b> Trapezoidal right hand thread	120	<b>0</b> 18x4	<b>1</b> 18x8
	160	<b>0</b> 24x5	<b>1</b> 24x10
	200	<b>0</b> 32x6	<b>1</b> 32x12
Trapezoidal left hand thread	120	<b>0</b> 18x4	<b>1</b> 18x8
	160	<b>0</b> 24x5	<b>1</b> 24x10
	200	<b>0</b> 32x6	<b>1</b> 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**

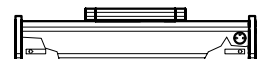
**Repeatability:**

± 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 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:

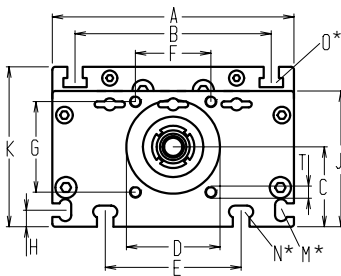
DLT160, trapezoidal right hand thread, with internal profile and cover bands, standard carriage, one shaft (locating bearing side), spindle 24x5, 1240 mm stroke.



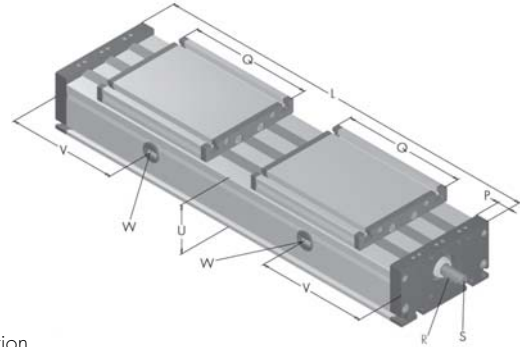
# Positioning system DLT/DLK 120, 160, 200

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

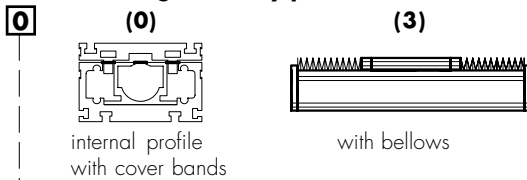
### Spindle:

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

### Selection of screw:

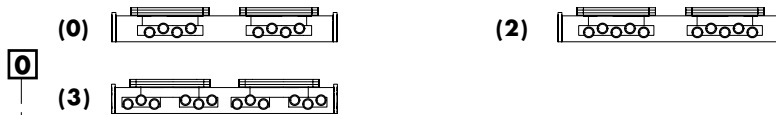
**3** (3) right - left hand (4) divided spindle

### 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	<b>(0)</b> 16x5	<b>(1)</b> 16x10* <b>(2)</b> 16x16* <b>(3)</b> 20x20* <b>(4)</b> 25x5* <b>(5)</b> 25x10*
	160	<b>(0)</b> 25x5	<b>(1)</b> 20x20* <b>(2)</b> 25x10* <b>(3)</b> 25x25*
	200	<b>(0)</b> 32x5	<b>(1)</b> 32x10* <b>(2)</b> 32x20* <b>(3)</b> 32x32*
Ballscrew left hand	upon request		

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