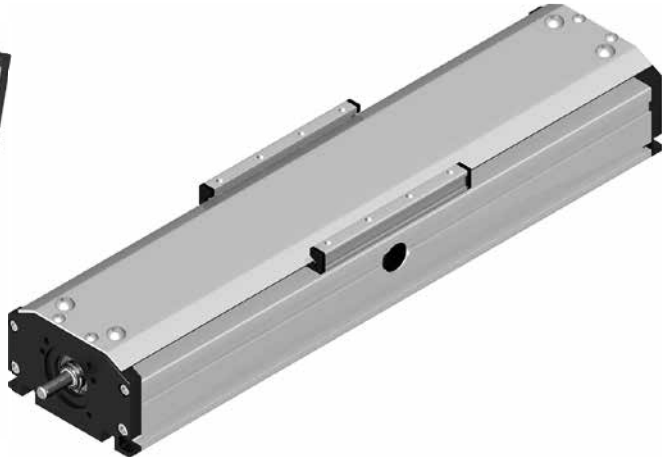
Positioning system DST/DSK 120 P, 160 P, 200 P

Spindle drives

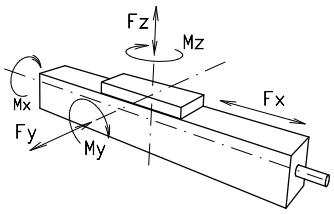


Function:
This unit consists of a rectangular aluminium profile with 2 integrated rail guides. The carriage is driven by means of a rotating spindle with leading nut. Where two parallel linear units are used or where two carriages are mounted on one unit, the leading-nut receiver can be used to adjust the symmetry of the carriages. A special curved aluminium sheet is covering the carriage side. There is only a small gap between carriage and aluminium sheet. The cover profile can be adjusted according to the mounting position.

Fitting position: As required, max. length DST/K 120P / 1600mm, DST/K 160P / 1800mm, DST/K 200P / 2000mm
Carriage mounting: By tapped holes.
Unit mounting: T-slots
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 ± 0,025 mm, trapezoidal thread ± 0,2 mm.

9.1

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)	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

All forces and torques related to the following:

existing values / table values

$$\frac{Fy}{Fy_{dyn}} + \frac{Fz}{Fz_{dyn}} + \frac{Mx}{Mx_{dyn}} + \frac{My}{My_{dyn}} + \frac{Mz}{Mz_{dyn}} \leq 1$$

No-load torque								
Trapezoidal thread	18 x 4	18 x 8	24 x5	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	32 x 32
(Nm)	0,7	1,0	1,0	1,2	1,3	1,6	1,7	1,7
Geometrical moments of inertia of aluminium profile								
I_x mm⁴	5,61x10⁵		2,13x10⁶		4,81 x10⁶			
I_y mm⁴	34,19x10⁵		12,33x10⁶		26,0 x10⁶			
Elastic modulus N/mm²	70000		70000		70000			

For life-time calculation use our homepage.

** referred to life-time*

Driving torque:

$$M_a = \frac{F * P * S_i}{2000 * \pi * \mu} + M_n$$

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

F = force (N)
P = thread pitch (mm)
Si = safety factor 1,2 ... 2
M_n = no-load torque (Nm)
n = rpm of screw (min^{-1})
M_a = driving torque (Nm)
μ = screw efficiency
P_a = motor power (KW)

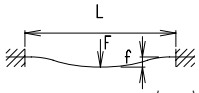
Efficiency of lead screws:

All ballscrew 0,900

Tr 24x5 0,384
Tr 24x10 0,550
Tr 32x6 0,360
Tr 32x12 0,524

Deflection:

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

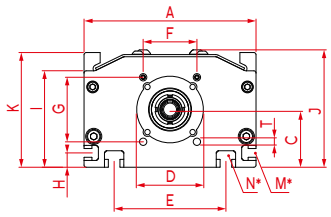


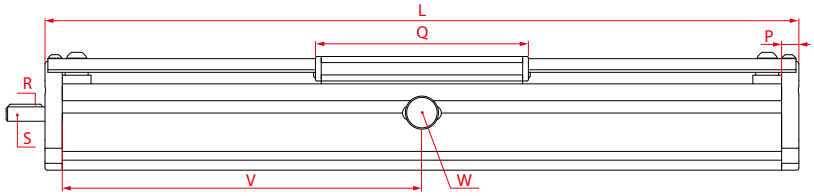
f = deflection (mm)
F = load (N)
L = free length (mm)
E = elastic modulus 70000 (N/mm^2)
I = second moment of area (mm^4)

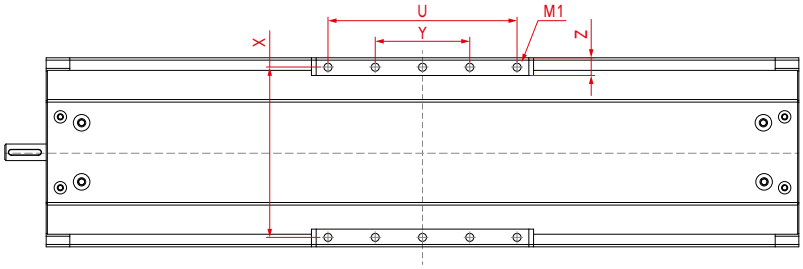
For the diagram for critical speeds of lead screws refer to catalog - chapter 4.2

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

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.

DS 120 M1 = M6 x 8 only 8 threaded holes in the carriage
DS 160 M1 = M8 x 12 **DS 200** M1 = M10 x 12
V = Q + 100 mm W = servicing position

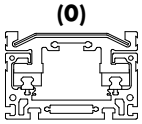
Size	Basic length L	A	C	D +0,1 +0,05	E	F	G	H	I	J	K	M for	N for	P	Q	Shaft R Key	Shaft S Ø h6 x length	T	U	X	Y	Z	Basic weight	Weight per 100 mm
DS 120	225	120	39	47	78	42	42	10	67	82	79	M5	M6	12	152	3x3x25	10 x 27	M6	120	106	40	11,5	3,67 kg	1,05 kg
DS 160	285	160	53	62	90	50	60	11	89	109	106	M6	M8	20	196	5x5x28	14 x 35	M8	160	144	80	15	9,45 kg	2,71 kg
DS 200	340	200	66	68	140	60	60	15	100	133	129	M8	M10	20	256	6x6x40	22 x 45	M8	200	180	100	17	17,43 kg	3,43 kg

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

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

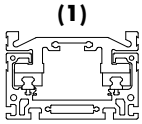
0 **Choice of guide body profile:**

(0)



with cover profile

(1)



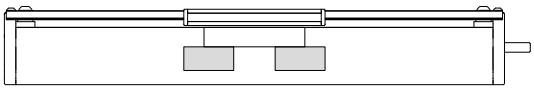
without cover profile

Stainless versions upon request.

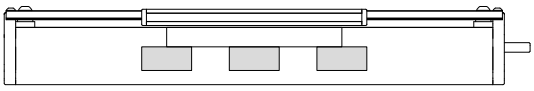
Size	Version 1 Q	Version 1 L
120	>152	>225
160	>228	>330
200	>296	>384

0 **Choice of carriages:**

(0)



(1)



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

0

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				
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			* by inquiry

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

DS	T	160 P	1	0	0	0	0	0	0	01500	1500
		Pos.	1	2	3	4	5	6	7		

Basic length + stroke = total length

Sample ordering code:
DST 160 P, trapezoidal right hand thread, with cover profile, standard carriage, one shaft (locating bearing side), spindle 24x5, 1215 mm stroke.