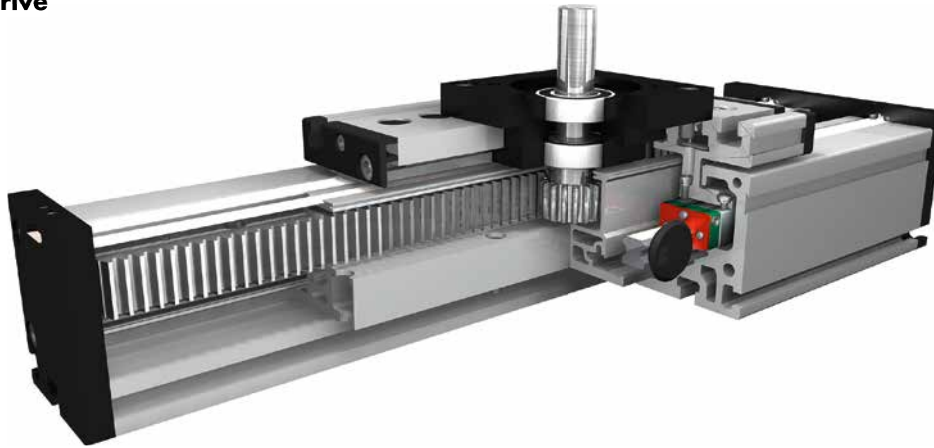


## Rack and pinion drive

**Function:**

This unit consists of a rectangular aluminium profile with 2 integrated rail guides. The carriage is driven by a pinion on 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:**

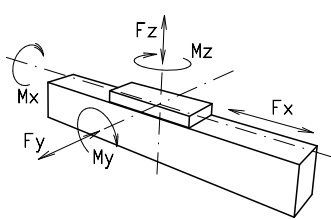
By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.

**Rack:**

6h23 Modul 2 (hardened and ground), repeatability  $\pm 0,1$  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.

**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)	894	800	1900	1800	4000	3800
$F_y$ (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	$\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$					
table values						
<b>No-load torque</b>						
Nm without cover bands	1,2		1,5		2,0	
Nm with cover bands	1,6		2,1		4	
<b>Speed</b>						
(m/s) max	5		5		5	
<b>Tensile force</b>						
permanent (N)	900		1900		4000	
0,2 s (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	

For life-time calculation use our homepage.

\* referred to life-time

Driving torque:

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

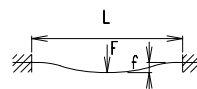
$$P_o = \frac{M_o \cdot n}{9550}$$

F = force (N)  
 P = pulley action perimeter (mm)  
 Si = safety factor 1,2 ... 2  
 Mn = no-load torque (Nm)  
 n = rpm pulley (min<sup>-1</sup>)  
 Mo = driving torque (Nm)  
 Po = motor power (KW)

Deflection:

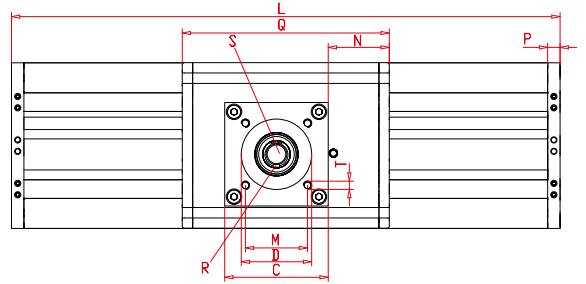
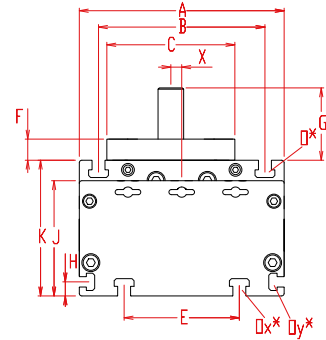
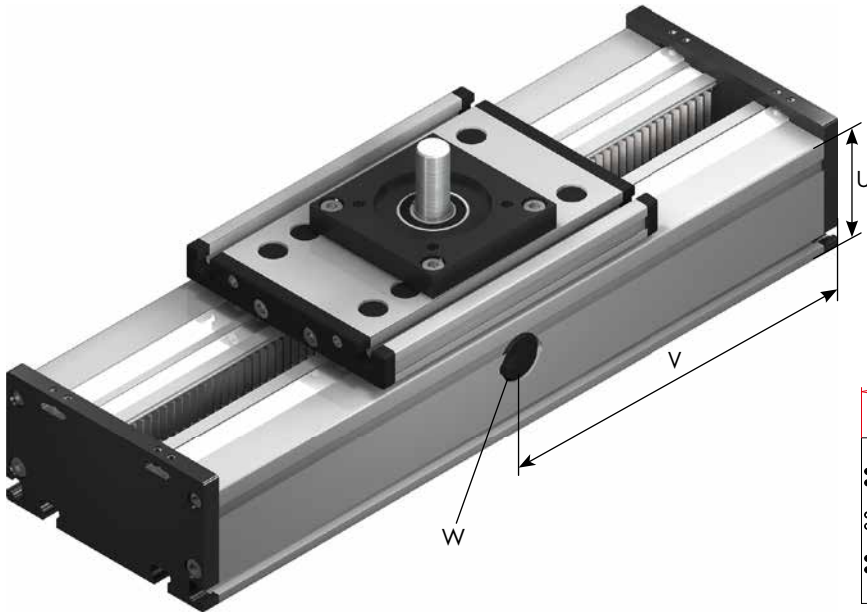
$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

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 DSZA 160, 200

Dimensions (mm)



V = Q + 100 mm  
W = servicing position

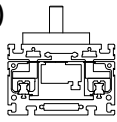
\*For slide nuts refer to chapter 2.2 page 2

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

Size	Basic length L	A	B	C	D ±0,05	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
DSZA 160	250	160	130	100	68	90	16,5	56,5	11	90	106	60	62	M 8	M 8	M 6	12	224	M 8	80	8,5	9,4 kg	2,15 kg
DSZA 200	320	200	160	120	90	140	20	45	15	110	129	80	95	M 10	M 10	M 8	15	270	M 8	100	9	28,9 kg	7,10 kg

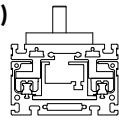
## 0 Choice of guide body profile:

(0)



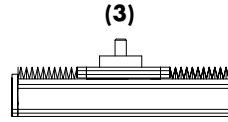
internal profile with cover bands

(1)



internal profile without cover bands

(3)

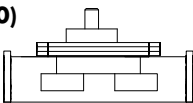


with bellows

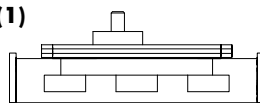
Stainless versions upon request.

## 0 Choice of carriage:

(0)



(1)



Size	Version 0		Version 1	
	Q	L	Q	L
160	224	250	360	390
200	270	320	320	360

## 1 Drive version:

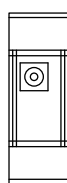
1



2



3



4



5



## Shaft dimensions:

Size	Shaft ø h6 x length	Key	Pinion	
	S	R	mm/U	Modul
160	20 x 40	6x6x35	100,53	2
200	18 x 26	6x6x20	94,25	2

DSZA 160 1 0 0 1 0 0 1 01500

Basic length + stroke = total length

Pos. 1 2 3 4 5 6 7

Sample ordering code:

DSZA 160 with internal profile and cover bands, standard carriage, 1250mm stroke.