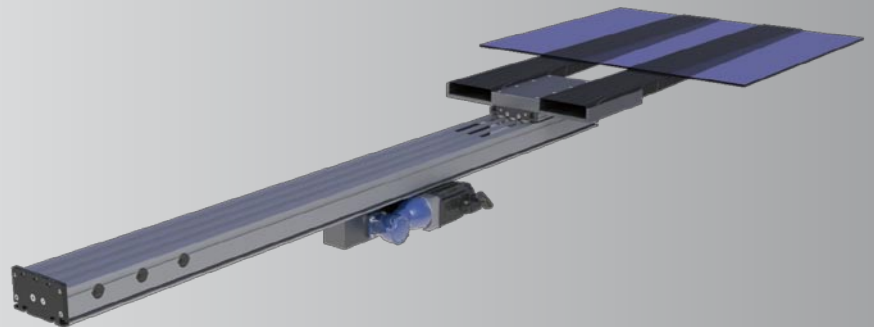
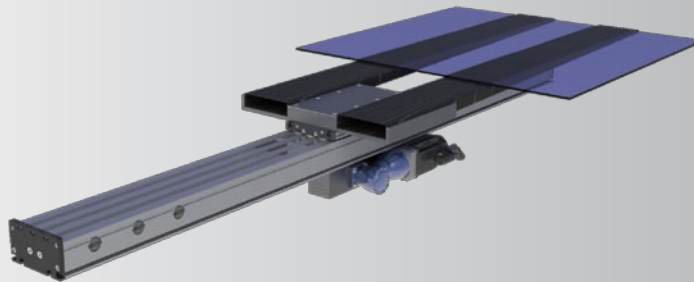
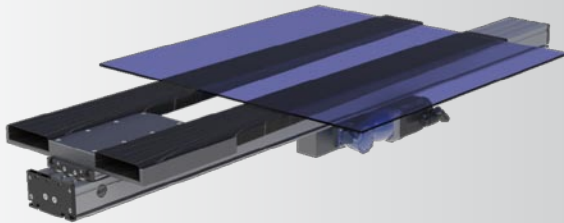
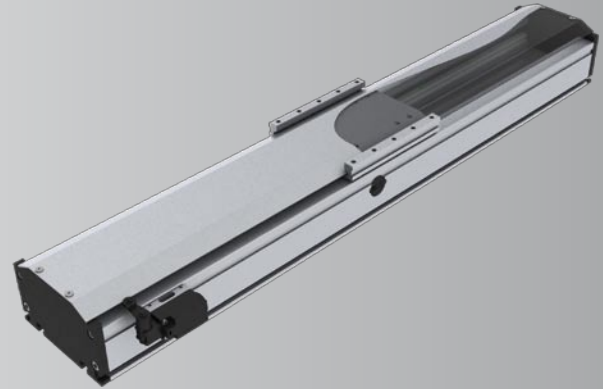
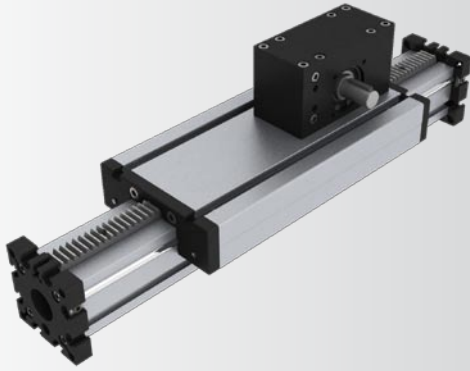


Product NEWS 2011



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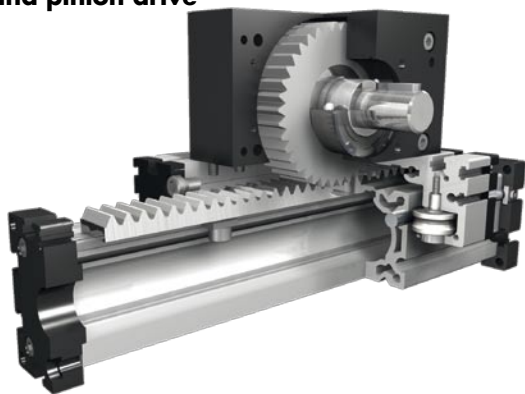
e-mail: Info@bahr-modultechnik.com

<http://www.bahr-modultechnik.com>

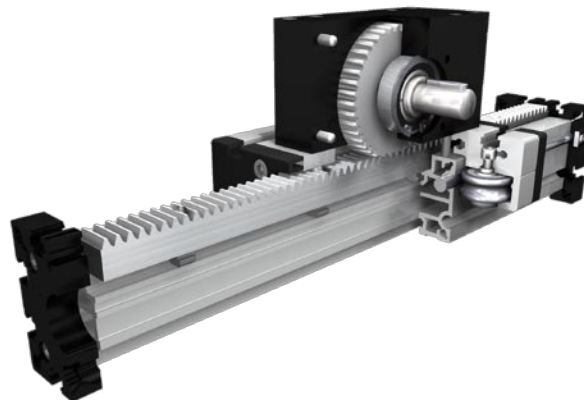
Positioning system ELZA 40, 80, 80S, 100 / ELDZA 60, 60S

Specifications

Rack and pinion drive



ELZA 40, 80, 80S, 100



ELDZA 60, 60S

We have been implementing comprehensive model improvement measures so that we are able to offer our products in the segment of toothed rack drives in a more cost-effective and application-oriented way.

New innovative guiding profiles ELDZA have been developed, which can be used effectively in combination with standardized toothed racks. Depending on the specific task (e. g. load, mounting position, service life or cost) it is possible to use different material combinations.

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 Tslots.

Unit mounting: By Tslots and holes in the bearing blocks, mounting sets.

Rack: C45,Steel 1.4305 or plastic (POM) possible. Repeatability: ± 0,2 mm.

| Forces and torques | Size | ELZA 40 | | ELDZA 60 | | ELDZA 60 S | | ELZA 80 | | ELZA 80 S | | ELZA 100 | |
|--|---------------------|--|---------|----------------------|---------|----------------------|---------|-----------------------|---------|-----------------------|---------|----------------------|---------|
| | Forces/Torques | static | dynamic | static | dynamic | static | dynamic | static | dynamic | static | dynamic | static | dynamic |
| | F _x (N) | 900 | 750 | 1500 * | 1200 * | 1500 * | 1200 * | 2200 | 1800 | 2200 | 1800 | 2900 | 2500 |
| | 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 |
| | 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 |
| All forces and torques related to the following: | | | | | | | | | | | | | |
| existing values | | $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ | | | | | | | | | | | |
| table values | | | | | | | | | | | | | |
| Speed | | | | | | | | | | | | | |
| (m/sec) max | | 2 | | 2,5 | | 2,5 | | 3 | | 3 | | 3 | |
| Geometrical moments of inertia of aluminium profile | | | | | | | | | | | | | |
| I _x mm ⁴ | | 1,32x10 ⁵ | | 4,86x10 ⁵ | | 4,86x10 ⁵ | | 18,99x10 ⁵ | | 18,99x10 ⁵ | | 44,4x10 ⁵ | |
| I _y mm ⁴ | | 1,34x10 ⁵ | | 4,87x10 ⁵ | | 4,87x10 ⁵ | | 18,97x10 ⁵ | | 18,97x10 ⁵ | | 44,8x10 ⁵ | |
| E-Modulus N/mm ² | | 70000 | | 70000 | | 70000 | | 70000 | | 70000 | | 70000 | |

* = Depending on material combinations (see page 3) F_x values could be different!
For life-time calculation of rollers use our CD-ROM or homepage!

Formula: ELZA/ELDZA

Driving torque:

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

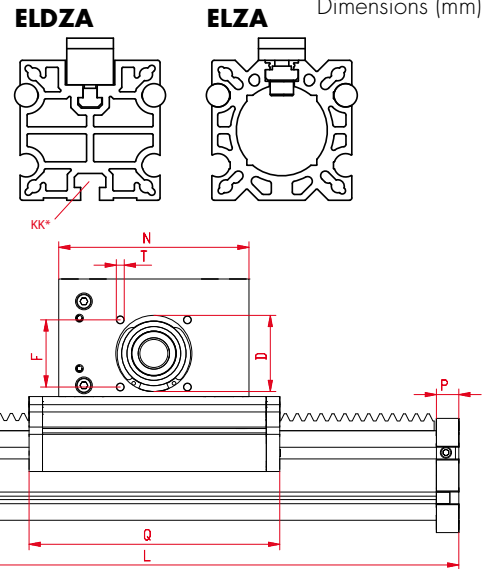
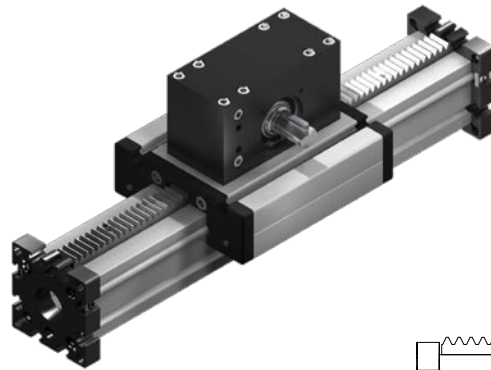
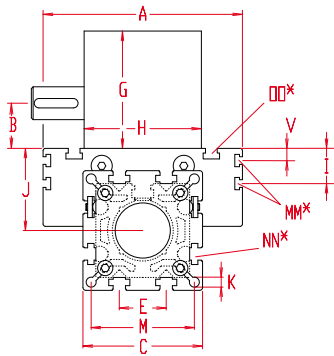
$$P_o = \frac{M_o \cdot n}{9550}$$

- F = force (N)
- P = pulley action perimeter (mm)
- S = safety factor 1,2 ... 2
- M_{leer} = no-load torque (Nm)
- n = rpm pulley (min⁻¹)
- 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/mm²)
- I = second moment of area (mm⁴)

Positioning system ELZA 40, 80, 80S, 100 / ELDZA 60, 60S



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

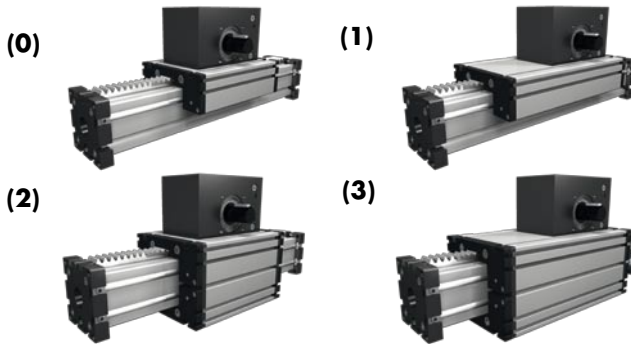
*For slide nuts refer to main catalog chapter 2.2 page 2

| Size □ | Basic length L | A | B | C | D | E | F | G | H | I | J | K | KK für | 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 |
| ELDZA 60 | 205 | 144 | 28,0 | 82 | 47 | 30 | 42 | 75 | 63 | - | 49 | 8,5 | M 6 | 69 | - | 130 | M 8 | M 8 | 16 | 168 | M 6 | - | 4,7 kg | 0,63 kg |
| ELDZA 60S | 230 | 170 | 34,5 | 82 | 47 | 30 | 42 | 92 | 63 | - | 53 | 8,5 | M 6 | 69 | - | 150 | M 8 | M 8 | 16 | 194 | M 6 | 10 | 7,2 kg | 0,63 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:

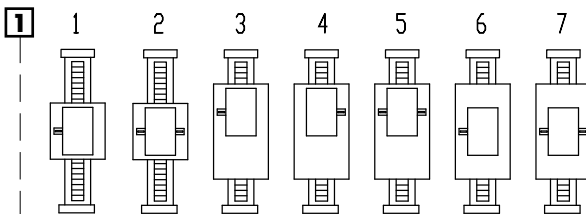
- 0** Standard
- 2** corrosion-protected guide rods and screws
- 4** expanded corrosion-protected version (depending on the availability of components)

Choice of carriages:



| Size | Version 1 | | Version 2 | | Version 3 | |
|------|-----------|-----|-----------|-----|-----------|-----|
| | Q | L | Q | L | Q | L |
| 40 | 227 | 255 | 138 | 166 | 243 | 271 |
| 60 | 303 | 340 | 184 | 221 | 319 | 356 |
| 60S | 329 | 366 | 214 | 251 | 349 | 386 |
| 80 | 369 | 415 | 210 | 256 | 385 | 431 |
| 80S | 389 | 435 | 234 | 280 | 409 | 455 |
| 100 | 505 | 565 | 316 | 376 | 521 | 581 |

Drive version:



| 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 | 251,3 | 2 |
| 60 S | 18 x 30 | 6x6x28 | 314,2 | 2 |
| 80 (S) | 28 x 40 | 8x7x35 | 358,0 | 3 |
| 100 | 28 x 40 | 8x7x35 | 508,9 | 3 |

Rack/Pinion Version: (ONLY for ELDZA)

| Version | 0 | 1 | 2 | 3 |
|----------------------|--------------------------|-------------------------|---------------|-------------------------|
| Material Rack/Pinion | Steel/Plastic (Standard) | Stainless steel/Plastic | Plastic/Steel | Plastic/Stainless steel |

1500 Basic length + stroke = total length

ELDZA 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 main catalog chapter 2.2

Version 0/1

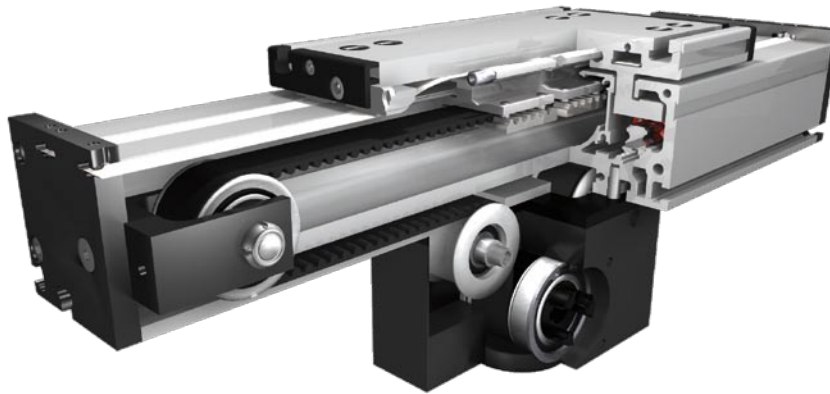
Version 2/3



Sample ordering code:

ELDZA 60 with standard body profile, standard carriage, standard shaft, steel pinion, 1295 mm stroke

Belt drive



Function:

This unit consists of a rectangular aluminium profile with 2 integrated rail guidess. The carriage is moved by a belt drive. An innovation is that the toothed belt is diverted within a drive block positioned centrally. The result is an enormous compactness with regard to the overall system length. The toothed drive pulley has a coupling claw in the standard version. 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 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.

| Forces and torques | Size | 120 | 160 | 200 |
|--|------|-----|------------------------|----------|
| | | | | |
| permitted dyn. Forces* | | | 5000 km | 10000 km |
| F_x (N) | | | 1900 | 1800 |
| F_y (N) | | | 5570 | 3900 |
| F_z (N) | | | 7050 | 5020 |
| M_x (Nm) | | | 358 | 255 |
| M_y (Nm) | | | 369 | 262 |
| M_z (Nm) | | | 364 | 258 |
| C (N) | | | 7800 | |
| All forces and torques related to the following: | | | | |
| existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ | | | | |
| table values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$ | | | | |
| No-load torque | | | | |
| Nm without cover bands | | | 1,5 | |
| Nm with cover bands | | | 2,1 | |
| Speed | | | | |
| (m/sec) max | | | 5 | |
| Tensile force | | | | |
| permanent (N) | | | 1900 | |
| 0,2 sec (N) | | | 2090 | |
| Geometrical moments of inertia of aluminium profile | | | | |
| I_x mm ⁴ | | | 21,32x10 ⁵ | |
| I_y mm ⁴ | | | 123,36x10 ⁵ | |
| Elastic modulus N/mm ² | | | 70000 | |

* referred to life-time

Formula: DSZS

Driving torque:

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

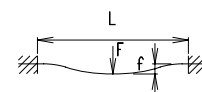
$$P_o = \frac{M_o \cdot n}{9550}$$

- F = force (N)
- P = pulley action perimeter (mm)
- S = safety factor 1,2 ... 2
- M_{leer} = no-load torque (Nm)
- n = rpm pulley (min⁻¹)
- 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
- I = second moment of area (mm⁴)



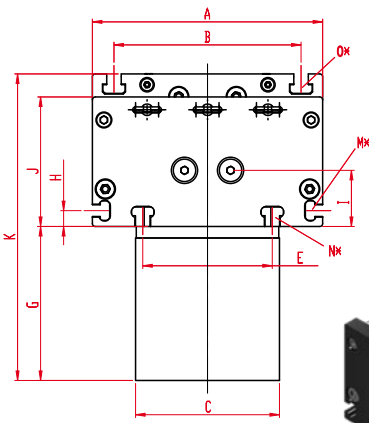
Nominal lifetime:

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

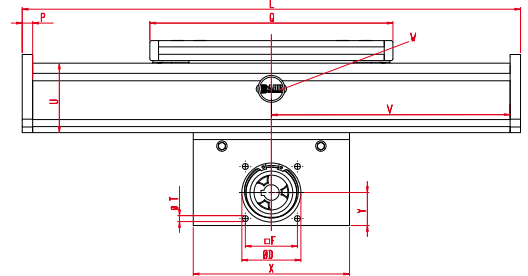
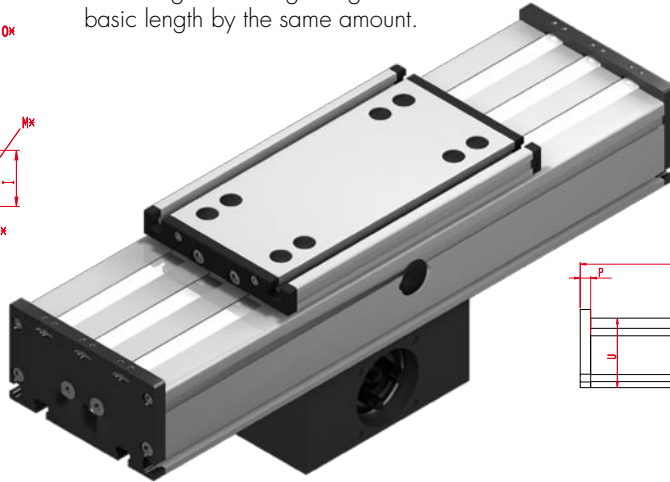
- L = Lifetime in meter
- C = Dynamic load factor (N)
- F = Middle load (N)

Positioning system DSZS 120, 160, 200

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

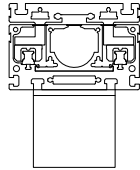
$V = Q + 100 \text{ mm}$ $W = \text{servicing position}$

| Size | Basic length L | 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 | |
|----------|----------------|-----|-----|-----|----|----|----|-----|----|----|----|-----|-------|-------|-------|----|-----|-----|----|-----|----|--------------|-------------------|--|
| DSZS 120 | | | | | | | | | | | | | | | | | | | | | | | | |
| DSZS 160 | 310 | 160 | 130 | 100 | 68 | 90 | 60 | 107 | 11 | 39 | 90 | 213 | M 6 | M 8 | M 8 | 12 | 280 | M 8 | 80 | 180 | 38 | 23,0 kg | 1,9 kg | |
| DSZS 200 | | | | | | | | | | | | | | | | | | | | | | | | |

Choice of guide body profile:

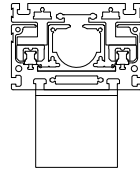
0

(0)



internal profile with cover bands

(1)



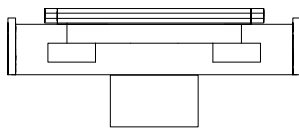
internal profile without cover bands

Stainless versions upon request.

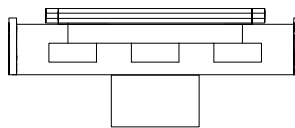
Choice of carriages:

0

(0)



(1)



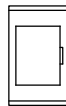
| Size | Version 0 | | Version 1 | |
|------|-----------|-----|-----------|-----|
| | Q | L | Q | L |
| 120 | | | | |
| 160 | 280 | 310 | 280 | 310 |
| 200 | | | | |

Drive version:

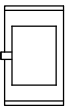
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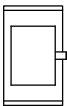
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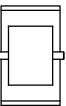
1



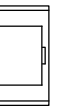
3



4



5



5 is as 0, but with coupling claws on both sides.

The standard version is supplied without shaft. A shaft can be retrofitted by inserting it into the pulley bore and securing it with 2 locking rings or tension sets (size 200).

Belt table

| Code No. | Size | Belt | mm/rev. | Number of teeth |
|----------|------|------|---------|-----------------|
| 0 4 | 120 | 5M25 | | |
| 0 7 | 160 | 8M30 | 192 | 24 |
| 0 9 | 200 | 8M50 | | |

Shaft dimensions

| Size | Shaft \varnothing h6 x length | Key |
|------|---------------------------------|--------|
| 120 | | |
| 160 | 18 x 45 | 6x6x40 |
| 200 | | |

Basic length + stroke = total length

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 main catalog chapter 2.2 - 4.2.



DSZS 160 1 0 0 0 0 7 1 01500

Pos. 1 2 3 4 5 6 7

Sample ordering code:

DSZS160 with internal profile and cover bands, standard carriage, coupling claw on one side, 1190 mm stroke.

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. A special design of the carriage geometry results in the guiding profile being covered. This prevents small parts from falling into the system, so that clean-room applications are possible.

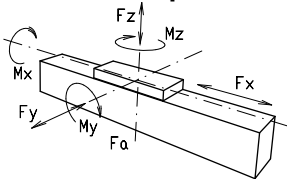
Fitting position: As required. Max. length 3.000 mm without joints.

Carriage mounting: By threaded 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 4 runner blocks which can be serviced at a central servicing position. For longer carriages the number of runner blocks can be increased. Repeatability $\pm 0,05\text{mm}$. Repeated accuracy max. $\pm 0,05\text{mm}$ up to 3.000 mm

Forces and torques



- F_z = external force by load
- F_a = magnetic attraction force
- F_{zm} = maximum force in consideration of motor power
- $F_{zm} = F_z + F_a$

| Size | 160 | | | 200 | | |
|--|------------------------|------|------|------------------------|------|-------|
| Motor size | 1 | 2 | 3 | 1 | 2 | 3 |
| permitted dyn.Forces* | 10000 km | | | 10000 km | | |
| F_a (N) | 1200 | 1800 | 5500 | 3600 | 5500 | 11000 |
| F_{zm} (N) | 1590 | 2800 | 7030 | 4990 | 7640 | 13860 |
| F_z (N) | 1775 | 1775 | 3550 | 4092 | 4092 | 8184 |
| M_x (Nm) | 160 | 128 | 153 | 357 | 231 | 462 |
| M_y (Nm) | 373 | 351 | 532 | 769 | 556 | 1540 |
| M_z (Nm) | 222 | 261 | 328 | 585 | 654 | 906 |
| C (N) | 7800 | | | 22800 | | |
| Number of runner blocks | 4 | 4 | 8 | 4 | 4 | 8 |
| All forces and torques related to the following: | | | | | | |
| existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_{zm}}{F_{zm_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1,5$ | | | | | | |
| table values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_{zm}}{F_{zm_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1,5$ | | | | | | |
| Motor specifications Fx | | | | | | |
| 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 |
| Moving force without current | | | | | | |
| N | 30 | 30 | 60 | 40 | 40 | 80 |
| Geometrical moments of inertia of aluminium profile | | | | | | |
| I_x mm ⁴ | 2,13 x 10 ⁶ | | | 4,81 x 10 ⁶ | | |
| I_y mm ⁴ | 12,3 x 10 ⁶ | | | 26,0 x 10 ⁶ | | |
| Elastic modulus N/mm ² | 70000 | | | 70000 | | |

* referred to life-time

Formula: DSM P

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/mm²)
- I = second moment of area (mm⁴)

Nominal lifetime:

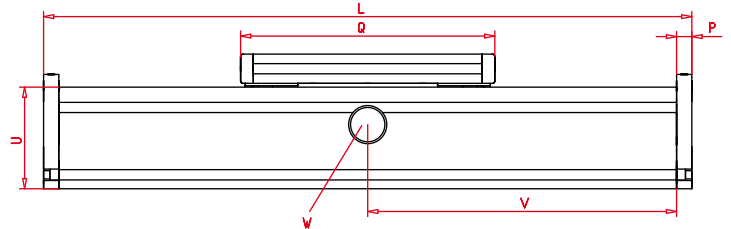
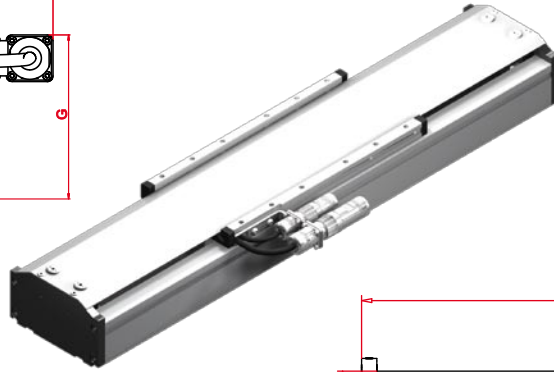
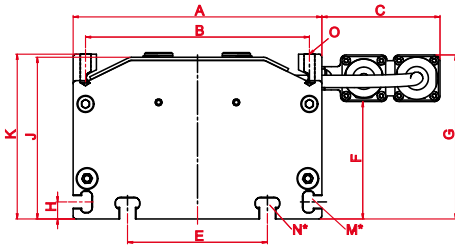
$$L = \left(\frac{C}{F} \right)^3 \times 10^5$$

C = Dynamic load factor (N)

F = Middle load (N)

Positioning system DSM 160P, 200P

Dimensions (mm)



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

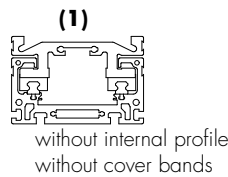
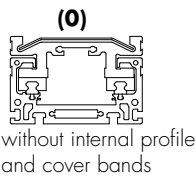
*For slide nuts refer to main catalog chapter 2.2 page 2

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

W = servicing position

| Size | Basic length L | A | B | C | E | F | G | 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 160P | Q + 30 | 160 | 144 | 76 | 90 | 76 | 106 | 11 | 104 | 106 | M 6 | M 8 | M 8 | 12 | 80 | 12,1/15/20 | 1,7/2,1/2,1 |
| DSM 200P | Q + 35 | 200 | 182 | 76 | 140 | 96 | 126 | 15 | 126 | 129 | M 8 | M 10 | M 10 | 15 | 100 | 26,1/29,6/36,8 | 2,8/2,8/2,8 |

0 Choice of guide body profile:



Stainless version upon request.

1 Measurement system:

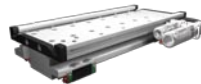
- (1) Measurement system LE100/1 5V (2) Measurement system LE100/1 10,5-30V (3) Hall sensor (4) Measurement system provided by customer
Resolution 0.05 Resolution 0.05

1 Plug:

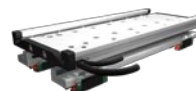
(1) Plug Pos. 1



(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 | | | | | | |
|--|-------|-------|----------|-------|-------|-------|
| | I_p | b_p | h_{ps} | Q_1 | Q_2 | Q_3 |
| 160 | Q-70 | 71 | 50 | 316 | 360 | 461 |
| 200 | Q-70 | 85 | 62 | 410 | 444 | 610 |

I_p = length primary part; b_p = width primary part;
 h_{ps} = height primary part + height secondary part
+ interspaces primary/secondary part

1500 Basic length + stroke = total length

DSM 160P 0 0 1 1 0 0 1 01500

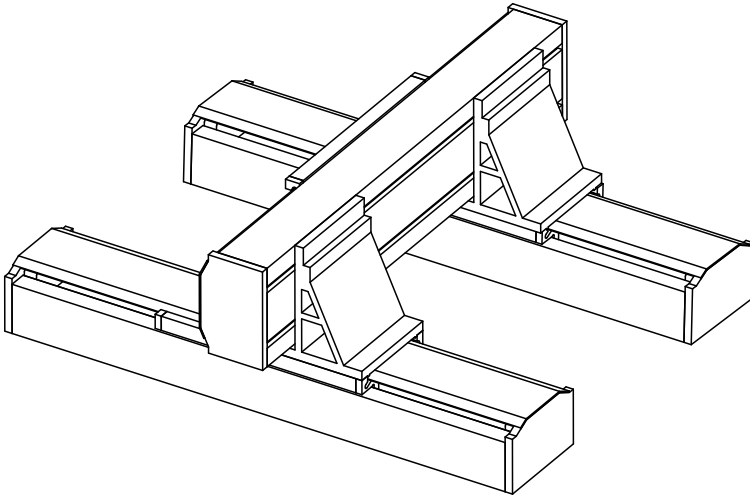
Pos. 1 2 3 4 5 6 7

Sample ordering code:

DSM160P, Bahr Modultechnik Linear motor, standard body profile, Measurement system LE100/1 5V, Plug Pos. 1, motor size 1, 1154 mm stroke

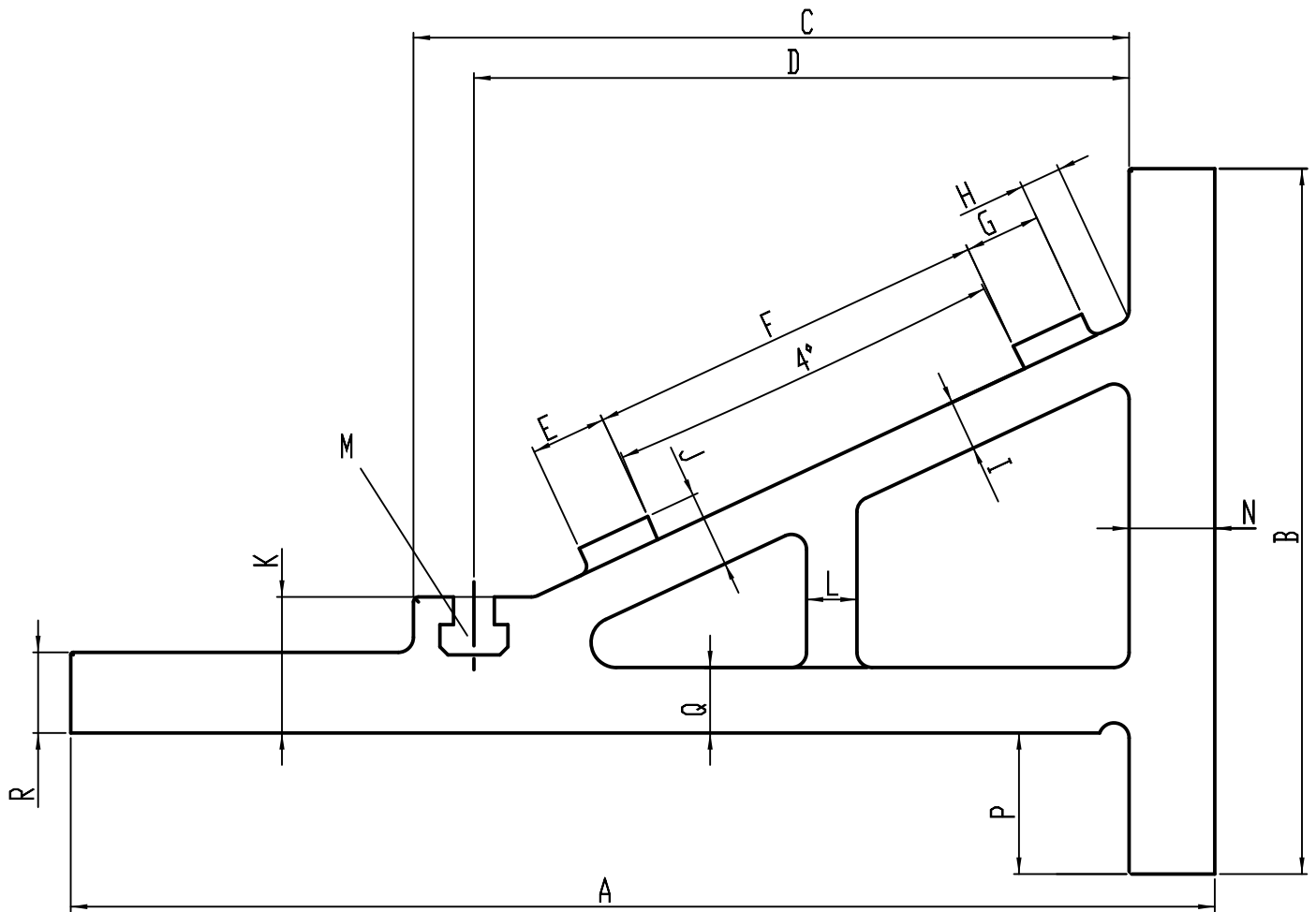
For standard carriage length see 'Q' in table.
The carriages can be delivered in any non-standard length upon request; the longer the carriage, the greater the load capacity. For digital controllers and linear encoder refer to main catalog chapter 9.1 page 10.

Angle bracket profile 140



Function:

Various assemblies and axis types can be connected to the angle bracket profile. It can also be used to reinforce self-supporting positioning systems or to mount portals on profile frames.



| Code-No. | A | B | C | D | E | F | G | H | I | J | K | L | M for | N | P | Q | R | m [kg/m] | L _{max.} |
|----------|-----|-----|-----|-----|----|----|----|------|----|----|----|----|-------|----|----|----|----|----------|-------------------|
| 4200x | 227 | 140 | 142 | 130 | 15 | 80 | 15 | 8,05 | 10 | 15 | 27 | 10 | M 6 | 17 | 28 | 13 | 16 | 19,9 | 6000 |