

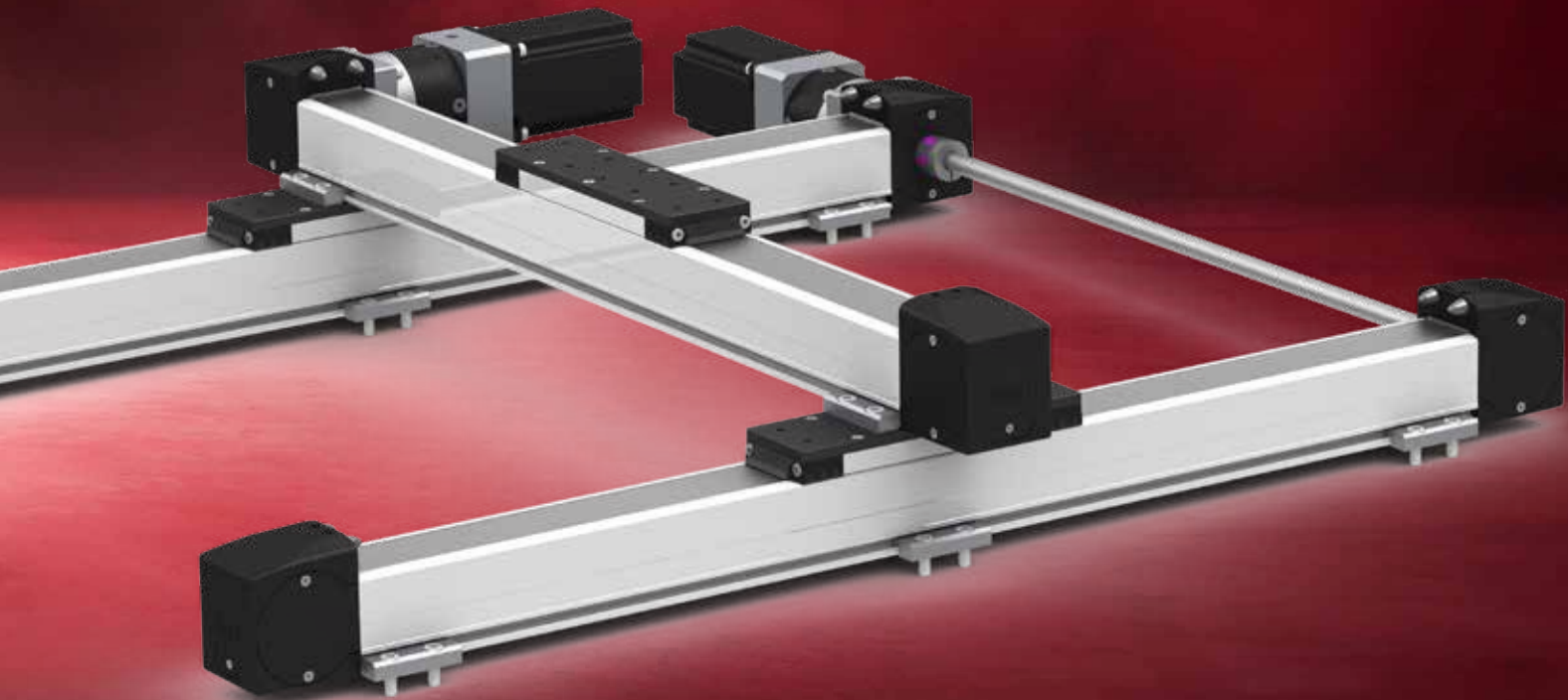


**isel**Germany  
*engineering to the point.*

Linear units

with toothed belt drive

Pinpoint accuracy with high dynamics over long distances



## Automation sales team



### **Steffan Gärtch**

Technical sales

Tel.: +49 (0) 6659 / 981-773

Fax: +49 (0) 6659 / 981-776

steffan.gaerth@isel.com



### **Katja Henkel**

Technical sales

Tel.: +49 (0) 6659 / 981-744

Fax: +49 (0) 6659 / 981-776

katja.henkel@isel.com



### **Jessica Gatterdam**

Team Assistant Sales

Tel.: +49 (0) 6659 / 981-751

Fax: +49 (0) 6659 / 981-776

jessica.gatterdam@isel.com

General Terms of Delivery and  
terms of payment



[www.isel.com/agb-aeb](http://www.isel.com/agb-aeb)

Stand: Februar 2025



## Content

Linear unit equipped with toothed belt drive LEZ 4G.....	6
Linear unit equipped with toothed belt drive LEZ 1 .....	10
Linear unit equipped with toothed belt drive LEZ 2 .....	12
Linear unit equipped with toothed belt drive LEZ 3 .....	14
Accessories LEZ.....	16

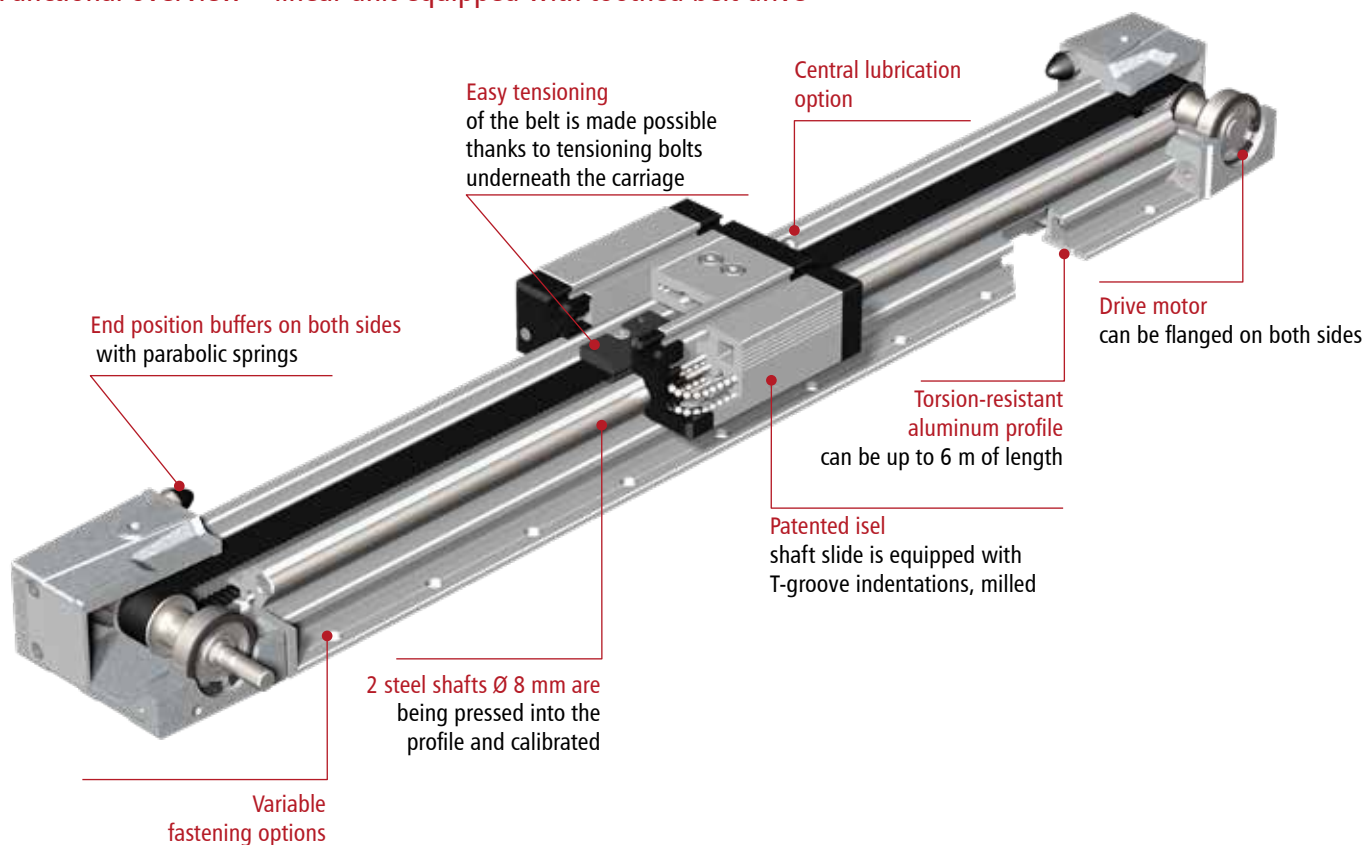


## Precisely with high dynamics throughout long distances

The linear units equipped with toothed belt drives are the first choice when it comes to high speeds and long travel distances, thanks to the precise positioning and high repeat accuracy in the areas of handling, assembly automation and machine handling. The compact and flexible modules turn on greatly dynamic movements, and that is why short cycle times do not require big investments.

The linear units are, therefore, the best for both fast handling-positioning tasks, and for performing light to medium-heavy loads. The modules are designed of extruded aluminum casing profiles, linear rail guides are based on the recirculating ball principle equipped with shaft slides or roller guides. Different versions of the linear units, which are equipped with toothed belt drive, provide our customers a large variety of products. Since there are countless varieties of accessories and due to the modular design, we can also adapt linear units to your individual demands or combine them together into multi-axis systems.

### Functional overview – linear unit equipped with toothed belt drive

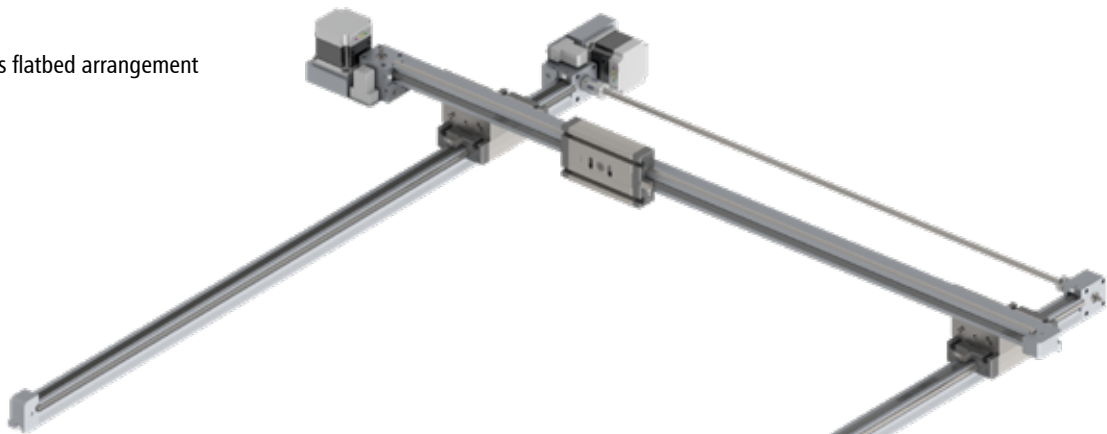




## Combination examples

### LEZ 1

- 2-axis flatbed arrangement



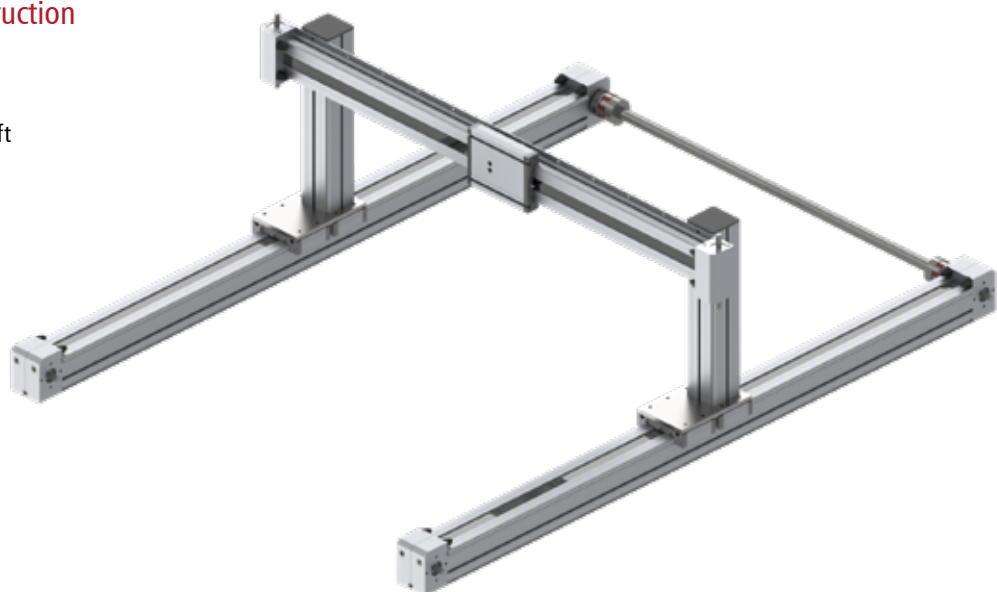
### XY stage LEZ 1

- 2 x LEZ 1
- 1 x connection plate



### 2-axis H-construction

- 2 x LEZ 3
- 1 x LEZ2
- Transmission shaft



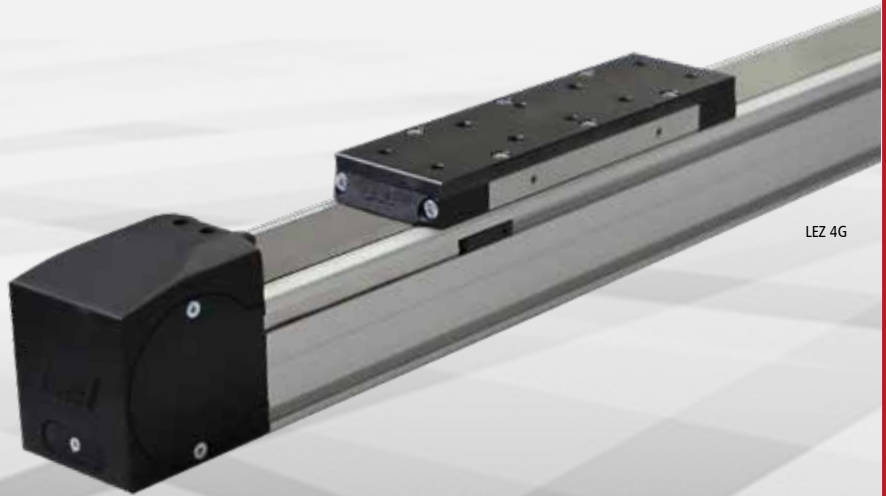


# Linear unit equipped with toothed belt drive LEZ 4G

- Stainless steel cover as standard
- External limit switch sensors as standard
- Feed speed up to 5 m/sec
- Repeat accuracy +/- 0.2 mm
- Standard length up to 3 m
- Feed per revolution 90 mm
- Planetary gearbox 1:3
- Direct motor adaptation via hollow shaft
- Motor connection for flange 60 mm
- protection class IP 50

**Options:**

- Special lengths and other reduction ratios on request



**Order key**

232200 XXXX

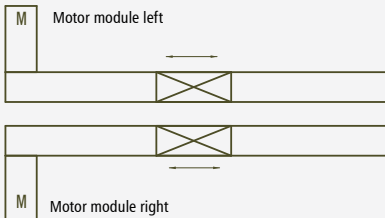
**Drive block version**

- 0 = without motor / without limit switch
- 1 = for motor right / with limit switch
- 2 = for motor left / with limit switch

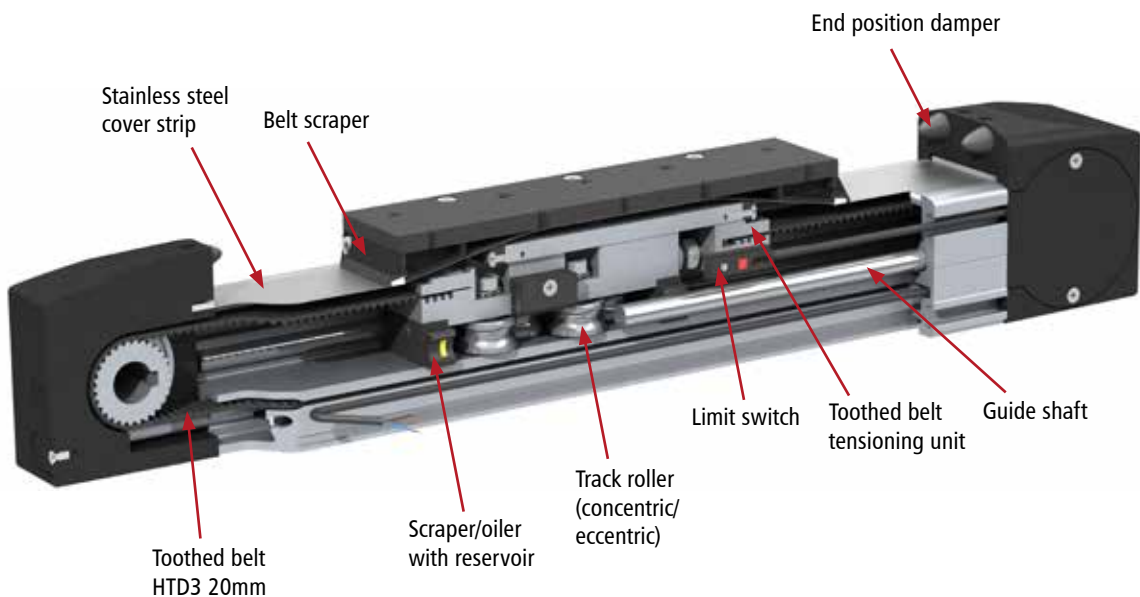
**Profile lengths (mm)\***

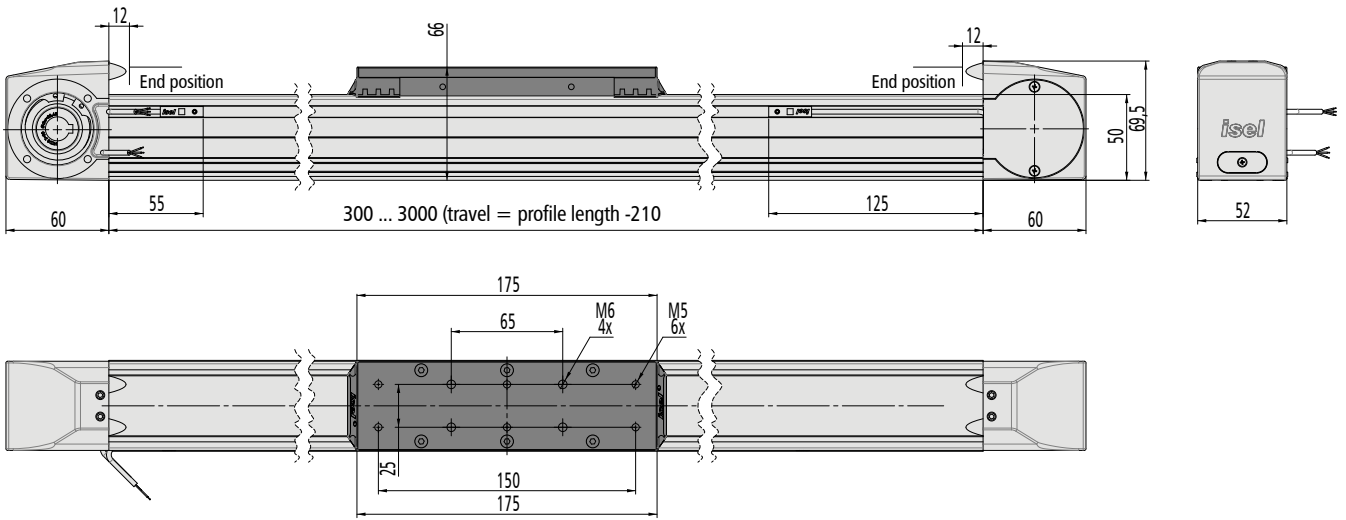
- z.B. 030 = 300 mm (min.)
- 300 = 3000 mm (max.)

\*Standard profile lengths can be ordered in 100 mm increments (travel = profile length -210 mm)



Limit switch, movable

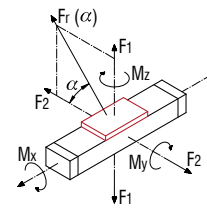




**Technical data**

Belt typ	HTD 3M, width 20 mm
Weight without drive module	1000 mm = 7,75 kg
Specific mass of the toothed belt	0,05 kg/m
Carriage weight	0,85 kg
Specific guide weight	0,280 kg/100 mm
Feed per revolution	90 mm
Mass moment of inertia of the synchronizing pulleys	0,00011 kgm <sup>2</sup>

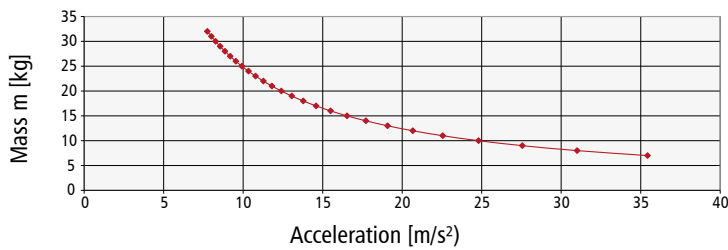
**Load data**



$$Fr(\alpha) = \frac{F_2}{\cos \alpha}$$

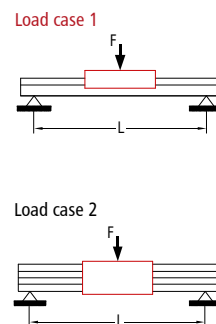
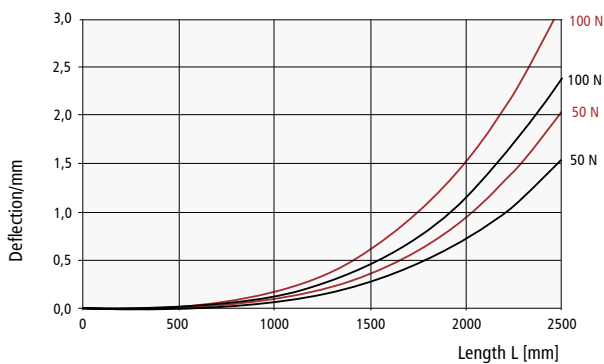
$$Fr(\alpha) = \frac{F_1}{\sin \alpha}$$

**Load diagram**



C <sub>y</sub>	2800 N
C <sub>0y</sub>	1488 N
C <sub>z</sub>	1776 N
C <sub>0z</sub>	1032 N
F <sub>1</sub> static	200 N
F <sub>1</sub> dynamic	850 N
F <sub>2</sub> static	300 N
F <sub>2</sub> dynamic	1400 N

**Deflection**

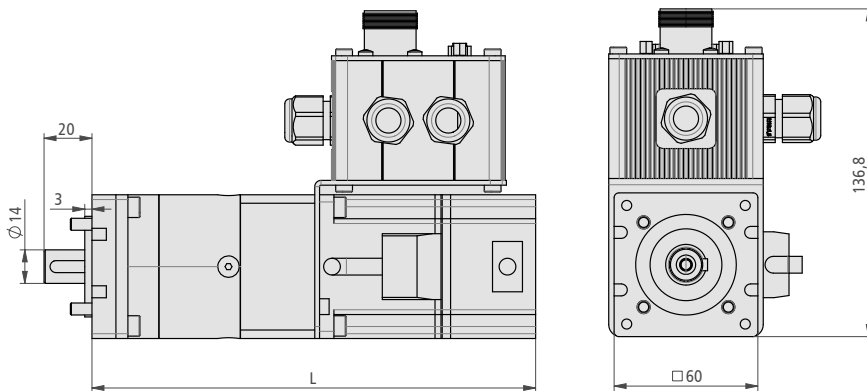


M <sub>0x</sub> static	23 Nm
M <sub>0y</sub> static	35 Nm
M <sub>0z</sub> static	37 Nm
M <sub>x</sub> dynamic	40 Nm
M <sub>y</sub> dynamic	60 Nm
M <sub>z1</sub> dynamic	70 Nm



### Drive modules | LEZ 4G

Drive module with stepper motor and EC servo motor



Part no.	Servo motor without gearbox	L
396421 9060X	200W / 48V without brake	102
396421 9260X	200W / 48V with brake	131
396421 9070X	200W / 310V without brake	102
396421 9270X	200W / 310V with brake	131

Part no.	Servomotor with gearbox 3:1	L
396421 9062X	200W / 48V without brake	185
396421 9262X	200W / 48V with brake	214
396421 9072X	200W / 310V without brake	185
396421 9272X	200W / 310V with brake	214

Part no.	Stepper motor without gearbox	L
396058 9060	MS200HT without brake	88
396058 9260	MS200HT with brake	126

Part no.	Stepper motor with gearbox 3:1	L
396058 9061	MS200HT without brake	164
396058 9261	MS200HT with brake	202

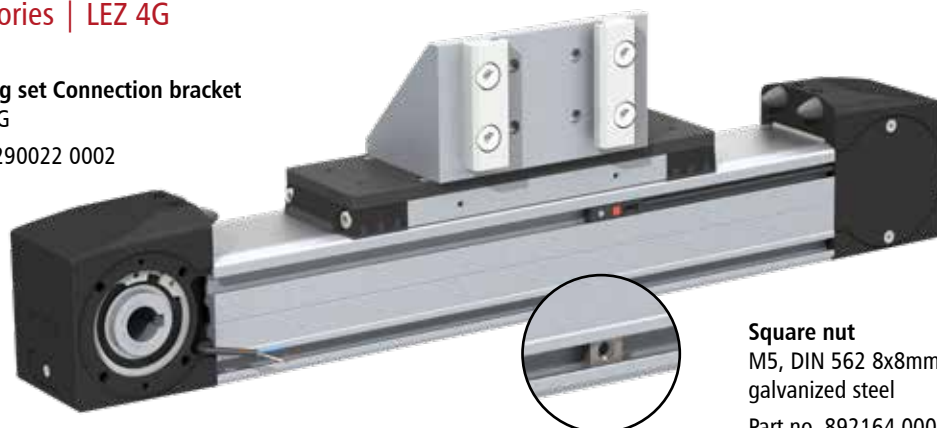
### Connection flange for alternative motors



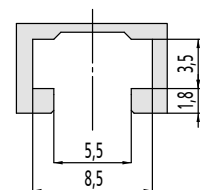
### Accessories | LEZ 4G

Mounting set Connection bracket for LEZ 4G

Part no. 290022 0002



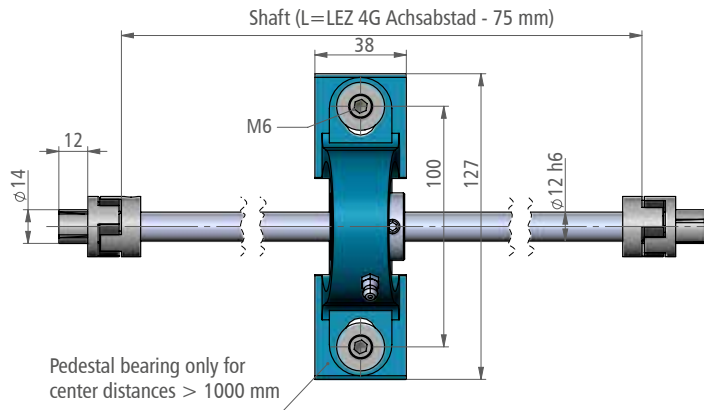
Square nut M5, DIN 562 8x8mm, galvanized steel Part no. 892164 0000





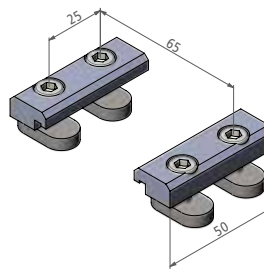
**Transmission shaft**

- prepared in lengths of 1 m and 2 m  
-> d= 12mm
- Mechanical connection via two hollow shaft couplings included in the scope of delivery
- Center distance < 1m  
Part no. 219002 1000
- Center distance > 1m  
Part no. 219002 2000  
(including pedestal bearing)

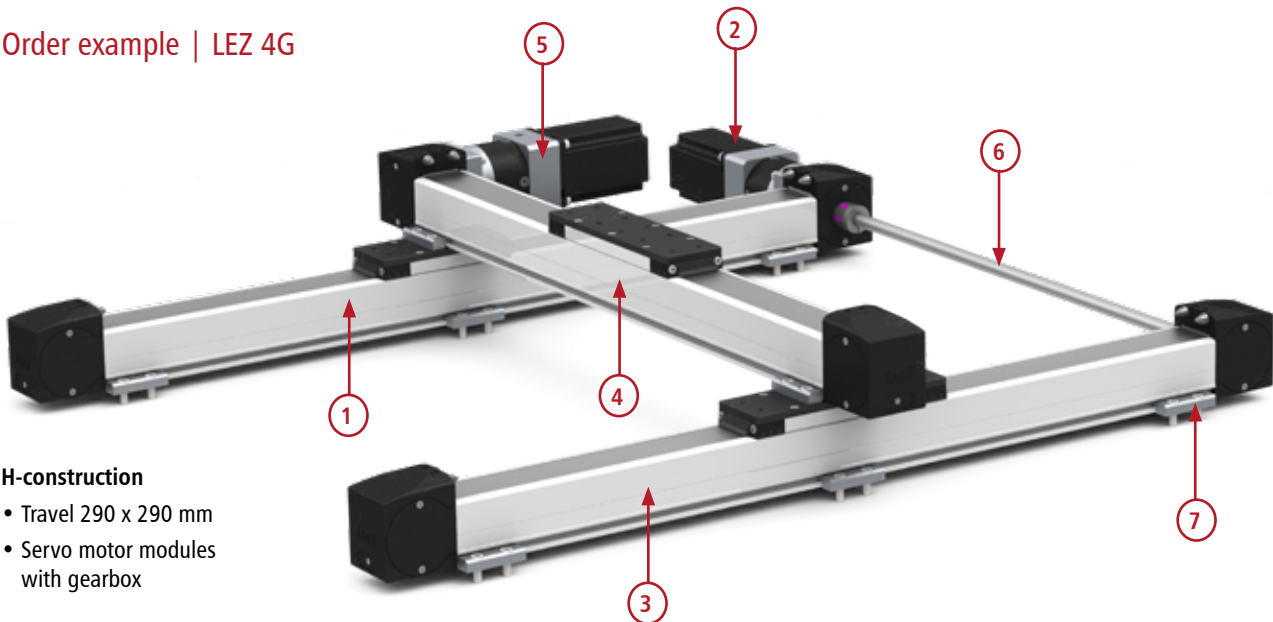


**Clamping claws**

- for attaching the axle to the mounting plate and for axle combinations
  - threaded holes suitably prepared for mounting an H-construction
  - PU = 10 pieces, incl. screws and sliding nuts
- Part no. 290022 0001



**Order example | LEZ 4G**



**H-construction**

- Travel 290 x 290 mm
- Servo motor modules with gearbox

**1. LEZ 4G for motor right, with limit switch**  
Part no. 232200 1500

**3. LEZ 4G without motor, without limit switch**  
Part no. 232200 0500

**5. Servo motor module with gearbox**  
Part no. 396421 9062X

**7. Clamping claws for LEZ 4G, PU 10 pieces**  
Part no. 290022 0001

**2. Servo motor module with gearbox**  
Part no. 396421 9062X

**4. LEZ 4G for motor left**  
Part no. 232200 2500

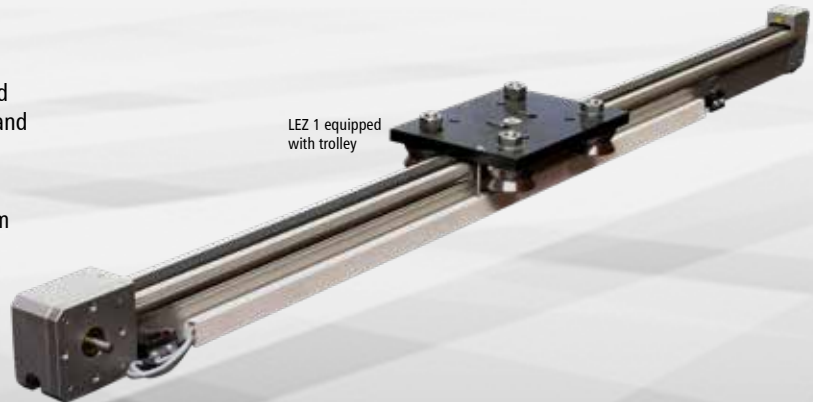
**6. Transmission shaft < 1 m, incl. couplings**  
Part no. 219002 1000

**Ask for your individual offer.**



# Linear unit equipped with toothed belt drive LEZ 1

- Aluminum profile, Miniature linear guide LFS-8-2
- Clearance-free feed is equipped with toothed belt drive toothed belt with 3 mm gradient and width of 9 mm
- Feed per rotation: 60 mm
- Repeatability less than or equal to  $\pm 0.2$  mm
- Maximum feed of 1.5 m/s
- Overrun limit switch is equipped with connection cable
- Mechanical limit switches

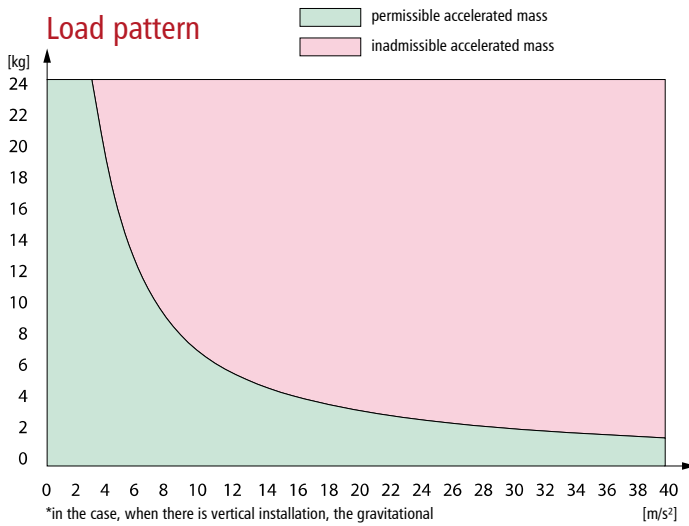


LEZ 1 equipped with trolley

### Options:

- Special lengths in grid size of 100 mm upon request, maximum size - 6,000 mm
- Fastening done via integrated threaded rail M6, grid size of 50 mm
- Stepping motor drive module of 50Ncm, SubD Part No.: **396049 3010L**
- Reed sensor

### Load pattern



\*in the case, when there is vertical installation, the gravitational acceleration ( $g = 9.81$  m/s²) must be taken into account

### Technical data

Belt type	HTD 3 M, width 9mm
Slide weight	0.430 kg
Weight without drive module	1000 mm = 3 kg
specific mass of the toothed belt	0.0225 kg/m
Carriage weight	1.03 kg
specific guidance on weight	0.200 kg/100 mm
Feed per rotation	60 mm
Effective diameter of the synchronizing pulleys	$\varnothing 19.10$ mm
Mass moment of inertia of the synchronizing pulleys	$5.585 \times 10^{-7}$ kg m²

### Order key

232005 XXXX

Drive/slide carriage

8 = without motor, with shaft slide

9 = without motor, with carriage

Profile lengths LFS-8-2 (mm)  
298, 398, 498, 598, 675, 698, 798, 998, 1,498, 1,798, 1,998, 2,498, 2,998  
(for example 398 mm = 040, 675 mm = 068)  
Option: up to 6,000 mm

Drive module with stepping motor MS-045 HT

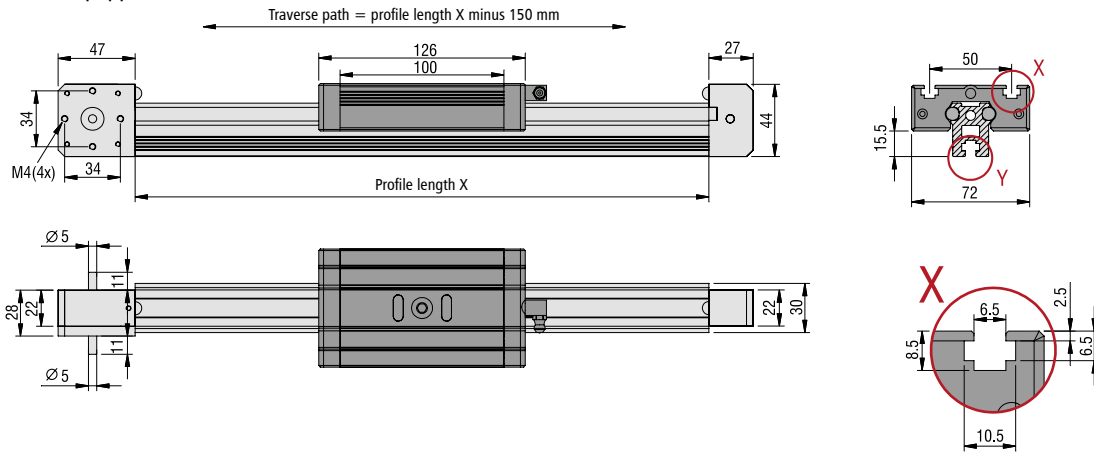


Drive module equipped with stepping motor MS-045 HT (reduction 2:1)

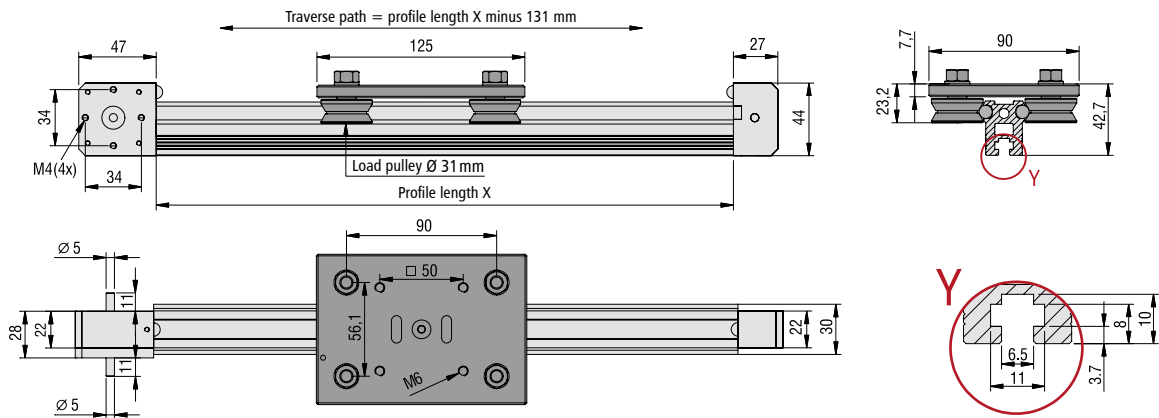


### Dimensional drawings

without motor, equipped with shaft slide



without motor, equipped with trolley



### Drive modules

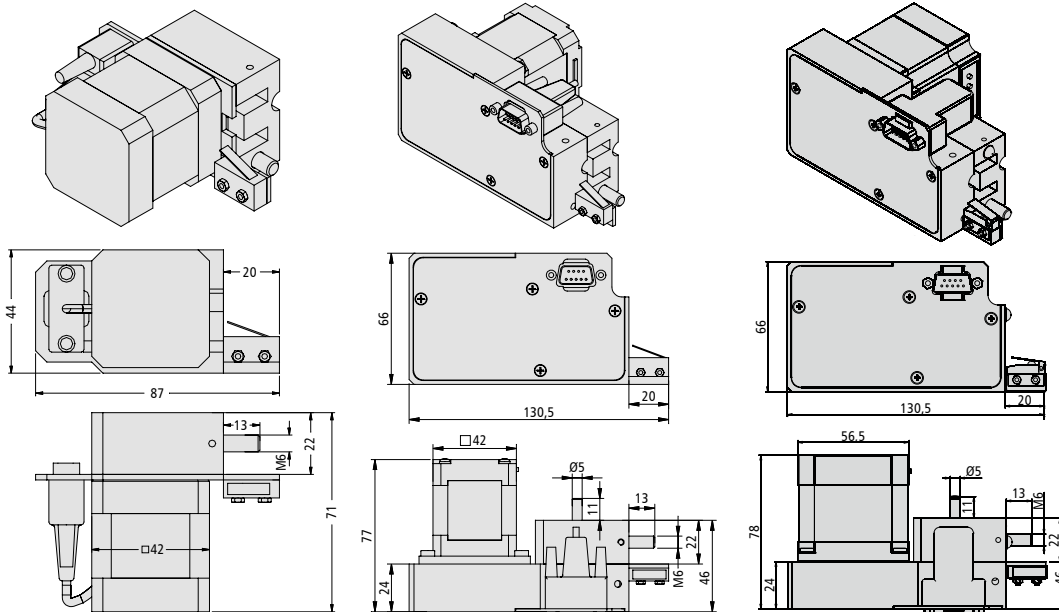
Drive module is with stepper motor MS-048 HT (direct drive)  
feed: 60 mm / revolution  
Part No.: 396048 3015

Drive module is with stepper motor MS-048 HT (reduction 2:1)  
Feed: 30 mm / rotation  
Part No.: 396049 3015

Drive module is with stepper motor MS-135 HT (reduction 2:1)  
Feed: 30 mm / rotation  
Part No.: 396056 3015

EC40 motor module  
100 W / 48 V TM  
(for LEZ1 with reduction ratio 2:1)  
Feed:  
30 mm / rotation  
Part No.:  
396410 3060

Total length including the motor module:  
Profile length + 115 mm





# Linear unit equipped with toothed belt drive LEZ 2

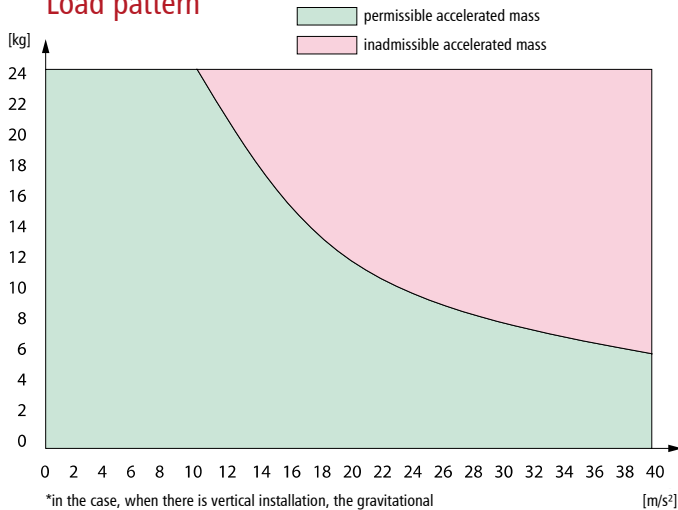
- Aluminum profile, with miniature linear guide LFS-8-5
- Clearance-free feed is equipped with toothed belt drive toothed belt with 5 mm gradient and width of 25 mm
- Maximum feed of 5 m/s
- Shaft slide WS 3, L 176 x W 130 mm
- Feed per rotation: 70 mm
- Repeatability less than or equal to  $\pm 0.2$  mm
- available in lengths up to 6,000 mm
- Overrun limit switch is equipped with connection cable
- Mechanical limit switches



**Options:**

- Special lengths in grid size of 100 mm upon request, maximum size - 6,000 mm
- Also as a direct drive, which is equipped with a stepping motor servo motor
- inductive limit switches

**Load pattern**



**Technical data**

Belt type	HTD 5M, width 25 mm
Slide weight	0.940 kg
Weight without drive module	1000 mm $\cong$ 7.9 kg
specific mass of the toothed belt	0.09 kg/m
Carriage weight	2.03 kg
specific guidance on weight	0.472 kg/100 mm
Feed per rotation	70 mm
Effective diameter of the synchronizing pulleys	$\varnothing 22.28$ mm
Mass moment of inertia of the synchronizing pulleys	$5.58 \cdot 10^{-6} \text{ kgm}^2$

**Order key**

232002 XXXX

<p>Drive/slide carriage</p> <p>8 = without motor, with shaft slide</p> <p>9 = without motor, with carriage</p>	<p>Profile lengths (mm)</p> <p>696, 996, 1496, 1996, 2496, 2996</p> <p>(e.g. 696 mm = 070 1496 mm = 150)</p> <p>Option: up to 6000 mm</p>
--	---

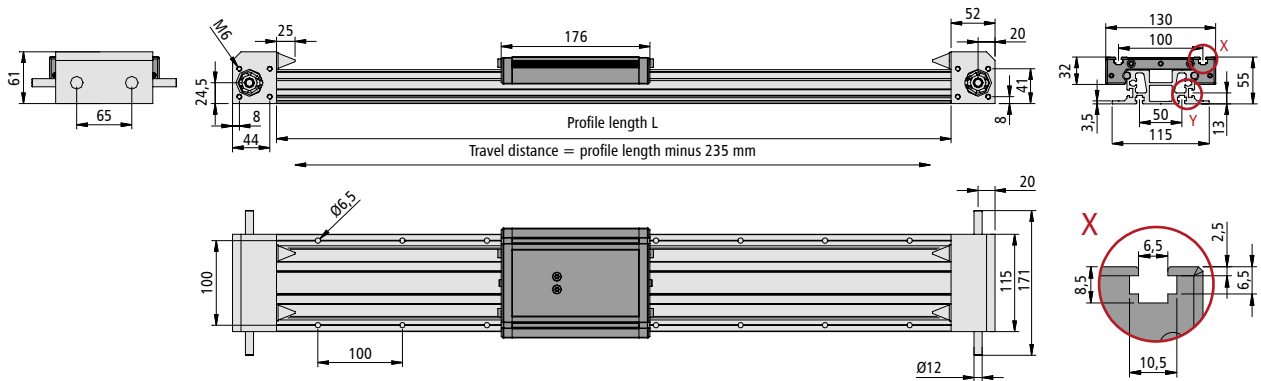
Drive module is equipped with servo motor EC 60



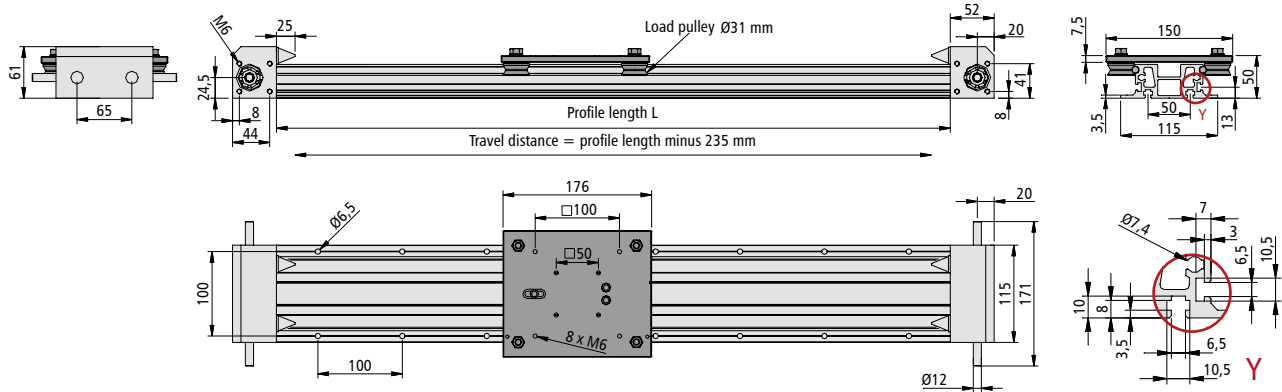


## Dimensional drawings

without motor, equipped with shaft slide



without motor, equipped with trolley

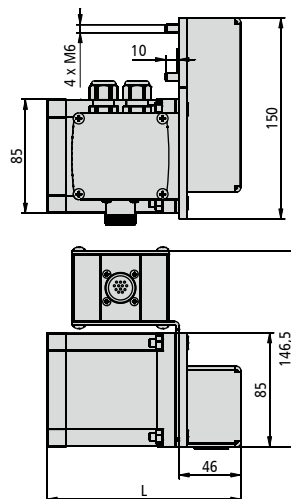


## Drive modules

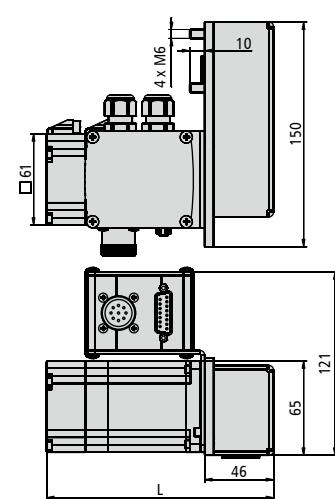
The drive module is equipped with both stepper motor and EC servo motor  
reduction 2:1 - feed: 35mm / revolution

Part No.	Motor module	Length, L
396086 3060	Stepping motor MS 600 HT	146.5 mm
396089 3060	Stepping motor MS 900 HT	174.5 mm
396421 3060	EC servo motor EC60 TM 200W 48V	151.5 mm
396421 3070	EC servo motor EC60 TM 200W 310V	155.7 mm
396440 3080	EC servo motor EC60 TM 400W 48V	179.5 mm
396440 3070	EC servo motor EC60 TM 400W 310V	183.7 mm
396421 3260	EC servo motor EC60 TM 200W 48V - with brake	198.5 mm
396421 3270	EC servo motor EC60 TM 200W 310V - with brake	202.7 mm
396440 3280	EC servo motor EC60 TM 400W 48V - with brake	226.5 mm
396440 3270	EC servo motor EC60 TM 400W 310V - with brake	226.5 mm

Dimensional drawing Stepping motor



Dimensional drawing EC servo motor





# Linear unit equipped with toothed belt drive LEZ 3

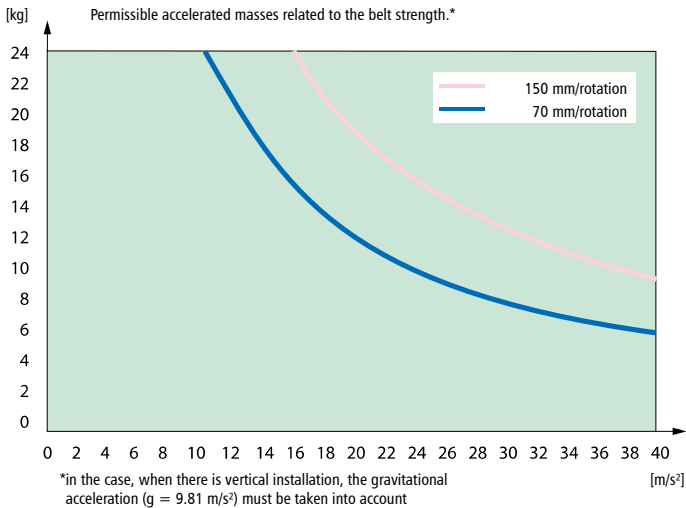
- Aluminum profile, miniature linear guide LFS-8-4
- Clearance-free feed is equipped with toothed belt drive toothed belt with 5 mm gradient and width of 25 mm
- Maximum feed of 5 m/s
- Shaft slide WS 3, L 176 x W 130 mm
- Feed per rotation: 70 mm or 150 mm
- Repeatability less than or equal to  $\pm 0.2$  mm
- Limit and/or reference switch accuracy  $< 0.1$  mm
- available in lengths up to 6,000 mm
- Motor modules can be flanged on the right and left side
- Mechanical limit switches



**Options:**

- Special lengths in grid size of 100 mm upon request, maximum size - 6000 mm

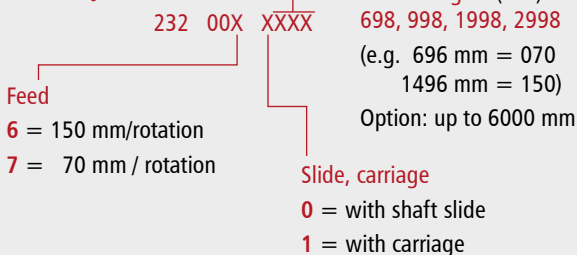
**Load pattern**



**Technical data**

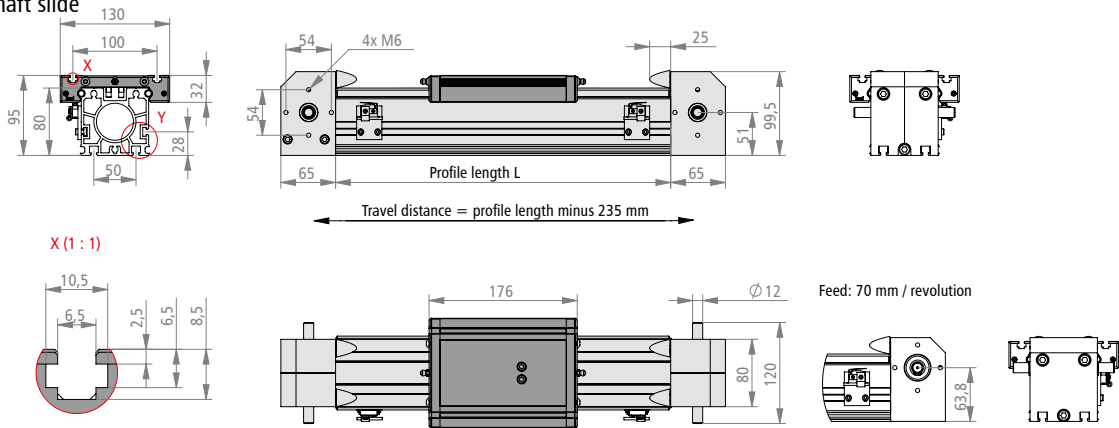
Belt type	HTD 5M, width 25 mm
Slide weight	0.940 kg
Weight without drive module	1000 mm $\hat{=}$ 10.5 kg
specific mass of the toothed belt	0.09 kg/m
Carriage weight	2.03 kg
specific guidance on weight	0.648 kg/100 mm
Feed per rotation	70 mm or 150 mm
Effective diameter of the synchronizing pulleys at 70 mm feed/rotation	$\varnothing 22.28$ mm
Effective diameter of the synchronizing pulleys at 150 mm feed/rotation	$\varnothing 47.75$ mm
The synchronizing pulleys have a mass moment of inertia at 70 mm feed/rotation	$5.58 \cdot 10^{-6} \text{ kgm}^2$
The synchronizing pulleys have a mass moment of inertia at 150 mm feed/rotation	$1.796 \times 10^{-4} \text{ kg m}^2$

**Order key**

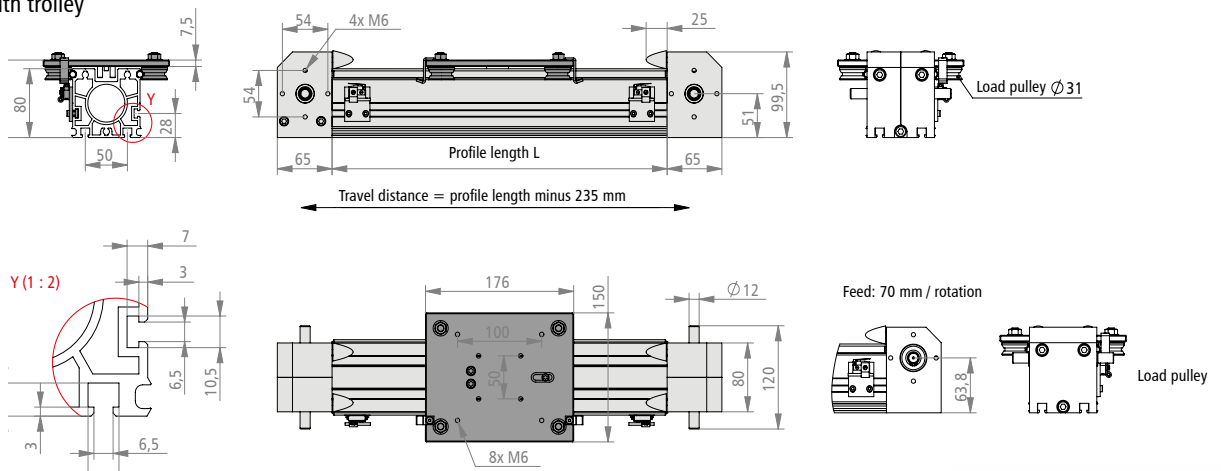




**Dimensional drawings**  
equipped with shaft slide

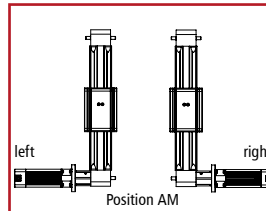
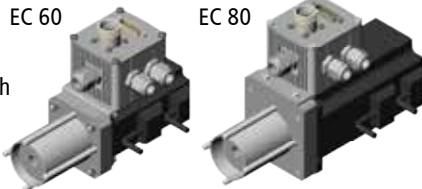


equipped with trolley



**Drive modules**

Drive module is equipped with EC servo motor (direct drive)

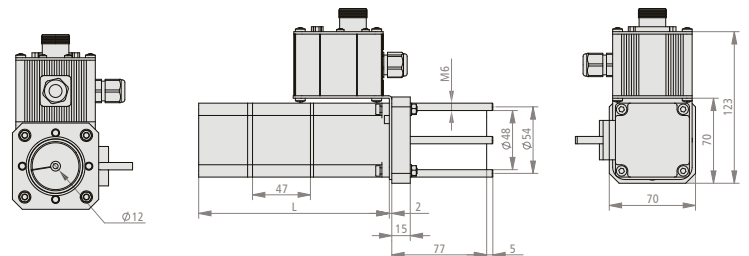


Drive module equipped with a stepping motor (direct drive)



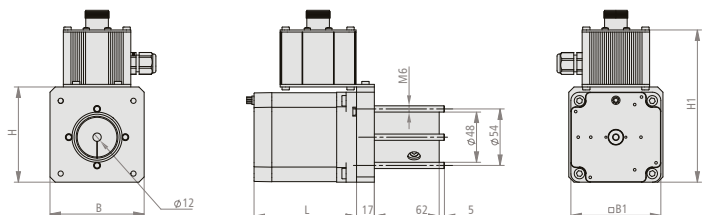
**Dimensional drawing EC 60**

Part No.	Motor module	Length, L
396421 006012	EC 60TM 200W 48V	103.5 mm
396421 026012	EC 60 TM 200W 48V equipped with brake	150.5 mm
396421 007012	EC 60 TM 200W 310V	107.7 mm
396421 027012	EC 60 TM 200W 310V equipped with brake	154.7 mm
396440 008012	EC 60 TM 400W 48V	131.5 mm
396440 028012	EC 60 TM 400W 48V equipped with brake	178.5 mm
396440 007012	EC 60 TM 400W 310V	135.7 mm
396440 027012	EC 60 TM 400W 310V equipped with brake	178.5 mm



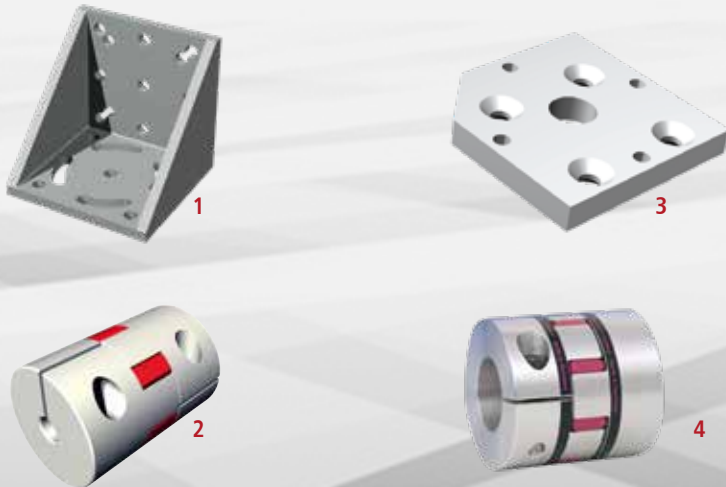
**Dimension drawing motor module 2**

Part No.	Motor module	L [mm]	H [mm]	H1 [mm]	B [mm]	B1 [mm]
396475 007012	EC 80 TM 750W	143	85	139.5	80	80
396475 027012	EC 80 TM 750W equipped with brake	191				
396085 006012	MS 600 HT	96	91	145.5	90	86
396088 006012	MS 900 HT	126				





## Accessories LEZ



### LEZ 1

#### Wire angle

- made for LEZ 1

Part No.: 209110 0010 (image 1)

#### 20/30 coupling

- made for LEZ 1
- 1 PU = 1 coupling

Part No.: 218001 5081 (image 2)

#### Shaft slide 1/70

- L 96 x W 72 x H 28.5 mm
- Milled clamping surface, M6 T-slot indentations
- centered Lubrication option, adjustable without clearance
- Weight: 0.35 kg
- Option: stainless design

Part No.: 223100 0070

stainless: 223101 0070

#### Transmission shaft

Length 1 m

Part No.: 227008 1000

### LEZ 2

#### Motor mounting plate

- made for LEZ 2
- Including mounting material
- made for direct drive

Part No.: 232199 0004 (image 3)

#### Coupling for the transmission shaft

- made for LEZ 2
- 1 PU = 2 pieces couplings

Part No.: 218050 0002 (image 4)

#### Transmission shaft Ø 25 mm

Length 1 m

Part No.: 219001 0125

Length 2 m

Part No.: 219001 0225

#### Pillow block bearing designed for transmission shaft

PU 1 piece

Part No.: 896202 5562

### LEZ 3

#### Coupling for the transmission shaft

- made for LEZ 3
- 1 PU = 2 pieces couplings

Part No.: 218050 0002 (image 5)

#### Transmission shaft Ø 25 mm

Length 1 m

Part No.: 219001 0125

Length 2 m

Part No.: 219001 0225

#### Pillow block bearing is designed for transmission shaft

PU 1 piece

Part No.: 896202 5562



## Customized special applications

### Mechanical components from isel **Flexible & highly efficient**

The custom-made product shown here for engraving brass instruments is based on an aluminum base frame, which impresses with its robustness and durability and forms the foundation for a high-precision axis system. A 3-axis cantilever arrangement consisting of our LES 5 and LES 6 linear units with servomotors forms the heart of the system.

The workpiece is manually fixed on an LES 6 using a handwheel and brought into the desired position by a controlled RDH-M rotation unit. The system is operated via the user-friendly iOP-19 control panel, which was mounted on a mobile stand at the customer's request.

The program is processed using ProNC, an advanced software solution that is renowned for its performance and user-friendliness.



Fig.: „Engraving machine“ for Buffet Crampon

### **Do you also have an application for which you need our expertise?**

Together with our design department and our sales team, we will find a customized solution for you.



### **Our linear units for automation**

In today's world of manufacturing and mechanical engineering and mechanical engineering, linear units have become indispensable.

[www.isel.com/automatisierung/achssysteme/linearachsen](http://www.isel.com/automatisierung/achssysteme/linearachsen)



### **Further publications**

Media are available in our download area, software and regular updates are available.

[www.isel.com/service/download](http://www.isel.com/service/download)



### **Optimally networked**

Find out more about our branches and cooperation with selected partners.

[www.isel.com/unternehmen/partner](http://www.isel.com/unternehmen/partner)

## **isel Germany GmbH**

Bürgermeister-Ebert-Straße 40

D-36124 Eichenzell

Tel: +49 (0) 66 59/981-700

E-Mail: [info@isel.com](mailto:info@isel.com)

[www.isel.com](http://www.isel.com)