

Toothed belt and ball screw axes ELGA

FESTO



Motion without compromise

Highlights

- Protected: insensitive to harsh ambient conditions
- Clean: virtually no particle emissions for use in cleanrooms
- Perfect fit: different guide variants
- Powerful: maximum feed force and maximum service life
- Efficient: optimally configured with PositioningDrives

ELGA – the perfect solution whenever you need a protected guide.

The complete series of linear axes with internal guides comes in many variants with toothed belt or ball screw drive for impressive dynamic response, speed and power, while the different guides ensure it can be used in a multitude of applications. The ELGA is available as an individual axis or as a complete solution for standard handling systems.

Versatile

Simple, durable, highly dynamic – this large product range with three guide variants is suitable for many different applications. The scope of applications is extended even further by the numerous sizes, the large stroke range, optional second slide and various safety features.

Protected

The internal guide protects the ELGA when the going gets tough. The stainless steel cover band, its virtually gap-free design and guide pulley in the slide provide protection on the outside and inside, enabling it to be used in cleanrooms.

Complete portfolio

The ELGA and the electric axis series EGC complement one another perfectly. The ELGA can be used wherever there is a need for protected or high-performance axes. And the EGC can be used wherever a high level of rigidity and cost effectiveness are essential. This provides you with the correct linear motion in all applications. Added bonus: identical interfaces for slide, aluminium profile and motor.

The ELGA series at a glance

Designs, variants and technical features



Ball screw drive ELGA-BS-..

- Precision positioning with ball screw
- Slide guide type: recirculating ball bearing guide -KF



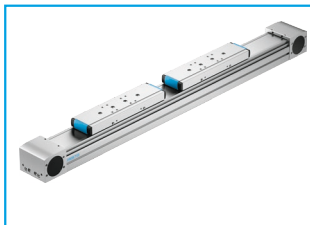
Motor positions

- Freely selectable at both ends of the axis
- Rotated 4 x 90° (can be changed)



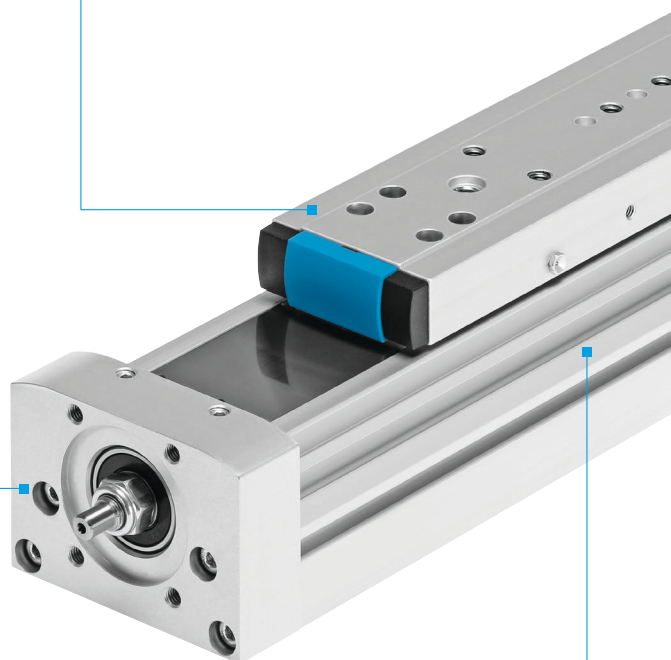
Aluminium profile

- Symmetrical profile design
- Optimised cross section and flow of forces



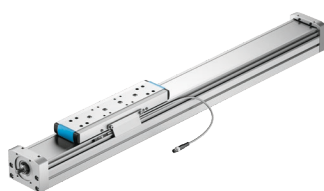
Second slide for toothed belt drive

- Additional, freely movable slide
- Able to absorb greater lateral and axial torques



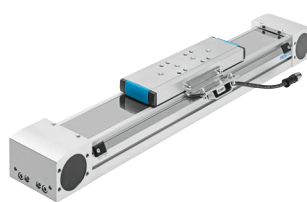
Central lubrication with recirculating ball bearing guide -KF

- 2 lubricating nipples for greasing the guide cassette and ball screw
- Alternative connection to a central lubrication system
- Suitable for oils and greases



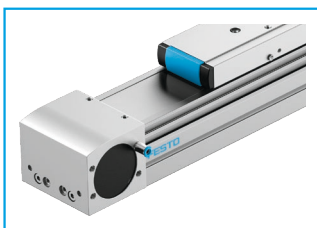
Inductive proximity sensor

- Easy to mount without protruding edges or additional mounting parts
- Up to 2 sensors per slot
- Can easily be added or repositioned at a later date



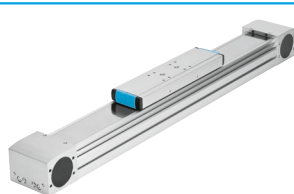
Incremental displacement encoder

- For safety-oriented 2-channel solutions
- For increased positioning accuracy of the toothed belt axis



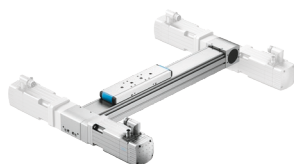
Connection for vacuum or sealing air

Greater protection thanks to an optional connection to prevent particles getting into or out of the internal space.



Toothed belt drive ELGA-TB-..

- Dynamic motion at up to 10 m/s
- Slide guide type:
 - Recirculating ball bearing guide -KF
 - Roller bearing guide -RF
 - Plain-bearing guide -G

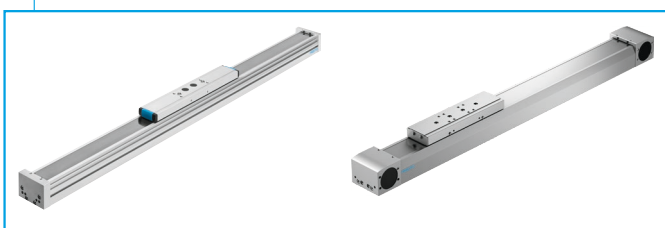
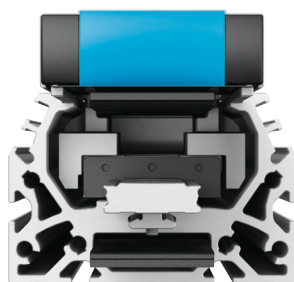


Motor positions

- Freely selectable at both ends of the axis
- Can be changed at any time

Aluminium profile

- Wide toothed belt
- Symmetrical profile design
- Optimised cross section and flow of forces



Guide axis ELFA

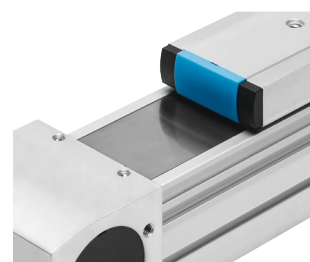
- Without its own drive
- Freely movable, passive slide
- Guide variants:
 - Roller bearing guide -RF
 - Recirculating ball bearing guide -KF (new for 2016)

Axis for use in the food industry

- Clean look: smooth surfaces, no sensor slots
- FDA-compliant materials
- Guide variants:
 - Roller bearing guide -RF
 - Recirculating ball bearing guide -KF (new for 2016)

Toothed belt

- Easy to replace without the need to disassemble the drive rollers and guide pulleys
- Material: black Neoprene (optional: white polyurethane, FDA compliant)



Stainless steel cover band

- Permanently seated and virtually gap-free thanks to magnetic strip
- Guide pulley in the slide

The technology of the ELGA series in detail

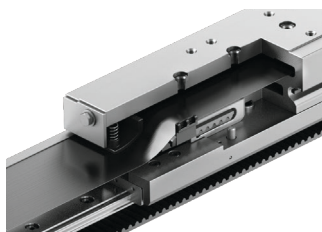
Toothed belt axes ELGA-TB

The drives ELGA are extremely dynamic thanks to high speeds even with large loads and long strokes.

Note:

There is no need for additional gear units due to the small drive rollers and guide pulleys.

- Recirculating ball bearing guide -KF for absorbing high loads from slides and guides with lateral forces and torques, even during motion.



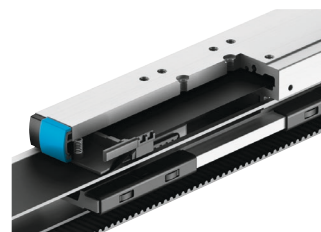
ELGA-TB-KF – Recirculating ball bearing guide

- Roller guide -RF for highly dynamic handling, even of medium and large-sized workpieces.



Roller bearing guide ELGA-TB-RF

- Plain-bearing guide -G for simple positioning and handling tasks or as a drive axis for applications with external guides.



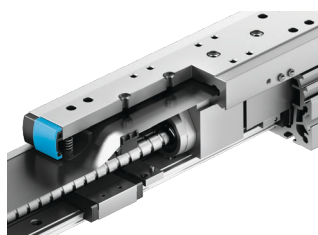
Plain-bearing guide ELGA-TB-G

Ball screw axes ELGA-BS

(new for 2016)

The drive for precise and smooth operation, even with high loads and long strokes.

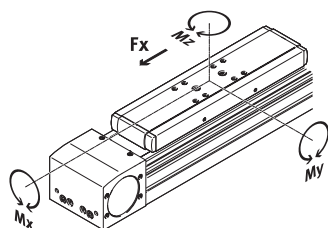
Slide guide type: recirculating ball bearing guide -KF for absorbing high lateral forces and torques, even during motion.



Recirculating ball bearing guide ELGA-BS-KF

Technical data

Type	ELGA-TB-KF				ELGA-TB-RF			ELGA-TB-G			ELGA-BS-KF			
Size (= profile width in mm)	70	80	120	150	70	80	120	70	80	120	70	80	120	150
Drive system	Toothed belt										Ball screw			
Guide type (slide)	Recirculating ball bearing guide				Roller bearing guide			Plain-bearing guide			Recirculating ball bearing guide			
Max. stroke [mm]	8500				7400			8500			2900			
Max. speed [m/s]	5				10			5			0.5	1	1.5	2
Repetition accuracy [μ m]	± 80				± 80			± 80			± 20			
Max. feed force F_x [N]	350	800	1300	2000	350	800	1300	350	800	1300	300	600	1300	3000
Max. torque load M_x [Nm]	16	36	104	167	11	30	100	5	10	20	16	36	104	167
M_y [Nm]	132	228	680	1150	40	180	640	30	60	120	132	228	680	1150
M_z [Nm]	132	228	680	1150	40	180	640	10	20	40	132	228	680	1150



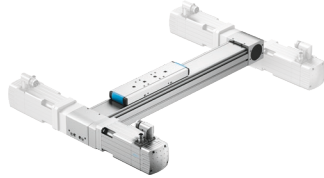
Torque load of axis

Motor positions

Toothed belt axis

ELGA-TB-G/-KF/-RF

- Motor can be attached on 4 sides, freely selectable
- Can be changed later at any time



Freely selectable motor positions

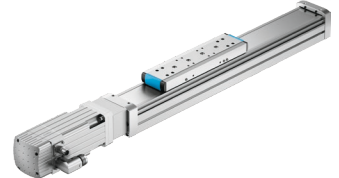
The benefits to you

Define an attachment variant with one part number as standard and modify the positions as and when needed.

Ball screw axis

ELGA-BS-KF

- Freely selectable at both ends of the axis
- Rotated 4 x 90°, can be changed at a later date



Freely selectable plug outlet direction

The benefits to you

Choose an attachment variant with one part number as standard and modify the plug outlet direction as and when needed.

Right or left motor position?

Simply choose by rotating the symmetrically designed axis by 180°.

Second slide

For toothed belt axes with recirculating ball bearing guide -KF

- 1 driven and 1 additional, freely movable slide
- For higher axial and lateral forces and higher loads
- Reduced, split guide loads for longer service life
- Additional mounting options

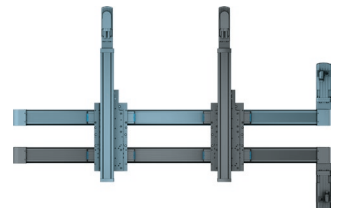


Optional second slide

Sample application:

Simple and flexible double pick & place solution

- Compact design
- Both Z-axes move independently
- Long Z-axis guide for high rigidity at high speeds and loads



Space-optimised solution for assembly technology or for packaging applications

Toothed belt axis for use in the food industry

- FDA-compliant materials and food-industry approved NSF-H1 lubrication
- Optional: FDA-compliant toothed belt made from white polyurethane (PU)
- Easy-to-clean surfaces
- Guide variants:
 - Roller bearing guide -RF
 - Recirculating ball bearing guide -KF (new for 2016)
- Freely positionable inductive proximity sensor for optional sensing
- Optional connection of vacuum for reduced particle emissions
- Optional connection of slight overpressure to prevent the ingress of dirt



ELGA in clean look with smooth surfaces and no sensor slots, with white PU toothed belt



Freely positionable IP67 sensor

Safety at a glance – sensors and safety solutions

Reliability thanks to optional sensing

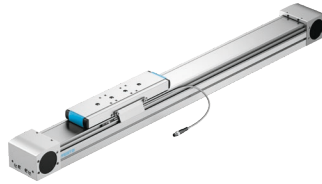
Inductive proximity sensor
SIES-8M

- Flush mounting of up to 2 sensors in the profile slot – no protruding edges outside of the drive cross section

Inductive proximity sensor
SIEN-M8B

- Up to 2 sensors can be mounted on the side using optional sensor bracket

Both sensors as normally closed/ normally open with PNP and NPN switching output - in protection class IP67.



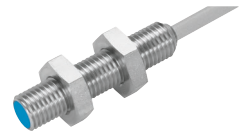
Features SIES-8M

- Switching distance 1.5 mm
- Repetition accuracy $\pm 50 \mu\text{m}$ (radial)
- Initial status display: 2 yellow LEDs for improved visibility – regardless of the direction of approach
- Max. cable length 7.5 m
- Electrical connection: 3-wire cable or 3-pin M8x1



SIEN-M8B features

- Switching distance 1.5 mm
- Repetition accuracy $\pm 70 \mu\text{m}$
- Switching status display: yellow LED
- Max. cable length 2.5 m
- Electrical connection: 3-wire cable or 3-pin M8x1

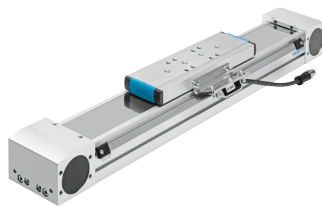


Displacement encoder for monitoring the linear axis

- Suitable for safety-oriented applications (2nd channel)

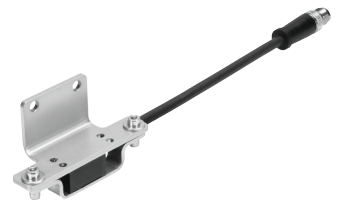
Drive mechanisms cannot be monitored exclusively by servo motors with encoders and safety functions in motor controllers or external monitoring systems.

However, with an external linear displacement encoder mounted directly on the drive, the axis slide position can be monitored for prompt, safety-oriented responses.



Greater positioning accuracy and maximum speed – toothed belt axes for positioning tasks

- Incremental displacement encoder for position detection
- Enhanced absolute accuracy with linear displacement encoder
- Detection of all drive train elasticity
- System-intrinsic inaccuracies can be optimally adjusted by the motor controller
- Minimum resolution: $2.5 \mu\text{m}$ at a maximum 4 m/s



Perfect fit: our range of motor controllers and motors

Controllers

Servo motor controller CMM-AS-M0/M3

This range of servo motor controllers provides a highly functional solution for dynamic movements. It is ideally suited for the electronic control of cam discs. CMM-AS-M0 as the basic variant with standard functions and CMM-AS-M3 with expansion options, e.g. for Ethercat connection or safety module.

- Software tools from Festo: a universal concept for commissioning, programming and parameterisation
- Integrated safe stop with restart blocking for safety-oriented applications
- SD card for parameters and firmware
- Safe Torque Off (STO) up to category 4, PLe integrated
- Safe stop functions and dynamic safety functions up to category 4, PLe



CMM-AS-M0



CMM-AS-M3

Stepper motor controller CMMx-ST

Single-axis position controller CMMS-ST with optional closed-loop servo system via encoder. Alternatively, it can be used as a low-cost open-loop system with stepper motors without encoder.

CMMO-ST is a closed-loop servo controller for stepper motors – with “WebConfig” and “WebDiag”, the integrated HTML web server for configuration and diagnostics. Quick and easy to select with one order code and STO (Safe Torque Off) with category 3, PLe included.



CMMS-ST



CMMO-ST

Motors

Servo motors EMMS/E-AS

- Single-turn rotary encoder (standard), multi-turn rotary encoder (optional)
- Protection class IP65 for motor housing and power/encoder connection



Servo motor EMMS-AS



Servo motor EMME-AS



Stepper motor EMMS-ST

Stepper motors EMMS-ST

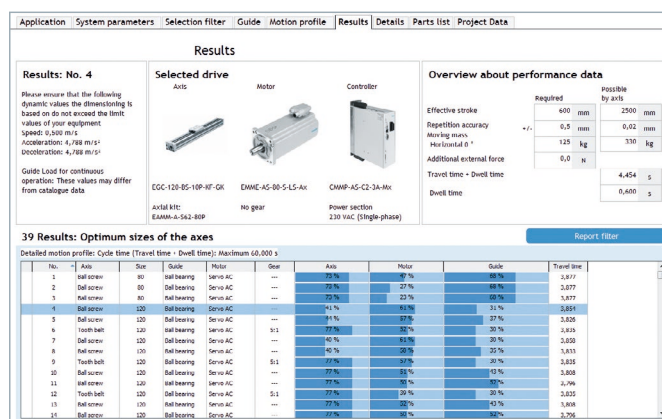
- Encoder for closed-loop function (optional)
- Protection class IP65 for motor housing and plug connection

Toothed belt and ball screw axes ELGA

Faster configuration with PositioningDrives

PositioningDrives calculates the ideal combination from the widely coordinated range of electromechanical linear axes, motors, gear units and controllers after a few application data have been entered. By specifying various project parameters, the tool can also calculate the characteristic load values for

the selected drive quickly and reliably. PositioningDrives prevents incorrect designs and energy waste by helping you to select the right components.



PositioningDrives simplifies configuration and eliminates costly oversizing

The ideal complement: toothed belt and ball screw axes EGC/EGC-HD

The entire EGC range is available in various sizes and slide variants – either as a toothed belt or ball screw axis. The heavy duty version EGC-HD with its dual guide and a very high load capacity rounds off the product range. It effectively absorbs lateral forces and torques and is optimally suited for gantry systems.

Common to all: specially developed profiles with an optimised cross section give the drives maximum rigidity and load capacity.

Slide variants

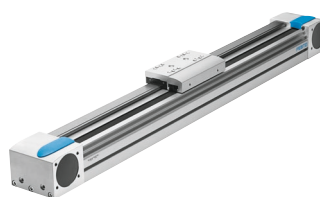
- Extended slide
- Second freely movable, passive slide
- Protected slide

Optional clamping unit

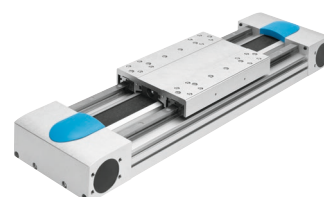
- Safe and reliable holding of loads and emergency brake directly on the guide

Technical data

- Max. speed: 10 m/s
- Max. stroke: 8.5 m
- Max. feed force: 3000 N
- Max. torque Mx lateral to axis: 900 Nm for HD axis



Toothed belt axis EGC-TB



Toothed belt axis EGC-TB-HD



Ball screw axis EGC-BS



Ball screw axis EGC-BS-HD

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