

## Guide axes ELFA, without drive

**FESTO**

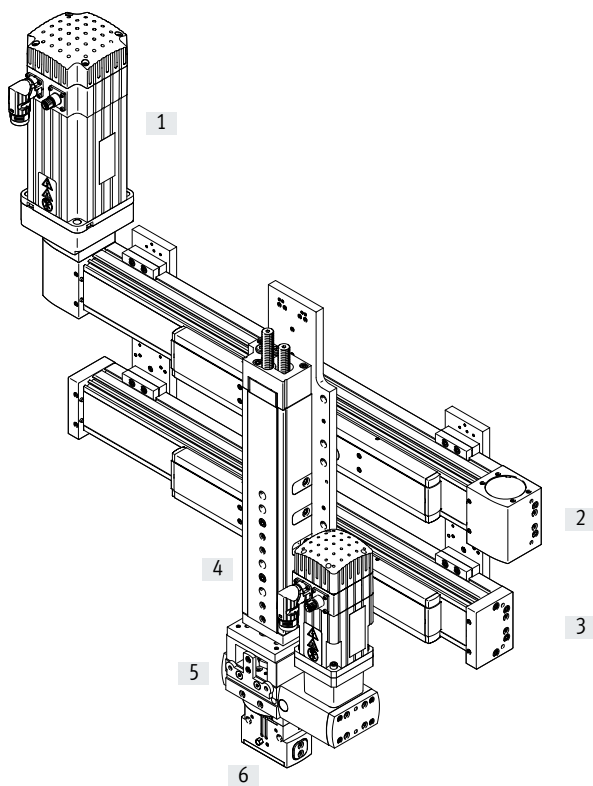


## Key features

### At a glance

- Driveless linear guide units with guide and freely movable slide
- The guide axis is designed to support force and torque capacity in multi-axis applications
- Stainless steel cover strip with magnetic seal provides basic protection for guide and spindle. This also makes it possible to reduce particulate emissions for use in clean environments
- The optional magnetic reversal in the slide guides the stainless steel cover strip through the slide and back onto the profile. The magnets ensure there is no friction on the visible surface of the cover strip
- The magnetic belt reversal minimises particulate emissions for use in clean rooms
- High torsional resistance
- Reduced vibrations with dynamic loads
- Drive axis and guide axis can be placed adjacent to or above one another

### System product for handling and assembly technology



### System components and accessories

	Description	→ Internet
[1] Motors	Servo and stepper motors, with or without gear unit	motor
[2] Axes	Wide range of combinations possible within handling and assembly technology	axis
[3] Guide axes	To support force and torque capacity in multi-axis applications	guide axis
[4] Drives	Wide range of combinations possible within handling and assembly technology	drive
[5] Adapter	For drive/drive and drive/gripper connections	gripper
[6] Gripper	Wide range of variations possible within handling and assembly technology	gripper

## Overview

### Guide axes and the corresponding axes

#### Guide axis EGC-FA



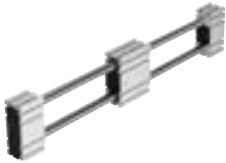
- Can be combined with:
  - Toothed belt axis EGC-TB
  - Spindle axis EGC-BS
- For size 70 ... 185
- Load capacity up to max. 15200 N or 1157 Nm

#### Guide axis DGC-FA



- Can be combined with:
  - Linear drive DGC-KF
- For size 8 ... 63
- Load capacity up to max. 15200 N or 1157 Nm

#### Guide axis ELFR



- Can be combined with:
  - Toothed belt axis ELGR
- For size 35 ... 55
- Load capacity up to max. 300 N or 124 Nm

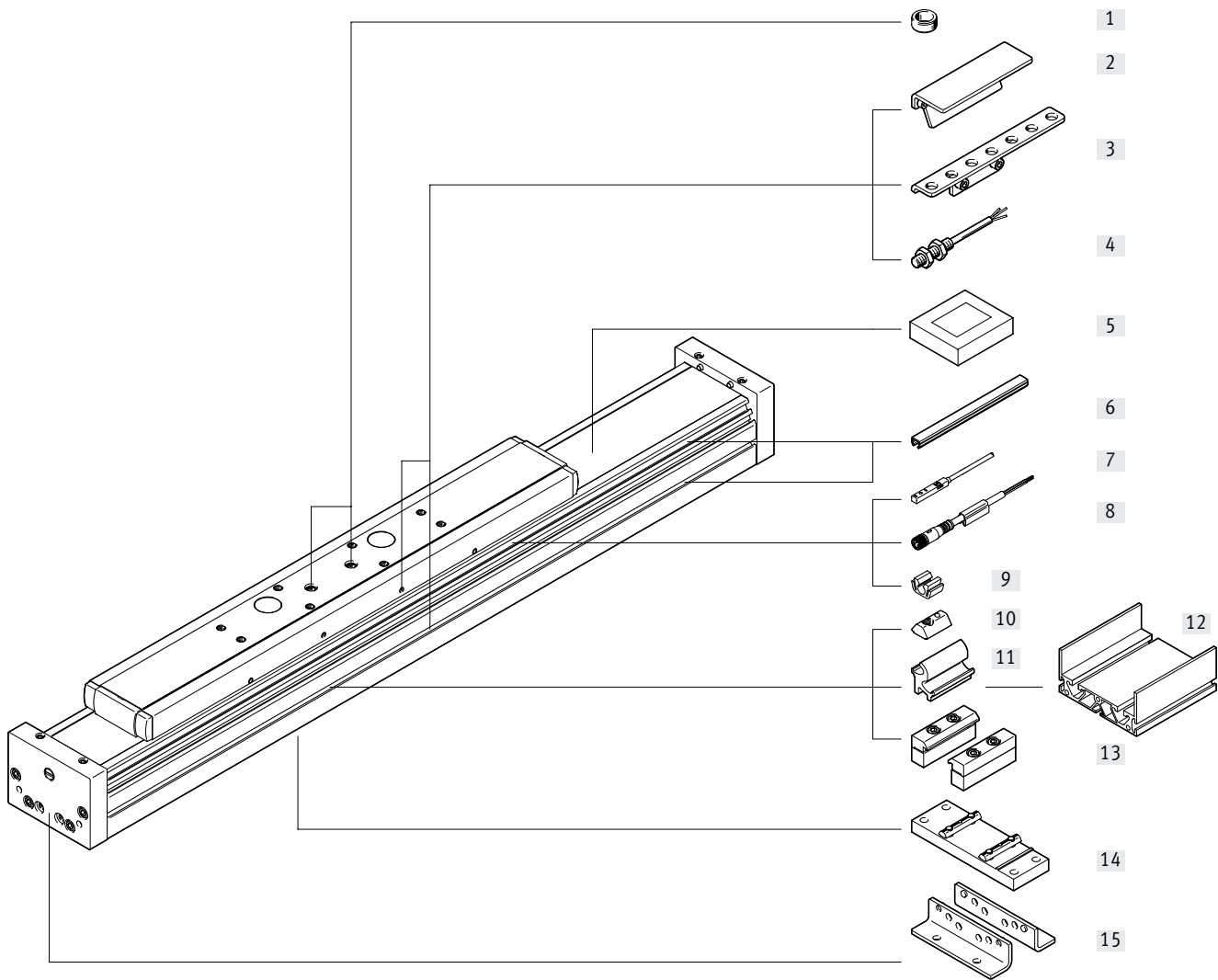
Design	Can be combined with	Size	Working stroke [mm]	Speed [m/s]	Guide characteristics Forces and torques					→ Page/ Internet
					F <sub>y</sub> [N]	F <sub>z</sub> [N]	M <sub>x</sub> [Nm]	M <sub>y</sub> [Nm]	M <sub>z</sub> [Nm]	
<b>ELFA-KF – Recirculating ball bearing guide</b>										
	<ul style="list-style-type: none"> <li>• Toothed belt axis ELGA-TB-KF</li> <li>• Spindle axis ELGA-BS-KF</li> </ul>	70	50 ... 5000	5	1500	1850	16	132	132	4
		80	50 ... 8500	5	2500	3050	36	228	228	
		120	50 ... 8500	5	5500	6890	104	680	680	
<b>ELFA-RF – Roller bearing guide</b>										
	Toothed belt axis ELGA-TB-RF	70	50 ... 7000	10	500	500	11	20	20	20
		80	50 ... 7000	10	800	800	30	90	90	

### Sealing air connections



- [1] Sealing air connections
- Application of negative pressure minimises the dispersal of abraded particles into the environment
  - Application of gauge pressure prevents dirt from getting into the axis

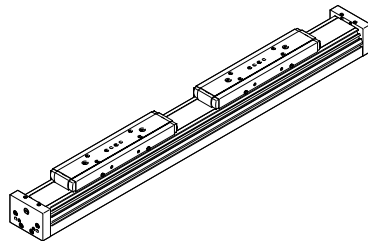
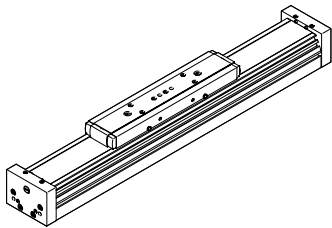
Peripherals overview



**Slide variants**

ELFA-...  
Standard slide

ELFA-...-ZL/-ZR  
Additional slide, left or right



## Peripherals overview

Variants and accessories			
Type	Description		→ Page/Internet
[1] Centring sleeve/centring pins ZBH/ZBS	<ul style="list-style-type: none"> <li>For centring loads and attachments on the slide</li> <li>Included in the scope of delivery:               <ul style="list-style-type: none"> <li>With size 70: 2x ZBS-5</li> <li>With size 80, 120: 2x ZBH-9</li> </ul> </li> </ul>		39
[2] Switch lug SF-EGC	For sensing the slide position		38
[3] Sensor bracket HWS-EGC	Adapter for mounting the inductive proximity sensors (round design) on the axis		38
[4] Proximity sensor, M8 SIEN-M8	Inductive proximity sensor, round design		41
[5] Clamping element EADT	Tool for retensioning the cover strip		39
[6] Slot cover ABP	For protection against contamination		39
[7] Proximity sensor, T-slot SIES-8M	Inductive proximity sensor, for T-slot		41
[8] Connecting cable NEBU	For proximity sensor		41
[9] Clip SMBK	For mounting the proximity sensor cable in the slot		39
[10] Slot nut NST	For mounting attachments		39
[11] Adapter kit DHAM	For mounting the support profile on the axis		40
[12] Support profile HMIA	For guiding an energy chain		40
[13] Profile mounting MUE	For mounting the axis on the side of the profile		35
[14] Central support EAHF-L5	For mounting the axis on the profile from underneath		36
[15] Foot mounting HPE	<ul style="list-style-type: none"> <li>For mounting the axis on the end cap.</li> <li>With higher forces and torques, the axis should be mounted using the profile</li> </ul>		34

## Guide axes ELFA-KF, without drive, with recirculating ball bearing guide




### Type codes

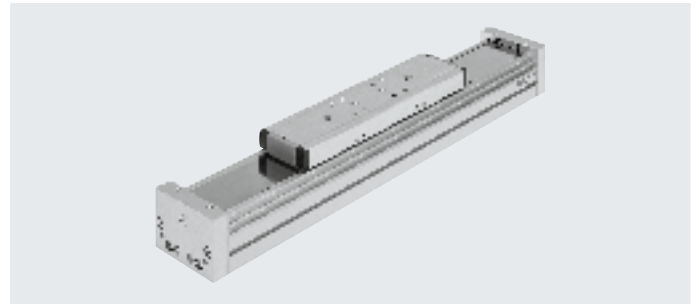
001	Series	
ELFA	Guide axis	
002	Guide	
KF	Recirculating ball bearing guide	
003	Size	
70	70	
80	80	
120	120	
004	Stroke [mm]	
...	50 ... 8500	

005	Stroke reserve	
OH	None	
...H	0 ... 999 mm	
006	Additional slide	
	None	
ZL	1 slide left	
ZR	1 slide right	
007	Protection against particles	
	Standard	
P11	Cover strip with magnetic deflection	

Data sheet



-  - Size  
70, 80, 120
-  - Stroke length  
50 ... 8500 mm
-  - [www.festo.com](http://www.festo.com)



General technical data			
Size		70	80   120
Design		Guide	
Guide		Recirculating ball bearing guide	
Mounting position		Any	
Working stroke	[mm]	50 ... 5000	50 ... 8500
Max. no-load resistance to shifting	[N]	11	12   23
Max. speed	[m/s]	5	
Max. acceleration	[m/s <sup>2</sup> ]	50	

Operating and environmental conditions		
Ambient temperature <sup>1)</sup>	[°C]	-10 ... +60
Degree of protection		IP40

1) Note operating range of proximity sensors

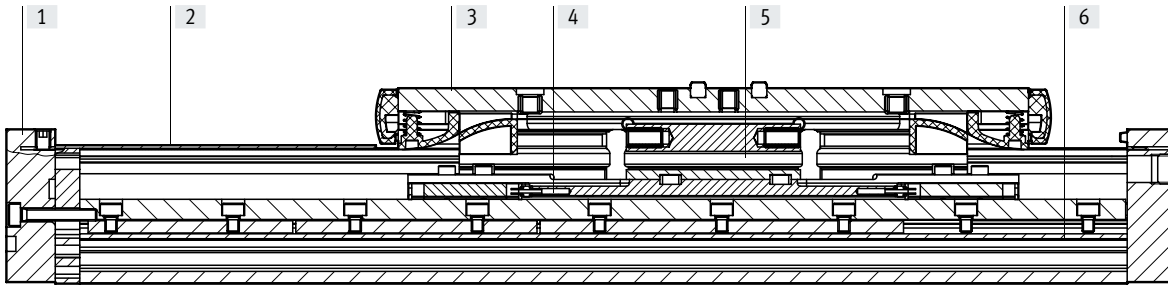
Weight [kg]			
Size		70	80   120
Product weight with 0 mm stroke <sup>1)</sup>		2.22	3.74   8.5
Additional weight per 1000 mm stroke		3.84	4.89   10.32
Moving mass		0.77	1.57   3.35

1) Including slide

## Data sheet

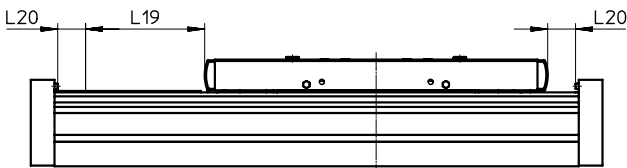
### Materials

#### Sectional view



Axis	
[1] End cap	Anodised wrought aluminium alloy
[2] Cover strip	Stainless steel
[3] Slide	Anodised wrought aluminium alloy
[4] Roller carriage	Stainless steel, tempered steel
[5] Guide rail	Stainless steel, corrotect-coated tempered steel
[6] Profile	Anodised wrought aluminium alloy
Note on materials	RoHS-compliant Contains paint-wetting impairment substances

### Stroke reserve



L19 = Nominal stroke

L20 = Stroke reserve

- The stroke reserve is a safety distance from the mechanical end position and is not used in normal operation
- The sum of the nominal stroke and 2x stroke reserve must not exceed the maximum permissible working stroke
- The stroke reserve length can be freely selected
- The stroke reserve is defined via the "stroke reserve" characteristic in the modular product system.

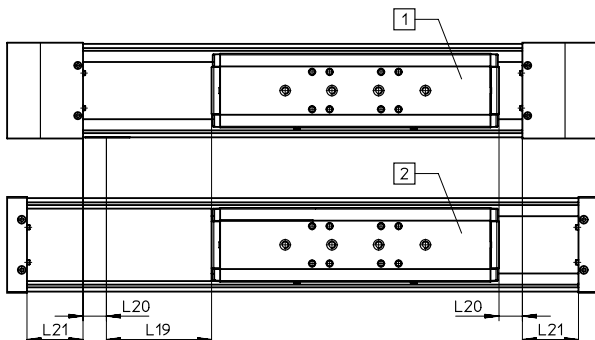
#### Example:

Type ELFA-KF-70-500-20H-...  
 Nominal stroke = 500 mm  
 2x stroke reserve = 40 mm  
 Working stroke = 540 mm  
 (540 mm = 500 mm + 2x 20 mm)

### Identical installation length between toothed belt axis ELGA-TB-KF and guide axis ELFA-KF

The different end cap lengths result in different overall lengths despite the nominal stroke and stroke reserve being the same.

To achieve the same overall length between two axes, the compensation dimension L21 must be added to the stroke reserve in the case of the guide axis ELFA-KF.



[1] ELGA-TB-KF

[2] ELFA-KF

L19 = Nominal stroke

L20 = Stroke reserve

L21 = Compensation dimension

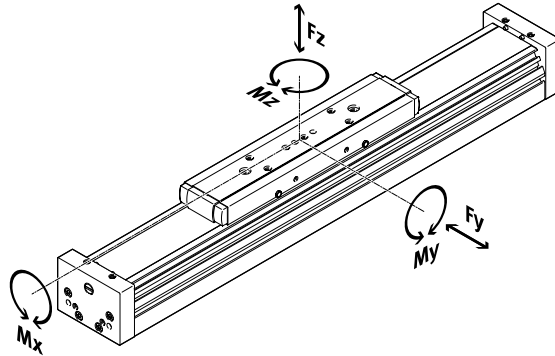
Size	70	80	120
Compensation dimension [mm]	41.5	48	75



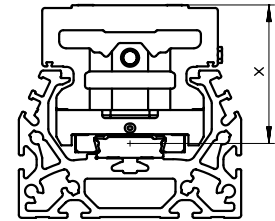
## Data sheet

### Characteristic load values

The indicated forces and torques refer to the centre of the guide. The point of application of force is the point where the centre of the guide and the longitudinal centre of the slide intersect. These values must not be exceeded during dynamic operation. Special attention must be paid to the deceleration phase.



Distance from the slide surface to the centre of the guide



#### Distance from the slide surface to the centre of the guide

Size	70	80	120
Dimension x [mm]	37	50	70

#### Max. permissible forces and torques for a service life of 5000 km

Size	70	80	120
$F_{y\max}$	1500	2500	5500
$F_{z\max}$	1850	3050	6890
$M_{x\max}$	16	36	104
$M_{y\max}$	132	228	680
$M_{z\max}$	132	228	680



#### Note

For a guide system to have a service life of 5000 km, the load comparison factor must have a value of  $f_v \leq 1$ , based on the maximum permissible forces and torques for a service life of 5000 km

If the axis is subjected to two or more of the indicated forces and torques simultaneously, the following equation must be satisfied in addition to the indicated maximum loads:

Calculating the load comparison factor:

$$f_v = \frac{|F_{y1}|}{F_{y2}} + \frac{|F_{z1}|}{F_{z2}} + \frac{|M_{x1}|}{M_{x2}} + \frac{|M_{y1}|}{M_{y2}} + \frac{|M_{z1}|}{M_{z2}} \leq 1$$

$F_1/M_1$  = dynamic value

$F_2/M_2$  = maximum value

## Data sheet

### Calculating the service life

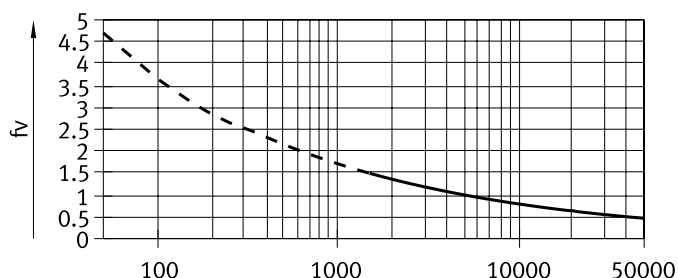
The service life of the guide depends on the load. To provide a rough indication of the service life of the guide, the graph below plots the load comparison factor  $f_v$  against the service life.

These values are only theoretical. You must consult your local contact person at Festo for load comparison factors  $f_v$  greater than 1.5.

#### Load comparison factor $f_v$ as a function of service life

Example:

A user wants to move an X kg load. Using the formula (→ page 9) gives a value of 1.5 for the load comparison factor  $f_v$ . According to the graph, the guide would have a service life of approx. 3000 km. Reducing the acceleration reduces the  $M_z$  and  $M_y$  values. A load comparison factor  $f_v$  of 1 now gives a service life of 10000 km.



#### Note

The engineering software can be used to calculate the guide workload for a service life of 10000 km.

$f_v > 1.5$  are only theoretical comparison values for the roller bearing guide.

### Comparison of the characteristic load values for 5000 km with dynamic forces and torques of recirculating ball bearing guides

The characteristic load values of bearing guides are standardised to ISO and JIS using dynamic and static forces and torques. These forces and torques are based on an expected service life of the guide system of 100 km to ISO or 50 km to JIS. As the characteristic load values are dependent on the service life, the maximum permissible forces and torques for a 5000 km service life cannot be compared with the dynamic forces and torques of bearing guides to ISO/JIS.

To make it easier to compare the guide capacity of linear axes ELGA with bearing guides, the table below lists the theoretically permissible forces and torques for a calculated service life of 100 km. This corresponds to the dynamic forces and torques to ISO.

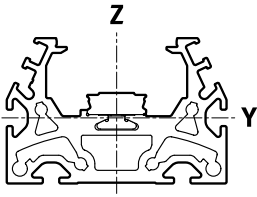
These 100 km values have been calculated mathematically and are only to be used for comparing with dynamic forces and torques to ISO. The drives must not be loaded with these characteristic values as this could damage the axes.

#### Max. permissible forces and torques for a theoretical service life of 100 km (from a guide perspective only)

Size		70	80	120
$F_{y_{max}}$	[N]	5520	9200	20240
$F_{z_{max}}$	[N]	6808	11224	25355
$M_{x_{max}}$	[Nm]	59	132	383
$M_{y_{max}}$	[Nm]	486	839	2502
$M_{z_{max}}$	[Nm]	486	839	2502

## Data sheet

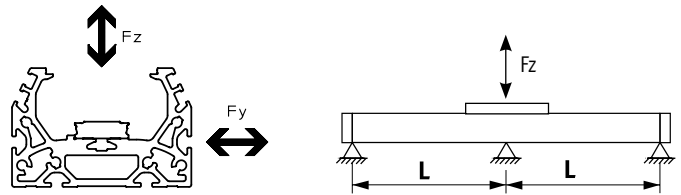
### Second moment of area



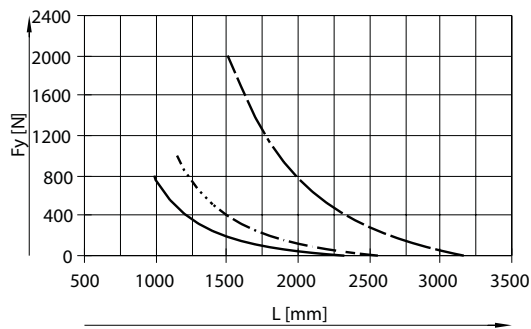
Size	70	80	120
$I_y$ [mm <sup>4</sup> ]	$1.46 \times 10^5$	$2.57 \times 10^5$	$1.26 \times 10^5$
$I_z$ [mm <sup>4</sup> ]	$4.59 \times 10^5$	$9.14 \times 10^6$	$4.37 \times 10^6$

### Maximum permissible support spacing L (without profile mounting MUE/central support EAHF) as a function of force F

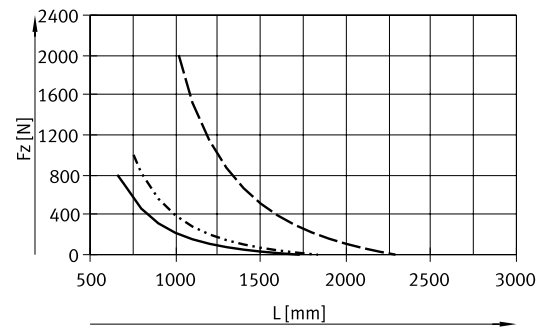
In order to limit deflection in the case of large strokes, the axis may need to be supported.  
The following graphs can be used to determine the maximum permissible support spacing L as a function of force F acting on the axis. The deflection is  $f = 0.5$  mm.



Force  $F_y$



Force  $F_z$



- ELFA-KF-70
- · - · - ELFA-KF-80
- - - ELFA-KF-120

### Recommended deflection limits

Adherence to the following deflection limits is recommended so as not to impair the functionality of the axes. Greater deformation can result in increased friction, greater wear and reduced service life.

Size	Dynamic deflection (moving mass)	Static deflection (stationary load)
70 ... 120	0.05% of the axis length, max. 0.5 mm	0.1% of the axis length

## Data sheet

### Central lubrication

The lubrication connections enable the guide of the guide axis ELFA-KF to be permanently lubricated in applications in humid or wet ambient conditions using semi- or fully automatic relubrication devices.

- The axes are suitable for oils and greases
- The connection options are already available in the standard design of the axes
- There is a dedicated lubrication connection for the spindle nut and the two ball cassettes

Slide dimensions

→ Page 15

### Structure of a central lubrication system

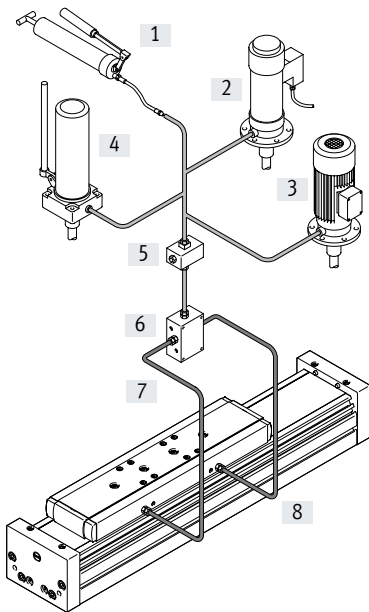
A central lubrication system requires various additional components. The illustration shows different options (using a hand pump, pneumatic container pump or electric container pump) required as a minimum for designing a central lubrication system.

Festo does not sell these additional components; however, they can be obtained from the following companies:

- Lincoln
- Bielomatik
- SKF (Vogel)

Festo recommends these companies because they can supply all the necessary components.

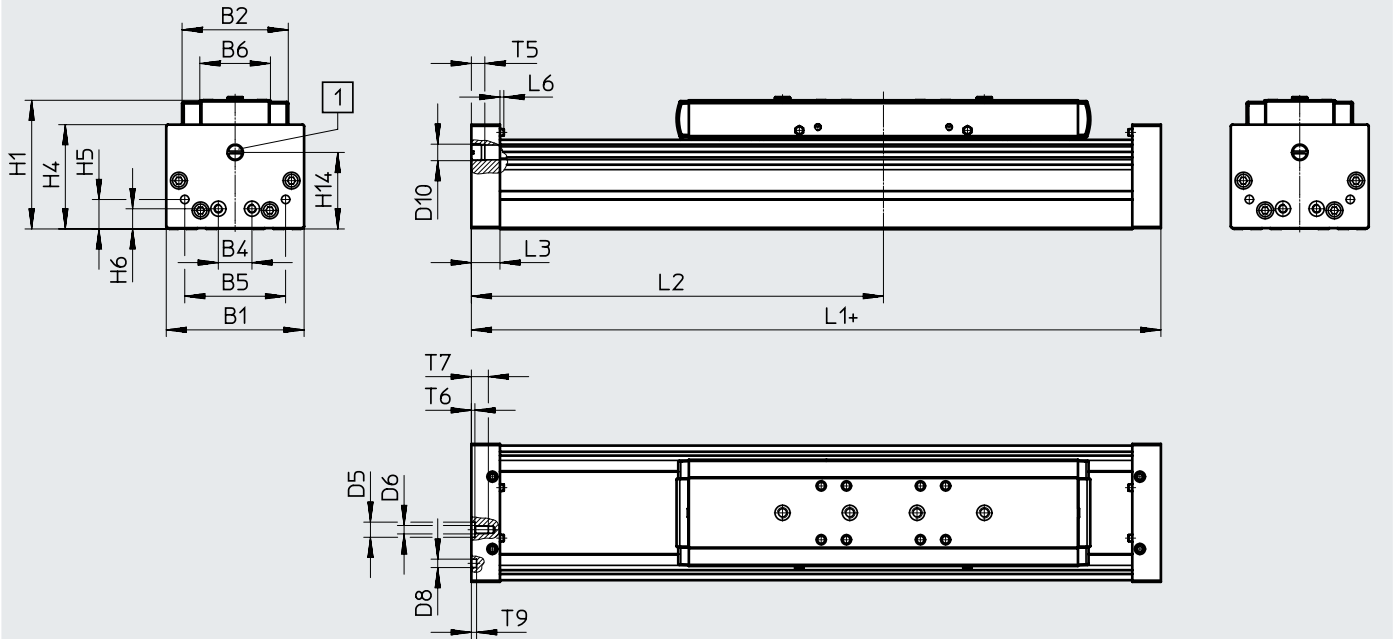
- [1] Hand pump
- [2] Pneumatic container pump
- [3] Electric container pump
- [4] Manually operated container pump
- [5] Nipple block
- [6] Distributor block
- [7] Tubing or piping
- [8] Fittings



Data sheet

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)



+ = plus stroke length + 2x stroke reserve

[1] Sealing air connection

Size	B1	B2	B4	B5	B6	D5 ∅ H7	D6	D8 ∅ H7	D10	H1	H4
70	69	48.2	30	45	30	–	M5	5	G1/8	64	50.5
80	82	63.2	20	60	42	9	M5	5	G1/8	76.5	62
120	120	95	40	80	68	–	M8	9	G1/8	111.5	89

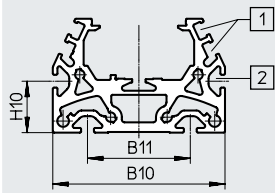
Size	H5	H6	H14	L1	L2	L3	L6	T5	T6	T7	T9
					min.						
70	13	13	32	263	136.5	16	2.3	8	–	10	3.1
80	17.5	12	40	290	145	17	2.3	8	2.1	10.1	3.1
120	22	22	65	396	198	25	2.5	8	–	16	2.1

## Data sheet

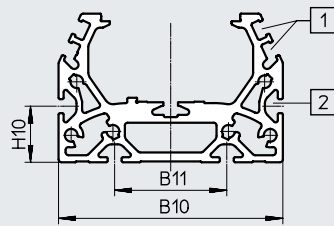
### Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

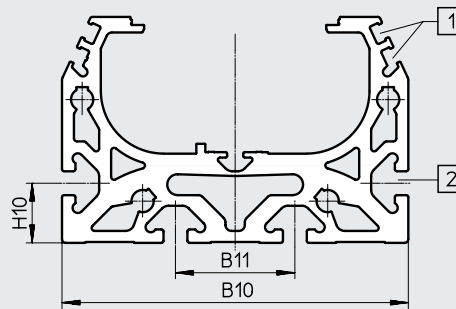
Profile  
Size 70



Size 80




Size 120



- [1] Sensor slot for proximity sensor
- [2] Mounting slot for slot nut

Size	B10	B11	H10
70	67	40	20
80	80	40	20
120	116	40	20

 **Note**

Requirements for the flatness of the bearing surface and of attachments as well as for use in parallel structures

→ [www.festo.com/sp](http://www.festo.com/sp)  
User documentation

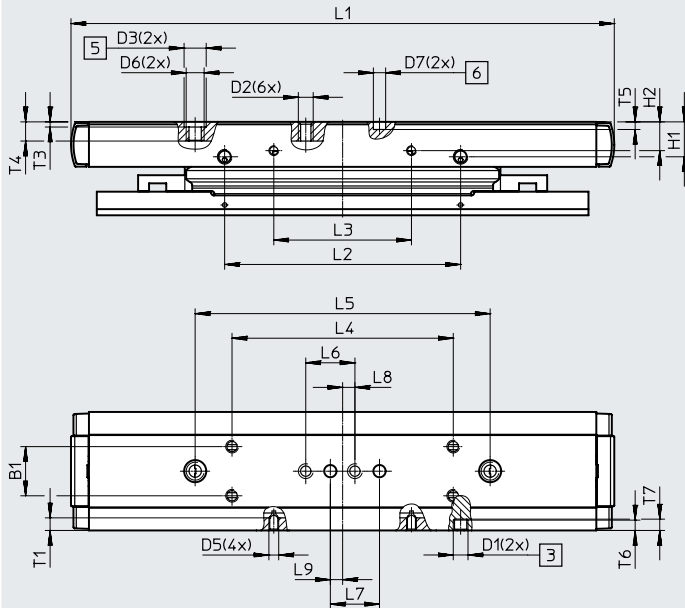
Data sheet

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Slide

Size 70



- [3] Lubrication connections
- [5] Drilled hole for centring sleeve ZBH
- [6] Drilled hole for centring pin ZBS

Size	B1	D1	D2	D3 ∅ H7	D5	D6	D7 ∅ H7	H1	H2	L1	L2	L3
70	±0.1 20	M6	M5	9	M4	M6	5	±0.1 14.2	±0.1 11.7	221	±0.1 96	±0.1 56

Size	L4	L5	L6	L7	L8	L9	T1	T3	T4	T5	T6	T7
70	±0.1 90	120	±0.1 20	±0.03 20	5	5	5.1	+0.1 2.1	7.5	±0.1 3.1	min. 4.2	-0.1 4.6

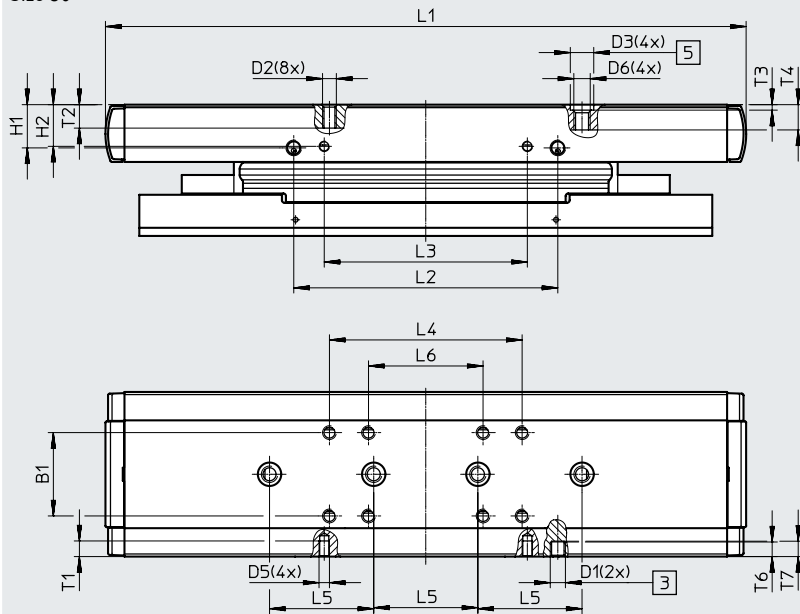
Data sheet

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Slide

Size 80



[3] Lubrication connections

[5] Drilled hole for centring sleeve ZBH

Size	B1	D1	D2	D3 ∅ H7	D5	D6	H1	H2	L1	L2
80	±0.1 32	M6	M5	9	M4	M6	±0.1 16.6	±0.1 16	246	±0.1 101.4

Size	L3	L4	L5	L6	T1	T2	T3	T4	T6	T7
80	±0.1 78	±0.1 74	±0.03 40	±0.1 44	6	9	+0.1 2.1	-0.2 9.7	min. 5.6	-0.1 5.9



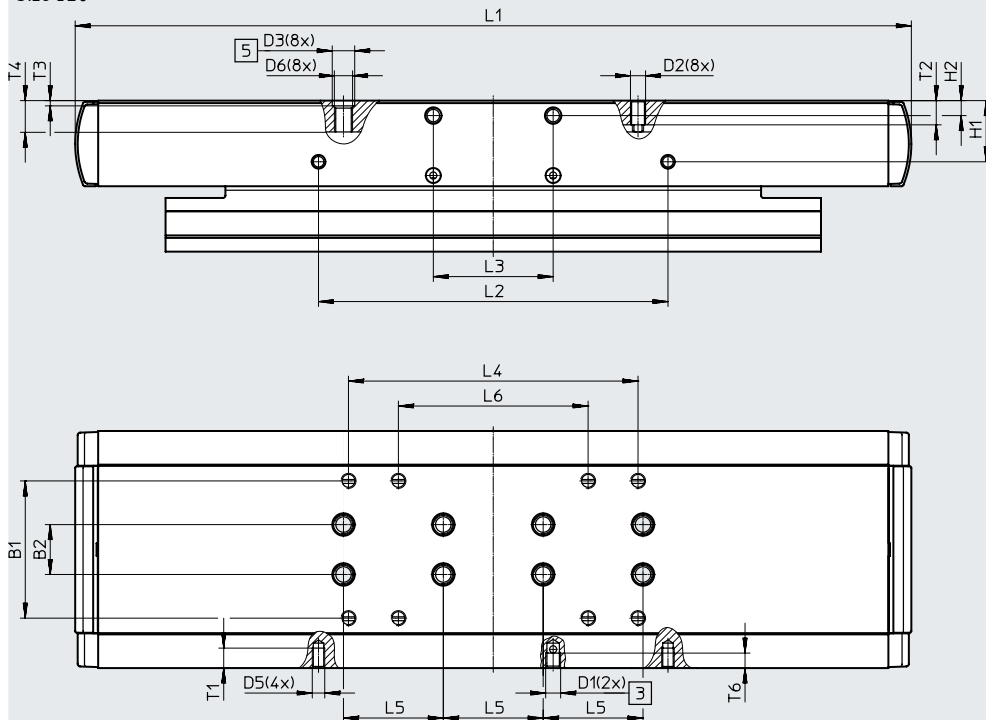
Data sheet

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Slide

Size 120



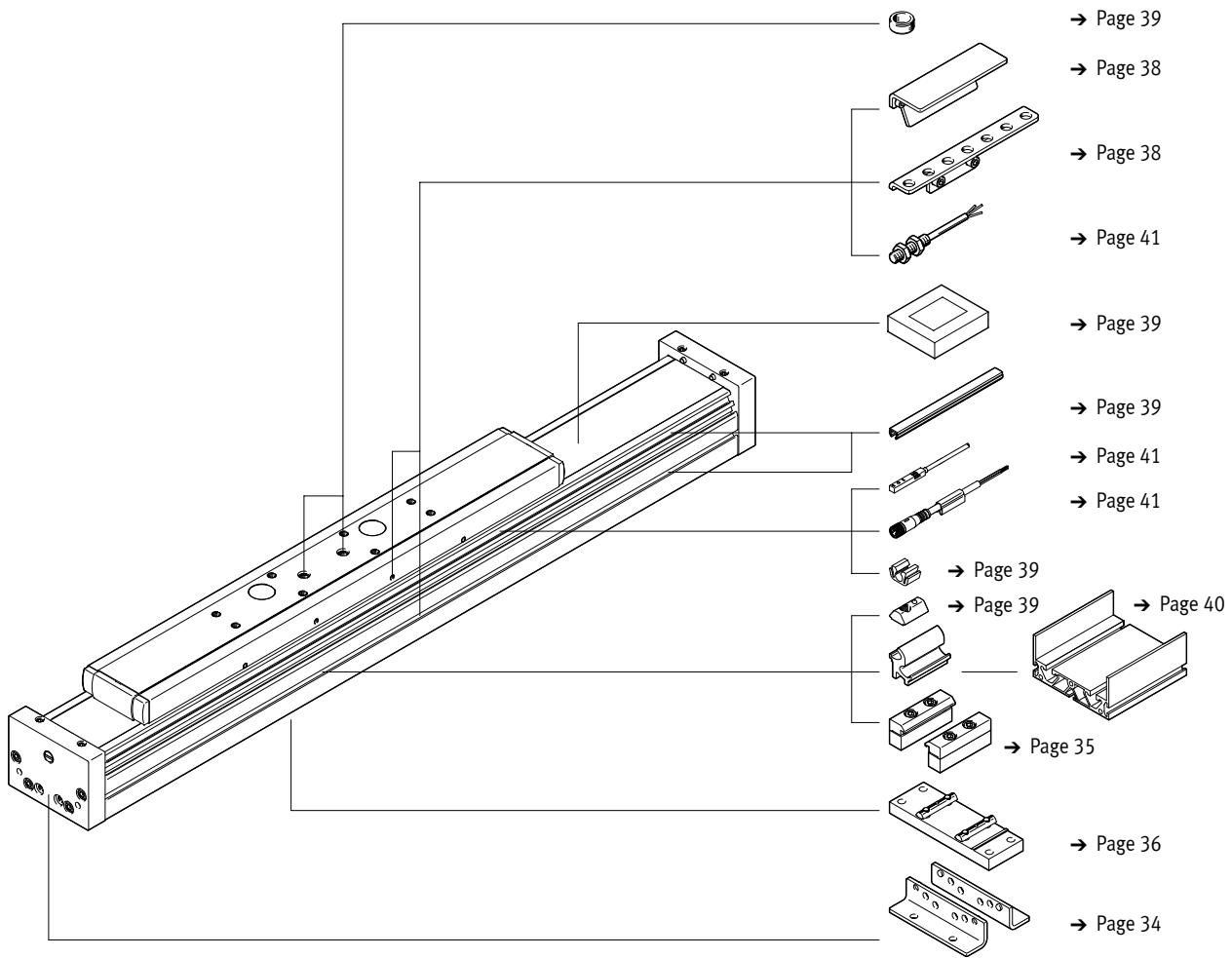
[3] Lubrication connections

[5] Drilled hole for centring sleeve ZBH

Size	B1	B2	D1	D2	D3 ∅ H7	D5	D6	H1	H2	L1
120	±0.1 55	±0.03 20	M6	M5	9	M5	M6	±0.1 24.5	6	335

Size	L2	L3	L4	L5	L6	T1	T2	T3	T4	T6
120	±0.1 140	±0.1 48	±0.1 116	±0.03 40	±0.1 76	8	9.7	+0.1 2.1	-0.3 12.6	6

Ordering data – Modular product system

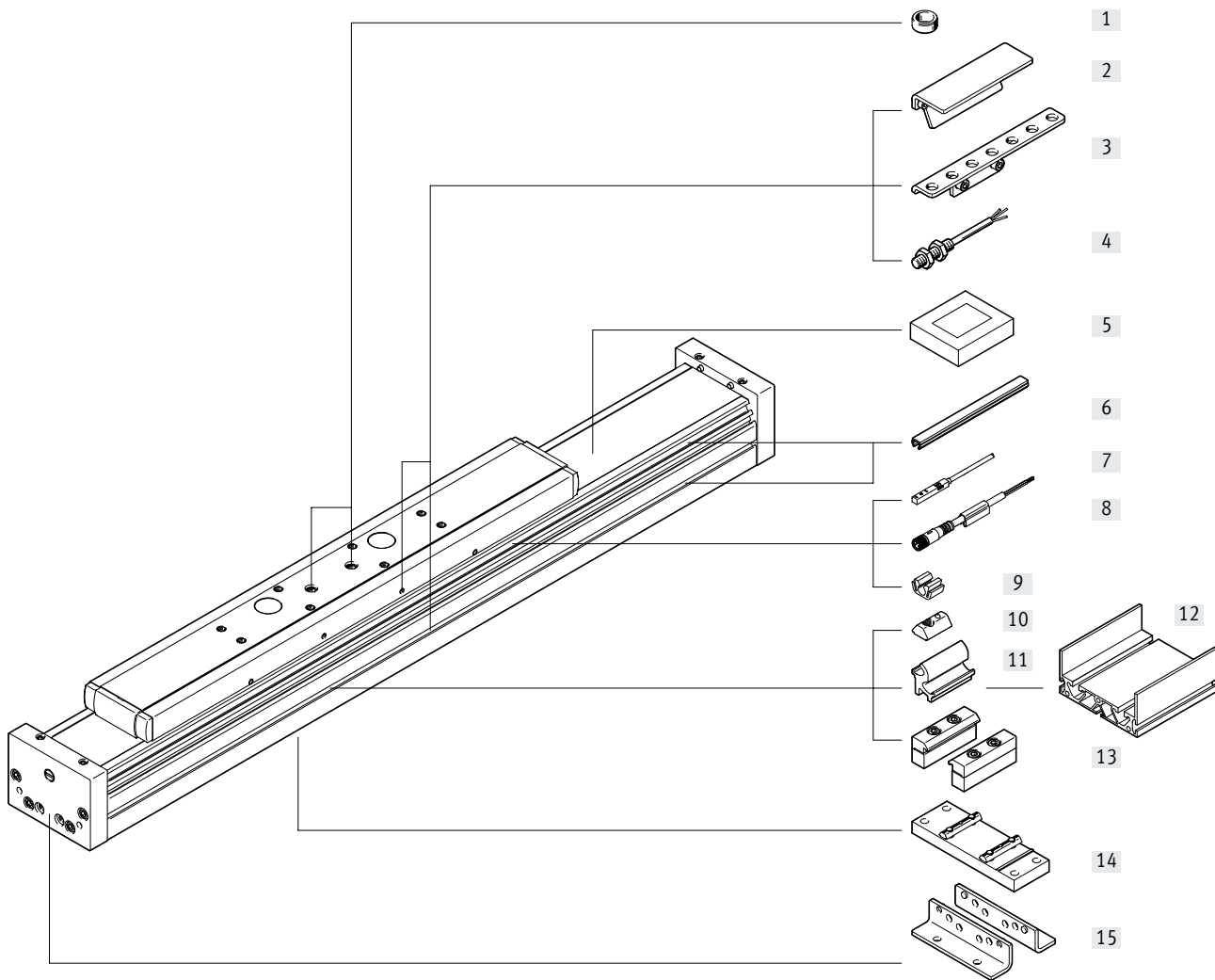


## Ordering data – Modular product system

Ordering table						
Size	70	80	120	Conditions	Code	Enter code
Module no.	<b>8037970</b>	<b>8037971</b>	<b>8037972</b>			
Design	Guide axis				<b>ELFA</b>	ELFA
Guide	Recirculating ball bearing guide				<b>-KF</b>	-KF
Size [mm]	70	80	120		<b>-...</b>	-...
Stroke length [mm]	50 ... 5000	50 ... 8500			<b>-...</b>	-...
Stroke reserve [mm]	0 ... 999 (0 = no stroke reserve)			[1]	<b>-...H</b>	-...H
Slide design	Standard slide					
	1 slide on left				<b>-ZL</b>	
	1 slide on right				<b>-ZR</b>	
Protection against particles	Standard					
	Cover strip with magnetic deflection				<b>P11</b>	

[1] ... The sum of the nominal stroke and 2x stroke reserve must be at least 50 mm and must not exceed the maximum stroke length.

Peripherals overview

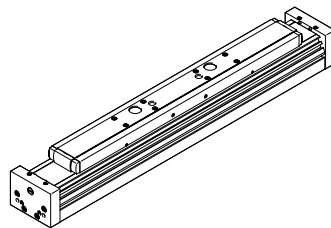
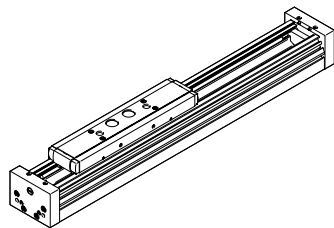
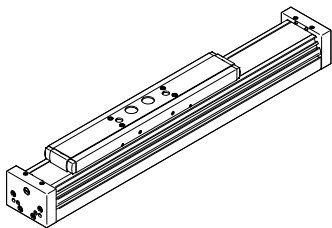


Slide variants

ELFA-...  
Standard slide

ELFA-...-S  
Short slide

ELFA-...-L  
Long slide



This variant is only available without cover strip.

## Peripherals overview

Variants and accessories		
Type	Description	→ Page/Internet
[1] Centring sleeve ZBH	<ul style="list-style-type: none"> <li>For centring loads and attachments on the slide</li> <li>Included in the scope of delivery:               <ul style="list-style-type: none"> <li>With size 70, 80: 2x ZBH-9</li> </ul> </li> </ul>	39
[2] Switch lug SF-EGC	For sensing the slide position	38
[3] Sensor bracket HWS-EGC	Adapter for mounting the inductive proximity sensors (round design) on the axis	38
[4] Proximity sensor, M8 SIEN-M8	Inductive proximity sensor, round design	41
[5] Clamping element EADT	Tool for retensioning the cover strip	39
[6] Slot cover ABP	For protection against contamination	39
[7] Proximity sensor, T-slot SIES-8M	Inductive proximity sensor, for T-slot	41
[8] Connecting cable NEBU	For proximity sensor	41
[9] Clip SMBK	For mounting the proximity sensor cable in the slot	39
[10] Slot nut NST	For mounting attachments	39
[11] Adapter kit DHAM	For mounting the support profile on the axis	40
[12] Support profile HMIA	For guiding an energy chain	40
[13] Profile mounting MUE	For mounting the axis on the side of the profile	35
[14] Central support EAHF-L5	For mounting the axis on the profile from underneath	36
[15] Foot mounting HPE	<ul style="list-style-type: none"> <li>For mounting the axis on the end cap.</li> <li>With higher forces and torques, the axis should be mounted using the profile</li> </ul>	34

## Type codes

001	Series
ELFA	Guide axis

002	Guide
RF	Roller bearing

003	Size
70	70
80	80

004	Stroke [mm]
...	50 ... 7000

005	Stroke reserve
OH	None
...H	0 ... 999 mm

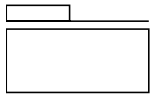
  




006	Slide design
	Standard
S	Slide, short
L	Slide, long

007	Protection against particles
	Standard
P0	Without strip cover

## Data sheet



-  Size  
70, 80
-  Stroke length  
50 ... 7000 mm
-  [www.festo.com](http://www.festo.com)



General technical data			
Size		70	80
Design		Guide	
Guide		Roller bearing guide	
Mounting position		Any	
Working stroke			
ELFA-...	[mm]	50 ... 7000	50 ... 7000
ELFA-...-S	[mm]	50 ... 7000	50 ... 7000
ELFA-...-L	[mm]	50 ... 6900	50 ... 6900
Max. no-load resistance to shifting	[N]	25	40
Max. speed	[m/s]	10	10
Max. acceleration	[m/s <sup>2</sup> ]	50	50

Operating and environmental conditions			
Ambient temperature <sup>1)</sup>	[°C]	-10 ... +60	
Degree of protection			
ELFA-...		IP40	
ELFA-...-P0		IP00	

1) Note operating range of proximity sensors

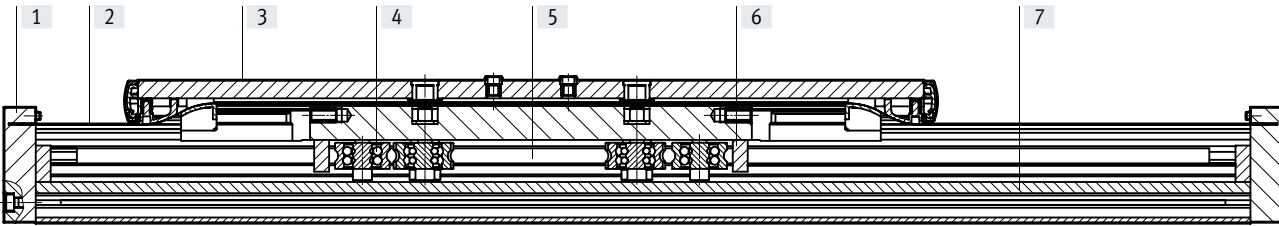
Weight [kg]			
Size		70	80
Product weight with 0 mm stroke <sup>1)</sup>			
ELFA-...		1.92	4.28
ELFA-...-S		1.56	3.67
ELFA-...-L		2.45	5.45
Additional weight per 1000 mm stroke			
ELFA-...		3.05	4.71
ELFA-...-P0		2.96	4.61
Moving mass			
ELFA-...		0.66	1.65
ELFA-...-S		0.56	1.48
ELFA-...-L		0.89	2.16

1) Including slide

## Data sheet

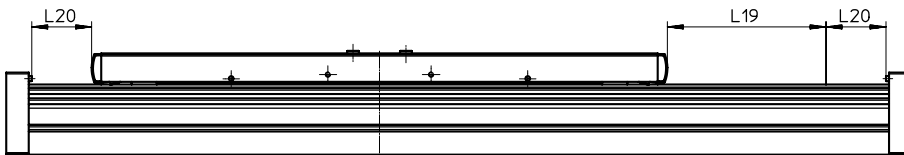
### Materials

Sectional view



Axis	
[1] End cap	Anodised wrought aluminium alloy
[2] Cover strip	Stainless steel
[3] Slide	Anodised wrought aluminium alloy
[4] Castor	Hardened rolled steel
[5] Guide rod	Hardened tempered steel
[6] Wiper seal	Oil-impregnated felt
[7] Profile	Anodised wrought aluminium alloy
Note on materials	RoHS-compliant
	Contains paint-wetting impairment substances

### Stroke reserve



L19 = Nominal stroke  
L20 = Stroke reserve

- The stroke reserve is a safety distance from the mechanical end position and is not used in normal operation
- The sum of the nominal stroke and 2x stroke reserve must not exceed the maximum permissible working stroke
- The stroke reserve length can be freely selected
- The stroke reserve is defined via the "stroke reserve" characteristic in the modular product system

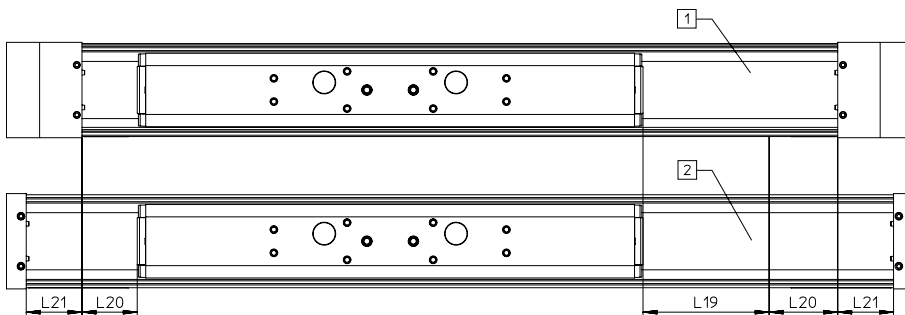
#### Example:

Type ELFA-RF-70-500-20H-...  
 Nominal stroke = 500 mm  
 2x stroke reserve = 40 mm  
 Working stroke = 540 mm  
 (540 mm = 500 mm + 2x 20 mm)

Identical installation length between toothed belt axis ELGA-TB-RF and guide axis ELFA-RF

The different end cap lengths result in different overall lengths despite the nominal stroke and stroke reserve being the same.

To achieve the same overall length between two axes, the compensation dimension L21 must be added to the stroke reserve in the case of the guide axis ELFA-RF.



[1] ELGA-TB-RF  
 [2] ELFA-RF  
 L19 = Nominal stroke  
 L20 = Stroke reserve  
 L21 = Compensation dimension

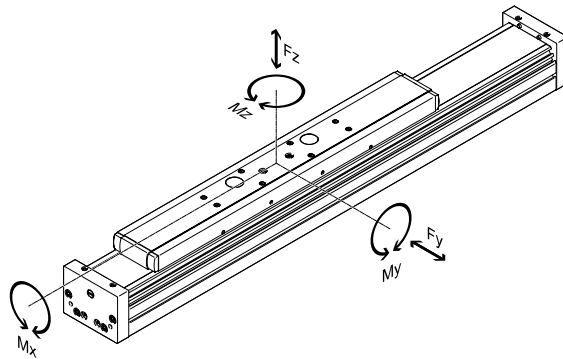
Size	70	80
Compensation dimension [mm]	41.5	48



## Data sheet

### Characteristic load values

The indicated forces and torques refer to the slide surface. The point of application of force is the point where the centre of the guide and the longitudinal centre of the slide intersect. These values must not be exceeded during dynamic operation. Special attention must be paid to the deceleration phase.



If the axis is subjected to two or more of the indicated forces and torques simultaneously, the following equation must be satisfied in addition to the indicated maximum loads:

Calculating the load comparison factor:

$$f_v = \frac{|F_{y1}|}{F_{y2}} + \frac{|F_{z1}|}{F_{z2}} + \frac{|M_{x1}|}{M_{x2}} + \frac{|M_{y1}|}{M_{y2}} + \frac{|M_{z1}|}{M_{z2}} \leq 1$$

$F_1/M_1$  = dynamic value

$F_2/M_2$  = maximum value

Permissible forces and torques for a service life of 10000 km		
Size	70	80
$F_{y_{max}}$	500	800
$F_{z_{max}}$	500	800
$M_{x_{max}}$	11	30
$M_{y_{max}}$		
ELFA-...	20	90
ELFA-...-S	20	90
ELFA-...-L	40	180
$M_{z_{max}}$		
ELFA-...	20	90
ELFA-...-S	20	90
ELFA-...-L	40	180

### Calculating the service life

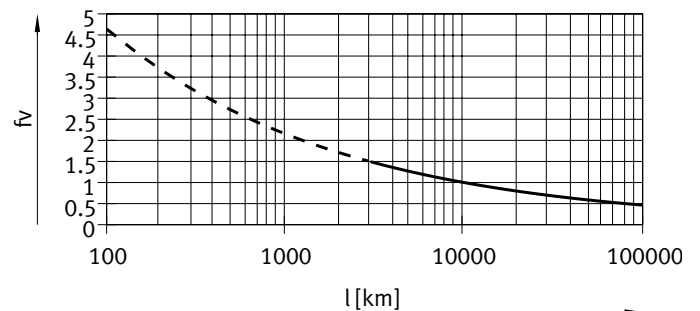
The service life of the guide depends on the load. To provide a rough indication of the service life of the guide, the graph below shows the load comparison factor  $f_v$  as a characteristic in relation to the service life.

These values are only theoretical. You must consult your local contact person at Festo for load comparison factors  $f_v$  greater than 1.5.

#### Load comparison factor $f_v$ as a function of service life

Example:

A user wants to move an X kg load. Using the formula (→ page 25) gives a value of 1.5 for the load comparison factor  $f_v$ . According to the graph, the guide would have a service life of approx. 3000 km. Reducing the acceleration reduces the  $M_z$  and  $M_y$  values. A load comparison factor  $f_v$  of 1 now gives a service life of 10000 km.



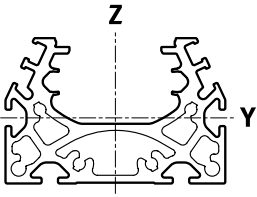
#### Note

The engineering software can be used to calculate the guide workload for a service life of 10000 km.

$f_v > 1.5$  are only theoretical comparison values for the roller bearing guide.

## Data sheet

### Second moment of area

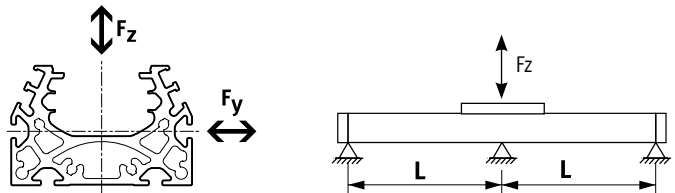


Size		70	80
$I_y$	[mm <sup>4</sup> ]	$1.39 \times 10^5$	$2.70 \times 10^5$
$I_z$	[mm <sup>4</sup> ]	$4.33 \times 10^5$	$1.02 \times 10^6$

### Maximum permissible support spacing L (without profile mounting MUE/central support EAHF) as a function of force F

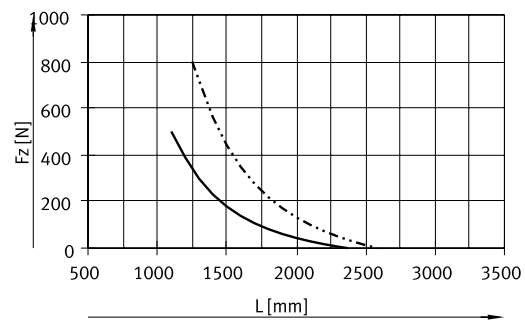
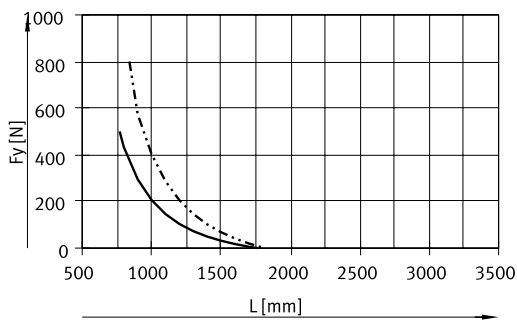
In order to limit deflection in the case of large strokes, the axis may need to be supported.

The following graphs can be used to determine the maximum permissible support spacing L as a function of force F acting on the axis. The deflection is  $f = 0.5$  mm.



Force  $F_y$

Force  $F_z$



- ELFA-RF-70
- - - ELFA-RF-80

### Recommended deflection limits

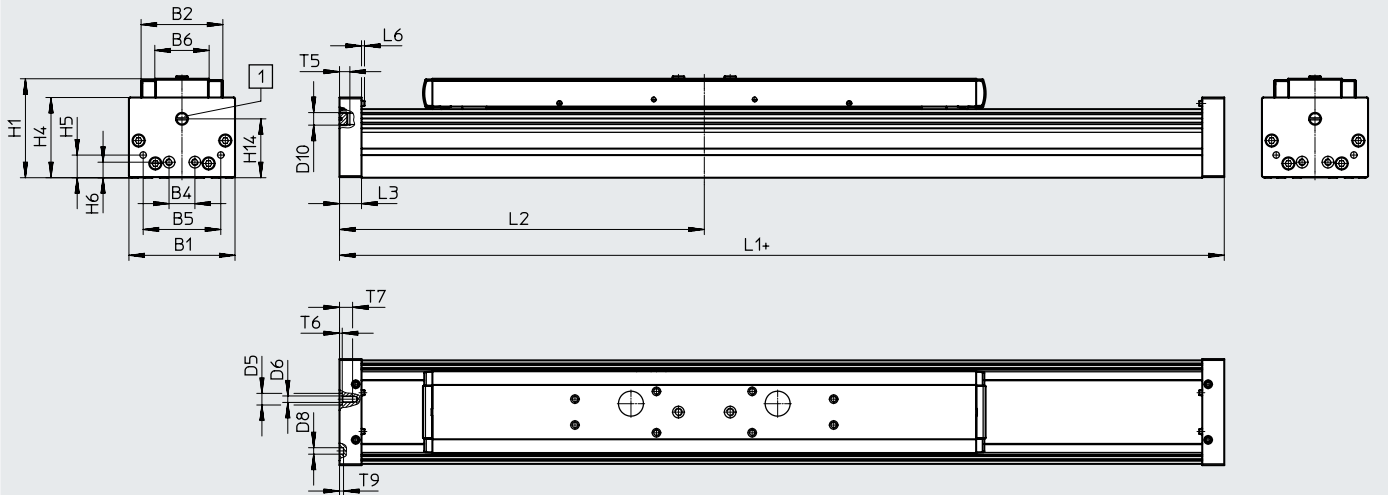
Adherence to the following deflection limits is recommended so as not to impair the functionality of the axes. Greater deformation can result in increased friction, greater wear and reduced service life.

Size	Dynamic deflection (moving mass)	Static deflection (stationary load)
70, 80	0.05% of the axis length, max. 0.5 mm	0.1% of the axis length

Data sheet

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)



+ = plus stroke length + 2x stroke reserve

[1] Sealing air connection

Size	B1	B2	B4	B5	B6	D5 ∅ H7	D6	D8 ∅ H7	D10	H1
70	69	48.2	30	45	30	–	M5	5	G1/8	64
80	82	63.2	20	60	42	9	M5	5	G1/8	76.5

Size	H4	H5	H6	H14	L3	L6	T5	T6	T7	T9
70	50.5	13	13	37.5	16	2.3	8	–	10	3.1
80	62	17.5	12	45.5	17	2.3	8	2.1	10.1	3.1

Size	L1			L2		
	ELFA-...			ELFA-...		
	-S	-L		min.	-S min.	-L min.
70	337	259	437	168.5	129.5	218.5
80	484	400	624	242	200	312

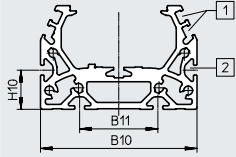
## Data sheet

### Dimensions

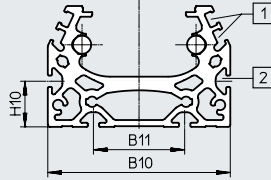
Download CAD data → [www.festo.com](http://www.festo.com)

Profile

Size 70



Size 80



[1] Sensor slot for proximity sensor

[2] Mounting slot for slot nut

Size	B10	B11	H10
70	67	40	20
80	80	40	20



#### Note

Requirements for the flatness of the bearing surface and of attachments as well as for use in parallel structures

→ [www.festo.com/sp](http://www.festo.com/sp)

User documentation

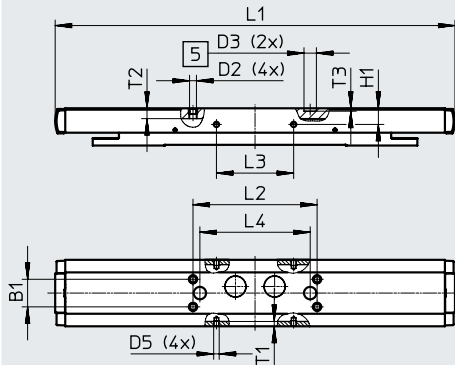
## Data sheet

### Dimensions

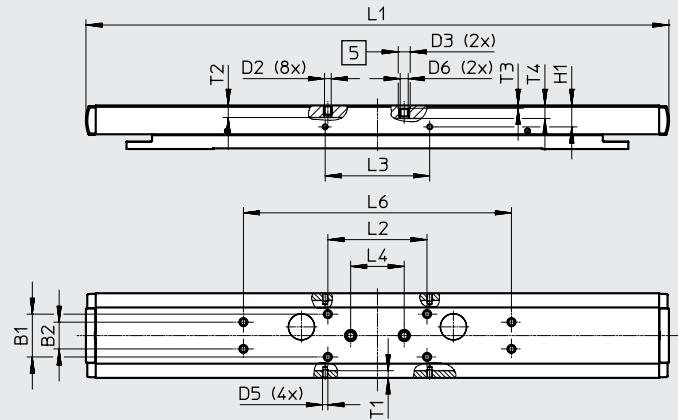
Download CAD data → [www.festo.com](http://www.festo.com)

ELFA... – Standard slide

Size 70



Size 80



[5] Drilled hole for centring sleeve ZBH

Size	B1	B2	D2	D3 ∅ H7	D5	D6	H1	L1
	±0.1	±0.1					±0.1	
70	20	–	M5	9	M4	–	11.7	290
80	32	20	M5	9	M4	M6	16	435

Size	L2	L3	L4	L6	T1	T2	T3	T4
	±0.2	±0.1	±0.03	±0.2				
70	90	56	80	–	3.5	7.5	2.1	–
80	74	78	40	200	5.1	9	2.1	9.7

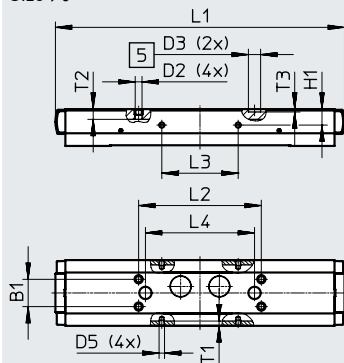
## Data sheet

### Dimensions

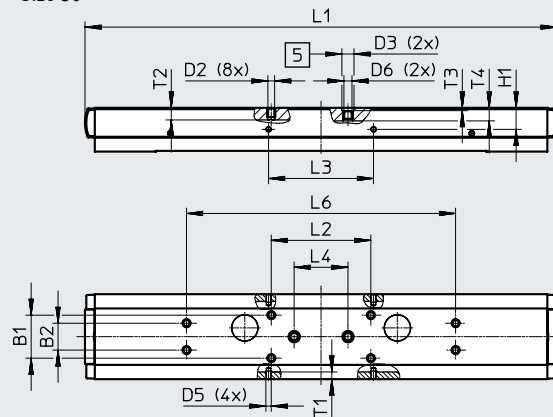
Download CAD data → [www.festo.com](http://www.festo.com)

ELFA-...S – Short slide

Size 70



Size 80



[5] Drilled hole for centring sleeve ZBH

Size	B1	B2	D2	D3 ∅ H7	D5	D6	H1	L1
70	±0.1	±0.1	M5	9	M4	–	±0.1	212
80	32	20	M5	9	M4	M6	16	351

Size	L2	L3	L4	L6	T1	T2	T3	T4
	±0.2	±0.1	±0.03	±0.2				
70	90	56	80	–	3.5	7.5	2.1	–
80	74	78	40	200	5.1	9	2.1	9.7

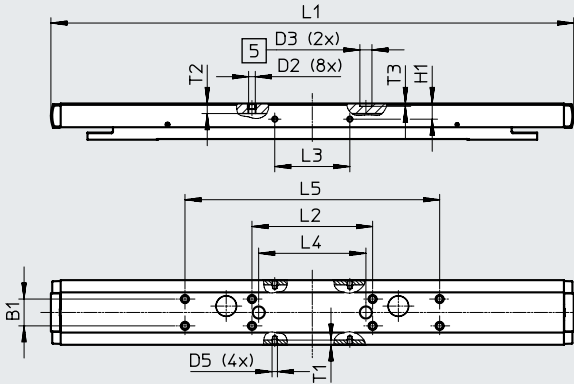
Data sheet

Dimensions

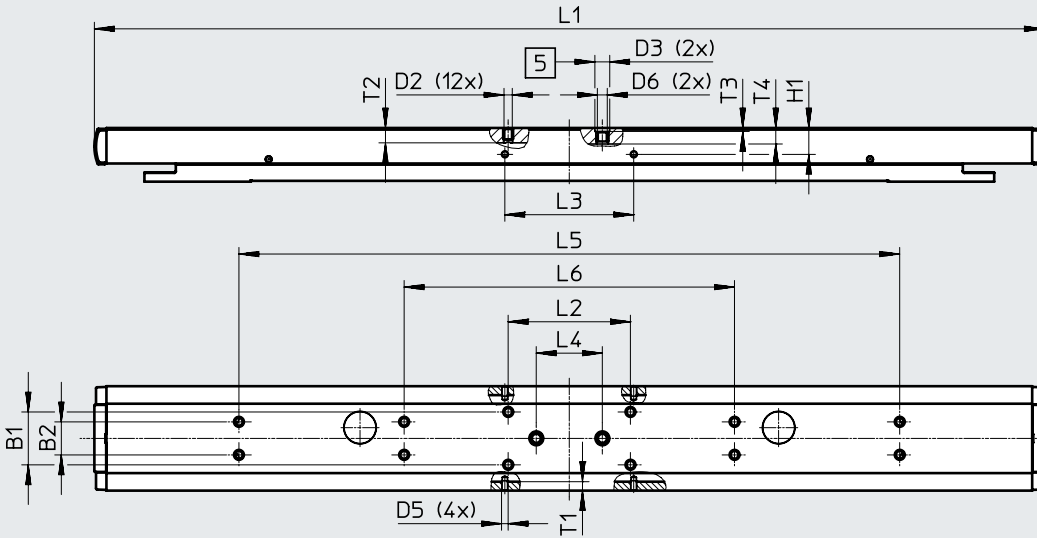
Download CAD data → [www.festo.com](http://www.festo.com)

ELFA...-L – Long slide

Size 70



Size 80



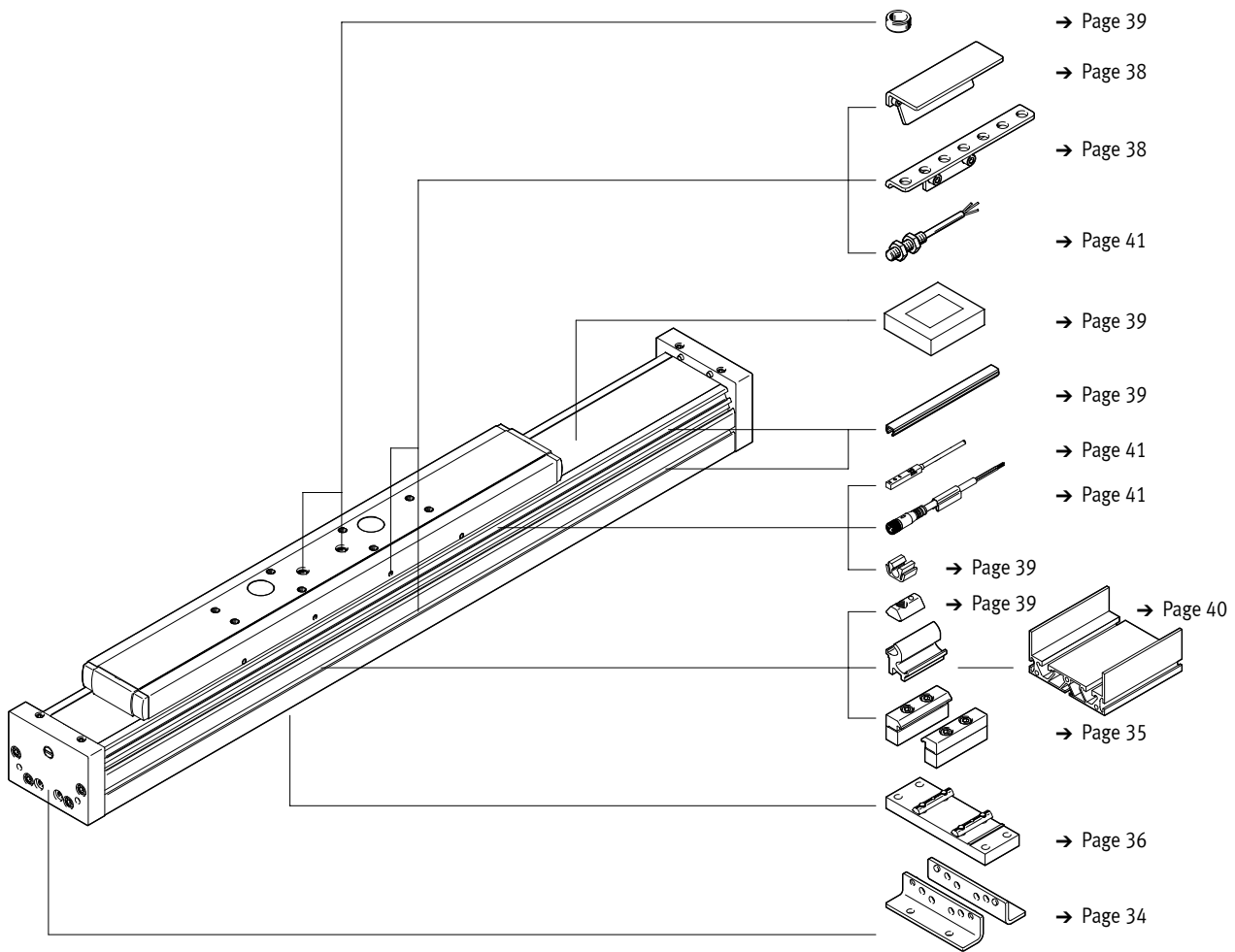
[5] Drilled hole for centring sleeve ZBH

Size	B1	B2	D2	D3 ∅ H7	D5
	±0.1	±0.1			
70	20	-	M5	9	M4
80	32	20	M5	9	M4

Size	D6	H1	L1	L2	L3	L4
		±0.1		±0.2	±0.1	±0.03
70	-	11.7	390	90	56	80
80	M6	16	575	74	78	40

Size	L5	L6	T1	T2	T3	T4
	±0.2	±0.2				
70	190	-	3.5	7.5	2.1	-
80	400	200	5.1	9	2.1	9.7

Ordering data – Modular product system





## Ordering data – Modular product system

Ordering table					
Size	70	80	Conditions	Code	Enter code
Module no.	<b>8037967</b>	<b>8037968</b>			
Design	Guide axis			<b>ELFA</b>	ELFA
Guide	Roller bearing guide			<b>-RF</b>	-RF
Size [mm]	70	80		<b>-...</b>	-...
Stroke length [mm]	50 ... 7000			<b>-...</b>	-...
Stroke reserve [mm]	0 ... 999 (0 = no stroke reserve)		[1]	<b>-...H</b>	
Slide design	Standard slide 50 ... 7000				
	Short slide 50 ... 7000		[2]	<b>-S</b>	
	Long slide 50 ... 6900			<b>-L</b>	
Protection against particles	Standard				
	Without cover strip			<b>-P0</b>	

[1] ... The sum of the nominal stroke and 2x stroke reserve must be at least 50 mm and must not exceed the maximum stroke length.

[2] S Only with P0.

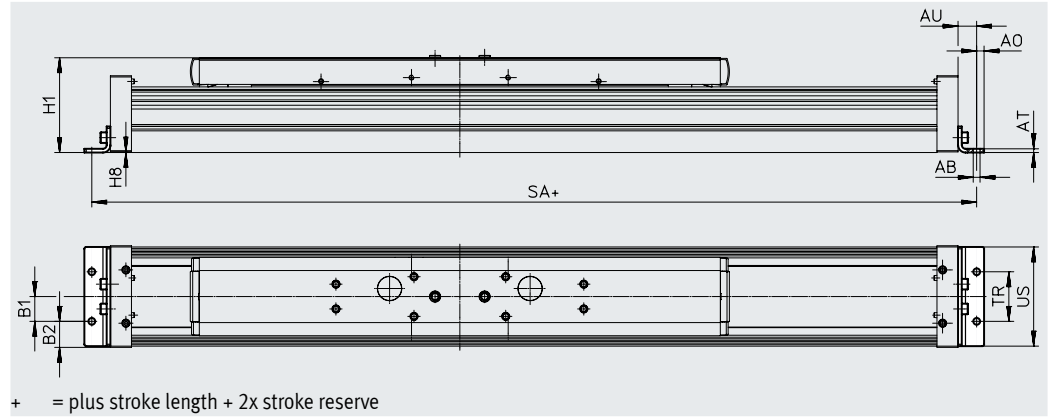
## Accessories

### Foot mounting HPE

Material:

Galvanised steel

RoHS-compliant



#### Dimensions and ordering data

For size	AB ∅	A0	AT	AU	B1	B2	H1
70	5.5	6	3	13	20	14.5	64
80	5.5	6	3	15	20	21	76.5
120	9	8	6	22	40	20	111.5

For size	H8	SA	TR	US
70	0.5	289	40	67
80	0.5	320	40	80
120	0.5	440	80	116

For size	Weight [g]	Part no.	Type
70	115	558321	HPE-70
80	150	558322	HPE-80
120	578	558323	HPE-120

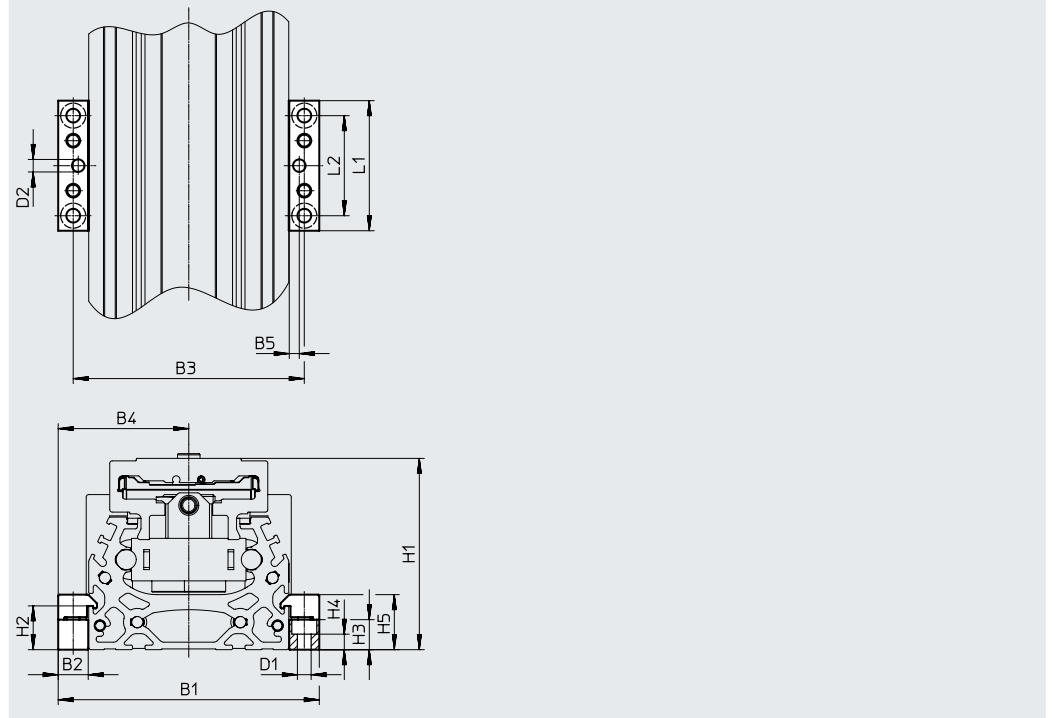
## Accessories

### Profile mounting MUE

Material:

Anodised aluminium

RoHS-compliant



#### Dimensions and ordering data

For size	B1	B2	B3	B4	B5	D1 ∅	D2 ∅ H7	H1	H2
70	91	12	79	39.5	4	5.5	5	64	17.5
80	104	12	92	46	4	5.5	5	76.5	17.5
120	154	19	135	67.5	4	9	5	111.5	16

For size	H3	H4	H5	L1	L2	Weight [g]	Part no.	Type
70	12	6.2	22	52	40	80	558043	MUE-70/80
80	12	6.2	22	52	40	80	558043	MUE-70/80
120	14	5.5	29.5	90	40	290	558044	MUE-120/185

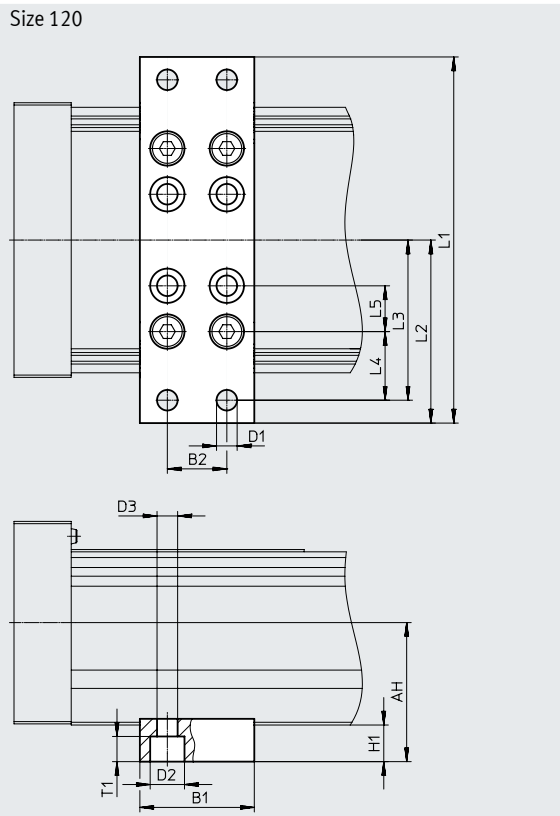
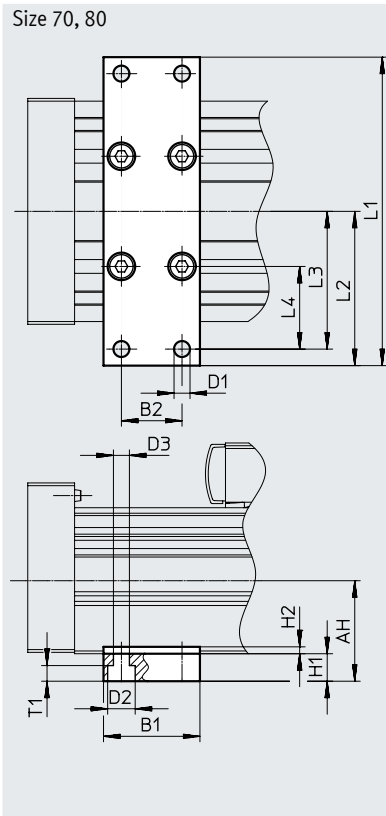
## Accessories

### Central support EAHF

Material:

Anodised aluminium

RoHS-compliant



#### Dimensions and ordering data

For size	AH	B1	B2	D1 ø	D2 ø	D3 ø	H1	L1
70	32.2	35	22	5.8	10	5.8	10	102
80	36.5							112
120	74.6	50	26	9	15	9	16	160

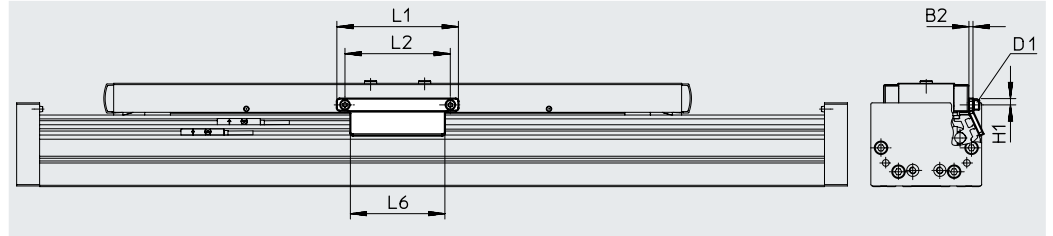
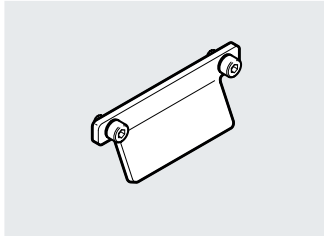
For size	L2	L3	L4	L5	T1	Weight [g]	Part no.	Type
70	51	45	25	-	5.7	113	<b>2349256</b>	<b>EAHF-L5-70-P</b>
80	56	50	30			123	<b>3535188</b>	<b>EAHF-L5-80-P</b>
120	80	70	30	20	11	384	<b>2410274</b>	<b>EAHF-L5-120-P</b>

## Accessories

### Switch lug SF-EGC-1

For sensing via proximity sensor  
SIES-8M

Material:  
Galvanised steel  
RoHS-compliant



#### Dimensions and ordering data

For size	B2	D1	H1	L1	L2	L6	Weight [g]	Part no.	Type
70	3	M4	4.65	70	56	50	50	558047	SF-EGC-1-70
80	3	M4	4.65	90	78	70	60	558048	SF-EGC-1-80
120	3	M5	8	170	140	170	147	558049	SF-EGC-1-120

## Accessories

### Switch lug SF-EGC-2

For sensing via proximity sensor  
SIEN-M8B/SIES-8M

Material:

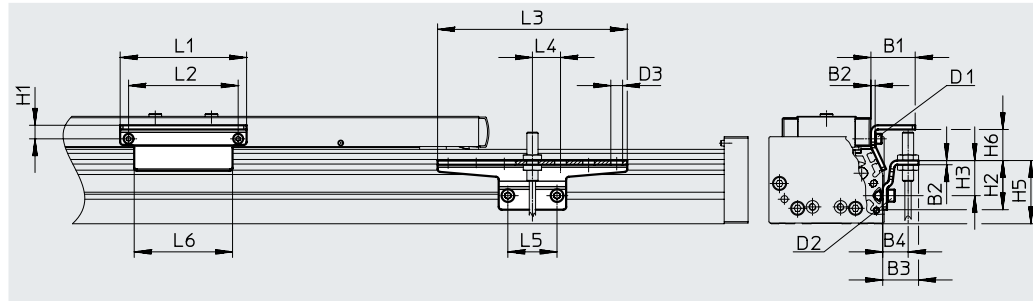
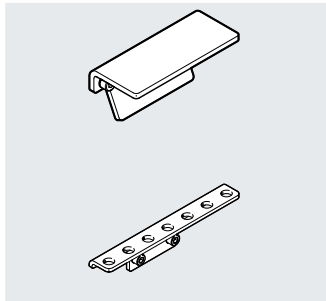
Galvanised steel  
RoHS-compliant

### Sensor bracket HWS-EGC

For proximity sensor SIEN-M8B

Material:

Galvanised steel  
RoHS-compliant



#### Dimensions and ordering data







For size	B1	B2	B3	B4	D1	D2	D3 ∅	H1	H2
70	31.5	3	25.5	18	M4	M5	8.4	9.5	35
80	31.5	3	25.5	18	M4	M5	8.4	9.5	35
120	32	3	25.5	18	M5	M5	8.4	13.2	65

For size	H3	H5	H6 max.	L1	L2	L3	L4	L5	L6
70	25	45	13.5	70	56	135	20	35	50
80	25	45	23.5	90	78	135	20	35	70
120	55	75	24	170	140	215	20	35	170

For size	Weight [g]	Part no.	Type
<b>Switch lug</b>			
70	100	558052	SF-EGC-2-70
80	130	558053	SF-EGC-2-80
120	277	558054	SF-EGC-2-120

For size	Weight [g]	Part no.	Type
<b>Sensor bracket</b>			
70	110	558057	HWS-EGC-M5
80	110	558057	HWS-EGC-M5
120	217	570365	HWS-EGC-M8-B

## Accessories

Ordering data			Part no.	Type	PU <sup>1)</sup>
	For size	Comment			
<b>Slot nut NST</b>					
	70, 80	For mounting slot	150914	NST-5-M5	1
			8047843	NST-5-M5-10	10
			8047878	NST-5-M5-50	50
	120		150915	NST-8-M6	1
			8047868	NST-8-M6-10	10
			8047869	NST-8-M6-50	50
<b>Centring pin/sleeve ZBS/ZBH</b>					
	70	For slide	150928	ZBS-5	10
	70, 80, 120		8137184	ZBH-9-B	
<b>Slot cover ABP</b>					
	70, 80	<ul style="list-style-type: none"> <li>For mounting slot</li> <li>Each 0.5 m</li> </ul>	151681	ABP-5	2
	120		151682	ABP-8	
<b>Slot cover ABP-S</b>					
	70, 80, 120	<ul style="list-style-type: none"> <li>For sensor slot</li> <li>Each 0.5 m</li> </ul>	563360	ABP-S-S1	2
<b>Clip SMBK</b>					
	70, 80, 120	For sensor slot, for mounting the proximity sensor cables	534254	SMBK-8	10
<b>Clamping element EADT</b>					
	70, 80	Tool for retensioning the cover strip	8058451	EADT-S-L5-70	1
	120		8058450	EADT-S-L5-120	




1) Packaging unit

## Accessories

### Mounting options between axis and support profile

Depending on the adapter kit, the spacing between the axis and the support profile is:  
x = 20 mm or 50 mm







The support profile must be mounted using at least 2 adapter kits. For longer strokes, an adapter kit must be used every 500 mm.

Ordering data		For size	Comment	Part no.	Type	PU <sup>1)</sup>
<b>Adapter kit DHAM</b>						
	80	20	<ul style="list-style-type: none"> <li>For mounting the support profile on the axis</li> <li>Spacing between axis and profile is 20 mm</li> </ul>	562241	DHAM-ME-N1-CL	1
	120			562242	DHAM-ME-N2-CL	
	70, 80	50	<ul style="list-style-type: none"> <li>For mounting the support profile on the axis</li> <li>Spacing between axis and profile is 50 mm</li> </ul>	574560	DHAM-ME-N1-50-CL	1
	120			574561	DHAM-ME-N2-50-CL	
<b>Support profile HMIA</b>						
	70, 80, 120		For guiding an energy chain	539379	HMIA-E07-	1

1) Packaging unit



## Accessories

Ordering data – Proximity sensors for T-slot, inductive						Data sheets → Internet: sies
	Type of mounting	Electrical connection	Switching output	Cable length [m]	Part no.	Type
<b>N/O contact</b>						
	Inserted in the slot from above, flush with the cylinder profile	Cable, 3-wire	PNP	7.5	551386	SIES-8M-PS-24V-K-7.5-OE
		Plug M8x1, 3-pin		0.3	551387	SIES-8M-PS-24V-K-0.3-M8D
		Cable, 3-wire	NPN	7.5	551396	SIES-8M-NS-24V-K-7.5-OE
		Plug M8x1, 3-pin		0.3	551397	SIES-8M-NS-24V-K-0.3-M8D
<b>N/C contact</b>						
	Inserted in the slot from above, flush with the cylinder profile	Cable, 3-wire	PNP	7.5	551391	SIES-8M-PO-24V-K-7.5-OE
		Plug M8x1, 3-pin		0.3	551392	SIES-8M-PO-24V-K-0.3-M8D
		Cable, 3-wire	NPN	7.5	551401	SIES-8M-NO-24V-K-7.5-OE
		Plug M8x1, 3-pin		0.3	551402	SIES-8M-NO-24V-K-0.3-M8D
Ordering data – Proximity sensor M8 (round design), inductive						Data sheets → Internet: sien
	Electrical connection	LED	Switching output	Cable length [m]	Part no.	Type
<b>N/O contact</b>						
	Cable, 3-wire	■	PNP	2.5	150386	SIEN-M8B-PS-K-L
	Plug M8x1, 3-pin	■	PNP	–	150387	SIEN-M8B-PS-S-L
<b>N/C contact</b>						
	Cable, 3-wire	■	PNP	2.5	150390	SIEN-M8B-PO-K-L
	Plug M8x1, 3-pin	■	PNP	–	150391	SIEN-M8B-PO-S-L
Ordering data – Connecting cables						Data sheets → Internet: nebu
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type	
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	159420	SIM-M8-3GD-2.5-PU	
			2.5	541333	NEBU-M8G3-K-2.5-LE3	
			5	541334	NEBU-M8G3-K-5-LE3	
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3	
			5	541341	NEBU-M8W3-K-5-LE3	