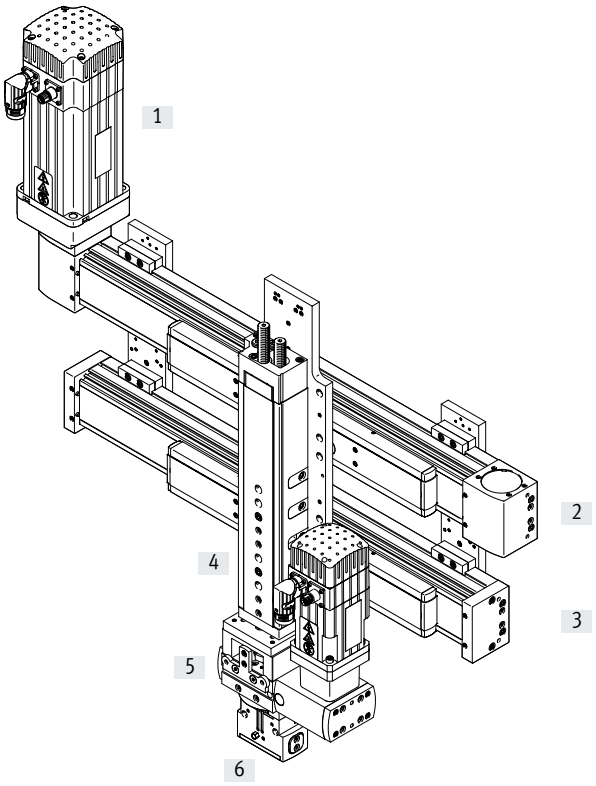
Guide axes ELFA, without drive

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

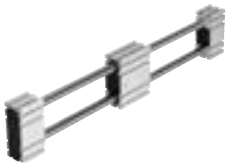
Guide axis EGC-FA

- 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

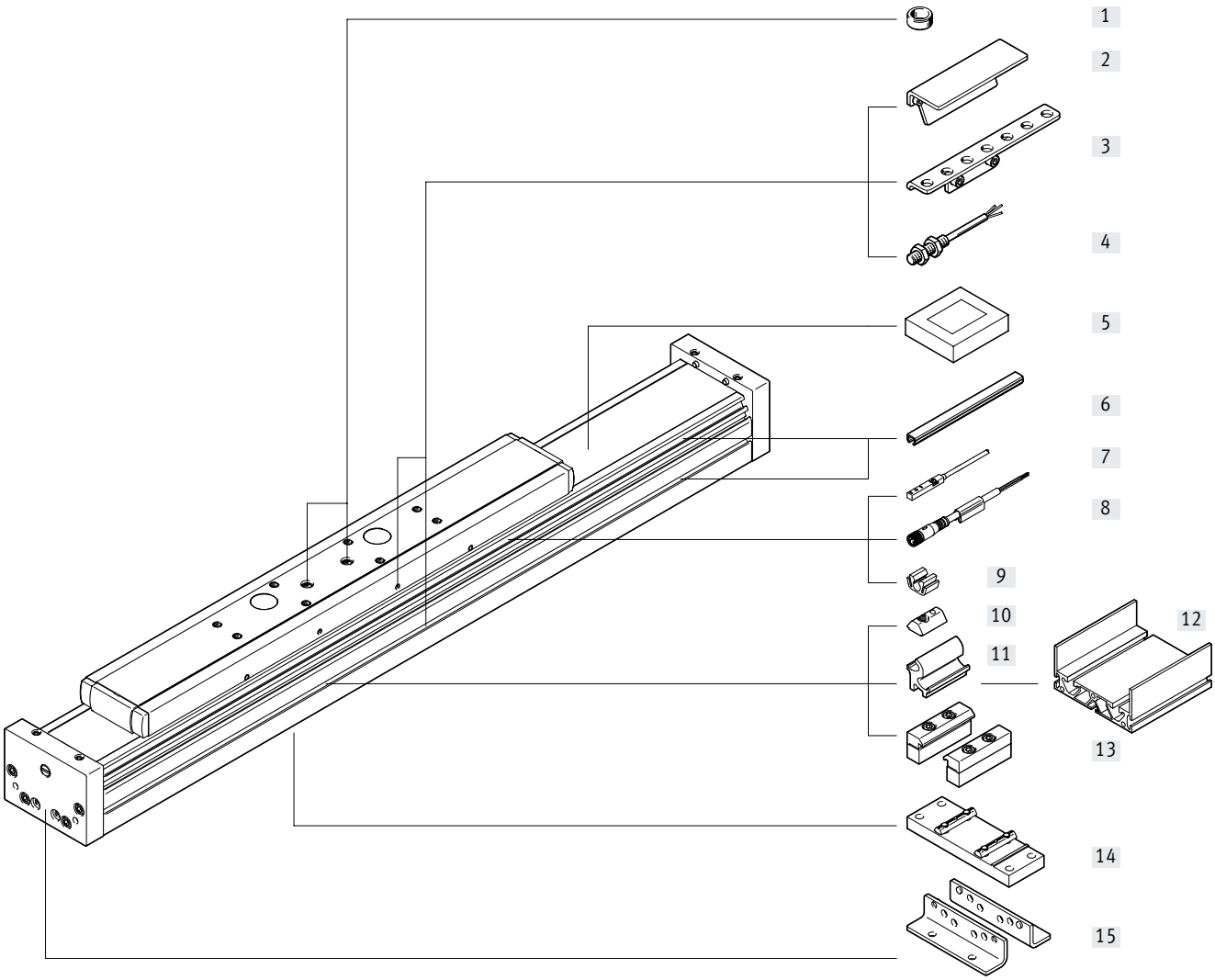
Design	Can be combined with	Size	Working stroke	Speed	Guide characteristics Forces and torques					→ Page/ Internet
					Fy	Fz	Mx	My	Mz	
			[mm]	[m/s]	[N]	[N]	[Nm]	[Nm]	[Nm]	
ELFA-KF – Recirculating ball bearing guide										
	• Toothed belt axis ELGA-TB-KF • Spindle axis ELGA-BS-KF	70	50 ... 5000	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	
ELFA-RF – Roller bearing guide										
	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

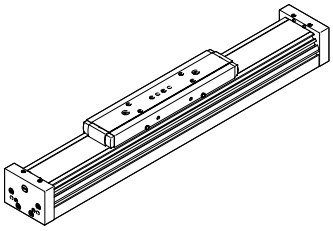
[1] Sealing air connections

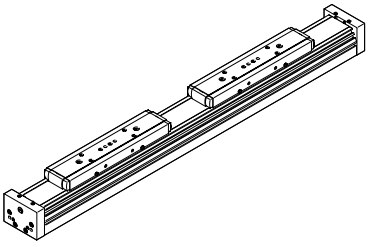
- Application of negative pressure minimises the dispersal of abraded particles into the environment
- Application of gauge pressure prevents dirt from getting into the axis

Peripherals overview



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





Peripherals overview

Variants and accessories

	Type	Description	→ Page/Internet
[1]	Centring sleeve/centring pins ZBH/ZBS	• For centring loads and attachments on the slide • Included in the scope of delivery: – With size 70: 2x ZBS-5 – With size 80, 120: 2x ZBH-9	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	• For mounting the axis on the end cap. • With higher forces and torques, the axis should be mounted using the profile	34

Type codes

001	Series	
ELFA	Guide axis	

002	Guide	
KF	Recirculating ball bearing guide	

003	Size	
70	70	
80	80	
120	120	

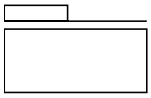
004	Stroke [mm]	
...	50 ... 8500	

005	Stroke reserve	
0H	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

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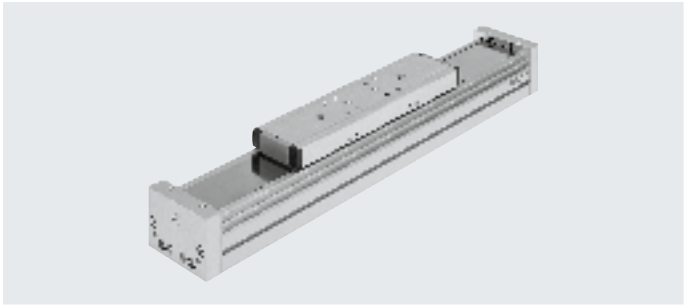


General technical data				
Size		70	80	120
Design		Guide		
Guide		Recirculating ball bearing guide		
Mounting position		Any		
Working stroke	[mm]	50 ... 5000	50 ... 8500	
Max. no-load resistance to shifting	[N]	11	12	23
Max. speed	[m/s]	5		
Max. acceleration	[m/s²]	50		

Operating and environmental conditions		
Ambient temperature[1]	[°C]	–10 ... +60
Degree of protection		IP40

1) Note operating range of proximity sensors

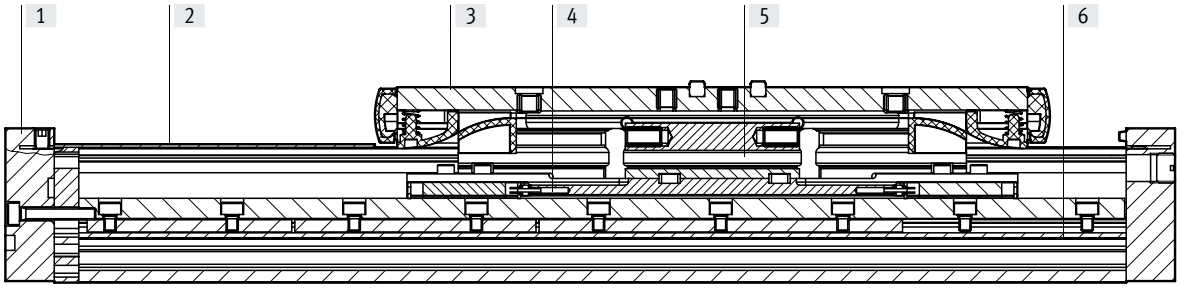
Weight [kg]				
Size		70	80	120
Product weight with 0 mm stroke[1]		2.22	3.74	8.5
Additional weight per 1000 mm stroke		3.84	4.89	10.32
Moving mass		0.77	1.57	3.35

1) Including slide

Data sheet

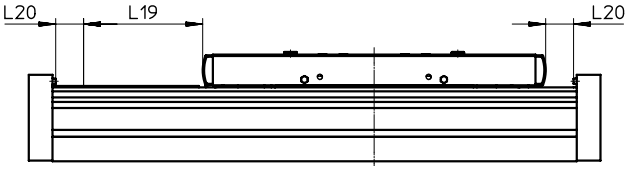
Materials

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, corrotec-coated tempered steel
[6]	Profile	Anodised wrought aluminium alloy
	Note on materials	RoHS-compliant
		Contains paint-wetting impairment substances

Stroke reserve



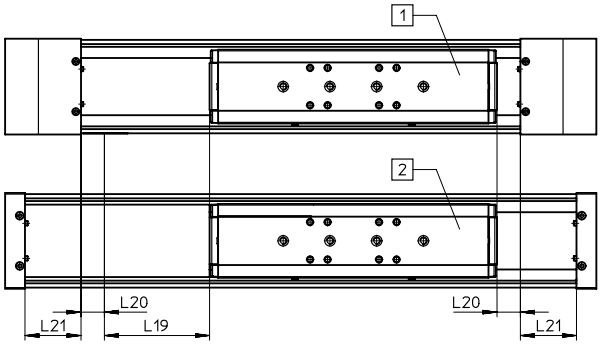
L19 = Nominal stroke
L20 = Stroke reserve

- 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.



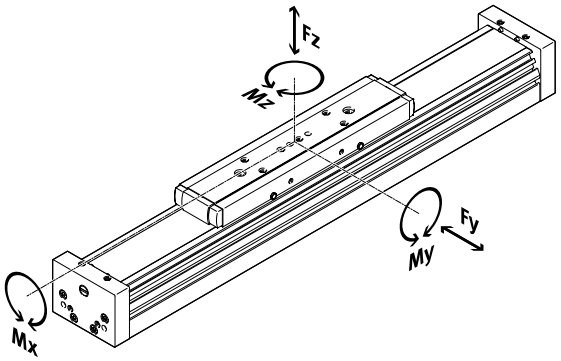
[1] ELGA-TB-KF
[2] ELFA-KF
L19 = Nominal stroke
L20 = Stroke reserve
L21 = Compensation dimension

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

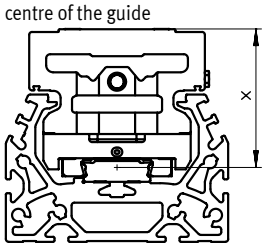
Data sheet

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
$Fy_{max.}$	1500	2500	5500
$Fz_{max.}$	1850	3050	6890
$Mx_{max.}$	16	36	104
$My_{max.}$	132	228	680
$Mz_{max.}$	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 fv ≤ 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

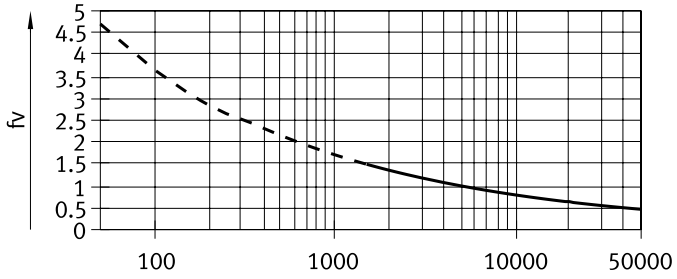
Calculating the service life

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 Mz and My 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.

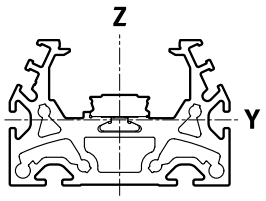
To make it easier to compare the guide capacity of linear axes ELGA with bearing guides, the table below lists the theoretically permissible forces and torques for a calculated service life of 100 km. This corresponds to the dynamic forces and torques to ISO.
These 100 km values have been calculated 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
$Fy_{max.}$	[N]	5520	9200	20240
$Fz_{max.}$	[N]	6808	11224	25355
$Mx_{max.}$	[Nm]	59	132	383
$My_{max.}$	[Nm]	486	839	2502
$Mz_{max.}$	[Nm]	486	839	2502

Data sheet

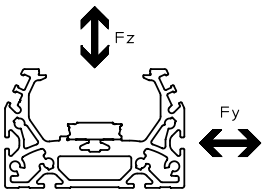
Second moment of area

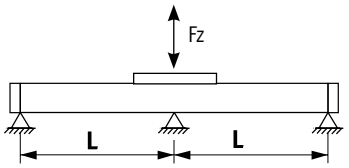


Size		70	80	120
Iy	[mm⁴]	1.46x10⁵	2.57x10⁵	1.26x10⁵
Iz	[mm⁴]	4.59x10⁵	9.14x10⁶	4.37x10⁶

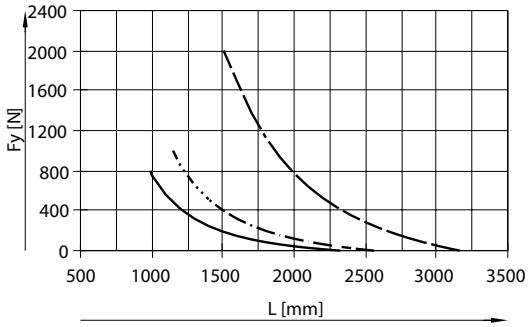
Maximum permissible support spacing L (without profile mounting MUE/central support EAHF) as a function of force F

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.

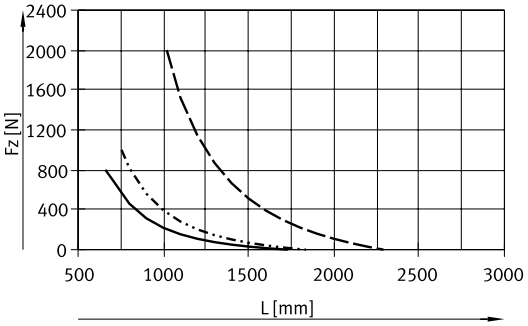




Force Fy



Force Fz



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.

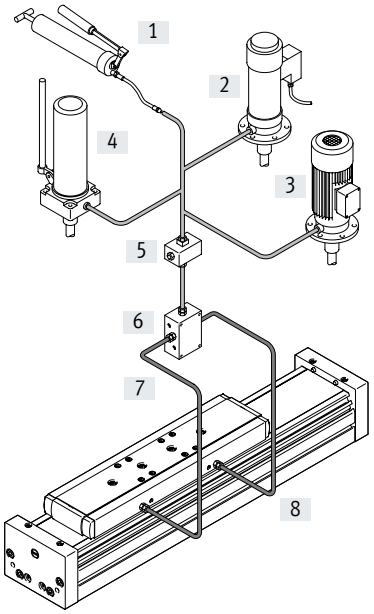
- The axes are suitable for oils and greases
- The connection options are already available in the standard design of the axes
- There is a dedicated lubrication connection for the spindle nut and the two ball cassettes

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:

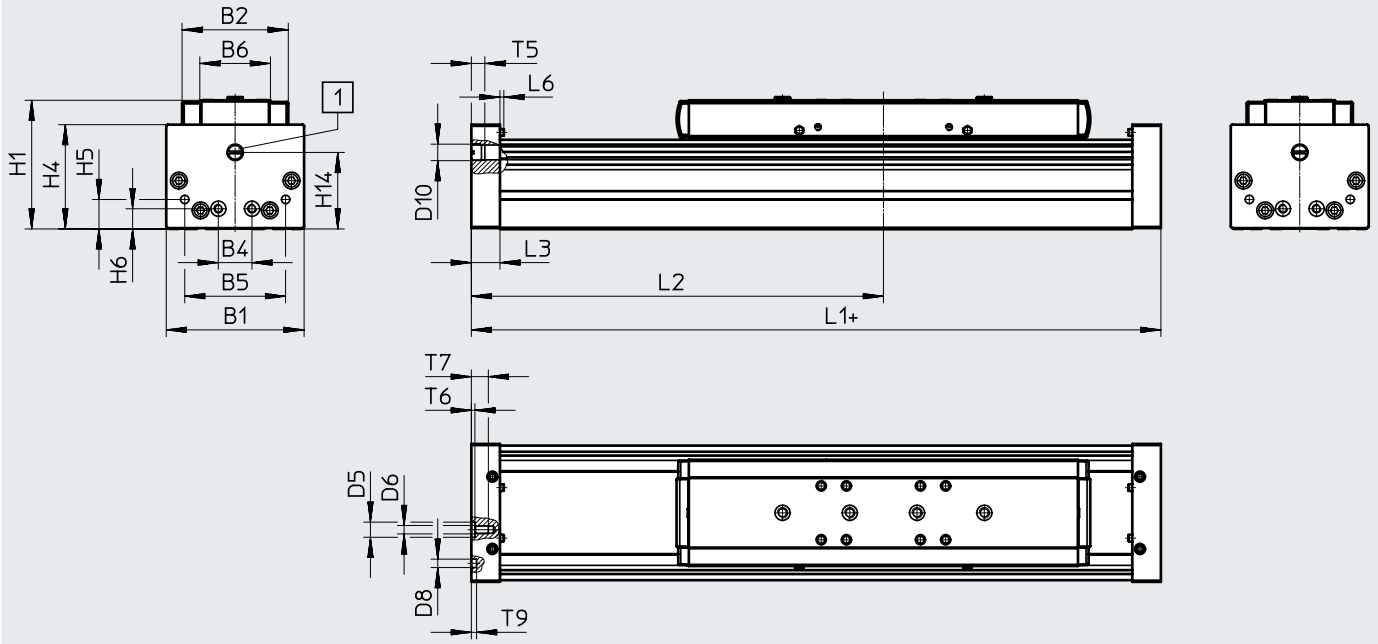
- Lincoln
- Bielomatik
- SKF (Vogel)

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



\+ = plus stroke length + 2x stroke reserve
[1] Sealing air connection

Size	B1	B2	B4	B5	B6	D5 ø H7	D6	D8 ø 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

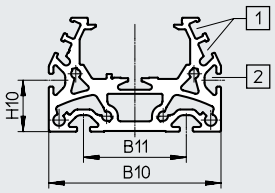
Size	H5	H6	H14	L1	L2 min.	L3	L6	T5	T6	T7	T9
70	13	13	32	263	136.5	16	2.3	8	–	10	3.1
80	17.5	12	40	290	145	17	2.3	8	2.1	10.1	3.1
120	22	22	65	396	198	25	2.5	8	–	16	2.1

Data sheet

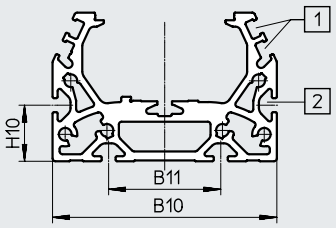
Dimensions Download CAD data ➔ www.festo.com

Profile

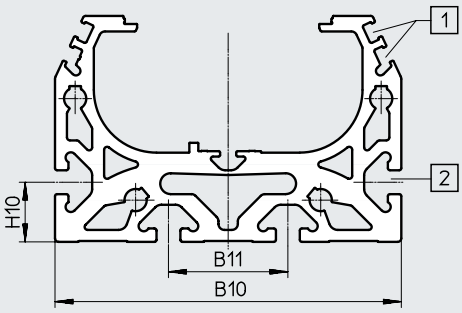
Size 70



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

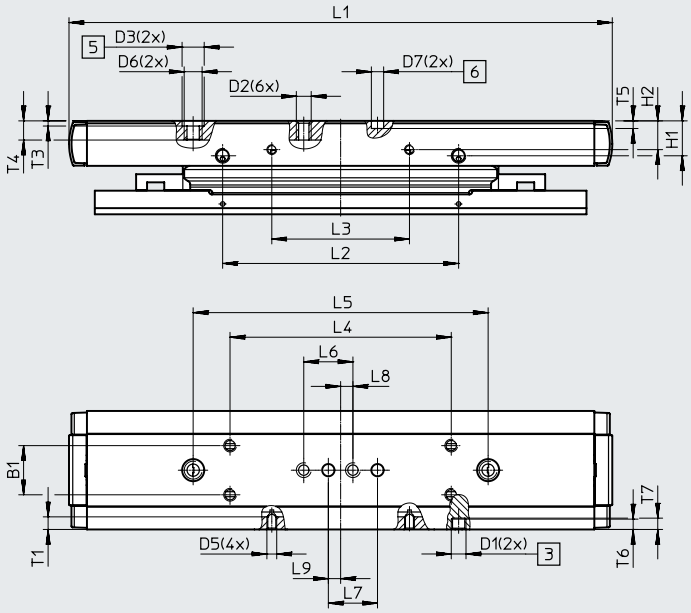
Requirements for the flatness of the bearing surface and of attachments as well as for use in parallel structures
➔ www.festo.com/sp
User documentation

Data sheet

Dimensions Download CAD data ➔ 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	D5	D6	D7	H1	H2	L1	L2	L3
				Ø			Ø					
	±0.1			H7			H7	±0.1	±0.1		±0.1	±0.1
70	20	M6	M5	9	M4	M6	5	14.2	11.7	221	96	56

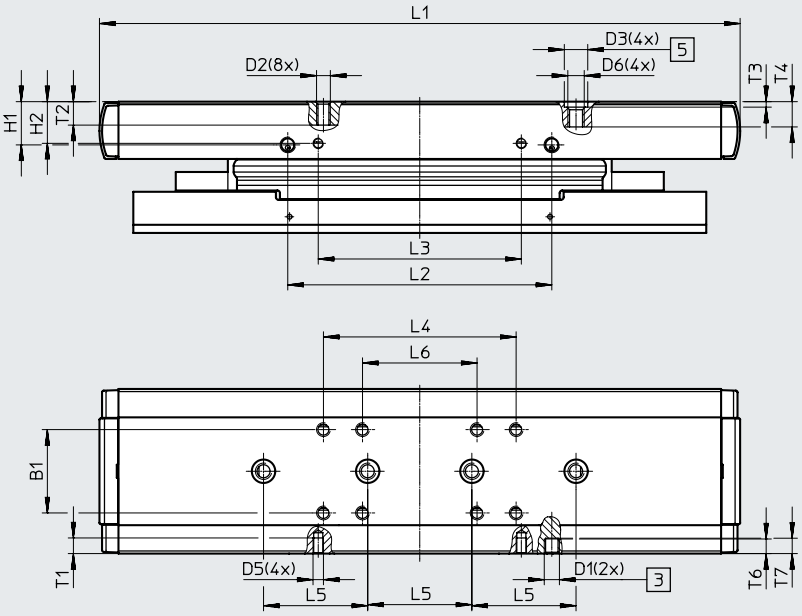
Size	L4	L5	L6	L7	L8	L9	T1	T3	T4	T5	T6	T7
	±0.1		±0.1	±0.03				+0.1		±0.1	min.	–0.1
70	90	120	20	20	5	5	5.1	2.1	7.5	3.1	4.2	4.6

Data sheet

Dimensions Download CAD data ➔ www.festo.com

Slide

Size 80



[3] Lubrication connections

[5] Drilled hole for centring sleeve ZBH

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

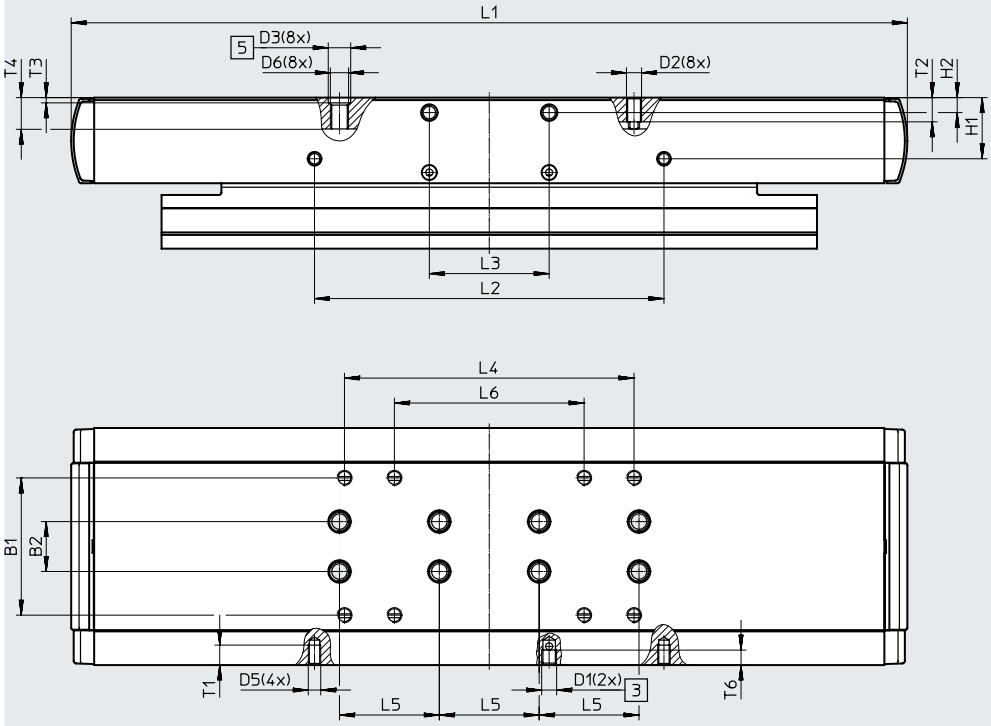
Size	L3	L4	L5	L6	T1	T2	T3	T4	T6	T7
	±0.1	±0.1	±0.03	±0.1			+0.1	–0.2	min.	–0.1
80	78	74	40	44	6	9	2.1	9.7	5.6	5.9

Data sheet

Dimensions Download CAD data ➔ www.festo.com

Slide

Size 120



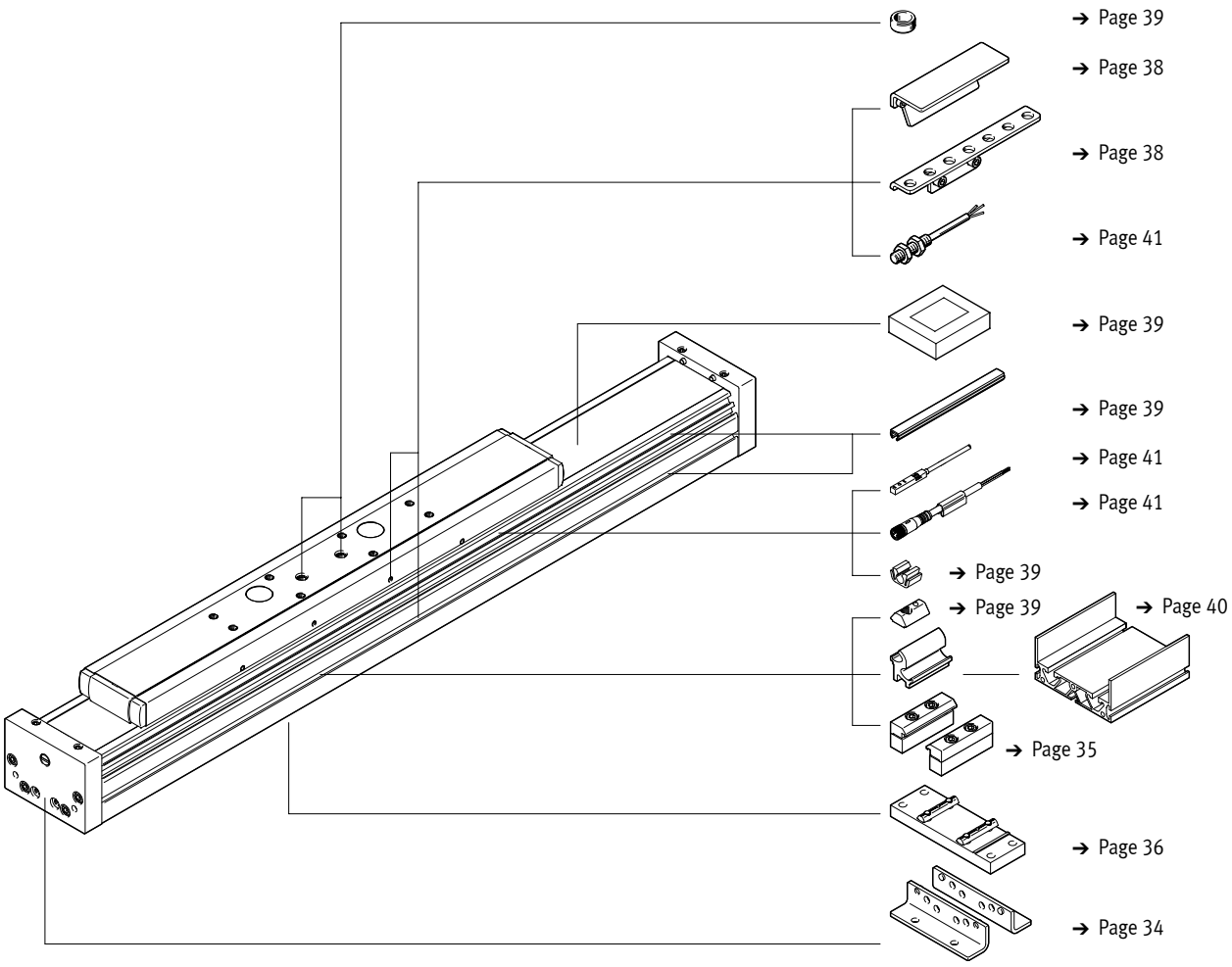
[3] Lubrication connections

[5] Drilled hole for centring sleeve ZBH

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

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

Ordering data – Modular product system



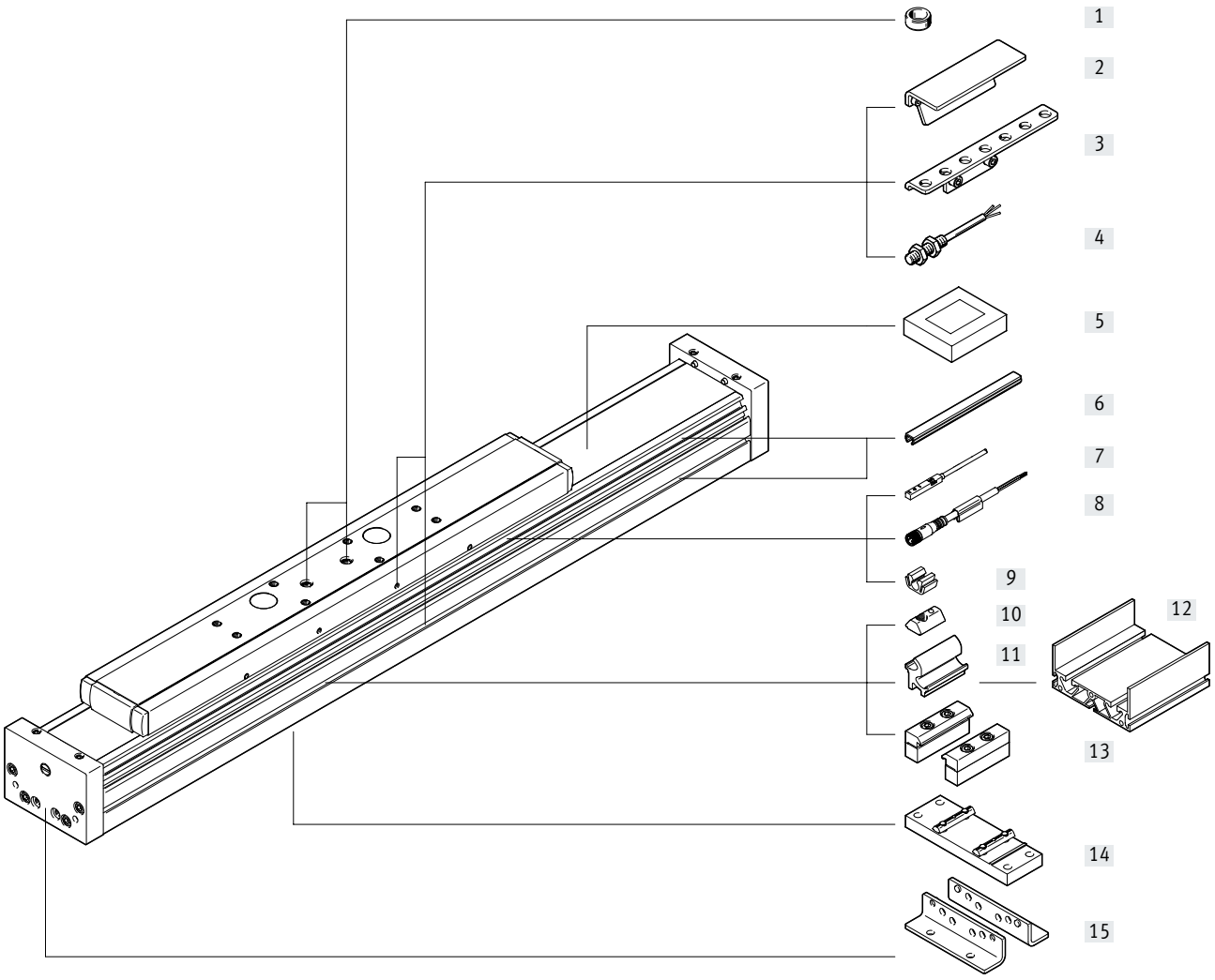
Ordering data – Modular product system

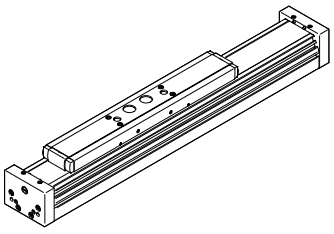
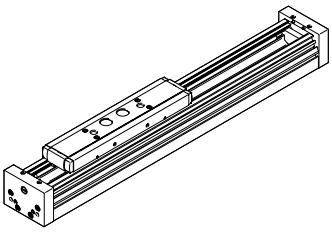
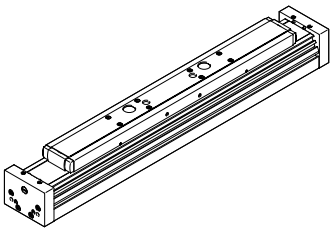
Ordering table

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

[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-...	ELFA-...-S	ELFA-...-L
Standard slide	Short slide	Long slide
		
	This variant is only available without cover strip.	

Peripherals overview

Variants and accessories

	Type	Description	→ Page/Internet
[1]	Centring sleeve ZBH	• For centring loads and attachments on the slide • Included in the scope of delivery: – With size 70, 80: 2x ZBH-9	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	• For mounting the axis on the end cap. • With higher forces and torques, the axis should be mounted using the profile	34

Type codes

001	Series	
ELFA	Guide axis	

002	Guide	
RF	Roller bearing	

003	Size	
70	70	
80	80	

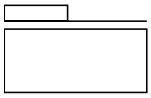
004	Stroke [mm]	
...	50 ... 7000	

005	Stroke reserve	
0H	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

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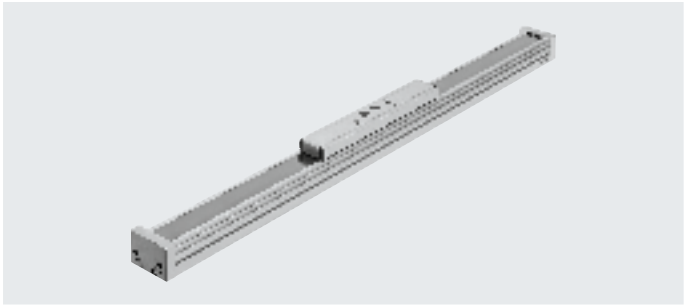


General technical data			
Size		70	80
Design		Guide	
Guide		Roller bearing guide	
Mounting position		Any	
Working stroke			
ELFA-...	[mm]	50 ... 7000	50 ... 7000
ELFA-...-S	[mm]	50 ... 7000	50 ... 7000
ELFA-...-L	[mm]	50 ... 6900	50 ... 6900
Max. no-load resistance to shifting	[N]	25	40
Max. speed	[m/s]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

Operating and environmental conditions		
Ambient temperature[1]	[°C]	–10 ... +60
Degree of protection		
ELFA-...		IP40
ELFA-...-P0		IP00

1) Note operating range of proximity sensors

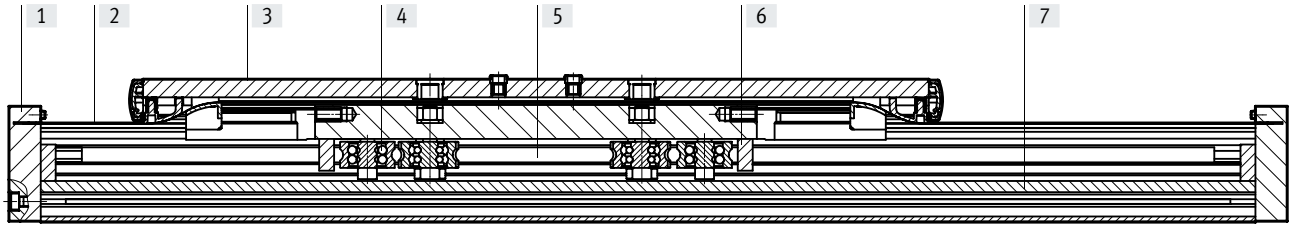
Weight [kg]		
Size	70	80
Product weight with 0 mm stroke[1]		
ELFA-...	1.92	4.28
ELFA-...-S	1.56	3.67
ELFA-...-L	2.45	5.45
Additional weight per 1000 mm stroke		
ELFA-...	3.05	4.71
ELFA-...-P0	2.96	4.61
Moving mass		
ELFA-...	0.66	1.65
ELFA-...-S	0.56	1.48
ELFA-...-L	0.89	2.16

1) Including slide

Data sheet

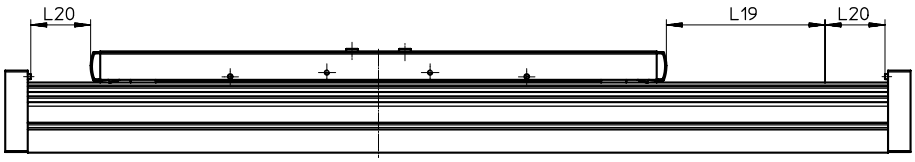
Materials

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



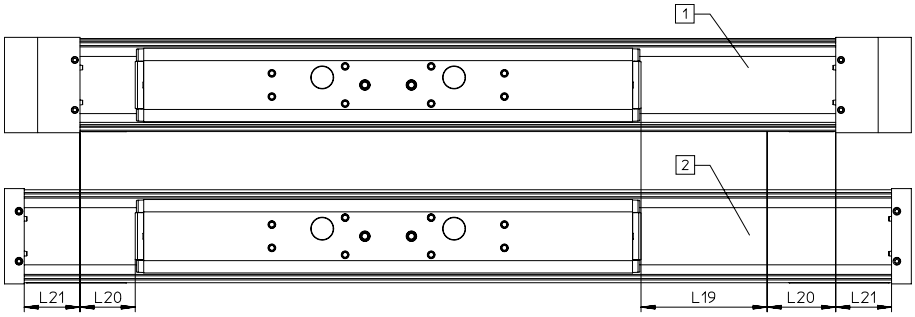
L19 = Nominal stroke
L20 = Stroke reserve

- 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.



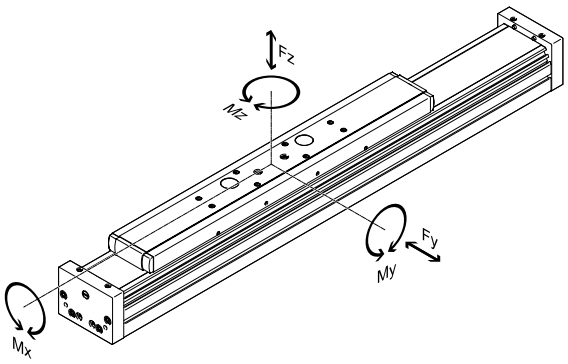
[1] ELGA-TB-RF
[2] ELFA-RF
L19 = Nominal stroke
L20 = Stroke reserve
L21 = Compensation dimension

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
$Fy_{max.}$	500	800
$Fz_{max.}$	500	800
$Mx_{max.}$	11	30
$My_{max.}$		
ELFA-...	20	90
ELFA-...-S	20	90
ELFA-...-L	40	180
$Mz_{max.}$		
ELFA-...	20	90
ELFA-...-S	20	90
ELFA-...-L	40	180

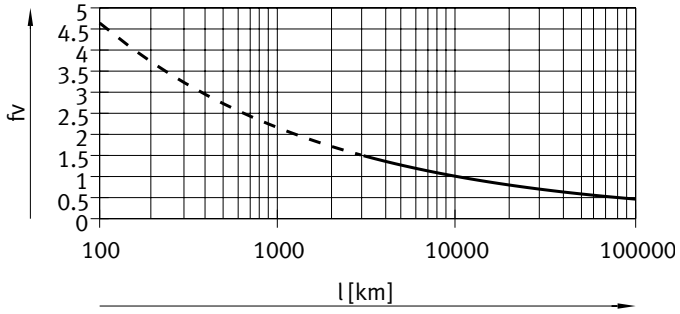
Calculating the service life

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

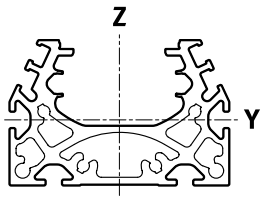
Example:
A user wants to move an X kg load. Using the formula (➔ page 25) gives a value of 1.5 for the load comparison factor f_v. According to the graph, the guide would have a service life of approx. 3000 km. Reducing the acceleration reduces the Mz and My values. A load comparison factor f_v of 1 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

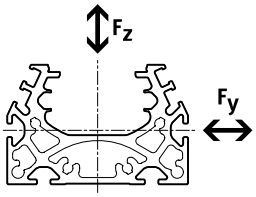
Second moment of area

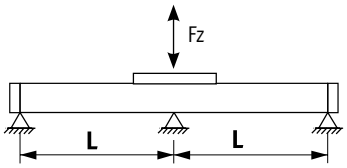


Size		70	80
Iy	[mm⁴]	1.39x10⁵	2.70x10⁵
Iz	[mm⁴]	4.33x10⁵	1.02x10⁶

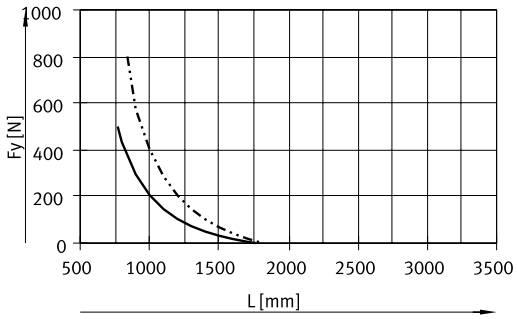
Maximum permissible support spacing L (without profile mounting MUE/central support EAHF) as a function of force F

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.

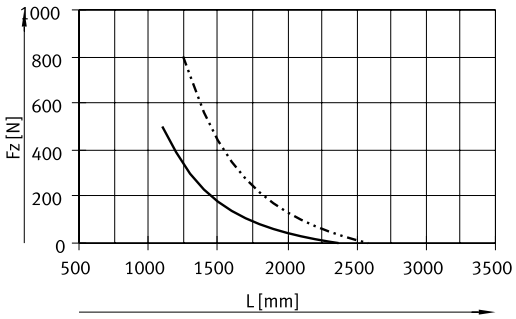




Force Fy



Force Fz



ELFA-RF-70
ELFA-RF-80

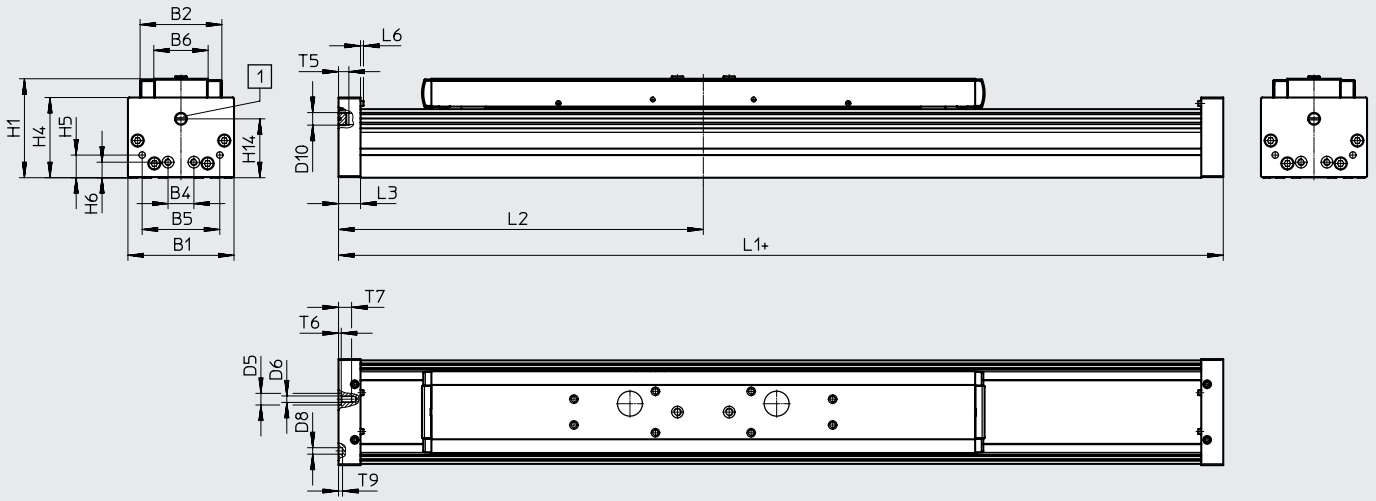
Recommended deflection limits

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



\+ = plus stroke length + 2x stroke reserve
[1] Sealing air connection

Size	B1	B2	B4	B5	B6	D5 ø H7	D6	D8 ø 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

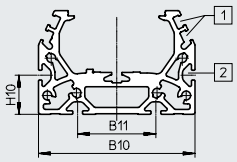
Size	L1			L2		
	ELFA-...	-S	-L	ELFA-...	-S	-L
				min.	min.	min.
70	337	259	437	168.5	129.5	218.5
80	484	400	624	242	200	312

Data sheet

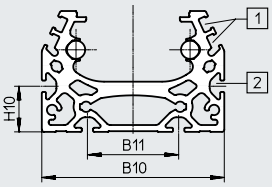
Dimensions Download CAD data ➔ www.festo.com

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

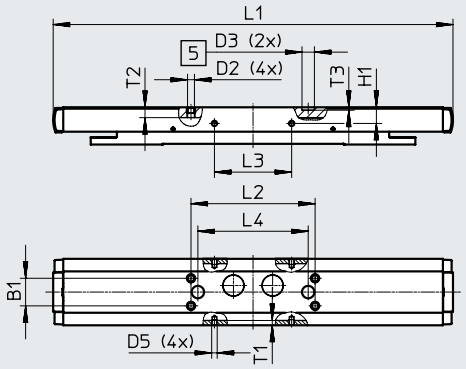
Requirements for the flatness of the bearing surface and of attachments as well as for use in parallel structures
➔ www.festo.com/sp
User documentation

Data sheet

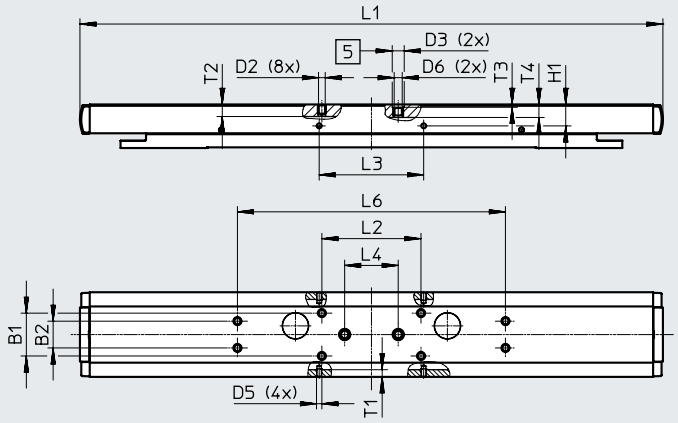
Dimensions Download CAD data ➔ www.festo.com

ELFA-... – Standard slide

Size 70



Size 80



[5] Drilled hole for centring sleeve ZBH

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

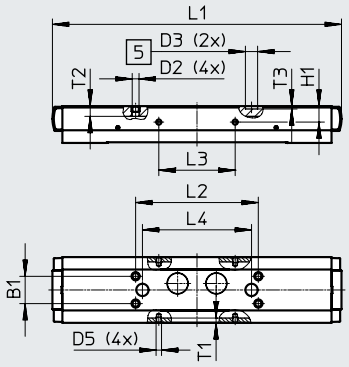
Size	L2 ±0.2	L3 ±0.1	L4 ±0.03	L6 ±0.2	T1	T2	T3	T4
70	90	56	80	–	3.5	7.5	2.1	–
80	74	78	40	200	5.1	9	2.1	9.7

Data sheet

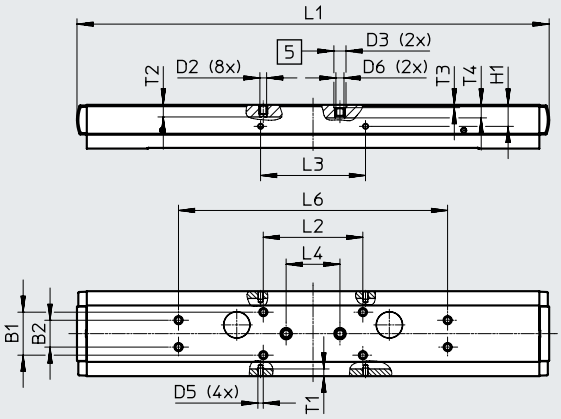
Dimensions Download CAD data ➔ www.festo.com

ELFA-...-S – Short slide

Size 70



Size 80



[5] Drilled hole for centring sleeve ZBH

Size	B1 ±0.1	B2 ±0.1	D2	D3 ø H7	D5	D6	H1 ±0.1	L1
70	20	–	M5	9	M4	–	11.7	212
80	32	20	M5	9	M4	M6	16	351

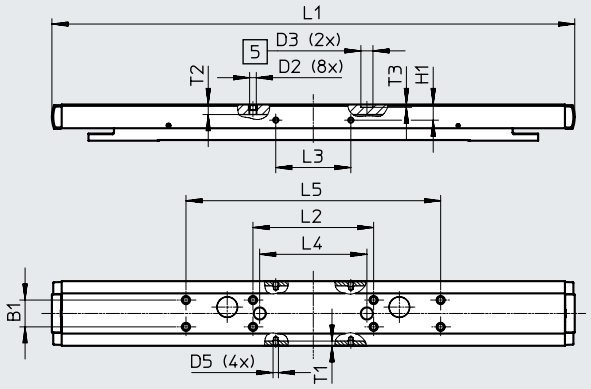
Size	L2 ±0.2	L3 ±0.1	L4 ±0.03	L6 ±0.2	T1	T2	T3	T4
70	90	56	80	–	3.5	7.5	2.1	–
80	74	78	40	200	5.1	9	2.1	9.7

Data sheet

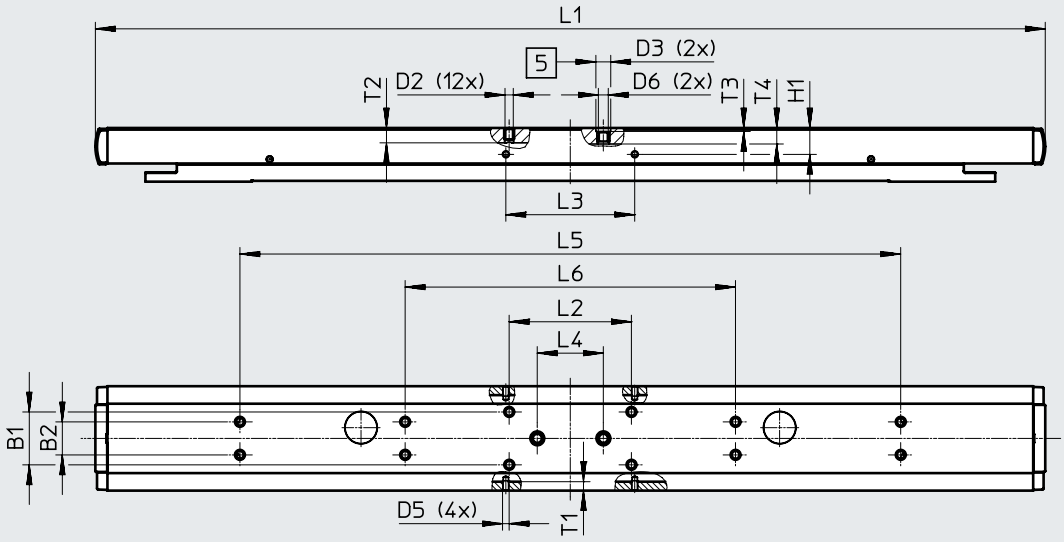
Dimensions Download CAD data ➔ www.festo.com

ELFA-...-L – Long slide

Size 70



Size 80



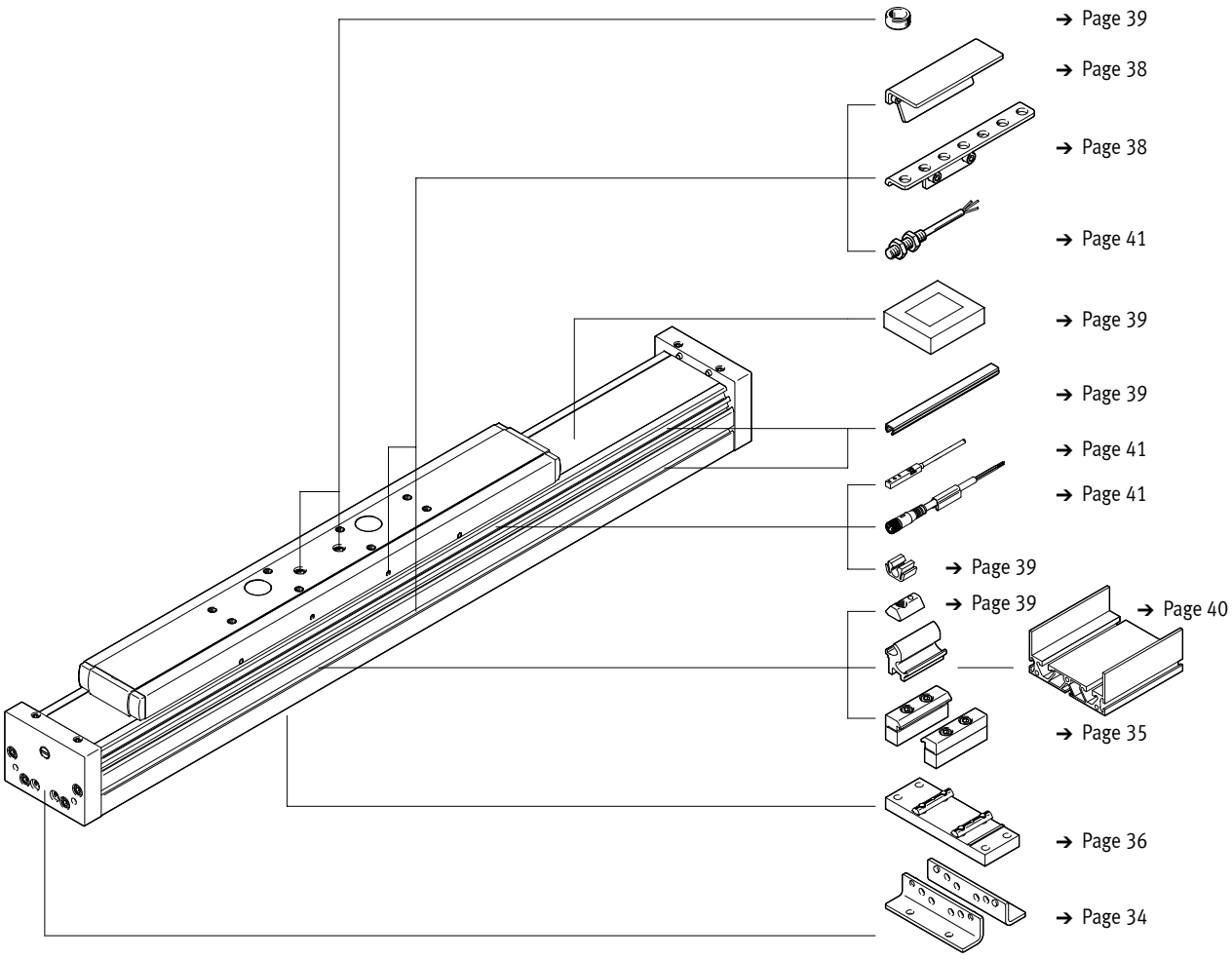
[5] Drilled hole for centring sleeve ZBH

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

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

Size	L5 ±0.2	L6 ±0.2	T1	T2	T3	T4
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

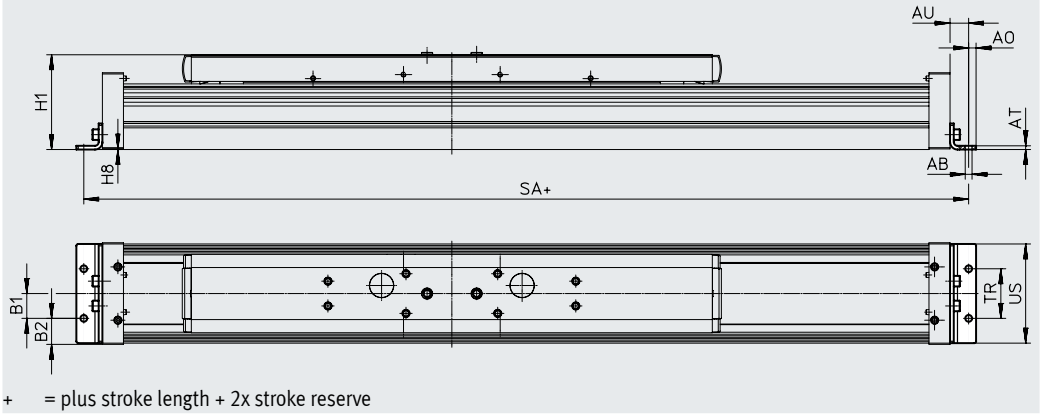
Size		70	80	Conditions	Code	Enter code
Module no.		**8037967**	**8037968**			
Design		Guide axis			**ELFA**	ELFA
Guide		Roller bearing guide			**-RF**	-RF
Size	[mm]	70	80		**-...**	-...
Stroke length	[mm]	50 ... 7000			**-...**	-...
Stroke reserve	[mm]	0 ... 999 (0 = no stroke reserve)		[1]	**-...H**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

[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



\+ = plus stroke length + 2x stroke reserve

Dimensions and ordering data

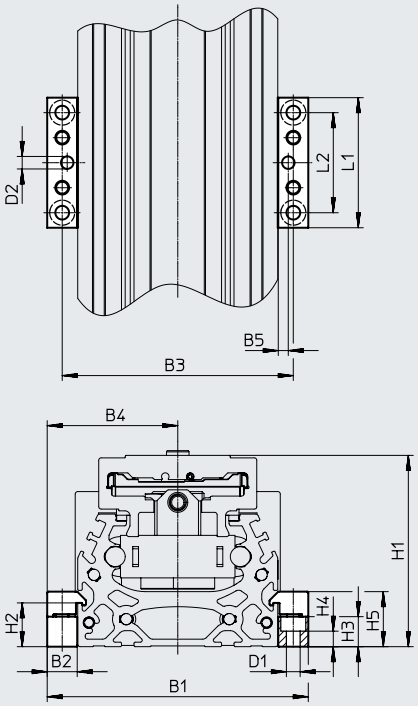
For size	AB ø	A0	AT	AU	B1	B2	H1
70	5.5	6	3	13	20	14.5	64
80	5.5	6	3	15	20	21	76.5
120	9	8	6	22	40	20	111.5

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

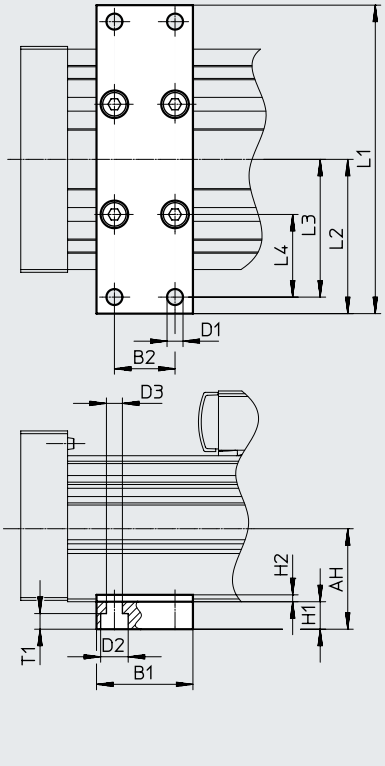
For size	B1	B2	B3	B4	B5	D1 ø	D2 ø H7	H1	H2
70	91	12	79	39.5	4	5.5	5	64	17.5
80	104	12	92	46	4	5.5	5	76.5	17.5
120	154	19	135	67.5	4	9	5	111.5	16

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**

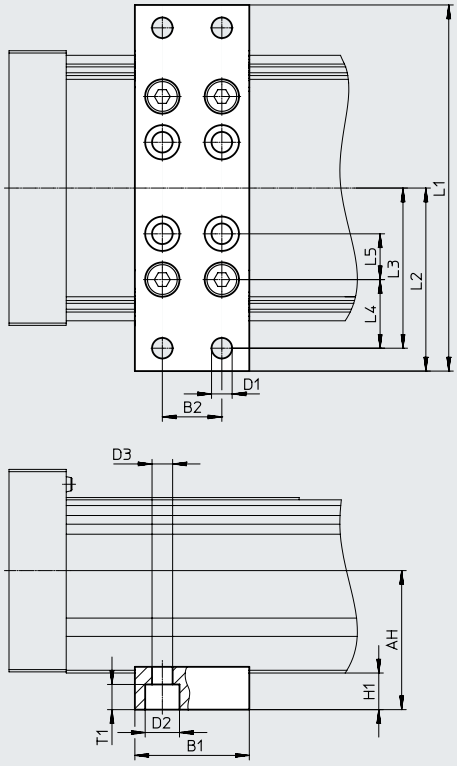
Accessories

Central support EAHF
Material:
Anodised aluminium
RoHS-compliant

Size 70, 80



Size 120



Dimensions and ordering data

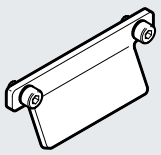
For size	AH	B1	B2	D1 ø	D2 ø	D3 ø	H1	L1
70	32.2	35	22	5.8	10	5.8	10	102
80	36.5							112
120	74.6	50	26	9	15	9	16	160

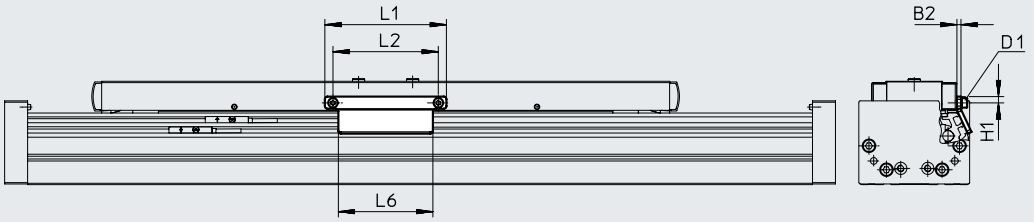
For size	L2	L3	L4	L5	T1	Weight [g]	Part no.	Type
70	51	45	25	–	5.7	113	**2349256**	**EAHF-L5-70-P**
80	56	50	30			123	**3535188**	**EAHF-L5-80-P**
120	80	70	30	20	11	384	**2410274**	**EAHF-L5-120-P**

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**

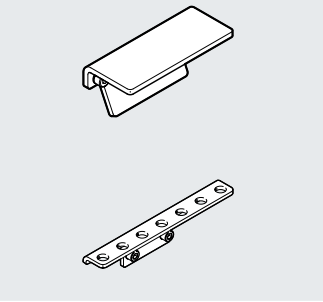
Accessories

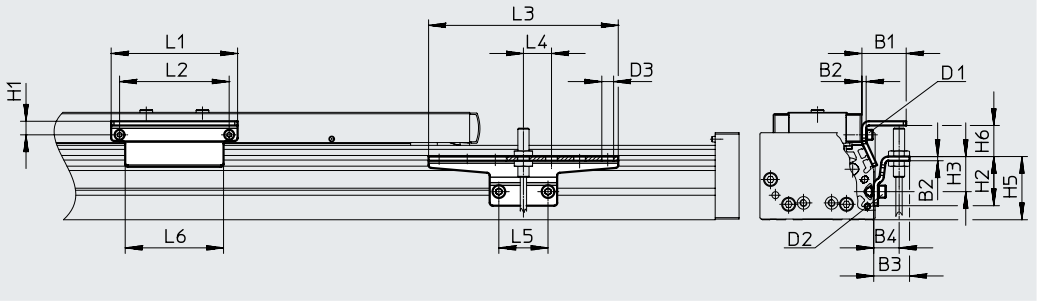
Switch lug SF-EGC-2
For sensing via proximity sensor SIEN-M8B/SIES-8M

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 ø	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
	Switch lug		
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
	Sensor bracket		
70	110	**558057**	**HWS-EGC-M5**
80	110	**558057**	**HWS-EGC-M5**
120	217	**570365**	**HWS-EGC-M8-B**

Accessories

Ordering data

	For size	Comment	Part no.	Type	PU[1]
Slot nut NST					
	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
Centring pin/sleeve ZBS/ZBH					
	70	For slide	**150928**	**ZBS-5**	10
	70, 80, 120		**8137184**	**ZBH-9-B**	
Slot cover ABP					
	70, 80	• For mounting slot • Each 0.5 m	**151681**	**ABP-5**	2
	120		**151682**	**ABP-8**	
Slot cover ABP-S					
	70, 80, 120	• For sensor slot • Each 0.5 m	**563360**	**ABP-5-S1**	2
Clip SMBK					
	70, 80, 120	For sensor slot, for mounting the proximity sensor cables	**534254**	**SMBK-8**	10
Clamping element EADT					
	70, 80	Tool for retensioning the cover strip	**8058451**	**EADT-S-L5-70**	1
	120		**8058450**	**EADT-S-L5-120**	

1) Packaging unit

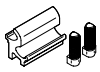
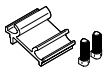
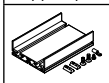
Accessories

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[1]
Adapter kit DHAM					
	80	• For mounting the support profile on the axis • Spacing between axis and profile is 20 mm	**562241**	**DHAM-ME-N1-CL**	1
	120		**562242**	**DHAM-ME-N2-CL**	
	70, 80	• For mounting the support profile on the axis • Spacing between axis and profile is 50 mm	**574560**	**DHAM-ME-N1-50-CL**	1
	120		**574561**	**DHAM-ME-N2-50-CL**	
Support profile HMIA					
	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
N/O contact						
	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**
N/C contact						
	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
N/O contact						
	Cable, 3-wire	■	PNP	2.5	**150386**	**SIEN-M8B-PS-K-L**
	Plug M8x1, 3-pin	■	PNP	–	**150387**	**SIEN-M8B-PS-S-L**
N/C contact						
	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**