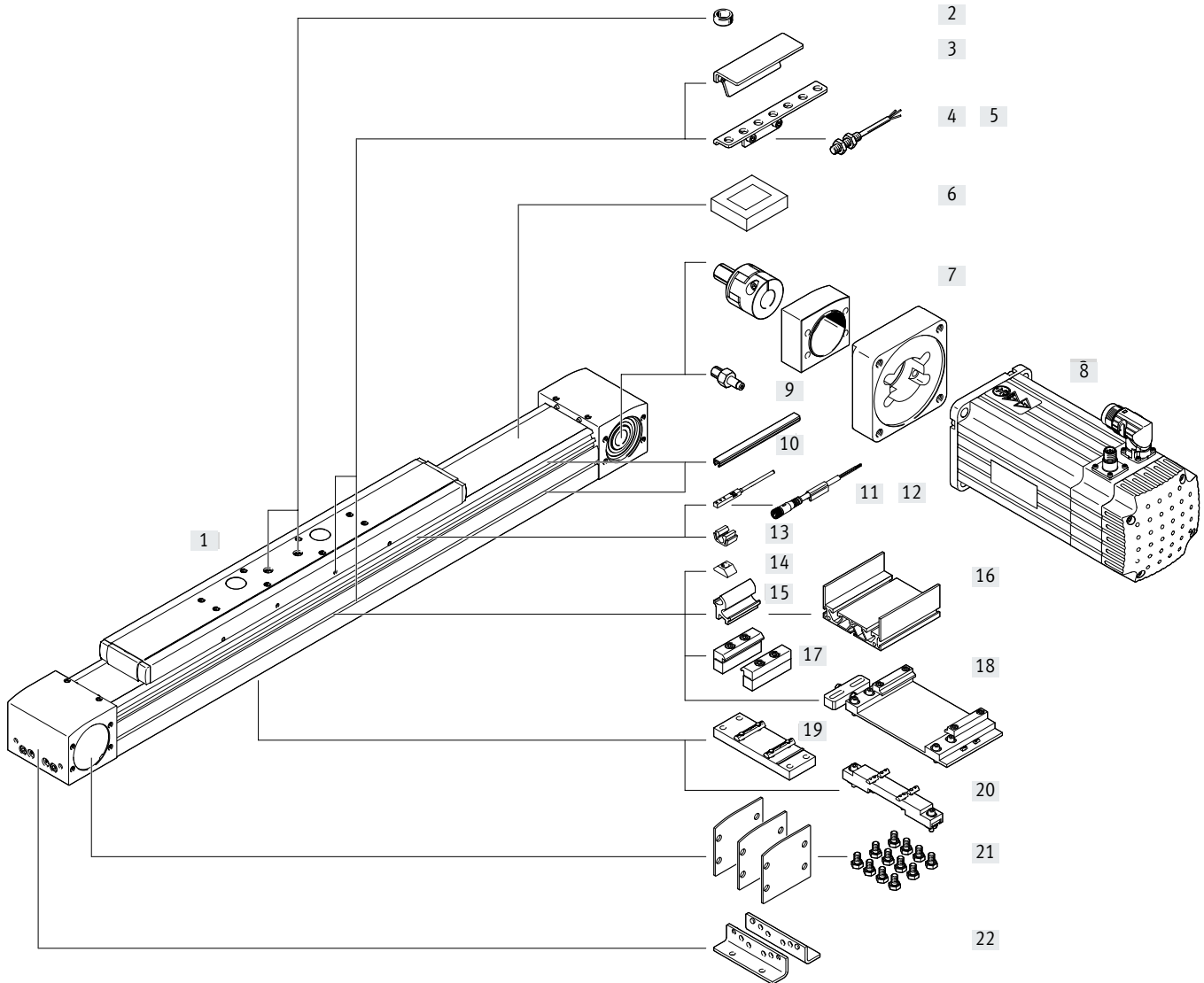
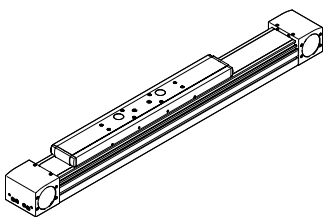


Peripherals overview

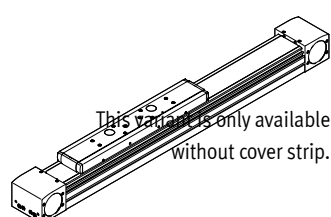


Slide variants

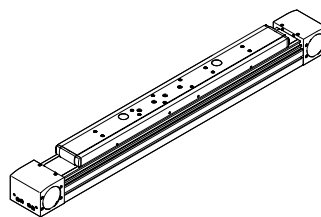
ELGA-...  
Standard slide



ELGA-...-S  
Slide, short



ELGA-...-L  
Long slide



## Peripherals overview

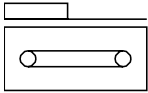
Accessories			
	Type/order code	Description	→ Page/Internet
[1]	Toothed belt axis ELGA-TB-RF	Electric drive	48
[2]	Centring pin/sleeve ZBS, ZBH	<ul style="list-style-type: none"> <li>For centring loads and attachments on the slide</li> <li>Included in the scope of delivery:               <ul style="list-style-type: none"> <li>With size 70, 80, 120: 2x ZBH-9</li> </ul> </li> </ul>	108
[3]	Switch lug SA, SB, SC, SD, SE, SF	For sensing the slide position	105
[4]	Sensor bracket SC, SD, SE, SF	For mounting the inductive proximity switches (round design) on the axis	106
[5]	Proximity switch, M8 SC, SD, SE, SF	<ul style="list-style-type: none"> <li>Inductive proximity switch, round design</li> <li>The order code SC, SD, SE, SF includes 1 switch lug and max. 2 sensor brackets in the scope of delivery</li> </ul>	110
[6]	Clamping element EADT	Tool for retensioning the cover strip	108
[7]	Axial kit EAMM	For axial motor mounting (comprising: coupling, coupling housing and motor flange)	94
[8]	Motor EMME, EMMS	Motors specially matched to the axis, with or without gear unit, with or without brake	94
[9]	Drive shaft EA	<ul style="list-style-type: none"> <li>Can, if required, be used as an alternative interface</li> <li>No drive shaft is required for the axis/motor combinations → page 94</li> </ul>	99
[10]	Slot cover NS, NC	<ul style="list-style-type: none"> <li>For protection against contamination</li> </ul>	108
[11]	Proximity switch, T-slot SA, SB	<ul style="list-style-type: none"> <li>Inductive proximity switch, for T-slot</li> <li>The order code SA, SB includes 1 switch lug in the scope of delivery</li> </ul>	109
[12]	Connecting cable CA	For proximity switch (order code SE and SF)	110
[13]	Clip CM	For mounting the proximity switch cable in the slot	108
[14]	Slot nut NM	For mounting attachments	108
[15]	Adapter kit DHAM	For mounting the support profile on the axis	109
[16]	Support profile HMA	For mounting and guiding an energy chain	109
[17]	Profile mounting MA	For mounting the axis on the side of the profile	101
[18]	Adjusting kit EADC-E16	For mounting the axis on a vertical surface. Once mounted, the axis can be aligned horizontally	104
[19]	Central support EAHF-L5	For mounting the axis on the profile from underneath	102
[20]	Adjusting kit EADC-E15	Height-adjustable. Can be used to easily compensate for any unevenness in the bearing surface	103
[21]	Cover kit EASC-L5	For covering the sides of the drive cover	108
[22]	Foot mounting MF	<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>	100




## Type codes

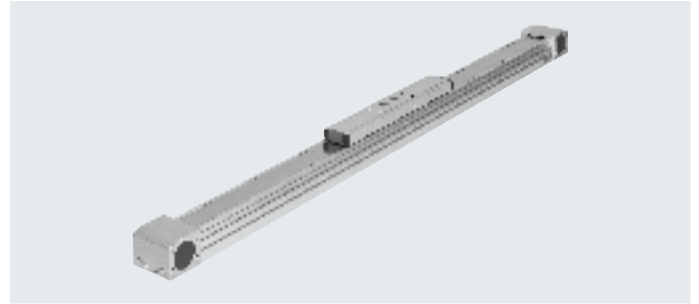
001	Series	
ELGA	Gantry axis	
002	Drive system	
TB	Toothed belt	
003	Guide	
RF	Roller bearing	
004	Size	
70	70	
80	80	
120	120	
005	Stroke range [mm]	
...	50 ... 7400	
006	Stroke reserve [mm]	
...	0 ... 999	
007	Slide design	
	Standard	
S	Slide, short	
L	Slide, long	
008	Protection against particles	
	Standard	
P0	Without strip cover	
009	Additional characteristics	
	None	
F1	Food-safe according to supplementary information on materials	
010	Displacement encoder	
	None	
M1	With displacement encoder, incremental, resolution 2.5 µm	
M2	With displacement encoder, incremental, resolution 10 µm	
011	Displacement encoder attachment position	
	None	
F	Front	
B	Rear	
012	Toothed belt material	
	Chloroprene rubber	
PU1	Uncoated PU, FDA-compliant	
PU2	Coated PU	
013	Foot mounting	
	None	
MF	1 record	

014	Profile mounting	
	None	
...MA	1 ... 50 pieces	
015	Proximity sensor, inductive, slot 8, N/O contact, cable 7.5 m	
	Without	
...SA	1 ... 6 units	
016	Proximity sensor, inductive, slot 8, N/C contact, cable 7.5 m	
	Without	
...SB	1 ... 6 units	
017	Proximity switch, inductive, M8, N/O contact, cable 2.5 m	
	None	
...SC	1 ... 99 pieces	
018	Proximity switch, inductive, M8, N/C contact, cable 2.5 m	
	Without	
...SD	1 ... 99 pieces	
019	Proximity switch, inductive, M8, N/O contact, M8 plug	
	Without	
...SE	1 ... 99 pieces	
020	Proximity switch, inductive, M8, N/C contact, M8 plug	
	None	
...SF	1 ... 99 pieces	
021	Connecting cable 2.5 m, M8, 3-wire	
	None	
...CA	1 ... 99 pieces	
022	Cover, sensor slot	
	None	
...NS	1 ... 50 pieces	
023	Mounting slot covering	
	None	
...NC	1 ... 50 units	
024	Slot nut for mounting slot	
	Without	
...NM	1 ... 99 units	
025	Drive shaft	
	None	
...EA	1 ... 4 pieces	
026	Cable clip [units]	
...	10 ... 100	

## Data sheet



-  Size  
70 ... 120
-  Stroke length  
50 ... 7400 mm
-  [www.festo.com](http://www.festo.com)



General technical data				
Size		70	80	120
Design		Electromechanical axis with toothed belt		
Guide		Roller bearing guide		
Mounting position		Any		
Working stroke				
ELGA-...	[mm]	50 ... 7000	50 ... 7000	50 ... 7400
ELGA-...S	[mm]	50 ... 7000	50 ... 7000	50 ... 7400
ELGA-...L	[mm]	50 ... 6900	50 ... 6900	50 ... 7200
Max. feed force $F_x$	[N]	350	800	1300
Max. no-load torque <sup>1)</sup>	[Nm]	0.66	1.35	3
Max. no-load resistance to shifting <sup>1)</sup>	[N]	46	68	114
Max. driving torque	[Nm]	5	15.9	34.1
Max. speed	[m/s]	10		
Max. acceleration	[m/s <sup>2</sup> ]	50		
Repetition accuracy	[mm]	±0.08		

1) At 0.2 m/s

Operating and environmental conditions		
Ambient temperature <sup>1)</sup>	[°C]	-10 ... +60
Degree of protection		
ELGA-...		IP40
ELGA-...-P0		IP00
Duty cycle	[%]	100

1) Note operating range of proximity switches

Weight [kg]				
Size		70	80	120
Basic weight with 0 mm stroke <sup>1)</sup>				
ELGA-...		2.78	6.25	17.39
ELGA-...S		2.39	5.62	15.82
ELGA-...L		3.33	7.49	21.44
Additional weight per 1000 mm stroke				
ELGA-...		3.29	5.17	10.81
ELGA-...-P0		3.18	5.06	10.66
Moving mass				
ELGA-...		0.80	2.01	5.08
ELGA-...S		0.70	1.85	4.65
ELGA-...L		1.03	2.53	6.63

1) Incl. slide

## Data sheet

Toothed belt				
Size		70	80	120
Pitch	[mm]	3	5	5
Elongation <sup>1)</sup>				
ELGA-...	[%]	0.213	0.168	0.21
ELGA-...-PU2	[%]	0.105	0.1	0.122
Effective diameter	[mm]	28.65	39.79	52.52
Feed constant	[mm/rev]	90	125	165

1) At max. feed force

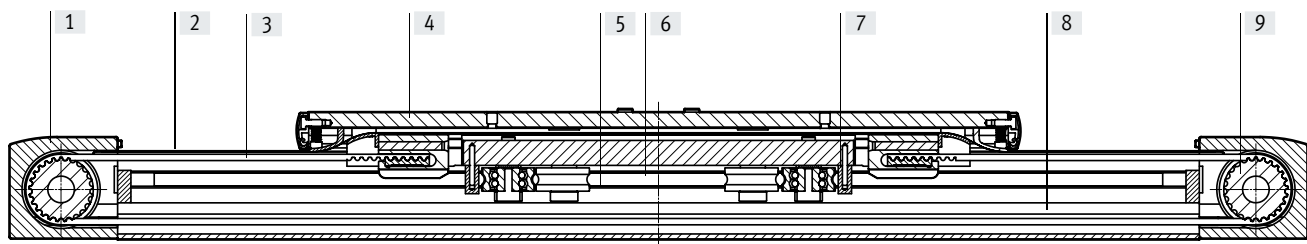
Mass moments of inertia				
Size		70	80	120
$J_0$				
ELGA-...	[kg mm <sup>2</sup> ]	232	1044	4935
ELGA-...-S	[kg mm <sup>2</sup> ]	207	968	4592
ELGA-...-L	[kg mm <sup>2</sup> ]	278	1247	6006
$J_H$ per metre stroke	[kg mm <sup>2</sup> /m]	19	97	221
$J_L$ per kg payload	[kg mm <sup>2</sup> /kg]	205	396	690

The mass moment of inertia  $J_A$  of the entire axis is calculated as follows:

$$J_A = J_0 + J_H \times \text{working stroke [m]} + J_L \times m_{\text{payload [kg]}}$$

### Materials

Sectional view



Axis	
[1] Drive cover	Anodised wrought aluminium alloy
[2] Cover strip	Stainless steel strip, non-corroding
[3] Toothed belt	
ELGA-...	Polychloroprene with glass cord and nylon coating
ELGA-...-PU2	Polyurethane with steel cord and nylon cover
[4] Slide	Anodised wrought aluminium alloy
[5] Roller	Rolled steel, hardened
[6] Guide rod	Hardened and hard-chromium plated tempered steel
[7] Wiper seal	Oil-impregnated felt
[8] Profile	Anodised wrought aluminium alloy
[9] Toothed belt pulley	High-alloy stainless steel
Note on materials	RoHS-compliant Contains paint-wetting impairment substances

## Data sheet

Dimensions → page 61

## Technical data – Displacement encoder

Type		ELGA-...-M1	ELGA-...-M2
Resolution	[μm]	2.5	10
Max. travel speed with displacement encoder	[m/s]	4	4
Encoder signal		5 V TTL; A/A, B/B; reference signal (N/N) cyclically every 5 mm (zero pulse)	
Signal output		Line driver, alternating, resistant to sustained short circuit	
Electrical connection		8-pin plug, round design, M12	
Cable length	[mm]	160	

## Operating and environmental conditions – Displacement encoder system

Ambient temperature	[°C]	-10 ... +70
Degree of protection		IP64
CE marking (see declaration of conformity)		To EU EMC Directive <sup>1)</sup>

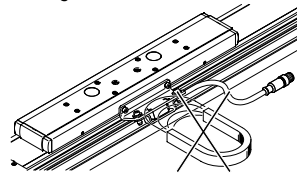
1) For information about the area of use, see the EC declaration of conformity at: [www.festo.com/sp](http://www.festo.com/sp) → Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

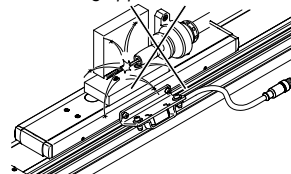
## Application information

The spindle axis with displacement encoder is not designed for the following application examples:

- Magnetic field

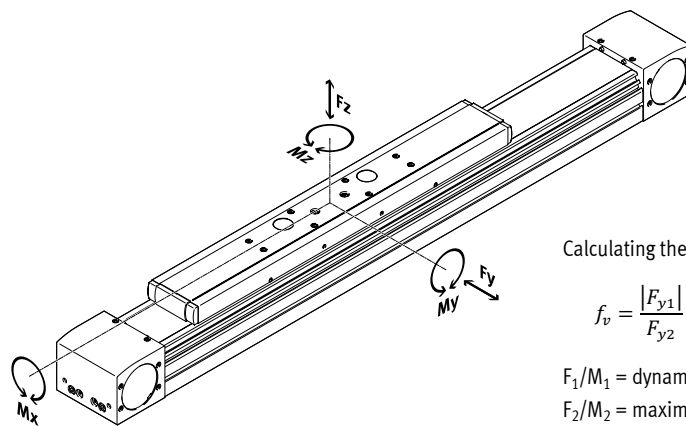


- Welding application



## 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 cushioning 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

## Max. permissible forces and torques for a service life of 10000 km

Size		70	80	120
$F_{y_{max}}$	[N]	500	800	2000
$F_{z_{max}}$	[N]	500	800	2000
$M_{x_{max}}$	[Nm]	11	30	100
$M_{y_{max}}$				
ELGA-...	[Nm]	20	90	320
ELGA-...-S	[Nm]	20	90	320
ELGA-...-L	[Nm]	40	180	640
$M_{z_{max}}$				
ELGA-...	[Nm]	20	90	320
ELGA-...-S	[Nm]	20	90	320
ELGA-...-L	[Nm]	40	180	640

## Data sheet

### Calculating the service life

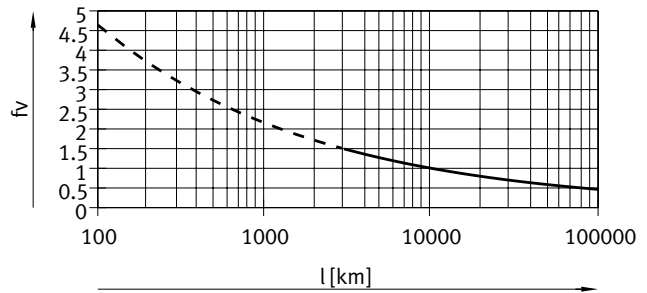
The service life of the guide depends on the load. To be able to make a statement as to the service life of the guide, the graph below plots the load comparison factor  $f_v$  against the service life.

These values are only theoretical. You must consult your local Festo contact for a load comparison factor  $f_v$  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 51) 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

Engineering software  
Electric Motion Sizing  
[www.festo.com/x/electric-motion-sizing](http://www.festo.com/x/electric-motion-sizing)

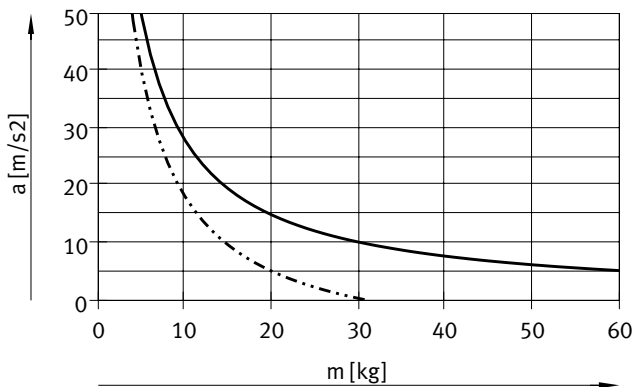
The engineering software can be used to calculate the guide workload for a service life of 5000 km.

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

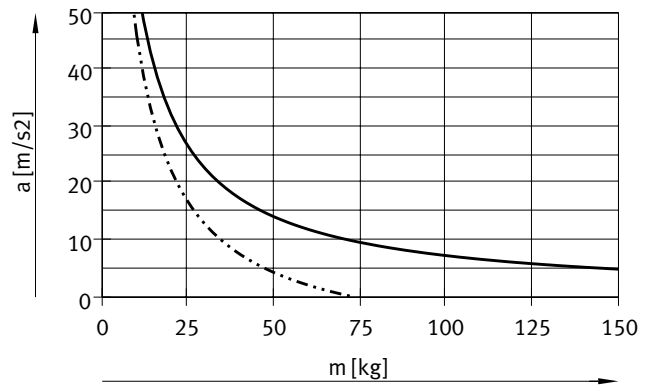
Data sheet

Max. acceleration  $a$  as a function of payload  $m$

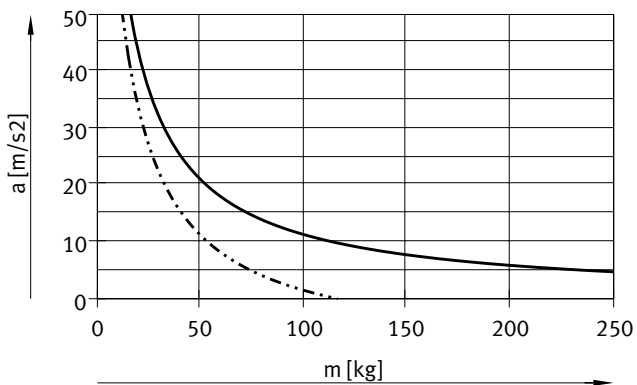
Size 70



Size 80

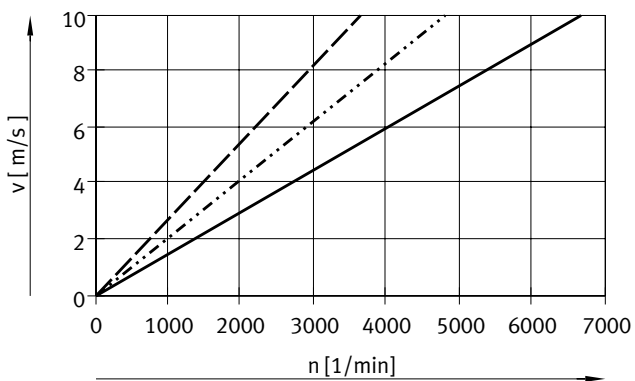


Size 120



— Horizontal mounting position  
 - - - Vertical mounting position

Velocity  $v$  as a function of rotational speed  $n$



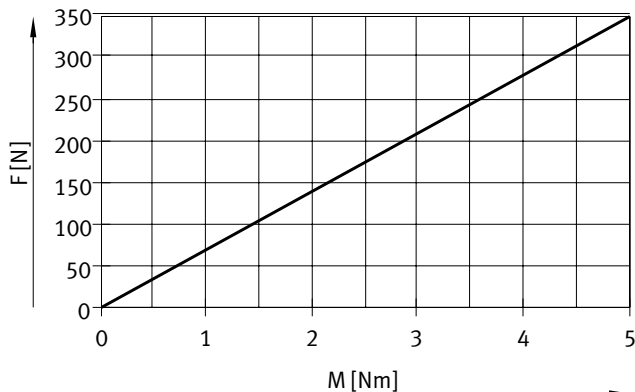
— ELGA-TB-RF-70  
 ..... ELGA-TB-RF-80  
 - - - ELGA-TB-RF-120



Data sheet

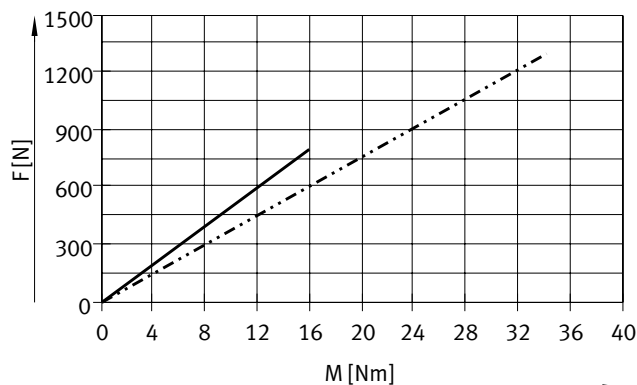
Theoretical feed force F as a function of input torque M

Size 70



ELGA-TB-RF-70

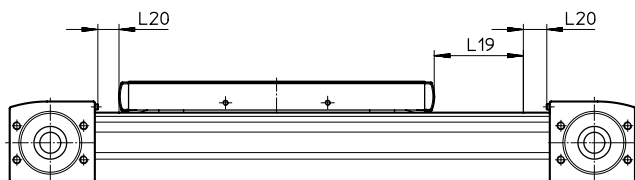
Size 80/120



ELGA-TB-RF-80

ELGA-TB-RF-120

Stroke reserve



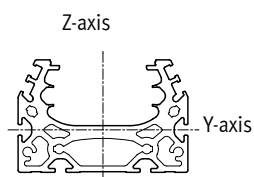
L19 = Nominal stroke  
L20 = Stroke reserve

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

2nd moments of area



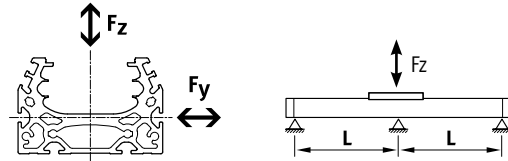
Size		70	80	120
ly	[mm <sup>4</sup> ]	1.39x10 <sup>5</sup>	2.70x10 <sup>5</sup>	1.42x10 <sup>6</sup>
lz	[mm <sup>4</sup> ]	4.33x10 <sup>5</sup>	1.02x10 <sup>6</sup>	5.02x10 <sup>6</sup>

## Data sheet

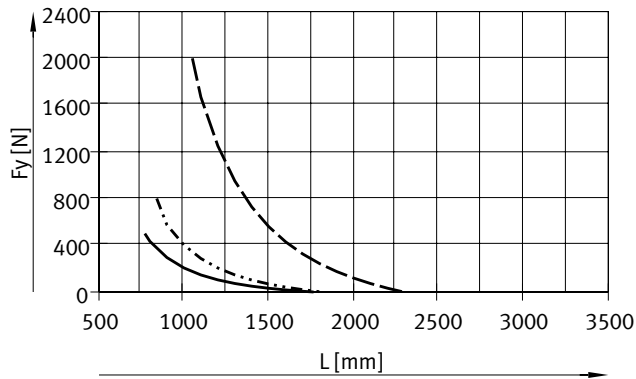
### Maximum permissible support spacing L (without profile mounting MUE/central support EAHF) as a function of force F

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

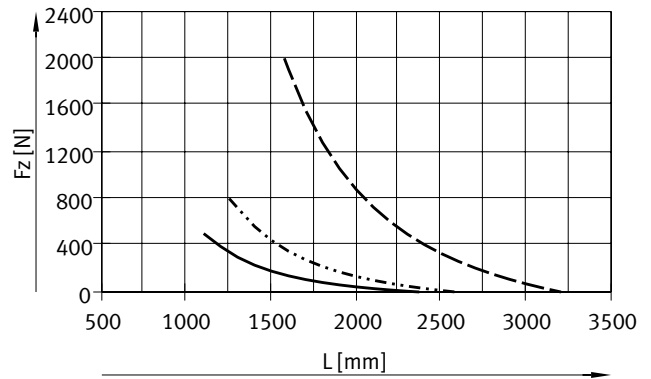
The following graphs can be used to determine the maximum permissible support spacing l as a function of force F acting on the axis. The deflection is  $f = 0.5$  mm.



Force Fy



Force Fz



- ELGA-TB-RF-70
- ELGA-TB-RF-80
- - - ELGA-TB-RF-120

### Recommended deflection limits

Adherence to the following deflection limits is recommended so as not to impair the functionality of the axes.

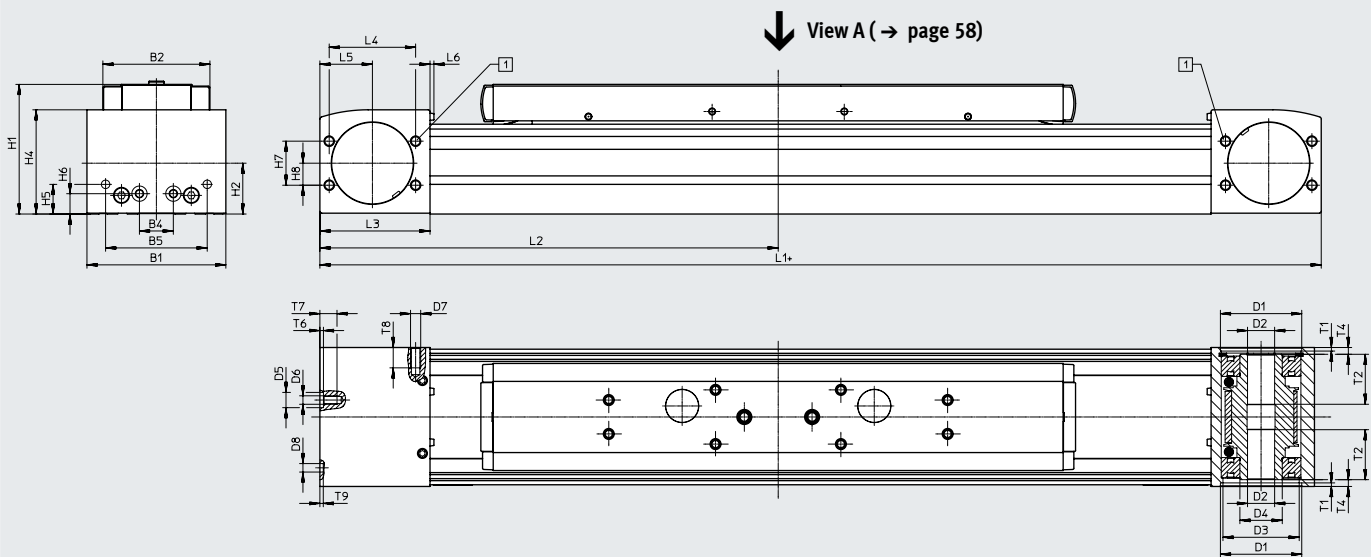
Greater deformation can result in increased friction, greater wear and reduced service life.

Size	Dynamic deflection (moving load)	Static deflection (stationary load)
70 ... 120	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	D1 ∅ H7	D2 ∅ H7	D3 ∅	D4 ∅	D5 ∅ H7	D6
70	69	48.2	30	45	38	16	34	25	–	M5
80	82	63.2	20	60	48	16	45	25	9	M5
120	120	95	80	40	80	23	72	45	–	M8

Size	D7	D8 ∅ H7	H1	H2	H4	H5	H6	H7	H8	L3
70	M6	5	64	26.5	50.8	13	13	24	12	57.5
80	M6	5	76.5	30	61.5	17.5	12	26	13	65
120	M8	9	111.5	45	91	22	22	59	32	100

Size	L4	L5	L6	T1	T2	T4	T6	T7	T8	T9
70	42	27.5	2.3	2.1	18	7.15	–	10	12	3.1
80	51	31	2.3	2.1	29.5	4	2.1	10.1	12	2
120	76	50	2.5	3.1	29.5	4	–	16	16	2.1

Size Slide design	L1			L2		
	ELGA-...	ELGA-...-S	ELGA-...-L	ELGA-... min.	ELGA-...-S min.	ELGA-...-L min.
70	420	342	520	210	171	260
80	580	496	720	290	248	360
120	775	673	1005	387.5	336.5	502.5

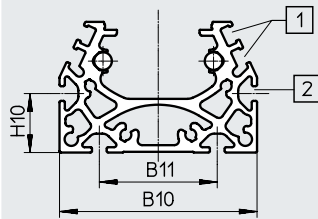
## Data sheet

## Dimensions

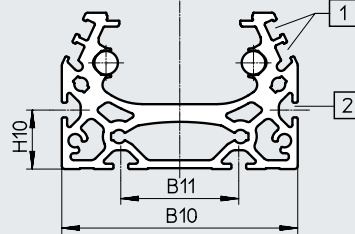
Download CAD data → [www.festo.com](http://www.festo.com)

## Profile

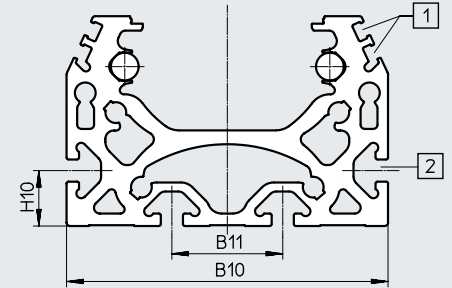
## Size 70



## Size 80




## Size 120



- [1] Sensor slot for proximity switch  
 [2] Mounting slot for slot nut  
 With size 70, 80: slot nut NST-5-M5  
 With size 120: slot nut NST-8-M6

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

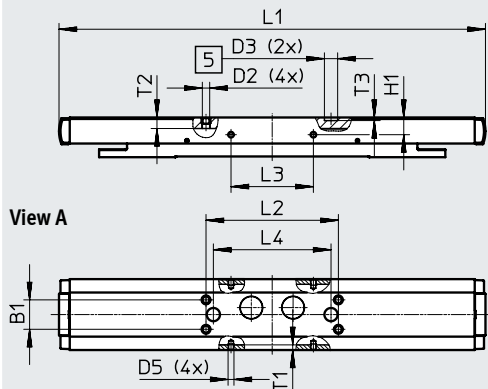
Data sheet

Dimensions

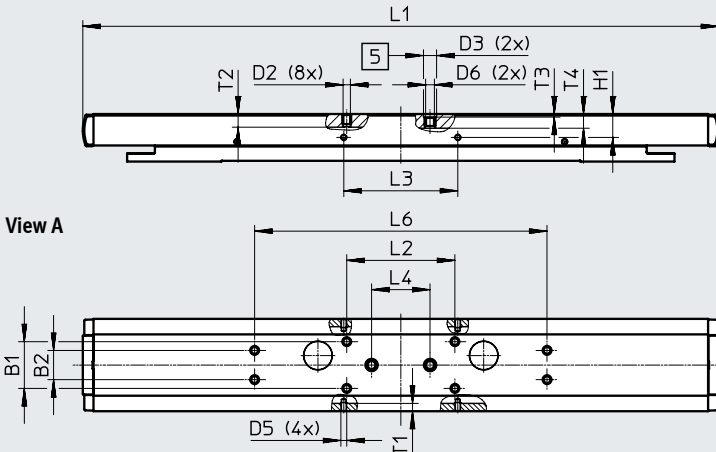
Download CAD data → [www.festo.com](http://www.festo.com)

ELGA... – Standard slide

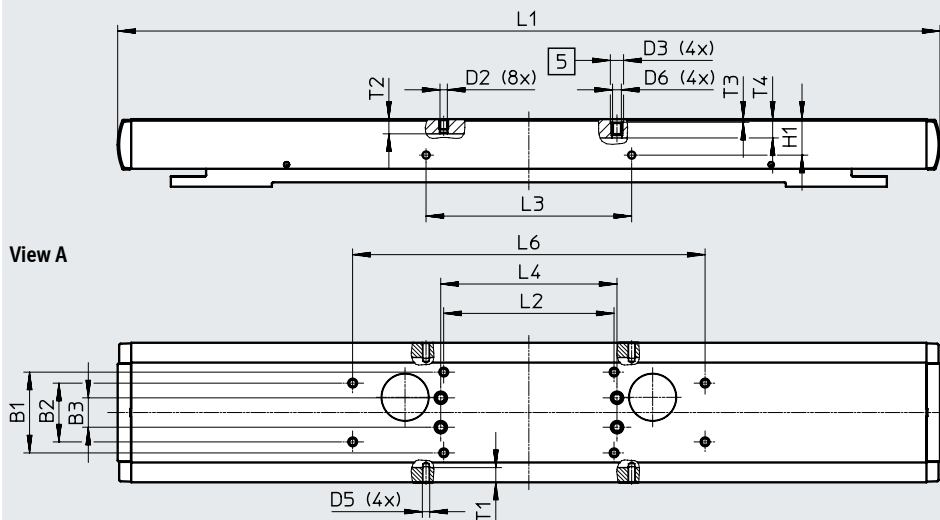
Size 70



Size 80



Size 120



[5] Drilled hole for centring sleeve

Size	B1	B2	B3	D2	D3 ∅ H7	D5	D6	H1
	±0.1	±0.1	±0.1					±0.1
70	20	-	-	M5	9	M4	-	11.7
80	32	20	-	M5	9	M4	M6	16
120	55	40	20	M5	9	M5	M6	24.5

Size	L1	L2	L3	L4	L6	T1	T2	T3	T4
		±0.2	±0.1	±0.03	±0.2				
70	290	90	56	80	-	3.5	7.5	2.1	-
80	435	74	78	40	200	5.1	9	2.1	9.7
120	560	116	140	120	240	10	10	2.1	12.8

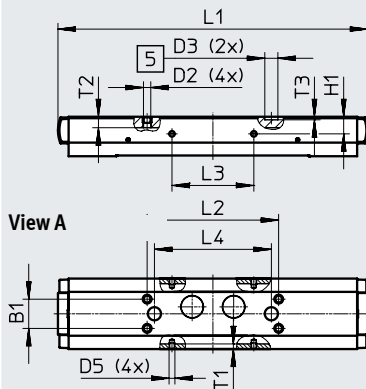
## Data sheet

## Dimensions

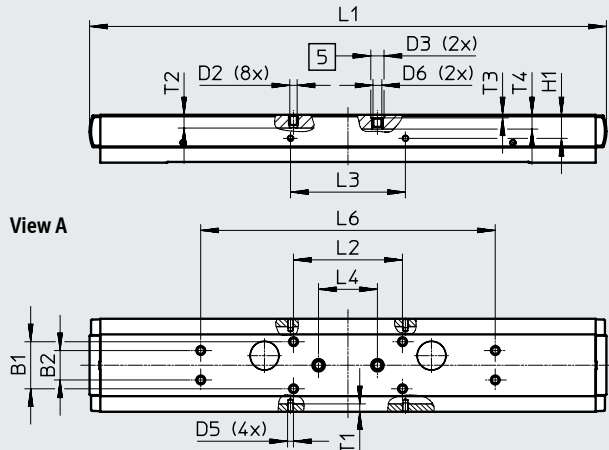
Download CAD data → [www.festo.com](http://www.festo.com)

ELGA-...S – Short slide

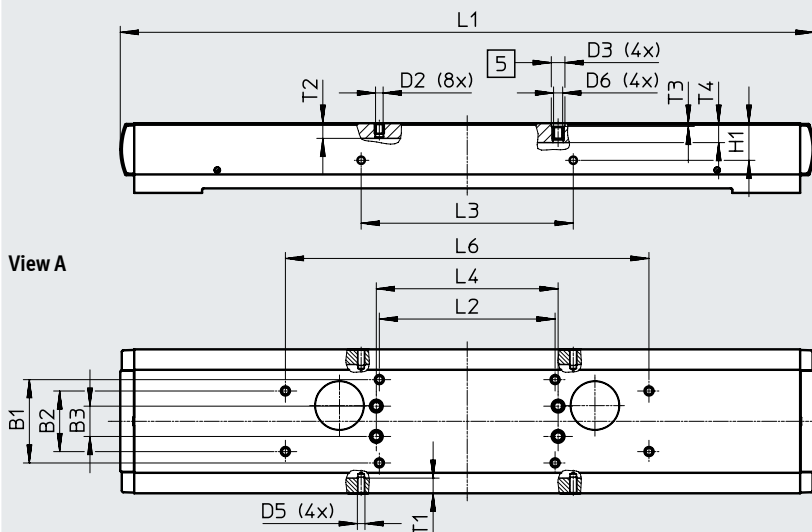
## Size 70



## Size 80



## Size 120



[5] Drilled hole for centring sleeve

Size	B1	B2	B3	D2	D3 ∅	D5	D6	H1
	±0.1	±0.1	±0.1		H7			±0.1
70	20	-	-	M5	9	M4	-	11.7
80	32	20	-	M5	9	M4	M6	16
120	55	40	20	M5	9	M5	M6	24.5

Size	L1	L2	L3	L4	L6	T1	T2	T3	T4
		±0.2	±0.1	±0.03	±0.2				
70	212	90	56	80	-	3.5	7.5	2.1	-
80	351	74	78	40	200	5.1	9	2.1	9.7
120	458	116	140	120	240	10	10	2.1	12.8

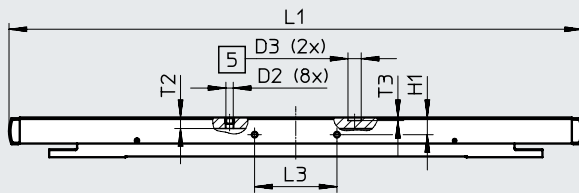
Data sheet

Dimensions

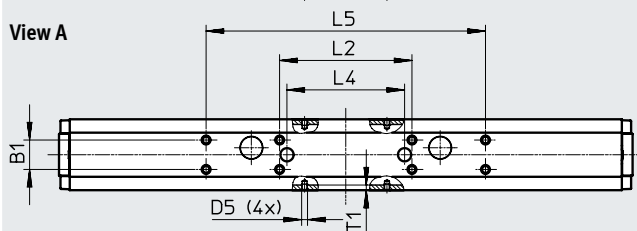
Download CAD data → [www.festo.com](http://www.festo.com)

ELGA...-L – Long slide

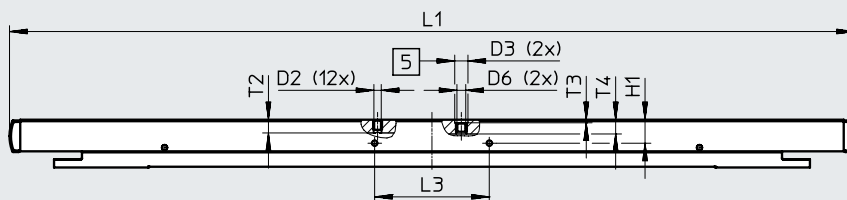
Size 70



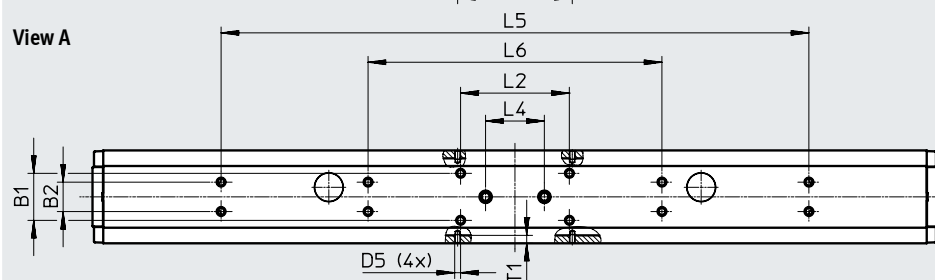
View A



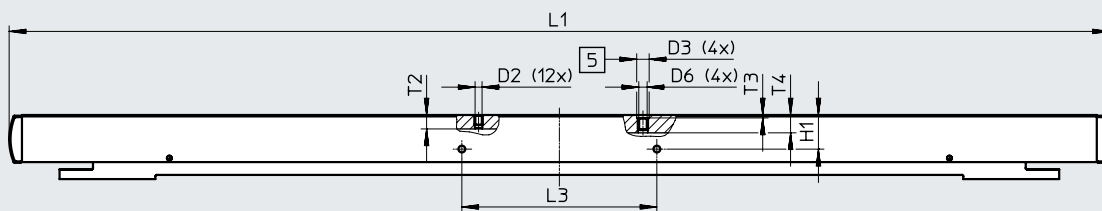
Size 80



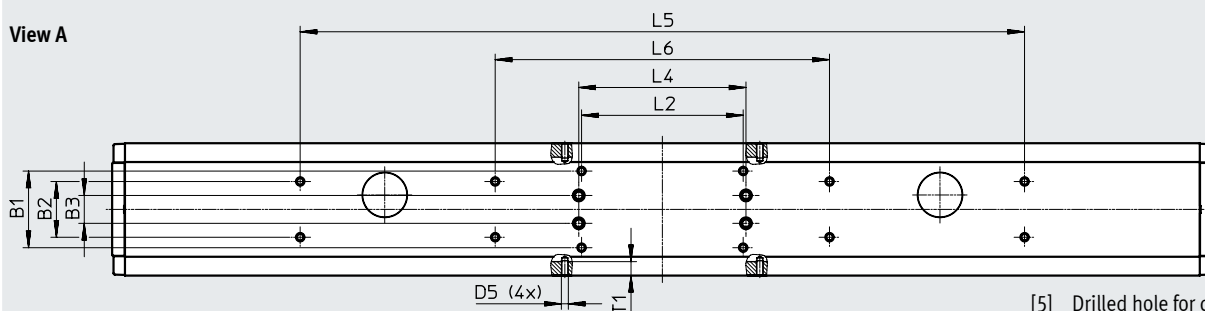
View A



Size 120



View A



[5] Drilled hole for centring sleeve

## Data sheet

Size	B1 ±0.1	B2 ±0.1	B3 ±0.1	D2	D3 ∅ H7	D5
70	20	–	–	M5	9	M4
80	32	20	–	M5	9	M4
120	55	40	20	M5	9	M5

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
120	M6	24.5	790	116	140	120

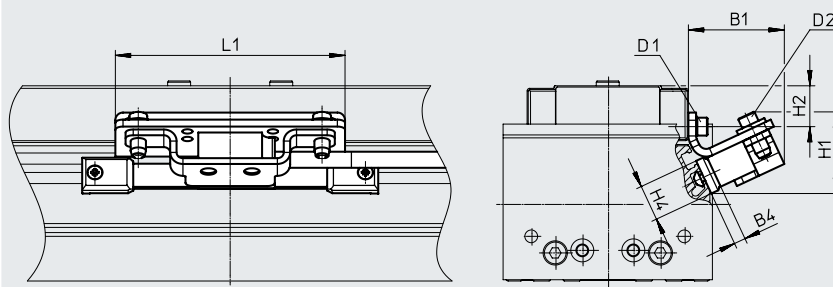
  

Size	L5 ±0.2	L6 ±0.2	T1	T2	T3	T4
70	190	–	3.5	7.5	2.1	–
80	400	200	5.1	9	2.1	9.7
120	520	240	10	10	2.1	12.8

## Dimensions

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

ELGA-...-M1/M2 – With incremental displacement encoder



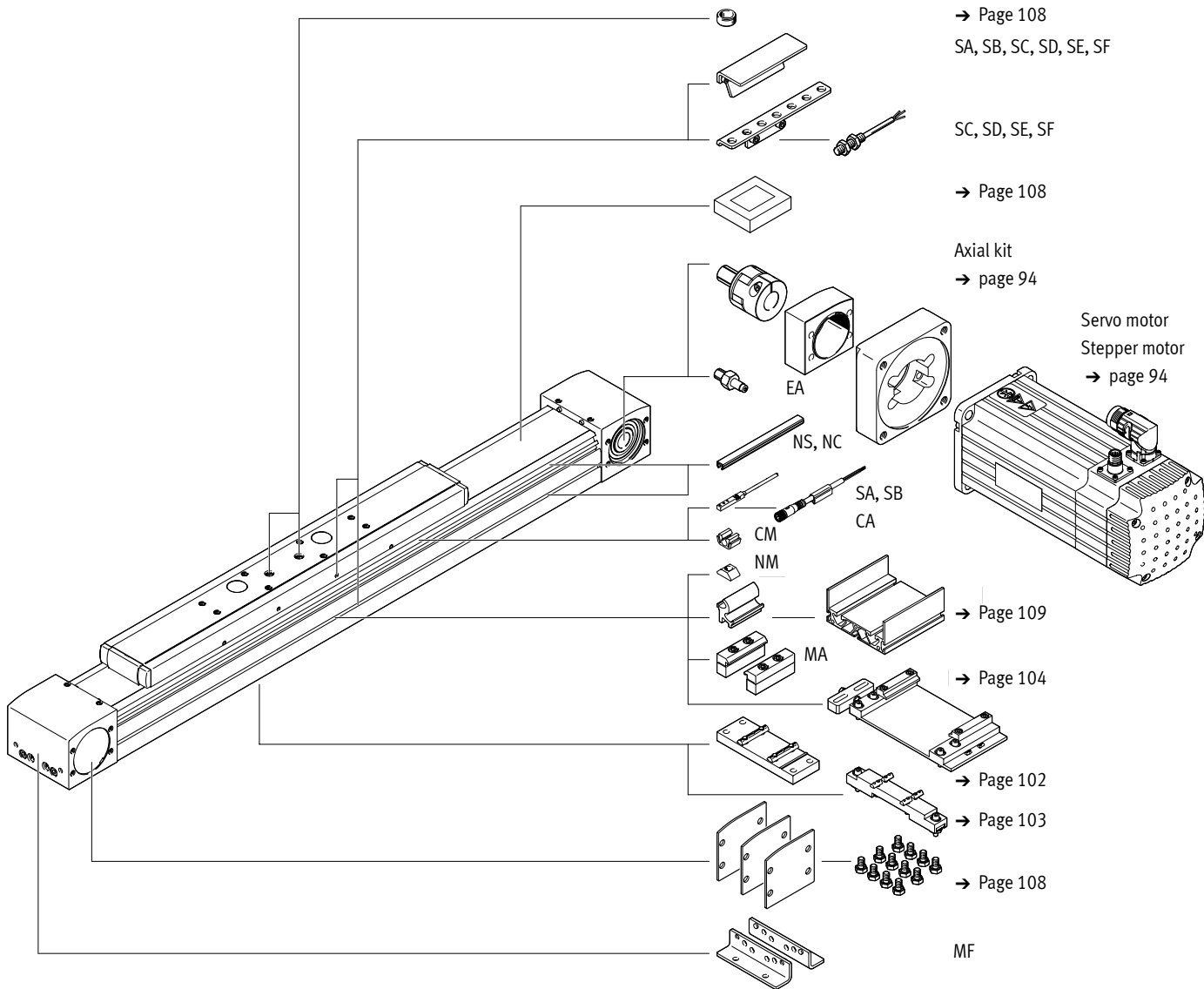
Encoder cable  
(connection to motor controller/  
safety system)  
→ Page 110

Size	B1	B4	D1	D2	H1	H2	H4	L1
70	37.6	4.5	M4x8	M4x14	37.9	11.7	14.1	86
80	37.6	4.5	M4x8	M4x14	32	16	14.1	90
120	38.5	4.5	M5x10	M4x14	37.7	24.5	14.1	170



Ordering data – Modular product system

Accessories



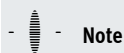
## Ordering data – Modular product system

Ordering table		70	80	120	Conditions	Code	Enter code
Size		70	80	120			
Module no.		<b>1371245</b>	<b>1371246</b>	<b>1371247</b>			
Design		Linear axis				<b>ELGA</b>	ELGA
Function		Toothed belt				★ <b>-TB</b>	-TB
Guide		Roller bearing guide				★ <b>-RF</b>	-RF
Size	[mm]	70	80	120		★ <b>-...</b>	
Stroke length	[mm]	1 ... 7000	1 ... 7000	1 ... 7400		★ <b>-...</b>	
Stroke reserve	[mm]	0 ... 999 (0 = no stroke reserve)			[1]	★ <b>-...H</b>	
Slide design	Standard slide					★	
	50 ... 7000	50 ... 7000	50 ... 7400				
	Slide, short			[2]		★ <b>-S</b>	
	50 ... 7000	50 ... 7000	50 ... 7400				
Long slide						★ <b>-L</b>	
	50 ... 6900	50 ... 6900	50 ... 7200				
Protection against particles	Standard					★	
	Without cover strip					★ <b>-P0</b>	
Measurement system	Without						
	With displacement encoder, incremental, resolution 2.5 µm					<b>-M1</b>	
	With displacement encoder, incremental, resolution 10 µm					<b>-M2</b>	
Displacement encoder attachment position	Without						
	Rear			[3]		<b>-B</b>	
	Front			[3]		<b>-F</b>	
Material of toothed belt	Chloroprene rubber						
	Coated PU					<b>-PU2</b>	
Accessories	Accessories enclosed separately					<b>+</b>	+
Foot mounting	1					<b>MF</b>	
Profile mounting	1 ... 50					<b>...MA</b>	
Proximity switch (SIES), inductive, slot type 0, PNP, incl. switch lug	N/O contact, 7.5 m cable	1 ... 6				<b>...SA</b>	
	N/C contact, 7.5 m cable	1 ... 6				<b>...SB</b>	
Proximity switch (SIEN), inductive, M8, PNP, incl. switch lug with sensor bracket	N/O contact, 2.5 m cable	1 ... 99				<b>...SC</b>	
	N/C contact, 2.5 m cable	1 ... 99				<b>...SD</b>	
	N/O contact, M8 plug	1 ... 99				<b>...SE</b>	
	N/C contact, M8 plug	1 ... 99				<b>...SF</b>	
Connecting cable 2.5 m M8, 3-wire	1 ... 99					<b>...CA</b>	
Sensor slot cover	1 ... 50 (1 = 2 units, 500 mm)					<b>...NS</b>	
Mounting slot cover	1 ... 50 (1 = 2 units, 500 mm)					<b>...NC</b>	
Slot nut for mounting slot	1 ... 99					<b>...NM</b>	
Clip for sensor slot	10, 20, 30, 40, 50, 60, 70, 80, 90					<b>...CM</b>	
Drive shaft	1 ... 4					<b>...EA</b>	

[1] **... H** 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

[3] **B, F** Mandatory in combination with (measurement system) M1, M2  
Only in combination with (measurement system) M1, M2

**Note**

The code SA, SB includes a switch lug in the scope of delivery.

The code SC, SD, SE, SF includes one switch lug and max. two sensor brackets in the scope of delivery.

Festo core product range



Generally ready for shipping ex works in 24 hours

Generally ready for shipping ex works in 5 days