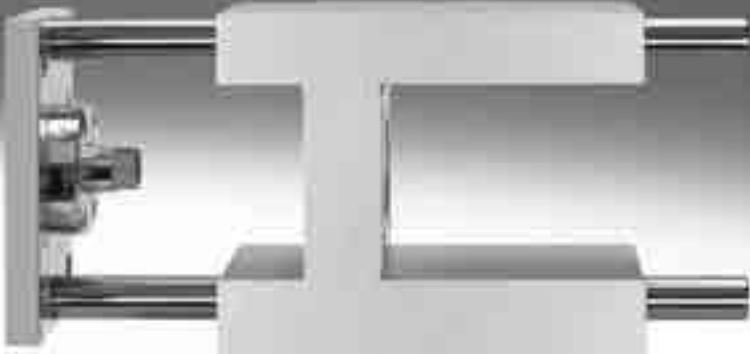


Guide units EAGF, for electric cylinders



Guide units EAGF, for electric cylinders

Key features



At a glance

The guide unit EAGF is used to protect electric cylinders from torsion when these are subjected to high torque loads.

It offers high precision guiding for workpiece handling and other applications.

The interface enables quick and easy installation on many Festo drives/axes.

For electric cylinder ESBF → 4

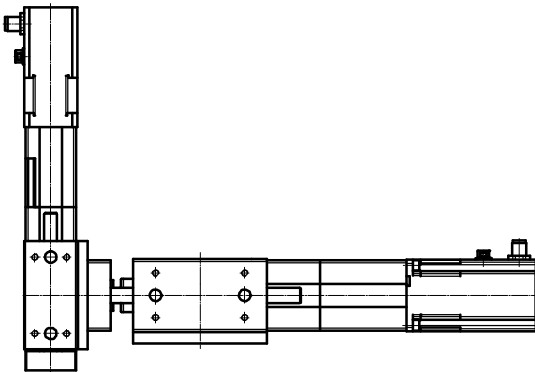


For electric cylinder EPCO → 12

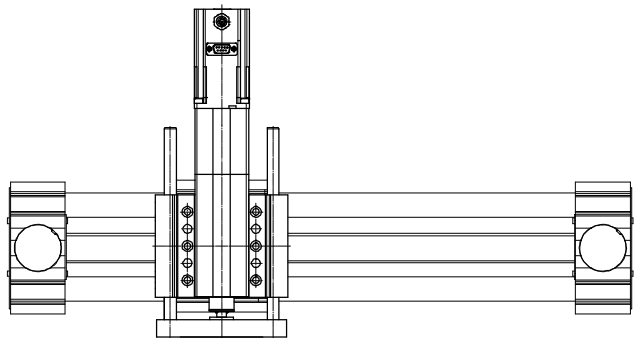


Application examples

Pick & place with two guide units

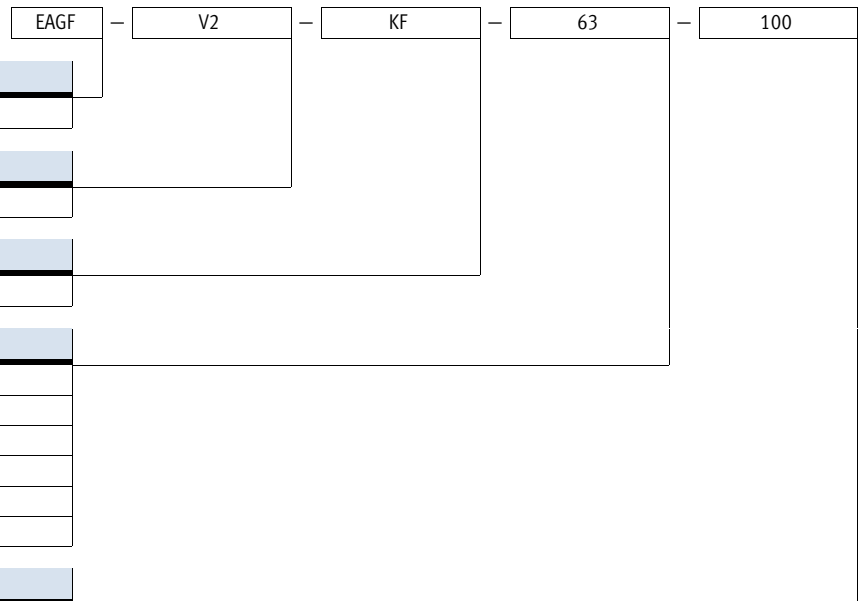


Pick & place with guide unit and linear axis



Guide units EAGF, for electric cylinders ESBF

Type codes



Guide units EAGF, for electric cylinders ESBF

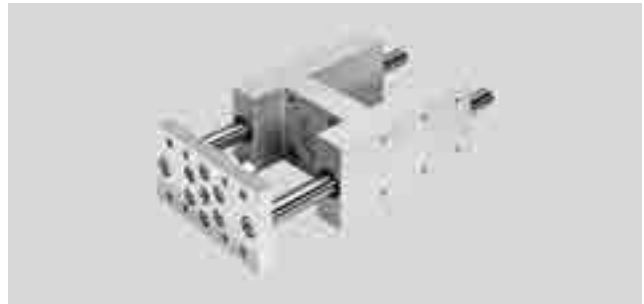
Technical data

FESTO

⊘ Diameter
32 ... 100 mm

 www.festo.com

┆ Stroke length
1 ... 500 mm



General technical data						
Size	32	40	50	63	80	100
Stroke [mm]	1 ... 500					
Design	Guide					
Guide	Recirculating ball bearing guide					
Displacement force [N]	15				40	
Reversing backlash [μm]	0					
Type of mounting	Via female thread					
Mounting position	Any					
Ambient temperature [°C]	-20 ... +80 °C					

Weight [g]						
Size	32	40	50	63	80	100
Basic weight with 0 mm stroke	1685	2517	4059	5525	10517	13263
Additional weight per 10 mm stroke	18	32	49	49	76	76
Moving mass with 0 mm stroke	724	1283	2015	2560	5166	6148
Additional mass per 10 mm stroke	18	32	49	49	76	76

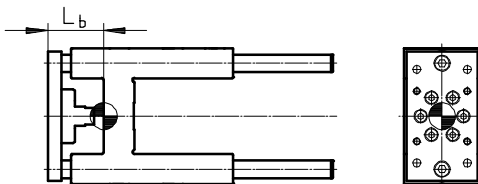
Calculation of the moving mass:

$$m_b = m_{0b} + H \times m_{Hb}$$

m_b = Moving mass of the guide unit
 m_{0b} = Moving mass with 0 mm stroke
 m_{Hb} = Additional mass per 10 mm stroke
 H = Stroke length

Centre of gravity of the moving mass [mm]						
Size	32	40	50	63	80	100
With 0 mm stroke	30	38	46	48	54	47
Supplement per 10 mm stroke	4.1	4.2	4.3	4.1	3.8	3.6

Calculation of the centre of gravity of the moving mass



$$L_b = L_{0b} + H \times L_{Hb}$$

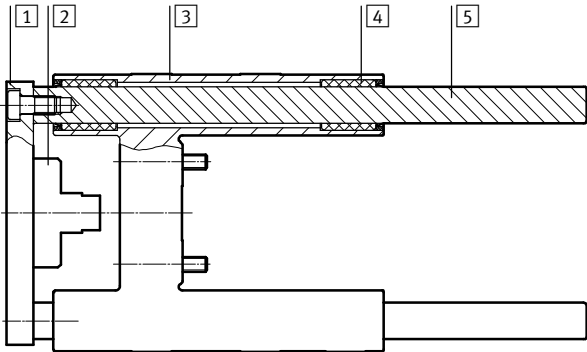
L_b = Centre of gravity of the moving mass of the guide unit
 L_{0b} = Centre of gravity of the moving mass with 0 mm stroke
 L_{Hb} = Supplement per 10 mm stroke
 H = Stroke length

Guide units EAGF, for electric cylinders ESBF

Technical data

Materials

Sectional view

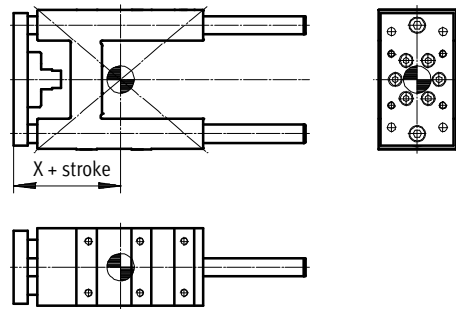
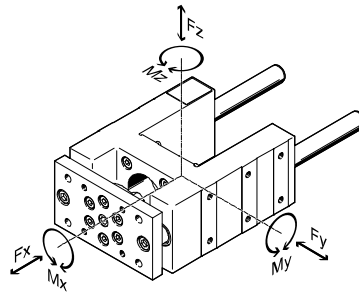


Guide unit

1	Yoke plate	Steel
2	Compensating component	Steel
3	Housing	Anodised wrought aluminium alloy
4	Bearing	Steel
5	Guide rod	Steel
-	Note on materials	RoHS compliant Free of copper and PTFE

Characteristic load values

The indicated forces and torques refer to the guide centre.



If the guide unit 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:

$$f_v = \frac{|F_y|}{F_{y,max}} + \frac{|F_z|}{F_{z,max}} + \frac{|M_x|}{M_{x,max}} + \frac{|M_y|}{M_{y,max}} + \frac{|M_z|}{M_{z,max}} \leq 1$$

Distance x

Size		32	40	50	63	80	100
Dimension x	[mm]	83	85	99	117	142	145

Max. permissible forces and torques

Size		32	40	50	63	80	100
Static							
$F_{y,max.}/F_{z,max.}$	[N]	510	630	800	800	1560	1560
$M_{x,max.}$	[Nm]	19	27	42	48	115	134
$M_{y,max.}/M_{z,max.}$	[Nm]	23	33	44	57	130	134
Dynamic (for a service life of 5000 km)							
$F_{y,max.}/F_{z,max.}$	[N]	750	1000	1260	1260	2300	2300
$M_{x,max.}$	[Nm]	28	44	65	75	170	198
$M_{y,max.}/M_{z,max.}$	[Nm]	34	52	70	90	191	197

Guide units EAGF, for electric cylinders ESBF

Technical data



Calculating 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 ratio q .

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

Load comparison factor f_v as a function of service life ratio q

Example:

The effect on the service life, deviating from the specified reference service

life, can be determined by means of the service life ratio q :

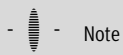
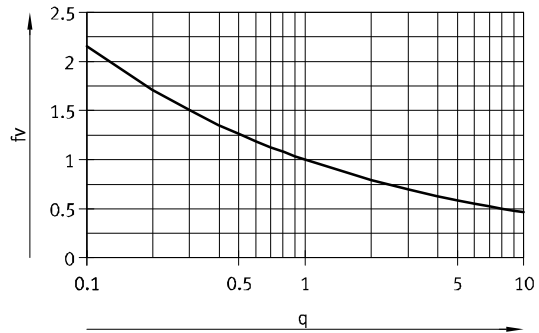
Given:

Reference service life = 5000 km

Required service life = 3000 km

$$q = \frac{3000\text{km}}{5000\text{km}} = 0.6$$

The graph gives a load comparison factor f_v of 1.2. This means that the permissible resultant load can be utilised up to 120%.

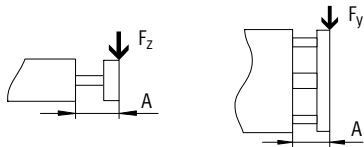


Note

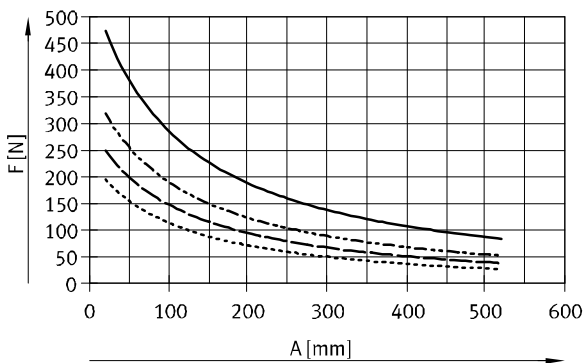
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Engineering software
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$f_v > 1.5$ are only theoretical comparison values.

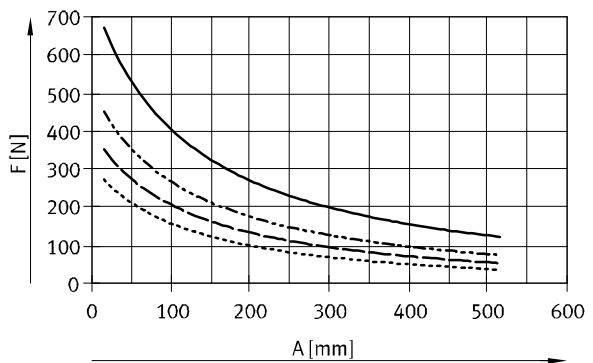
Max. lateral force F as a function of projection A



Size 32



Size 40

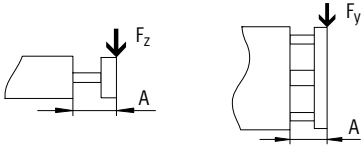


- Running performance of 500 km
- - - Running performance of 2500 km
- · - Running performance of 5000 km
- · · Running performance of 10000 km

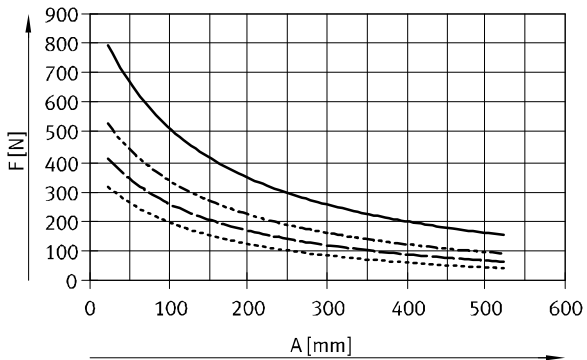
Guide units EAGF, for electric cylinders ESBF

Technical data

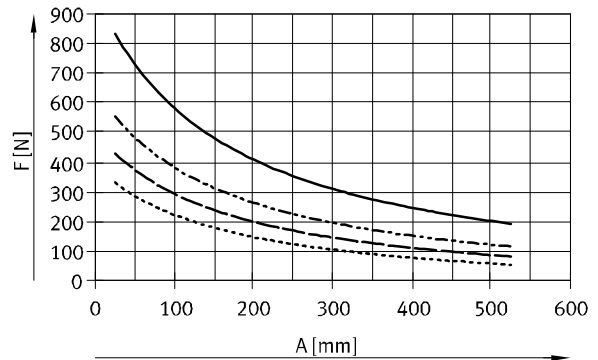
Max. lateral force F as a function of projection A



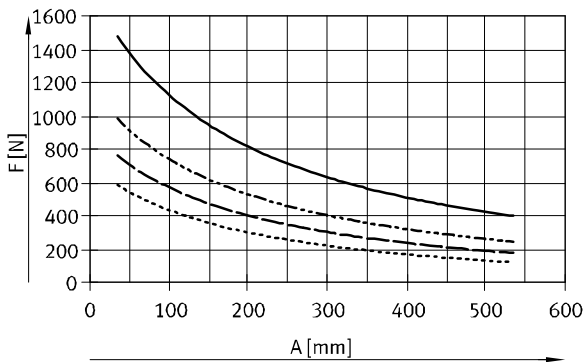
Size 50



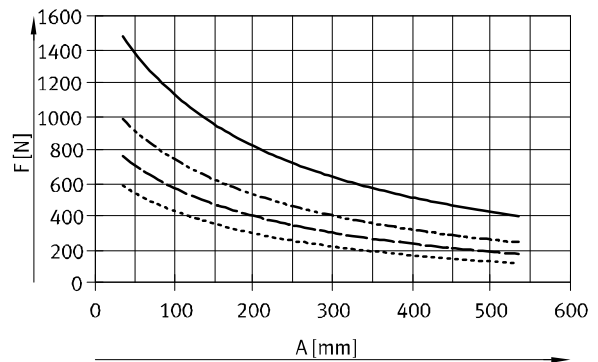
Size 63



Size 80



Size 100



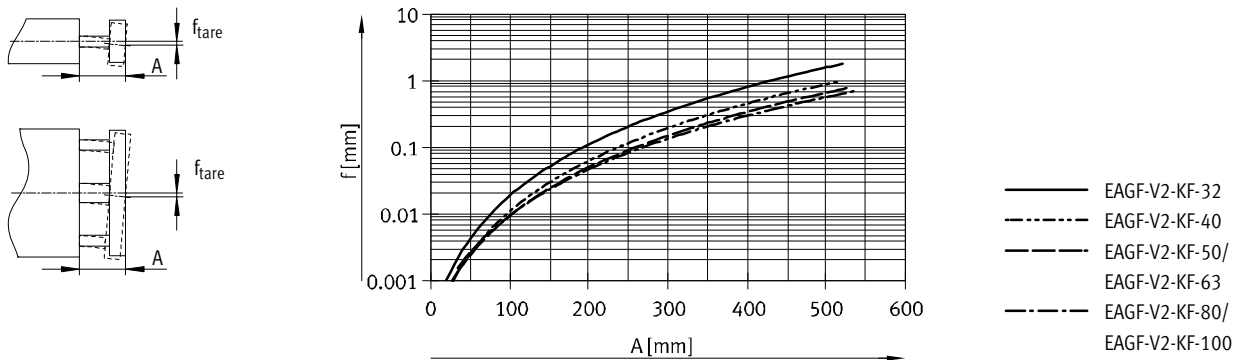
- Running performance of 500 km
- - - - - Running performance of 2500 km
- · - · - Running performance of 5000 km
- · · · · Running performance of 10000 km

Guide units EAGF, for electric cylinders ESBF

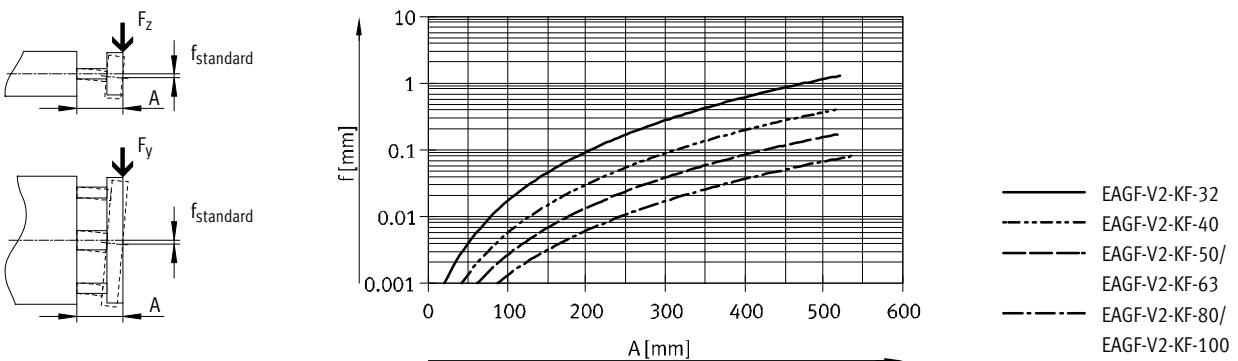
Technical data

FESTO

Deflection f_{tare} (due to tare weight) as a function of projection A



Deflection $f_{standard}$ (due to lateral force) as a function of projection A



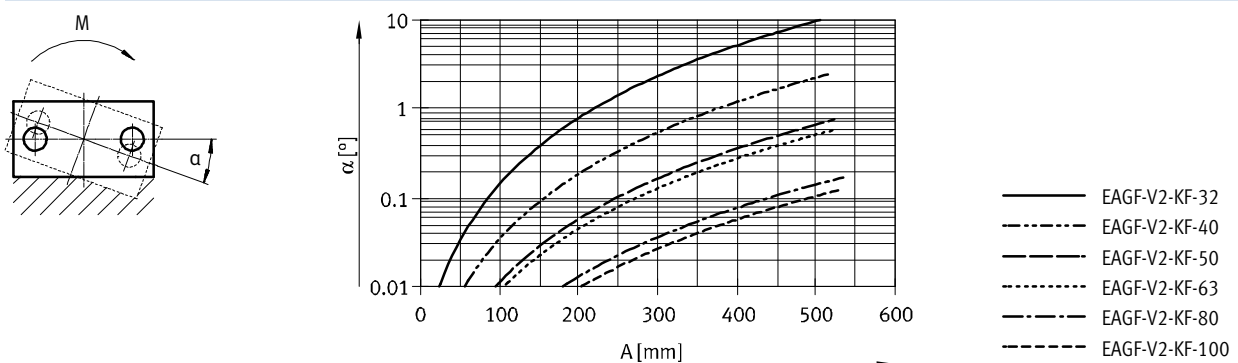
The maximum permissible lateral force must not be exceeded.

$$f_{quer} = \frac{F_{quer}}{F_{norm}} \times f_{norm}$$

$$F_{standard} = 10 \text{ N}$$

A = Projection of guide rod
 $f_{lateral}$ = Deflection due to lateral force
 $F_{lateral}$ = Lateral force
 $F_{standard}$ = Standardised lateral force
 $f_{standard}$ = Deflection due to standardised lateral force (value from graph)

Inclination α (due to torque) as a function of projection A



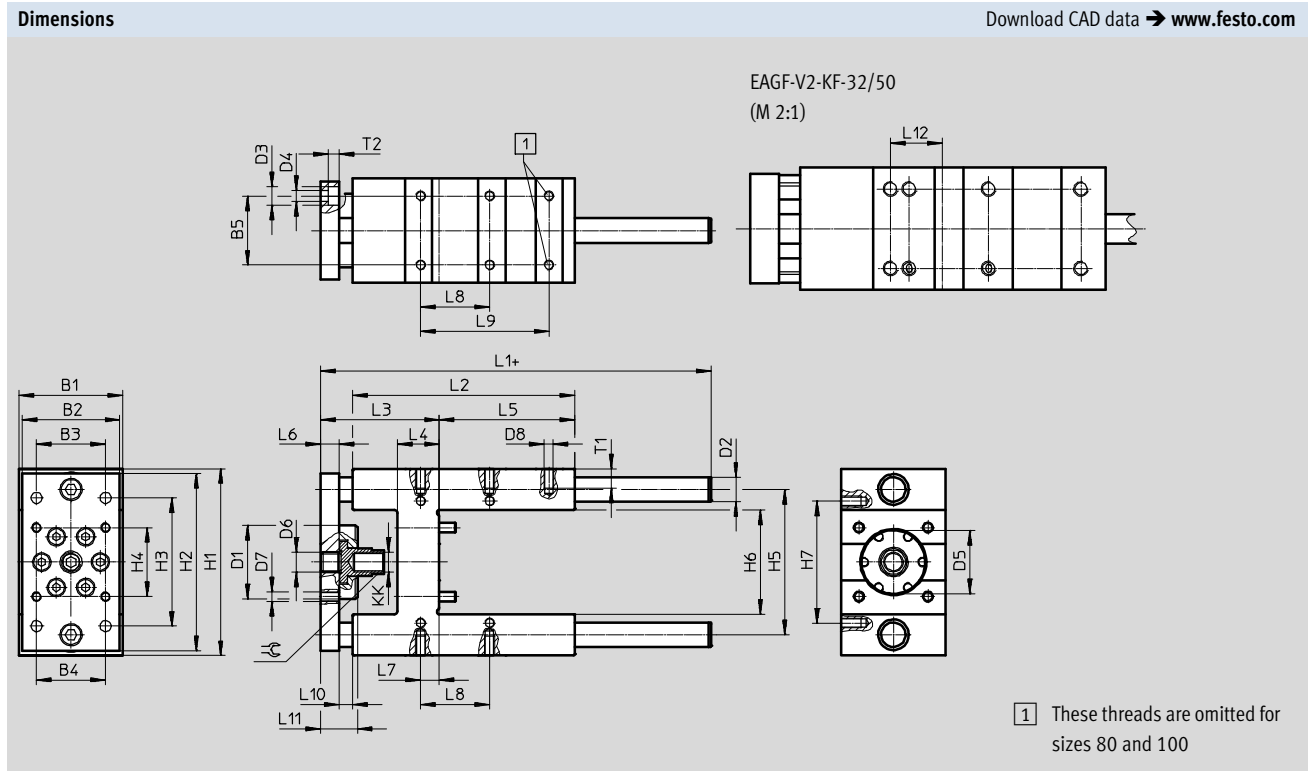
$$\alpha = \frac{M}{M_{norm}} \times \alpha_{norm}$$

$M_{standard} = 2 \text{ Nm}$
 (valid for $\alpha \leq 10^\circ$)

A = Projection of guide rod
 α = Inclination due to torque
 M = Torque
 $M_{standard}$ = Standardised torque
 $\alpha_{standard}$ = Deflection due to standardised torque

Guide units EAGF, for electric cylinders ESBF

Technical data



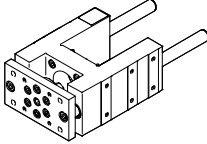
Size	B1	B2	B3	B4	B5	D1	D2	D3	D4	D5	D6	D7
	-0.3		±0.2	±0.2	±0.2	∅	∅ h6	∅	∅	∅ H8		
32	50	45	32.5	32.5	32.5	44	12	11	6.6	34	M6	M6
40	58	54	38	38	38	48	16	11	6.6	39	M 8	M 8
50	70	63	46.5	46.5	46.5	60	20	15	9	45	M 8	M 8
63	85	80	56.5	56.5	56.5	60	20	15	9	52	M16	M 8
80	105	100	72	72	72	78	25	18	11	60	M18	M10
100	130	120	89	89	89	78	25	18	11	70	M18	M10

Size	D8	H1	H2	H3	H4	H5	H6	H7	KK	L1	L2
		-0.5		±0.2	±0.2	±0.2		±0.2		±1	
32	M6	97	90	78	32.5	74	50.5±0.3	61	M10x1.25	154.8	125
40	M6	115	110	84	38	87	58.5±0.3	69	M12x1.25	172.8	140
50	M 8	137	130	100	46.5	104	70.5±0.3	85	M16x1.5	187.8	150
63	M 8	153	145	105	56.5	119	85.5±0.3	100	M16x1.5	219.8	182
80	M10	189	180	130	72	148	106+1/-0.6	130	M20x1.5	257.8	215
100	M10	213	200	150	89	172	131+1/-0.6	150	M20x1.5	262.8	220

Size	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	T1	T2	∅C1
						±0.2	±0.2						
32	69.5 ⁺⁵	24	76	12	4.3	32.5	78	-	24	12	12	6.5	15
40	74.5 ⁺⁵	28	81	15	11	38	84	-	27	-	14	6.5	15
50	94.5 ⁺⁵	34	79	15	18.8	46.5	100	-	30	37	16	9	19
63	96.6	34	111	15	15.3	56.5	105	11	30	-	16	9	19
80	121.6	40	128	20	21	72	-	15	39	-	20	11	27
100	126.6	40	128	20	24.5	89	-	15	39	-	20	11	27

Guide units EAGF, for electric cylinders ESBF

Technical data

Ordering data				
Guide unit	Size	Stroke [mm]	Part No.	Type
	32	100	2782679	EAGF-V2-KF-32-100
		200	2782818	EAGF-V2-KF-32-200
		320	2782885	EAGF-V2-KF-32-320
		400	2782923	EAGF-V2-KF-32-400
		1 ... 500	3038083	EAGF-V2-KF-32-
	40	100	2782939	EAGF-V2-KF-40-100
		200	2782976	EAGF-V2-KF-40-200
		320	2783047	EAGF-V2-KF-40-320
		400	2783080	EAGF-V2-KF-40-400
		1 ... 500	3038089	EAGF-V2-KF-40-
	50	100	2783639	EAGF-V2-KF-50-100
		200	2784152	EAGF-V2-KF-50-200
		320	2784164	EAGF-V2-KF-50-320
		400	2784184	EAGF-V2-KF-50-400
		1 ... 500	3038094	EAGF-V2-KF-50-
	63	100	1725842	EAGF-V2-KF-63-100
		200	1725843	EAGF-V2-KF-63-200
		320	1725844	EAGF-V2-KF-63-320
		400	1725845	EAGF-V2-KF-63-400
		1 ... 500	2608521	EAGF-V2-KF-63-
	80	100	1725846	EAGF-V2-KF-80-100
		200	1725847	EAGF-V2-KF-80-200
		320	1725848	EAGF-V2-KF-80-320
		400	1725849	EAGF-V2-KF-80-400
		1 ... 500	2608528	EAGF-V2-KF-80-
100	100	1725850	EAGF-V2-KF-100-100	
	200	1725851	EAGF-V2-KF-100-200	
	320	1725852	EAGF-V2-KF-100-320	
	400	1725853	EAGF-V2-KF-100-400	
	1 ... 500	2608532	EAGF-V2-KF-100-	

Guide units EAGF, for electric cylinders EPCO

Type codes



EAGF - P1 - KF - 16 - 100

Type	
EAGF	Guide unit

Designation	
P1	For electric cylinder EPCO

Guide	
KF	Recirculating ball bearing guide

Size	
16	16 mm
25	25 mm
40	40 mm


Stroke [mm]	
50	50 mm
75	75 mm
100	100 mm
125	125 mm
150	150 mm
175	175 mm
200	200 mm
250	250 mm
300	300 mm
350	350 mm
400	400 mm

Guide units EAGF, for electric cylinders EPCO

Technical data

 Diameter
16, 25, 40 mm

 www.festo.com

 Stroke length
50 ... 400 mm



General technical data				
Size		16	25	40
Stroke	[mm]	50, 75, 100, 125, 150, 175, 200	50, 75, 100, 125, 150, 175, 200, 250, 300	50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400
Design		Guide		
Guide		Recirculating ball bearing guide		
Displacement force	[N]	3.2	4	6
Reversing backlash	[μ m]	0		
Permissible speed	[m/s]	1		
Permissible acceleration	[m/s ²]	25		
Type of mounting		Via female thread		
Mounting position		Any		

Operating and environmental conditions				
Size		16	25	40
Ambient temperature	[°C]	0 ... +50		
Storage temperature	[°C]	-20 ... +60		
Relative air humidity		0 ... 95 (non-condensing)		
Degree of protection		IP40		
Corrosion resistance class CRC ¹⁾		1		

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Guide units EAGF, for electric cylinders EPCO

Technical data

Weight [g]			
Size	16	25	40
Basic weight with 0 mm stroke	600	1080	1910
Additional weight per 10 mm stroke	8	11	18
Moving mass with 0 mm stroke	160	300	560
Additional mass per 10 mm stroke	8	11	18

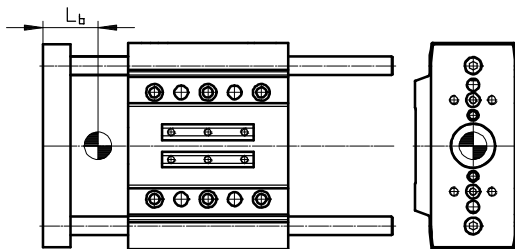
Calculation of the moving mass:

$$m_b = m_{0b} + H \times m_{Hb}$$

m_b = Moving mass of the guide unit
 m_{0b} = Moving mass with 0 mm stroke
 m_{Hb} = Additional mass per 10 mm stroke
 H = Stroke length

Centre of gravity of the moving mass [mm]			
Size	16	25	40
With 0 mm stroke	29	30	36
Supplement per 10 mm stroke	4.5	4.5	4.5

Calculation of the centre of gravity of the moving mass



$$L_b = L_{0b} + H \times L_{Hb}$$

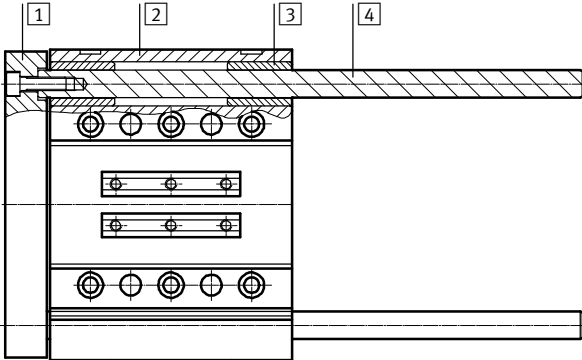
L_b = Centre of gravity of the moving mass of the guide unit
 L_{0b} = Centre of gravity of the moving mass with 0 mm stroke
 L_{Hb} = Supplement per 10 mm stroke
 H = Stroke length

Guide units EAGF, for electric cylinders EPCO

Technical data

Materials

Sectional view

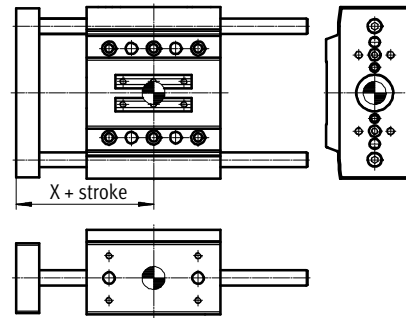
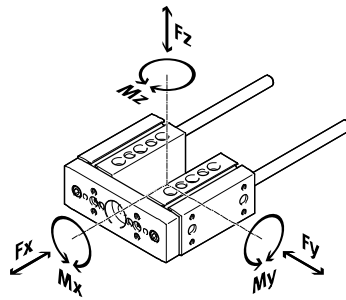


Guide unit

1	Yoke plate	Anodised wrought aluminium alloy
2	Housing	Anodised wrought aluminium alloy
3	Bearing	Steel
4	Guide rod	Hard-chromium plated tempered steel
-	Note on materials	RoHS compliant Free of copper and PTFE

Characteristic load values

The indicated forces and torques refer to the guide centre.



If the guide unit 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:

$$f_v = \frac{|F_y|}{F_{y,max}} + \frac{|F_z|}{F_{z,max}} + \frac{|M_x|}{M_{x,max}} + \frac{|M_y|}{M_{y,max}} + \frac{|M_z|}{M_{z,max}} \leq 1$$

Distance x				
Size		16	25	40
Dimension x	[mm]	51	59	72

Max. permissible forces and torques				
Size		16	25	40
Static				
$F_{y,max.}/F_{z,max.}$	[N]	355	415	510
$M_{x,max.}$	[Nm]	13	19	27
$M_{y,max.}/M_{z,max.}$	[Nm]	9	12	20
Dynamic (for a service life of 5000 km)				
$F_{y,max.}/F_{z,max.}$	[N]	160	320	380
$M_{x,max.}$	[Nm]	6	15	20
$M_{y,max.}/M_{z,max.}$	[Nm]	4	10	15

Guide units EAGF, for electric cylinders EPCO

Technical data

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 ratio q .

These values are only theoretical. You must consult your local Festo contact

for load comparison factors f_v greater than 1.5.

Load comparison factor f_v as a function of service life ratio q

Example:

The effect on the service life, deviating from the specified reference service

life, can be determined by means of the service life ratio q :

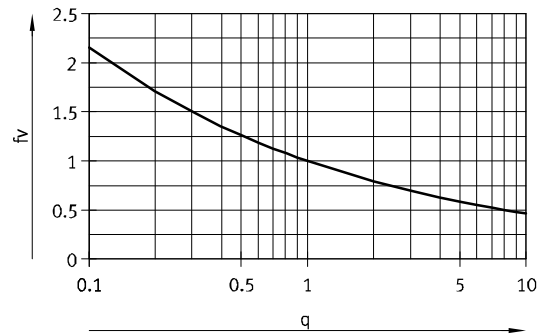
Given:

Reference service life = 5000 km

Required service life = 3000 km

$$q = \frac{3000\text{km}}{5000\text{km}} = 0.6$$

The graph gives a load comparison factor f_v of 1.2. This means that the permissible resultant load can be utilised up to 120%.

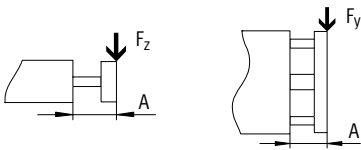


Note

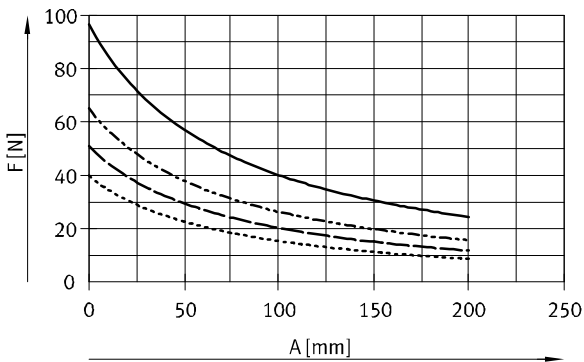
PositioningDrives
Engineering software
www.festo.com

$f_v > 1.5$ are only theoretical comparison values.

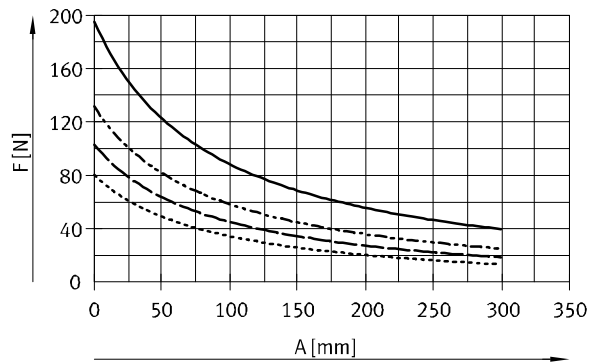
Max. lateral force F as a function of projection A



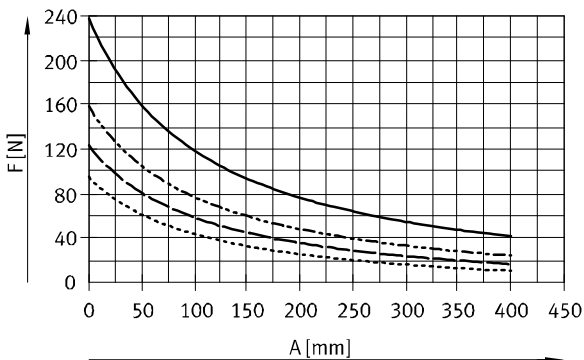
Size 16



Size 25



Size 40

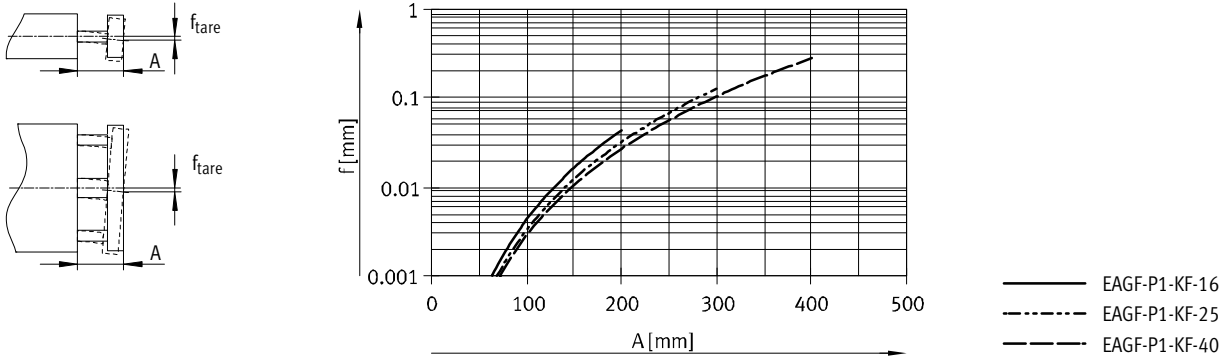


- Running performance of 500 km
- - - Running performance of 2500 km
- Running performance of 5000 km
- - - Running performance of 10000 km

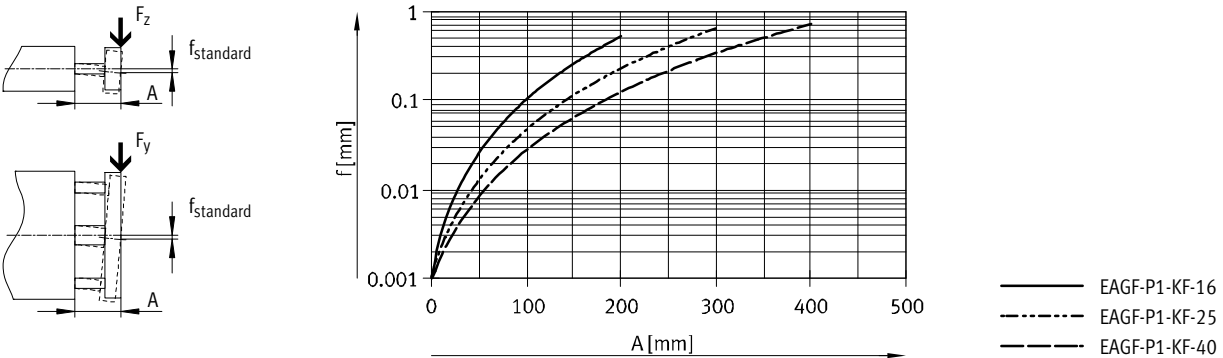
Guide units EAGF, for electric cylinders EPCO

Technical data

Deflection f_{tare} (due to tare weight) as a function of projection A



Deflection $f_{standard}$ (due to lateral force) as a function of projection A



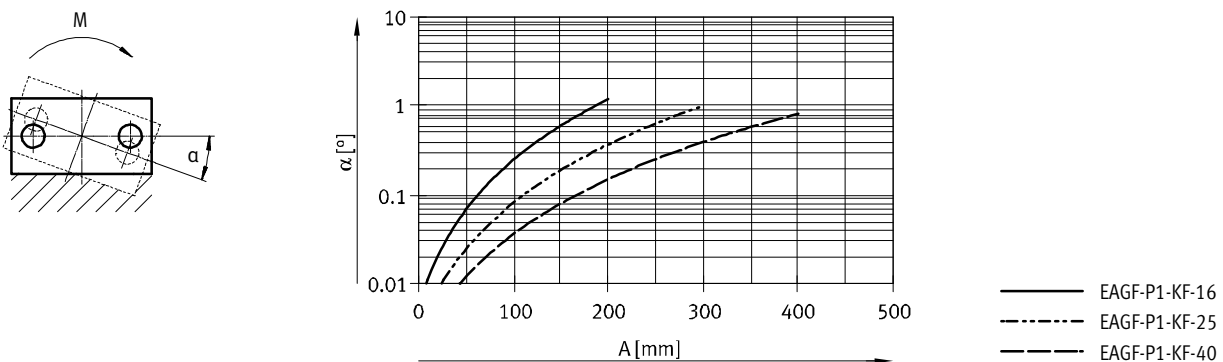
The maximum permissible lateral force must not be exceeded.

$$f_{quer} = \frac{F_{quer}}{F_{norm}} \times f_{norm}$$

$$F_{standard} = 10 \text{ N}$$

- A = Projection of guide rod
- $f_{lateral}$ = Deflection due to lateral force
- $F_{lateral}$ = Lateral force
- $F_{standard}$ = Standardised lateral force
- $f_{standard}$ = Deflection due to standardised lateral force (value from graph)

Inclination α (due to torque) as a function of projection A



$$\alpha = \frac{M}{M_{norm}} \times \alpha_{norm}$$

$$M_{standard} = 2 \text{ Nm}$$

(valid for $\alpha \leq 10^\circ$)

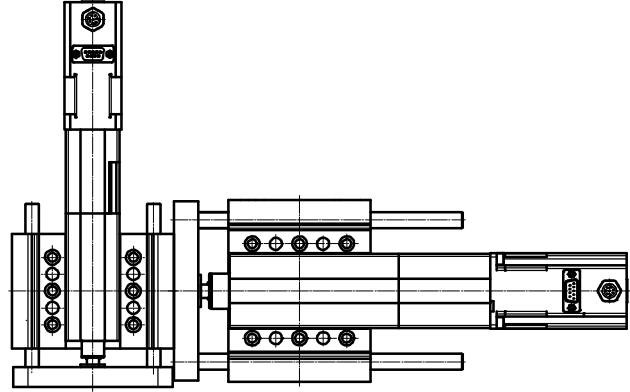
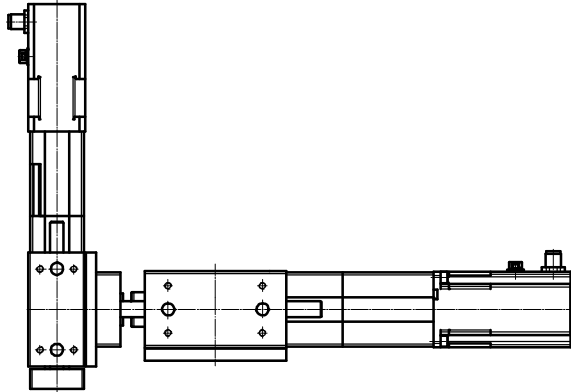
- A = Projection of guide rod
- α = Inclination due to torque
- M = Torque
- $M_{standard}$ = Standardised torque
- $\alpha_{standard}$ = Deflection due to standardised torque

Guide units EAGF, for electric cylinders EPCO

Technical data

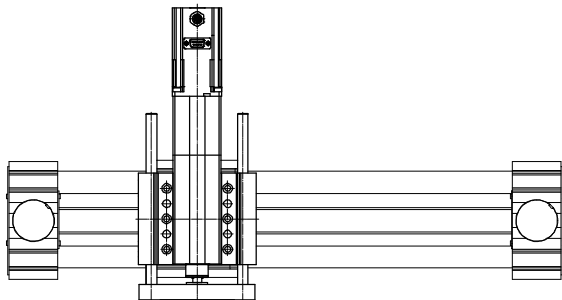
Possible combinations with other drives/axes via direct mounting

Guide unit EAGF with electric cylinder EPCO and guide unit EAGF



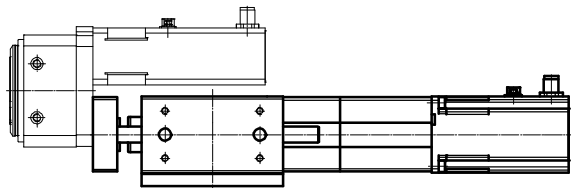
Size	Base axis	
	EAGF-P1-KF-25	EAGF-P1-KF-40
Assembly axis		
EAGF-P1-KF-16	■	-
EAGF-P1-KF-25	-	■

Toothed belt axis ELGR with electric cylinder EPCO and guide unit EAGF



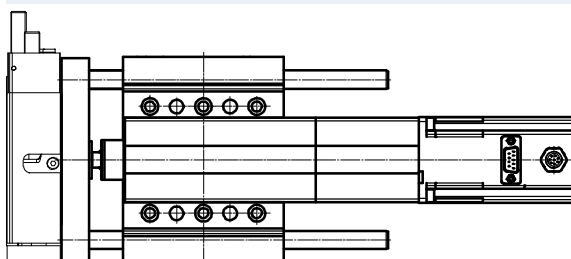
Size	Base axis		
	ELGR-TB-35	ELGR-TB-45	ELGR-TB-55
Assembly axis			
EAGF-P1-KF-16	■	-	-
EAGF-P1-KF-25	-	■	-
EAGF-P1-KF-40	-	-	■

Rotary drive ERMO with electric cylinder EPCO and guide unit EAGF



Size	Base axis		
	EAGF-P1-KF-16	EAGF-P1-KF-25	EAGF-P1-KF-40
Assembly axis			
ERMO-12	■	-	-
ERMO-16	-	■	-
ERMO-25	-	-	■

Mini slide DGSL with electric cylinder EPCO and guide unit EAGF



Size	Base axis		
	EAGF-P1-KF-16	EAGF-P1-KF-25	EAGF-P1-KF-40
Assembly axis			
DGSL-8-40 ¹	■	-	-
DGSL-10-30 ¹	-	■	-
DGSL-12-40 ¹	-	-	■

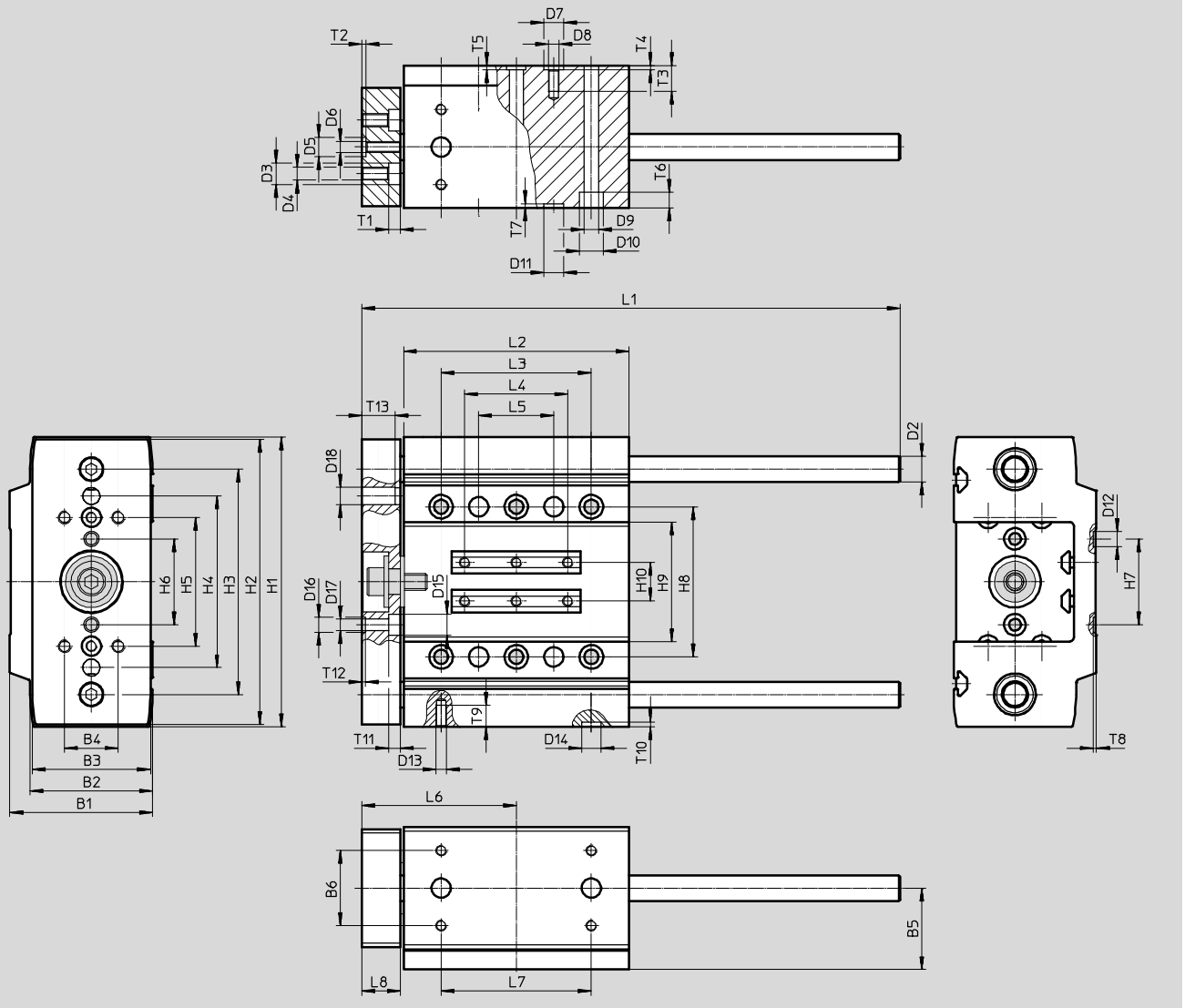
1) Minimal stroke

Guide units EAGF, for electric cylinders EPCO

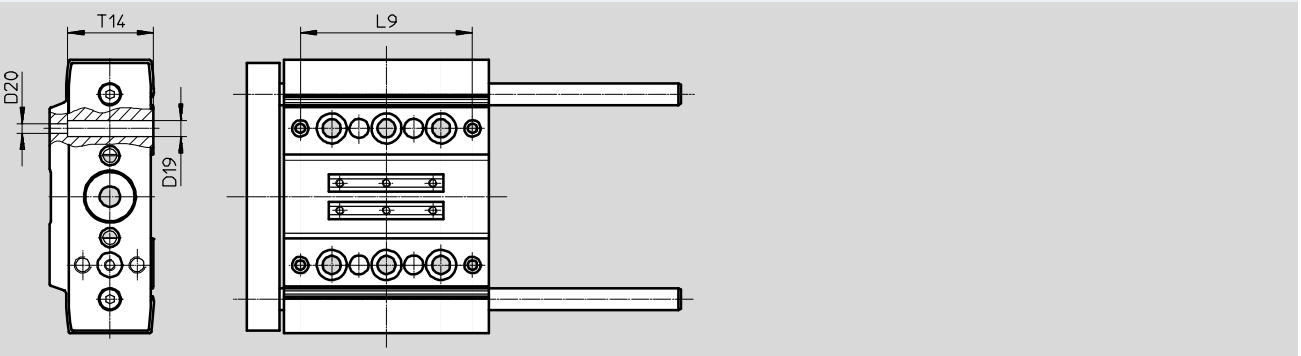
Technical data

Dimensions

Download CAD data → www.festo.com



Size 16



Guide units EAGF, for electric cylinders EPCO

Technical data

Size	B1	B2	B3	B4 ±0.05	B5	B6 ±0.05	D2 ∅ h7	D3 ∅	D4 ∅	D5 ∅ H8	D6	D7 ∅ H8
16	38	32	30	20	22	20	8	–	M6	9	M4	9
25	50	42	40	20	29	25	10	10	M6	9	M4	9
40	66.5	57	55	25	38	35	12	10	M6	9	M5	9

Size	D8	D9 ∅	D10 ∅	D11 ∅ H8	D12 ∅ H8	D13	D14 ∅ H8	D15 ∅	D16 ∅ H8	D17 ∅	D18 ∅ H7	D19 ∅
16	M5	6.6	11	7	7	M5	9	8	7	5 ^{H7}	–	6
25	M5	6.6	11	9	7	M5	9	10	7	5.5	5	–
40	M5	6.6	11	9	7	M5	9	10	7	5.5	8	–

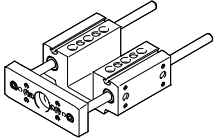
Size	D20 ∅	H1	H2	H3	H4 ±0.05	H5 ±0.05	H6 ±0.05	H7 ±0.05	H8 ±0.05	H9	H10
16	3.4	100	98	75	–	50	30	30	50	30.7	10
25	–	120	118	90	70	50	33	40	60	40.7	14
40	–	135	133	105	80	60	40	40	70	55.7	18



Size	L1	L2	L3 ±0.05	L4	L5 ±0.05	L6	L7 ±0.05	L8	L9	T1	T2
16	109 + stroke	75	40	34	20	51	50	12	63	–	2.1
25	124 + stroke	85	50	40	25	59	60	15	–	5.5	2.1
40	151 + stroke	105	70	48	35	72	70	18	–	5.5	2.1

Size	T3	T4 +0.1	T5 +0.1	T6	T7 +0.1	T8 +0.1	T9	T10 +0.1	T11	T12 +0.1	T13 ±1	T14
16	15.5	2.1	2.1	6.5	1.6	1.6	8.5 _{-0.5}	2.1	4.4	1.6	–	31.5
25	14	2.1	2.1	6.4	2.1	1.6	Min. 10	2.1	5.7	1.6	12.5	–
40	12	2.1	2.1	7.3	2.1	1.6	Min. 10	2.1	5.5	1.6	15.5	–

Guide units EAGF, for electric cylinders EPCO

Technical data

Ordering data				
Guide unit	Size	Stroke [mm]	Part No.	Type
	16	50	3192932	EAGF-P1-KF-16-50
		100	3192934	EAGF-P1-KF-16-100
		150	3192936	EAGF-P1-KF-16-150
		200	3192938	EAGF-P1-KF-16-200
		75, 125, 175	3192939	EAGF-P1-KF-16-
	25	50	3192943	EAGF-P1-KF-25-50
		100	3192945	EAGF-P1-KF-25-100
		150	3192947	EAGF-P1-KF-25-150
		200	3192949	EAGF-P1-KF-25-200
		300	3192951	EAGF-P1-KF-25-300
		75, 125, 175, 250	3192952	EAGF-P1-KF-25-
	40	50	3192955	EAGF-P1-KF-40-50
		100	3192957	EAGF-P1-KF-40-100
		150	3192959	EAGF-P1-KF-40-150
		200	3192961	EAGF-P1-KF-40-200
		300	3192963	EAGF-P1-KF-40-300
		75, 125, 175, 250 350, 400	3192966	EAGF-P1-KF-40-

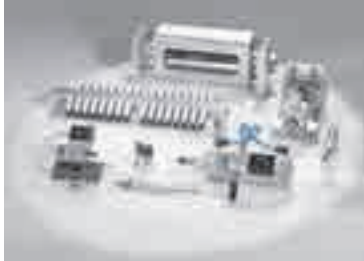
Accessories					
Ordering data					
	For size	Description	Part No.	Type	PU ¹⁾
Centring sleeve					
	16, 25, 40	For centring the drive or attachments	186717	ZBH-7	10
			150927	ZBH-9	
Connector sleeve					
	16	For centring the drive or attachments	548805	ZBV-9-7	10

1) Packaging unit

Product Range and Company Overview

A Complete Suite and Company Overview

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



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Complete custom engineered solutions



Custom Control Cabinets
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Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.

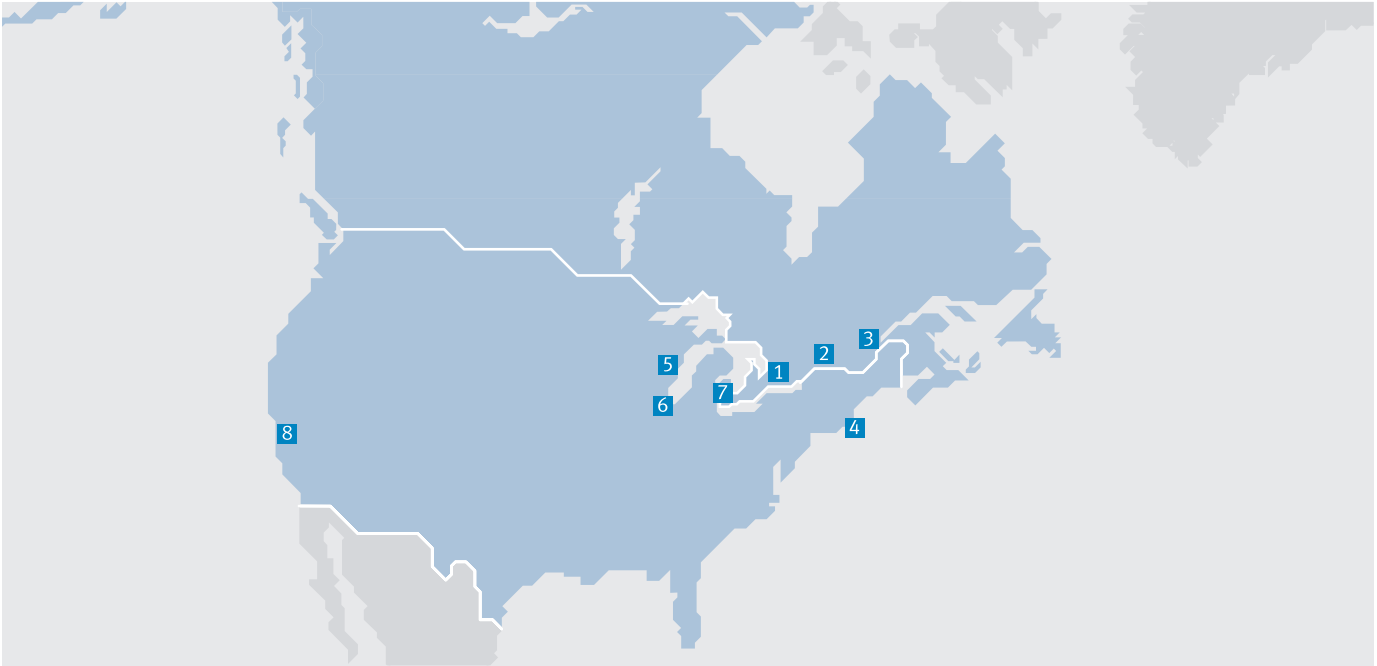


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Festo North America



**1 Festo Canada
Headquarters
Festo Inc.**
5300 Explorer Drive
Mississauga, ON
L4W 5G4

2 Montréal
5600, Trans-Canada
Pointe-Claire, QC
H9R 1B6

3 Québec City
2930, rue Watt#117
Québec, QC
G1X 4G3



**4 Festo United States
Headquarters
Festo Corporation**
395 Moreland Road
Hauppauge, NY
11788

5 Appleton
North 922 Tower View Drive, Suite N
Greenville, WI
54942

7 Detroit
1441 West Long Lake Road
Troy, MI
48098

6 Chicago
85 W Algonquin - Suite 340
Arlington Heights, IL
60005

8 Silicon Valley
4935 Southfront Road, Suite F
Livermore, CA
94550

Festo Regional Contact Center

Canadian Customers

Commercial Support:
Tel: 1 877 GO FESTO (1 877 463 3786)
Fax: 1 877 FX FESTO (1 877 393 3786)
Email: festo.canada@ca.festo.com

Technical Support:
Tel: 1 866 GO FESTO (1 866 463 3786)
Fax: 1 877 FX FESTO (1 877 393 3786)
Email: technical.support@ca.festo.com

USA Customers

Commercial Support:
Tel: 1 800 99 FESTO (1 800 993 3786)
Fax: 1 800 96 FESTO (1 800 963 3786)
Email: customer.service@us.festo.com

Technical Support:
Tel: 1 866 GO FESTO (1 866 463 3786)
Fax: 1 800 96 FESTO (1 800 963 3786)
Email: product.support@us.festo.com