Passive guide axes FDG, without drive

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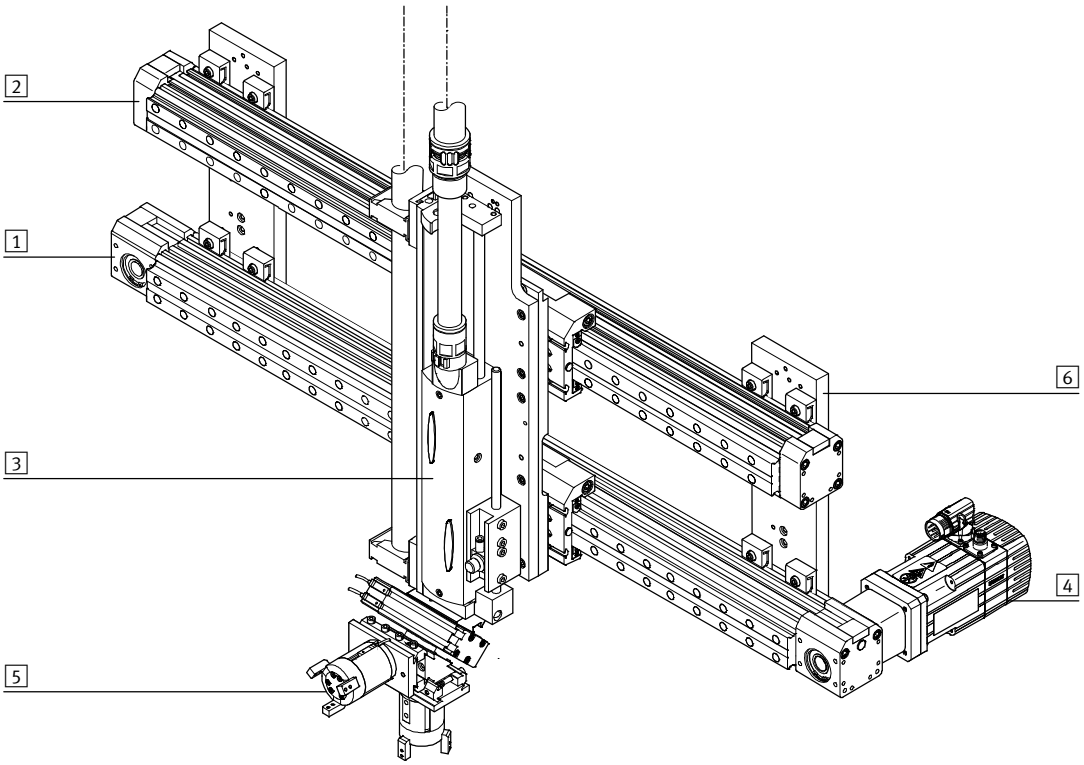
Passive guide axes FDG, without drive

Key features

At a glance

- Driveless linear guide unit with guide and freely movable slide
- The passive guide axis is designed to increase force and torque capacities in multi-axis applications
- Higher torsional resistance
- Reduced vibrations with dynamic loads
- Drive axis and passive guide axis can be arranged adjacent to or above one another

System product for handling and assembly technology



System components and accessories

	Description	➔ Page/Internet
1 Axes	Wide range of combinations possible within handling and assembly technology	axis
2 Passive guide axes	For increasing force and torque capacity in multi-axis applications	guide axis
3 Drives	Wide range of combinations possible within handling and assembly technology	drive
4 Motors	Servo and stepper motors, with or without gearing	motor
5 Grippers	Wide range of variations possible within handling and assembly technology	gripper
6 Adapters	For drive/drive and drive/gripper combinations	adapter kit

Passive guide axes FDG, without drive

Key features

Passive guide axes and the corresponding axes/drives

Passive guide axis ELFA-RF

- Can be combined with:
  - Toothed belt axis ELGA-TB-RF
- For size 70, 80
- Load capacity up to max. 800 N or 180 Nm

Passive 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

Passive 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

Passive guide axis FDG-ZR-RF

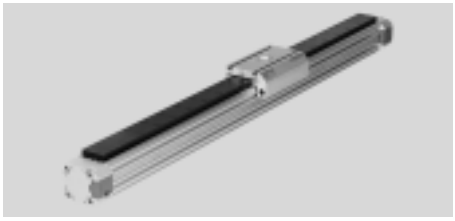
- Can be combined with:
  - Toothed belt axis DGE-ZR-RF
- For size 25 ... 63
- Load capacity up to max. 600 N or 600 Nm

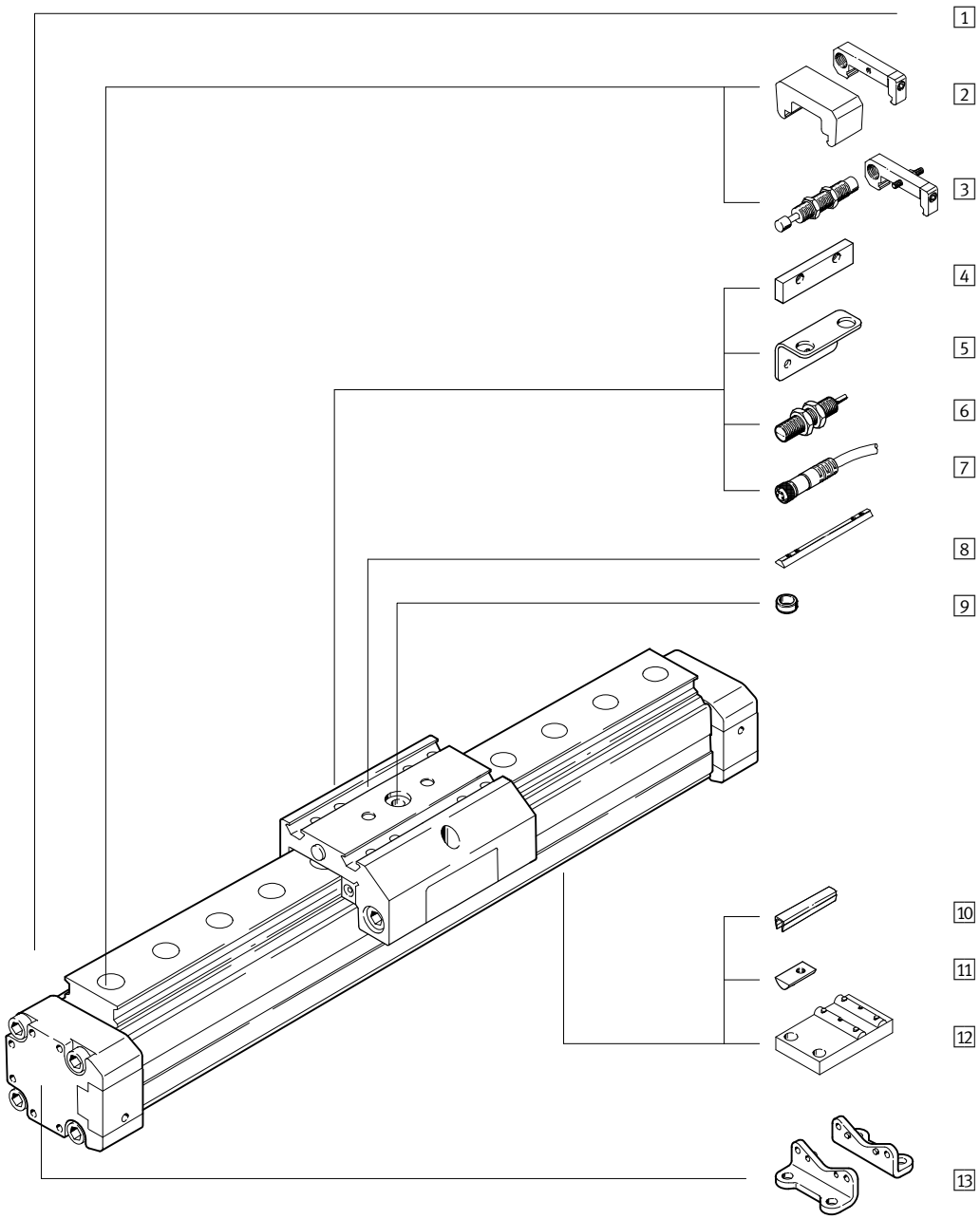
Passive guide axis FDG-ZR/-SP

- Can be combined with:
  - Toothed belt axis DGE-ZR-KF
  - Spindle axis DGE-SP-KF
- For size 18 ... 63
- Load capacity up to max. 14050 N or 1820 Nm

Passive guide axes FDG, without drive

Peripherals overview





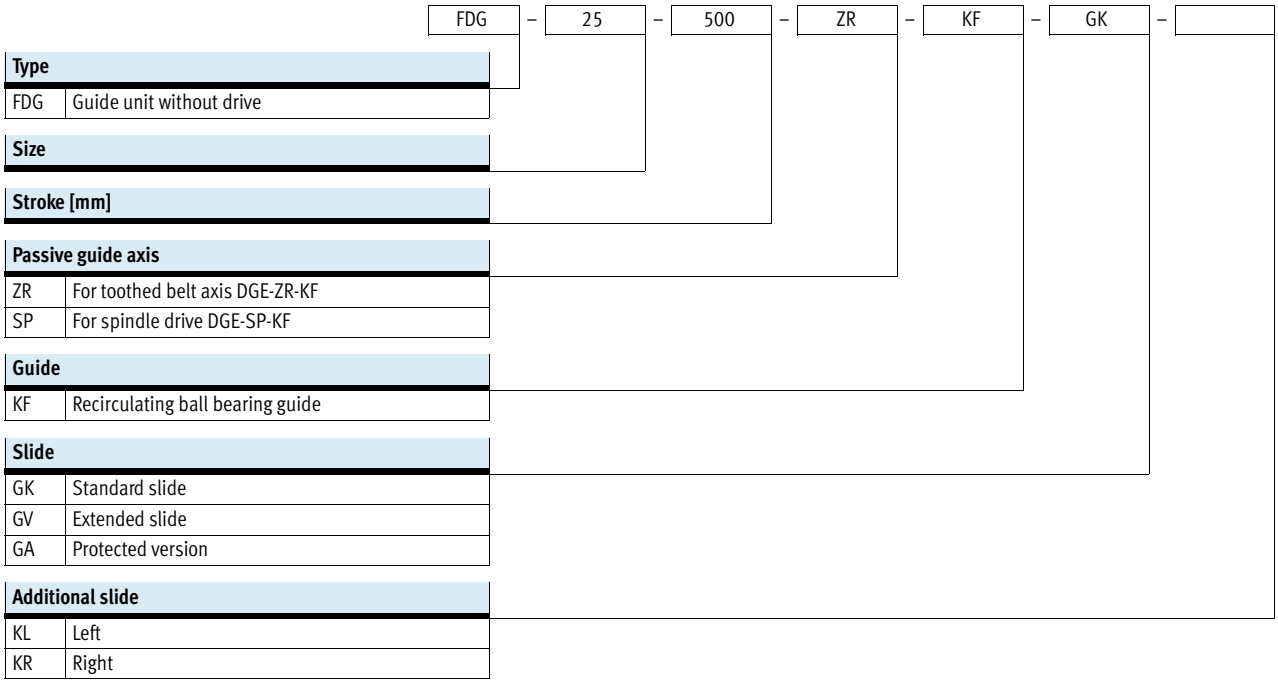
Passive guide axes FDG, without drive

Peripherals overview

Variants and accessories			
	Type	**Description**	**➔ Page/Internet**
1	Passive guide axis FDG	Guide without drive	6
2	Emergency buffer with retainer A	Absorbs the energy created by the movement of the slide when it reaches the end position	22
3	Shock absorber kits C/E	Absorbs the energy created by the movement of the slide when it reaches the end position	21
4	Switching lug L	For sensing the slide position	23
5	Sensor bracket T	Adapter for mounting the SIEN proximity sensor on the axis	23
6	Proximity sensors O/P/R/W	For providing a proximity signal or safety check	25
7	Cable with socket V	For proximity sensor	25
8	Slot nut for slide X	For mounting loads and attachments on the slide	24
9	Centring sleeve Z	For centring loads and attachments on the slide	24
10	Slot cover B/S	To protect against the ingress of dirt	24
11	Slot nut for mounting slot Y	For mounting attachments	24
12	Central support M	To mount the axis	20
13	Foot mounting F	To mount the axis	20

Passive guide axes FDG, without drive

Type codes



Type	
FDG	Guide unit without drive

Size	

Stroke [mm]	

Passive guide axis	
ZR	For toothed belt axis DGE-ZR-KF
SP	For spindle drive DGE-SP-KF

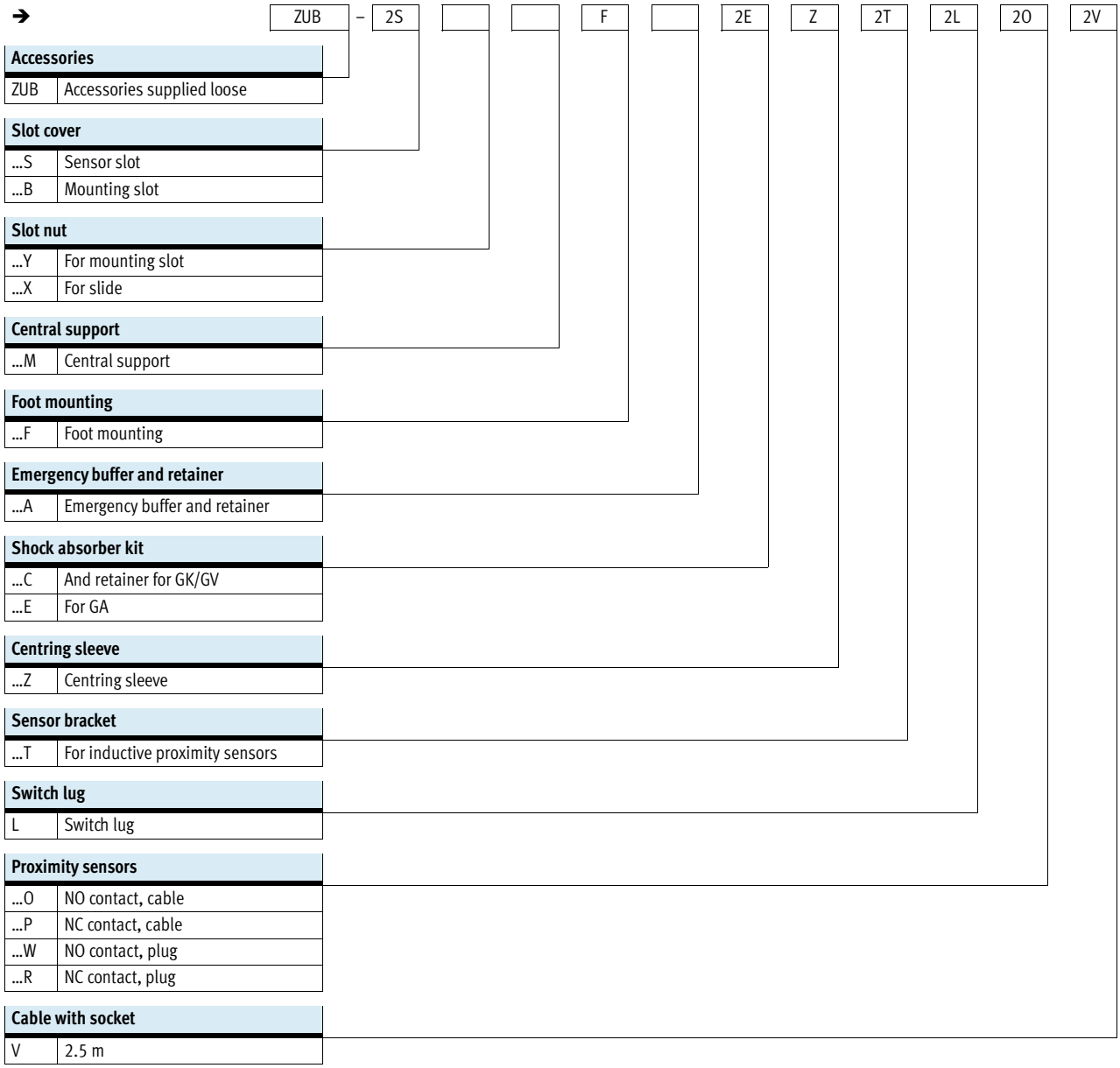
Guide	
KF	Recirculating ball bearing guide

Slide	
GK	Standard slide
GV	Extended slide
GA	Protected version

Additional slide	
KL	Left
KR	Right

Passive guide axes FDG, without drive

Type codes

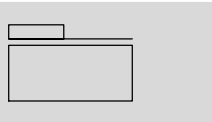


Passive guide axes FDG, without drive

Technical data

FESTO

Function



Size
18 … 63

Stroke length
100 … 5100 mm

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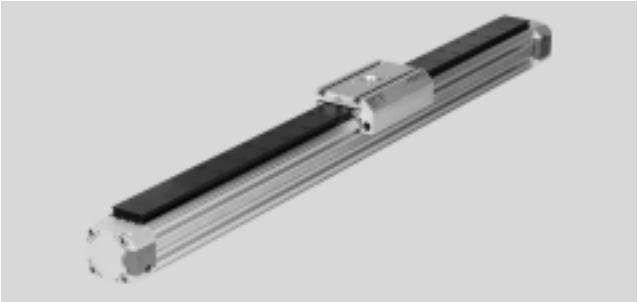


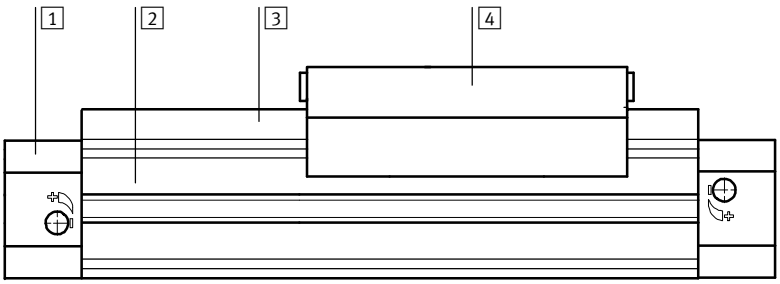
General technical data						
Size			18	25	40	63
Max. stroke	FDG-ZR	[mm]	1 … 1000	1 … 5100	1 … 4900	1 … 4700
	FDG-SP	[mm]	1 … 500	1 … 1000	1 … 1500	1 … 2000
Design			Driveless linear guide unit with slide			
Guide			External recirculating ball bearing guide			
Fitting position			Any			
Cushioning			Not adjustable at either end			
			Self-adjusting at both ends			
Type of mounting			Profile mounting			
			Foot mounting			
			Direct mounting			
Increase in no-load drive torque	for DGE-...-ZR by	[Nm]	0.005	0.02	0.03	0.085
	for DGE-SP by	[Nm]	0.04	0.1	0.15	0.45
Thrust[1)]		[N]	5	10	9	16
Ambient temperature		[°C]	–10 … +60			

1) Measured at FDG-18 = 0.05 m/s; FDG-25… 63 = 0.2m/s

Weights [kg]					
Size		18	25	40	63
FDG-ZR					
Basic weight at 0 mm stroke	GK	0.879	2.022	6.055	21.493
	GV	1.341	2.927	7.939	31.464
	GA	–	2.931	8.128	–
Additional weight per 100 mm stroke	GK	0.274	0.479	0.968	2.423
	GV	0.274	0.479	0.968	2.423
	GA	–	0.570	1.092	–
FDG-SP					
Basic weight at 0 mm stroke	GK	0.743	1.482	4.296	13.454
	GV	1.232	2.530	7.678	25.847
	GA	–	2.459	6.798	–
Additional weight per 100 mm stroke	GK	0.274	0.479	0.968	2.423
	GV	0.274	0.479	0.968	2.423
	GA	–	0.570	1.092	–

Materials

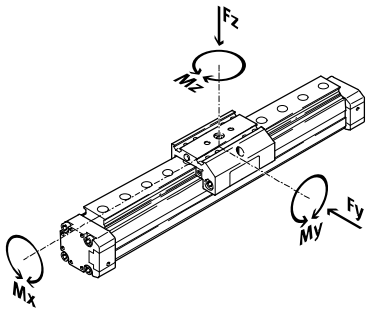
Sectional view



Axis			
1	End cap		Anodised aluminium
2	Profile		Anodised aluminium
3	Guide rail	∅ 18	Hardened steel
		∅ 25 ... 63	Hardened steel with corrosion resistant coating
4	Slide		Anodised aluminium
	Note on material		Free of copper and PTFE

Characteristic load values

The forces and torques specified refer to the centre of the guide rails. They must not be exceeded during dynamic operation. Special attention must be paid to the cushioning phase.



If the axis is simultaneously subjected to several of the forces and torques listed below, the following equations must be satisfied in addition to the indicated maximum loads.

$$\frac{Fy}{Fy_{max.}} + \frac{Fz}{Fz_{max.}} + \frac{Mx}{Mx_{max.}} + \frac{My}{My_{max.}} + \frac{Mz}{Mz_{max.}} \leq 1$$

Permissible forces and torques					
Size		18	25	40	63
GK/GA – standard slide/protected slide					
$Fy_{max.}$	[N]	930	380	7300	14050
$Fz_{max.}$	[N]	930	3080	7300	14050
$Mx_{max.}$	[Nm]	7	45	170	580
$My_{max.}$	[Nm]	23	85	330	910
$Mz_{max.}$	[Nm]	23	85	330	910
GV – extended slide					
$Fy_{max.}$	[N]	930	3080	7300	14050
$Fz_{max.}$	[N]	930	3080	7300	14050
$Mx_{max.}$	[Nm]	7	45	170	580
$My_{max.}$	[Nm]	45	170	660	1820
$Mz_{max.}$	[Nm]	45	170	660	1820

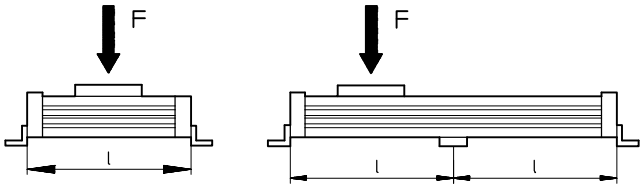
Passive guide axes FDG, without drive

Technical data

Maximum permissible support span l as a function of the force F

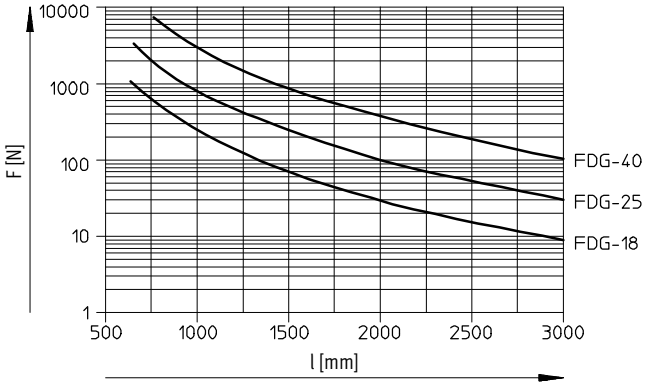
The axis may need to be supported with central supports MUP in order to limit deflection in the case of large strokes. The following diagrams serve to determine the maximum permissible support span l as a function of the force F.

Force on the surface of the slide

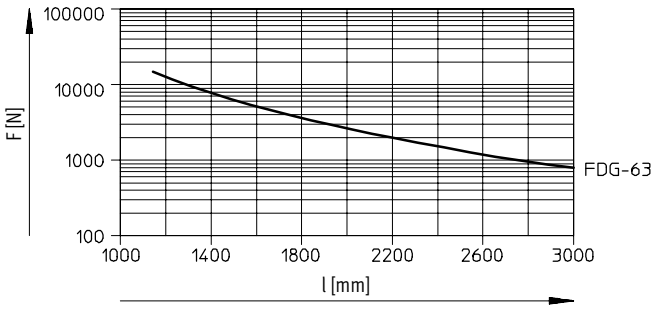


Maximum permissible support span l (without central support) as a function of the force F

Size 18...40



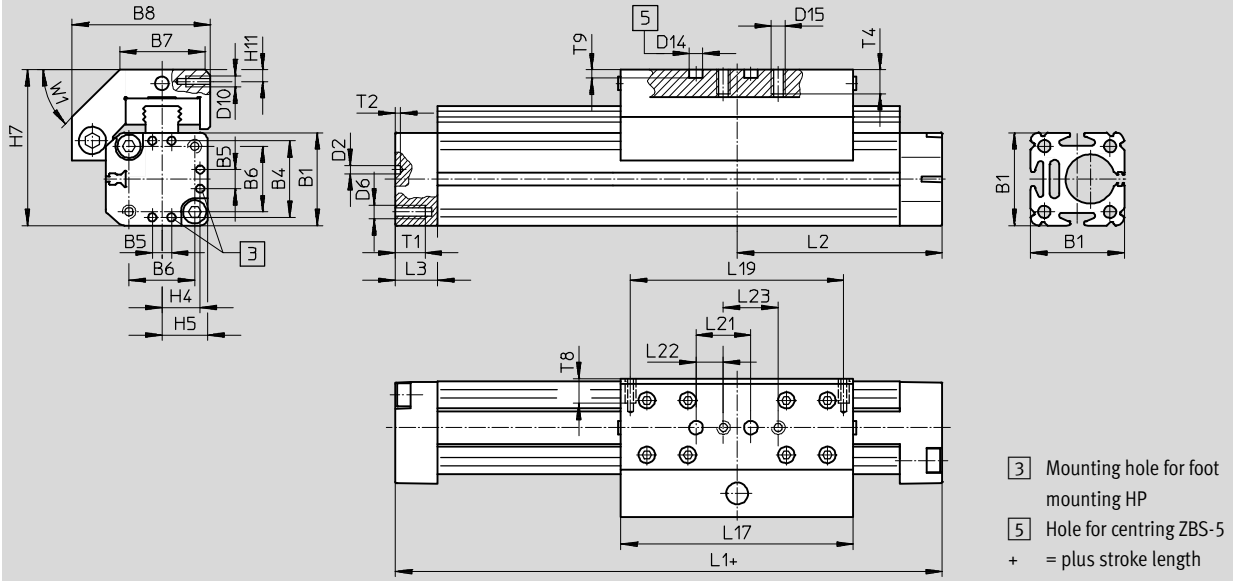
Size 63



Dimensions Download CAD data ➔ **www.festo.com**

Standard slide GK

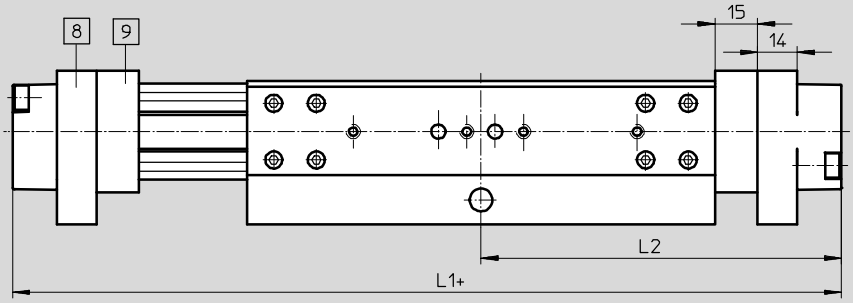
Size 18



3 Mounting hole for foot mounting HP
5 Hole for centring ZBS-5
\+ = plus stroke length

Extended slide GV

Size 18



8 Shock absorber retainer KYP
9 Emergency buffer NPE
\+ = plus stroke length

Size	B1	B4	B5	B6	B7	B8	D2 ∅	D6	D10
18	34	28	7	24	32	50,5	3	M5	M4

Size	D14 ∅ H7	D15	H4	H5	H7	H11	L3	L17	L19 ±0,1
18	5	M5	14	17	57	4,3	15,5	85	78

Size	L21 ±0,03	L22 ±0,1	L23 ±0,1	T1	T2	T4 max.	T8	T9	W1
18	20	10	20	11	2	14	9	3	45 °

Type	L1		L2	
	GK	GV	GK	GV
FDG-18-...-ZR-...	221	301	110.5	150.5
FDG-18-...-SP-...	171	261	92	132

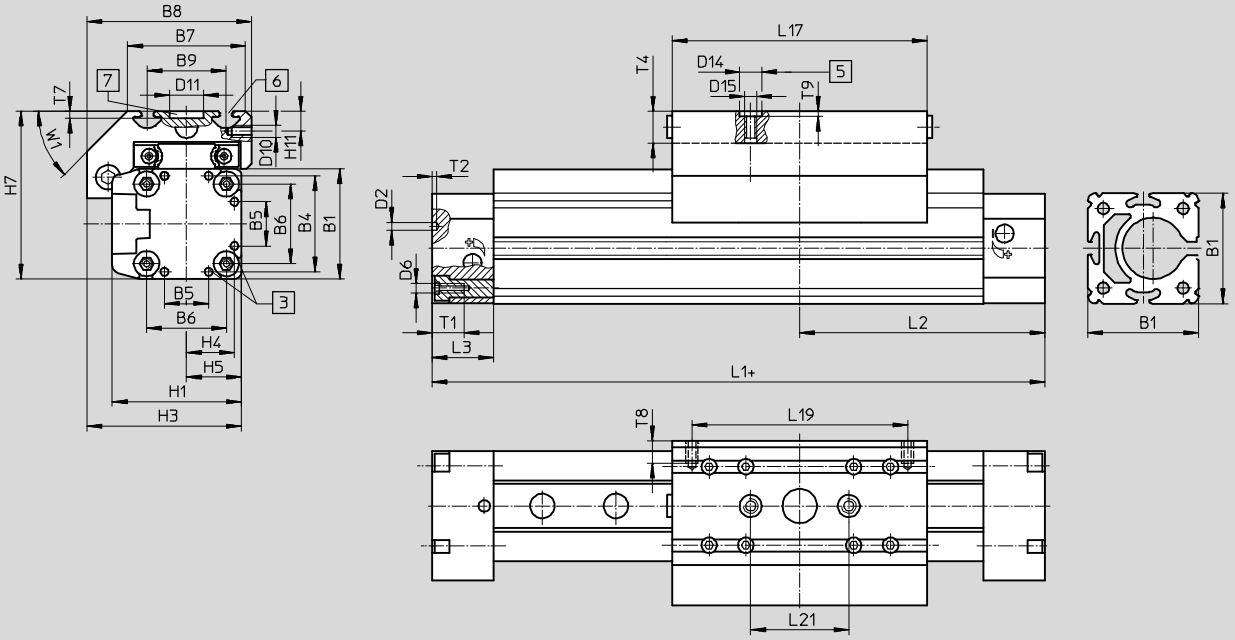
Passive guide axes FDG, without drive

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Standard slide GK

Size 25



3 Mounting hole for foot mounting HP

5 Hole for centring sleeve ZBH-9

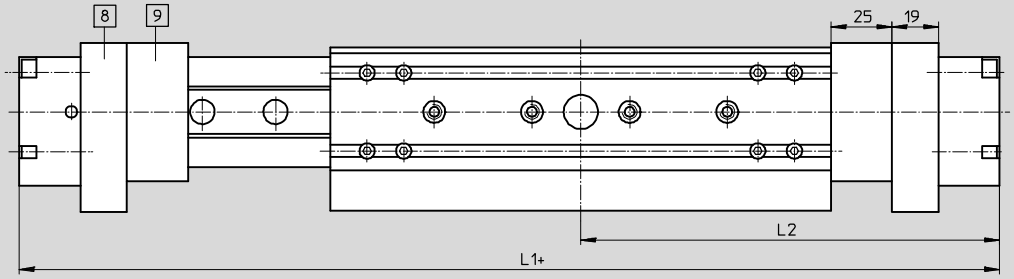
6 Mounting slot for slot nut NSTL

7 Drilled hole for central mounting SLZZ

\+ = plus stroke length

Extended slide GV

Size 25



8 Shock absorber retainer KYP

9 Emergency buffer NPE

\+ = plus stroke length

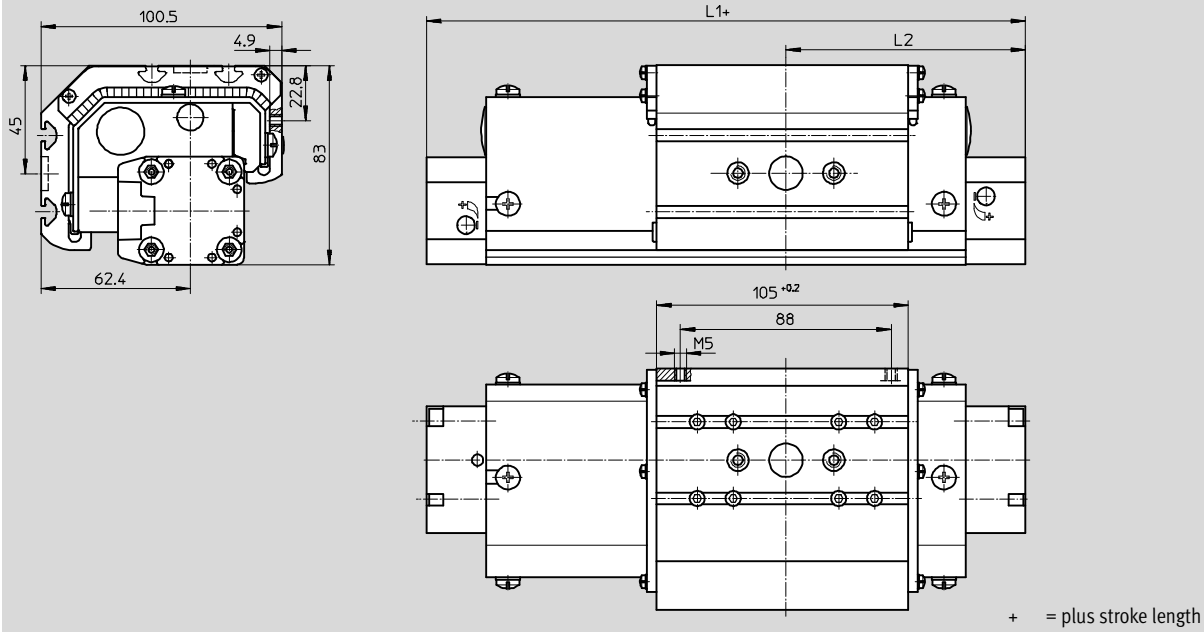
Passive guide axes FDG, without drive

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Protected version GA

Size 25



Size	B1	B4	B5	B6	B7	B8	B9 ±0,2	D2 ∅	D6	D10
25	45	39,1	18	32,5	48	67	32	3,3	M4	M5

Size	D11 ∅ G7	D14 ∅ H7	D15	H1	H3	H4	H5	H7	H11	L3
25	14	9	M6	52,8	63	19,5	22,5	68,5	8,2	25

Size	L17 ±0,2	L19 ±0,1	L21 ±0,1	T1 ±0,03	T2	T4 max.	T7	T8	T9 ±0,1	W1
25	105	88	40	13	2	12,5	3	8,5	2,1	45 °

Type	L1			L2		
	GK	GV	GA	GK	GV	GA
FDG-25-...-ZR-...	326	426	326	163	213	163
FDG-25-...-SP-...	213	343	243	101.5	171.5	121.5

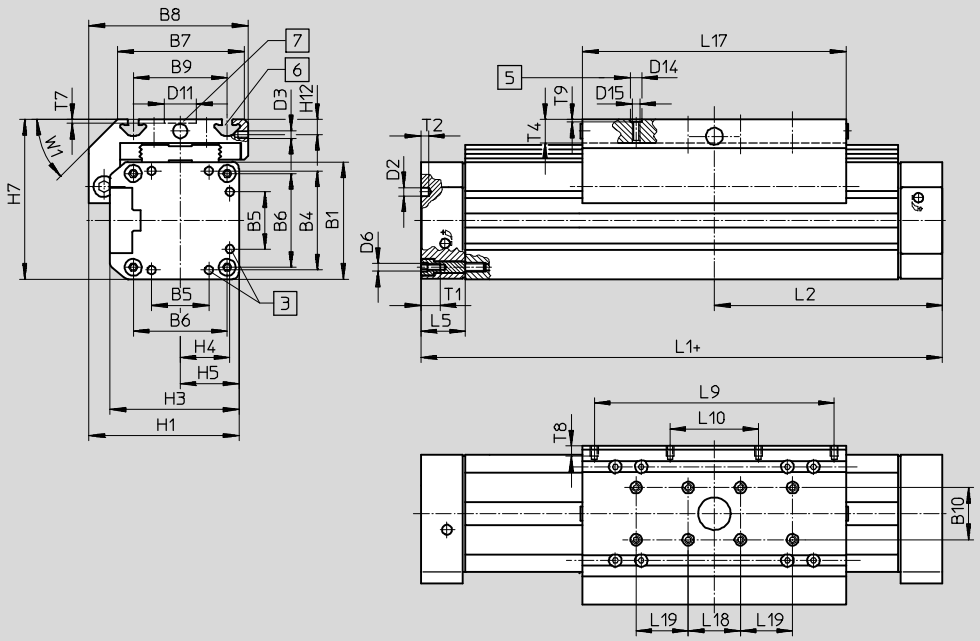
Passive guide axes FDG, without drive

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Standard slide GK

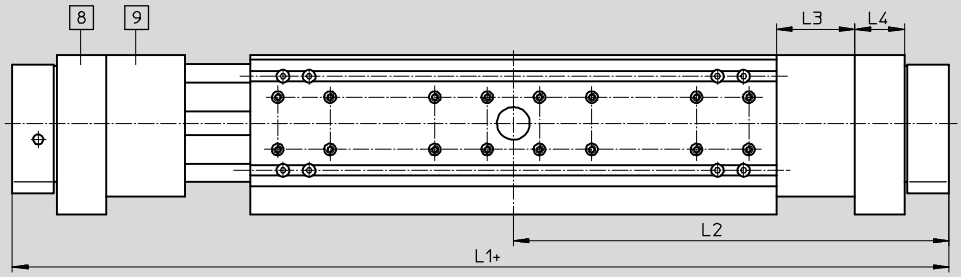
Size 40, 63



3 Mounting hole for foot mounting HP
5 Hole for centring sleeve ZBH-9
6 Mounting slot for slot nut NSTL
7 Drilled hole for central mounting SLZZ
\+ = plus stroke length

Extended slide GV

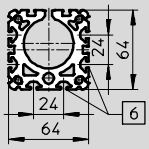
Size 40, 63



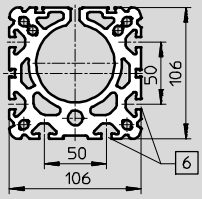
8 Shock absorber retainer KYP
9 Emergency buffer NPE
\+ = plus stroke length

Profile barrel

Size 40



Size 63



6 Mounting slot for slot nut NST

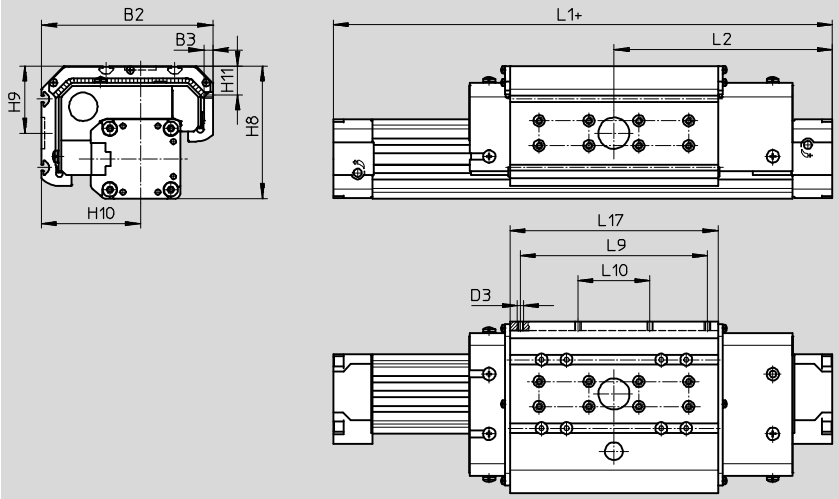
Passive guide axes FDG, without drive

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

Protected version GA

Size 40



\+ = plus stroke length

Size	B1	B2	B3	B4	B5	B6	B7	B8	B9 ±0,2	B10	B13
40	64	137,6	7	53	28	49	78,5	96,5	55	20	24
63	106	–	–	89	44	83	121	142	90	40	50

Size	D2 ∅	D3	D6	D11 G7	D14 H7	D15	H1	H2	H3	H4	H5
40	4,3	M5	M5	25	9	M6	86	78	71,8	26,5	32
63	6,3	M8	M8	25	9	M6	131	122	115	44,5	53

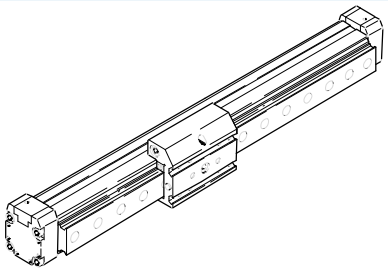
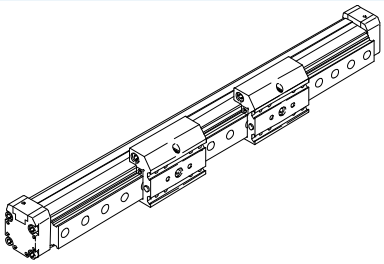
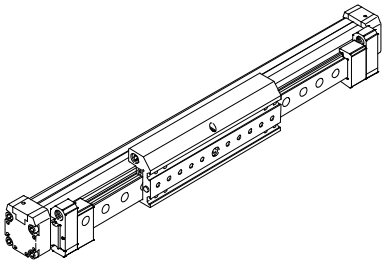
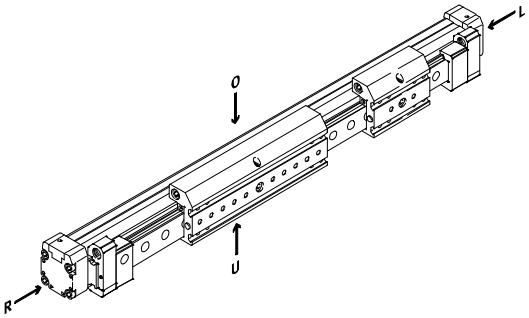
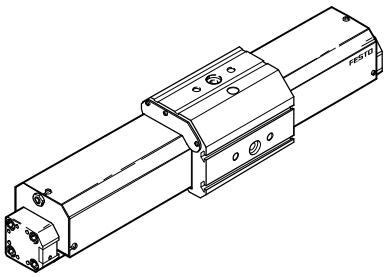
Size	H7	H8	H9	H10	H11	H12	L3	L4	L5	L9 ±0,1	L10 ±0,1
40	90,5	106,6	54	79,6	23,1	7	40	32	31	150	58
63	144,5	–	–	–	–	12,5	63	44	34	200	72

Size	L17 ±0,2	L18 ±0,03	L19 ±0,03	L20	L21 ±0,1	T1	T2	T4 max.	T7	T8	T9 ±0,1	W1
40	167	40	40	337	40	13,2	4	12,5	3	8,5	2,1	45°
63	230	40	40	480	120	21,2	6	20,5	3	10,5	2,1	45°

Type	L1			L2		
	GK	GV	GA	GK	GV	GA
FDG-40-...-ZR-...-	497	667	497	248.5	333.5	248.5
FDG-63-...-ZR-...-	738	988	–	369	494	–
FDG-40-...-SP-...-	315	545	375	153	271.5	186.5
FDG-63-...-SP-...-	406	756	–	198	378	–

Passive guide axes FDG, without drive

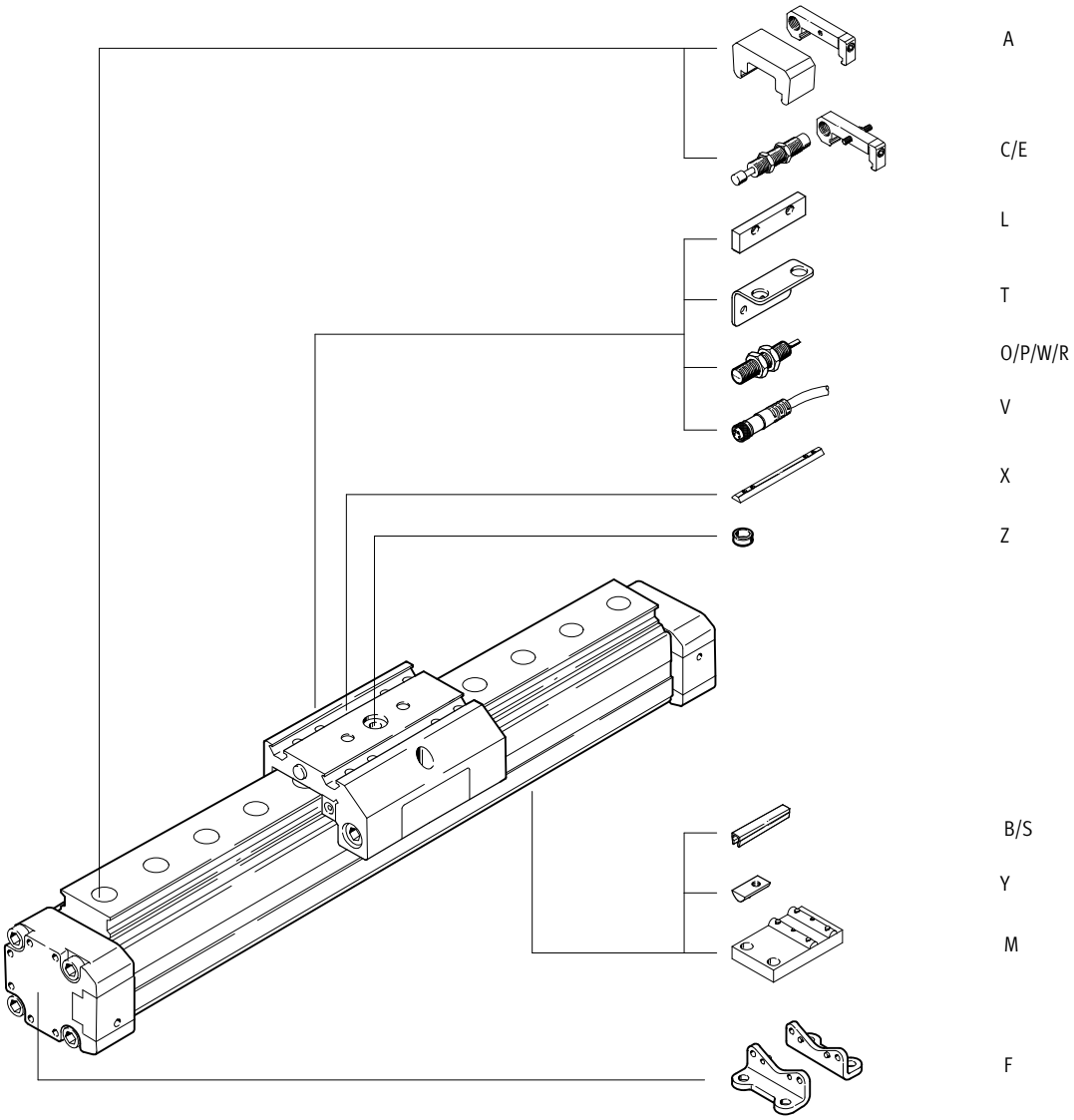
Ordering data – Modular product system

Order code	
Mandatory data/Options	
Standard slide GK	Standard slide plus additional slide GK-KL/-KR
	
Extended slide GV	Extended slide plus additional slide GK-KL/-KR
	
Dust-proof version GA	
	

- Note

O = top
R = right
U = underneath
L = left

Order code
Options



Passive guide axes FDG, without drive

Ordering data – Modular product system

Ordering table

Size			18	25	40	63	Condi-tions	Code	Enter code
M	Module No.		**192850**	**192851**	**192853**	**192855**			
	Drive function		Guide unit without drive					**FDG**	FDG
	Size		18	25	40	63		**-...**	
	Stroke [mm] (as for corresponding drive axis)	with ZR	1 ... 1700	1 ... 5100	1 ... 4900	1 ... 4700		**-...**	
		with SP	1 ... 500	1 ... 1000	1 ... 1500	1 ... 2000			
	Passive guide axis	for	DGE-ZR	DGE-ZR	DGE-ZR	DGE-ZR		**-ZR**	
		for	DGE-SP	DGE-SP	DGE-SP	DGE-SP		**-SP**	
	Guide		Recirculating ball bearing guide					**-KF**	-KF
	Slide		Standard					**-GK**	
			Extended					**-GV**	
			Maximum stroke [mm]						
		with ZR	(920)	(5000)	(4730)	(4450)			
		with SP	(410)	(870)	(1270)	(1650)			
			–	Protected version		–	1	**-GA**	
			Maximum stroke [mm]						
		with ZR	–	(1800)	(1800)	–			
		with SP	–	(970)	(1440)	–			
O	Additional slide		Standard slide left				2	**-KL**	
↓			Standard slide right				2	**-KR**	

1 **GA** Not with accessories T, L, O, P, W, R.

2 **KL, KR** Only with slide GK or GV.

M Mandatory data
O Options

Transfer order code

	FDG	–		–		–		–	KF	–		–	

Passive guide axes FDG, without drive

Ordering data – Modular product system

Ordering table

Size			18	25	40	63	Condi-tions	Code		Enter code
↓	Accessories		Supplied separately					**ZUB-**		ZUB-
O	Slot cover	Sensor slot	1 … 10					**…S**		
		Mounting slot	–	–	1 … 10			**…B**		
	Slot nut	for mounting slot	1 … 10					**…Y**		
		for slide	–	1 … 10				**…X**		
	Central support		1 … 10					**…M**		
	Foot mounting (kit)		1 … 10					**…F**		
	Emergency buffer and retainer		1 … 2	1 … 2	1 … 2	1 … 2	3	**…A**		
			Effective stroke reduction [mm] with emergency buffer at both ends							
			(10)	(30)	(60)	(100)				
	Shock absorber	and retainer	1 … 2				4	**…C**		
		for dust-proof version	–	1 … 2		–	5	**…E**		
	Centring sleeve (pack of 10)		10, 20, 30, 40, 50, 60, 70, 80, 90					**…Z**		
	Sensor bracket		1 … 5		1 … 5	1 … 5		**…T**		
	Switching lug		1		1	1		**L**		
	Inductive proximity sensor	NO contact, cable	1 … 5		1 … 5	1 … 5		**…O**		
		NC contact, cable	1 … 5		1 … 5	1 … 5		**…P**		
		NO contact, plug	1 … 5		1 … 5	1 … 5		**…W**		
		NC contact, plug	1 … 5		1 … 5	1 … 5		**…R**		
	Cable with socket, 2.5 m		1 … 5		1 … 5	1 … 5		**…V**		

3 **A** Mounted as standard for slides GV, GA.

4 **C** Only with slides GK and GV.

5 **E** Only with slide GA

M Mandatory data

O Options

Transfer order code

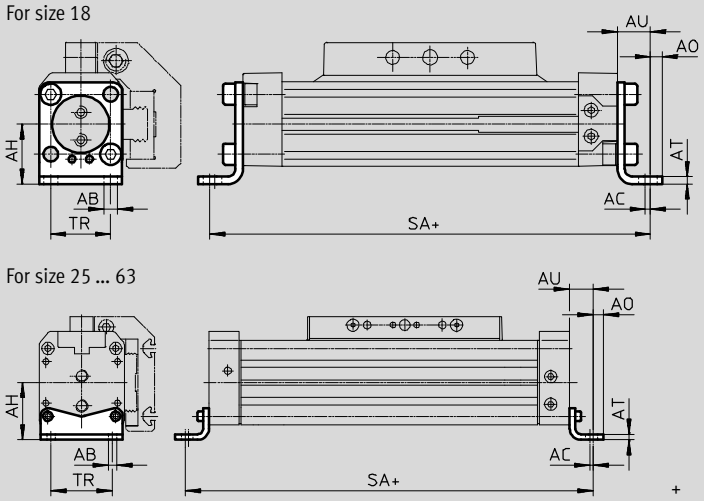
ZUB	–											

Foot mounting HP
(Order code: F)

Material:
Galvanised steel

Free of copper and PTFE

HP-25



\+ = plus stroke length

Dimensions and ordering data

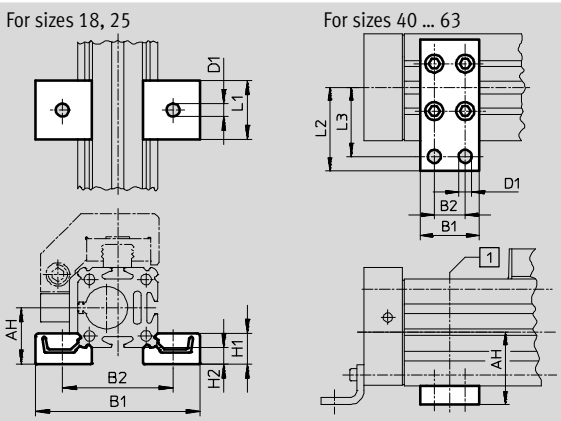
For size	AB ∅	AC	AH	AO	AT	AU	SA	TR	Weight [g]	Part No.	Type
18	5.5	2	24	4.8	3	13.2	176	24	70	**158472**	**HP-18**
25	5.5	2	29.5	6	3	13	226	32.5	61	**150731**	**HP-25**
40	6.6	2	46	8.5	5	17.5	335	45	188	**150733**	**HP-40**
63	11	3	69	13.5	6	28	456	75	305	**150735**	**HP-63**

Central support MUP
(Order code: M)

Material:
Anodised aluminium

Free of copper and PTFE

MUP-40



1 Position of the central support along the profile barrel is freely selectable

Dimensions and ordering data

For size	AH	B1	B2	D1 ∅	H1	H2	L1	L2	L3	Weight [g]	Part No.	Type
18	24	70.5	47	5.5	13	7	25	–	–	33	**150736**	**MUP-18/25**
25	29.5	81	58	5.5	13	7	25	–	–	33	**150736**	**MUP-18/25**
40	46	35	22	6.6	–	–	–	47	40	126	**150738**	**MUP-40**
63	69	50	26	11	–	–	–	77	65	340	**150800**	**MUP-63**

Shock absorber YSR-...-C
(Order code: C)

Material:
Housing: Galvanised steel; piston rod: high-alloy steel,
Seals: NBR, PUR
Free of copper and PTFE

Note

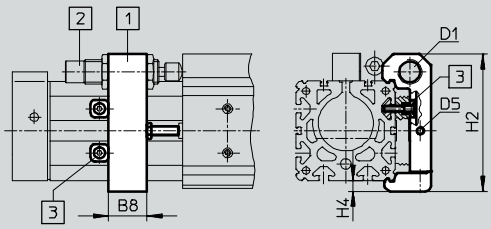
Shock absorber YSRW with progressive characteristic
➔ Internet: ysrw

Ordering data

For size	Weight [g]	Part No.	Type
18	30	**34571**	**YSR-8-8-C**
25	70	**34572**	**YSR-12-12-C**
40	140	**34573**	**YSR-16-20-C**
63	240	**34574**	**YSR-20-25-C**

Shock absorber retainer KYP
(Order code: C)

Material:
Retainer: Aluminium
Sleeve: Steel, corrosion resistant



1 Shock absorber retainer KYP (if the retainer is in contact with the front cap, i.e. cap serves to secure the position, the entire stroke length can be utilised)

2 Shock absorber YSR-...-C

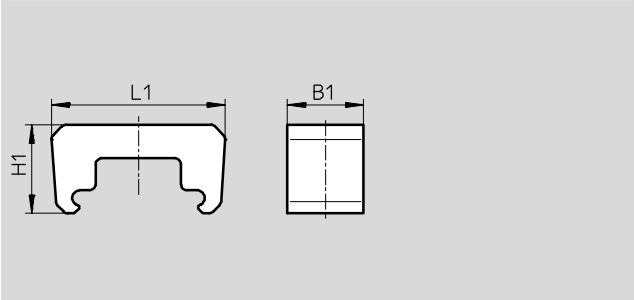
3 Position retainer (included in scope of delivery) either behind or underneath the shock absorber retainer KYP

Dimensions and ordering data

For size	B8	D1	D5	H2	H4	Weight [g]	Part No.	Type
18	14	M12x1	M4	50.5	4.5	66	**158907**	**KYP-18**
25	19	M16x1	M5	69.5	6	95	**158908**	**KYP-25**
40	32	M22x1.5	M5	102	8	209	**158910**	**KYP-40**
63	44	M26x1.5	M10	152.5	11.5	609	**158912**	**KYP-63**

Emergency buffer NPE
(Order code: A)

Material:
PUR



Dimensions and ordering data						
For size	B1	L1	H1	Weight [g]	Part No.	Type
18	15	43.1	28.5	6	**193901**	**NPE-18**
25	25	57	29	12	**193902**	**NPE-25**
40	40	80.5	36	41	**193904**	**NPE-40**
63	60	128.6	55	152	**193906**	**NPE-63**

Note

The emergency buffer can only be used in conjunction with shock absorber retainer KYP. ➔page 21
(A threaded pin and nut are not required.)

Shock absorber DG-GA
for protected version GA
(Order code: E)

Material:
Housing: Galvanised steel; piston rod: high-alloy steel
Seals: NBR, PUR
Free of copper and PTFE

Ordering data			
For size	Weight [g]	Part No.	Type
25	70	**192875**	**DG-GA-25-YSR**
40	140	**192877**	**DG-GA-40-YSR**

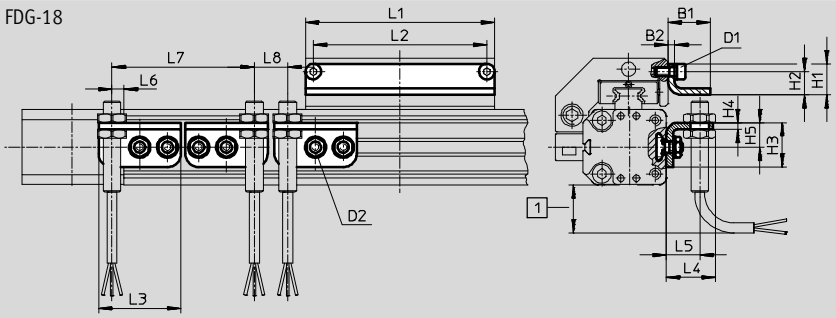
Passive guide axes FDG, without drive

Accessories

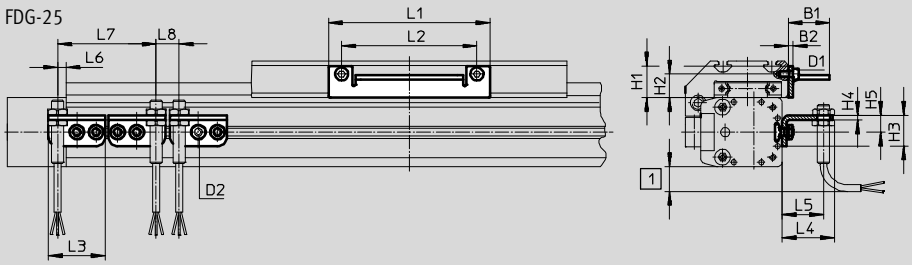
Sensor bracket HWS
For inductive proximity sensors
(Order code: T)
Material:
Galvanised steel

Switching lug SF
(Order code: L)
Material:
Galvanised steel

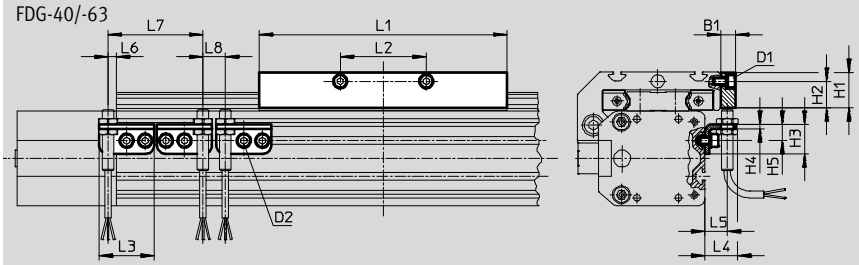
FDG-18



FDG-25



FDG-40/-63



1 Protruding sensor cable, ensure sufficient installation space

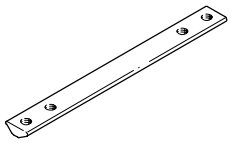
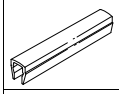
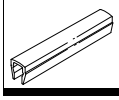
Dimensions and ordering data

For size	D1	D2	B1	B2	H1	H2	H3	H4	H5	L1	L2
18	M4	M5	19	3	14	10.5	20	3	11	85	78
25	M5	M5	27	3	20.5	15.3	20	3	11	105	88
40	M5	M5	10	–	24	18	20	3	11	167	58
63	M8	M5	10	–	35	25	20	3	11	230	72

For size	L3	L4	L5	L6 max.	L7 min.	L8 min.	Weight [g]	Part No.	Type
18	37	22.5	15	5.5	64	15	30	**188968**	**HWS-18/25-M8**
							60	**188964**	**SF-18**
25	37	34.5	27	5.5	64	15	30	**540780**	**HWS-25-MAB-M8**
							80	**540430**	**SF-25-MAB**
40	37	22.5	15	5.5	64	15	40	**188969**	**HWS-40-M8**
							310	**188966**	**SF-40**
63	37	22.5	15	5.5	64	15	40	**188970**	**HWS-63-M8**
							630	**188967**	**SF-63**

Passive guide axes FDG, without drive

Accessories

Ordering data						
	For size	Remarks	Order code	Part No.	Type	PU[1]
Slot nut NST						Technical data ➔ Internet: nst
	18, 25	For mounting slot	Y	**526091**	**NST-HMV-M4**	10
	40			**150914**	**NST-5-M5**	1
	63			**150915**	**NST-8-M6**	1
Slot nut NSTL						Technical data ➔ Internet: nstl
	25	For slide	X	**158410**	**NSTL-25**	1
	40			**158412**	**NSTL-40**	1
	63			**158414**	**NSTL-63**	1
Centring pin/sleeve ZBS/ZBH						Technical data ➔ Internet: zbs, zbh
	18	For slide	Z	**150928**	**ZBS-5**	10
	25 ... 63			**150927**	**ZBH-9**	10
Slot cover ABP						Technical data ➔ Internet: abp
	40	For mounting slot	B	**151681**	**ABP-5**	2
	63	0.5 m each		**151682**	**ABP-8**	
Slot cover ABP-S						Technical data ➔ Internet: abp
	18 ... 63	For sensor slot 0.5 m each	S	**151680**	**ABP-5-S**	2

1) Packaging unit quantity

Ordering data – Inductive proximity sensors M8 — Technical data ➔ Internet: sien

	Electrical connection		Switch output	LED	Cable length [m]	Part No.	Type
	Cables	M8 plug					
NO contact							
	3-wire	–	PNP	■	2.5	**150386**	**SIEN-M8B-PS-K-L**
	–	3-pin	PNP	■	–	**150387**	**SIEN-M8B-PS-S-L**
NC contact							
	3-wire	–	PNP	■	2.5	**150390**	**SIEN-M8B-PO-K-L**
	–	3-pin	PNP	■	–	**150391**	**SIEN-M8B-PO-S-L**

Ordering data – Connecting cables — Technical data ➔ 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	**541333**	**NEBU-M8G3-K-2.5-LE3**
			5.0	**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**
			5.0	**541341**	**NEBU-M8W3-K-5-LE3**