

## Guide units FEN/FENG for standards-based cylinders

**FESTO**



## Key features

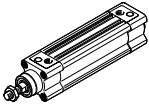
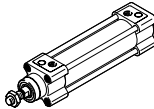
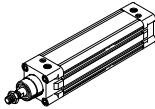
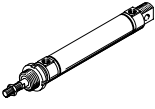
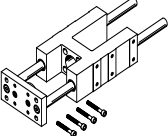
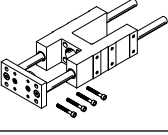
### At a glance

The guide units FEN and FENG protect standards-based cylinders against torsion when these are subjected to high torque loads. They offer high-precision guidance for workpiece handling and other application areas.

Two guide variants are available:

- Plain-bearing guide (GF)
- Recirculating ball bearing guide (KF)

### Drive/guide unit combination options

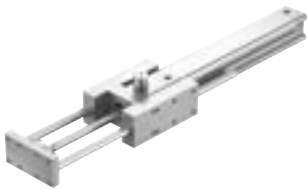
Drive/guide unit	DSBC	DSBG	DNC	DSNU
				
FENG 	■	■	■	-
FEN 	-	-	-	■
→ Page/Internet	dsbc	dsbg	dnc	dsnu

### Position sensing

With standards-based cylinder DNC:  
When installed, a mounting kit is required to sense the front end position.

The rear end position can be sensed directly via the sensor slot.

With standards-based cylinder DSNU:  
With these standards-based cylinders, a mounting kit is absolutely necessary for sensing the end positions.



Mounting kits		Part no.	Type
Actuator	Piston ø		
DSNU...-A	8	175091	SMBR-8-8
	10	175092	SMBR-8-10
	12	175093	SMBR-8-12
	16	175094	SMBR-8-16
	20	175095	SMBR-8-20
	25	175096	SMBR-8-25
DNC...-A	32, 40	175705	SMB-8-FENG-32/40
	50, 63	175706	SMB-8-FENG-50/63
	80, 100	175707	SMB-8-FENG-80/100

## Type codes

001	Series
<b>FEN</b>	Guide unit for standards-based cylinder to ISO 6432
<b>FENG</b>	Guide unit for standards-based cylinder to ISO 15552

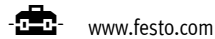
002	Size
<b>8/10</b>	8/10
<b>12/16</b>	12/16
<b>20</b>	20 mm
<b>25</b>	25 mm
<b>32</b>	32 mm
<b>40</b>	40 mm
<b>50</b>	50 mm
<b>63</b>	63 mm
<b>80</b>	80 mm
<b>100</b>	100 mm

003	Stroke range [mm]
...	1 ... 500

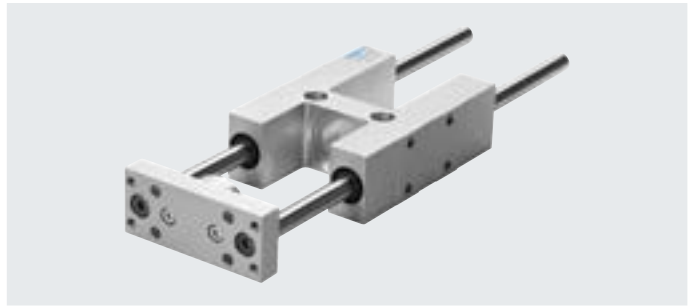
004	Guide
<b>GF</b>	Plain bearing
<b>KF</b>	Recirculating ball bearing guide

## Datasheet

FEN to ISO 6432



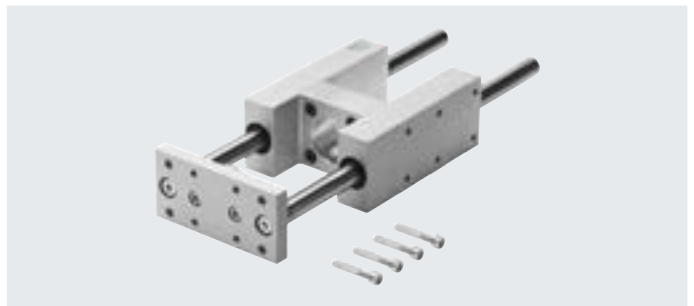
- Diameter  
8 ... 25 mm
- Stroke length  
1 ... 250 mm



FENG to ISO 15552



- Diameter  
32 ... 100 mm
- Stroke length  
10 ... 500 mm



General technical data										
Type	FEN...				FENG...					
Piston ø	8, 10	12, 16	20	25	32	40	50	63	80	100
Stroke [mm]	1 ... 100	1 ... 200	2 ... 250		10 ... 500					
Design	Guide									
Guide										
FEN/FENG...-GF	Plain-bearing guide									
FEN/FENG...-KF	Recirculating ball bearing guide									
Displacement force										
FEN/FENG...-GF [N]	15	15	15	15	30	30	50	50	70	70
FEN/FENG...-KF [N]	15	15	15	15	15	15	15	15	40	40
Type of mounting	With female thread									
Mounting position	Any									
Ambient temperature [°C]	-20 ... +80°C									

Weight [g] (calculation example → page 8)										
Type	FEN...				FENG...					
Piston ø	8, 10	12, 16	20	25	32	40	50	63	80	100
<b>Plain-bearing guide (GF)</b>										
Basic weight with 0 mm stroke	332	490	873	866	1570	2480	4190	5540	10720	13420
Additional weight per 10 mm stroke	8	12	12	12	17	31	48	48	76	76
Moving mass with 0 mm stroke	90	161	269	269	478	782	1414	1720	4955	5935
Additional mass per 10 mm stroke	8	12	12	12	17	31	48	48	76	76
<b>Recirculating ball bearing guide (KF)</b>										
Basic weight with 0 mm stroke	300	429	828	813	1530	2370	4030	5410	10430	12990
Additional weight per 10 mm stroke	8	12	12	12	18	32	49	49	77	77
Moving mass with 0 mm stroke	90	161	269	269	483	792	1430	1739	4990	5970
Additional mass per 10 mm stroke	8	12	12	12	18	32	49	49	77	77

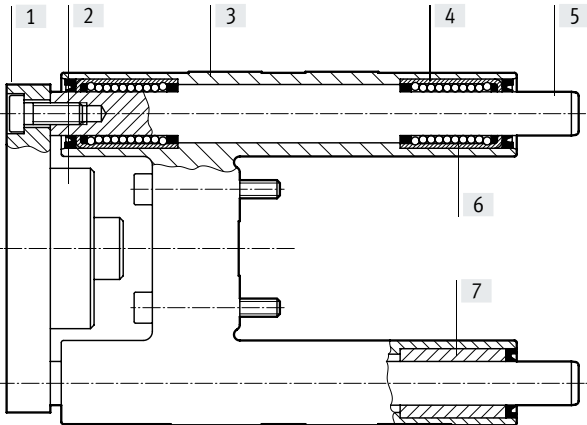
## Datasheet

Centre of gravity of the moving mass [mm] (calculation example → page 8)

Type	FEN-...					FENG-...				
	8, 10	12, 16	20	25	32	40	50	63	80	100
Piston ø										
With 0 mm stroke	30	40	42	42	43	57	60	69	54	47
Supplement per 10 mm stroke	4.9	4.9	4.7	4.7	4.5	4.7	4.7	4.6	3.9	3.6

### Materials

Sectional view



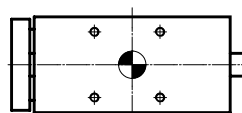
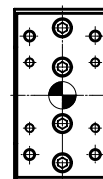
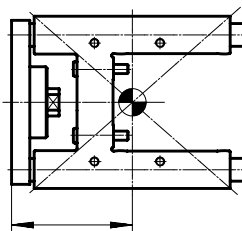
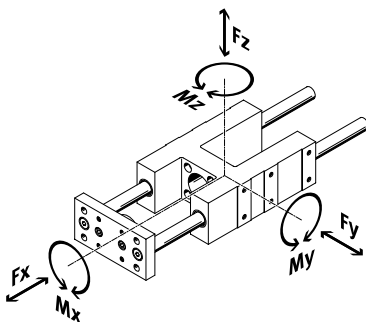
- [6] Recirculating ball bearing guide
- [7] Plain-bearing guide

Guide unit	FEN/FENG-...-GF	FEN/FENG-...-KF
[1] Yoke plate		
Piston ø 32 ... 63	Aluminium	Aluminium
Piston ø 80, 100	Steel	Steel
[2] Coupling	Steel	Steel
[3] Guide	Aluminium	Aluminium
[4] Bearing	Sintered bronze	Steel
[5] Guide rods	Steel	Steel
- Note on materials	RoHS-compliant	
RoHS-compliant	VDMA24364-B2-L	

## Datasheet

### Characteristic load value for FEN-...-KF/FENG-...-KF

The indicated forces and torques refer to the centre of the guide.



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:

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

#### Distance X (calculation example → page 8)

Type	FEN-...-KF			FENG-...-KF					
Piston ø	8, 10	12, 16	20, 25	32	40	50	63	80	100
Dimension X	55	68	69	83	85	99	117	142	145

#### Max. permissible forces and torques

Type	FEN-...-KF			FENG-...-KF					
Piston ø	8, 10	12, 16	20, 25	32	40	50	63	80	100
<b>Static</b>									
$F_{y2}/F_{z2}$	680	830	830	1020	1260	1600	1600	3120	3120
$M_{x2}$	16	20	24	38	55	83	95	231	268
$M_{y2}/M_{z2}$	7	12	31	46	65	89	115	259	267
<b>Dynamic (for a service life of 5000 km)</b>									
$F_{y2}/F_{z2}$	450	520	520	750	1000	1260	1260	2300	2300
$M_{x2}$	11	12	15	28	44	65	75	170	198
$M_{y2}/M_{z2}$	5	7	20	34	52	70	90	191	197

## Datasheet

### 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 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 ratio $q$

Example: The effect on the service life, deviating from the specified reference service life, can be determined using the service life ratio  $q$ :

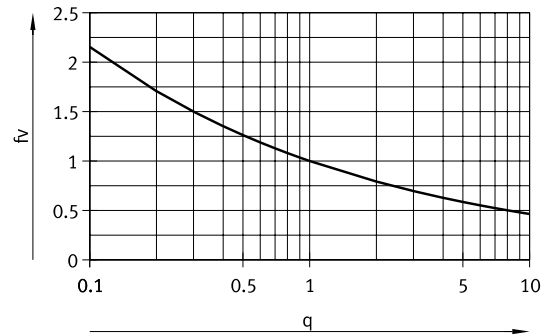
Assuming:

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 total load can be utilised up to 120%.

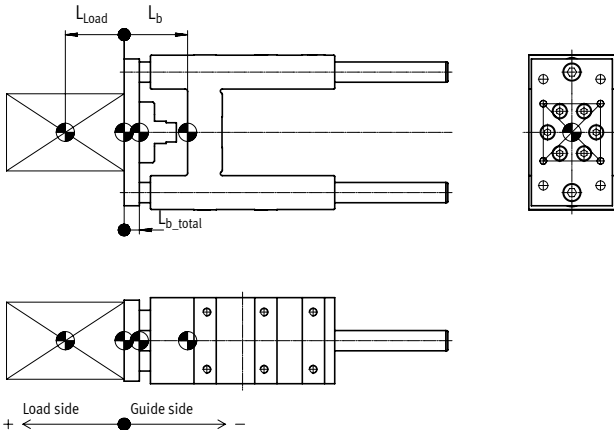


 **Note**  
Engineering software  
Electric Motion Sizing  
[www.festo.com](http://www.festo.com)

$f_v > 1.5$  are only theoretical comparison values.

## Datasheet

### Calculation example



$L_b$  = Centre of gravity of the moving mass of the guide unit

$L_{Load}$  = Centre of gravity of payload

$L_{b\_total}$  = Centre of gravity of the total moving mass

Length measurements should be provided with plus/minus signs as shown in the figure:

$L_{b\_total} > 0$  = Centre of gravity of the moving mass is on the payload side

$L_{b\_total} < 0$  = Centre of gravity of the moving mass is on the guide side

#### Assuming:

- Guide unit: FENG-32-200-KF
- Stroke length:  $H = 200$  mm
- Centre of gravity of payload:  $L_{Load} = 15$  mm
- Payload:  $m_{Load} = 5$  kg
- Acceleration:  $a_x = a_y = 2$  m/s<sup>2</sup>,  $a_z = 0$  m/s<sup>2</sup>

#### Required:

- Loads  $F_{y\_dyn}/F_{z\_dyn}$  and  $M_{x\_dyn}/M_{y\_dyn}/M_{z\_dyn}$
- Verification of operation with combined load
- Expected service life

#### Solution:

Moving mass:

$$m_{b\_total} = m_b + m_{Load} \quad (m_b = m_{Ob} + H \times m_{Hb})$$

From table → page 4

$$m_{Ob} = 0.483$$
 kg

$$m_{Hb} = 0.018$$
 kg/10 mm

$$m_b = 0.483$$
 kg + 200 mm x 0.018 kg/10 mm = 0.843 kg

$$m_{b\_total} = 0.843$$
 kg + 5 kg = 5.843 kg

$m_b$  = Moving mass of the guide unit

$m_{Ob}$  = Moving mass with 0 mm stroke

$m_{Hb}$  = Additional mass per 10 mm stroke

$H$  = Stroke length

#### Centre of gravity of the moving mass

$$L_{b\_ges} = \frac{L_1 \cdot m_1 + L_b \cdot m_b}{m_{b\_ges}} \quad (L_b = L_{Ob} + H \times L_{Hb})$$

From table → page 5

$$L_{Ob} = 43$$
 mm

$$L_{Hb} = 4.5$$
 mm/10 mm

$$L_b = 43$$
 mm + 200 mm x 4.5 mm/10 mm = 133 mm

$$L_{b\_ges} = \frac{(+15 \text{ mm}) \cdot 5 \text{ kg} + (-133 \text{ mm}) \cdot 0.843 \text{ kg}}{5.843 \text{ kg}} = -6 \text{ mm}$$

$L_b$  = Centre of gravity of the moving mass of the guide unit

$m_b$  = Moving mass of the guide unit

$L_1$  = Centre of gravity of payload

$m_1$  = Payload

$L_{Ob}$  = Centre of gravity of the moving mass with 0 mm stroke

$L_{Hb}$  = Additional centre of gravity of the moving mass per 10 mm stroke

Length measurements should be provided with plus/minus signs as shown in the figure:

$L_{b\_total} > 0$  = Centre of gravity of the moving mass is on the payload side

$L_{b\_total} < 0$  = Centre of gravity of the moving mass is on the guide side



## Datasheet

### Calculation example

Loads  $F_{y_{dyn}}/F_{z_{dyn}}$  and  $M_{x_{dyn}}/M_{y_{dyn}}/M_{z_{dyn}}$

$$F_{y_{dyn}} = m_{b\_total} \times a_y = 5.843 \text{ kg} \times 2 \text{ m/s}^2 = 12 \text{ N}$$

$$F_{z_{dyn}} = m_{b\_total} \times (g + a_z) = 5.843 \text{ kg} \times (9.81 \text{ m/s}^2 + 0 \text{ m/s}^2) = 57 \text{ N}$$

From table → page 6

Dimension X = 83 mm

$$M_{y_{dyn}} = F_{z_{dyn}} \times (\text{dimension X} + \text{stroke} + L_{b\_total}) = 57 \text{ N} \times (83 \text{ mm} + 200 \text{ mm} + (-6 \text{ mm})) = 16 \text{ Nm}$$

$$M_{z_{dyn}} = F_{y_{dyn}} \times (\text{dimension X} + \text{stroke} + L_{b\_total}) = 12 \text{ N} \times (83 \text{ mm} + 200 \text{ mm} + (-6 \text{ mm})) = 3 \text{ Nm}$$

### Verification of operation with combined load

Max. values from table → page 6

$$F_{y_{max}} = 750 \text{ N}$$

$$F_{z_{max}} = 750 \text{ N}$$

$$M_{x_{max}} = 28 \text{ Nm}$$

$$M_{y_{max}} = 34 \text{ Nm}$$

$$M_{z_{max}} = 34 \text{ Nm}$$

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

$$f_v = \frac{12 \text{ N}}{750 \text{ N}} + \frac{60 \text{ N}}{750 \text{ N}} + \frac{0 \text{ Nm}}{28 \text{ Nm}} + \frac{16 \text{ Nm}}{34 \text{ Nm}} + \frac{3 \text{ Nm}}{34 \text{ Nm}} = 0,7 \leq 1$$

$F_1/M_1$  = dynamic value

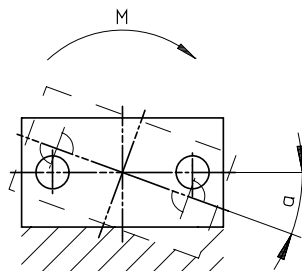
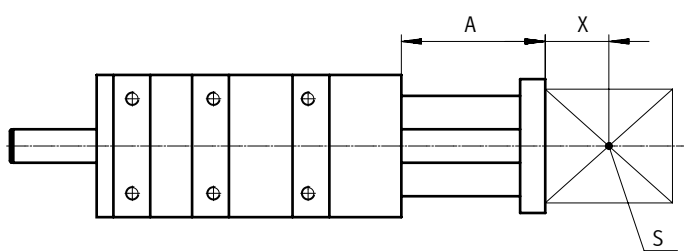
$F_2/M_2$  = maximum value

### Expected service life

$$L = \frac{L_{ref}}{f_v^3} = \frac{5000 \text{ km}}{0,7^3} = 14000 \text{ km}$$

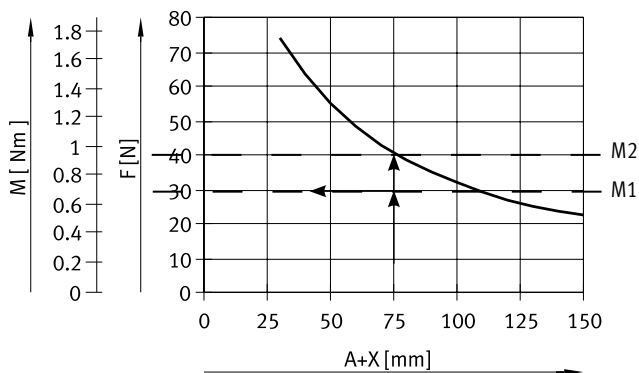
## Datasheet

### Max. payload F and torque M as a function of cantilever load A



- A = Cantilever load
- X = Distance to the centre of gravity of the payload
- S = Centre of gravity of the payload
- M = Torque

### Explanation of how to read the graphs in the case of a combined load

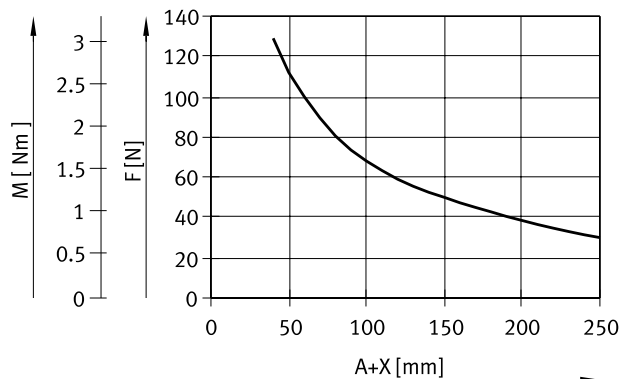
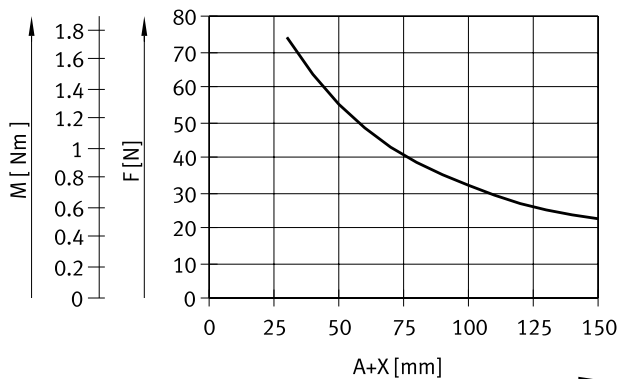


- Determine cantilever load (75 mm)
- Enter proportion that is payload (30 N)
- Enter distance from curve
- Permitted torque is the difference between M2 and M1

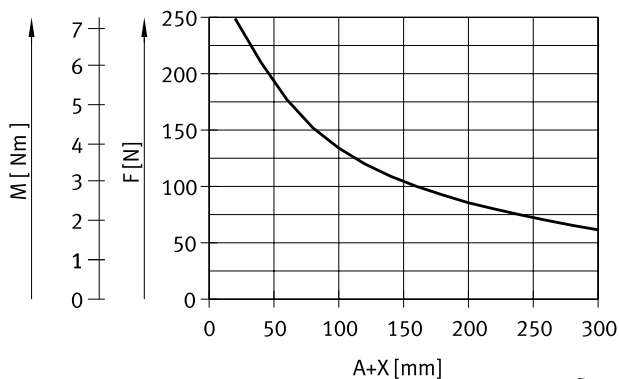
### FEN... with plain-bearing guide

Piston  $\varnothing$  8/10

Piston  $\varnothing$  12/16

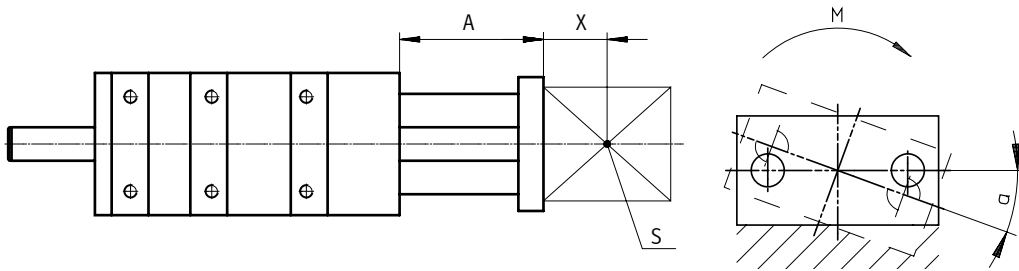


Piston  $\varnothing$  20/25



Datasheet

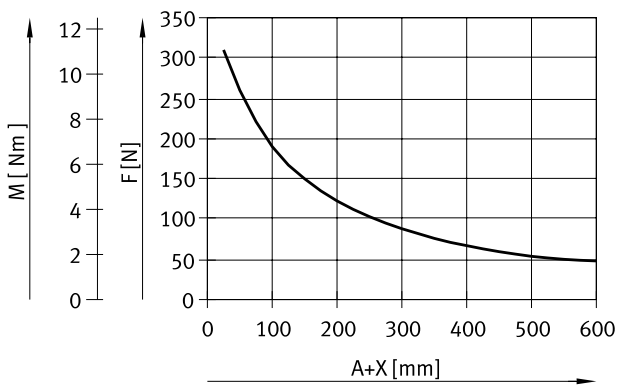
Max. payload  $F$  and torque  $M$  as a function of cantilever load  $A$



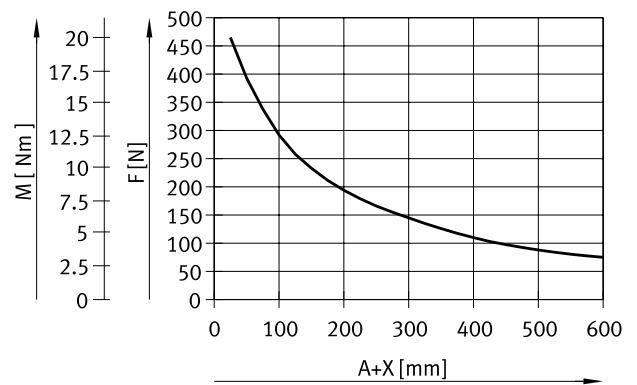
- A = Cantilever load
- X = Distance to the centre of gravity of the payload
- S = Centre of gravity of the payload
- M = Torque

FENG... with plain-bearing guide

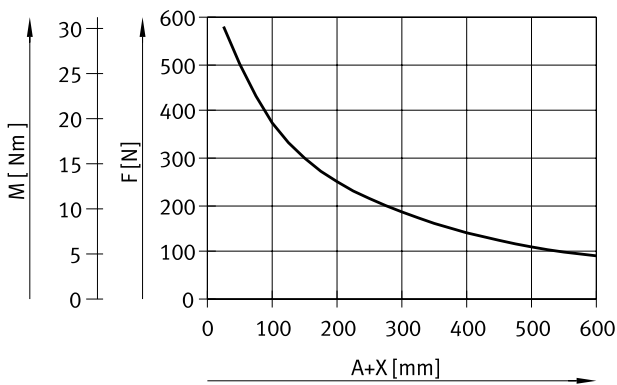
Piston  $\varnothing 32$



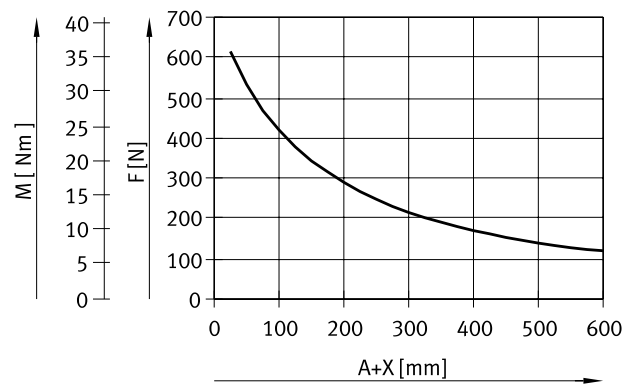
Piston  $\varnothing 40$



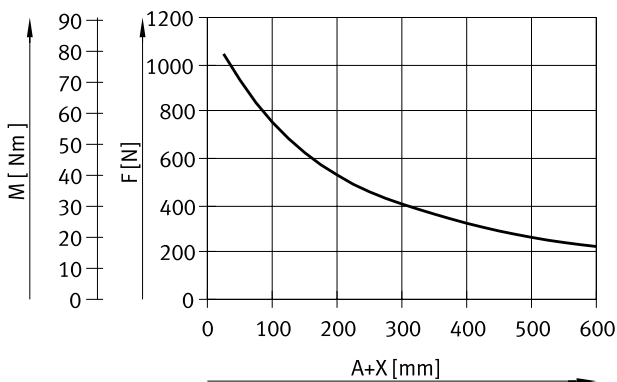
Piston  $\varnothing 50$



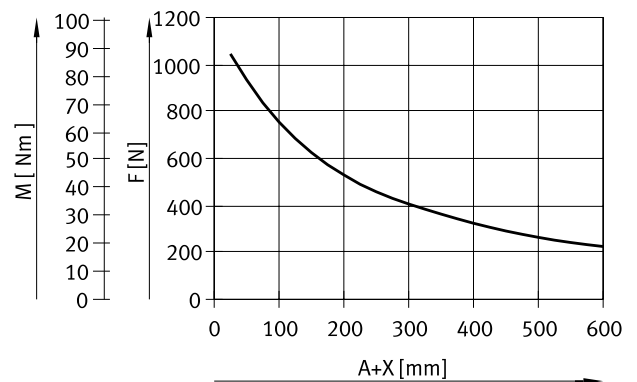
Piston  $\varnothing 63$



Piston  $\varnothing 80$

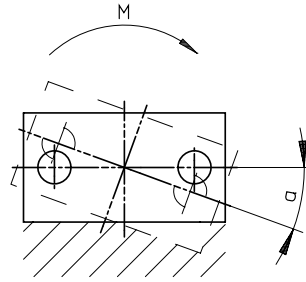
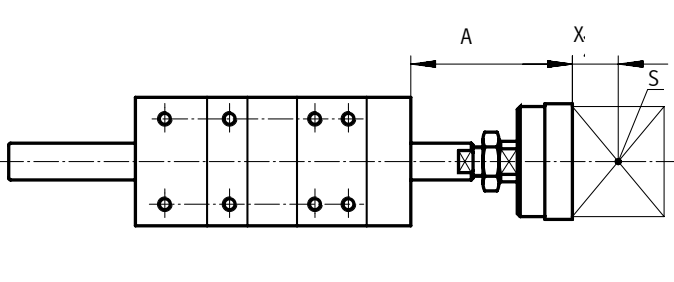


Piston  $\varnothing 100$



Datasheet

Max. payload F and torque M as a function of cantilever load A

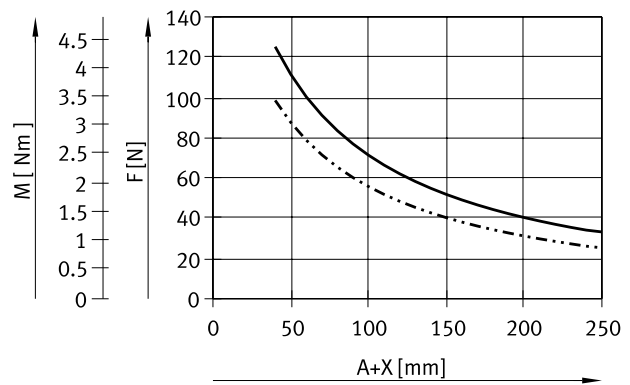
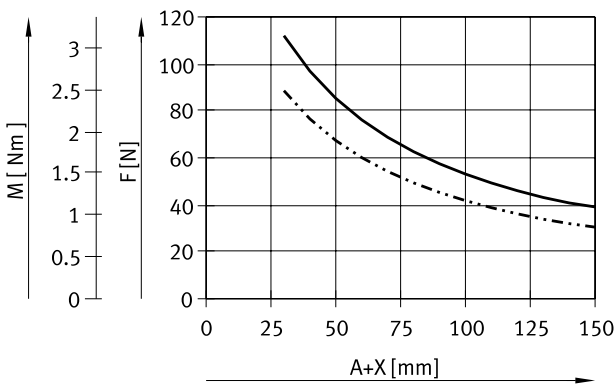


- A = Cantilever load
- X = Distance to the centre of gravity of the payload
- S = Centre of gravity of the payload
- M = Torque

FEN... with recirculating ball bearing guide

Piston  $\varnothing$  8/10

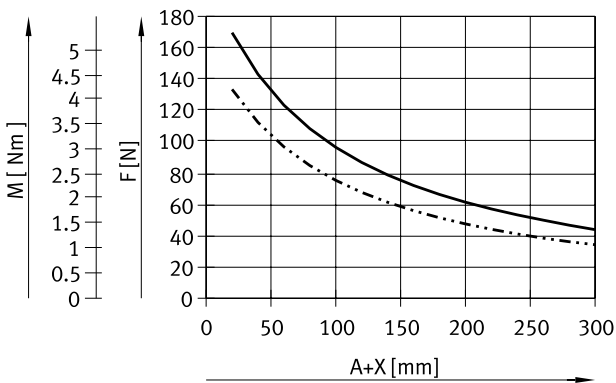
Piston  $\varnothing$  12/16



- Running performance of 1500 km
- · - · - Running performance of 3000 km

- Running performance of 1500 km
- · - · - Running performance of 3000 km

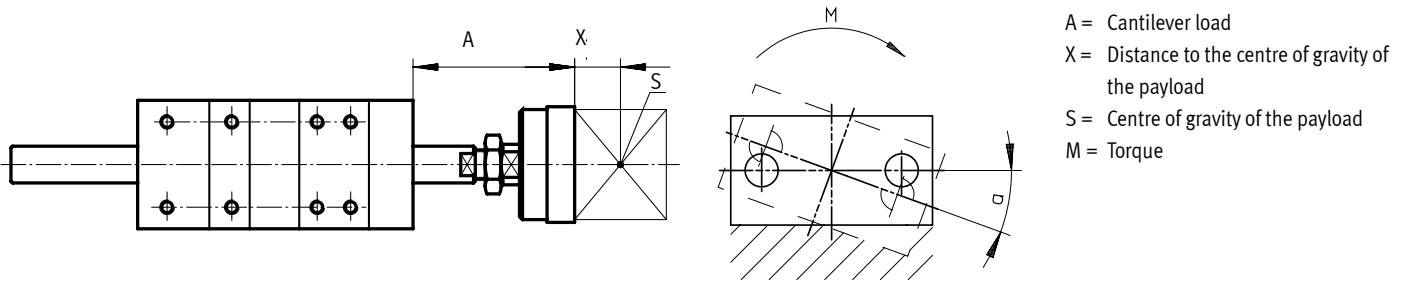
Piston  $\varnothing$  20/25



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

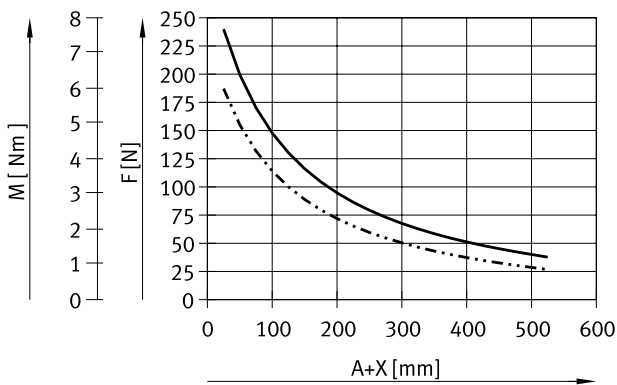
Datasheet

Max. payload F and torque M as a function of cantilever load A

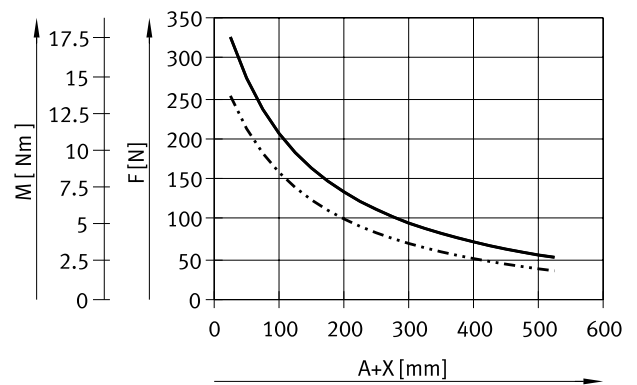


FENG... with recirculating ball bearing guide

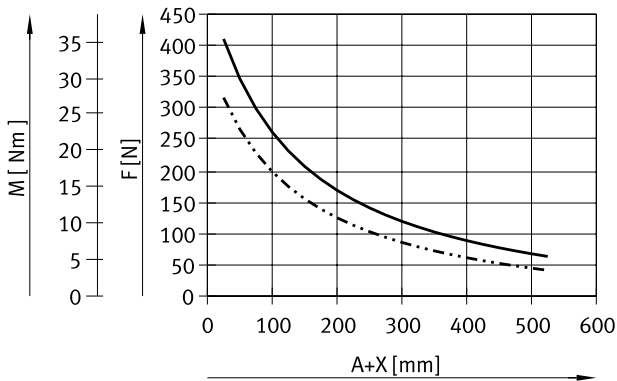
Piston  $\varnothing$  32



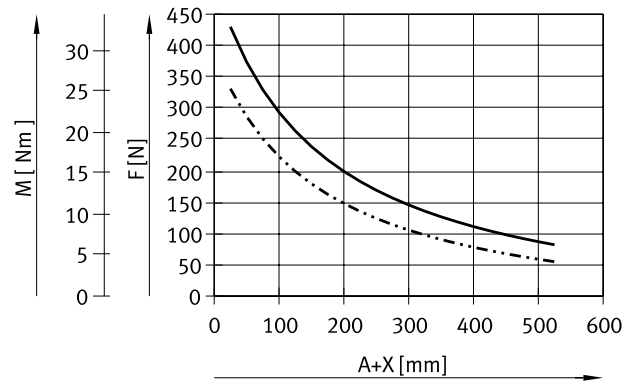
Piston  $\varnothing$  40



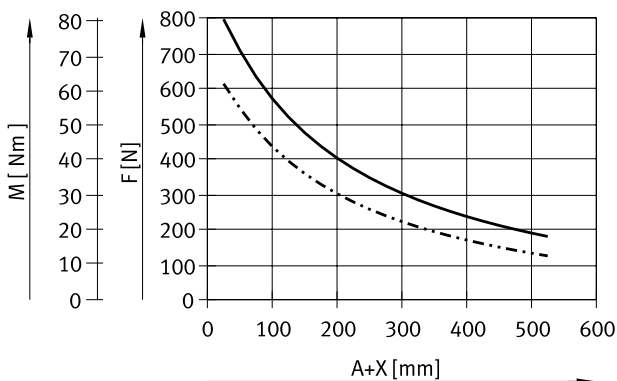
Piston  $\varnothing$  50



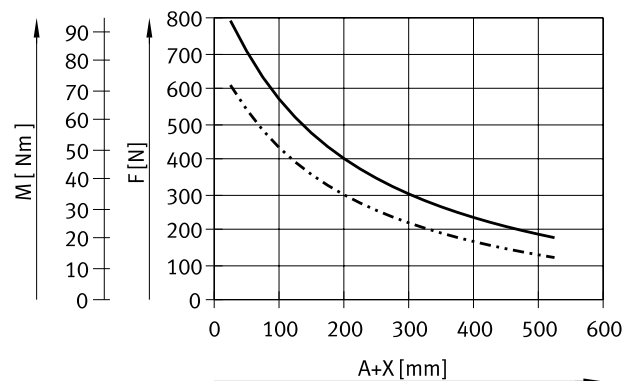
Piston  $\varnothing$  63



Piston  $\varnothing$  80



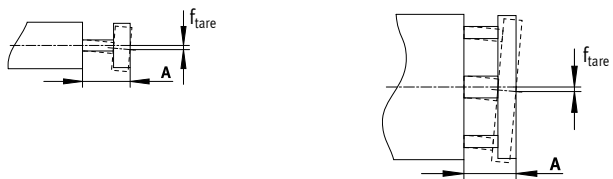
Piston  $\varnothing$  100



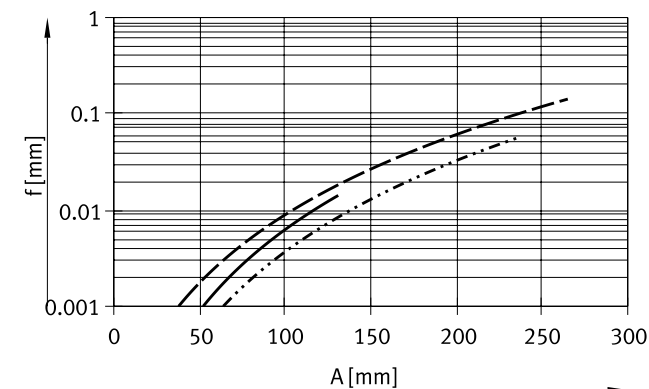
— Running performance of 5000 km  
 - - - - - Running performance of 10000 km

Datasheet

Deflection  $f_{tare}$  (due to tare weight) as a function of cantilever load A

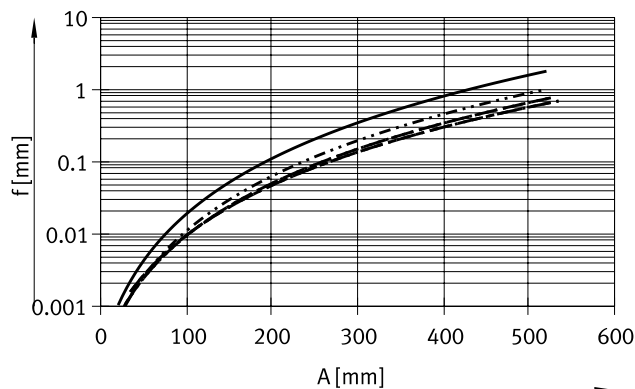


FEN...



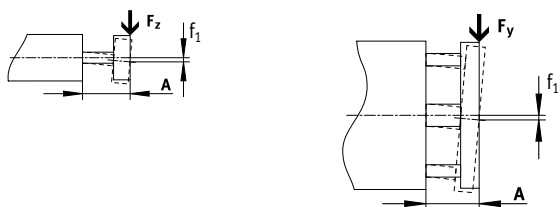
- FEN-8/10...-GF/KF
- ..... FEN-12/16...-GF/KF
- - - FEN-20/25...-GF/KF

FENG...



- FENG-32...-GF/KF
- ..... FENG-40...-GF/KF
- - - FENG-50/63...-GF/KF
- · - · FENG-80/100...-GF/KF

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



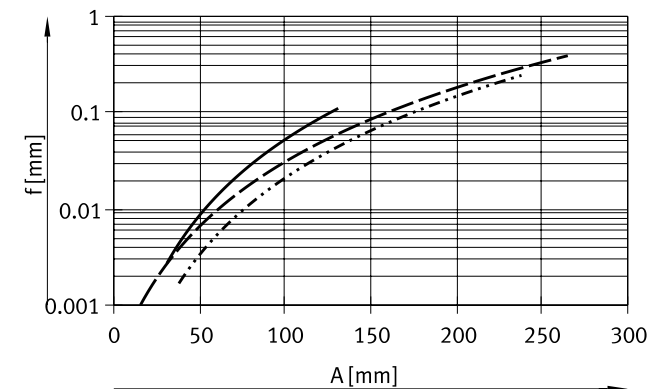
The maximum permissible lateral force must not be exceeded.

- A = Cantilever load of guide rod
- $f_1$  = Deflection due to lateral force
- $F_1$  = Lateral force
- $F_2$  = Standardised lateral force
- $f_2$  = Deflection due to standardised lateral force (value from graph)

$$f_1 = \frac{F_1}{F_2} \cdot f_2$$

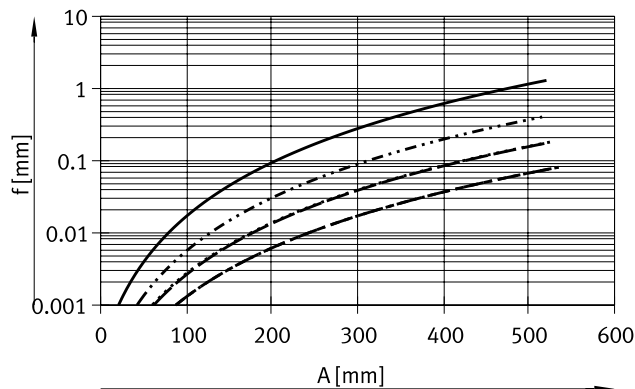
$F_2 = 10 \text{ N}$

FEN...



- FEN-8/10...-GF/KF
- ..... FEN-12/16...-GF/KF
- - - FEN-20/25...-GF/KF

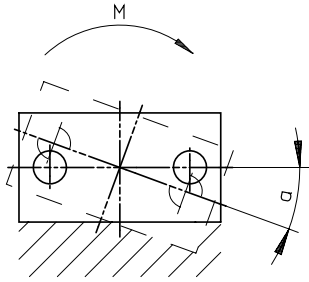
FENG...



- FENG-32...-GF/KF
- ..... FENG-40...-GF/KF
- - - FENG-50/63...-GF/KF
- · - · FENG-80/100...-GF/KF

Datasheet

Incline  $\alpha_1$  (due to torque) as a function of cantilever load A

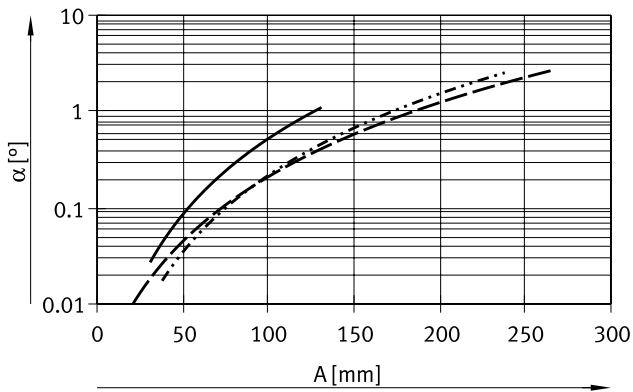


$$\alpha_1 = \frac{M_1}{M_2} \cdot \alpha_2$$

$M_2 = 2 \text{ Nm}$   
(valid for  $\alpha \leq 10^\circ$ )

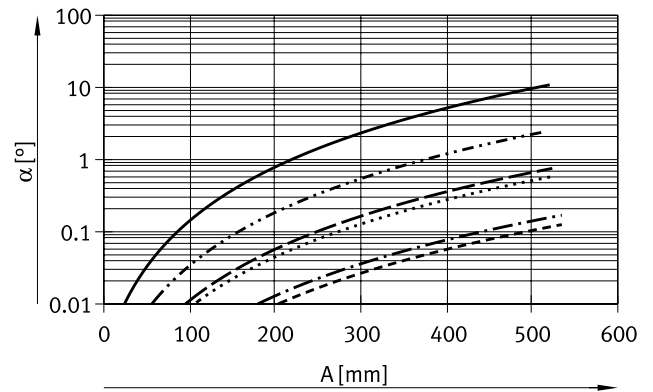
- A = Cantilever load of guide rod
- $\alpha_1$  = Incline due to torque
- $M_1$  = Torque
- $M_2$  = Standardised torque
- $\alpha_2$  = Deflection due to standardised torque

FEN-...



- FEN-8/10-...-GF/KF
- - - FEN-12/16-...-GF/KF
- - - FEN-20/25-...-GF/KF

FENG-...



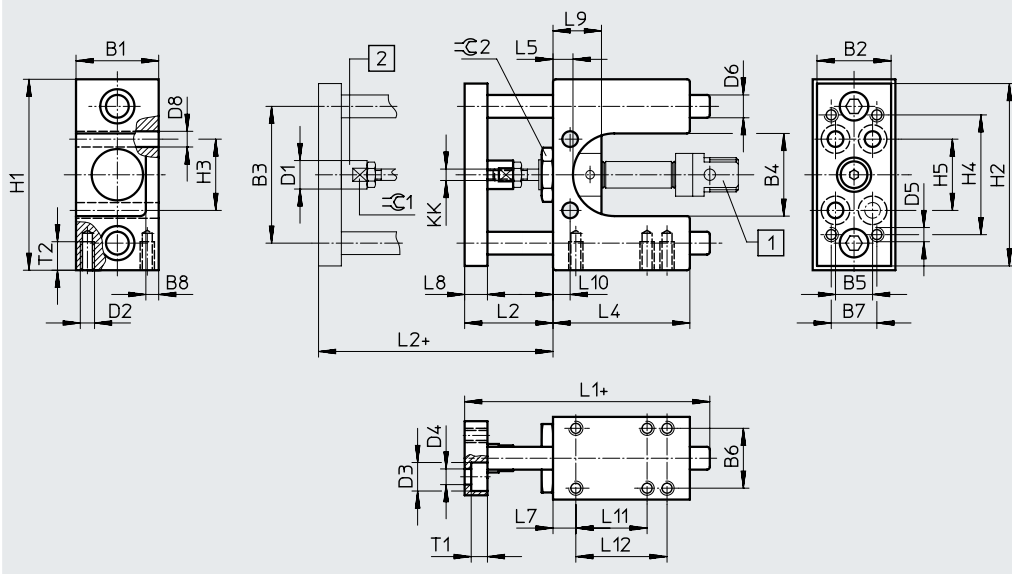
- FENG-32-...-GF/KF
- - - FENG-40-...-GF/KF
- - - FENG-50-...-GF/KF
- ..... FENG-63-...-GF/KF
- - - FENG-80-...-GF/KF
- - - FENG-100-...-GF/KF

Datasheet

Dimensions

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FEN-8, 10



- [1] Cylinder DSNU
  - [2] Compensating coupling for radial and axial alignment
- + = plus stroke length

∅	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D5	D6 <sup>1)</sup>	D8	H1	H2
[mm]	-0.3		±0.15						∅		∅	∅		∅	∅	-0.4	
8	29	26	48	29	13	21	16	4.5	10	M5	10	5.5	M5	8	5.5	67	64
10																	

∅	H3	H4	H5	KK	L1	L2	L4	L5	L7	L8	L9	L10	L11	L12	T1	T2	⌀1	⌀2
[mm]						+2												
8	25	42	25	M4	86	31	48	7	8	8	17	6	25	32	5.7	10	9	19
10																		

1) FEN-...-GF: Tolerance class h8  
 FEN-...-KF: Tolerance class h6

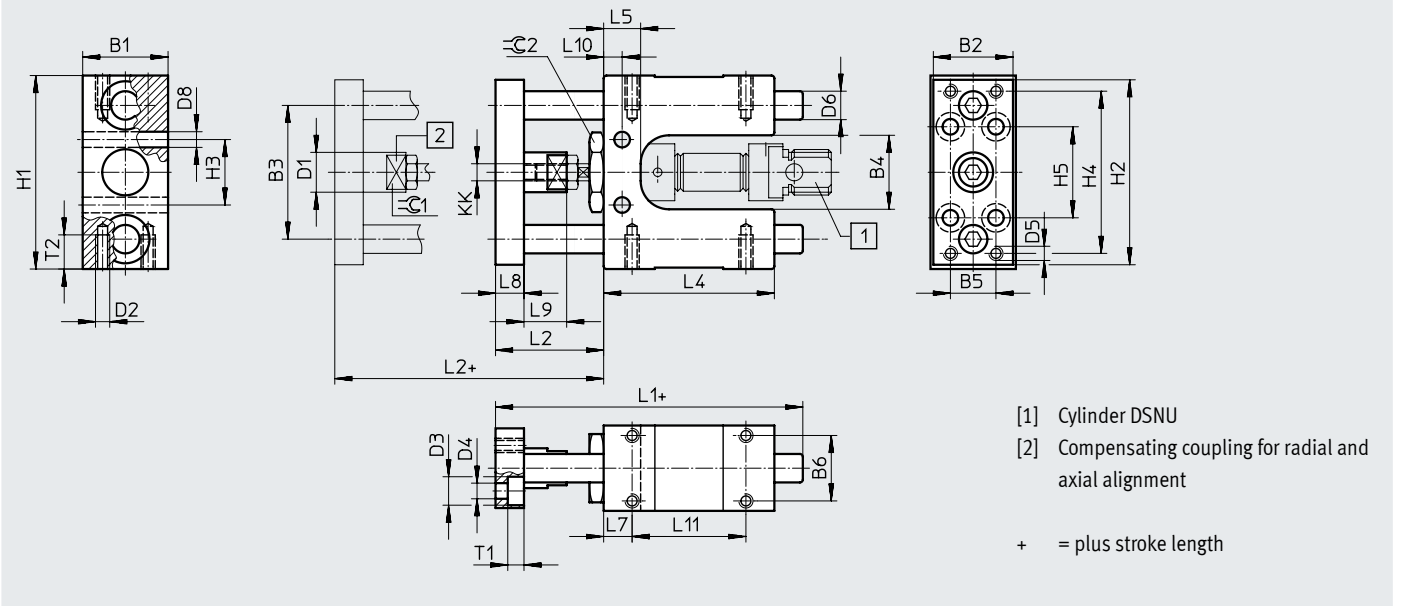


Datasheet

Dimensions

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FEN-12, 16



∅	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	D5	D6 <sup>1)</sup>	D8	H1	H2	H3
[mm]	-0.3		±0.15			±0.15	∅		∅	∅		∅	∅	-0.4		±0.15
12	30	28	47	26	16	23	14	M5	10	5.5	M5	10	5.5	68	65	23
16																

∅	H4	H5	KK	L1	L2	L4	L5	L7	L8	L9	L10	L11	T1	T2	⊖C1	⊖C2
[mm]					+5							±0.15				
12	57	32	M6	108	38	60	13	10	10	15	6.5	40	5.7	12	12	24
16																

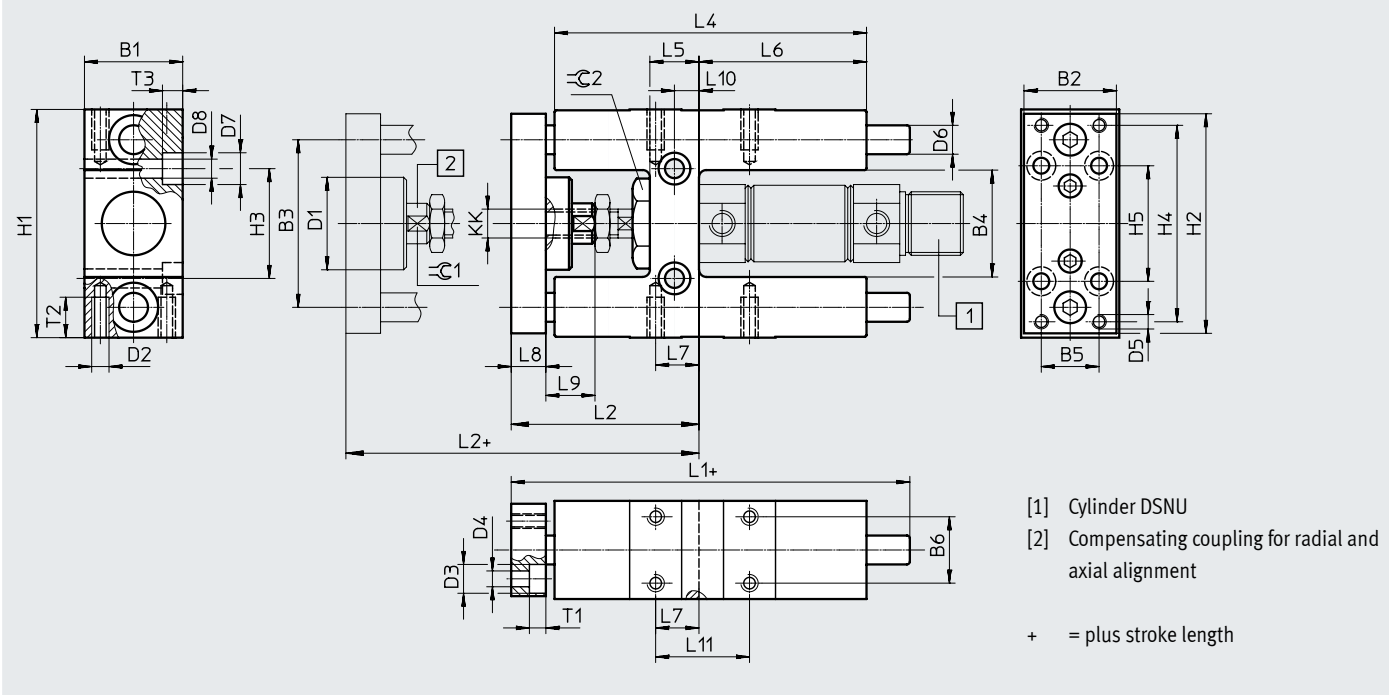
1) FEN-...-GF: Tolerance class h8  
 FEN-...-KF: Tolerance class h7

Datasheet

Dimensions

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FEN-20, 25



∅	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	D5	D6 <sup>1)</sup>	D7	D8	H1	H2	H3	H4
[mm]	-0.3		±0.2				∅		∅	∅		∅	∅	∅	-0.4		±0.2	
20	34	32	58	37	20	23	32	M6	10	5.5	M5	10	11	6.6	79	76	38	68
25																		

∅	H5	KK	L1	L2	L4	L5	L6	L7	L8	L9	L10	L11	T1	T2	T3	≈C1	≈C2
[mm]				+5								±0.2					
20	40	M8	138	65	108	17	58	15	12	22	8.5	32.5	5.7	14	6.8	13	27
25		M10x1.25								17							

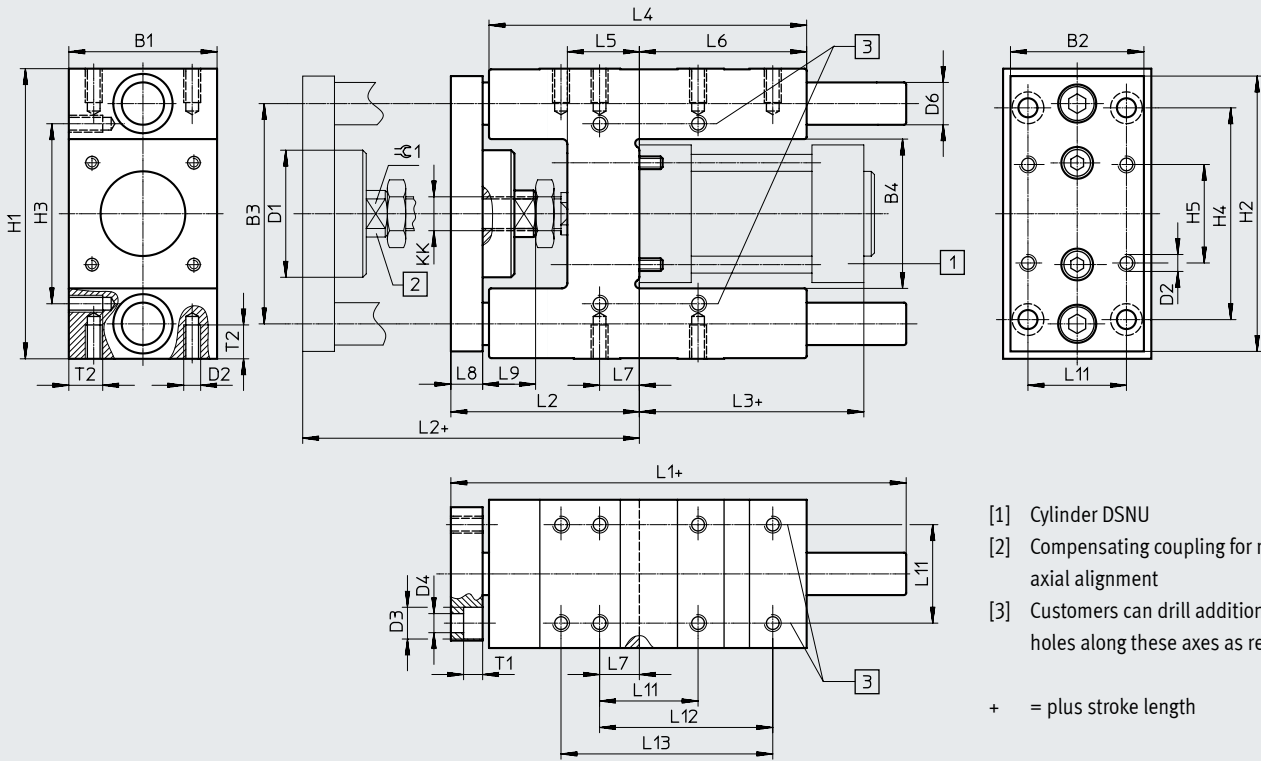
1) FEN-...-GF: Tolerance class h8  
 FEN-...-KF: Tolerance class h7

Datasheet

Dimensions

FENG-32 ... 100

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∅	B1	B2	B3	B4	D1 ∅	D2	D3 ∅	D4 ∅	D6 <sup>1)</sup> ∅	H1	H2	H3	H4	H5	KK
[mm]	-0.3		±0.2									±0.2	±0.2	±0.2	
32	50	45	74	50.5 ±0.3	45	M6	11	6.6	12	97 -0.4	90	61	78	32.5	M10x1.25
40	58	54	87	58.5 ±0.3	45	M6	11	6.6	16	115 -0.4	110	69	84	38	M12x1.25
50	70	63	104	70.5 ±0.3	60	M8	15	9	20	137 -0.5	130	85	100	46.5	M16x1.5
63	85	80	119	85.5 ±0.3	60	M8	15	9	20	152 -0.5	145	100	105	56.5	M16x1.5
80	105	100	148	106 ±0.6	78	M10	18	11	25	189 -0.5	180	130	130	72	M20x1.5
100	130	120	172	131 ±0.6	78	M10	18	11	25	213 -0.5	200	150	150	89	M20x1.5

∅	L1	L2	L3	L4	L5	L6	L7	L8	L9	L11	L12	L13	T1	T2	≈∅1
[mm]										±0.2	±0.2	±0.2		max.	
32	155	67 +5	94	125	24	76	4.3	12	20	32.5	70.3	78	6.5	14	15
40	170	75 +5	105	140	28	81	11	12	22	38	84	-	6.5	14	15
50	188	89 +10	106	150	34	79	18.8	15	25	46.5	81.8	100	9	16	19
63	220	89 +10	121	182	34	111	15.3	15	25	56.5	105	-	9	16	19
80	258	111 +10	128	215	40	128	21	20	32	72	-	-	11	20	27
100	263	116 +10	138	220	40	128	24.5	20	32	89	-	-	11	20	27

1) FENG-...-GF: Tolerance class h8  
 FENG-...-KF: Tolerance class h7

## Ordering data

### FEN with plain-bearing guide GF, variable strokes

#### For standards-based cylinder DSNU

Piston ø [mm]	Stroke [mm]	Part no.	Type
8, 10	1 ... 100	<b>35196</b>	FEN-8/10-...-GF
12, 16	1 ... 200	<b>19168</b>	FEN-12/16-...-GF
20	2 ... 250	<b>19169</b>	FEN-20-...-GF
25	2 ... 250	<b>19170</b>	FEN-25-...-GF

### FEN with recirculating ball bearing guide KF, variable strokes

#### For standards-based cylinder DSNU

Piston ø [mm]	Stroke [mm]	Part no.	Type
8, 10	1 ... 100	<b>35197</b>	FEN-8/10-...-KF
12, 16	1 ... 200	<b>33481</b>	FEN-12/16-...-KF
20	2 ... 250	<b>33482</b>	FEN-20-...-KF
25	2 ... 250	<b>33483</b>	FEN-25-...-KF

### FEN with plain-bearing guide GF, fixed strokes

#### For standards-based cylinder DSNU

Piston ø [mm]	Stroke [mm]	Part no.	Type
12, 16	40	<b>8204041</b>	FEN-12/16-40-GF
	80	<b>8204042</b>	FEN-12/16-80-GF
	100	<b>8204043</b>	FEN-12/16-100-GF
	125	<b>8204044</b>	FEN-12/16-125-GF
	160	<b>8208450</b>	FEN-12/16-160-GF
	200	<b>8204045</b>	FEN-12/16-200-GF
20	50	<b>8204046</b>	FEN-20-50-GF
	100	<b>8204047</b>	FEN-20-100-GF
	125	<b>8204048</b>	FEN-20-125-GF
	160	<b>8204049</b>	FEN-20-160-GF
	200	<b>8204050</b>	FEN-20-200-GF
	250	<b>8204051</b>	FEN-20-250-GF
25	50	<b>8204052</b>	FEN-25-50-GF
	80	<b>8204053</b>	FEN-25-80-GF
	100	<b>8204054</b>	FEN-25-100-GF
	125	<b>8204055</b>	FEN-25-125-GF
	160	<b>8204056</b>	FEN-25-160-GF
	200	<b>8204057</b>	FEN-25-200-GF
	250	<b>8204058</b>	FEN-25-250-GF

### FEN with recirculating ball bearing guide KF, fixed strokes

#### For standards-based cylinder DSNU

Piston ø [mm]	Stroke [mm]	Part no.	Type
12, 16	50	<b>8204025</b>	FEN-12/16-50-KF
	80	<b>8204026</b>	FEN-12/16-80-KF
	100	<b>8204027</b>	FEN-12/16-100-KF
	125	<b>8204028</b>	FEN-12/16-125-KF
	160	<b>8204029</b>	FEN-12/16-160-KF
	200	<b>8204030</b>	FEN-12/16-200-KF
20	50	<b>8204031</b>	FEN-20-50-KF
	250	<b>8204032</b>	FEN-20-250-KF
25	25	<b>8204033</b>	FEN-25-25-KF
	50	<b>8204034</b>	FEN-25-50-KF
	80	<b>8204035</b>	FEN-25-80-KF
	100	<b>8204036</b>	FEN-25-100-KF
	125	<b>8204037</b>	FEN-25-125-KF
	160	<b>8204038</b>	FEN-25-160-KF
	200	<b>8204039</b>	FEN-25-200-KF
	250	<b>8204040</b>	FEN-25-250-KF

## Ordering data

**FEN with plain-bearing guide GF, variable strokes**  
**For standards-based cylinders DNC/DSBC/DSBG**

Piston ø [mm]	Stroke [mm]	Part no.	Type
32	10 ... 500	34481	FENG-32-...-GF
40		34482	FENG-40-...-GF
50		34483	FENG-50-...-GF
63		34484	FENG-63-...-GF
80		34485	FENG-80-...-GF
100		34486	FENG-100-...-GF

**FEN with recirculating ball bearing guide KF, variable strokes**  
**For standards-based cylinders DNC/DSBC/DSBG**

Piston ø [mm]	Stroke [mm]	Part no.	Type
32	10 ... 500	34487	FENG-32-...-KF
40		34488	FENG-40-...-KF
50		34489	FENG-50-...-KF
63		34490	FENG-63-...-KF
80		34491	FENG-80-...-KF
100		34492	FENG-100-...-KF

**FEN with plain-bearing guide GF, fixed strokes**  
**For standards-based cylinders DNC/DSBC/DSBG**

Piston ø [mm]	Stroke [mm]	Part no.	Type
32	50	8204059	FENG-32-50-GF
	80	8204060	FENG-32-80-GF
	100	8204061	FENG-32-100-GF
	125	8204062	FENG-32-125-GF
	160	8204063	FENG-32-160-GF
	200	8204064	FENG-32-200-GF
	250	8204065	FENG-32-250-GF
	320	8204066	FENG-32-320-GF
	400	8204067	FENG-32-400-GF
40	500	8204068	FENG-32-500-GF
	50	8204069	FENG-40-50-GF
	100	8204070	FENG-40-100-GF
	160	8204071	FENG-40-160-GF
	200	8204072	FENG-40-200-GF
	250	8204073	FENG-40-250-GF
50	320	8204074	FENG-40-320-GF
	500	8204075	FENG-40-500-GF
	50	8204076	FENG-50-50-GF
	80	8204077	FENG-50-80-GF
	100	8204078	FENG-50-100-GF
50	200	8204079	FENG-50-200-GF
	250	8204080	FENG-50-250-GF

## Ordering data

FEN with recirculating ball bearing guide KF, fixed strokes  
For standards-based cylinders DNC/DSBC/DSBG

Piston ø [mm]	Stroke [mm]	Part no.	Type
32	50	34493	FENG-32-50-KF
	100	34494	FENG-32-100-KF
	160	34495	FENG-32-160-KF
	200	34496	FENG-32-200-KF
	250	150289	FENG-32-250-KF
	320	34497	FENG-32-320-KF
	400	150290	FENG-32-400-KF
	500	34498	FENG-32-500-KF
40	50	34499	FENG-40-50-KF
	100	34500	FENG-40-100-KF
	160	34501	FENG-40-160-KF
	200	34502	FENG-40-200-KF
	250	34503	FENG-40-250-KF
	320	34504	FENG-40-320-KF
	400	150291	FENG-40-400-KF
	500	34505	FENG-40-500-KF
50	50	34506	FENG-50-50-KF
	100	34507	FENG-50-100-KF
	160	34508	FENG-50-160-KF
	200	34509	FENG-50-200-KF
	250	34510	FENG-50-250-KF
	320	34511	FENG-50-320-KF
	400	150292	FENG-50-400-KF
	500	34512	FENG-50-500-KF
63	50	34513	FENG-63-50-KF
	100	34514	FENG-63-100-KF
	160	34515	FENG-63-160-KF
	200	34516	FENG-63-200-KF
	250	34517	FENG-63-250-KF
	320	34518	FENG-63-320-KF
	400	34519	FENG-63-400-KF
	500	34520	FENG-63-500-KF
80	50	34521	FENG-80-50-KF
	100	34522	FENG-80-100-KF
	160	34523	FENG-80-160-KF
	200	34524	FENG-80-200-KF
	250	34525	FENG-80-250-KF
	320	34526	FENG-80-320-KF
	400	34527	FENG-80-400-KF
	500	34528	FENG-80-500-KF
100	50	34529	FENG-100-50-KF
	100	34530	FENG-100-100-KF
	160	34531	FENG-100-160-KF
	200	34532	FENG-100-200-KF
	250	34533	FENG-100-250-KF
	320	34534	FENG-100-320-KF
	400	34535	FENG-100-400-KF
	500	34536	FENG-100-500-KF