Guide units FEN/FENG for ISO cylinders

FESTO

Guide units FEN/FENG for ISO cylinders

Key features

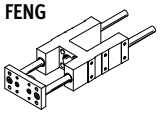
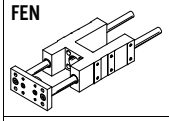
At a glance

The guide units FEN and FENG protect ISO cylinders against torsion when these are subjected to high torque loads.

They offer high precision guidance for workpiece handling and other handling applications.

Two guide variants are available:
- Plain-bearing guide (GF)
- Recirculating ball bearing guide (KF)

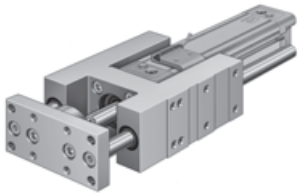
Drive/guide unit combination options

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

Position sensing

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

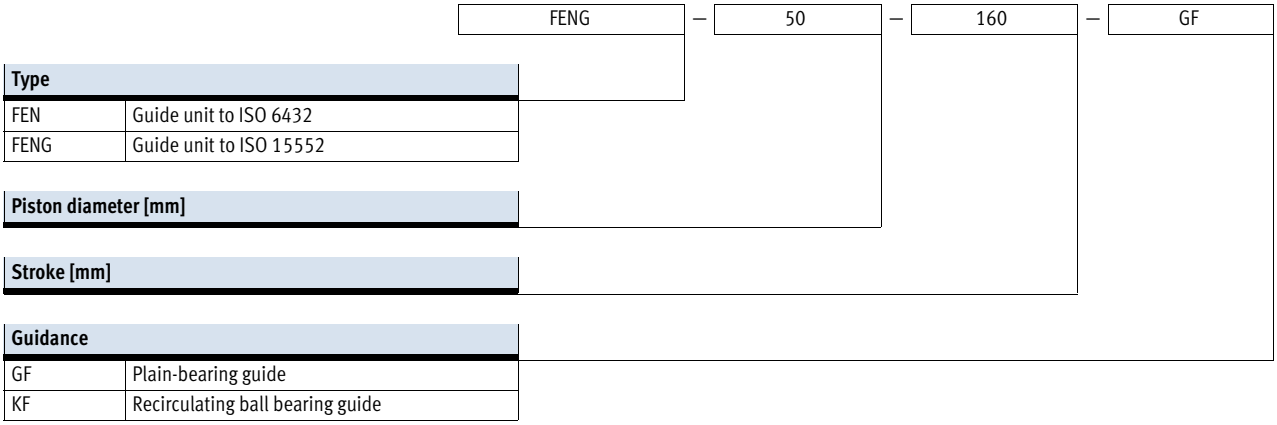


Mounting kits

Drive	Piston diameter	Part No.	Type
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**

Guide units FEN/FENG for ISO cylinders

Type codes



Type	
FEN	Guide unit to ISO 6432
FENG	Guide unit to ISO 15552

Piston diameter [mm]

Stroke [mm]

Guidance	
GF	Plain-bearing guide
KF	Recirculating ball bearing guide

Guide units FEN/FENG for ISO cylinders

Technical data

FEN to ISO 6432

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

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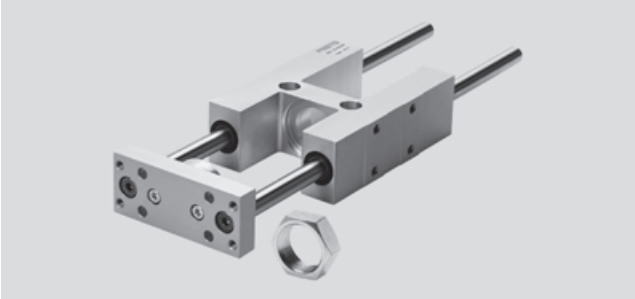
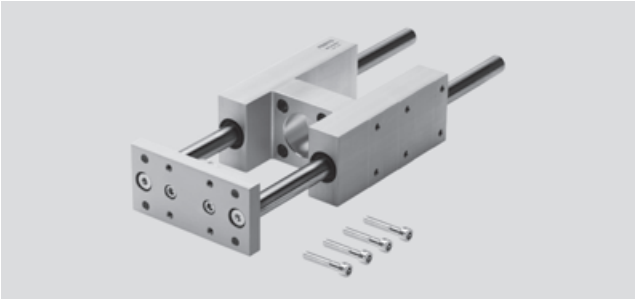


FENG to ISO 15552

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



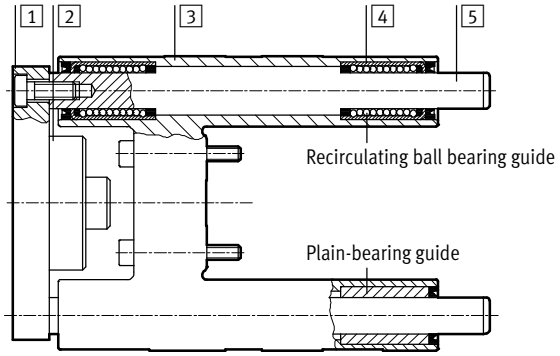
General technical data											
Type		FEN-...				FENG-...					
Piston diameter		8, 10	12, 16	20	25	32	40	50	63	80	100
Stroke	[mm]	1 … 100	1 … 200	2 … 250		10 … 500					
Design		Guide									
Guidance											
FEN/FENG-...-GF		Plain-bearing guide									
FEN/FENG-...-KF		Recirculating ball bearing 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		Via female thread									
Mounting position		Any									
Ambient temperature	[°C]	–20 … +80 °C									

Weight [g] (for calculation example ➔ page 8)										
Type	FEN-...				FENG-...					
Piston diameter	8, 10	12, 16	20	25	32	40	50	63	80	100
Plain-bearing guide (GF)										
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
Recirculating ball bearing guide (KF)										
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

Centre of gravity of the moving mass [mm] (for calculation example ➔ page 8)										
Type	FEN-...				FENG-...					
Piston diameter	8, 10	12, 16	20	25	32	40	50	63	80	100
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

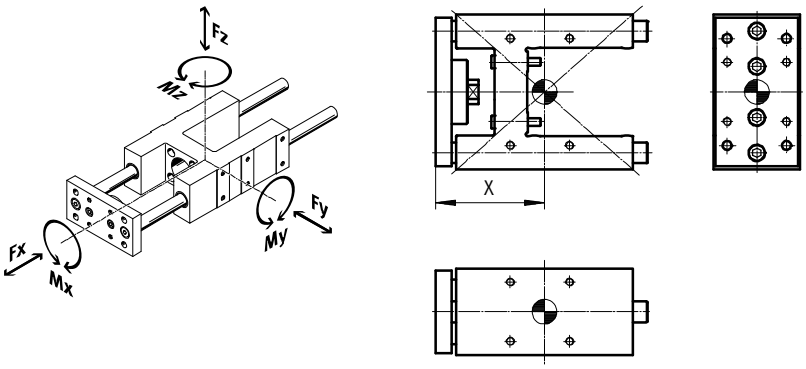
Sectional view



Guide unit		FEN/FENG-...-GF	FEN/FENG-...-KF
1	Yoke plate		
	Piston diameter 32 ... 63	Aluminium	Aluminium
	Piston diameter 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	–	Free of copper and PTFE
		RoHS compliant	

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

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:

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

Distance X (for calculation example ➔ page 8)									
Type	FEN-...-KF			FENG-...-KF					
Piston diameter	8, 10	12, 16	20, 25	32	40	50	63	80	100
Dimension X	55	68	69	83	85	99	117	142	145

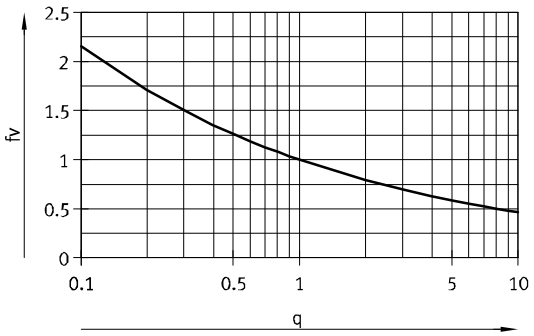
Max. permissible forces and torques									
Type	FEN-...-KF			FENG-...-KF					
Piston diameter	8, 10	12, 16	20, 25	32	40	50	63	80	100
Static									
$Fy_{max.}/Fz_{max.}$	680	830	830	1020	1260	1600	1600	3120	3120
$Mx_{max.}$	16	20	24	38	55	83	95	231	268
$My_{max.}/Mz_{max.}$	7	12	31	46	65	89	115	259	267
Dynamic (for a service life of 5000 km)									
$Fy_{max.}/Fz_{max.}$	450	520	520	750	1000	1260	1260	2300	2300
$Mx_{max.}$	11	12	15	28	44	65	75	170	198
$My_{max.}/Mz_{max.}$	5	7	20	34	52	70	90	191	197

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

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

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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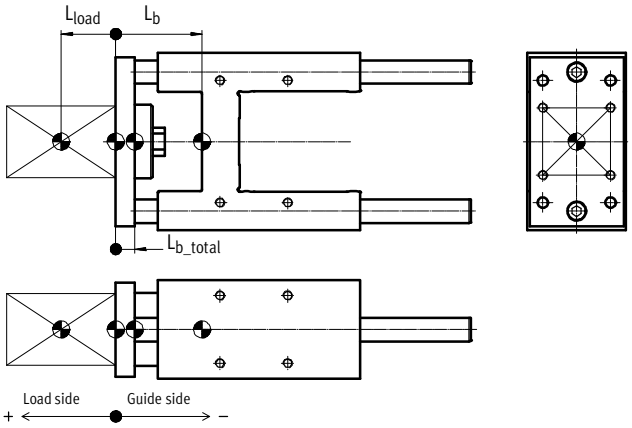
$f_v > 1.5$ are only theoretical comparison values.

Calculation example



L_b = Centre of gravity of the moving mass of the guide unit
L_{load} = Centre of gravity of the 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

Given:

- 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: $a_x = a_y = 2\ m/s^2$, $a_z = 0\ m/s^2$

To be calculated:

- Loads Fy_{dyn}/Fz_{dyn} and $Mx_{dyn}/My_{dyn}/Mz_{dyn}$
- Verification of operation with combined load
- Expected service life

Solution:

Moving load:

$$m_{b\_total} = m_b + m_{load} \qquad (m_b = m_{0b} + H \times m_{Hb})$$

From table ➔ page 4
m_{0b} = 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_{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

$$L_{b\_total} = \frac{L_{load} \times m_{load} + L_b \times m_b}{m_{b\_total}} \qquad (L_b = L_{0b} + H \times L_{Hb})$$

From table ➔ page 5
L_{0b} = 43 mm
L_{Hb} = 4.5 mm/10 mm

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

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

L_b = Centre of gravity of the moving mass of the guide unit
m_b = Moving mass of the guide unit
L_{load} = Centre of gravity of the payload
m_{load} = Payload
L_{0b} = 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

Calculation example

Loads Fy_{dyn}/Fz_{dyn} and $Mx_{dyn}/My_{dyn}/Mz_{dyn}$

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

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

From table ➔ page 6
Dimension X = 83 mm

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

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

Verification of operation with combined load

Max values from table ➔ page 6

$Fy_{max} = 750\ N$ $\quad Mx_{max} = 28\ Nm$
$Fz_{max} = 750\ N$ $\quad My_{max} = 34\ Nm$
$\quad Mz_{max} = 34\ Nm$

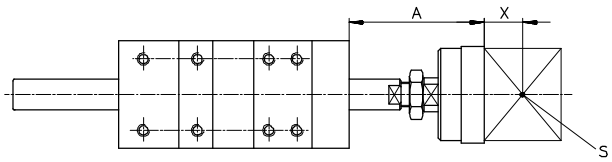
$$f_v = \frac{|F_y|}{F_{y,max}} + \frac{|F_z|}{F_{z,max}} + \frac{|M_x|}{M_{x,max}} + \frac{|M_y|}{M_{y,max}} + \frac{|M_z|}{M_{z,max}} \leqq 1$$

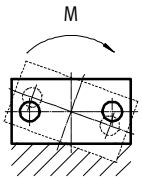
$$f_v = \frac{12\ N}{750\ N} + \frac{57\ N}{750\ N} + \frac{0\ Nm}{28\ Nm} + \frac{16\ Nm}{34\ Nm} + \frac{3\ Nm}{34\ Nm} = 0.7 \leqq 1$$

Expected service life

$$L_{calc} = \frac{L_{ref}}{f_v^{\,3}} = \frac{5000\ km}{0.7^3} = 14000\ km$$

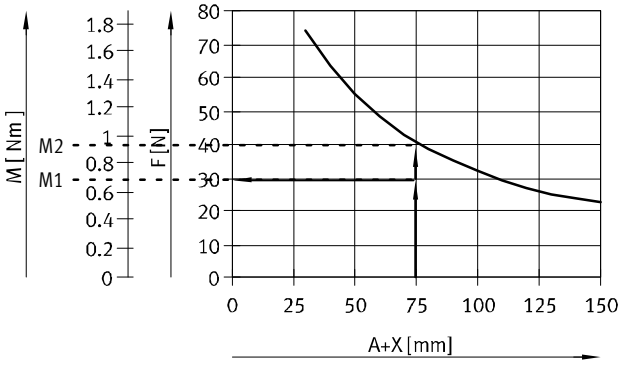
Max. payload F and torque M as a function of cantilever load A





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

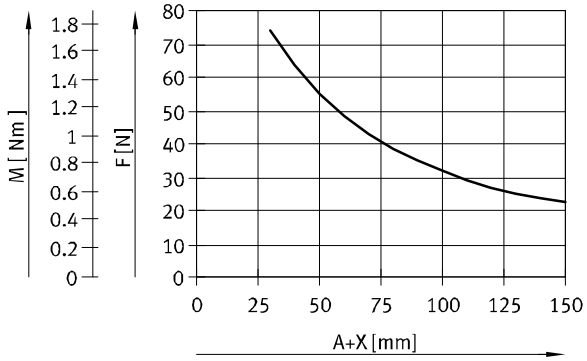
Explanation of how to read graphs in the case of a combined load



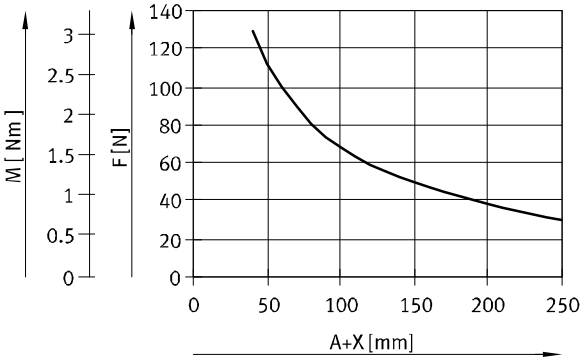
- Determine cantilever load (75 mm)
- Enter proportion that is payload (30 N)
- Enter distance from curve
- Permitted torque is the difference between M2 and M1

FEN-... with plain-bearing guide

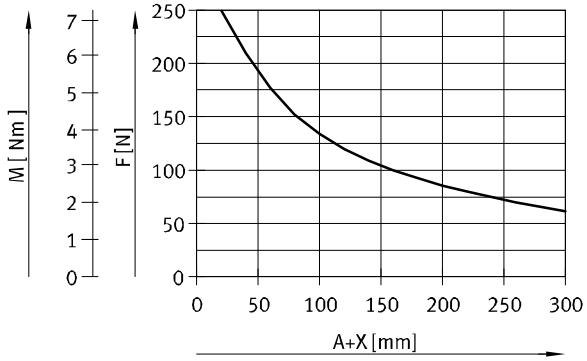
Piston diameter 8/10



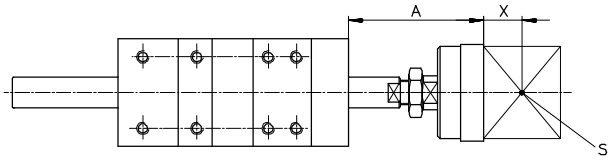
Piston diameter 12/16

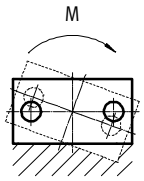


Piston diameter 20/25



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

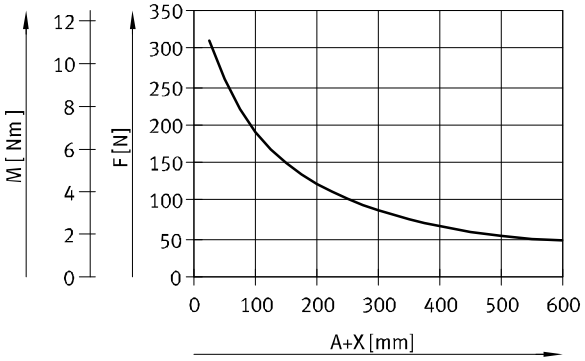




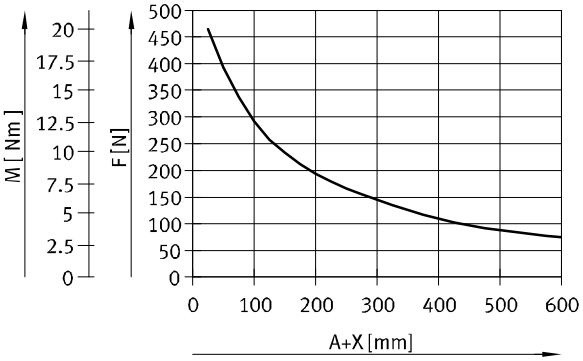
A = Cantilever load
X = Distance to centre of gravity of the payload
S = Centre of gravity of the payload
M = Torque

FENG-... with plain-bearing guide

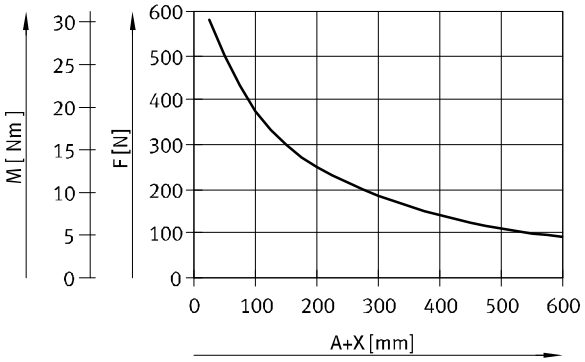
Piston diameter 32



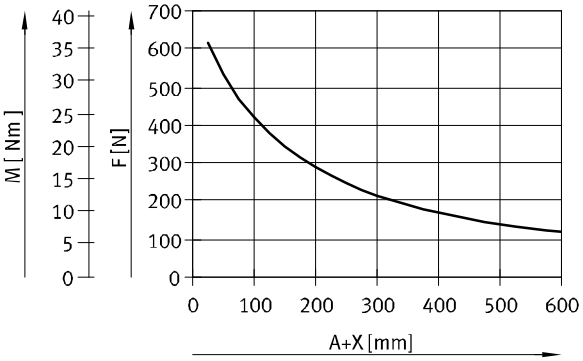
Piston diameter 40



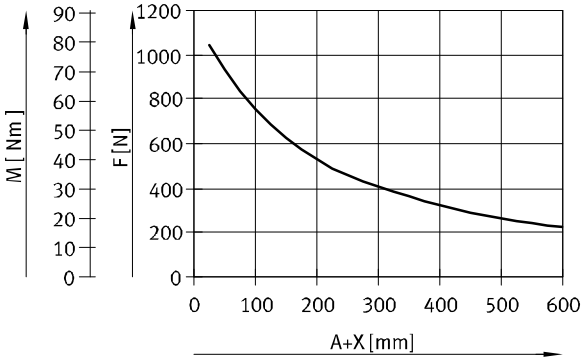
Piston diameter 50



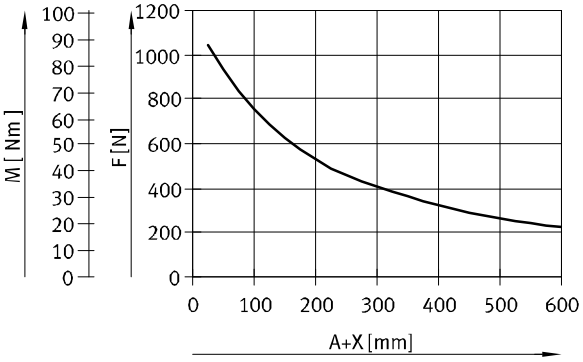
Piston diameter 63



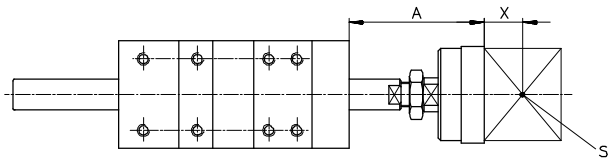
Piston diameter 80

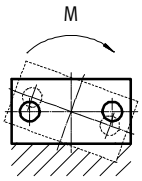


Piston diameter 100



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

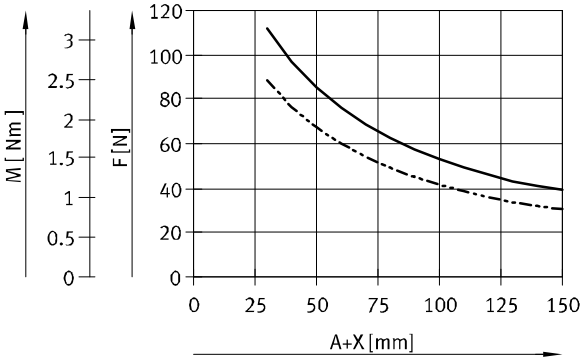




A = Cantilever load
X = Distance to centre of gravity of the payload
S = Centre of gravity of the payload
M = Torque

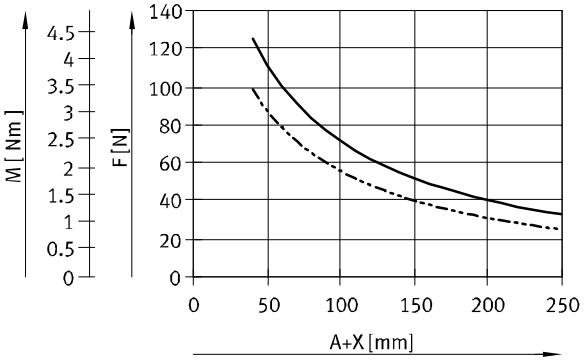
FEN-... with recirculating ball bearing guide

Piston diameter 8/10



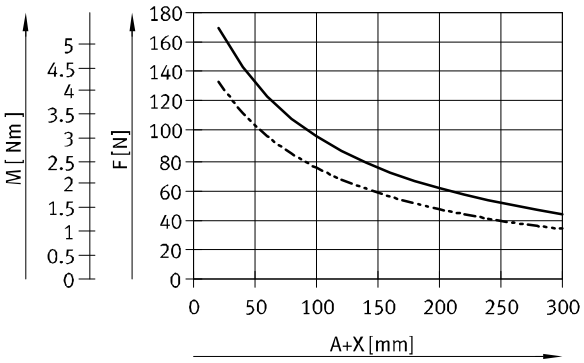
Running performance of 1500 km
Running performance of 3000 km

Piston diameter 12/16



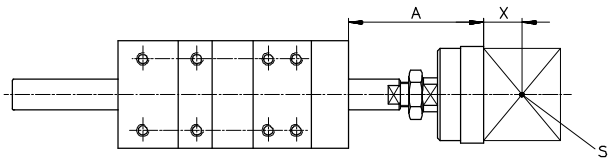
Running performance of 1500 km
Running performance of 3000 km

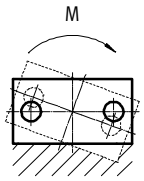
Piston diameter 20/25



Running performance of 5000 km
Running performance of 10000 km

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

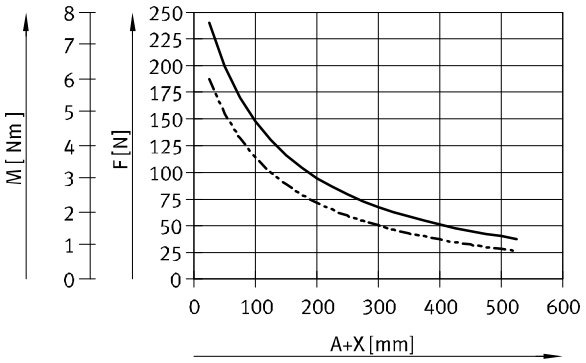




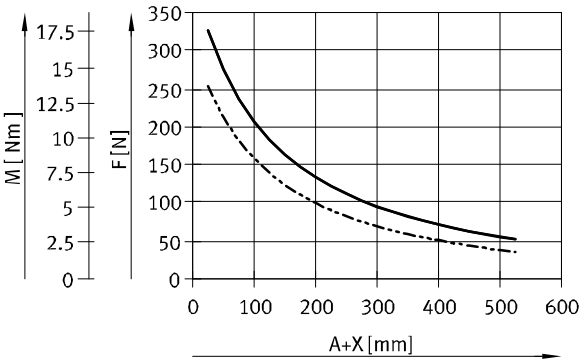
A = Cantilever load
X = Distance to centre of gravity of the payload
S = Centre of gravity of the payload
M = Torque

FENG-... with recirculating ball bearing guide

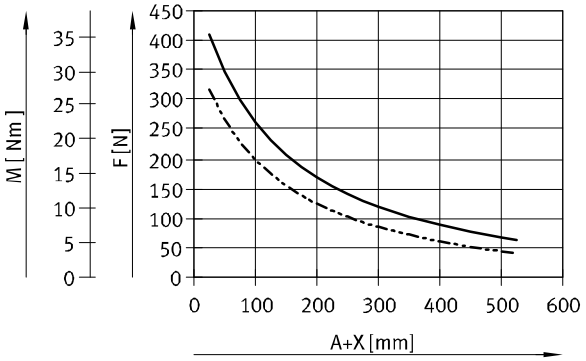
Piston diameter 32



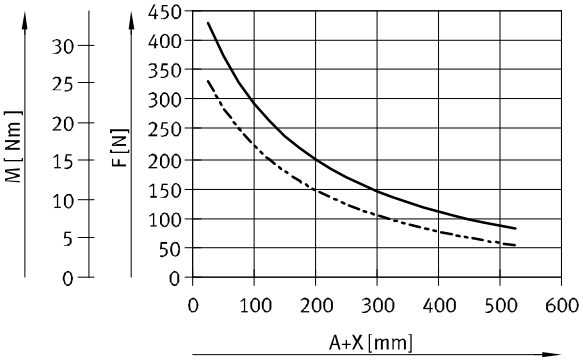
Piston diameter 40



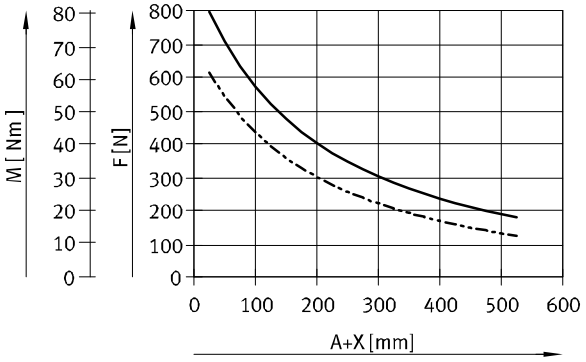
Piston diameter 50



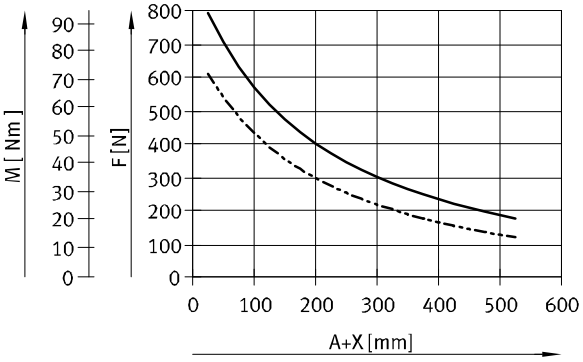
Piston diameter 63



Piston diameter 80

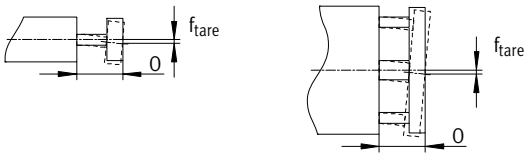


Piston diameter 100

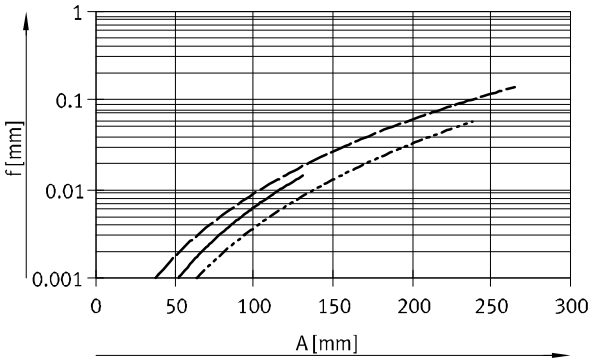


Running performance of 5000 km
Running performance of 10000 km

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

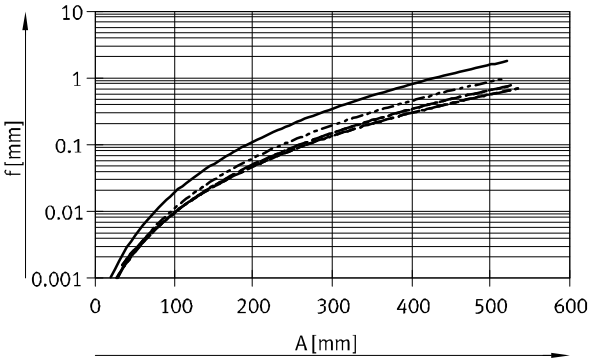


FEN-...



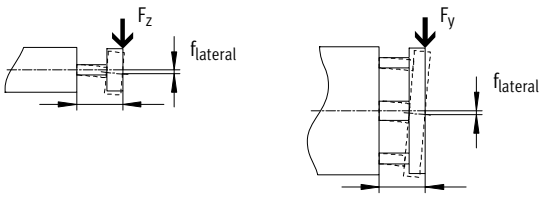
- FEN-8/10-...-GF/KF
- FEN-12/16-...-GF/KF
- FEN-20/25-...-GF/KF

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



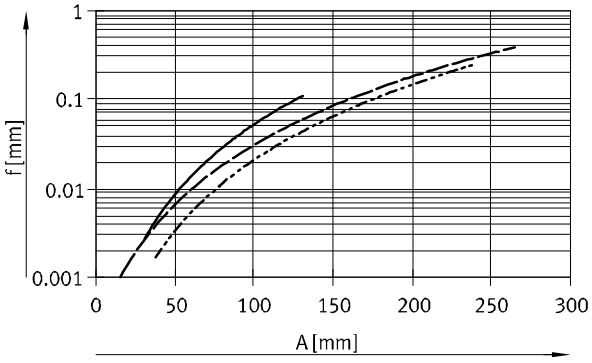
The maximum permissible lateral force must not be exceeded.

$$f_{lateral} = \frac{F_{lateral}}{F_{standard}} \times f_{standard}$$

$F_{standard}$ = 10 N

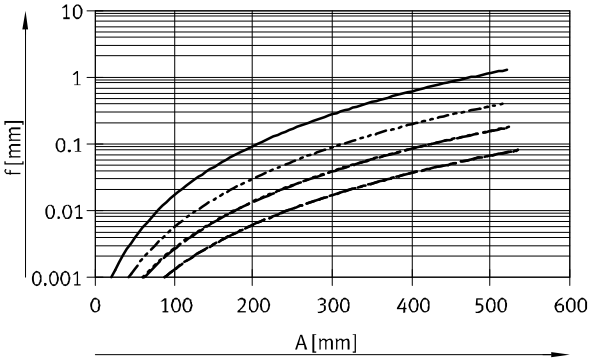
A = Cantilever load of guide rod
$f_{lateral}$ = Deflection due to lateral force
$F_{lateral}$ = Lateral force
$F_{standard}$ = Standardised lateral force
$f_{standard}$ = Deflection due to standardised lateral force (value from graph)

FEN-...



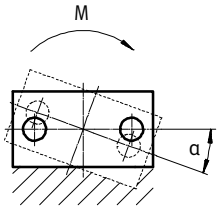
- FEN-8/10-...-GF/KF
- FEN-12/16-...-GF/KF
- FEN-20/25-...-GF/KF

FENG-...



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

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

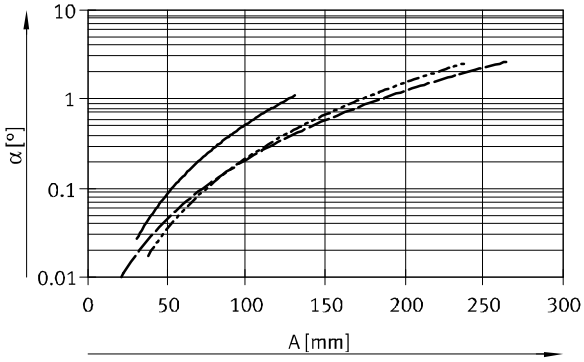


$$\alpha = \frac{M}{M_{standard}} \times \alpha_{standard}$$

$M_{standard}$ = 2 Nm
(valid for α ≤ 10°)

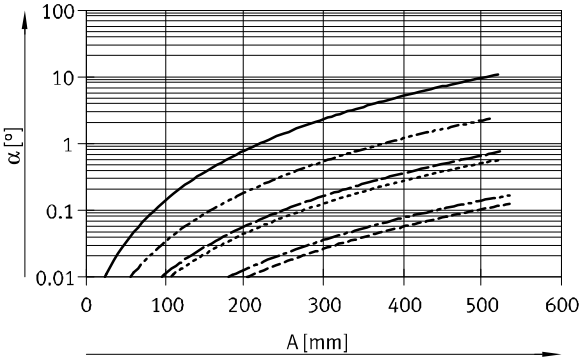
A = Cantilever load of guide rod
α = Inclination due to torque
M = Torque
$M_{standard}$ = Standardised torque
$\alpha_{standard}$ = Deflection due to standardised torque

FEN-...



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

FENG-...



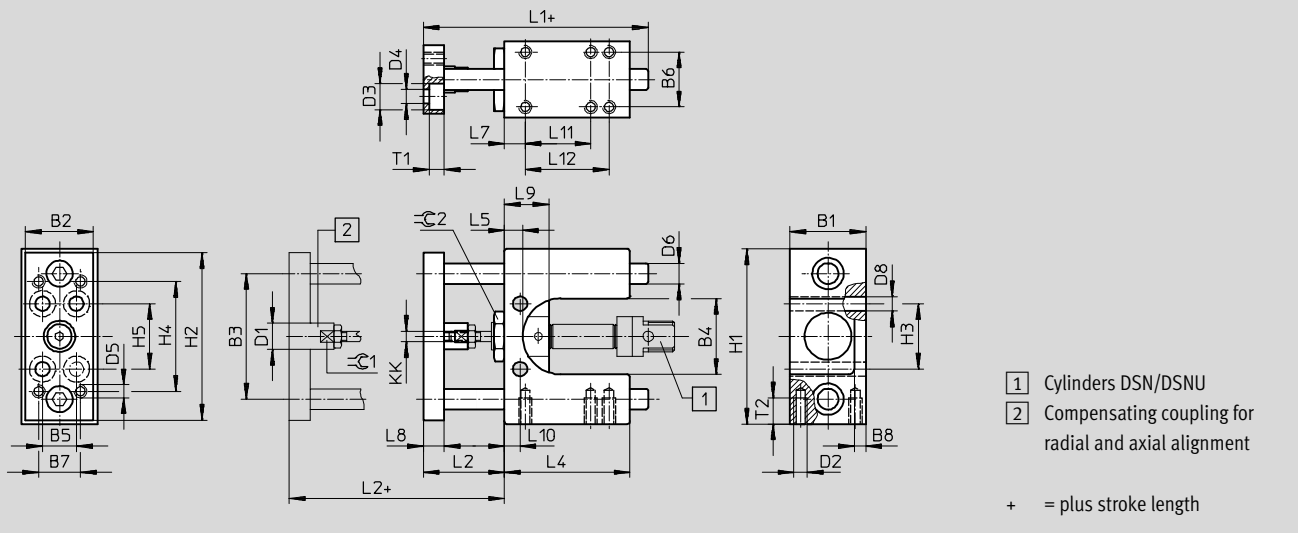
FENG-32-...-GF/KF
FENG-40-...-GF/KF
FENG-50-...-GF/KF
FENG-63-...-GF/KF
FENG-80-...-GF/KF
FENG-100-...-GF/KF

Guide units FEN/FENG for ISO cylinders

Technical data

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

FEN-8, 10



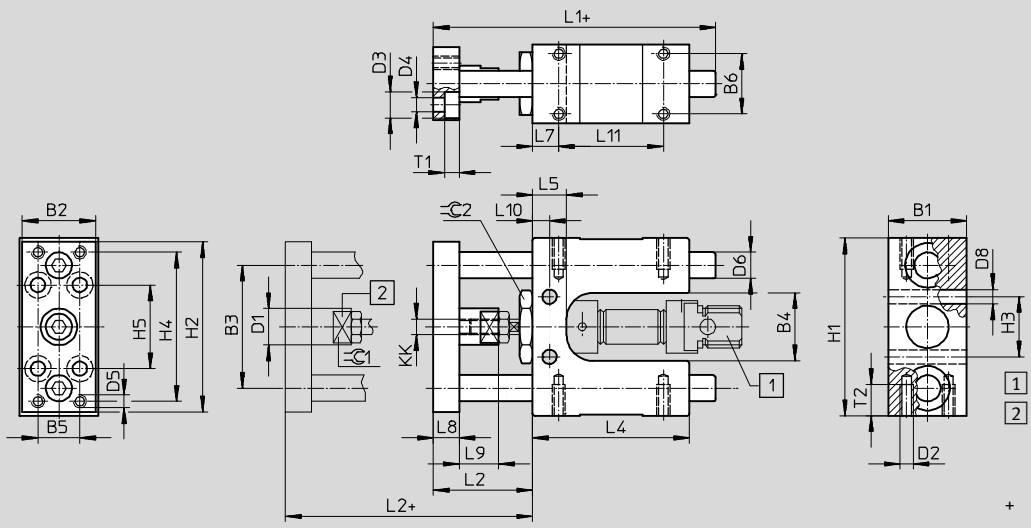
∅ [mm]	B1 −0.3	B2	B3 ±0.15	B4	B5	B6	B7	B8	D1 ∅	D2	D3 ∅	D4 ∅	D5	D6[1] ∅	D8 ∅	H1 −0.4	H2
8	29	26	48	29	13	21	16	4.5	10	M5	10	5.5	M5	8	5.5	67	64
10																	

∅ [mm]	H3	H4	H5	KK	L1	L2 +2	L4	L5	L7	L8	L9	L10	L11	L12	T1	T2	=C1	=C2
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 f8
FEN-...-KF: Tolerance class h6

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

FEN-12, 16



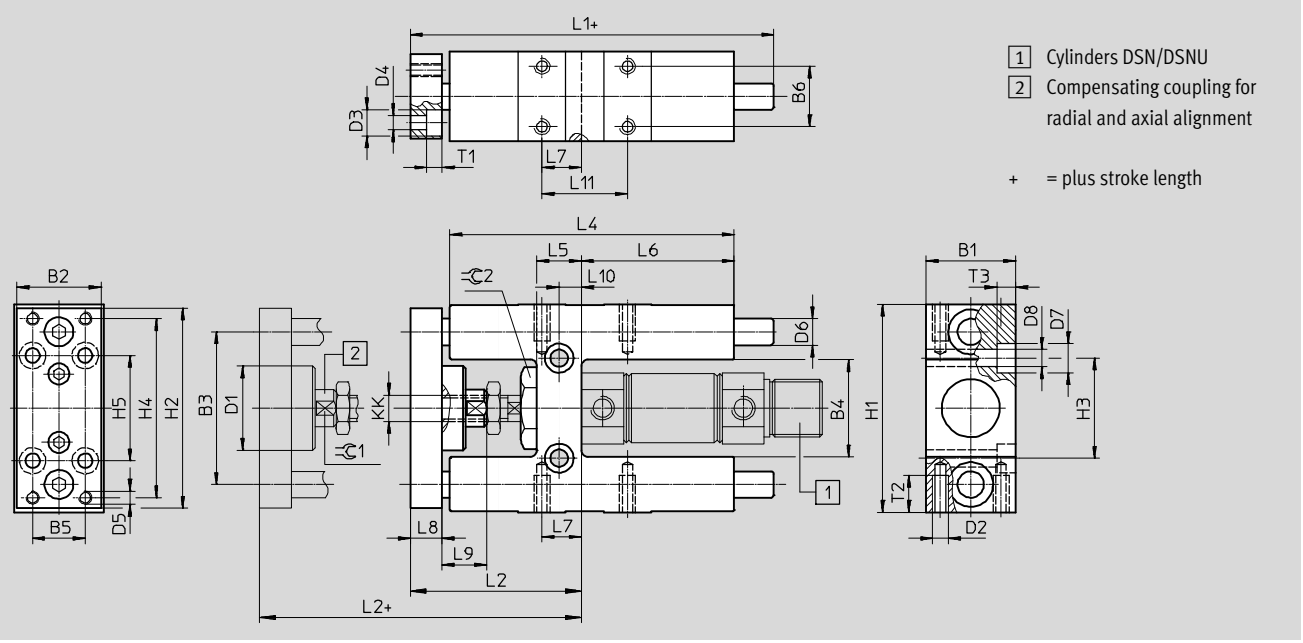
∅ [mm]	B1 −0.3	B2	B3 ±0.15	B4	B5	B6 ±0.15	D1 ∅	D2	D3 ∅	D4 ∅	D5	D6[1] ∅	D8 ∅	H1 −0.4	H2	H3 ±0.15
12	30	28	47	26	16	23	14	M5	10	5.5	M5	10	5.5	68	65	23
16																

∅ [mm]	H4	H5	KK	L1	L2 +5	L4	L5	L7	L8	L9	L10	L11 ±0.15	T1	T2	⌭1	⌭2
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 f8
FEN-...-KF: Tolerance class h6

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

FEN-20, 25



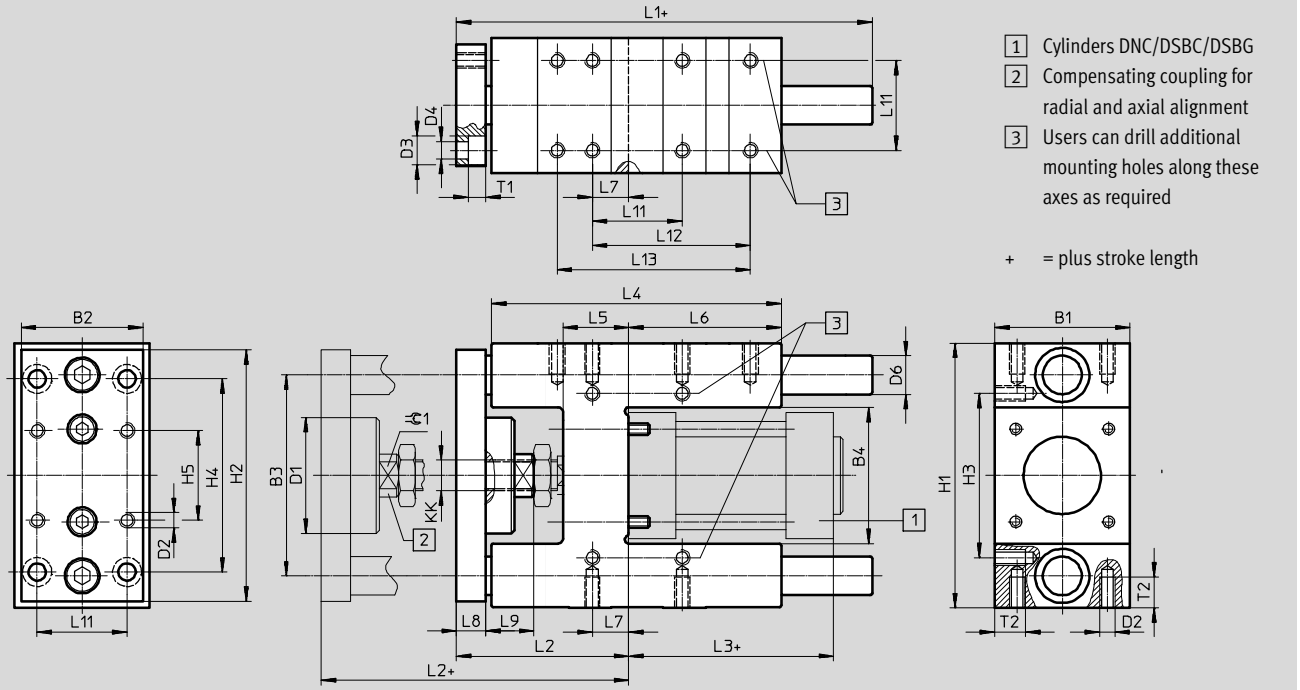
∅ [mm]	B1 −0.3	B2	B3 ±0.2	B4	B5	B6	D1 ∅	D2	D3 ∅	D4 ∅	D5	D6[1] ∅	D7 ∅	D8 ∅	H1 −0.4	H2	H3 ±0.2	H4
20	34	32	58	37	20	23	32	M6	10	5.5	M5	10	11	6.6	79	76	38	68
25																		

∅ [mm]	H5	KK	L1	L2 +5	L4	L5	L6	L7	L8	L9	L10	L11 ±0.2	T1	T2	T3	⌯1	⌯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 f8
FEN-...-KF: Tolerance class h6

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

FENG-32 ... 100



∅ [mm]	B1 −0.3	B2	B3 ±0.2	B4	D1 ∅	D2	D3 ∅	D4 ∅	D6[1] ∅	H1	H2	H3 ±0.2	H4 ±0.2	H5 ±0.2	KK
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

∅ [mm]	L1	L2	L3	L4	L5	L6	L7	L8	L9	L11 ±0.2	L12 ±0.2	L13 ±0.2	T1	T2 Max.	⌭1
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 f8
FENG-...-KF: Tolerance class h6

Guide units FEN/FENG for ISO cylinders

Technical data

Ordering data FEN-... for variable strokes for ISO cylinders DSNU					
Piston diameter [mm]	Stroke [mm]	With plain-bearing guide		With recirculating ball bearing guide	
		Part No.	Type	Part No.	Type
8, 10	1 ... 100	**35196**	**FEN-8/10-...-GF**	**35197**	**FEN-8/10-...-KF**
12, 16	1 ... 200	**19168**	**FEN-12/16-...-GF**	**33481**	**FEN-12/16-...-KF**
20	2 ... 250	**19169**	**FEN-20-...-GF**	**33482**	**FEN-20-...-KF**
25	2 ... 250	**19170**	**FEN-25-...-GF**	**33483**	**FEN-25-...-KF**

Ordering data FENG-... for variable strokes for ISO cylinders DNC/DSBC/DSBG					
Piston diameter [mm]	Stroke [mm]	With plain-bearing guide		With recirculating ball bearing guide	
		Part No.	Type	Part No.	Type
32	10 ... 500	**34481**	**FENG-32-...-GF**	**34487**	**FENG-32-...-KF**
40		**34482**	**FENG-40-...-GF**	**34488**	**FENG-40-...-KF**
50		**34483**	**FENG-50-...-GF**	**34489**	**FENG-50-...-KF**
63		**34484**	**FENG-63-...-GF**	**34490**	**FENG-63-...-KF**
80		**34485**	**FENG-80-...-GF**	**34491**	**FENG-80-...-KF**
100		**34486**	**FENG-100-...-GF**	**34492**	**FENG-100-...-KF**

Ordering data FENG-...-KF with recirculating ball bearing guide for fixed strokes for ISO cylinders DNC/DSBC/DSBG							
Piston diameter [mm]	Part No.	Type	Part No.	Type	Part No.	Type	Part No.	Type
Stroke	50 mm		100 mm		160 mm		200 mm	
32	**34493**	**FENG-32-50-KF**	**34494**	**FENG-32-100-KF**	**34495**	**FENG-32-160-KF**	**34496**	**FENG-32-200-KF**
40	**34499**	**FENG-40-50-KF**	**34500**	**FENG-40-100-KF**	**34501**	**FENG-40-160-KF**	**34502**	**FENG-40-200-KF**
50	**34506**	**FENG-50-50-KF**	**34507**	**FENG-50-100-KF**	**34508**	**FENG-50-160-KF**	**34509**	**FENG-50-200-KF**
63	**34513**	**FENG-63-50-KF**	**34514**	**FENG-63-100-KF**	**34515**	**FENG-63-160-KF**	**34516**	**FENG-63-200-KF**
80	**34521**	**FENG-80-50-KF**	**34522**	**FENG-80-100-KF**	**34523**	**FENG-80-160-KF**	**34524**	**FENG-80-200-KF**
100	**34529**	**FENG-100-50-KF**	**34530**	**FENG-100-100-KF**	**34531**	**FENG-100-160-KF**	**34532**	**FENG-100-200-KF**
Stroke	250 mm		320 mm		400 mm		500 mm	
32	**150289**	**FENG-32-250-KF**	**34497**	**FENG-32-320-KF**	**150290**	**FENG-32-400-KF**	**34498**	**FENG-32-500-KF**
40	**34503**	**FENG-40-250-KF**	**34504**	**FENG-40-320-KF**	**150291**	**FENG-40-400-KF**	**34505**	**FENG-40-500-KF**
50	**34510**	**FENG-50-250-KF**	**34511**	**FENG-50-320-KF**	**150292**	**FENG-50-400-KF**	**34512**	**FENG-50-500-KF**
63	**34517**	**FENG-63-250-KF**	**34518**	**FENG-63-320-KF**	**34519**	**FENG-63-400-KF**	**34520**	**FENG-63-500-KF**
80	**34525**	**FENG-80-250-KF**	**34526**	**FENG-80-320-KF**	**34527**	**FENG-80-400-KF**	**34528**	**FENG-80-500-KF**
100	**34533**	**FENG-100-250-KF**	**34534**	**FENG-100-320-KF**	**34535**	**FENG-100-400-KF**	**34536**	**FENG-100-500-KF**

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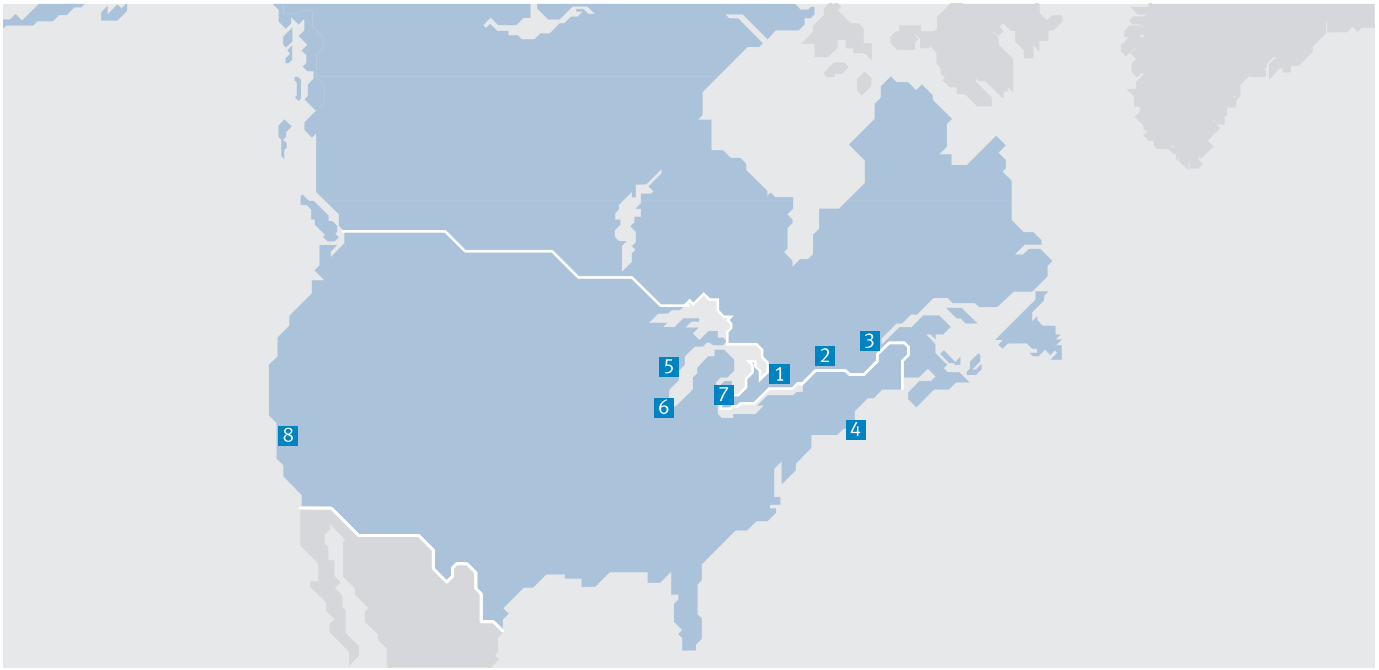

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