

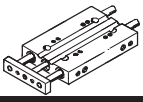


- Miniature guided drive
- Minimal space requirement
- Drive and guide in a single housing – with either plain-bearing guide or recirculating ball bearing guide
- For contactless end-position sensing
- Sturdy and precise

Mini guided drives DFC

Product range and peripherals overview

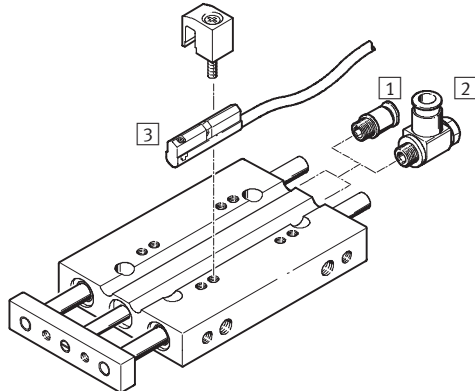
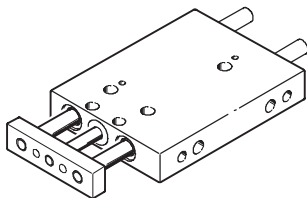
FESTO

Function	Version	Type	Piston Ø [mm]	Stroke [mm]
Double-acting		DFC	4	5, 10, 15, 20
			6	5, 10, 15, 20, 25, 30
			10	5, 10, 15, 20, 25, 30

Piston Ø 4 mm

Piston Ø 6, 10 mm

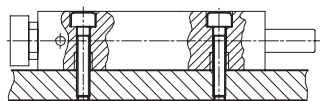
Integrated push-in/threaded fitting



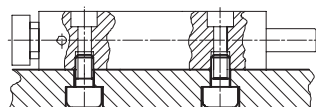
Accessories					
	Brief description	Piston Ø 4 mm	Piston Ø 6 mm	Piston Ø 10 mm	→ Page
1	Push-in/threaded fitting QSM	–	■	■	Volume 3
2	One-way flow control valve GRLZ	–	–	■	1 / 6.2-62
3	Proximity sensor SME/SMT-10	–	■	■	1 / 6.2-62

Mounting options

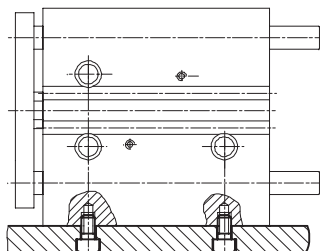
Horizontal mounting from above



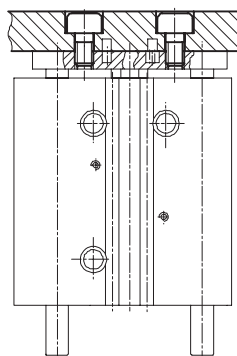
Horizontal mounting from below



Side mounting from below



Yoke mounting



Mini guided drives DFC

Type code

FESTO

		DFC	–	6	–	20	–	P	–	A	–	GF
Type												
Double-acting												
DFC	Mini guided drive											
Piston ∅ [mm]												
Stroke [mm]												
Cushioning												
P	Flexible cushioning rings/plates at both ends											
Position sensing												
	No position sensing											
A	Via proximity sensor											
Guide												
GF	Plain-bearing guide											
KF	Recirculating ball bearing guide											

Mini guided drives DFC

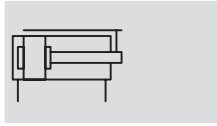
Technical data

FESTO

Function

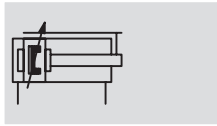
DFC-...

without end-position sensing

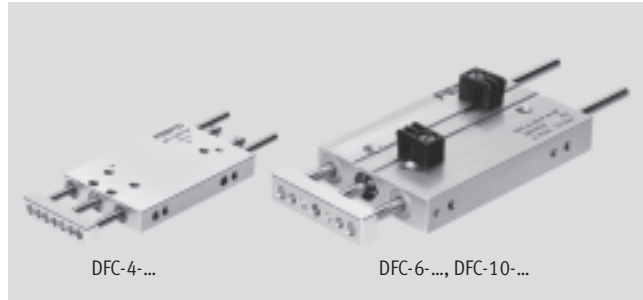


DFC-...-A-...

with end position sensing



-  - Diameter
4, 6, 10 mm
-  - Stroke length
5 ... 30 mm
-  - [www.festo.com/en/
Spare_parts_service](http://www.festo.com/en/Spare_parts_service)



General technical data			
Piston Ø	4	6	10
Pneumatic connection	Barbed fitting PK-3 for 3 mm plastic tubing	M3	M5
Operating medium	Compressed air, filtered, lubricated or unlubricated		
Operating pressure [bar]	3.5 ... 7.0	1.5 ... 10.0	1.0 ... 10.0
Constructional design	Piston		
	Piston rod		
	Guide rods with yoke		
Cushioning	Flexible cushioning rings/plates at both ends		
Position sensing	–	Via proximity sensor	
Type of mounting	Via through holes		
	Via female thread		
Mounting position	Any		
Protection against torsion/guide	Guide rod with yoke with plain-bearing guide	Guide rod with yoke with plain-bearing or ball bearing guide	

Ambient conditions		
Variant	Plain-bearing guide GF	Recirculating ball bearing guide KF
Ambient temperature ¹⁾ [°C]	-5 ... +60	
Corrosion resistance class CRC ²⁾	2	-

1) Note operating range of proximity sensors.

2) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Speeds [m/s] at maximum stroke length			
Piston Ø	4	6	10
Maximum speed	1.0	1.0	1.0
Minimum speed	0.1	0.1	0.1

Forces [N]			
Piston Ø	4	6	10
Theoretical force at 6 bar, advancing	7.5	17	47
Theoretical force at 6 bar, retracting	5.5	12.5	35

Mini guided drives DFC

Technical data

FESTO

Impact energy [J]			
Piston Ø	4	6	10
Max. impact energy at end positions	0.006	0.008	0.05

Permissible impact velocity:

$$v_{\text{perm.}} = \sqrt{\frac{2 \times E_{\text{perm.}}}{m_{\text{dead}} + m_{\text{load}}}}$$

Maximum permissible load:

$$m_{\text{load}} = \frac{2 \times E_{\text{perm.}}}{v^2} - m_{\text{dead}}$$

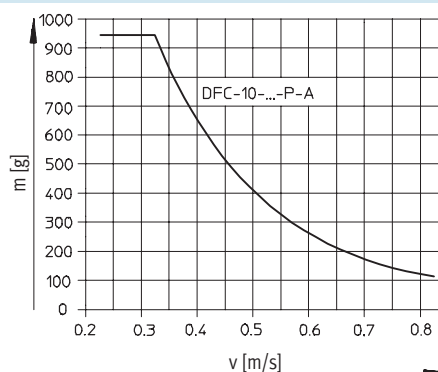
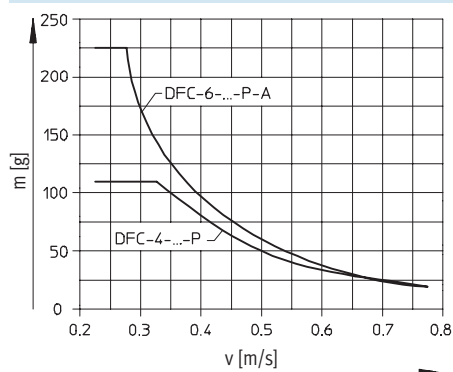


Note

This data represents the maximum values which can be achieved. Values fluctuate in practice relative to the size of the effective load. Allowance

must also be made for the limits of the cushioning capacity of the drive cylinder and the permissible impact energy.

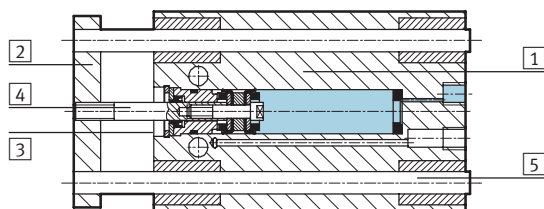
Maximum permissible load m as a function of the impact speed v



Weights [g]			
Piston Ø	4	6	10
Product weight	at 5 mm stroke	10	28
	at 10 mm stroke	12	34
	at 15 mm stroke	15	39
	at 20 mm stroke	18	44
	at 25 mm stroke	–	49
	at 30 mm stroke	–	55
Moving load at 0 mm stroke		3.2	8.8
Additional load per 10 mm stroke		1.3	2.8
			27.2
			7.2

Materials

Sectional view



Mini guided drives		
1	Housing	Wrought aluminium alloy
2	Yoke plate	Wrought aluminium alloy
3	Cover	Wrought aluminium alloy
4	Piston rod	High-alloy stainless steel
5	Guide rods	Tempered steel
–	Seals	Polyurethane, nitrile rubber

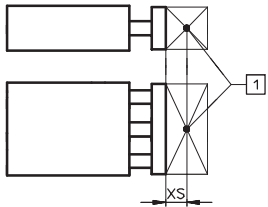
Mini guided drives DFC

Technical data

FESTO

Maximum effective load F [N]

Plain-bearing guide GF and recirculating ball bearing guide KF

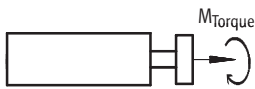


1 Centre of gravity of effective load

Piston Ø [mm]		XS [mm]	Stroke [mm]					
			5	10	15	20	25	30
4	GF	5	1.7	1.7	1.7	1.7	–	–
	KF		–	–	–	–	–	–
6	GF	10	4.8	4.8	4.8	4.8	4.8	4.8
	KF		4.6	4.6	4.6	4.6	4.6	4.6
10	GF	15	12.2	12.2	12.2	12.2	12.2	12.2
	KF		9.8	9.8	9.8	9.8	9.8	9.8

Permissible torque load M [Nm]

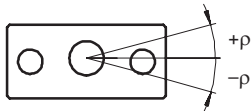
Plain-bearing guide GF and recirculating ball bearing guide KF



Piston Ø [mm]		Stroke [mm]					
		5	10	15	20	25	30
4	GF	0.02	0.02	0.02	0.02	–	–
	KF	–	–	–	–	–	–
6	GF	0.1	0.1	0.1	0.1	0.1	0.1
	KF	0.1	0.1	0.1	0.1	0.1	0.1
10	GF	0.4	0.4	0.4	0.4	0.4	0.4
	KF	0.3	0.3	0.3	0.3	0.3	0.3

Torsional backlash p

Plain-bearing guide GF and recirculating ball bearing guide KF



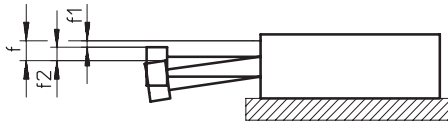
Piston Ø		4	6	10
In retracted state				
Torsional backlash [°]	GF	0.07	0.05	0.04
	KF	0.07	0.05	0.03
In advanced state with maximum stroke				
Torsional backlash [°]	GF	0.11	0.07	0.06
	KF	0.12	0.08	0.05

Mini guided drives DFC

Technical data

FESTO

Deflection of piston rod



$$f = f_1 + f_2$$

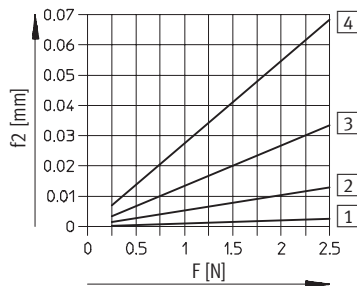
f = Total deflection of piston rod

f_1 = Deflection due to bearing backlash = max. 0.02 mm

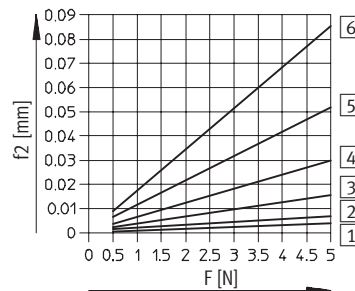
f_2 = Deflection due to lateral force

Deflection f_2 due to lateral force F as a function of the stroke

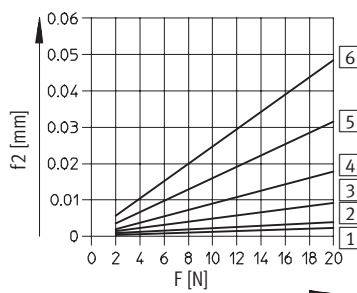
Piston $\varnothing$ 4 mm



Piston $\varnothing$ 6 mm



Piston $\varnothing$ 10 mm



- 1 5 mm stroke
- 2 10 mm stroke
- 3 15 mm stroke
- 4 20 mm stroke
- 5 25 mm stroke
- 6 30 mm stroke

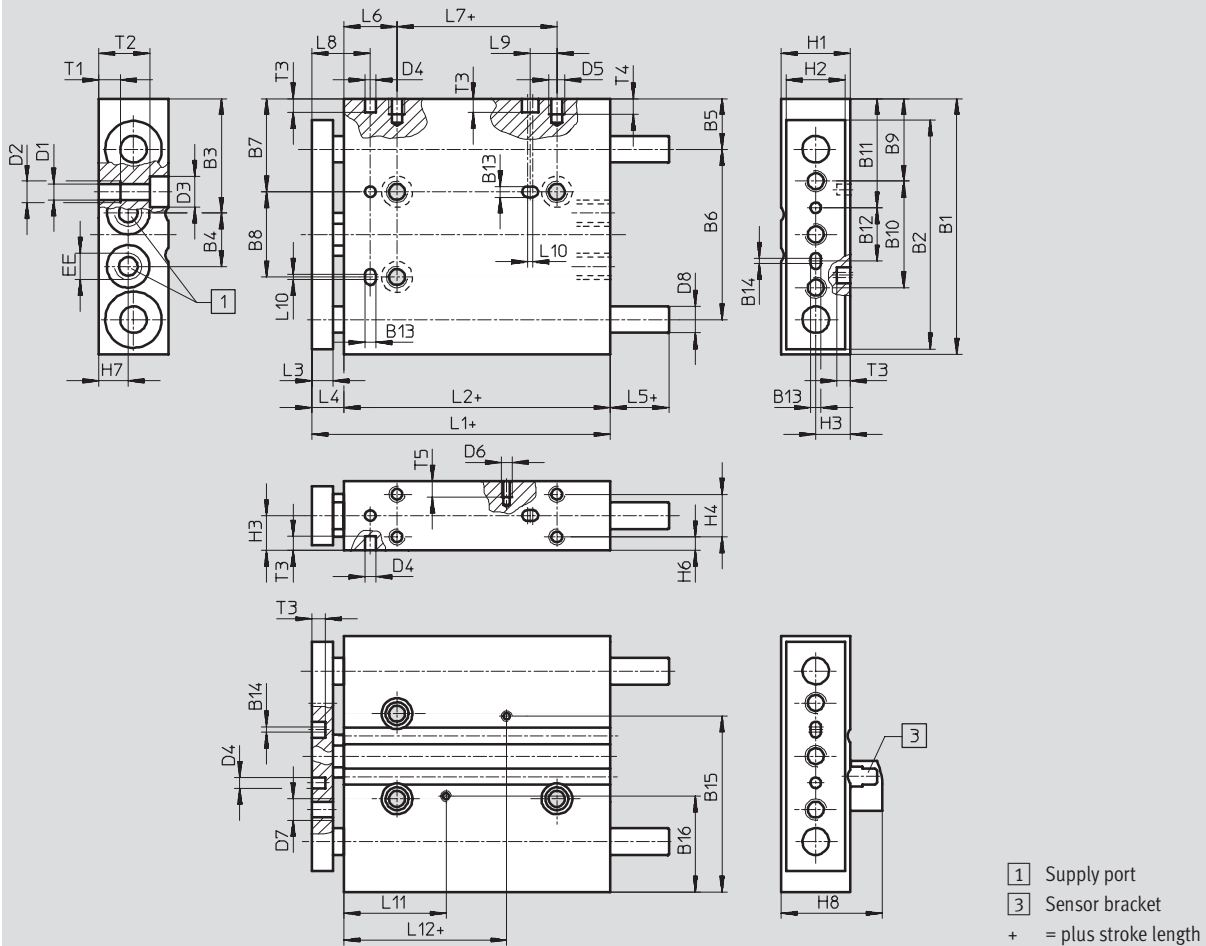
Mini guided drives DFC

Technical data

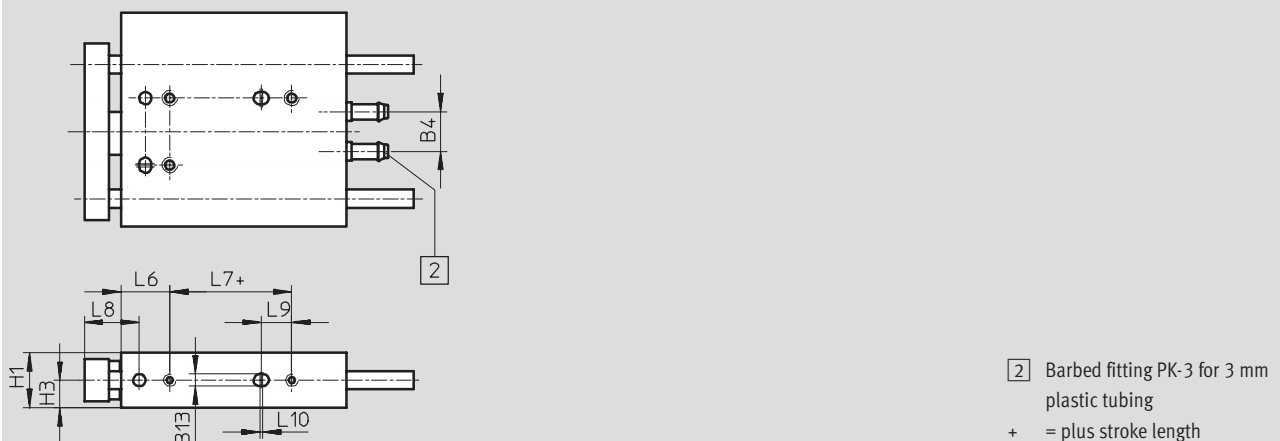
FESTO

Dimensions

Download CAD data → www.festo.com/en/engineering



Piston $\varnothing$ 4 mm



Mini guided drives DFC

Technical data

FESTO

Ø [mm]	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13 H8	B14	B15	B16	D1 Ø
4	24	20	9.8	7.4	6	15	9.5	8	8.5	10	11	5	2	–	–	–	2.1
6	35	29	17	6.5	8.5	22	14	11	12	15	15.75	8	2	1	26.2	12.8	2
10	48	43	21.5	10	9.5	32	17.5	16	15.5	20	20.5	10	2	1	33	18	3.2

Ø [mm]	D2	D3 Ø	D4 Ø H8	D5	D6 Ø	D7	D8 Ø	EE	H1	H2	H3	H4	H6	H7	H8	L1	L2
4	–	–	2	M2	–	M2	2	–	5.5	4.5	2.75	–	2.75	2.75	–	24	18
6	M2.5	4	2	M2.5	M2	M2.5	3	M3	9	7	4.5	–	4.5	3.5	15	34	27
10	M4	5.8	2	M3	M2	M4	5	M5	13	11	6.5	8	2.5	5.5	19	48	40

Ø [mm]	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	T1	T2	T3	T4	T5
4	4	6	1	8	3	11	3.5	0.5	–	–	–	5.5	2	4	–
6	5	7	1	8	10	10	5	0.5	16	19.35	3	6.1	2.6	5	2.5
10	6	8	1	10	20	13	5	1	22.2	25.6	4	9.6	2.6	3	3

Ordering data					
Piston Ø [mm]	Stroke [mm]	Plain-bearing guide GF		Recirculating ball bearing guide KF	
		Part No.	Type	Part No.	Type
4	5	189 479	DFC-4-5-P-GF	—	
	10	189 452	DFC-4-10-P-GF		
	15	189 453	DFC-4-15-P-GF		
	20	189 454	DFC-4-20-P-GF		
6	5	189 455	DFC-6-5-P-A-GF ¹⁾	189 461	DFC-6-5-P-A-KF ¹⁾
	10	189 456	DFC-6-10-P-A-GF ¹⁾	189 462	DFC-6-10-P-A-KF ¹⁾
	15	189 457	DFC-6-15-P-A-GF ¹⁾	189 463	DFC-6-15-P-A-KF ¹⁾
	20	189 458	DFC-6-20-P-A-GF ¹⁾	189 464	DFC-6-20-P-A-KF ¹⁾
	25	189 459	DFC-6-25-P-A-GF ¹⁾	189 465	DFC-6-25-P-A-KF ¹⁾
	30	189 460	DFC-6-30-P-A-GF ¹⁾	189 466	DFC-6-30-P-A-KF ¹⁾
10	5	189 467	DFC-10-5-P-A-GF ¹⁾	189 473	DFC-10-5-P-A-KF ¹⁾
	10	189 468	DFC-10-10-P-A-GF ¹⁾	189 474	DFC-10-10-P-A-KF ¹⁾
	15	189 469	DFC-10-15-P-A-GF ¹⁾	189 475	DFC-10-15-P-A-KF ¹⁾
	20	189 470	DFC-10-20-P-A-GF ¹⁾	189 476	DFC-10-20-P-A-KF ¹⁾
	25	189 471	DFC-10-25-P-A-GF ¹⁾	189 477	DFC-10-25-P-A-KF ¹⁾
	30	189 472	DFC-10-30-P-A-GF ¹⁾	189 478	DFC-10-30-P-A-KF ¹⁾

1) Mounting kits for proximity sensors included in scope of delivery.

Mini guided drives DFC

Accessories

FESTO

Ordering data – Proximity sensor, magneto-resistive							Technical data➔ 1 / 10.2-52	
	Assembly	Switch output	Electrical connection		Cable length [m]	Connection direction	Part No.	Type
			Cable	Plug M8				
NO contact								
	With mounting kit	PNP	–	3-pin	0.3	In-line	173 220	SMT-10-PS-SL-LED-24
			3-wire	–	2.5		173 218	SMT-10-PS-KL-LED-24

Ordering data – Proximity sensor, magnetic reed							Technical data➔ 1 / 10.2-55	
	Assembly	Electrical connection		Cable length	Connection direction	Part No.	Type	
		Cable	Plug M8					
NO contact								
	With mounting kit	3-wire	–	0.3	In-line	173 212	SME-10-SL-LED-24	
		–	3-pin	2.5		173 210	SME-10-KL-LED-24	

Ordering data – Plug sockets with cable							Technical data → 109	
	Assembly	Switch output		Connection	Cable length [m]	Part No.	Type	
		PNP	NPN					
Straight socket								
	M8 locknut	■	■	3-pin	2.5	159 420	SIM-M8-3GD-2,5-PU	
					5	159 421	SIM-M8-3GD-5-PU	
Angled socket								
	M8 locknut	■	■	3-pin	2.5	159 422	SIM-M8-3WD-2,5-PU	
					5	159 423	SIM-M8-3WD-5-PU	

Ordering data – One-way flow control valves					Technical data➔ Volume 2	
	Connection		Material	Part No.	Type	
	Thread	For tubing OD				
	M5	3	Metal design	193 153	GRLZ-M5-QS-3-D	
		4		193 154	GRLZ-M5-QS-4-D	
		6		193 155	GRLZ-M5-QS-6-D	

 Core Range