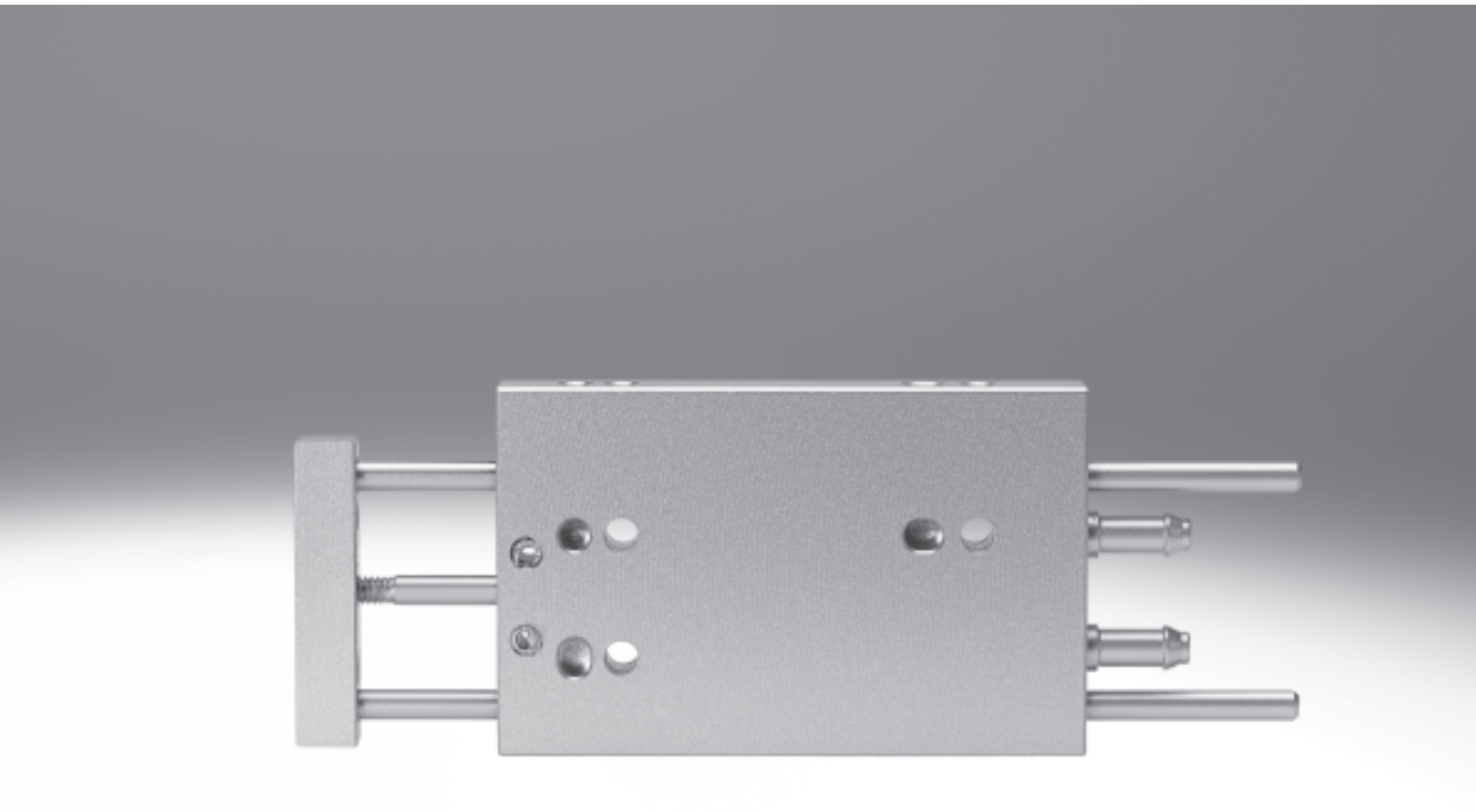
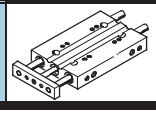
Mini guided cylinders DFC

FESTO



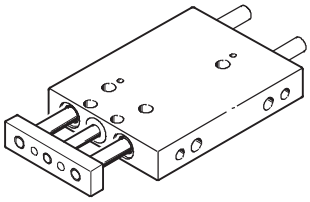
Mini guided cylinders DFC

Product range and peripherals overview

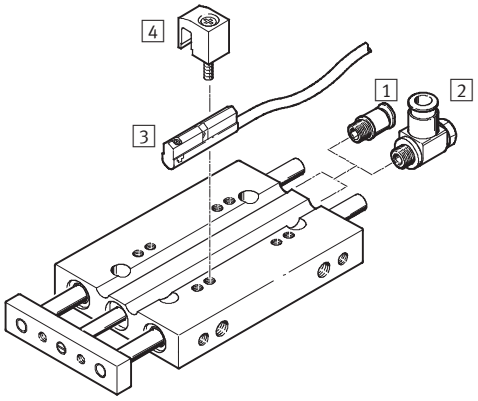
Function	Version	Type	Piston ∅ [mm]	Stroke [mm]
Double-acting		DFC	4	5, 10, 15, 20
			6	5, 10, 15, 20, 25, 30
			10	5, 10, 15, 20, 25, 30

Piston ∅ 4 mm

Integrated push-in/threaded fitting



Piston ∅ 6, 10 mm

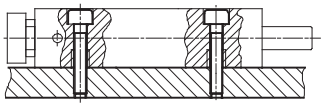


Accessories

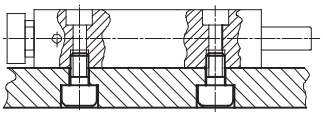
	Brief description	Piston ∅ 4 mm	Piston ∅ 6 mm	Piston ∅ 10 mm	→ Page/Internet
1 Push-in/threaded fitting QSM	For connecting compressed air tubing with standard O.D.	–	■	■	quick star
2 One-way flow control valve GRLZ	For speed regulation	–	–	■	10
3 Proximity sensor SME/SMT-10	–	–	■	■	10
4 Sensor bracket	Included in the scope of delivery of the mini slide unit	–	■	■	–

Mounting options

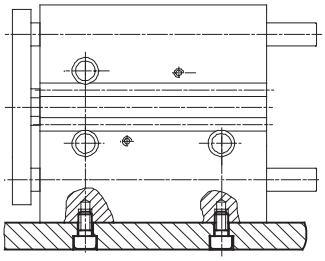
Horizontal mounting from above



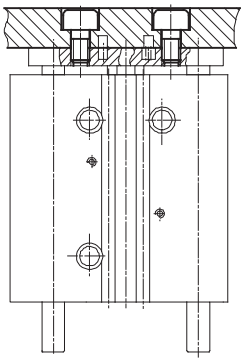
Horizontal mounting from below



Side mounting from below

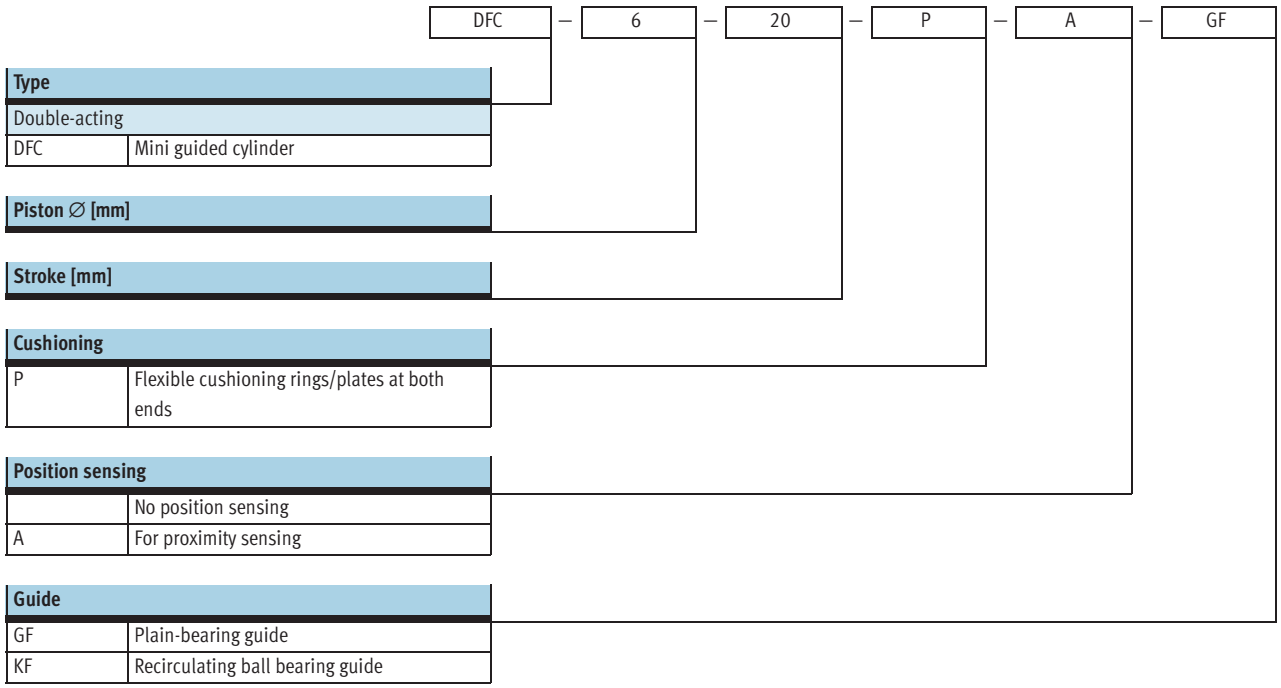


Yoke mounting



Mini guided cylinders DFC

Type code



Type	
Double-acting	
DFC	Mini guided cylinder

Piston ∅ [mm]

Stroke [mm]

Cushioning	
P	Flexible cushioning rings/plates at both ends

Position sensing	
	No position sensing
A	For proximity sensing

Guide	
GF	Plain-bearing guide
KF	Recirculating ball bearing guide

Mini guided cylinders DFC

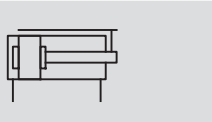
Technical data

FESTO

Function

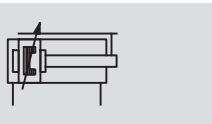
DFC-...

without end-position sensing



DFC-...-A-...

with end position sensing



Diameter
4, 6, 10 mm

Stroke length
5 ... 30 mm

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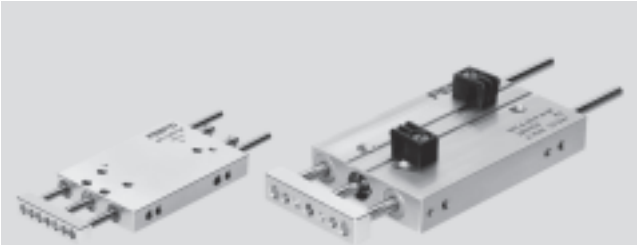


DFC-4-... DFC-6-..., DFC-10-...

General technical data			
Piston ∅	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	–	For proximity sensing	
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 ∅	4	6	10
Maximum speed	1.0	1.0	1.0
Minimum speed	0.1	0.1	0.1

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

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

Permissible impact velocity:

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

Maximum permissible load:

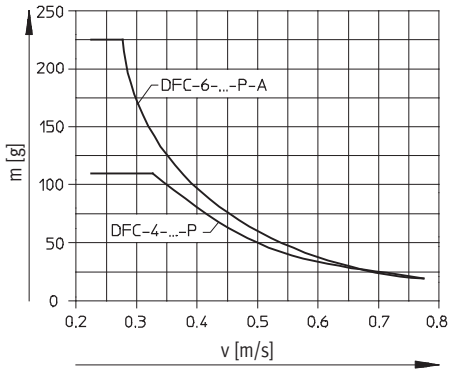
$$m_{load} = \frac{2 \times E_{perm.}}{v^2} - m_{dead}$$

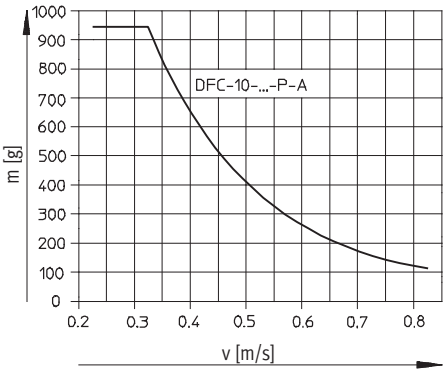
$v_{perm.}$ Permissible impact velocity
$E_{perm.}$ Max. impact energy
m_{dead} Moving load (drive)
m_{load} Moving work load

- Note

These specifications represent the maximum values which can be reached. Note the maximum permitted impact energy.

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

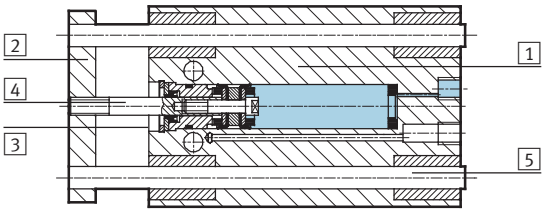




Weights [g]				
Piston ∅		4	6	10
Product weight	at 5 mm stroke	10	28	91
	at 10 mm stroke	12	34	100
	at 15 mm stroke	15	39	108
	at 20 mm stroke	18	44	117
	at 25 mm stroke	–	49	125
	at 30 mm stroke	–	55	134
Moving load at 0 mm stroke		3.2	8.8	27.2
Additional load per 10 mm stroke		1.3	2.8	7.2

Materials

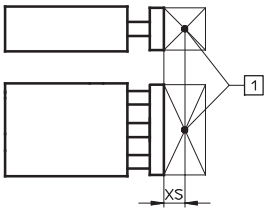
Sectional view



Mini guided cylinder		
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	High-alloy steel
–	Seals	Polyurethane, nitrile rubber

Maximum effective load F [N]

Plain-bearing guide GF and recirculating ball bearing guide KF

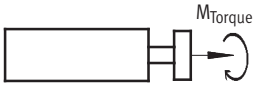


1 Centre of gravity of effective load

Piston ∅ [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]

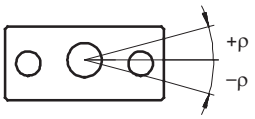
Plain-bearing guide GF and recirculating ball bearing guide KF



Piston ∅ [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

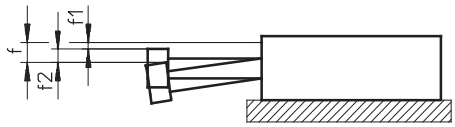
Torsional backlash p

Plain-bearing guide GF and recirculating ball bearing guide KF



Piston ∅		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

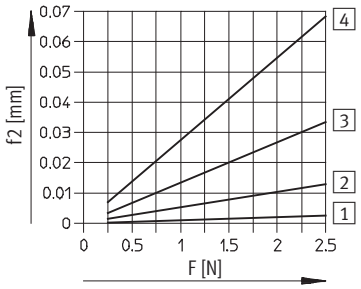
Deflection of piston rod



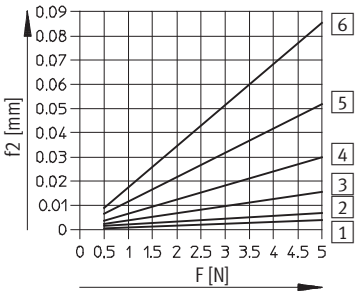
f = f1 + f2
f = Total deflection of piston rod
f1 = Deflection due to bearing backlash = max. 0.02 mm
f2 = Deflection due to lateral force

Deflection f2 due to lateral force F as a function of the stroke

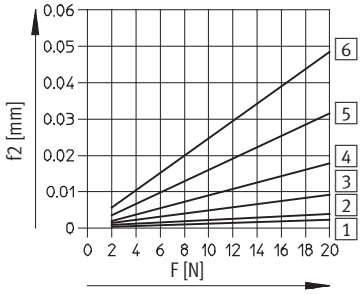
Piston ∅ 4 mm



Piston ∅ 6 mm

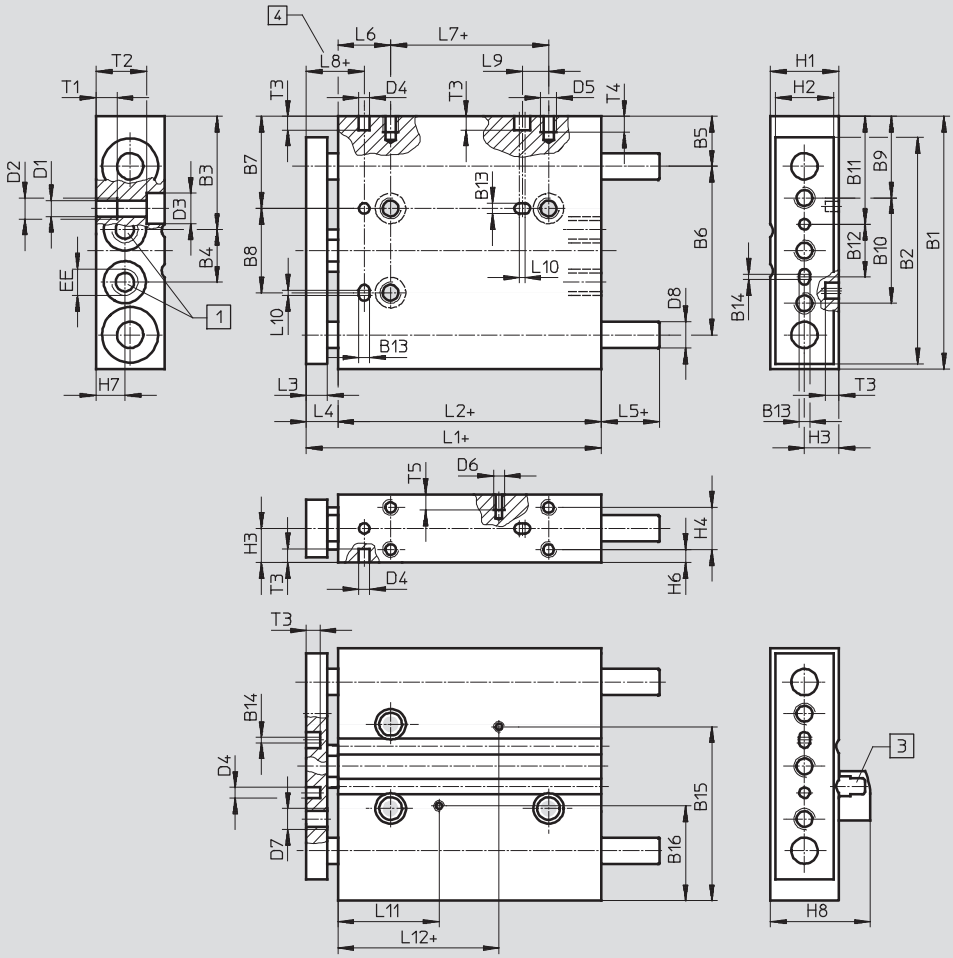


Piston ∅ 10 mm



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

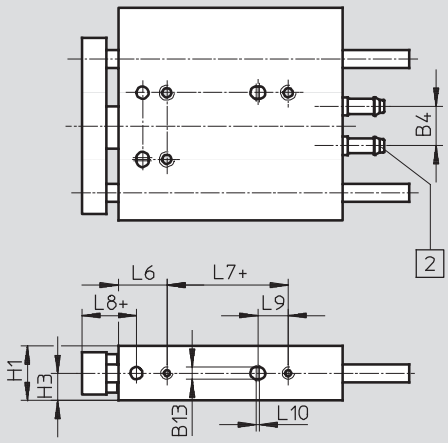
Dimensions Download CAD data ➔ **www.festo.com**



1 Supply port
3 Sensor bracket (included in the scope of delivery of the mini slide unit)
4 Dimension L8 set when extended

\+ = plus stroke length

Piston ∅ 4 mm



2 Barbed fitting PK-3 for 3 mm plastic tubing

\+ = plus stroke length

Mini guided cylinders DFC

Technical data

∅ [mm]	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13 H8	B14	B15	B16	D1 ∅
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

∅ [mm]	D2	D3 ∅	D4 ∅ H8	D5	D6 ∅	D7	D8 ∅	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

∅ [mm]	L3	L4 +0.3 −0.9	L5	L6	L7	L8 +0.2	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

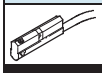
Piston ∅ [mm]	Stroke [mm]	Plain-bearing guide GF Part No.	Type	Recirculating ball bearing guide KF Part No.	Type
4	5	**189 479**	**DFC-4-5-P-GF**	**–**	
	10	**189 452**	**DFC-4-10-P-GF**		
	15	**189 453**	**DFC-4-15-P-GF**		
	20	**189 454**	**DFC-4-20-P-GF**		
6	5	**189 455**	**DFC-6-5-P-A-GF[1)]**	**189 461**	**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.

Ordering data – Proximity sensors for C-slot, magneto-resistive — Technical data ➔ Internet: smt

	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above	PNP	Plug M8x1, 3-pin, in-line	0.3	**551 375**	**SMT-10M-PS-24V-E-0,3-L-M8D**
			Cable, 3-wire, in-line	2.5	**551 373**	**SMT-10M-PS-24V-E-2,5-L-OE**

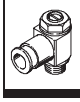
Ordering data – Proximity sensors for C-slot, magnetic reed — Technical data ➔ Internet: sme

	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot lengthwise	Contacting	Plug M8x1, 3-pin, in-line	0.3	**173 212**	**SME-10-SL-LED-24**
			Cable, 3-wire, in-line	2.5	**173 210**	**SME-10-KL-LED-24**

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	**541 333**	**NEBU-M8G3-K-2.5-LE3**
			5	**541 334**	**NEBU-M8G3-K-5-LE3**
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541 338**	**NEBU-M8W3-K-2.5-LE3**
			5	**541 341**	**NEBU-M8W3-K-5-LE3**

Ordering data – One-way flow control valves — Technical data ➔ Internet: grlz

	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**