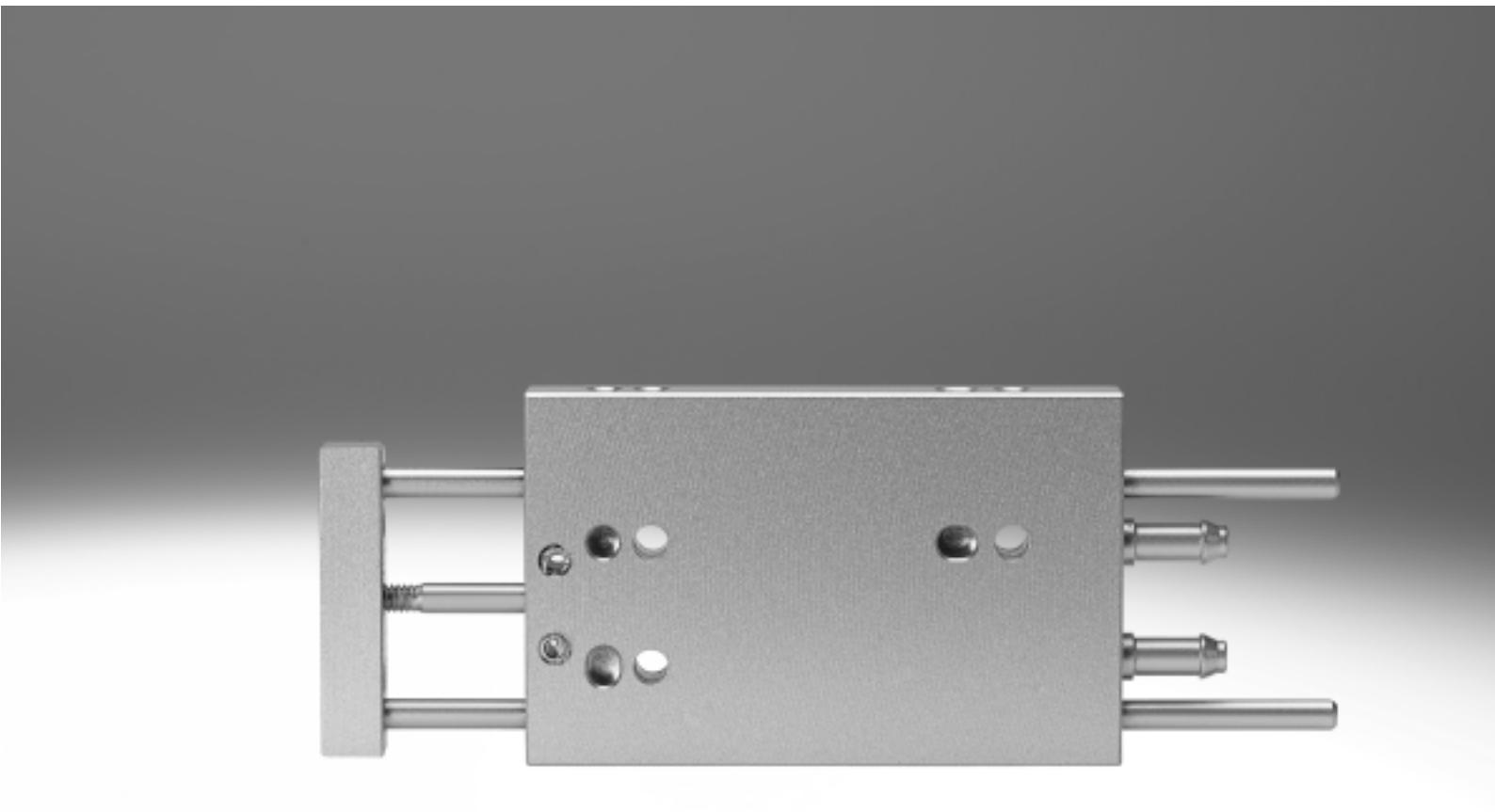
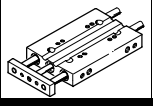
Mini guided cylinders DFC

FESTO



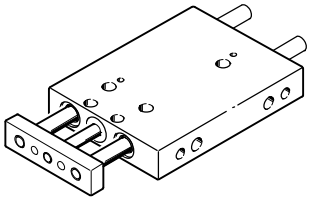
Mini guided cylinders DFC

Product range and peripherals overview

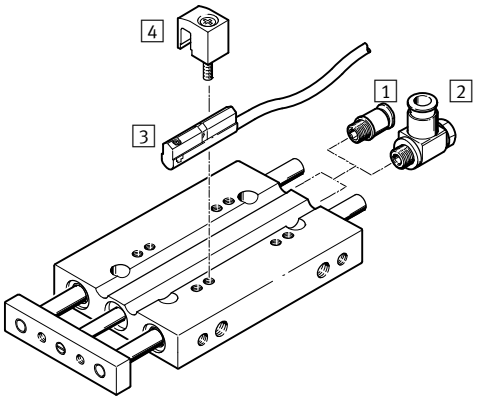
Function	Version	Type	Piston ∅ [mm]	Stroke [mm]
Double-acting		DFC	4	5, 10, 15, 20
			6	5, 10, 15, 20, 25, 30
			10	5, 10, 15, 20, 25, 30

Piston ∅ 4 mm

Integrated push-in/threaded fitting



Piston ∅ 6, 10 mm

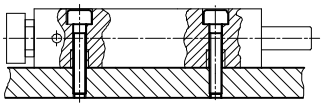


Accessories

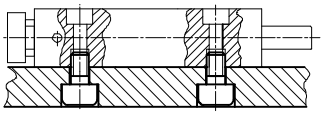
		Description	Piston ∅ 4 mm	Piston ∅ 6 mm	Piston ∅ 10 mm	→ Page/Internet
1	Push-in/threaded fitting QSM	For connecting compressed air tubing with standard O.D.	–	■	■	qs
2	One-way flow control valve GRLZ	For speed regulation	–	–	■	10
3	Proximity sensor SME/SMT-10	–	–	■	■	10
4	Sensor bracket	Included in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

Mounting options

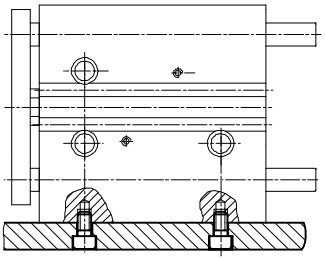
Horizontal mounting from above



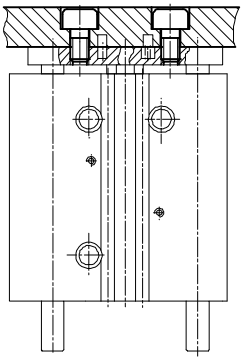
Horizontal mounting from below



Side mounting from below

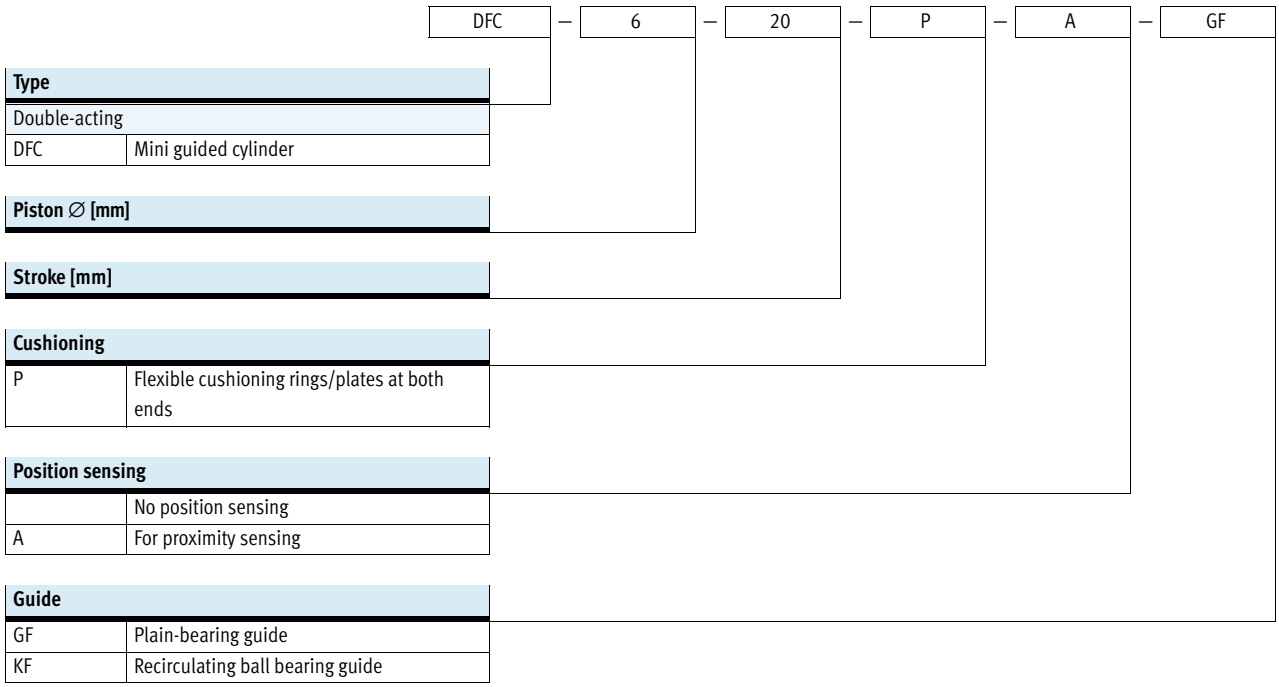


Yoke mounting



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

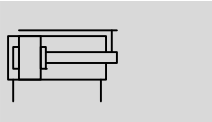
Technical data

FESTO

Function

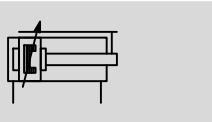
DFC-...

without end-position sensing



DFC-...-A-...

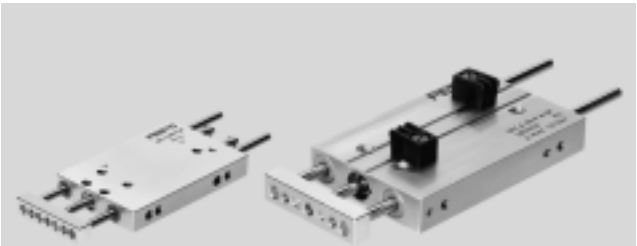
with end position sensing



Diameter
4, 6, 10 mm

Stroke length
5 ... 30 mm

www.festo.com



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 in accordance with ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)		
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 CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

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:

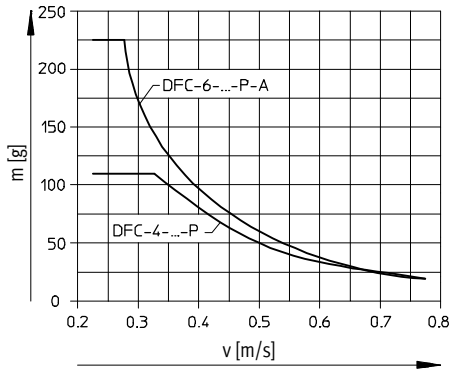
$$m_{load} = \frac{2 \times E_{perm.}}{v^2} - m_{dead}$$

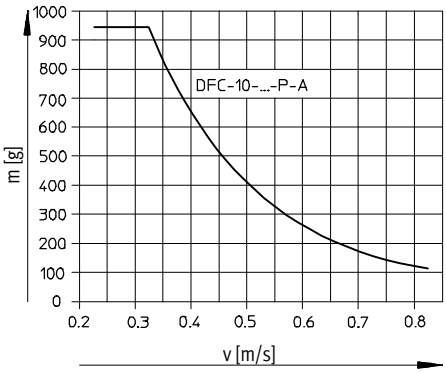
$v_{perm.}$ Permissible impact velocity
$E_{perm.}$ Max. impact energy
m_{dead} Moving load (drive)
m_{load} Moving work load

- 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

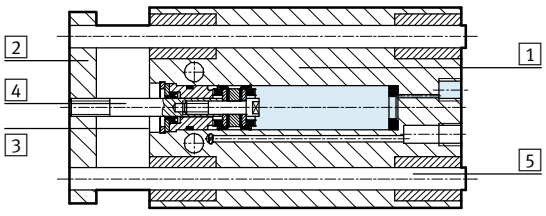




Weights [g]				
Piston ∅		4	6	10
Product weight	at 5 mm stroke	10	28	91
	at 10 mm stroke	12	34	100
	at 15 mm stroke	15	39	108
	at 20 mm stroke	18	44	117
	at 25 mm stroke	–	49	125
	at 30 mm stroke	–	55	134
Moving load at 0 mm stroke		3.2	8.8	27.2
Additional load per 10 mm stroke		1.3	2.8	7.2

Materials

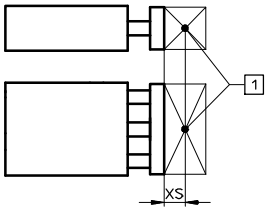
Sectional view



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

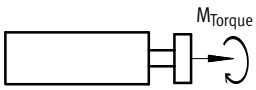


1 Centre of gravity of effective load

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]

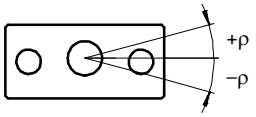
Plain-bearing guide GF and recirculating ball bearing guide KF



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

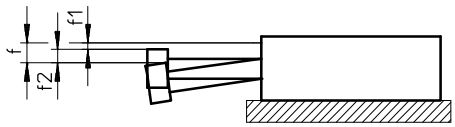
Torsional backlash p

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

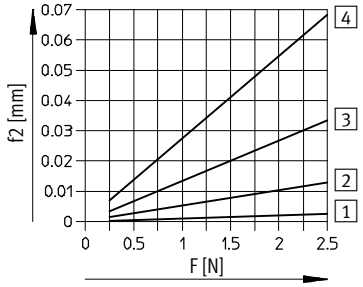
Deflection of piston rod



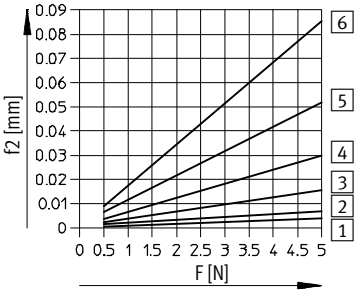
f = f1 + f2
f = Total deflection of piston rod
f1 = Deflection due to bearing backlash = max. 0.02 mm
f2 = Deflection due to lateral force

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

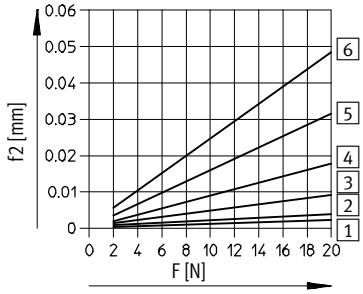
Piston ∅ 4 mm



Piston ∅ 6 mm

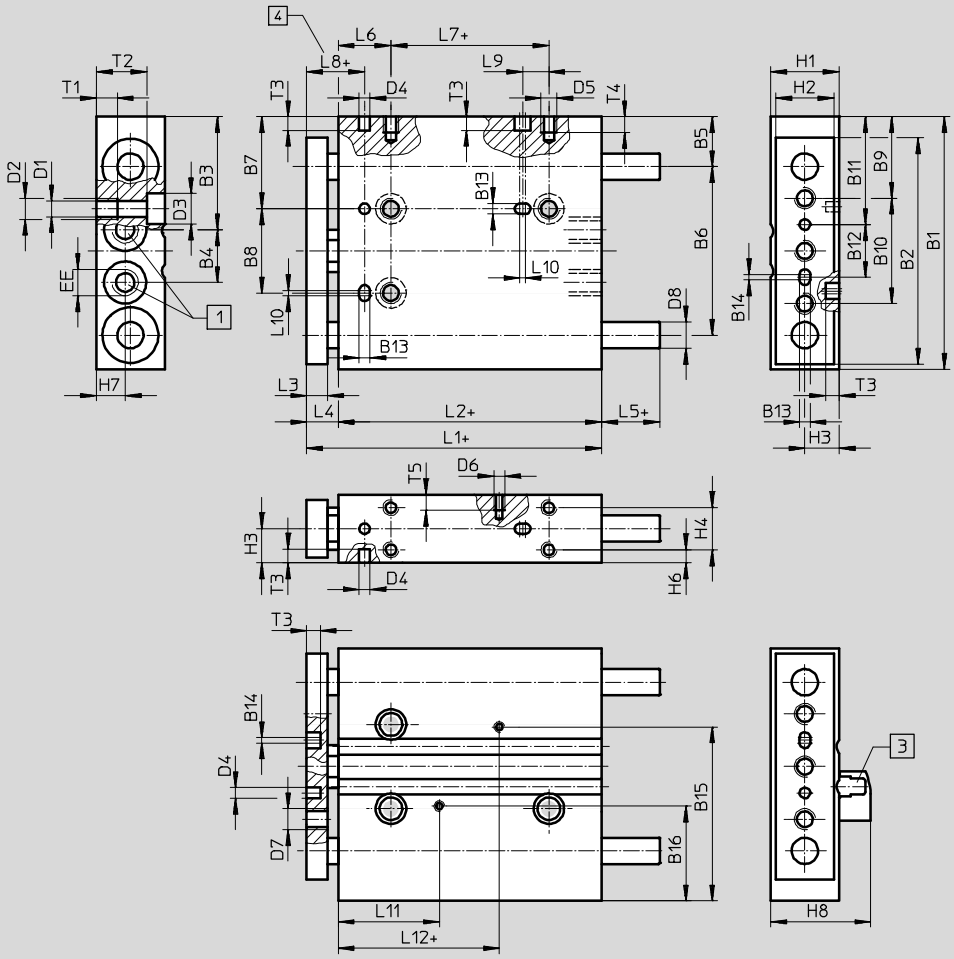


Piston ∅ 10 mm



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

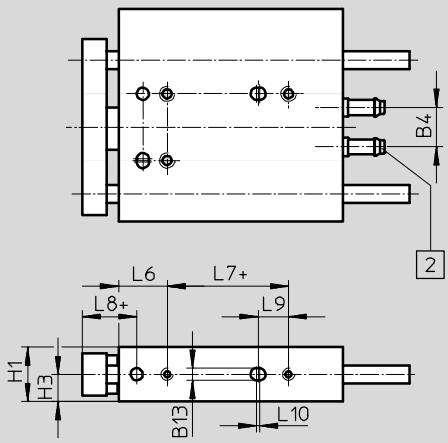
Dimensions Download CAD data ➔ **www.festo.com**



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

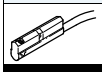
Piston ∅ [mm]	Stroke [mm]	Plain-bearing guide GF Part No.	Type	Recirculating ball bearing guide KF Part No.	Type
4	5	**189479**	**DFC-4-5-P-GF**	**–**	
	10	**189452**	**DFC-4-10-P-GF**		
	15	**189453**	**DFC-4-15-P-GF**		
	20	**189454**	**DFC-4-20-P-GF**		
6	5	**189455**	**DFC-6-5-P-A-GF[1)]**	**189461**	**DFC-6-5-P-A-KF[1)]**
	10	**189456**	**DFC-6-10-P-A-GF[1)]**	**189462**	**DFC-6-10-P-A-KF[1)]**
	15	**189457**	**DFC-6-15-P-A-GF[1)]**	**189463**	**DFC-6-15-P-A-KF[1)]**
	20	**189458**	**DFC-6-20-P-A-GF[1)]**	**189464**	**DFC-6-20-P-A-KF[1)]**
	25	**189459**	**DFC-6-25-P-A-GF[1)]**	**189465**	**DFC-6-25-P-A-KF[1)]**
	30	**189460**	**DFC-6-30-P-A-GF[1)]**	**189466**	**DFC-6-30-P-A-KF[1)]**
10	5	**189467**	**DFC-10-5-P-A-GF[1)]**	**189473**	**DFC-10-5-P-A-KF[1)]**
	10	**189468**	**DFC-10-10-P-A-GF[1)]**	**189474**	**DFC-10-10-P-A-KF[1)]**
	15	**189469**	**DFC-10-15-P-A-GF[1)]**	**189475**	**DFC-10-15-P-A-KF[1)]**
	20	**189470**	**DFC-10-20-P-A-GF[1)]**	**189476**	**DFC-10-20-P-A-KF[1)]**
	25	**189471**	**DFC-10-25-P-A-GF[1)]**	**189477**	**DFC-10-25-P-A-KF[1)]**
	30	**189472**	**DFC-10-30-P-A-GF[1)]**	**189478**	**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	**551375**	**SMT-10M-PS-24V-E-0,3-L-M8D**
			Cable, 3-wire, in-line	2.5	**551373**	**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	**173212**	**SME-10-SL-LED-24**
			Cable, 3-wire, in-line	2.5	**173210**	**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	**541333**	**NEBU-M8G3-K-2.5-LE3**
			5	**541334**	**NEBU-M8G3-K-5-LE3**
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541338**	**NEBU-M8W3-K-2.5-LE3**
			5	**541341**	**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	**193153**	**GRLZ-M5-QS-3-D**
		4		**193154**	**GRLZ-M5-QS-4-D**
		6		**193155**	**GRLZ-M5-QS-6-D**