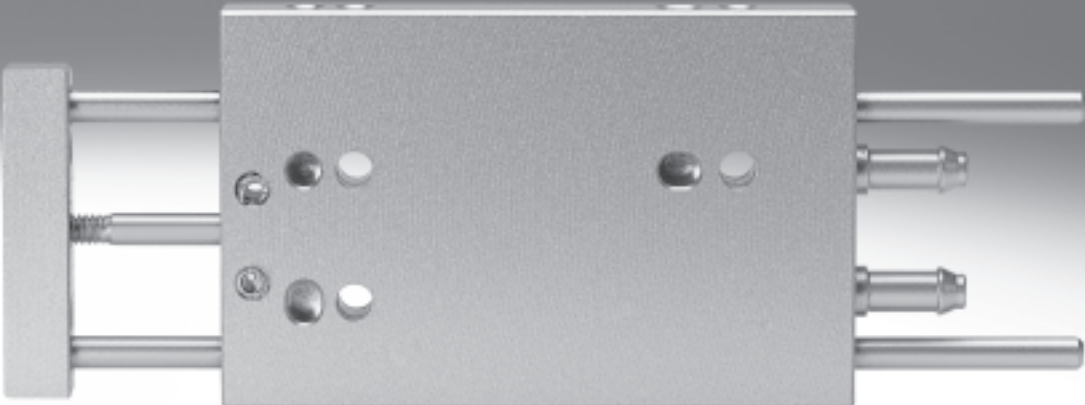


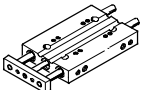
Mini guided cylinders DFC



Mini guided cylinders DFC

Product range and peripherals overview

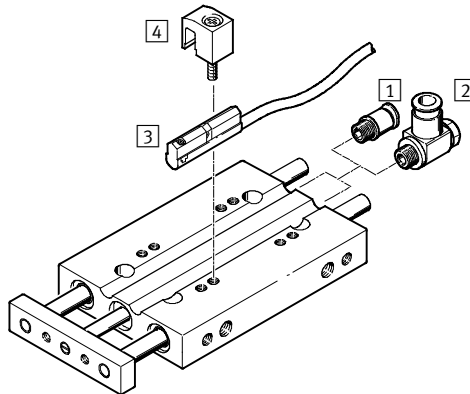
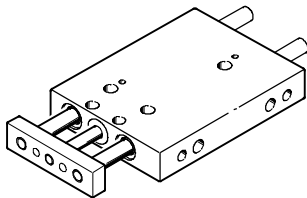
FESTO

| 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

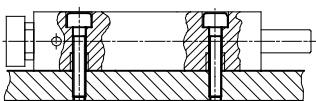
Integrated push-in/threaded fitting



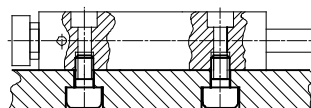
| Accessories | | | | | |
|-------------|---------------------------------|---------------|---------------|----------------|-----------------|
| | Brief description | Piston Ø 4 mm | Piston Ø 6 mm | Piston Ø 10 mm | → Page/Internet |
| 1 | Push-in/threaded fitting QSM | - | ■ | ■ | quick star |
| 2 | One-way flow control valve GRLZ | - | - | ■ | 10 |
| 3 | Proximity sensor SME/SMT-10 | - | ■ | ■ | 10 |
| 4 | Sensor bracket | - | ■ | ■ | - |

Mounting options

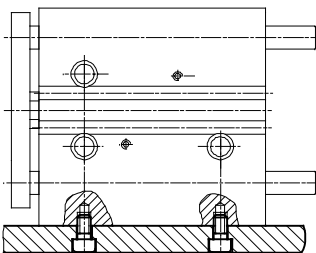
Horizontal mounting from above



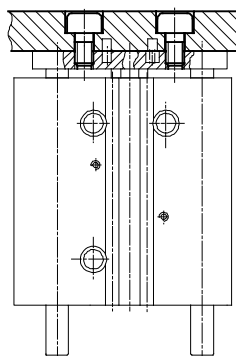
Horizontal mounting from below



Side mounting from below



Yoke mounting



Mini guided cylinders DFC

Type code

DFC – 6 – 20 – P – A – GF

Type

| | |
|---------------|----------------------|
| Double-acting | |
| DFC | Mini guided cylinder |

Piston Ø [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 |

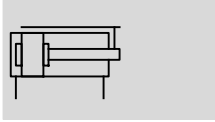
Mini guided cylinders DFC



Technical data

FESTO

Function

DFC-...
without end-position sensing

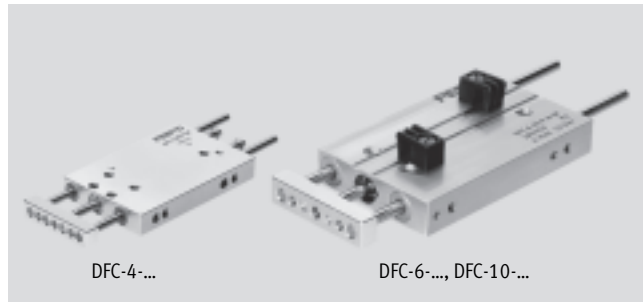
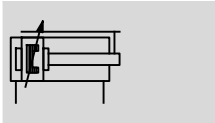


-  - Diameter
4, 6, 10 mm
-  - Stroke length
5 ... 30 mm

-  - www.festo.com

DFC-...-A-...

with end position sensing



| General technical data | | | |
|----------------------------------|--|-----------------------|--|
| Piston \varnothing | 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 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 \varnothing | 4 | 6 | 10 |
| Maximum speed | 1.0 | 1.0 | 1.0 |
| Minimum speed | 0.1 | 0.1 | 0.1 |

| Forces [N] | | | |
|--|-----|------|----|
| Piston \varnothing | 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 cylinders DFC


Technical data

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

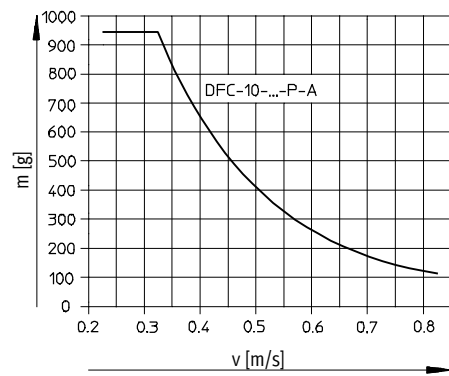
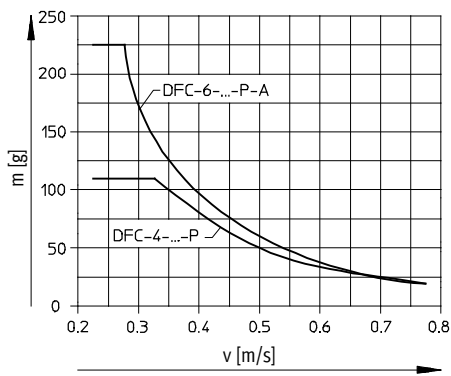
Permissible impact velocity:
$$v_{perm.} = \sqrt{\frac{2 \times E_{perm.}}{m_{dead} + m_{load}}}$$

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.

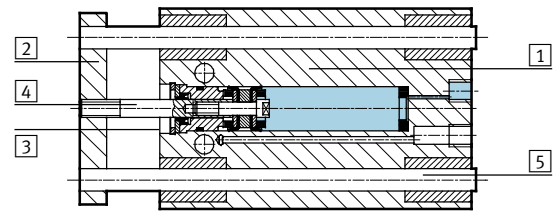
Maximum permissible load m as a function of the impact speed v



| Weights [g] | | | | |
|----------------------------------|-----------------|-----|------|-----|
| Piston Ø | 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 |

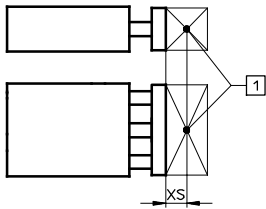
Mini guided cylinders DFC

Technical data

FESTO

Maximum effective load F [N]

Plain-bearing guide GF and recirculating ball bearing guide KF

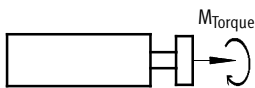


1 Centre of gravity of effective load

| 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]

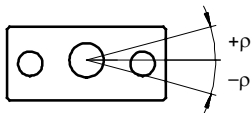
Plain-bearing guide GF and recirculating ball bearing guide KF



| 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

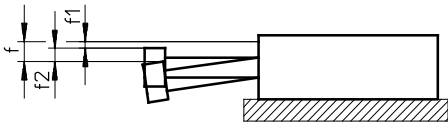


| Piston Ø | | 4 | 6 | 10 |
|---------------------------------------|----|------|------|------|
| In retracted state | | | | |
| Torsional backlash [°] | GF | 0.07 | 0.05 | 0.04 |
| | KF | 0.07 | 0.05 | 0.03 |
| In advanced state with maximum stroke | | | | |
| Torsional backlash [°] | GF | 0.11 | 0.07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

Mini guided cylinders DFC

Technical data

Deflection of piston rod



$$f = f_1 + f_2$$

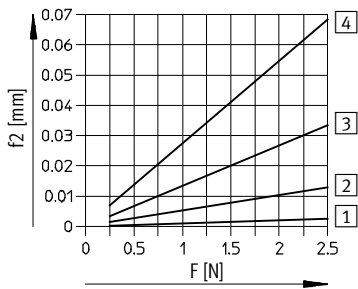
f = Total deflection of piston rod

f₁ = Deflection due to bearing backlash = max. 0.02 mm

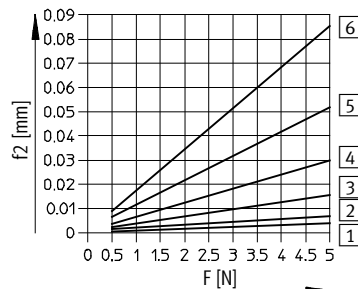
f₂ = Deflection due to lateral force

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

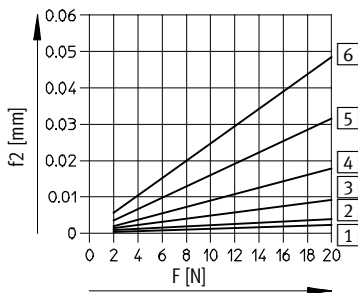
Piston Ø 4 mm



Piston Ø 6 mm



Piston Ø 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

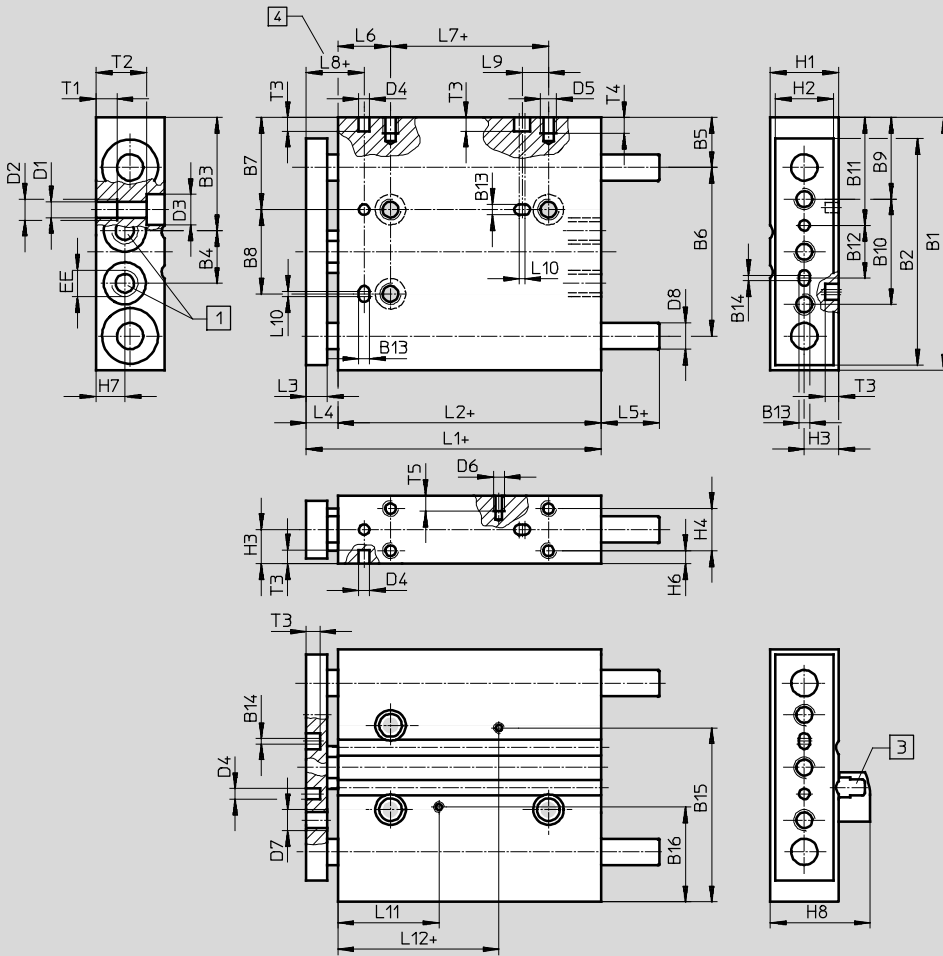
Mini guided cylinders DFC

Technical data

FESTO

Dimensions

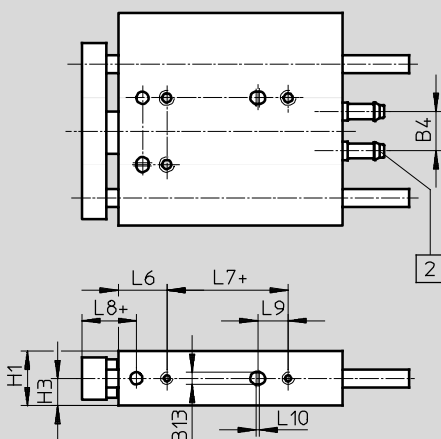
Download CAD data → www.festo.com



- 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 Ø 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 | | 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 cylinders DFC


Accessories

FESTO

| 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 | GR LZ-M5-QS-3-D |
| | | 4 | | 193 154 | GR LZ-M5-QS-4-D |
| | | 6 | | 193 155 | GR LZ-M5-QS-6-D |