

Flat Cylinders DZF - Inch Series

Overview

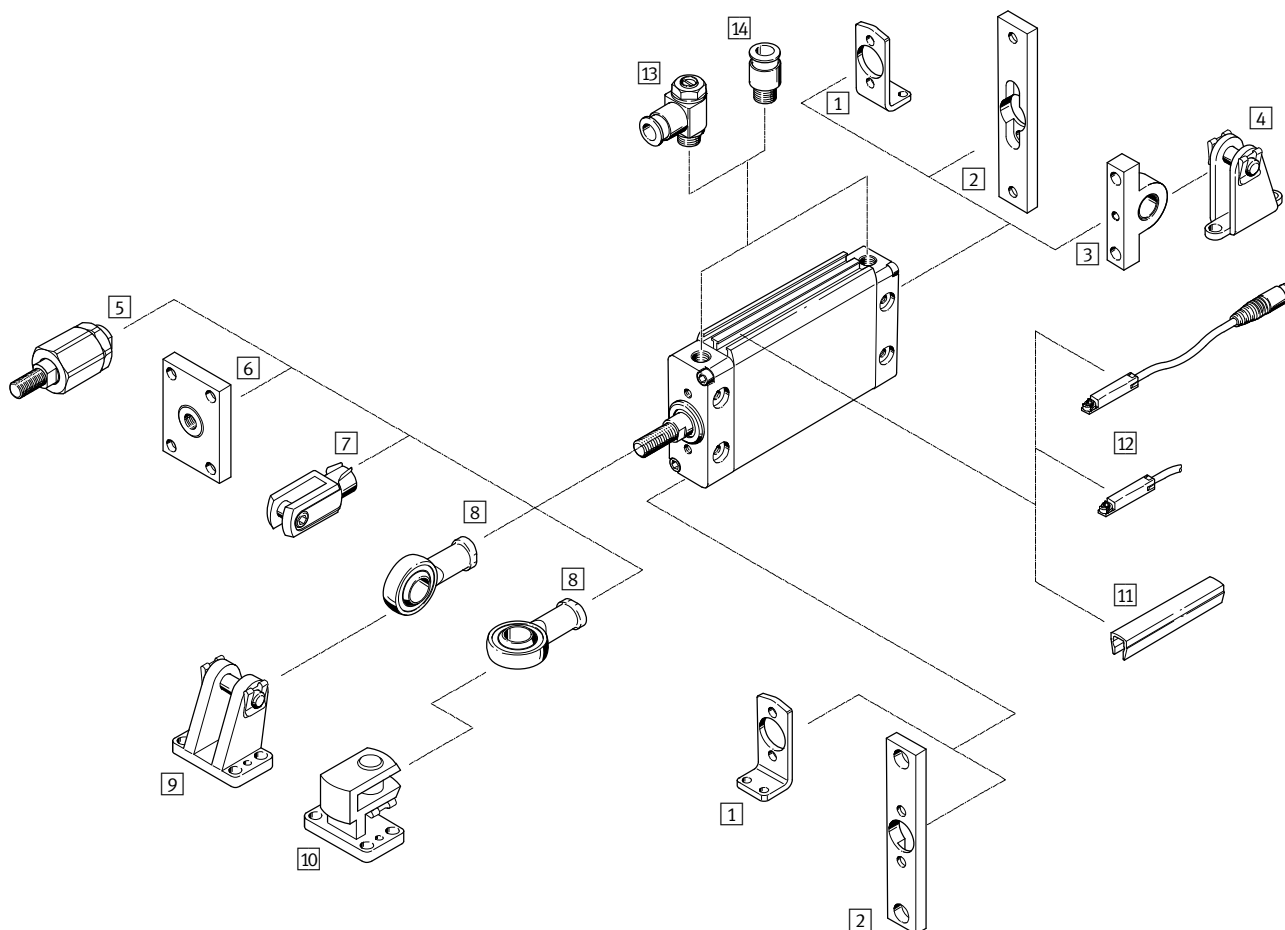


- Non-rotating oval piston
- Piston \varnothing 1/2" to 2-1/2"
- Standard strokes up to 12", variable strokes up to 13"
- Double-acting
- Moment capacity up to 13.3 lbf-in
- Male or female rod thread
- Extensive range of accessories
- Versatile mounting options

| Product range overview | | | | | | | | | |
|-----------------------------|--------|---|------------------------------|----------------------------------|-------------------------|---------------------------------|---------------|-------------|--|
| Function | Design | Type | Piston \varnothing [in] | Standard stroke [in] | Variable stroke [in] | Magnet for position sensing (A) | Piston rod | | Heat resistant seals up to 302 °F (S6) |
| | | | | | | | female thread | male thread | |
| Double-acting flat cylinder | | DZF Single-ended piston rod | 1/2, 11/16, 1 | 1/2, 1, 2, 3, 4, 5, 6, 8 | 0.04 ... 8 | ■ | ■ | ■ | ■ |
| | | | 1-1/4, 1-5/8, 2, 2-1/2 | 1/2, 1, 2, 3, 4, 5, 6, 8, 10, 12 | 0.04... 13 | | | | |
| | | DZF-...-S2 Through piston rod | 1/2, 11/16, 1 | - | 0.04 ... 8 | ■ | ■ | ■ | - |
| | | | 1-1/4, 1-5/8, 2, 2-1/2 | - | 0.04 ... 13 | | | | |
| | | DZF-...-S20 Through, hollow piston rod | 1/2, 11/16, 1 | - | 0.04 ... 8 | ■ | ■ | ■ | - |
| | | | 1-1/4, 1-5/8, 2, 2-1/2 | - | 0.04 ... 13 | | | | |

Flat cylinders DZF - Inch Series

Accessories overview



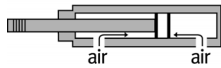
| Mounting attachments and accessories | |
|--------------------------------------|--|
| | Description |
| 1 | Foot mounting HZF for bearing and end caps |
| 2 | Flange mounting FZF for bearing and end caps |
| 3 | Swivel flange SZF for end caps |
| 4 | Clevis foot LZF - |
| 5 | Self-aligning rod coupler FK for compensating radial and angular deviations |
| 6 | Coupling piece KSZ for cylinders with a non-rotating piston rod to compensate for radial deviations |
| 7 | Rod clevis SG permits a swivelling movement of the cylinder in one plane |
| 8 | Rod eye SGS with spherical bearing |
| 9 | Clevis foot LBG - |
| 10 | Right-angle clevis foot LQG - |
| 11 | Slot cover ABP-5-S to protect the sensor cable and keep dirt out of the sensor slots |
| 12 | Proximity sensor SME/SMT-8 can be integrated in the cylinder profile barrel |
| 13 | One-way flow control valve GRLA/GRLZ to regulate speed |
| 14 | Push-in fitting QS for connecting compressed air tubing with standard external diameters |

Flat cylinders DZF - Inch Series



Technical Data

Double-acting



Equivalent Piston Diameter 1/2 ...
2-1/2 inch
Stroke length 0.4... 13 inch

Options:

- Non-rotating elliptical piston
- Male or female rod thread
- Through piston rod (S2)
- Through, hollow piston rod (S20)
- Heat resistant (S6)



| General technical data | | | | | | | | |
|---|--------|---|-------------|------------|------------|-------------|------------|------------|
| Piston Ø | | 1/2 | 11/16 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 |
| Pneumatic connection | | 10-32 UNF | 10-32 UNF | 10-32 UNF | 1/8" NPT | 1/8" NPT | 1/4" NPT | 1/4" NPT |
| Piston rod thread | female | 4-48 UNF | 8-36 UNF | 10-32 UNF | 1/4-28 UNF | 5/16-24 UNF | 3/8-24 UNF | 3/8-24 UNF |
| | male | 10-32 UNF | 5/16-24 UNF | 3/8-24 UNF | 3/8-24 UNF | 1/2-20 UNF | 5/8-18 UNF | 5/8-18 UNF |
| Operating medium | | Filtered compressed air, lubricated or unlubricated | | | | | | |
| Constructional design | | Piston | | | | | | |
| | | Piston rod | | | | | | |
| Cushioning | | Flexible cushioning rings at both ends | | | | | | |
| Magnet for position sensing ¹⁾ | | Standard | | | | | | |

1) Position sensing via magnetic proximity sensor (ordered separately, see accessories).

| Operating pressure [psi] | | | | | | | | |
|--------------------------|--|------------|------------|---|-------|-------|---|-------|
| Piston Ø | | 1/2 | 11/16 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 |
| | | 23 ... 145 | 15 ... 145 | | | | | |

| Ambient conditions | | |
|--|---------------|------------|
| Variant | Basic version | S6 |
| Ambient temperature ¹⁾ [°F] | 0 ... +176 | 0 ... +302 |
| Corrosion resistance class CRC ²⁾ | 2 | 2 |

1) Observe operating range of proximity sensors.
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.

| Forces [lbf] and impact energy [ft-lbf] | | | | | | | | |
|---|--------|------|-------|------|-------|-------|-------|-------|
| Piston Ø | | 1/2 | 11/16 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 |
| Theoretical force at 90 psi, extending | | 15.2 | 36.3 | 66.1 | 108.2 | 168.9 | 263.9 | 418.9 |
| | S2/S20 | 11.4 | 27.3 | 55.3 | 93.0 | 141.8 | 221.8 | 376.8 |
| Theoretical force at 90 psi, retracting | | 11.4 | 27.3 | 55.3 | 93.0 | 141.8 | 221.8 | 376.8 |
| | S2/S20 | 11.4 | 27.3 | 55.3 | 93.0 | 141.8 | 221.8 | 376.8 |
| Max. impact energy at endpositions | | 0.07 | 0.07 | 0.07 | 0.30 | 0.38 | 0.47 | 0.52 |

| Torque [lbf-in] and torsional backlash [°] | | | | | | | | |
|---|--|------|-------|------|-------|-------|------|-------|
| Piston Ø | | 1/2 | 11/16 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 |
| Max. torque at the piston rod ¹⁾ | | 0.9 | 1.8 | 4.4 | 7.1 | 8.9 | 10.6 | 13.3 |
| Max. torsional backlash of the piston rod | | ±2.5 | ±1.2 | ±1.0 | ±0.8 | ±0.6 | ±0.5 | ±0.4 |

1) The max. torque must also be observed when fitting mounting attachments to the piston rod.

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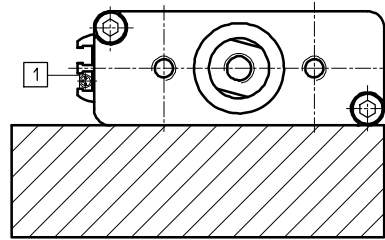
Data sheet



| Weights [oz] | | | | | | | |
|-------------------------------------|-----|-------|-----|-------|-------|------|-------|
| Piston \varnothing | 1/2 | 11/16 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 |
| Product weight at 0 inch stroke | 3.4 | 3.8 | 5.9 | 9.6 | 16.9 | 30.2 | 48.7 |
| Additional weight per 1 inch stroke | 0.8 | 1.2 | 1.6 | 2.2 | 3.6 | 5.7 | 8.2 |

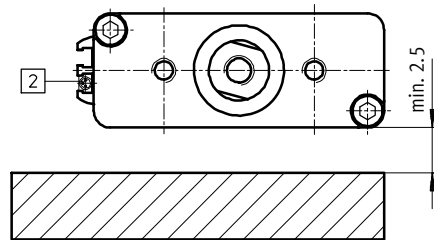
Safety clearances for reliable switching function

Cylinders mounted to ferritic surfaces



1 SMT-8...

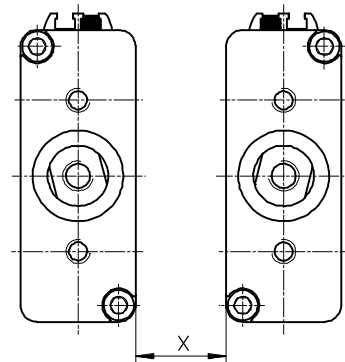
If a proximity sensor SME-8 is used, with piston \varnothing 1/2 to 1-1/4 inch, a minimum clearance to the ferritic component of 2.5 inch must be maintained. SMT-8 can be used regardless of clearance.



2 SME-8...

Cylinder to cylinder spacing

Safety clearance X must be maintained when connecting cylinders together in series, as the stray fields of the switching magnets can result in incorrect switching.



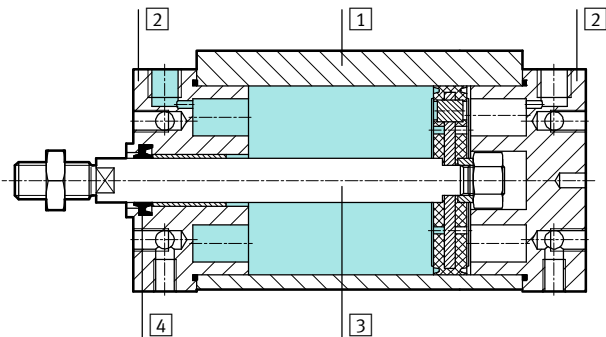
| Piston \varnothing | | 1/2 | 11/16 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 |
|-------------------------|----------|-----|-------|---|-------|-------|---|-------|
| Min. safety clearance X | SMT-8... | 1.4 | | | 1.0 | 1.8 | | 3.1 |
| [in] | SME-8... | 2.0 | | | 1.8 | 2.6 | | 2.0 |

Flat cylinders DZF - Inch Series

Data sheet

Materials

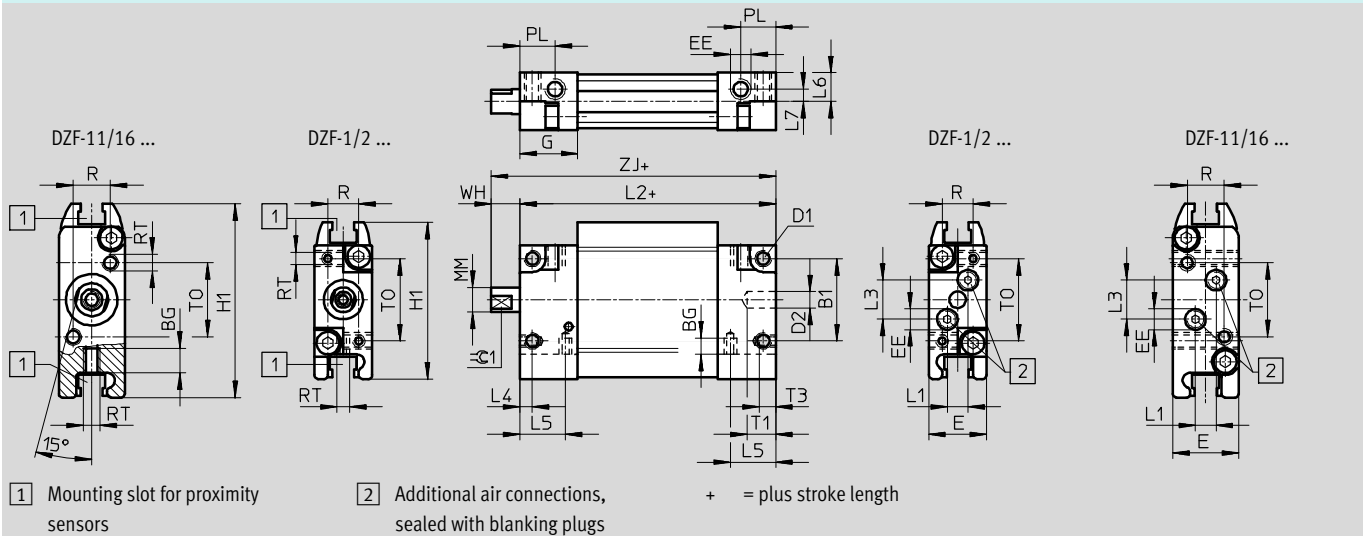
Sectional view



| Cylinder | Basic version | S6 |
|-------------------|--|--|
| 1 Cylinder barrel | Wrought aluminum alloy, anodized | Wrought aluminum alloy, anodized |
| 2 Bearing end cap | Wrought aluminum alloy | Wrought aluminum alloy |
| 3 Piston rod | $\varnothing 1/2 \dots 1$ High-alloy stainless steel $\varnothing 1-1/4 \dots 2-1/2$ High-alloy steel | High-alloy stainless steel High-alloy steel |
| 4 Dynamic seals | Polyurethane | Fluorocarbon rubber |

Dimensions – Basic version

Piston $\varnothing 1/2, 11/16$



| \varnothing [in] | B1 | BG | D1 | D2 \varnothing | E | EE | G | H1 | L1 | L2 | L3 | L4 | L5 |
|-----------------------|-----|------|----------|---------------------|-------|-----------|-----|-----|-----|-----|------|------|-----|
| 1/2 | 0.8 | 0.15 | 8-32 UNC | 0.15 | 0.551 | 10-32 UNF | 0.6 | 1.5 | 0.2 | 2.4 | 0.37 | 0.12 | 0.4 |
| 11/16 | 0.8 | 0.24 | 8-32 UNC | 0.15 | 0.551 | 10-32 UNF | 0.6 | 1.9 | 0.2 | 2.4 | 0.37 | 0.14 | 0.2 |

| \varnothing [in] | L6 | L7 | MM \varnothing | PL | R | RT | T1 | T3 | T0 | WH | ZJ | $\approx \varnothing 1$ [mm] |
|-----------------------|------|------|---------------------|------|------|----------|------|------|-----|------|-----|---------------------------------|
| 1/2 | 0.28 | 0.12 | 0.24 | 0.33 | 0.30 | 4-48 UNF | 0.28 | 0.16 | 0.8 | 0.28 | 2.7 | 5 |
| 11/16 | - | - | 0.31 | 0.33 | 0.35 | 8-32 UNC | 0.28 | 0.24 | 0.7 | 0.28 | 2.7 | 7 |

Dimensions are in inches, unless otherwise noted.

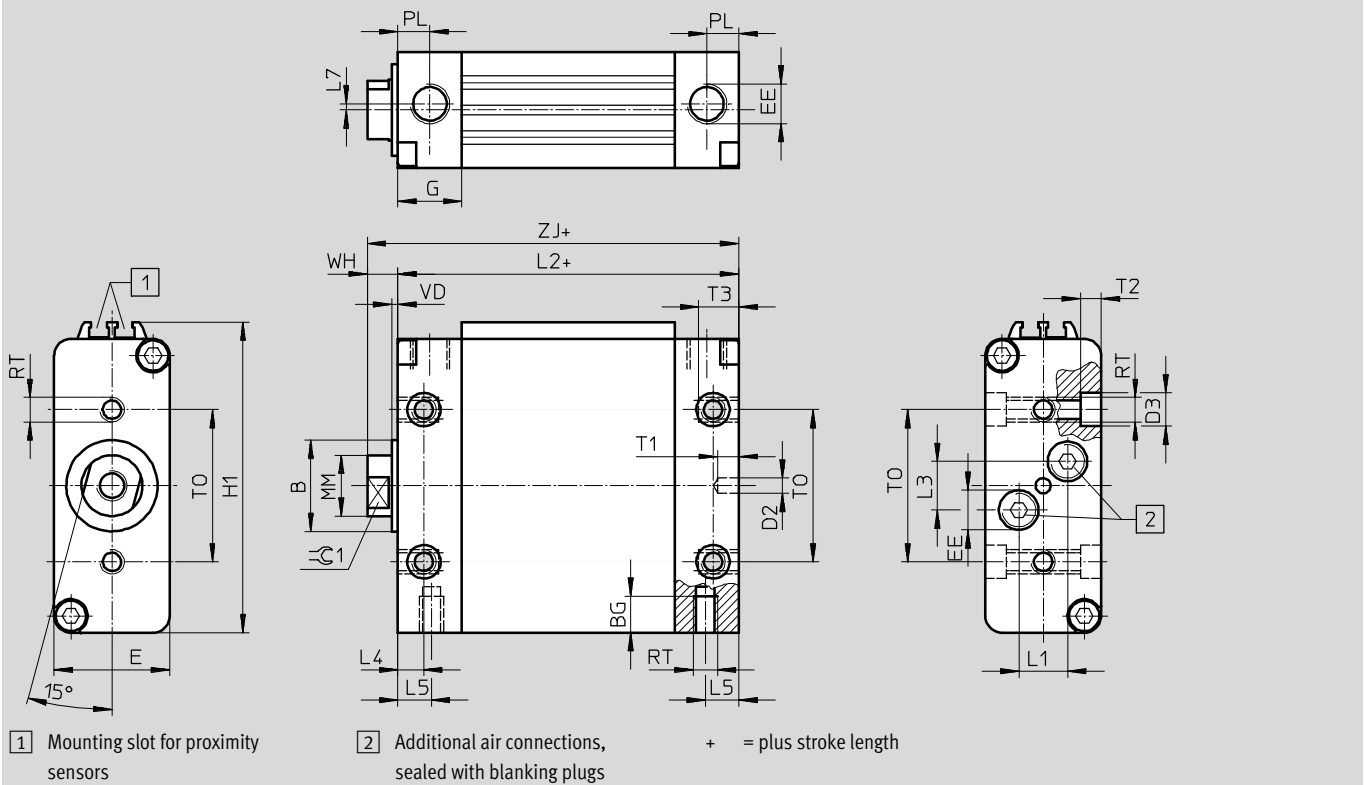
Flat cylinders DZF - Inch Series

Data sheet

FESTO

Dimensions – Basic version

Piston \varnothing 1 ...2-1/2



| \varnothing [in] | B \varnothing | BG | D2 \varnothing | D3 \varnothing | E | EE | G | H1 | L1 | L2 | L3 | L4 |
|-----------------------|--------------------|-----|---------------------|---------------------|-----|-----------|-----|-----|-----|-----|-----|-----|
| 1 | 0.6 | 0.3 | 0.2 | 0.3 | 0.8 | 10-32 UNF | 0.5 | 2.2 | 0.2 | 2.4 | 0.4 | 0.2 |
| 1-1/4 | 0.8 | 0.4 | 0.2 | 0.4 | 0.9 | 1/8" NPT | 0.7 | 2.6 | 0.3 | 2.8 | 0.6 | 0.3 |
| 1-5/8 | 1.0 | 0.4 | 0.2 | 0.4 | 1.2 | 1/8" NPT | 0.7 | 3.2 | 0.3 | 3.0 | 0.6 | 0.3 |
| 2 | 1.2 | 0.5 | 0.2 | 0.4 | 1.5 | 1/4" NPT | 0.8 | 4.0 | 0.6 | 3.2 | 0.6 | 0.3 |
| 2-1/2 | 1.2 | 0.6 | 0.2 | 0.6 | 2.0 | 1/4" NPT | 0.8 | 5.0 | 0.7 | 3.2 | 0.8 | 0.3 |

| \varnothing [in] | L5 | L7 | MM \varnothing | PL | RT | T1 | T2 | T3 | T0 | VD | WH | ZJ | \approx C1 [mm] |
|-----------------------|-----|-----|---------------------|-----|-------------|-----|-----|-----|-----|-----|-----|-----|----------------------|
| 1 | 0.2 | - | 0.4 | 0.2 | 10-24 UNC | 0.3 | 0.2 | 0.3 | 1.0 | 0.1 | 0.3 | 2.8 | 9 |
| 1-1/4 | 0.3 | 0.1 | 0.5 | 0.3 | 1/4-20 UNC | 0.3 | 0.2 | 0.4 | 1.3 | 0.1 | 0.3 | 3.1 | 10 |
| 1-5/8 | 0.3 | - | 0.6 | 0.3 | 1/4-20 UNC | 0.3 | 0.2 | 0.4 | 1.6 | 0.1 | 0.4 | 3.3 | 13 |
| 2 | 0.3 | - | 0.8 | 0.4 | 5/16-18 UNC | 0.3 | 0.2 | 0.5 | 2.0 | 0.1 | 0.4 | 3.6 | 17 |
| 2-1/2 | 0.3 | - | 0.8 | 0.4 | 3/8-16 UNC | 0.3 | 0.2 | 0.6 | 2.4 | 0.1 | 0.4 | 3.6 | 17 |

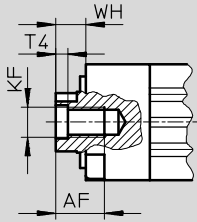
Dimensions are in inches, unless otherwise noted.

Flat cylinders DZF - Inch Series

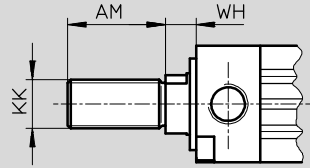
Data sheet

Dimensions – Options

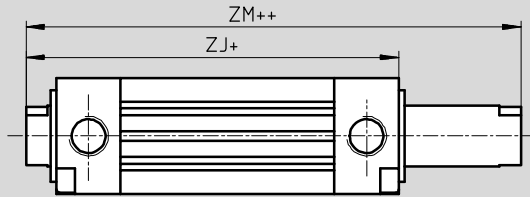
Basic version with female thread



Basic version with male thread

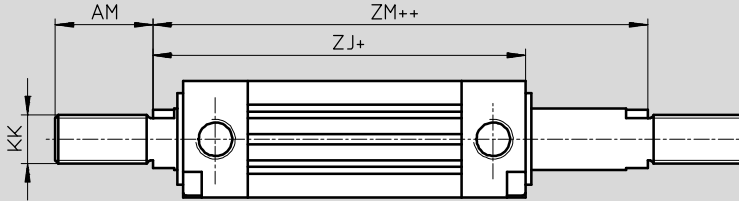


S2 – Through piston rod with female thread



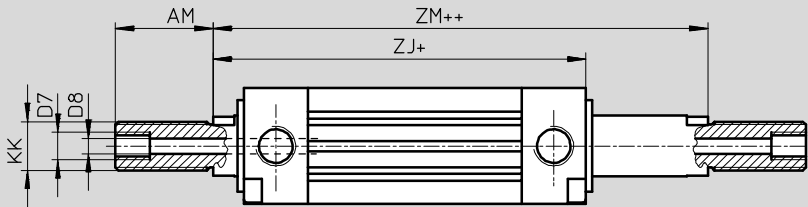
+ = plus stroke length
++ = plus 2x stroke length

S2 – Through piston rod with male thread



+ = plus stroke length
++ = plus 2x stroke length

S20 – Through, hollow piston rod



+ = plus stroke length
++ = plus 2x stroke length

| ∅ [in] | AF | AM | D7 | D8 ∅ | KF | KK | T4 | WH | ZJ | ZM |
|-----------|-----|-----|------------|---------|-------------|-------------|------|-----|-----|-----|
| 1/2 | 0.3 | 0.6 | - | 0.07 | 4-48 UNF | 10-32 UNF | 0.06 | 0.3 | 2.7 | 3.0 |
| 11/16 | 0.4 | 0.8 | - | 0.11 | 8-36 UNF | 5/16-24 UNF | 0.06 | 0.3 | 2.7 | 3.0 |
| 1 | 0.5 | 0.9 | - | 0.15 | 10-32 UNF | 3/8-24 UNF | 0.08 | 0.3 | 2.8 | 3.1 |
| 1-1/4 | 0.6 | 0.9 | - | 0.18 | 1/4-28 UNF | 3/8-24 UNF | 0.10 | 0.3 | 3.1 | 3.5 |
| 1-5/8 | 0.6 | 0.9 | - | 0.2 | 5/16-24 UNF | 1/2-20 UNF | 0.13 | 0.4 | 3.3 | 3.7 |
| 2 | 0.8 | 1.3 | 1/4-18 NPT | 0.3 | 3/8-24 UNF | 5/8-18 UNF | 0.19 | 0.4 | 3.6 | 4.0 |
| 2-1/2 | 0.8 | 1.3 | 1/4-18 NPT | 0.3 | 3/8-24 UNF | 5/8-18 UNF | 0.19 | 0.4 | 3.6 | 4.0 |

Dimensions are in inches, unless otherwise noted.

Flat cylinders DZF - Inch Series

Ordering Data



| M Mandatory data | | | | | | O Options | |
|------------------|--|-------------|-------------------|------------|-----------------------------|--------------------|-----------------------|
| Function | Piston Ø | Stroke | Piston rod thread | Cushioning | Magnet for position sensing | Type of piston rod | Temperature Resistant |
| DZF | 1/2 1 1/16 1 1 1/4 1 5/8 2 2 1/2 | 0.40 ... 13 | A | P | A | S2 S20 | S6 |
| DZF | - 1 1/4 | - 10 | - | - P | - A | - S6 | |

| Ordering table | | | | | | | | | | | |
|-----------------------------|--|--------|---|-------|-------|---|-------|------------|-------------|------------|-----|
| Size | 1/2 | 1 1/16 | 1 | 1 1/4 | 1 5/8 | 2 | 2 1/2 | Conditions | Code | Enter code | |
| M Function | Flat, double-acting cylinder | | | | | | | | DZF | | DZF |
| Piston Ø [in] | 1/2 | 1 1/16 | 1 | 1 1/4 | 1 5/8 | 2 | 2 1/2 | | -... | | |
| Stroke [in] | 0.4 ... 13 | | | | | | | | -... | | |
| Piston rod thread | Female thread | | | | | | | | - | | |
| | Male thread | | | | | | | | -A | | |
| Cushioning | Flexible cushioning rings at both ends | | | | | | | | -P | | -P |
| Magnet for position sensing | For use with magnetic proximity sensor | | | | | | | | -A | | -A |
| O Type of piston rod | Through piston rod | | | | | | | | -S2 | | |
| | Through, hollow piston rod | | | | | | | | -S20 | | |
| Temperature-resistant | Heat-resistant seals up to max. 302 °F | | | | | | | | -S6 | | |

1 Not in combination with S2 or S20

Transfer order code

DZF - - - - **P** - **A** -

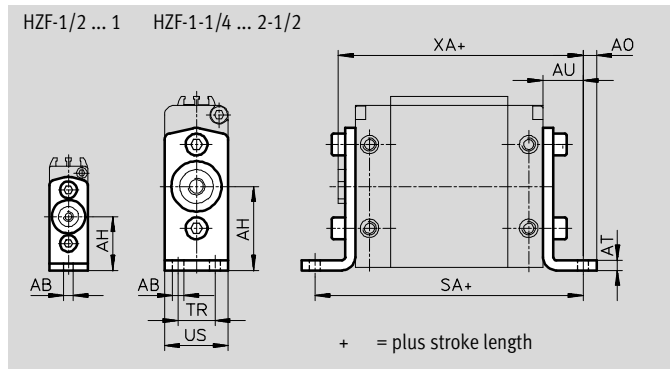
Flat cylinders DZF - Inch Series

Accessories



Foot mounting HZF

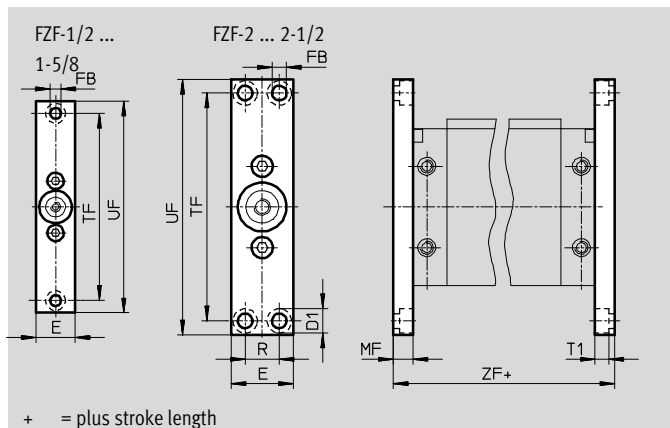
Material:
Steel



| Dimensions and ordering data | | | | | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|----------------|----------|------------|
| For \varnothing [in] | AB \varnothing | AH | AO | AT | AU | SA | TR | US | XA | Weight [oz] | Part No. | Type |
| 1/2 | 0.18 | 1.0 | 0.2 | 0.1 | 0.5 | 3.5 | - | 0.6 | 3.2 | 0.28 | 546560 | HZF-1/2" |
| 11/16 | 0.22 | 1.1 | 0.2 | 0.1 | 0.7 | 3.8 | - | 0.6 | 3.4 | 0.35 | 546561 | HZF-11/16" |
| 1 | 0.22 | 1.1 | 0.3 | 0.1 | 0.6 | 3.7 | - | 0.8 | 3.4 | 0.74 | 546562 | HZF-1" |
| 1-1/4 | 0.22 | 1.3 | 0.2 | 0.1 | 0.7 | 4.3 | 0.5 | 0.9 | 3.9 | 0.95 | 546563 | HZF-1 1/4" |
| 1-5/8 | 0.22 | 1.6 | 0.3 | 0.2 | 0.8 | 4.6 | 0.6 | 1.2 | 4.1 | 2.01 | 546564 | HZF-1 5/8" |
| 2 | 0.26 | 2.0 | 0.3 | 0.2 | 0.9 | 5.1 | 0.9 | 1.5 | 4.6 | 3.42 | 546565 | HZF-2" |
| 2-1/2 | 0.35 | 2.5 | 0.4 | 0.2 | 1.1 | 5.4 | 1.2 | 2.0 | 4.7 | 5.89 | 546566 | HZF-2 1/2" |

Flange mounting FZF

Material:
Wrought aluminum alloy



| Dimensions and ordering data | | | | | | | | | | | | |
|------------------------------|---------------------|-----|---------------------|-----|-----|------|-----|-----|-----|----------------|----------|------------|
| For \varnothing [in] | D1 \varnothing | E | FB \varnothing | MF | R | T1 | TF | UF | ZF | Weight [oz] | Part No. | Type |
| 1/2 | 0.3 | 0.6 | 0.18 | 0.3 | - | 0.18 | 3.0 | 3.5 | 3.1 | 0.71 | 546553 | FZF-1/2" |
| 11/16 | 0.3 | 0.6 | 0.18 | 0.3 | - | 0.18 | 3.1 | 3.7 | 3.1 | 0.85 | 546554 | FZF-11/16" |
| 1 | 0.4 | 0.8 | 0.22 | 0.4 | - | 0.22 | 3.9 | 4.4 | 3.2 | 1.76 | 546555 | FZF-1" |
| 1-1/4 | 0.4 | 0.9 | 0.26 | 0.4 | - | 0.26 | 4.5 | 5.1 | 3.6 | 2.40 | 546556 | FZF-1 1/4" |
| 1-5/8 | 0.4 | 1.2 | 0.26 | 0.4 | - | 0.25 | 5.2 | 5.7 | 3.8 | 3.46 | 546557 | FZF-1 5/8" |
| 2 | 0.6 | 1.5 | 0.35 | 0.5 | 0.8 | 0.33 | 5.5 | 6.2 | 4.2 | 5.19 | 546558 | FZF-2" |
| 2-1/2 | 0.6 | 2.0 | 0.35 | 0.6 | 1.3 | 0.33 | 5.5 | 6.2 | 4.4 | 9.14 | 546559 | FZF-2 1/2" |

Dimensions are in inches, unless otherwise noted.

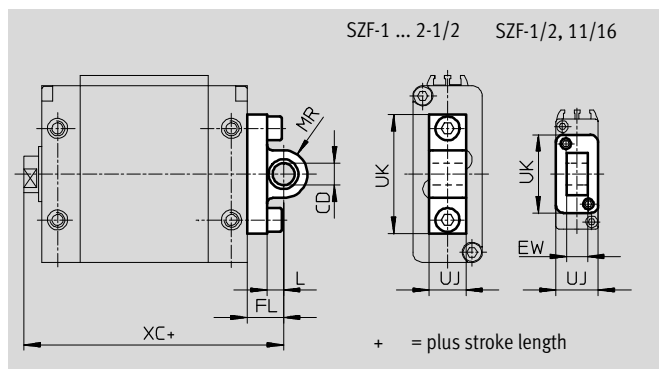
Flat cylinders DZF - Inch Series

Accessories



Swivel flange SZF

Material:
Corrosion resistant cast steel

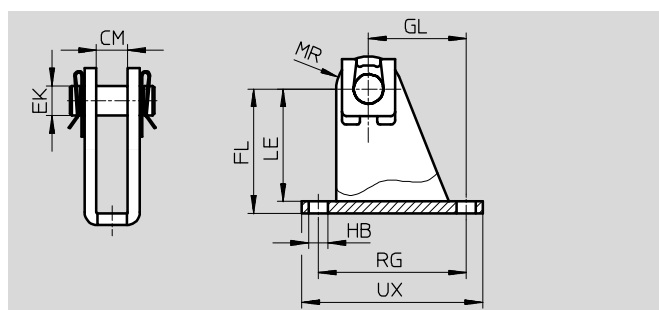


| Dimensions and ordering data | | | | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-----|-----|-------------------|----------|------------|
| For \varnothing [in] | CD \varnothing | EW | FL | L | MR | UJ | UK | XC | CRC ¹⁾ | Part No. | Type |
| 1/2 | 0.3 | 0.3 | 0.6 | 0.5 | 0.3 | 0.6 | 1.0 | 3.3 | 2 | 546567 | SZF-1/2" |
| 11/16 | 0.3 | 0.3 | 0.7 | 0.6 | 0.3 | 0.6 | 1.0 | 3.4 | 2 | 546568 | SZF-11/16" |
| 1 | 0.3 | - | 0.6 | 0.3 | 0.3 | 0.4 | 1.5 | 3.3 | 2 | 546569 | SZF-1" |
| 1-1/4 | 0.4 | - | 0.6 | 0.2 | 0.4 | 0.4 | 1.7 | 3.7 | 2 | 546570 | SZF-1 1/4" |
| 1-5/8 | 0.5 | - | 0.7 | 0.4 | 0.5 | 0.4 | 2.0 | 4.1 | 2 | 546571 | SZF-1 5/8" |
| 2 | 0.5 | - | 0.8 | 0.4 | 0.5 | 0.8 | 2.6 | 4.4 | 2 | 546572 | SZF-2" |
| 2-1/2 | 0.6 | - | 0.9 | 0.5 | 0.7 | 1.0 | 3.1 | 4.6 | 2 | 546573 | SZF-2 1/2" |

1) Corrosion resistance class 2 according to Festo standard 940 070
Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Clevis foot LZF

Material:
Steel



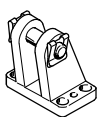
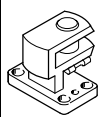
| Dimensions and ordering data | | | | | | | | | | | |
|------------------------------|------|---------------------|-----|-----|---------------------|-----|-----|-----|-----|----------|-----------|
| For \varnothing [in] | CM | EK \varnothing | FL | GL | HB \varnothing | LE | MR | RG | UX | Part No. | Type |
| 1/2 | 0.28 | 0.3 | 1.3 | 0.7 | 0.2 | 1.1 | 0.3 | 1.2 | 1.5 | 163962 | LZF-12/18 |
| 11/16 | 0.28 | 0.3 | 1.3 | 0.7 | 0.2 | 1.1 | 0.3 | 1.2 | 1.5 | 163962 | LZF-12/18 |
| 1 | 0.36 | 0.3 | 1.4 | 1.0 | 0.2 | 1.3 | 0.4 | 1.6 | 1.9 | 163963 | LZF-25 |
| 1-1/4 | 0.42 | 0.4 | 1.7 | 1.3 | 0.3 | 1.5 | 0.4 | 2.0 | 2.4 | 163964 | LZF-32 |
| 1-5/8 | 0.42 | 0.5 | 2.0 | 1.2 | 0.3 | 1.9 | 0.6 | 2.0 | 2.4 | 163965 | LZF-40 |
| 2 | 0.79 | 0.5 | 2.2 | 0.9 | 0.4 | 2.0 | 0.6 | 1.2 | 1.8 | 163966 | LZF-50 |
| 2-1/2 | 0.99 | 0.6 | 2.7 | 1.3 | 0.4 | 2.5 | 0.7 | 1.6 | 2.4 | 163967 | LZF-63 |


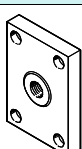


Dimensions are in inches, unless otherwise noted.



Flat cylinders DZF - Inch Series




Accessories

FESTO

| Ordering data – Mounting attachments | | | | | | | |
|---|------------|----------|--------|---|------------|----------|--------|
| Designation | For Ø [in] | Part No. | Type | Designation | For Ø [in] | Part No. | Type |
| Clevis foot LBG | | | | Right-angle clevis foot LQG | | | |
|  | 1-1/4 | 31761 | LBG-32 |  | 1-1/4 | 31768 | LQG-32 |
| | 1-5/8 | 31762 | LBG-40 | | 1-5/8 | 31769 | LQG-40 |
| | 2 | 31763 | LBG-50 | | 2 | 31770 | LQG-50 |
| | 2-1/2 | 31764 | LBG-63 | | 2-1/2 | 31771 | LQG-63 |

| Ordering data – Piston rod attachments | | | | | | | |
|---|------------|----------|--------------|---|------------|----------|----------------|
| Designation | For Ø [in] | Part No. | Type | Designation | For Ø [in] | Part No. | Type |
| Rod eye SGS | | | | Coupling piece KSZ | | | |
|  | 1/2 | 532694 | SGS-10-32 |  | 1/2 | – | |
| | 11/16 | 13002871 | SGS-5/16-24 | | 11/16 | | |
| | 1, 1-1/4 | 532696 | SGS-3/8-24 | | 1, 1-1/4 | 36129 | KSZ-3/8-24-UNF |
| | 1-5/8 | 532697 | SGS-1/2-20 | | 1-5/8 | 36130 | KSZ-1/2-20-UNF |
| | 2, 2-1/2 | 532698 | SGS-5/8-18 | | 2, 2-1/2 | 36131 | KSZ-5/8-18-UNF |
| Rod clevis SG | | | | Self-aligning rod coupler FK | | | |
|  | 1/2 | 13005667 | SG-10-32 |  | 1/2 | 532703 | FK-10-32 |
| | 11/16 | 11129 | SG-5/16"-24 | | 11/16 | 532704 | FK-5/16-24 |
| | 1, 1-1/4 | 546540 | SG-3/8"-24-B | | 1, 1-1/4 | 532705 | FK-3/8-24 |
| | 1-5/8 | 546545 | SG-1/2-20-B | | 1-5/8 | 532706 | FK-1/2-20 |
| | 2, 2-1/2 | 546575 | SG-5/8-18-B | | 2, 2-1/2 | 532707 | FK-5/8-18 |

| Ordering data – Proximity sensors for T-slot, magneto-resistive | | | | | | Technical data → Internet: smt | |
|---|--|------------------|-----------------------|------------------|---------------------------|--------------------------------|--|
| | Type of mounting | Switch output | Electrical connection | Cable length [m] | Part No. | Type | |
| N/O contact | | | | | | | |
|  | Insertable in the slot from above, flush with cylinder profile, short design | PNP | Cable, 3-wire | 2.5 | 574335 | SMT-8M-A-PS-24V-E-2,5-OE | |
| | | | Plug M8x1, 3-pin | 0.3 | 574334 | SMT-8M-A-PS-24V-E-0,3-M8D | |
| | | NPN | Plug M12x1, 3-pin | 0.3 | 574337 | SMT-8M-A-PS-24V-E-0,3-M12 | |
| | | | Cable, 3-wire | 2.5 | 574338 | SMT-8M-A-NS-24V-E-2,5-OE | |
| | | Plug M8x1, 3-pin | 0.3 | 574339 | SMT-8M-A-NS-24V-E-0,3-M8D | | |
| N/C contact | | | | | | | |
|  | Insertable in the slot from above, flush with cylinder profile, short design | PNP | Cable, 3-wire | 7.5 | 574340 | SMT-8M-A-PO-24V-E-7,5-OE | |

| Ordering data – Proximity sensors for T-slot, magnetic reed | | | | | | Technical data → Internet: sme | |
|---|--|---------------|-----------------------|------------------|----------|--------------------------------|--|
| | Type of mounting | Switch output | Electrical connection | Cable length [m] | Part No. | Type | |
| N/O contact | | | | | | | |
|  | Insertable in the slot from above, flush with cylinder profile | Contacting | Cable, 3-wire | 2.5 | 543 862 | SME-8M-DS-24V-K-2,5-OE | |
| | | | Cable, 2-wire | 5.0 | 543 863 | SME-8M-DS-24V-K-5,0-OE | |
| | | | Plug M8x1, 3-pin | 2.5 | 543 872 | SME-8M-ZS-24V-K-2,5-OE | |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | Contacting | Cable, 3-wire | 0.3 | 543 861 | SME-8M-DS-24V-K-0,3-M8D | |
| | | | Plug M8x1, 3-pin | 2.5 | 150 855 | SME-8-K-LED-24 | |
| | | | Plug M8x1, 3-pin | 0.3 | 150 857 | SME-8-S-LED-24 | |
| N/C contact | | | | | | | |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | Contacting | Cable, 3-wire | 7.5 | 160 251 | SME-8-0-K-LED-24 | |

Flat cylinders DZF - Inch Series

Accessories



| Ordering data – Connecting cables | | | Technical data → www.festo.com/catalogue/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 |
| | | | 5.0 | 541334 | NEBU-M8G3-K-5-LE3 |
| | Straight socket, M12x1, 5-pin | Cable, open end, 3-wire | 2.5 | 541363 | NEBU-M12G5-K-2.5-LE3 |
| | | | 5.0 | 541364 | NEBU-M12G5-K-5-LE3 |
| | Angled socket, M8x1, 3-pin | Cable, open end, 3-wire | 2.5 | 541338 | NEBU-M8W3-K-2.5-LE3 |
| | | | 5.0 | 541341 | NEBU-M8W3-K-5-LE3 |
| | Angled socket, M12x1, 5-pin | Cable, open end, 3-wire | 2.5 | 541367 | NEBU-M12W5-K-2.5-LE3 |
| | | | 5.0 | 541370 | NEBU-M12W5-K-5-LE3 |

| Ordering data – Slot cover for T-slot | | | Part No. | Type |
|---------------------------------------|---------------------|-------------|----------|---------|
| | Mounting | Length [ft] | | |
| | inserted from above | 2x 0.5 | 151680 | ABP-5-S |

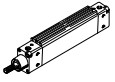
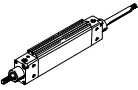
| Ordering data – One-way flow control valves | | | | | |
|---|------------|---------------|----------|--------------------------|------------------------|
| | Connection | | Part No. | Type | |
| | Thread | For tubing OD | | | |
| For exhaust air | | | | | |
| | 10-32 UNF | 5/32 | 165008 | GRLA-10-32-UNF-QS-5/32-U | |
| | | 1/4 | 192753 | GRLA-10-32-UNF-QS-1/4-U | |
| | 1/8" NPT | 5/32 | 3/16 | 165009 | GRLA-1/8-NPT-QS-5/32-U |
| | | | 1/4 | 190941 | GRLA-1/8-NPT-QS-3/16-U |
| | | 1/4 | 5/16 | 165010 | GRLA-1/8-NPT-QS-1/4-U |
| | | | 3/16 | 165013 | GRLA-1/8-NPT-QS-5/16-U |
| | 1/4" NPT | 3/16 | 1/4 | 190944 | GRLA-1/4-NPT-QS-3/16-U |
| | | | 5/16 | 165011 | GRLA-1/4-NPT-QS-1/4-U |
| | | 1/4 | 3/8 | 165014 | GRLA-1/4-NPT-QS-5/16-U |
| | | | 1/2 | 190947 | GRLA-1/4-NPT-QS-3/8-U |
| | 3/8" NPT | 1/4 | 5/16 | 165012 | GRLA-3/8-NPT-QS-1/4-U |
| | | | 3/8 | 165015 | GRLA-3/8-NPT-QS-5/16-U |
| 3/8 | | 1/2 | 190950 | GRLA-3/8-NPT-QS-3/8-U | |
| | | 1/2 | 190951 | GRLA-3/8-NPT-QS-1/2-U | |
| For supply air | | | | | |
| | 10-32 UNF | - | 151576 | GRLZ-10-UNF-B | |
| | | | 151579 | GRLZ-10-UNF-RS-B | |
| | | 3/16 | 151577 | GRLZ-10-UNF-3/16-B | |
| | | | 151578 | GRLZ-10-UNF-1/4-B | |
| | 1/8" NPT | - | 151561 | GRLZ-1/8-NPT-B | |
| | | | 151564 | GRLZ-1/8-NPT-RS-B | |
| | | 1/4 | 151562 | GRLZ-1/8-NPT-1/4-B | |

Flat Cylinders DZH - Inch Series

Overview



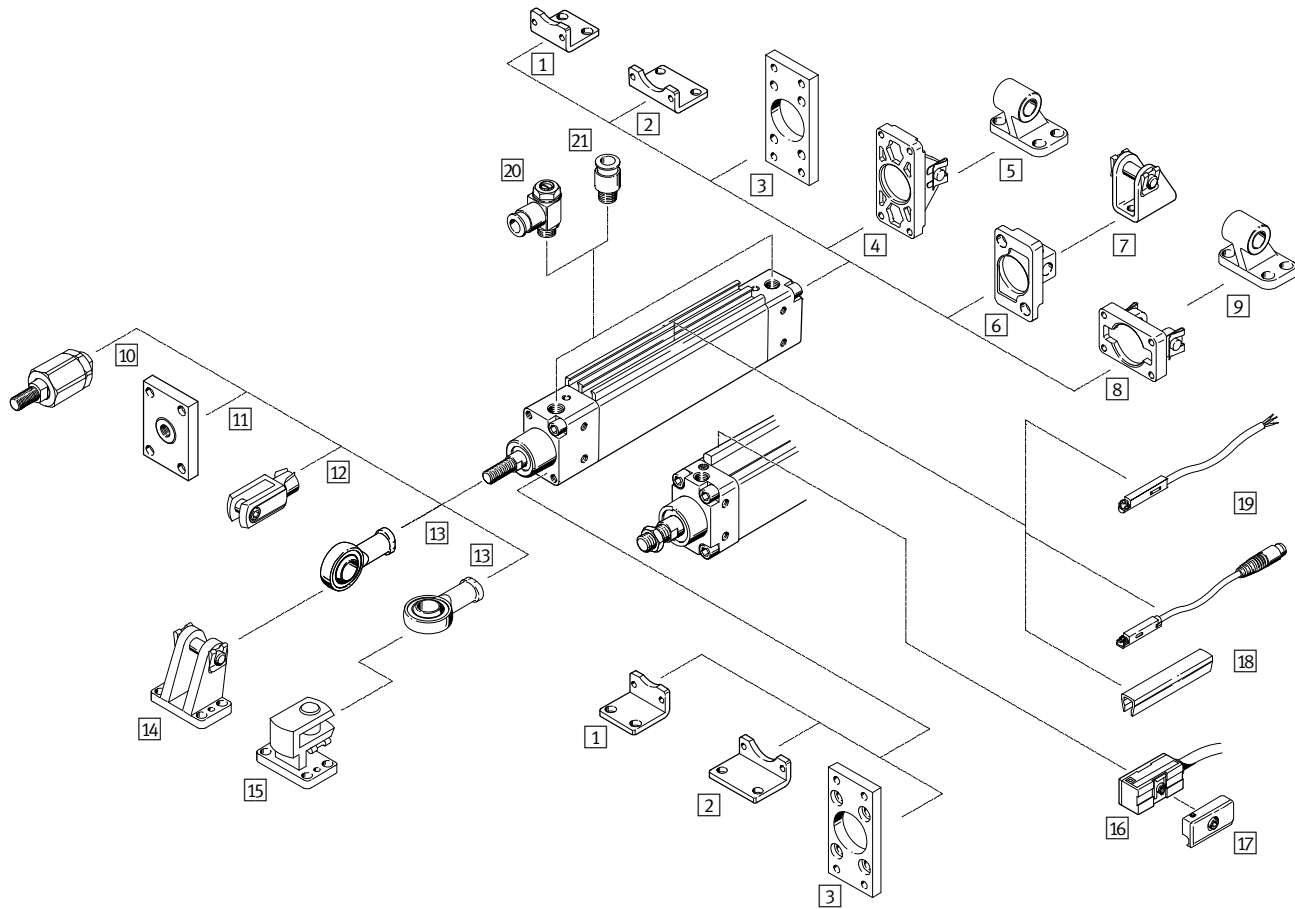
- Non-rotating oval piston
- Piston Ø 5/8" to 2-1/2"
- Strokes up to 40"
- Double-acting
- Moment capacity up to 2.2 lbf-in
- Extensive range of accessories
- Versatile mounting options

| Product range overview | | | | | | | | |
|-----------------------------|---|----------------------------------|---------------------------|-----------------|-----------------------------|---------------------------------|-------------|--|
| Function | Design | Type | Piston Ø | Variable stroke | Standard stroke | Magnet for position sensing (A) | Piston rod | Heat resistant seals up to 302 °F (S6) |
| | | | [in] | [in] | [in] | | male thread | |
| Double-acting flat cylinder |  | DZH Single-ended piston rod | 5/8 | 0.04 ... 8 | 1, 2, 3, 4, 5, 6, 8 | ■ | ■ | ■ |
| | | | 3/4 | 0.04... 13 | 1, 2, 3, 4, 5, 6, 8, 10, 12 | | | |
| | | | 1, 1-1/4, 1-5/8, 2, 2-1/2 | 0.04... 40 | 1, 2, 3, 4, 5, 6, 8, 10, 12 | | | |
| |  | DZH-...-S2 Through piston rod | 5/8 | 0.04... 8 | - | ■ | ■ | - |
| | | | 3/4 | 0.04... 13 | - | | | |
| | | | 1, 1-1/4, 1-5/8, 2, 2-1/2 | 0.04... 40 | - | | | |

Flat cylinders DZH - Inch Series

Accessories overview

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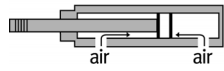


| Mounting attachments and accessories | | Description | Piston \varnothing 5/8" ... 1" | 1-1/4" ... 2-1/2" |
|--------------------------------------|---------------------------------|--|----------------------------------|-------------------|
| 1 | Foot mounting, narrow HZS | for bearing and end caps | ■ | ■ |
| 2 | Foot mounting, wide HZB | for bearing and end caps | ■ | ■ |
| 3 | Flange mounting FZS | for bearing and end caps | ■ | ■ |
| 4 | Swivel flange, narrow SZS | for end caps | - | ■ |
| 5 | Clevis foot LBZB/LBZS | - | - | ■ |
| 6 | Swivel flange, narrow SZSB | for end caps | ■ | - |
| 7 | Clevis foot LBN | - | ■ | - |
| 8 | Swivel flange, wide SZB | for end caps | - | ■ |
| 9 | Clevis foot LN | - | - | ■ |
| 10 | Self-aligning rod coupler FK | for compensating radial and angular deviations | ■ | ■ |
| 11 | Coupling piece KSZ | for cylinders with a non-rotating piston rod to compensate for radial deviations | ■ | ■ |
| 12 | Rod clevis SG | permits a swivelling movement of the cylinder in one plane | ■ | ■ |
| 13 | Rod eye SGS | with spherical bearing | ■ | ■ |
| 14 | Clevis foot LBG | - | ■ | ■ |
| 15 | Right-angle clevis foot LQG | - | ■ | ■ |
| 16 | Proximity sensors SMxO-1 | - | - | ■ |
| 17 | Mounting kit SMB-1 | - | - | ■ |
| 18 | Slot cover ABP-5-S | to protect the sensor cable and keep dirt out of the sensor slots | ■ | - |
| 19 | Proximity sensors SME/SMT-8 | can be integrated in the cylinder profile barrel | ■ | - |
| 20 | One-way flow control valve GRLx | to regulate speed | ■ | ■ |
| 21 | Push-in fitting QS | for connecting compressed air tubing with standard external diameters | ■ | ■ |

Flat cylinders DZH - Inch Series

Technical Data

Double-acting



Options:

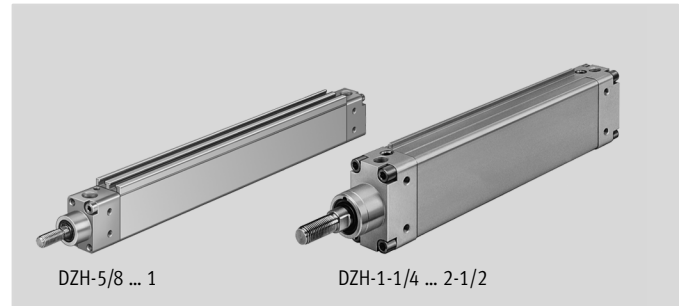
- Non rotating
- Through piston rod (S2)
- Heat resistant variant (S6)

Equivalent Piston Diameter

5/8 ... 2-1/2 inch

Stroke length

0.4 ... 40 inch



| Design | | | | | | | | |
|---|---|-------------|------------|------------|------------|------------|------------|--|
| Piston Ø | 5/8 | 3/4 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 | |
| Pneumatic connection | 10-32 UNF | 1/8" NPT | 1/8" NPT | 1/8" NPT | 1/4" NPT | 1/4" NPT | 3/8" NPT | |
| End of piston rod Male thread | 10-32 UNF | 5/16-24 UNF | 3/8-24 UNF | 3/8-24 UNF | 1/2-20 UNF | 5/8-18 UNF | 5/8-18 UNF | |
| Operating medium | Filtered compressed air, lubricated or unlubricated | | | | | | | |
| Constructional design | Piston | | | | | | | |
| | Piston rod | | | | | | | |
| Protection against torsion | Oval piston | | | | | | | |
| Cushioning | Adjustable air cushioning at both ends | | | | | | | |
| Cushioning length [in] | 0.55 | 0.67 | 0.67 | 0.75 | 0.83 | 0.91 | 0.23 | |
| Magnet for position sensing ¹⁾ | Standard | | | | | | | |

1) Position sensing via magnetic proximity sensor (ordered separately, see accessories).

| Operating pressure [psi] | | | | | | | | | |
|--------------------------|--------------|-----|---|-----------|-------|---|-------|--|--|
| Piston Ø | 5/8 | 3/4 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 | | |
| | 14.5 ... 145 | | | 9 ... 145 | | | | | |

| Ambient conditions | | |
|--|---------------|-------------|
| Variant | Basic version | S6 |
| Ambient temperature ¹⁾ [°F] | -4 ... +176 | 32 ... +302 |
| Corrosion resistance class CRC ²⁾ | 2 | 2 |

1) Observe operating range of proximity sensors.

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

| Forces [lbf] and torques [ft-lbf] | | | | | | | | |
|---|------|------|------|-------|-------|-------|-------|-------|
| Piston Ø | 5/8 | 3/4 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 | |
| Theoretical force at 90 psi, extending | | 27.2 | 42.3 | 66.3 | 108.6 | 169.5 | 264.8 | 420.4 |
| | S2 | 23.4 | 35.5 | 55.5 | 93.3 | 142.3 | 222.3 | 378.1 |
| Theoretical force at 90 psi, retracting | | 23.4 | 35.5 | 55.5 | 93.3 | 142.3 | 222.3 | 378.1 |
| | S2 | 23.4 | 35.5 | 55.5 | 93.3 | 142.3 | 222.3 | 378.1 |
| Max. torque at the piston rod ¹⁾ | 0.55 | 0.66 | 0.89 | 1.11 | 1.33 | 1.88 | 2.21 | |

1) The max. torque must also be observed when fitting mounting attachments to the piston rod.

| Weights [oz] | | | | | | | | |
|-------------------------------------|-----|-----|------|-------|-------|------|-------|--|
| Piston Ø | 5/8 | 3/4 | 1 | 1-1/4 | 1-5/8 | 2 | 2-1/2 | |
| Product weight at 0 inch stroke | 4.9 | 8.1 | 11.6 | 17.6 | 29.0 | 42.3 | 59.6 | |
| Additional weight per 1 inch stroke | 1.0 | 1.3 | 1.9 | 2.7 | 3.6 | 5.4 | 7.1 | |

Flat cylinders DZH - Inch Series

Data sheet

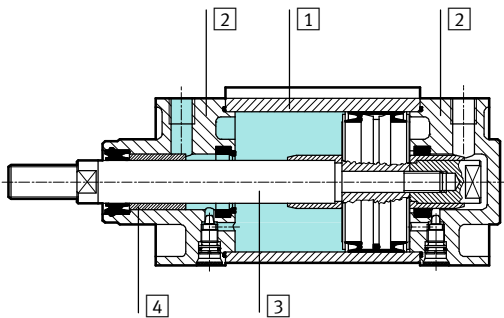
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| Minimum stroke length [inch] for magnetic position sensing with one proximity sensor | | | | | |
|--|--|-------|-------|---|-------|
| Piston \varnothing | | 1-1/4 | 1-5/8 | 2 | 2-1/2 |
| SMEO-1/SMT0-1 | | | | | |
| Plug | | 0.4 | | | |
| Cable | | | | | |

| Minimum stroke length [inch] for magnetic position sensing with two proximity sensors | | | | | |
|---|-----------------------|---|-------|-----|-------|
| Piston \varnothing | | 1-1/4 | 1-5/8 | 2 | 2-1/2 |
| SMEO-1 | | | | | |
| Plug | outlet towards caps | 3.4 | 3.4 | 3.5 | 3.6 |
| | outlet towards center | 1.8 | 1.9 | 1.9 | 2.0 |
| Cable | outlet towards caps | 2.5 | 2.5 | 2.6 | 2.7 |
| | outlet towards center | 1.9 | 2.0 | 2.0 | 2.1 |
| SMT0-1 | | | | | |
| Plug | outlet towards caps | 4.1 | 4.2 | 4.2 | 4.2 |
| | outlet towards center | not possible as the plug would cover the pneumatic port | | | |
| Cable | outlet towards caps | 3.2 | 3.3 | 3.3 | 3.4 |
| | outlet towards center | 0.7 | 0.8 | 0.8 | 0.9 |

Materials

Sectional view



| Cylinder | | Basic version | S6 |
|----------|-----------------|-------------------------------|---------------------|
| 1 | Cylinder barrel | Anodized aluminum | Anodized aluminum |
| 2 | Bearing end cap | Aluminum | Aluminum |
| 3 | Piston rod | \varnothing 5/8 ... 1 | Stainless steel |
| | | \varnothing 1-1/4 ... 2-1/2 | High-alloy steel |
| 4 | Dynamic seals | Polyurethane | Fluorocarbon rubber |

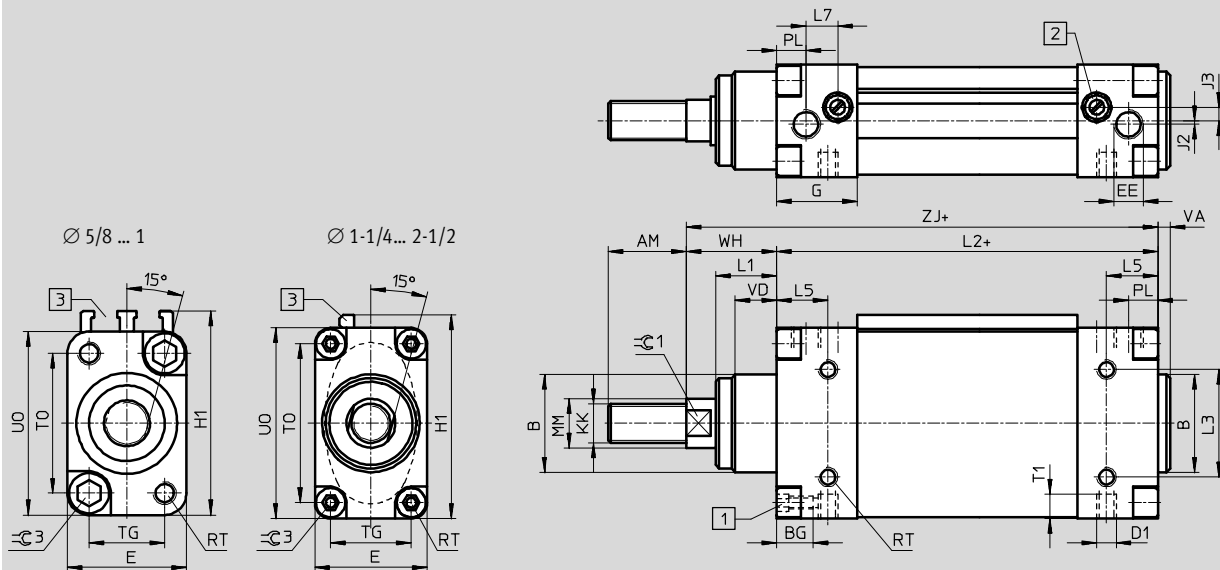
Flat cylinders DZH - Inch Series

Data sheet



Dimensions

Basic version



- [1] Socket head screw with female thread
- [2] Regulating screw for adjustable end-position cushioning
- [3] Ø 5/8 ... 1: Mounting slot for proximity sensors
Ø 1-1/4 ... 2-1/2: Mounting rail for proximity sensor

+ = plus stroke length

| Ø [in] | AM | B Ø | BG | D1 | D8 Ø | E | EE | G | H1 | J2 | J3 | KK | L1 | L2 | L3 |
|--------|-----|-----|-----|-------------|------|-----|-----------|-----|-----|-------|-----|-------------|-----|-----|-----|
| 5/8 | 0.6 | 0.6 | 0.2 | 8-32 UNC | 0.1 | 0.8 | 10-32 UNF | 0.8 | 1.4 | -0.03 | 0.1 | 10-32 UNF | 0.5 | 3.1 | 0.5 |
| 3/4 | 0.8 | 0.8 | 0.2 | 8-32 UNC | 0.1 | 0.9 | 1/8" NPT | 1.0 | 1.6 | -0.03 | 0.2 | 5/16-24 UNF | 0.6 | 3.6 | 0.6 |
| 1 | 0.9 | 0.9 | 0.3 | 10-24 UNC | 0.1 | 1.0 | 1/8" NPT | 1.0 | 1.8 | -0.01 | 0.2 | 3/8-24 UNF | 0.6 | 3.6 | 0.7 |
| 1-1/4 | 0.9 | 1.2 | 0.5 | 1/4-20 UNC | - | 1.4 | 1/8" NPT | 1.1 | 2.1 | - | 0.1 | 3/8-24 UNF | 0.6 | 3.7 | 0.7 |
| 1-5/8 | 0.9 | 1.4 | 0.5 | 1/4-20 UNC | - | 1.6 | 1/4" NPT | 1.3 | 2.6 | - | 0.2 | 1/2-20 UNF | 0.8 | 4.1 | 1.3 |
| 2 | 1.3 | 1.6 | 0.6 | 5/16-18 UNC | - | 1.8 | 1/4" NPT | 1.3 | 3.2 | 0.10 | 0.1 | 5/8-18 UNF | 1.0 | 4.2 | 1.7 |
| 2-1/2 | 1.3 | 1.7 | 0.6 | 3/8-16 UNC | - | 2.1 | 3/8" NPT | 1.4 | 4.3 | 0.16 | 0.2 | 5/8-18 UNF | 1.1 | 4.5 | 2.5 |

| Ø [in] | L5 | L7 | MM Ø | PL | RT | T1 | TG | TO | UO | VA | VD | WH | ZJ | ZM | ≈C1 [mm] | ≈C3 [mm] |
|--------|------|------|------|------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|----------|
| 5/8 | 0.47 | 0.33 | 0.2 | 0.30 | M4 | 0.2 | 0.5 | 0.9 | 1.2 | 0.1 | 0.5 | 0.7 | 3.8 | 4.5 | 5 | 4 |
| 3/4 | 0.59 | 0.41 | 0.3 | 0.37 | M4 | 0.2 | 0.6 | 1.1 | 1.4 | 0.1 | 0.6 | 0.7 | 4.3 | 5.0 | 7 | 4 |
| 1 | 0.63 | 0.39 | 0.4 | 0.41 | M5 | 0.3 | 0.6 | 1.2 | 1.6 | 0.1 | 0.6 | 0.8 | 4.4 | 5.3 | 9 | 5 |
| 1-1/4 | 0.51 | 0.40 | 0.5 | 0.35 | M5 | 0.4 | 1.0 | 1.4 | 1.9 | 0.2 | 0.6 | 1.0 | 4.7 | 5.8 | 10 | 6 |
| 1-5/8 | 0.65 | 0.52 | 0.6 | 0.43 | M5 | 0.4 | 1.1 | 2.0 | 2.4 | 0.2 | 0.8 | 1.2 | 5.3 | 6.5 | 13 | 6 |
| 2 | 0.83 | 0.55 | 0.8 | 0.41 | M6 | 0.4 | 1.3 | 2.6 | 3.1 | 0.2 | 0.7 | 1.5 | 5.6 | 7.1 | 17 | 6 |
| 2-1/2 | 0.89 | 0.57 | 0.8 | 0.49 | M6 | 0.5 | 1.6 | 3.5 | 4.1 | 0.2 | 0.8 | 1.6 | 6.1 | 7.7 | 17 | 6 |

Note

The maximum permissible torque must not be exceeded when attaching components onto the piston rod. Counterhold by means of the wrench flats ≈C1.

Dimensions are in inches, unless otherwise noted.

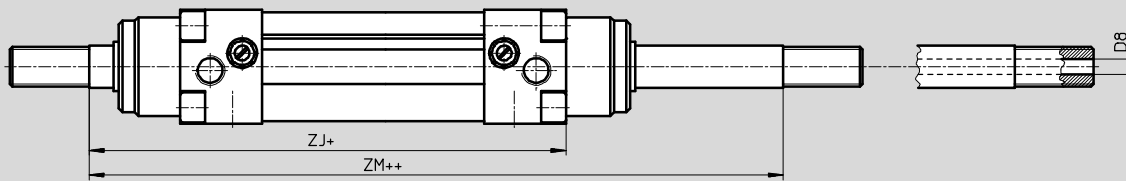
Flat cylinders DZH - Inch Series

Data sheet



Dimensions

Variant S2 – Through piston rod



+ = plus stroke length ++ = plus 2x stroke length

| Ø [in] | D8 Ø | ZJ | ZM |
|-----------|---------|-----|-----|
| 5/8 | 0.09 | 3.8 | 4.5 |
| 3/4 | 0.13 | 4.3 | 5.0 |
| 1 | 0.15 | 4.4 | 5.3 |
| 1-1/4 | - | 4.7 | 5.8 |
| 1-5/8 | - | 5.3 | 6.5 |
| 2 | - | 5.6 | 7.1 |
| 2-1/2 | - | 6.1 | 7.7 |

Dimensions are in inches, unless otherwise noted.

Flat cylinders DZH - Inch Series

Ordering Data



| M Mandatory data | | | | | O Options | |
|------------------|---|-------------|--------------|-----------------------------|--------------------|-----------------------|
| Function | Piston Ø | Stroke | Cushioning | Magnet for position sensing | Type of piston rod | Temperature Resistant |
| DZH | 5/8 3/4 1 1 1/4 1 5/8 2 2 1/2 | 0.04 ... 40 | PPV | A | S2 | S6 |
| DZH | - 1 5/8 | - 10 | - PPV | - A | - | S6 |

| Ordering table | | | | | | | | | | |
|-----------------------------|--|-----|---|-------|-------|---|-------|--------------|-------------|------------|
| Size | 5/8 | 3/4 | 1 | 1 1/4 | 1 5/8 | 2 | 2 1/2 | Conditions | Code | Enter code |
| M Function | Flat, double-acting cylinder | | | | | | | | DZH | DZH |
| Piston Ø [in] | 5/8 | 3/4 | 1 | 1 1/4 | 1 5/8 | 2 | 2 1/2 | | -... | |
| Stroke [in] | 0.04 ... 40 | | | | | | | | -... | |
| Cushioning | Adjustable air cushioning at both ends | | | | | | | | -PPV | -PPV |
| Magnet for position sensing | For use with magnetic proximity sensor | | | | | | | | -A | -A |
| O Type of piston rod | Through piston rod | | | | | | | | -S2 | |
| Temperature resistant | Heat-resistant seals up to max. 302 °F | | | | | | | ¹ | -S6 | |

¹ Not in combination with S2

Transfer order code

DZH - - - **PPV** - **A** -

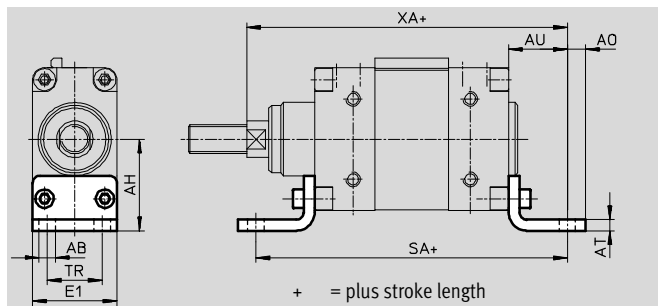
Flat cylinders DZH - Inch Series

Accessories



Foot mounting HZS, narrow

Material:
Steel
Free of copper, PTFE and silicone

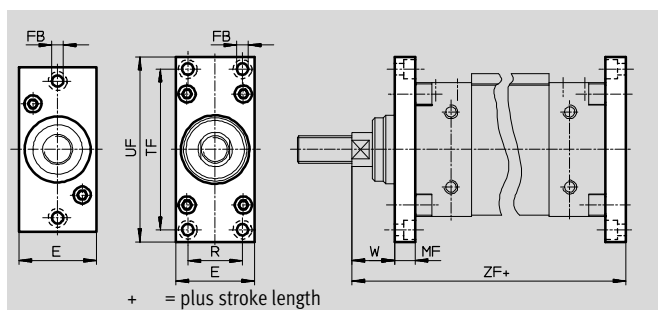
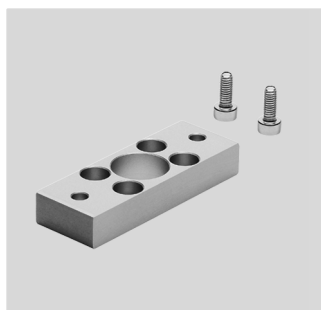


| Dimensions and ordering data | | | | | | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-------------------|----------------|----------|--------|
| For \varnothing [in] | AB \varnothing | AH | AO | AT | AU | E1 | SA | TR | XA | CRC ¹⁾ | Weight [oz] | Part No. | Type |
| 5/8 | 0.2 | 1.0 | 0.2 | 0.2 | 0.8 | 0.8 | 4.7 | 0.5 | 4.6 | 2 | 2.1 | 151933 | HZS-16 |
| 3/4 | 0.2 | 1.1 | 0.2 | 0.2 | 0.8 | 0.9 | 5.2 | 0.6 | 5.1 | 2 | 2.5 | 151932 | HZS-20 |
| 1 | 0.2 | 1.2 | 0.2 | 0.2 | 1.0 | 1.0 | 5.6 | 0.6 | 5.4 | 2 | 3.2 | 151931 | HZS-25 |
| 1-1/4 | 0.3 | 1.3 | 0.3 | 0.2 | 0.9 | 1.4 | 5.6 | 0.9 | 5.7 | 2 | 3.7 | 14879 | HZS-32 |
| 1-5/8 | 0.4 | 1.6 | 0.4 | 0.2 | 1.1 | 1.6 | 6.3 | 1.0 | 6.4 | 2 | 5.8 | 14880 | HZS-40 |
| 2 | 0.4 | 2.0 | 0.4 | 0.2 | 1.3 | 1.8 | 6.7 | 1.2 | 6.9 | 2 | 9.5 | 14881 | HZS-50 |
| 2-1/2 | 0.4 | 2.4 | 0.6 | 0.2 | 1.4 | 2.1 | 7.3 | 1.5 | 7.5 | 2 | 12.9 | 14882 | HZS-63 |

1) Corrosion resistance class 2 according to Festo standard 940 070
Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Flange mounting FZS

Material:
Wrought aluminum alloy



| Dimensions and ordering data | | | | | | | | | | | | |
|------------------------------|-----|---------------------|-----|-----|-----|-----|-----|-----|-------------------|----------------|----------|--------|
| For \varnothing [in] | E | FB \varnothing | MF | R | TF | UF | W | ZF | CRC ¹⁾ | Weight [oz] | Part No. | Type |
| 5/8 | 0.8 | 0.19 | 0.4 | – | 1.9 | 2.4 | 0.3 | 4.2 | 2 | 1.1 | 151930 | FZS-16 |
| 3/4 | 0.9 | 0.19 | 0.4 | – | 2.1 | 2.8 | 0.3 | 4.7 | 2 | 1.4 | 151929 | FZS-20 |
| 1 | 1.1 | 0.23 | 0.4 | – | 2.4 | 3.0 | 0.4 | 4.8 | 2 | 1.8 | 151928 | FZS-25 |
| 1-1/4 | 1.4 | 0.23 | 0.4 | 0.9 | 2.4 | 3.0 | 0.6 | 5.1 | 2 | 2.1 | 14887 | FZS-32 |
| 1-5/8 | 1.6 | 0.23 | 0.4 | 1.1 | 3.1 | 3.5 | 0.8 | 5.7 | 2 | 2.8 | 14888 | FZS-40 |
| 2 | 1.8 | 0.27 | 0.5 | 1.3 | 3.7 | 4.3 | 1.0 | 6.1 | 2 | 4.8 | 14889 | FZS-50 |
| 2-1/2 | 2.1 | 0.27 | 0.6 | 1.6 | 4.7 | 5.3 | 1.0 | 6.7 | 2 | 9.2 | 14890 | FZS-63 |

1) Corrosion resistance class 2 according to Festo standard 940 070
Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

All dimensions are in inches, unless otherwise noted.

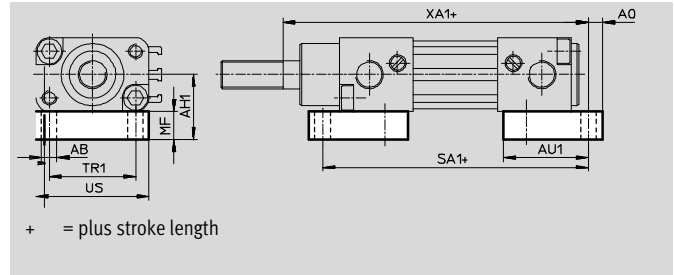
Flat cylinders DZH - Inch Series

Accessories



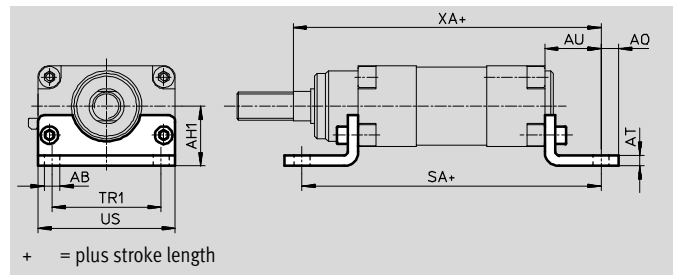
Foot mounting HZB, wide for piston \varnothing 5/8 ... 1 inch

Material:
Wrought aluminum alloy



for piston \varnothing 1-1/4 ... 2-1/2 inch

Material:
Steel



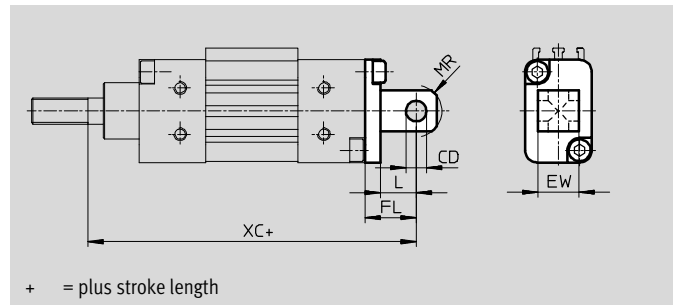
Dimensions and ordering data

| For \varnothing [in] | AB \varnothing | AH1 | AO | AT | AU | AU1 | MF | SA | SA1 | TR1 | US | XA | XA1 | CRC ¹⁾ | Weight [oz] | Part No. | Type |
|---------------------------|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------|----------------|----------|--------|
| 5/8 | 0.2 | 0.8 | 0.2 | - | - | 0.9 | 0.4 | - | 3.5 | 0.9 | 1.2 | - | 4.0 | 2 | 1.8 | 151936 | HZB-16 |
| 3/4 | 0.2 | 0.8 | 0.2 | - | - | 1.0 | 0.4 | - | 4.0 | 1.1 | 1.4 | - | 4.5 | 2 | 2.1 | 151935 | HZB-20 |
| 1 | 0.2 | 0.9 | 0.2 | - | - | 1.2 | 0.4 | - | 4.1 | 1.2 | 1.6 | - | 4.7 | 2 | 2.8 | 151934 | HZB-25 |
| 1-1/4 | 0.3 | 1.0 | 0.3 | 0.2 | 0.9 | - | - | 5.6 | - | 1.3 | 1.9 | 5.7 | - | 2 | 4.6 | 14875 | HZB-32 |
| 1-5/8 | 0.4 | 1.1 | 0.4 | 0.2 | 1.1 | - | - | 6.3 | - | 1.8 | 2.4 | 6.4 | - | 2 | 8.3 | 14876 | HZB-40 |
| 2 | 0.4 | 1.3 | 0.4 | 0.2 | 1.3 | - | - | 6.7 | - | 2.4 | 3.1 | 6.9 | - | 2 | 14.5 | 14877 | HZB-50 |
| 2-1/2 | 0.4 | 1.5 | 0.6 | 0.2 | 1.4 | - | - | 7.3 | - | 3.5 | 4.1 | 7.5 | - | 2 | 22.6 | 14878 | HZB-63 |

1) Corrosion resistance class 2 according to Festo standard 940 070
Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Swivel flange SZSB, narrow/wide for piston \varnothing 5/8 ... 1 inch

Material:
High-alloy stainless steel



Dimensions and ordering data

| For \varnothing [in] | CD \varnothing | EW | FL | L | XC | Weight [oz] | Part No. | Type |
|---------------------------|---------------------|-----|-----|-----|-----|----------------|----------|---------|
| 5/8 | 0.16 | 0.3 | 0.6 | 0.3 | 4.3 | 0.35 | 151927 | SZSB-16 |
| 3/4 | 0.24 | 0.5 | 0.6 | 0.4 | 4.9 | 0.71 | 151926 | SZSB-20 |
| 1 | 0.31 | 0.6 | 0.8 | 0.6 | 5.2 | 1.41 | 151925 | SZSB-25 |

All dimensions are in inches, unless otherwise noted.

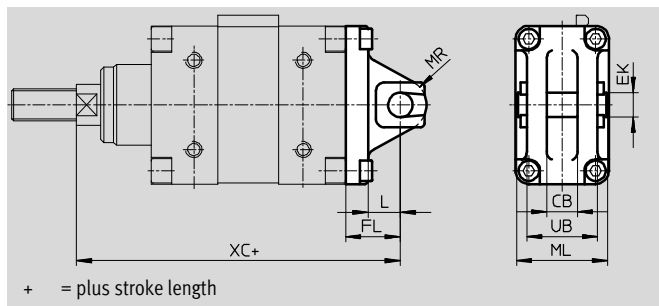
Flat cylinders DZH - Inch Series

Accessories



Swivel flange SZS, narrow for piston \varnothing 1-1/4 ... 2-1/2 inch

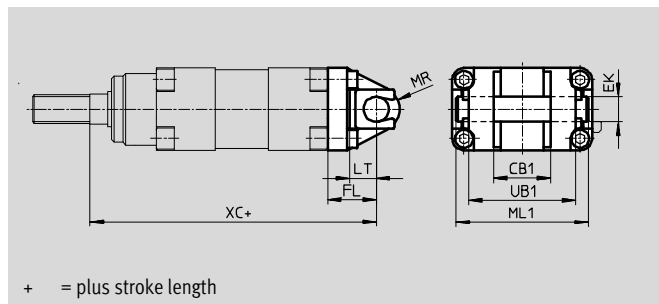
Material:
Die-cast aluminum



| Dimensions and ordering data | | | | | | | | | | | |
|------------------------------|------|---------------------|-----|------|------|-----|------|-----|----------------|----------|--------|
| For \varnothing [in] | CB | EK \varnothing | FL | L | ML | MR | UB | XC | Weight [oz] | Part No. | Type |
| 1-1/4 | 0.37 | 0.4 | 0.9 | 0.53 | 1.40 | 0.4 | 1.02 | 5.6 | 2.8 | 14883 | SZS-32 |
| 1-5/8 | 0.49 | 0.5 | 1.0 | 0.61 | 1.56 | 0.5 | 1.13 | 6.3 | 4.2 | 14884 | SZS-40 |
| 1 | 0.57 | 0.5 | 1.1 | 0.61 | 1.80 | 0.5 | 1.37 | 6.7 | 6.0 | 14885 | SZS-50 |
| 2-1/2 | 0.65 | 0.6 | 1.4 | 0.88 | 2.11 | 0.7 | 1.61 | 7.5 | 11.3 | 14886 | SZS-63 |

Swivel flange SZB, wide for piston \varnothing 1-1/4 ... 2-1/2 inch

Material:
High-alloy stainless steel



| Dimensions and ordering data | | | | | | | | | | | |
|------------------------------|-----|---------------------|-----|-----|-----|-----|-----|-----|----------------|----------|--------|
| For \varnothing [in] | CB1 | EK \varnothing | FL | LT | ML1 | MR | UB1 | XC | Weight [oz] | Part No. | Type |
| 1-1/4 | 0.6 | 0.4 | 0.9 | 0.6 | 1.9 | 0.4 | 1.4 | 5.6 | 6.0 | 30798 | SZB-32 |
| 1-5/8 | 1.1 | 0.5 | 1.0 | 0.6 | 2.4 | 0.5 | 2.0 | 6.3 | 9.9 | 30799 | SZB-40 |
| 2 | 1.3 | 0.5 | 1.1 | 0.6 | 3.0 | 0.5 | 2.4 | 6.7 | 14.5 | 30629 | SZB-50 |
| 2-1/2 | 1.6 | 0.6 | 1.4 | 0.9 | 4.1 | 0.7 | 2.8 | 7.5 | 23.3 | 30630 | SZB-63 |

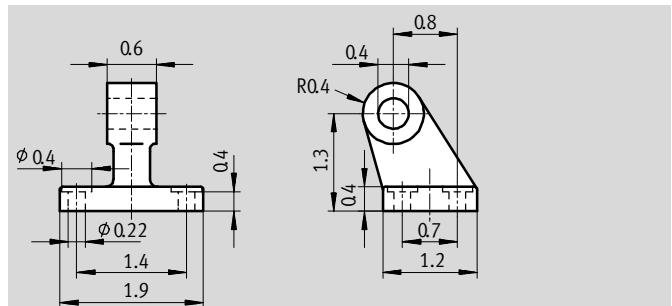
All dimensions are in inches, unless otherwise noted.

Flat cylinders DZH - Inch Series

Accessories

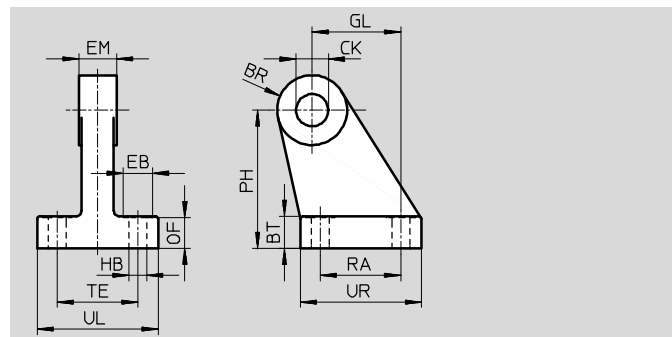
Clevis foot LBZB for piston \varnothing 1-1/4 inch

Material:
High-alloy stainless steel



Clevis foot LBZS for piston \varnothing 1-1/4 ... 2-1/2 inch

Material:
High-alloy stainless steel



| Dimensions and ordering data | | | | | | | | | | | | | | | Weight | Part No. | Type |
|------------------------------|--------------------------|-----|---------------------|---------------------|-----|-----|---------------------|------|-----|-----|-----|-----|-----|------|--------|----------|---------|
| For \varnothing [in] | BR | BT | CK \varnothing | EB \varnothing | EM | GL | HB \varnothing | OF | PH | RA | TE | UL | UR | [oz] | | | |
| LBZB | | | | | | | | | | | | | | | | | |
| 1-1/4 | Dimensions → shown above | | | | | | | | | | | | | | 3.2 | 33842 | LBZB-32 |
| LBZS | | | | | | | | | | | | | | | | | |
| 1-1/4 | 0.4 | 0.3 | 0.4 | 0.4 | 0.4 | 0.8 | 0.22 | 0.29 | 1.3 | 0.7 | 0.9 | 1.4 | 1.2 | 3.2 | 33843 | LBZS-32 | |
| 1-5/8 | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.9 | 0.22 | 0.37 | 1.6 | 0.9 | 1.1 | 1.5 | 1.4 | 4.8 | 33844 | LBZS-40 | |
| 2 | 0.5 | 0.5 | 0.5 | 0.4 | 0.5 | 1.3 | 0.26 | 0.45 | 2.0 | 1.2 | 1.2 | 1.8 | 1.8 | 8.3 | 33845 | LBZS-50 | |
| 2-1/2 | 0.6 | 0.5 | 0.6 | 0.4 | 0.6 | 1.5 | 0.26 | 0.44 | 2.4 | 1.4 | 1.5 | 2.1 | 2.0 | 10.8 | 33846 | LBZS-63 | |


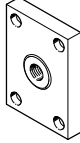


All dimensions are in inches, unless otherwise noted.


| Ordering data – Mounting attachments | | | | Ordering data – Mounting attachments | | | |
|--------------------------------------|------------------------|----------|-----------|--------------------------------------|------------------------|----------|--------|
| Designation | For \varnothing [in] | Part No. | Type | Designation | For \varnothing [in] | Part No. | Type |
| Clevis foot LBN | | | | Clevis foot LN | | | |
| | 5/8 | 6058 | LBN-12/16 | | 1-1/4 | 5147 | LN-32 |
| | 3/4 | 6059 | LBN-20/25 | | 1-5/8 | 5148 | LN-40 |
| | 1 | | | | 2 | 5149 | LN-50 |
| | | | 2-1/2 | | 5150 | LN-63 | |
| Clevis foot LBG | | | | Right-angle clevis foot LQG | | | |
| | 1-1/4 | 31761 | LBG-32 | | 1-1/4 | 31768 | LQG-32 |
| | 1-5/8 | 31762 | LBG-40 | | 1-5/8 | 31769 | LQG-40 |
| | 2 | 31763 | LBG-50 | | 2 | 31770 | LQG-50 |
| | 2-1/2 | 31764 | LBG-63 | | 2-1/2 | 31771 | LQG-63 |


Flat cylinders DZH - Inch Series


Accessories


FESTO

| Ordering data – Piston rod attachments | | | | | | | |
|---|------------|----------|--------------|---|------------|----------|----------------|
| Designation | For Ø [in] | Part No. | Type | Designation | For Ø [in] | Part No. | Type |
| Rod eye SGS | | | | Coupling piece KSZ | | | |
|  | 5/8 | 532694 | SGS-10-32 |  | 5/8 | – | |
| | 3/4 | 13002871 | SGS-5/16-24 | | 3/4 | | |
| | 1 | 532696 | SGS-3/8-24 | | 1 | 36129 | KSZ-3/8-24-UNF |
| | 1-1/4 | | | | 1-1/4 | | |
| | 1-5/8 | 532697 | SGS-1/2-20 | | 1-5/8 | 36130 | KSZ-1/2-20-UNF |
| | 2 | 532698 | SGS-5/8-18 | | 2 | 36131 | KSZ-5/8-18-UNF |
| 2-1/2 | | | 2-1/2 | | | | |
| Rod clevis SG | | | | Self-aligning rod coupler FK | | | |
|  | 5/8 | 13005667 | SG-10-32 |  | 5/8 | 532703 | FK-10-32 |
| | 3/4 | 11129 | SG-5/16"-24 | | 3/4 | 532704 | FK-5/16-24 |
| | 1 | 546540 | SG-3/8"-24-B | | 1 | 532705 | FK-3/8-24 |
| | 1-1/4 | | | | 1-1/4 | | |
| | 1-5/8 | 546545 | SG-1/2-20-B | | 1-5/8 | 532706 | FK-1/2-20 |
| | 2 | 546575 | SG-5/8-18-B | | 2 | 532707 | FK-5/8-18 |
| 2-1/2 | | | 2-1/2 | | | | |

| Ordering data – Block-shaped proximity sensor, magneto-resistive | | | | | | | |
|---|-------------------|---------------|-----------------------|---------|-------------------|----------|----------------------|
| | Mounting | Switch output | Electrical connection | | Cable length [ft] | Part No. | Type |
| | | | Cables | M8 plug | | | |
| NO contact | | | | | | | |
|  | With mounting kit | PNP | 3 wires | – | 8.2 | 151 683 | SMT0-1-PS-K-LED-24-C |
| | | | – | 3-pin | – | 151 685 | SMT0-1-PS-S-LED-24-C |
| | | NPN | 3 wires | – | 8.2 | 151 684 | SMT0-1-NS-K-LED-24-C |
| | | | – | 3-pin | – | 151 686 | SMT0-1-NS-S-LED-24-C |

| Ordering data – Block-shaped proximity sensor, magnetic reed | | | | | | |
|---|-------------------|-----------------------|---------|-------------------|----------|--------------------|
| | Mounting | Electrical connection | | Cable length [ft] | Part No. | Type |
| | | Cables | M8 plug | | | |
| NO contact | | | | | | |
|  | With mounting kit | 3 wires | – | 8.2 | 30459 | SME0-1-LED-24-B |
| | | 3 wires | – | 16.4 | 151672 | SME0-1-LED-24-K5-B |
| | | – | 3-pin | – | 150848 | SME0-1-S-LED-24-B |



| Ordering data – Block-shaped proximity sensor, pneumatic | | | |
|---|-------------------|---|------------------|
| | Mounting | Pneumatic connection | Part No. Type |
| 3/2-way valve, normally closed | | | |
|  | With mounting kit | Barbed fitting for tubing ID of Q1 inch | 31008 SMP0-1-H-B |




| Ordering data – Mounting kit | | | |
|---|--|----------|-------|
| | Mounting | Part No. | Type |
|  | for cylinder with tie rod Ø Q2 inch or DUO rail mounting profile | 11886 | SMB-1 |



Flat cylinders DZH - Inch Series

Accessories

FESTO

| Ordering data – Proximity sensors for T-slot, magneto-resistive | | | | | | Technical data → Internet: smt | |
|---|--|----------------|-----------------------|------------------|----------|--------------------------------|--|
| | Type of mounting | Switch out-put | Electrical connection | Cable length [m] | Part No. | Type | |
| N/O contact | | | | | | | |
|  | Insertable in the slot from above, flush with cylinder profile, short design | PNP | Cable, 3-wire | 2.5 | 574335 | SMT-8M-A-PS-24V-E-2,5-OE | |
| | | | Plug M8x1, 3-pin | 0.3 | 574334 | SMT-8M-A-PS-24V-E-0,3-M8D | |
| | | | Plug M12x1, 3-pin | 0.3 | 574337 | SMT-8M-A-PS-24V-E-0,3-M12 | |
| | | NPN | Cable, 3-wire | 2.5 | 574338 | SMT-8M-A-NS-24V-E-2,5-OE | |
| | | | Plug M8x1, 3-pin | 0.3 | 574339 | SMT-8M-A-NS-24V-E-0,3-M8D | |
| N/C contact | | | | | | | |
|  | Insertable in the slot from above, flush with cylinder profile, short design | PNP | Cable, 3-wire | 7.5 | 574340 | SMT-8M-A-PO-24V-E-7,5-OE | |

| Ordering data – Proximity sensors for T-slot, magnetic reed | | | | | | Technical data → Internet: sme | |
|---|--|----------------|-----------------------|------------------|----------|--------------------------------|--|
| | Type of mounting | Switch out-put | Electrical connection | Cable length [m] | Part No. | Type | |
| N/O contact | | | | | | | |
|  | Insertable in the slot from above, flush with cylinder profile | Contacting | Cable, 3-wire | 2.5 | 543 862 | SME-8M-DS-24V-K-2,5-OE | |
| | | | | 5.0 | 543 863 | SME-8M-DS-24V-K-5,0-OE | |
| | | | Cable, 2-wire | 2.5 | 543 872 | SME-8M-ZS-24V-K-2,5-OE | |
| | | | Plug M8x1, 3-pin | 0.3 | 543 861 | SME-8M-DS-24V-K-0,3-M8D | |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | Contacting | Cable, 3-wire | 2.5 | 150 855 | SME-8-K-LED-24 | |
| | | | Plug M8x1, 3-pin | 0.3 | 150 857 | SME-8-S-LED-24 | |
| N/C contact | | | | | | | |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | Contacting | Cable, 3-wire | 7.5 | 160 251 | SME-8-0-K-LED-24 | |



| Ordering data – Connecting cables | | | | Technical data → www.festo.com/catalogue/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 | |
| | | | 5.0 | 541334 | NEBU-M8G3-K-5-LE3 | |
| | Straight socket, M12x1, 5-pin | Cable, open end, 3-wire | 2.5 | 541363 | NEBU-M12G5-K-2.5-LE3 | |
| | | | 5.0 | 541364 | NEBU-M12G5-K-5-LE3 | |
|  | Angled socket, M8x1, 3-pin | Cable, open end, 3-wire | 2.5 | 541338 | NEBU-M8W3-K-2.5-LE3 | |
| | | | 5.0 | 541341 | NEBU-M8W3-K-5-LE3 | |
| | Angled socket, M12x1, 5-pin | Cable, open end, 3-wire | 2.5 | 541367 | NEBU-M12W5-K-2.5-LE3 | |
| | | | 5.0 | 541370 | NEBU-M12W5-K-5-LE3 | |

| Ordering data – Slot cover for T-slot | | | | | |
|---|---------------------|-------------|----------|---------|--|
| | Mounting | Length [ft] | Part No. | Type | |
|  | inserted from above | 2x 0.5 | 151680 | ABP-5-S | |

Flat cylinders DZH - Inch Series

Accessories



| Ordering data – One-way flow control valves | | | | |
|--|------------|---------------|----------|--------------------------|
| | Connection | | Part No. | Type |
| | Thread | For tubing OD | | |
| For exhaust air | | | | |
|  | 10-32 UNF | 5/32 | 165008 | GRLA-10-32-UNF-QS-5/32-U |
| | | 1/4 | 192753 | GRLA-10-32-UNF-QS-1/4-U |
| | 1/8" NPT | 5/32 | 165009 | GRLA-1/8-NPT-QS-5/32-U |
| | | 3/16 | 190941 | GRLA-1/8-NPT-QS-3/16-U |
| | | 1/4 | 165010 | GRLA-1/8-NPT-QS-1/4-U |
| | | 5/16 | 165013 | GRLA-1/8-NPT-QS-5/16-U |
| | | 3/16 | 190944 | GRLA-1/4-NPT-QS-3/16-U |
| | 1/4" NPT | 1/4 | 165011 | GRLA-1/4-NPT-QS-1/4-U |
| | | 5/16 | 165014 | GRLA-1/4-NPT-QS-5/16-U |
| | | 3/8 | 190947 | GRLA-1/4-NPT-QS-3/8-U |
| | | 1/4 | 165012 | GRLA-3/8-NPT-QS-1/4-U |
| | 3/8" NPT | 5/16 | 165015 | GRLA-3/8-NPT-QS-5/16-U |
| | | 3/8 | 190950 | GRLA-3/8-NPT-QS-3/8-U |
| | | 1/2 | 190951 | GRLA-3/8-NPT-QS-1/2-U |
| | | | | |
| For supply air | | | | |
|  | 10-32 UNF | - | 151576 | GRLZ-10-UNF-B |
| | | | 151579 | GRLZ-10-UNF-RS-B |
| | | 3/16 | 151577 | GRLZ-10-UNF-3/16-B |
| | | 1/4 | 151578 | GRLZ-10-UNF-1/4-B |
| | 1/8" NPT | - | 151561 | GRLZ-1/8-NPT-B |
| | | | 151564 | GRLZ-1/8-NPT-RS-B |
| | | 1/4 | 151562 | GRLZ-1/8-NPT-1/4-B |
| | | | | |

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