

Linear drive units DGO



Linear drive units DGO

Features

FESTO



General information

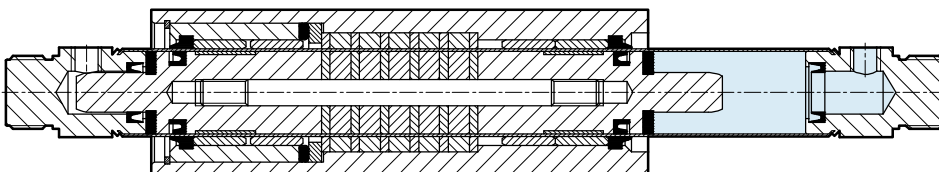
- Double-acting
- Magnetically coupled without mechanical connections
- Piston chamber and slide are pressure tight
- Pressure tight and leak-free system
- Dirt and dust cannot enter
- Space-saving installation with long strokes
- For contactless position sensing
- With adjustable end-position cushioning at both ends (not for piston \varnothing of 12 mm)

The technology in detail

Motion is transmitted via the force locking of the magnetic coupling on the moveable outer slide.

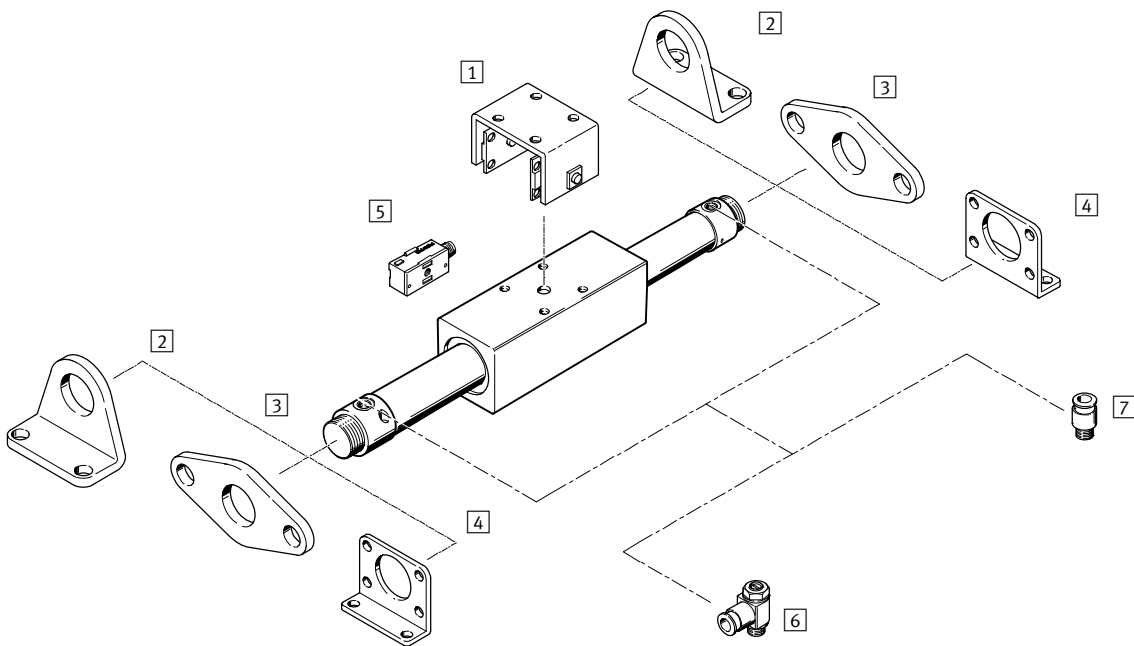
This means that there is no advancing piston rod; the installation space required is less than for conventional pneumatic cylinders.

The cylinder chamber is hermetically sealed against the outer slide as there is no mechanical connection. This prevents any leakage loss.



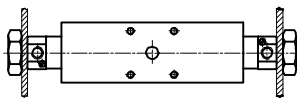
Linear drive units DGO

Peripherals overview



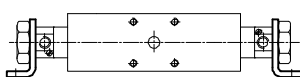
Mounting options

With hexagonal nuts (included in scope of delivery)



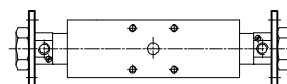
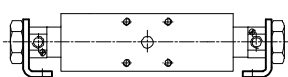
With mounting attachments

Foot mounting HBN



Flange mounting

FBN



Mounting attachments and accessories

| Type/Order code | Description | → Page/Internet |
|---|---|-----------------|
| 1 Moment compensator FKG | To compensate misalignments and eliminate tilting moments | 10 |
| 2 Foot mounting HBN | On end caps for piston \varnothing 12 ... 25 mm | 10 |
| 3 Flange mounting FBN | On end caps for piston \varnothing 12 ... 25 mm | 11 |
| 4 Flange mounting FBN | On end caps for piston \varnothing 32 ... 40 mm | 11 |
| 5 Proximity sensors SMEO-/SMTO-/SMPO-1 | For contactless position sensing, mountable externally via a mounting kit | 12 |
| 6 One-way flow control valve GRLA | To regulate speed | 12 |
| 7 Push-in fitting QS | For connecting compressed air tubing with standard external diameters | qs |

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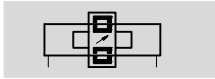
Type codes

| | | | | | | | | | | | |
|-------------------------|---|---|----|---|------|---|-----|---|---|---|---|
| | DGO | - | 25 | - | 3000 | - | PPV | - | A | - | B |
| Type | | | | | | | | | | | |
| Double-acting | | | | | | | | | | | |
| DGO | Linear drive unit | | | | | | | | | | |
| Piston Ø [mm] | | | | | | | | | | | |
| Stroke [mm] | | | | | | | | | | | |
| Cushioning | | | | | | | | | | | |
| P | Flexible cushioning rings/plates at both ends | | | | | | | | | | |
| PPV | Pneumatic cushioning adjustable at both ends | | | | | | | | | | |
| Position sensing | | | | | | | | | | | |
| A | For proximity sensing | | | | | | | | | | |
| Generation | | | | | | | | | | | |
| B | B series | | | | | | | | | | |

Linear drive units DGO

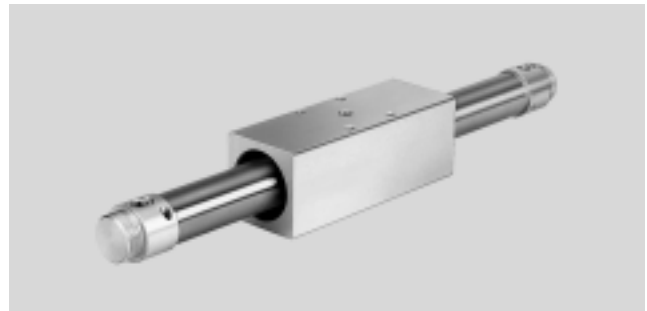
Technical data

Function



- \varnothing - Diameter
12 ... 40 mm

- | - Stroke length
10 ... 4,000 mm



| General technical data | | | | | | |
|--------------------------------|--|--|-----------------|--------------|-----------------|----|
| Piston \varnothing | 12 | 16 | 20 | 25 | 32 | 40 |
| Stroke [mm] | 10 ... 1,200 | 10 ... 2,500 | 10 ... 3,000 | 10 ... 3,500 | 10 ... 4,000 | |
| Pneumatic connection | M5 | | G $\frac{1}{8}$ | | G $\frac{1}{4}$ | |
| Operating medium | Compressed air in accordance with ISO 8573-1:2010 [7:-:-] | | | | | |
| Note on operating/pilot medium | Operation with lubricated medium possible (in which case lubricated operation will always be required) | | | | | |
| Design | Rodless | | | | | |
| Driver principle | Force-locking (magnetic) | | | | | |
| Cushioning | Flexible cushioning rings/plates at both ends | Pneumatic cushioning adjustable at both ends | | | | |
| Cushioning length [mm] | - | 14 | 17 | 19 | 20 | 23 |
| Position sensing | For proximity sensing | | | | | |
| Type of mounting | With hexagonal nuts | | | | | |
| | With accessories | | | | | |
| Fitting position | Any | | | | | |

| Operating and environmental conditions | | | | | | |
|--|-------------|-----------|-----------|-----------|-----------|-----------|
| Piston \varnothing | 12 | 16 | 20 | 25 | 32 | 40 |
| Operating pressure [bar] | 2 ... 7 | 1.7 ... 7 | 1.6 ... 7 | 1.5 ... 7 | 1.4 ... 7 | 1.3 ... 7 |
| Temperature range ¹⁾ [°C] | -20 ... +60 | | | | | |

1) Note operating range of proximity sensors

| Forces [N] | | | | | | |
|--|-----|-----|-----|-----|-----|-------|
| Piston \varnothing | 12 | 16 | 20 | 25 | 32 | 40 |
| Theoretical force at 6 bar | 68 | 121 | 188 | 295 | 483 | 754 |
| Breakaway force of the magnetic coupling | 100 | 160 | 270 | 400 | 680 | 1,050 |

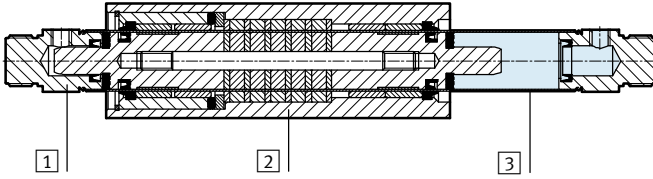
| Weights [g] | | | | | | |
|------------------------------------|-----|-----|-------|-------|-------|-------|
| Piston \varnothing | 12 | 16 | 20 | 25 | 32 | 40 |
| Product weight with 0 mm stroke | 320 | 620 | 1,000 | 1,340 | 2,400 | 3,920 |
| Additional weight per 10 mm stroke | 2 | 3 | 4 | 4.8 | 6 | 8 |

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Technical data

Materials

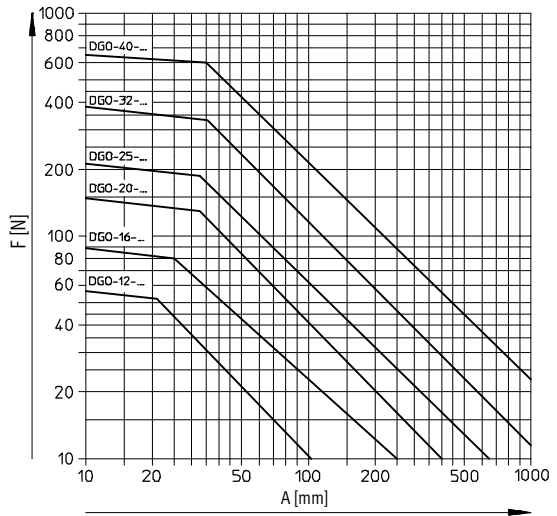
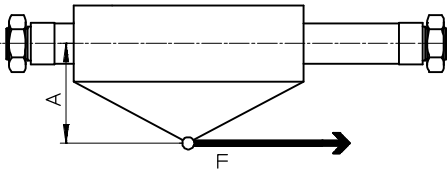
Sectional view



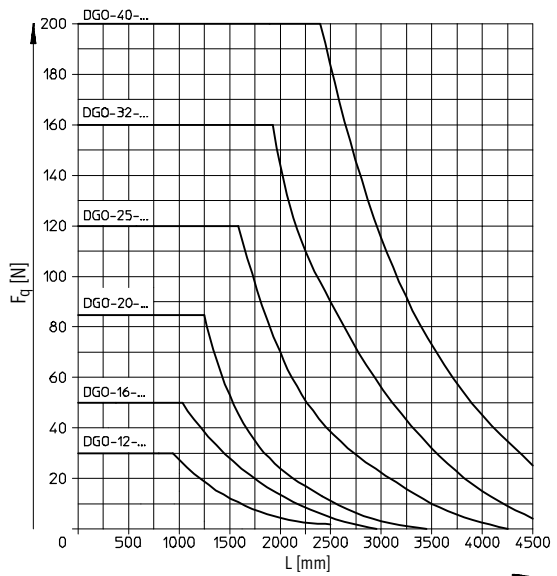
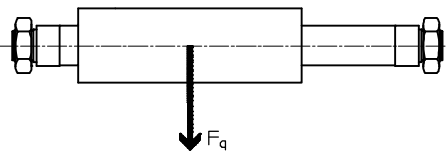
Linear drive unit

| | | |
|---|-----------------|------------------------------|
| 1 | End cap | Anodised aluminium |
| 2 | Outer slide | Anodised aluminium |
| 3 | Cylinder barrel | High-alloy steel |
| - | Seals | Nitrile rubber, polyurethane |

Permissible axial force F dependent on lever arm A



Permissible lateral force F_q dependent on stroke length L

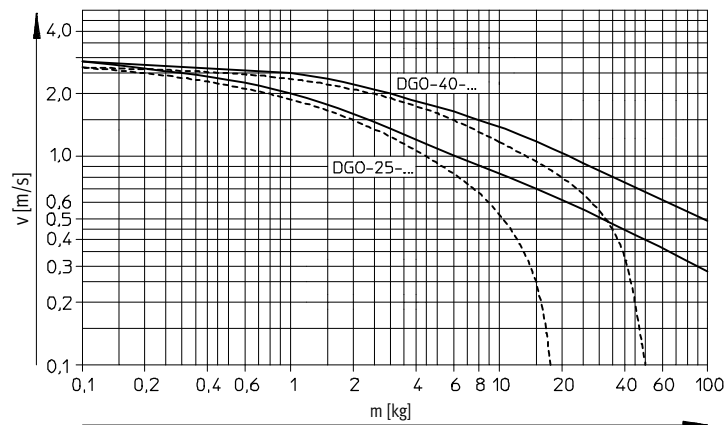
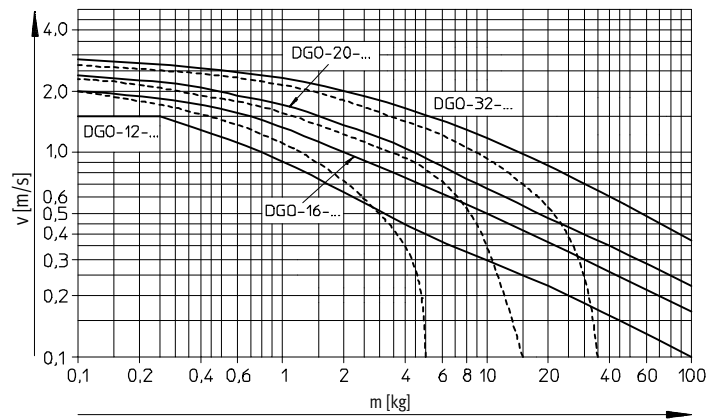


Linear drive units DGO

Technical data

Max. piston speed v dependent on the moving mass m

If the operating conditions are outside the permissible range, the moving mass must be externally cushioned using suitable equipment (shock absorbers or stops).

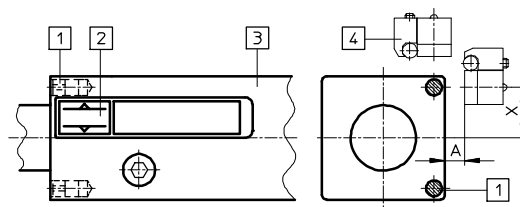


— Horizontal mounting position
 - - - - Vertical mounting position

Contactless position sensing

Mounting the proximity sensors SMEO-/SMTO-/SMPO-1

The proximity sensors are fitted by the user near the linear drive unit (e.g. on a $\varnothing 6$ mm rod). Contactless position sensing is only possible in the area shown. Too small a distance A can cause multiple switching.



- 1 Switching magnet for proximity sensor
- 2 Switching range
- 3 Outer slide 360° rotatable
- 4 Proximity sensor with mounting kit SMB-1

Switching distances, switching travel and hysteresis [mm]

| Proximity sensors | A | X | | | | | | Switching travel | Hysteresis |
|-------------------|-------------|------------|------------|------------|------------|------------|------------|------------------|-------------|
| | | DGO-12-... | DGO-18-... | DGO-20-... | DGO-25-... | DGO-32-... | DGO-40-... | | |
| SMEO-1, SMTO-1 | 6.0 ... 8.0 | 10 ... 11 | 13 ... 14 | 16 ... 17 | 20 ... 21 | 25 ... 26 | 32 ... 33 | 7.5 ... 13 | 1.0 ... 4.5 |
| SMPO-1-H-B | 5.0 ... 6.0 | | | | | | | 7.0 ... 15 | 0.4 ... 2.5 |

Linear drive units DGO

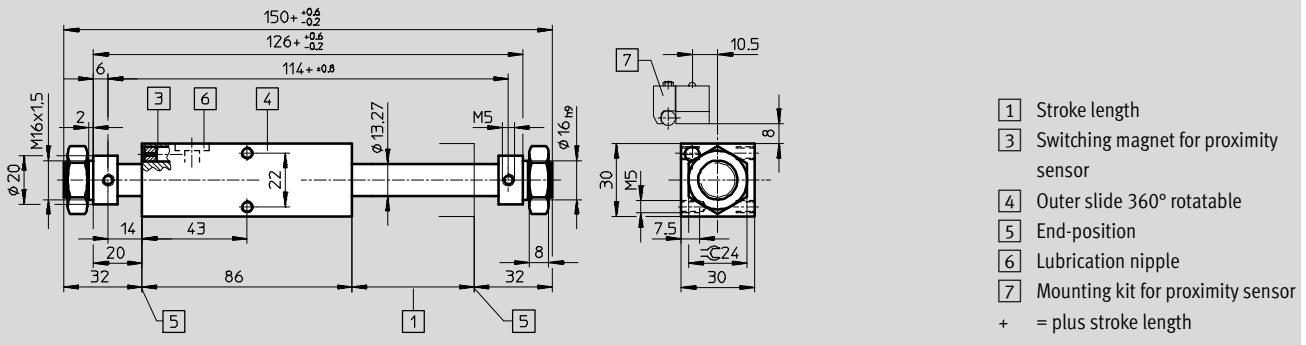
Technical data

FESTO

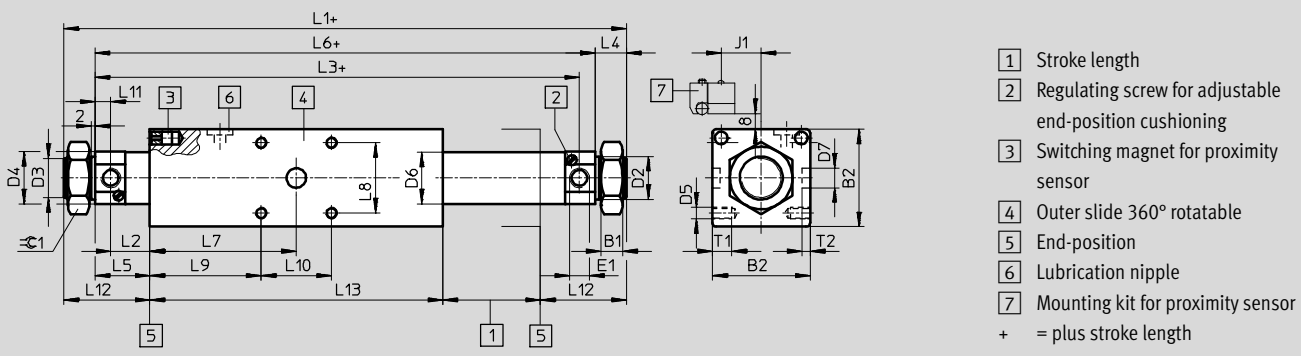
Dimensions

Download CAD data → www.festo.com

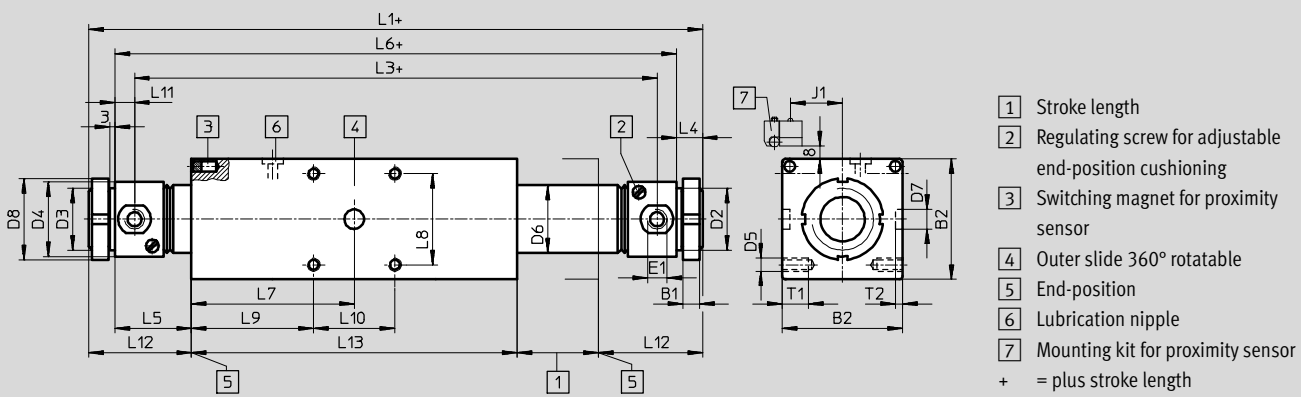
Piston Ø12 mm



Piston Ø16... 25 mm



Piston Ø32... 40 mm



Linear drive units DGO

Technical data

| Dimensions | | | | | | | | | |
|------------|----|----|---------|---------|----|----|------|---------|----|
| ∅ | B1 | B2 | D2 | D3 | D4 | D5 | D6 | D7 | D8 |
| [mm] | | | ∅ h9 | | ∅ | | ∅ | ∅ h8 | ∅ |
| 16 | 8 | 36 | 16 | M16x1.5 | 20 | M5 | 17.5 | 8 | – |
| 20 | 11 | 42 | 22 | M22x1.5 | 27 | M5 | 21.3 | 8 | – |
| 25 | 11 | 50 | 22 | M22x1.5 | 27 | M6 | 26.5 | 10 | – |
| 32 | 8 | 60 | 30 | M30x1.5 | 38 | M6 | 33.6 | 10 | 42 |
| 40 | 10 | 74 | 38 | M38x1.5 | 46 | M8 | 42.6 | 12 | 50 |

| ∅ | E1 | J1 | L1 | L2 | L3 | L4 | L5 | L6 | L7 |
|------|--------------------|------|---------------|------|---------------|----|------|---------------|------|
| [mm] | | | | | | | | | |
| 16 | M5 | 13.5 | 205 +1/-0.5 | 12 | 149 +1/-0.5 | 12 | 28 | 181 ± 0.6 | 62.5 |
| 20 | G1/8 | 16.5 | 217 +0.8/-0.6 | 16.5 | 169 +1/-0.8 | 16 | 24.5 | 185 +0.8/-0.6 | 67.5 |
| 25 | G1/8 ¹⁾ | 20.5 | 238 +1.3/-0.7 | 20 | 190 +1.5/-0.9 | 16 | 28 | 206 +1.3/-0.7 | 75 |
| 32 | G1/8 | 25.5 | 270 +0.8/-0.6 | 23.6 | 218 +0.8/-0.6 | 16 | 33.6 | 238 +0.8/-0.6 | 85 |
| 40 | G1/4 | 32 | 327 +1.3/-0.7 | 35 | 271 +1.5/-0.9 | 16 | 47 | 295 +1.3/-0.7 | 100 |

| ∅ | L8 | L9 | L10 | L11 | L12 | L13 | T1 | T2 | ≈C1 |
|------|----|------|-----|-----|------|-----|------|-----|-----|
| [mm] | | | | | | | | | |
| 16 | 26 | 49.5 | 26 | 16 | 40 | 125 | 8 | 4 | 24 |
| 20 | 32 | 51.5 | 32 | 8 | 40.5 | 135 | 10 | 3 | 32 |
| 25 | 36 | 57 | 36 | 8 | 44 | 150 | 10 | 4 | 32 |
| 32 | 48 | 61 | 48 | 10 | 49.5 | 170 | 12.5 | 4 | – |
| 40 | 56 | 75 | 50 | 12 | 63 | 200 | 16 | 4.5 | – |

1) Max. screw-in depth 7 mm. Use screws supplied by Festo: → www.festo.com

| Ordering data | | | |
|---------------|--------------|----------|--------------------|
| ∅ | Stroke | Part No. | Type |
| [mm] | [mm] | | |
| 12 | 10 ... 1,200 | 15 221 | DGO-12-...-P-A-B |
| 16 | 10 ... 2,500 | 15 222 | DGO-16-...-PPV-A-B |
| 20 | 10 ... 3,000 | 15 223 | DGO-20-...-PPV-A-B |
| 25 | 10 ... 3,500 | 15 224 | DGO-25-...-PPV-A-B |
| 32 | 10 ... 3,500 | 15 225 | DGO-32-...-PPV-A-B |
| 40 | 10 ... 4,000 | 15 226 | DGO-40-...-PPV-A-B |

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Accessories

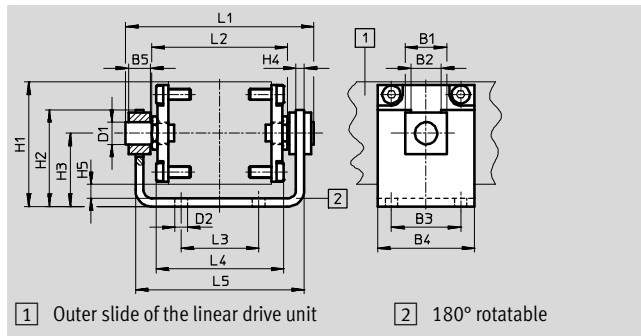


Moment compensator FKG

for piston \varnothing 16 ... 40 mm
Maximum permissible misalignment of parallel guide in longitudinal axis of cylinder = 1 mm.

Scope of delivery: 1 moment compensator and 8 mounting screws

Material:
Galvanised steel



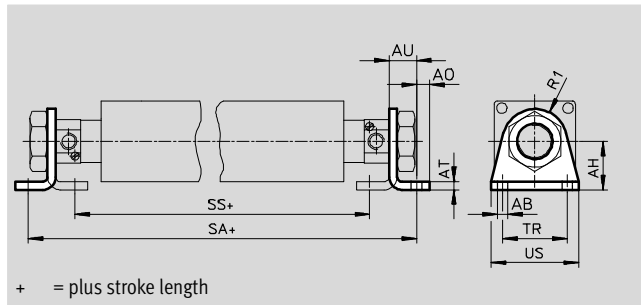
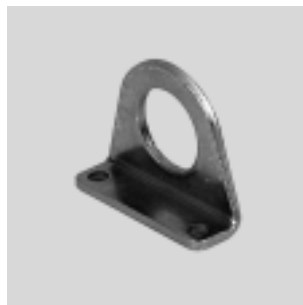
| Dimensions and ordering data | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|----|----|----|----|----|---------------------|---------------------|----|----|----|----|----|-----|----|----|----|-----|-------------------|---------------|----------|----------|
| For \varnothing | B1 | B2 | B3 | B4 | B5 | D1 \varnothing | D2 \varnothing | H1 | H2 | H3 | H4 | H5 | L1 | L2 | L3 | L4 | L5 | CRC ¹⁾ | Weight [g] | Part No. | Type |
| 16 | 18 | 14 | 26 | 40 | 8 | 10 | 5.5 | 47 | 40 | 29 | 4 | 7 | 74 | 54 | 26 | 49 | 68 | 2 | 257 | 15 233 | FKG-16-B |
| 20 | 18 | 14 | 32 | 42 | 8 | 10 | 5.5 | 53 | 43 | 32 | 4 | 7 | 82 | 62 | 32 | 57 | 76 | 2 | 302 | 33 339 | FKG-20-B |
| 25 | 22 | 16 | 36 | 50 | 12 | 12 | 6.6 | 63 | 50 | 38 | 5 | 8 | 98 | 70 | 36 | 64 | 89 | 2 | 511 | 15 234 | FKG-25-B |
| 32 | 22 | 16 | 48 | 60 | 12 | 12 | 6.6 | 73 | 55 | 43 | 5 | 8 | 108 | 80 | 48 | 74 | 99 | 2 | 677 | 33 340 | FKG-32-B |
| 40 | 30 | 22 | 50 | 70 | 16 | 16 | 9 | 90 | 70 | 53 | 6 | 10 | 134 | 98 | 56 | 92 | 122 | 2 | 1277 | 15 235 | FKG-40-B |

1) 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.

Foot mounting HBN

for piston \varnothing 12 ... 25 mm

Material:
Galvanised steel
Free of copper and PTFE



| Dimensions and ordering data | | | | | | | | | | | | | | |
|------------------------------|---------------------|----|----|----|----|----|-----|-----|----|----|-------------------|---------------|----------|---------------|
| For \varnothing | AB \varnothing | AH | AO | AT | AU | R1 | SA | SS | TR | US | CRC ¹⁾ | Weight [g] | Part No. | Type |
| 12 | 5.5 | 20 | 6 | 4 | 14 | 13 | 153 | 105 | 32 | 42 | 1 | 43 | 5125 | HBN-12/16x1 |
| 16 | 5.5 | 27 | 6 | 4 | 14 | 13 | 209 | 161 | 32 | 42 | 1 | 51 | 6062 | HBN-12/16x1-A |
| 20 | 6.6 | 30 | 8 | 5 | 17 | 20 | 219 | 161 | 40 | 54 | 1 | 104 | 6064 | HBN-20/25x1-A |
| 25 | 6.6 | 30 | 8 | 5 | 17 | 20 | 240 | 182 | 40 | 54 | 1 | 104 | 6064 | HBN-20/25x1-A |

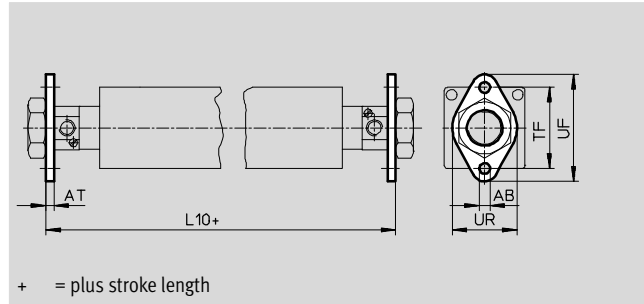
1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Linear drive units DGO

Accessories

Flange mounting FBN
for piston \varnothing 12 ... 25 mm

Material:
Galvanised steel
Free of copper and PTFE

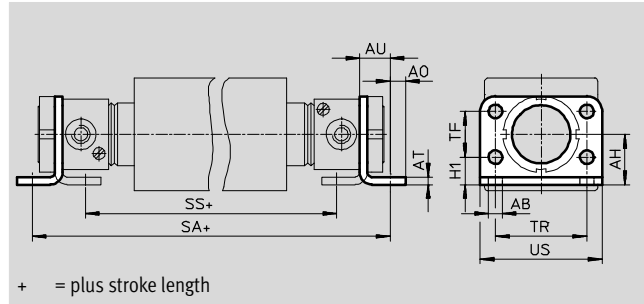


| Dimensions and ordering data | | | | | | | | | | | | |
|------------------------------|---------------------|----|-----|----|----|----|----|-------------------|---------------|----------|-----------|--|
| For \varnothing | AB \varnothing | AT | L10 | TF | UF | UR | US | CRC ¹⁾ | Weight [g] | Part No. | Type | |
| 12 | 5.5 | 4 | 133 | 40 | 53 | 30 | 42 | 1 | 26 | 5130 | FBN-12/16 | |
| 16 | 5.5 | 4 | 189 | 40 | 53 | 30 | 42 | 1 | 26 | 5130 | FBN-12/16 | |
| 20 | 6.6 | 5 | 189 | 50 | 66 | 40 | 54 | 1 | 52 | 5131 | FBN-20/25 | |
| 25 | 6.6 | 5 | 216 | 50 | 66 | 40 | 54 | 1 | 52 | 5131 | FBN-20/25 | |

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Flange mounting FBN
for piston \varnothing 32 ... 40 mm

Material:
Galvanised steel
Free of copper and PTFE




| Dimensions and ordering data | | | | | | | | | | | | | | | |
|------------------------------|---------------------|----|----|----|----|----|-----|-----|----|----|----|-------------------|---------------|----------|--------|
| For \varnothing | AB \varnothing | AH | A0 | AT | AU | H1 | SA | SS | TF | TR | US | CRC ¹⁾ | Weight [g] | Part No. | Type |
| 32 | 7 | 28 | 7 | 4 | 14 | 14 | 266 | 218 | 28 | 52 | 66 | 1 | 103 | 195855 | FBN-32 |
| 40 | 9 | 33 | 10 | 5 | 19 | 18 | 335 | 265 | 30 | 60 | 80 | 1 | 191 | 195856 | FBN-40 |


1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).


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
Accessories



FESTO


| Ordering data – Rectangular proximity sensors, magneto-resistive | | | | | | Technical data → Internet: smto | |
|---|------------------|---------------|-----------------------|---------|------------------|---------------------------------|-----------------------------|
| | Mounting | Switch output | Electrical connection | | Cable length [m] | Part No. | Type |
| | | | Cable | M8 plug | | | |
| NO contact | | | | | | | |
|  | With accessories | PNP | 3-wire | – | 2.5 | 151683 | SMTO-1-PS-K-LED-24-C |
| | | | – | 3-pin | – | 151685 | SMTO-1-PS-S-LED-24-C |
| | | NPN | 3-wire | – | 2.5 | 151684 | SMTO-1-NS-K-LED-24-C |
| | | | – | 3-pin | – | 151686 | SMTO-1-NS-S-LED-24-C |

| Ordering data – Rectangular proximity sensors, magnetic reed | | | | | | Technical data → Internet: smeo | |
|---|------------------|-----------------------|---------|------------------|---------------|---------------------------------|--|
| | Mounting | Electrical connection | | Cable length [m] | Part No. | Type | |
| | | Cable | M8 plug | | | | |
| NO contact | | | | | | | |
|  | With accessories | 3-wire | – | 2.5 | 30459 | SMEO-1-LED-24-B | |
| | | 3-wire | – | 5.0 | 151672 | SMEO-1-LED-24-K5-B | |
| | | – | 3-pin | – | 150848 | SMEO-1-S-LED-24-B | |

| Ordering data – Rectangular proximity sensors, pneumatic | | | | | Technical data → Internet: smpo | |
|--|------------------|-----------------------------------|--|--------------|---------------------------------|--|
| | Mounting | Pneumatic connection | | Part No. | Type | |
| 3/2-way valve, normally closed | | | | | | |
|  | With accessories | Barbed fitting for 3 mm tubing ID | | 31008 | SMPO-1-H-B | |

| Ordering data – Mounting kit | | | | Technical data → Internet: smb | |
|---|---|--|--|--------------------------------|--------------|
| | Mounting | | | Part No. | Type |
|  | For cylinder with tie rod \varnothing 6 mm or DUO rail mounting profile | | | 11886 | SMB-1 |

| 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: grla | |
|---|-----------------|---------------|--------------|---------------|---|--|
| | Connection | | Material | Part No. | Type | |
| | Thread | For tubing OD | | | | |
|  | M5 | 3 | Metal design | 193137 | GRLA-M5-QS-3-D | |
| | | 4 | | 193138 | GRLA-M5-QS-4-D | |
| | G $\frac{1}{8}$ | 4 | | 193143 | GRLA-$\frac{1}{8}$-QS-4-D | |
| | | 6 | | 193144 | GRLA-$\frac{1}{8}$-QS-6-D | |
| | G $\frac{1}{4}$ | 6 | | 193146 | GRLA-$\frac{1}{4}$-QS-6-D | |
| | | 8 | | 193147 | GRLA-$\frac{1}{4}$-QS-8-D | |