

Passive guide axes FDG-ZR-RF, without drive



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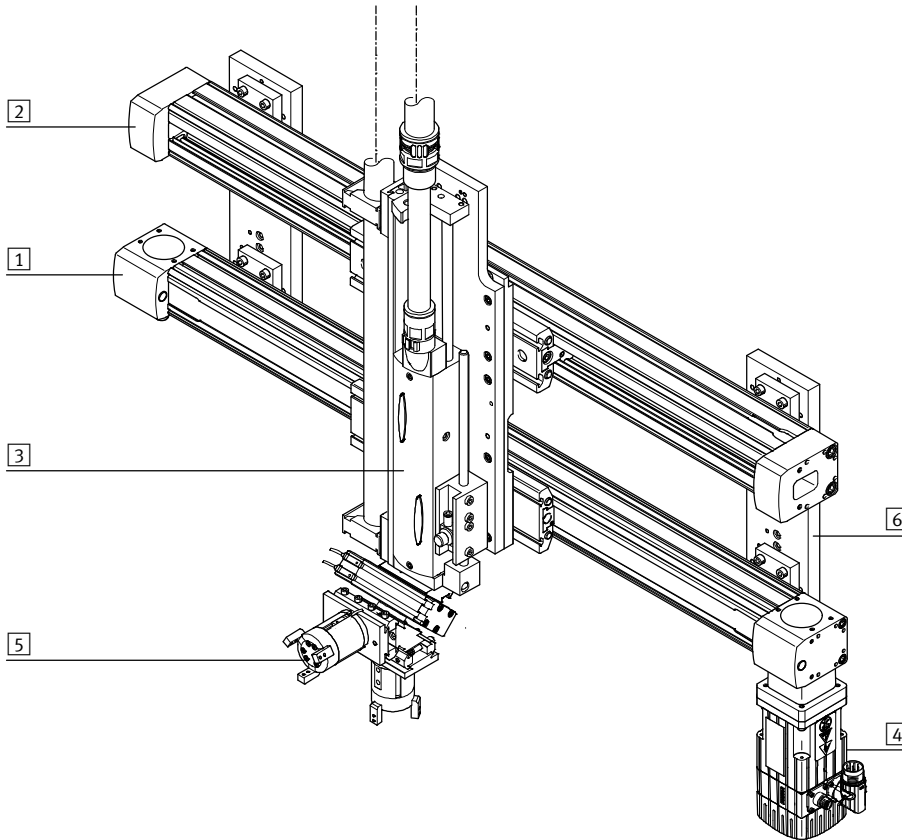
Key features



At a glance

- Driveless linear guide unit with guide and freely movable slide
- The passive guide axis is designed to increase force and torque capacities in multi-axis applications
- Higher torsional resistance
- Reduced vibrations with dynamic loads
- Drive axis and passive guide axis can be arranged adjacent to or above one another

System product for handling and assembly technology



System components and accessories

| | Brief description | → Page/Internet |
|---|--------------------|--|
| 1 | Axes | Wide range of combinations possible within handling and assembly technology axis |
| 2 | Passive guide axes | For increasing force and torque capacity in multi-axis applications guide axis |
| 3 | Drives | Wide range of combinations possible within handling and assembly technology drive |
| 4 | Motors | Servo and stepper motors, with or without gearing motor |
| 5 | Grippers | Wide range of variations possible within handling and assembly technology gripper |
| 6 | Adapters | For drive/drive and drive/gripper combinations adapter kit |

Passive guide axes FDG-ZR-RF, without drive

Key features

Passive guide axes and the corresponding axes/drives

Passive guide axis ELFA-RF



- Can be combined with:
 - Toothed belt axis ELGA-TB-RF
- For size 70, 80
- Load capacity up to max. 800 N or 180 Nm

Passive guide axis EGC-FA



- Can be combined with:
 - Toothed belt axis EGC-TB
 - Spindle axis EGC-BS
- For size 70 ... 185
- Load capacity up to max. 15200 N or 1157 Nm

Passive guide axis DGC-FA



- Can be combined with:
 - Linear drive DGC-KF
- For size 8 ... 63
- Load capacity up to max. 15200 N or 1157 Nm

Passive guide axis FDG-ZR-RF



- Can be combined with:
 - Toothed belt axis DGE-ZR-RF
- For size 25 ... 63
- Load capacity up to max. 600 N or 600 Nm

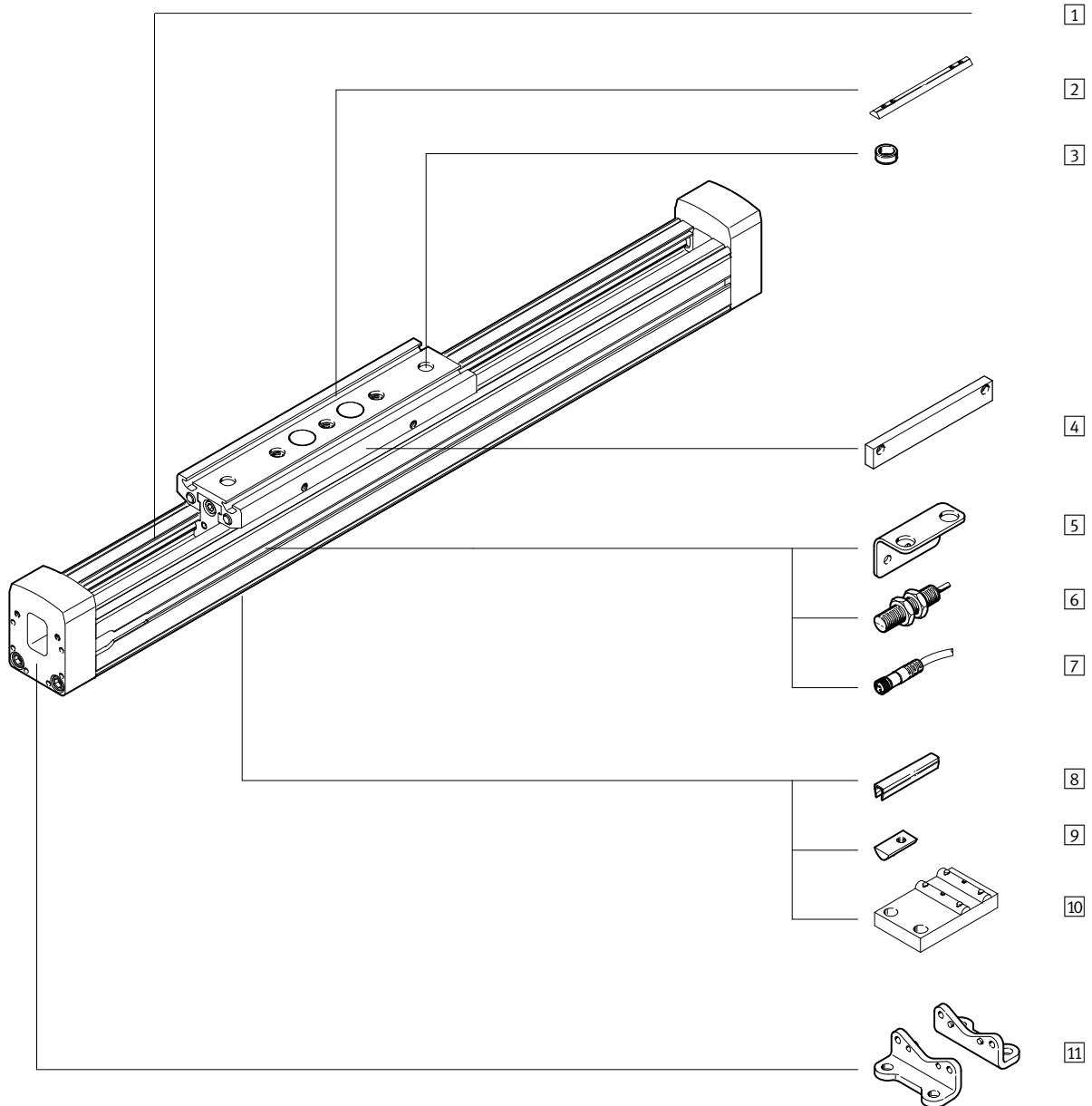
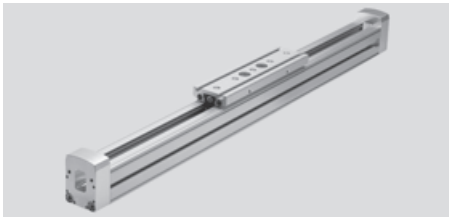
Passive guide axis FDG-ZR/-SP



- Can be combined with:
 - Toothed belt axis DGE-ZR-KF
 - Spindle axis DGE-SP-KF
- For size 18 ... 63
- Load capacity up to max. 14050 N or 1820 Nm

Passive guide axes FDG-ZR-RF, without drive

Peripherals overview



Passive guide axes FDG-ZR-RF, without drive

Peripherals overview

| Variants and accessories | | |
|---|--|-----------------|
| Type | Brief description | → Page/Internet |
| 1 Passive guide axis FDG-ZR-RF | Guide without drive | 8 |
| 2 Slot nut for slide X | For mounting loads and attachments on the slide | 17 |
| 3 Centring sleeve Z | For centring loads and attachments on the slide | 17 |
| 4 Switching lug L | For sensing the slide position | 18 |
| 5 Mounting bracket T | Adapter for mounting the sensors on the axis | 18 |
| 6 Inductive proximity sensor O/P/W/R | For use as a proximity signal and safety monitor | 19 |
| 7 Cable with socket V | For proximity sensors | 19 |
| 8 Slot cover B | For protecting against ingress of dirt | 17 |
| 9 Slot nut for profile slot Y | For mounting attachments | 17 |
| 10 Central support M | For mounting the axis | 16 |
| 11 Foot mounting F | For mounting the axis | 16 |

Passive guide axes FDG-ZR-RF, without drive

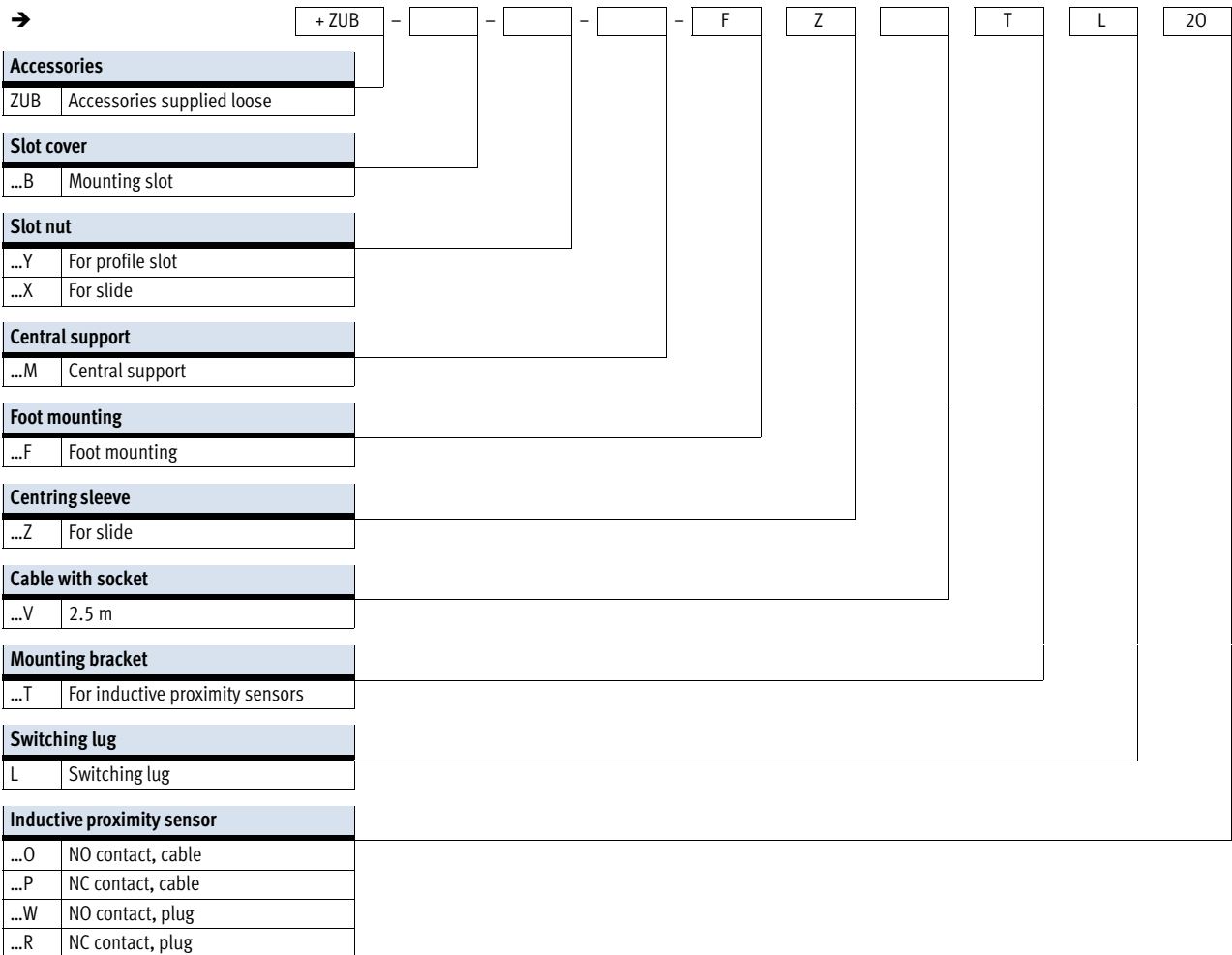
Type codes



| | | | | | | | | | | | | |
|--------------------|---------------------------------|-----|---|----|---|-----|---|----|---|----|---|----|
| | | FDG | - | 25 | - | 500 | - | ZR | - | RF | - | GK |
| Type | | | | | | | | | | | | |
| FDG | Guide unit without drive | | | | | | | | | | | |
| Size | | | | | | | | | | | | |
| Stroke [mm] | | | | | | | | | | | | |
| Guide axis | | | | | | | | | | | | |
| ZR | For toothed belt axis DGE-ZR-RF | | | | | | | | | | | |
| Guide | | | | | | | | | | | | |
| RF | Roller guide | | | | | | | | | | | |
| Slide | | | | | | | | | | | | |
| GK | Standard slide | | | | | | | | | | | |
| GV | Extended slide | | | | | | | | | | | |

Passive guide axes FDG-ZR-RF, without drive

Type codes

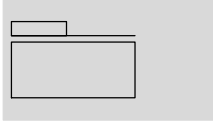




Passive guide axes FDG-ZR-RF, without drive

FESTO

Technical data

Function



-  - Size
25 ... 63
-  - Stroke length
1 ... 5000 mm



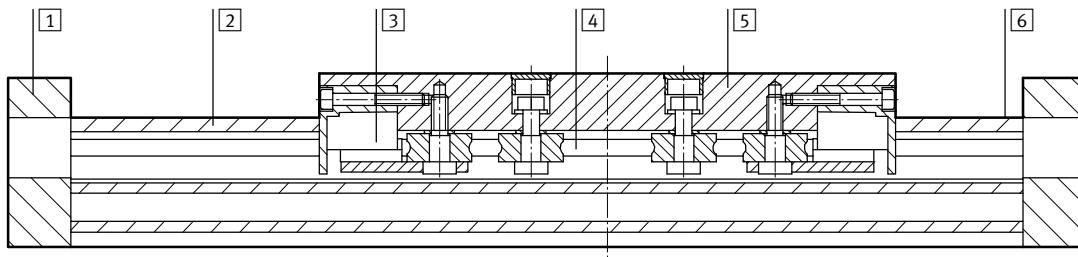
| General technical data | | 25 | 40 | 63 |
|-----------------------------------|---------------------|--------------------------|------------|--------------------------|
| Size | | 25 | 40 | 63 |
| Design | | Guide unit without drive | | |
| Guide | | Internal roller guide | | |
| Assembly position | | Any | | |
| Max. working stroke ¹⁾ | [mm] | 1 ... 5000 | 1 ... 5000 | 1 ... 5000 ²⁾ |
| Max. working load | [kg] | 15 | 30 | 60 |
| Thrust | [N] | 5 ... 12 | 5 ... 35 | 5 ... 30 |
| Max. speed | [m/s] | 10 | | |
| Max. acceleration | [m/s ²] | 50 | | |
| Ambient temperature | [°C] | 0 ... +60 | | |

- 1) Total stroke = working stroke + 2x stroke reserve
- 2) The max. working stroke for the variant with extended slide (GV) is 4,800 mm.

| Weights [kg] | | 25 | | 40 | | 63 | |
|-------------------------------------|--|------|-----|------|-----|------|------|
| Slide design | | GK | GV | GK | GV | GK | GV |
| Basic weight with 0 mm stroke | | 2.0 | 2.5 | 6.1 | 7.6 | 20.4 | 25.4 |
| Additional weight per 100 mm stroke | | 0.29 | | 0.59 | | 1.38 | |
| Moving load | | 0.5 | 0.8 | 1.8 | 2.5 | 4.6 | 6.4 |

Materials

Sectional view



| Axis | |
|------|--|
| 1 | End cap Anodised aluminium |
| 2 | Housing Anodised aluminium |
| 3 | Cover cap Polyamide |
| 4 | Guide rail Steel |
| 5 | Slide Anodised aluminium |
| 6 | Guide element Steel |
| - | Note on materials Free of copper and PTFE |

Passive guide axes FDG-ZR-RF, without drive

Technical data

Stroke reserve

L9 The stroke reserve is a safety distance available on both sides of the axis in addition to the stroke.

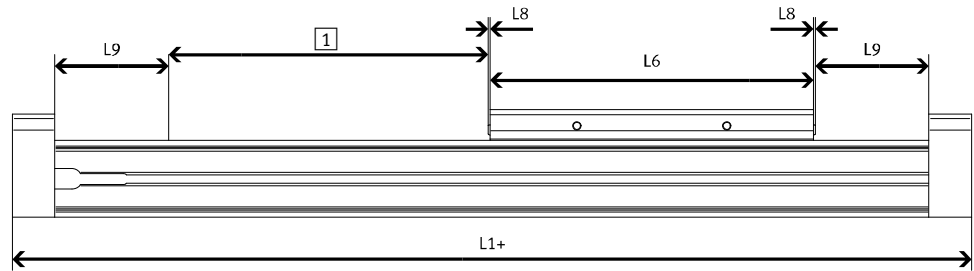
The indicated values only apply in combination with the toothed belt axis DGE-ZR-RF.

L6 Slide length

L8 Stop element

L1+ Overall length of axis

1 Working stroke



Example:

Type FDG-25-500-ZR-RF

Working stroke = 500 mm
 Stroke reserve = (2x 86 mm) = 172 mm
 Total stroke = 500 mm + 172 mm = 672 mm

| Size | 25 | 40 | 63 |
|--------------------------|----|-----|-----|
| L9 per end position [mm] | 86 | 136 | 244 |

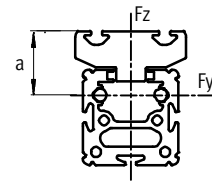
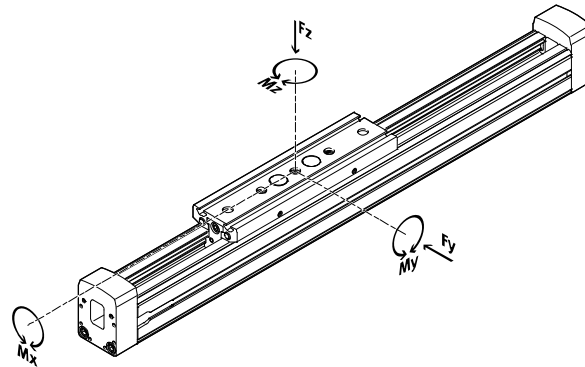
Passive guide axes FDG-ZR-RF, without drive

Technical data



Characteristic load values

The indicated forces and torques refer to the centre of the guide. They must not be exceeded in the dynamic range. Special attention must be paid to the cushioning phase.



| Size | a in [mm] |
|------|-----------|
| 25 | 30 |
| 40 | 37 |
| 63 | 44.6 |

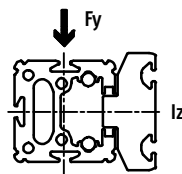
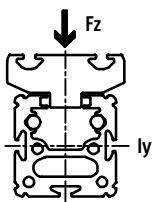
If the drive is subjected to more than two of the indicated forces and torques simultaneously, the following equations must be satisfied in addition to the indicated maximum loads:

$$\frac{F_y}{F_{y_{max.}}} + \frac{F_z}{F_{z_{max.}}} + \frac{M_x}{M_{x_{max.}}} + \frac{M_y}{M_{y_{max.}}} + \frac{M_z}{M_{z_{max.}}} \leq 1$$

Permissible forces and torques

| Size | 25 | | 40 | | 63 | |
|------------------------------------|-----|----|-----|-----|-----|-----|
| | GK | GV | GK | GV | GK | GV |
| F _{y_{max.}} [N] | 150 | | 300 | | 600 | |
| F _{z_{max.}} [N] | 150 | | 300 | | 600 | |
| M _{x_{max.}} [Nm] | 7 | | 18 | | 65 | |
| M _{y_{max.}} [Nm] | 15 | 30 | 60 | 120 | 170 | 340 |
| M _{z_{max.}} [Nm] | 15 | 30 | 90 | 180 | 300 | 600 |

2nd moment of area



| Size | 25 | 40 | 63 |
|-----------------------------------|-----------------------|-----------------------|-----------------------|
| I _y [mm ⁴] | 5.947x10 ⁵ | 2.479x10 ⁶ | 1.664x10 ⁷ |
| I _z [mm ⁴] | 2.372x10 ⁵ | 9.463x10 ⁵ | 5.997x10 ⁶ |

Passive guide axes FDG-ZR-RF, without drive

Technical data

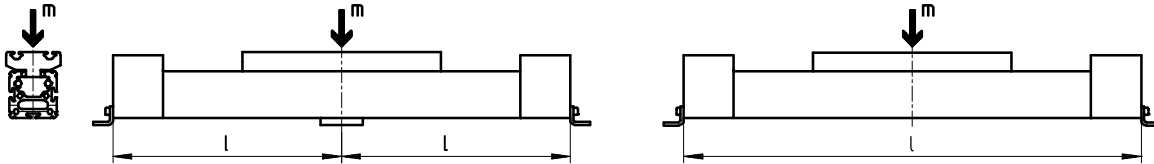
Maximum permissible support span l as a function of the applied load m

The axis may need to be supported with central supports MUP in order to limit deflection in the case of large strokes. The following diagrams serve

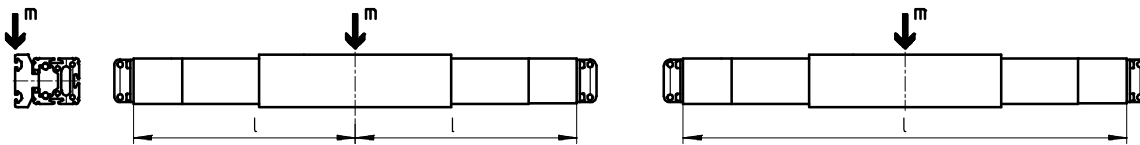
to determine the maximum permissible support span as a function of the applied load acting upon the axis.

A distinction is made here between forces acting upon the surface of the slide and forces acting upon the front of the slide.

1 Load on the surface of the slide

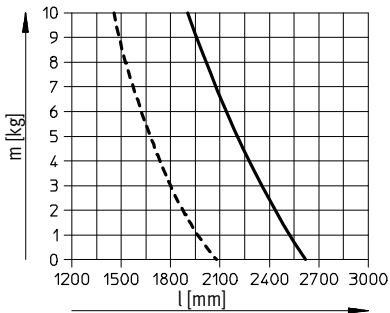


2 Load on the front of the slide

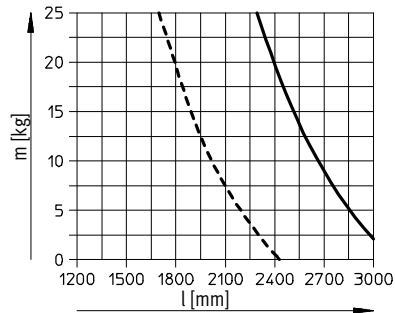


Maximum support span l (without central support) as a function of the applied load m

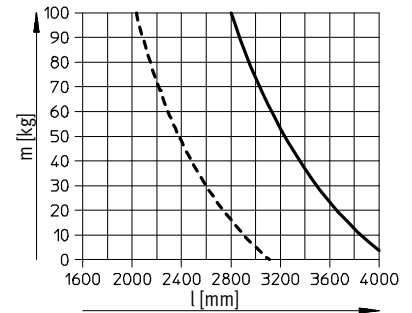
FDG-25



FDG-40



FDG-63



- 1
- - - 2

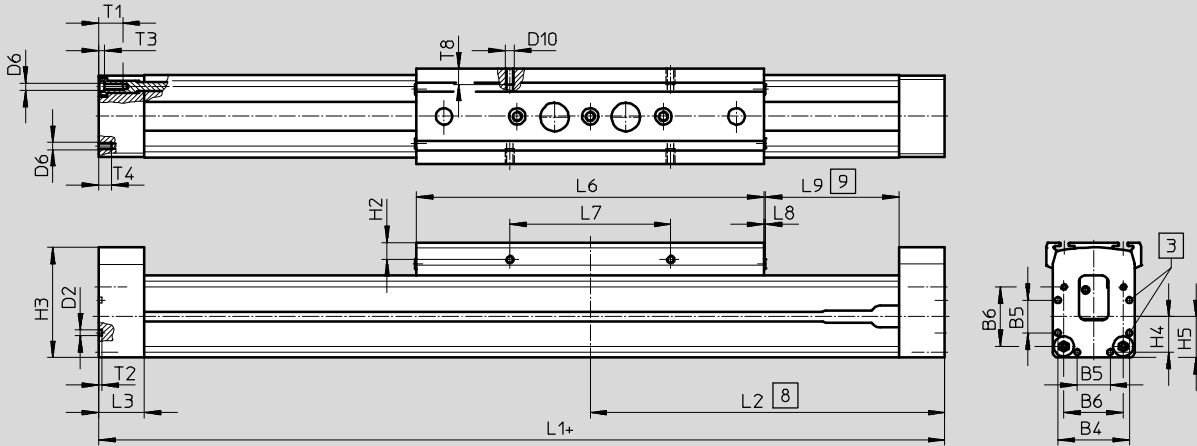
Passive guide axes FDG-ZR-RF, without drive

Technical data

Dimensions

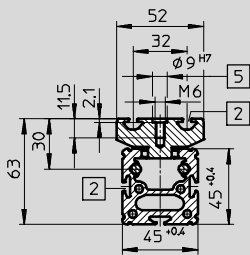
Download CAD data → www.festo.com

FDG-25/-40/-63



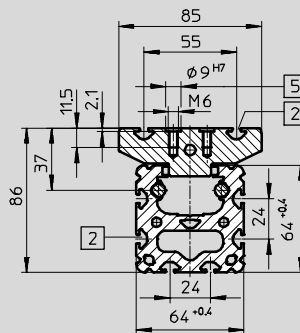
- 3 Centring hole for foot mounting
- 8 Driver in end position of the working stroke (including L9)
- 9 Recommended stroke reserve
+ = plus stroke length

FDG-25

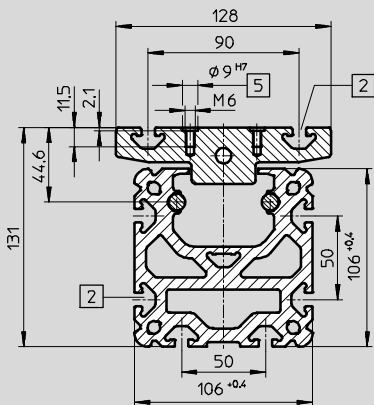


- 2 Slot for slot nuts
- 5 Hole for centring sleeve ZBH-9 and mounting thread

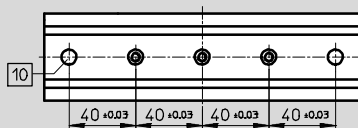
FDG-40



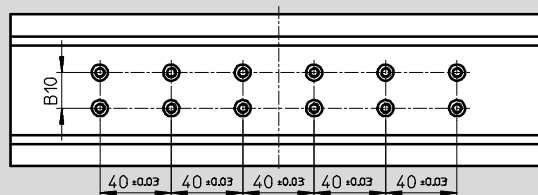
FDG-63



FDG-25-GK



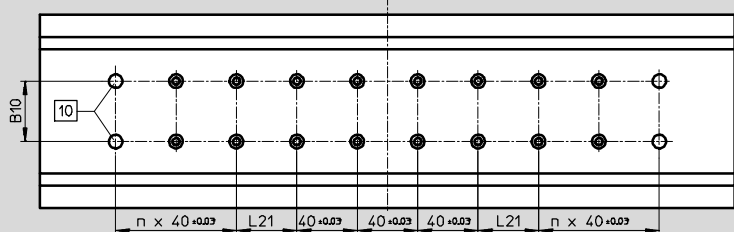
FDG-40-GK



FDG-25-GV



FDG-40-GV, FDG-63-GK



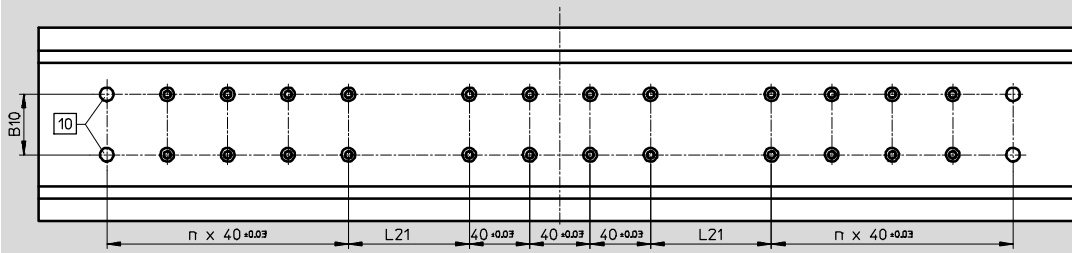
- 10 Hole for centring sleeve ZBH-9

Passive guide axes FDG-ZR-RF, without drive

Technical data



FDG-63-GV



| Size | | B4 | B5 | B6 | B10 ±0.03 | D2 | D6 | D10 | H2 | H3 |
|------|----------|------|----|------|--------------|---------------------|----|-----|------|-------|
| 25 | GK GV | 39.1 | 18 | 32.5 | - | 3.3 _{+0.1} | M4 | M5 | 9.3 | 60.4 |
| 40 | GK GV | 53 | 28 | 49 | 20 | 4.4 _{H13} | M5 | M5 | 9.5 | 83.8 |
| 63 | GK GV | 89 | 44 | 83 | 40 | 6.4 _{+0.1} | M8 | M8 | 10.5 | 129.3 |

| Size | | H4 | H5 | L1 | L2 | L3 | L6 | L7 | L8 |
|------|----------|------|------|--------------|--------------|----|------------|--------------------|----|
| 25 | GK GV | 19.6 | 22.5 | 414 509 | 207 254.5 | 25 | 190 285 | 88 _{±0.2} | 1 |
| 40 | GK GV | 26.5 | 32 | 638 778 | 319 389 | 31 | 300 440 | 58 _{±0.1} | 2 |
| 63 | GK GV | 44.5 | 52.8 | 1020 1250 | 510 625 | 34 | 460 690 | 72 _{±0.1} | 2 |

| Size | | L9 | L21 ±0.03 | n | T1 | T2 | T3 | T4 | T8 |
|------|----------|-----|--------------|--------|----|----|----|----|-----|
| 25 | GK GV | 86 | - | - | 13 | 2 | 3 | 8 | 8.5 |
| 40 | GK GV | 136 | 40 | - 2 | 13 | 3 | 5 | 12 | 8.5 |
| 63 | GK GV | 244 | 40 80 | 2 4 | 21 | 4 | 6 | - | 12 |

Passive guide axes FDG-ZR-RF, without drive

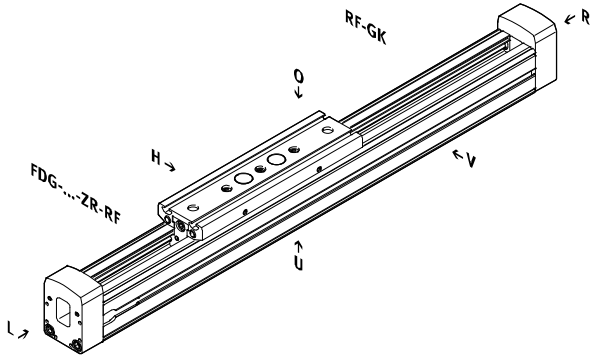
Ordering data – Modular products



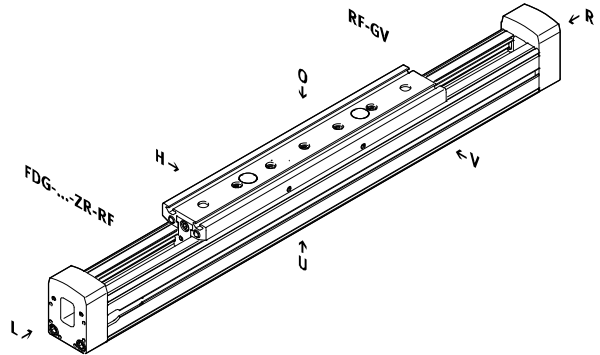
Ordering code

Mandatory data

GK Standard slide

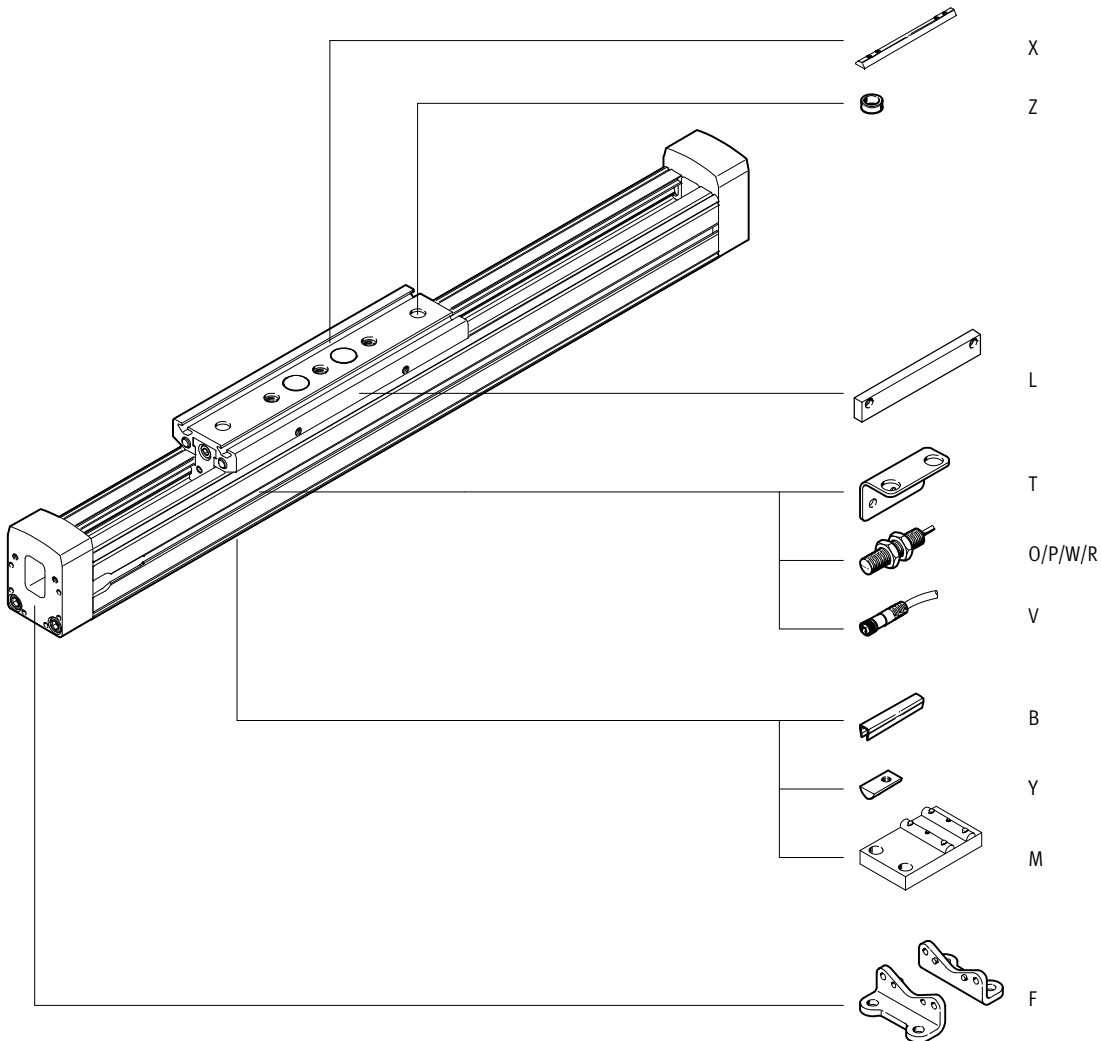


GV Extended slide



Ordering code

Options



Passive guide axes FDG-ZR-RF, without drive

Ordering data – Modular products

| M Mandatory data | | | | | | | O Options | |
|-------------------------|------------|-------------|--------------|-------------|-------------|-------------|---|-------------|
| Module No. | Function | Size | Stroke | Guide axis | Guide | Slide | Accessories | |
| 538791 | FDG | 25 | 1 ... 5 000 | ZR | RF | GK | ...B, ...Y, ...X, ...M, ...F, ...Z, ...V, ...T, L, ...O, ...P, ...W, ...R | |
| 538792 | | 40 | | | | GV | | |
| 538793 | | 63 | | | | | | |
| Ordering example | | | | | | | | |
| 538791 | FDG | - 25 | - 300 | - ZR | - RF | - GK | - ZUB | - 2B |

| Ordering table | | | | | | | |
|----------------|--|------------------------------------|----------|-----------------|------|---------------|-------|
| Size | 25 | 40 | 63 | Condi- tions | Code | Enter code | |
| M | Module No. | 538791 | 538792 | 538793 | | | |
| | Function | Guide axis without drive | | | | FDG | FDG |
| | Size | 25 | 40 | 63 | | -... | |
| | Stroke [mm] | 1 ... 5000 | | | | -... | |
| | Guide axis | for DGE-ZR-RF | | | | -ZR | -ZR |
| | Guide | Roller guide | | | | -RF | -RF |
| | Slide | Standard slide | | | | -GK | |
| | | Extended slide | | | 1 | -GV | |
| O | Accessories | Accessories supplied loose | | | | -ZUB- | -ZUB- |
| | Slot cover for mounting slot | 1 ... 10 | | | | ...B | |
| | Slot nut | Mounting slot | 1 ... 10 | | | ...Y | |
| | | For slide | 1 ... 10 | | | ...X | |
| | Central support | 1 ... 10 | | | | ...M | |
| | Foot mounting | 1 ... 10 | | | | ...F | |
| | Centring sleeve (pack of 10) | 10, 20, 30, 40, 50, 60, 70, 80, 90 | | | | ...Z | |
| | Cable with socket, M8, 2.5 m | 1 ... 10 | | | | ...V | |
| | Mounting bracket for inductive proximity sensors | 1 ... 5 | | | | ...T | |
| | Switching lug | 1 | | | | L | |
| | Inductive proximity sensor | NO contact, cable 2.5 m | 1 ... 5 | | | ...O | |
| | | NC cable, cable 2.5 m | 1 ... 5 | | | ...P | |
| | | NO contact, plug M8 | 1 ... 5 | | | ...W | |
| | | NC contact, plug M8 | 1 ... 5 | | | ...R | |

1 **GV** Maximum stroke Size 25: 4 905 mm
Size 40: 4 860 mm
Size 63: 4 770 mm

Passive guide axes FDG-ZR-RF, without drive

Accessories

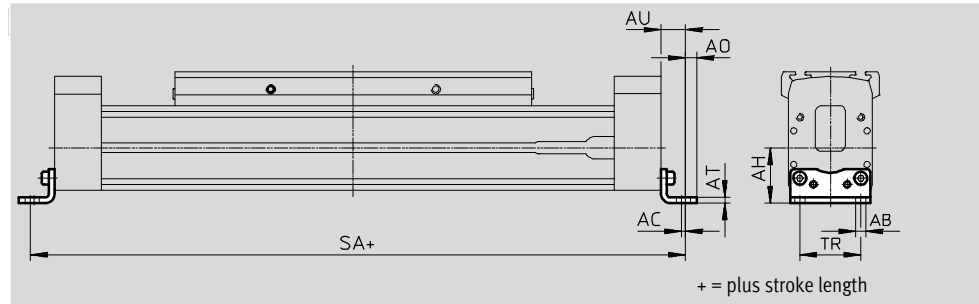


Foot mounting HP (order code: F)

Material:
Galvanised steel
Free of copper and PTFE



HP-25



Dimensions and ordering data

| For size | AB ∅ | AC | AH | AO | AT | AU |
|----------|---------|----|------|------|----|------|
| 25 | 5.5 | 2 | 29.5 | 6 | 3 | 13 |
| 40 | 6.6 | 2 | 46 | 8.5 | 5 | 17.5 |
| 63 | 11 | 3 | 69 | 13.5 | 6 | 28 |

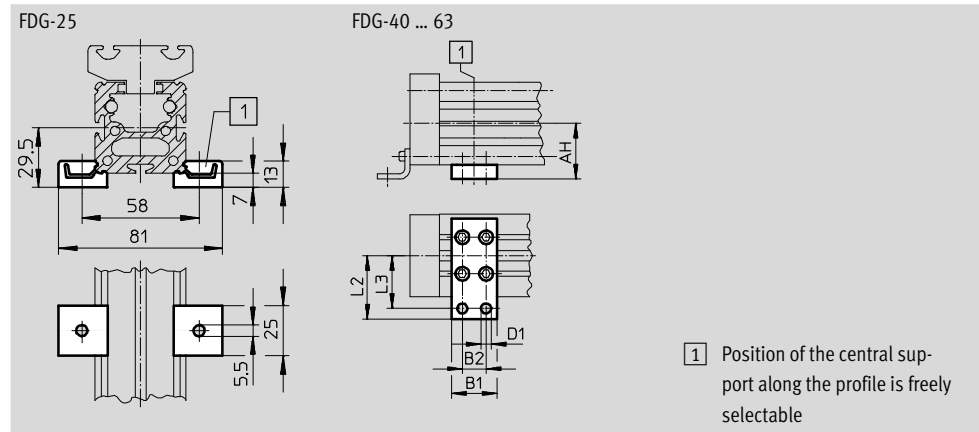
| For size | SA | | TR | Weight [g] | Part No. | Type |
|----------|------|------|------|---------------|----------|-------|
| | GK | GV | | | | |
| 25 | 440 | 535 | 32.5 | 61 | 150731 | HP-25 |
| 40 | 673 | 813 | 45 | 188 | 150733 | HP-40 |
| 63 | 1076 | 1306 | 75 | 305 | 150735 | HP-63 |

Central support MUP (order code: M)

Material:
Anodised aluminium
Free of copper and PTFE



MUP-40


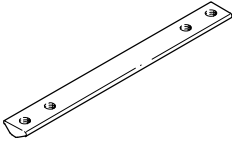

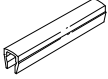
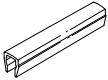


Dimensions and ordering data

| For size | AH | B1 | B2 | D1 ∅ | L2 | L3 | Weight [g] | Part No. | Type |
|----------|----|----|----|---------|----|----|---------------|----------|-----------|
| 25 | - | - | - | - | - | - | 33 | 150736 | MUP-18/25 |
| 40 | 46 | 35 | 22 | 6.6 | 47 | 40 | 126 | 150738 | MUP-40 |
| 63 | 69 | 50 | 26 | 11 | 77 | 65 | 340 | 150800 | MUP-63 |

Passive guide axes FDG-ZR-RF, without drive

Accessories

| Ordering data | | | | | | |
|---|------------|--------------------------------|---------------|---------------|-------------------|------------------|
| | For size | Remarks | Ordering code | Part No. | Type | PU ¹⁾ |
| Slot nut NST Technical data → Internet: nst | | | | | | |
|  | 25 | For mounting slot/profile slot | Y | 526091 | NST-HMV-M4 | 10 |
| | 40 | | | 150914 | NST-5-M5 | 1 |
| | 63 | | | 150915 | NST-8-M6 | 1 |
| Slot nut NSTL Technical data → Internet: nstl | | | | | | |
|  | 25 | For slide | X | 158410 | NSTL-25 | 1 |
| | 40 | | | 158412 | NSTL-40 | 1 |
| | 63 | | | 158414 | NSTL-63 | 1 |
| Centring pin/sleeve ZBH Technical data → Internet: zbh | | | | | | |
|  | 25, 40, 63 | For slide | Z | 150927 | ZBH-9 | 10 |
| Slot cover ABP-S Technical data → Internet: abp | | | | | | |
|  | 25 | For mounting slot every 0.5 m | B | 151680 | ABP-5-S | 2 |
| Slot cover ABP Technical data → Internet: abp | | | | | | |
|  | 40 | For mounting slot every 0.5 m | B | 151681 | ABP-5 | 2 |
| | 63 | | | 151682 | ABP-8 | |

1) Packaging unit quantity

Passive guide axes FDG-ZR-RF, without drive

Accessories



Sensor bracket HWS

for inductive proximity sensors

(order code: T)

Material:

Galvanised steel

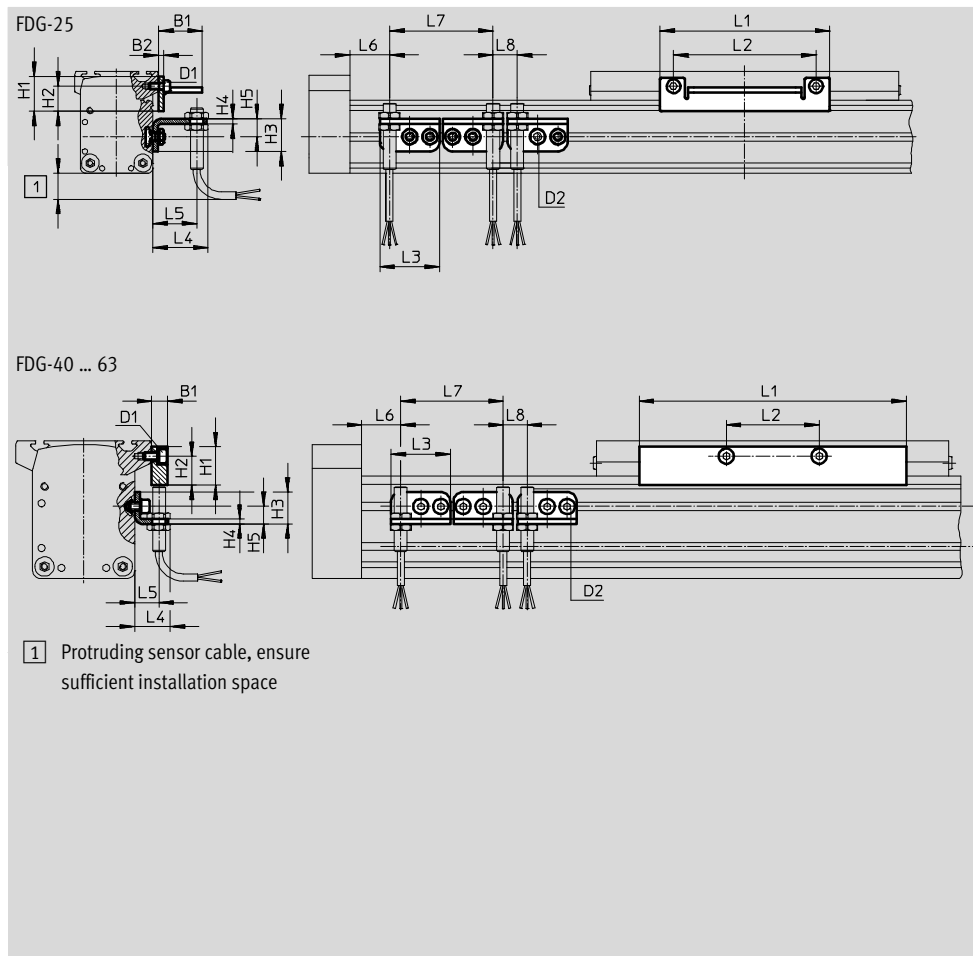


Switching lug SF

(order code: L)

Material:

Galvanised steel









| Dimensions and ordering data | | | | | | | | | | | | | | |
|------------------------------|----|----|----|----|------|------|----|----|----|-----|----|----|------|----|
| For size | D1 | D2 | B1 | B2 | H1 | H2 | H3 | H4 | H5 | L1 | L2 | L3 | L4 | L5 |
| 25 | M5 | M5 | 27 | 3 | 20.5 | 15.3 | 20 | 3 | 11 | 105 | 88 | 37 | 34.5 | 27 |
| 40 | M5 | M5 | 10 | - | 24 | 18 | 20 | 3 | 11 | 167 | 58 | 37 | 22.5 | 15 |
| 63 | M8 | M5 | 10 | - | 35 | 25 | 20 | 3 | 11 | 230 | 72 | 37 | 22.5 | 15 |

| For size | L6 | | L7 | L8 | Weight | Part No. | Type |
|----------|------|-------|----|----|--------|----------|---------------|
| | GK | GV | | | | | |
| 25 | 43.5 | 91 | 64 | 15 | 30 | 540780 | HWS-25-MAB-M8 |
| | | | | | 80 | 540430 | SF-25-MAB |
| 40 | 68.5 | 138.5 | 64 | 15 | 40 | 188969 | HWS-40-M8 |
| | | | | | 310 | 188966 | SF-40 |
| 63 | 117 | 232 | 64 | 15 | 40 | 188970 | HWS-63-M8 |
| | | | | | 630 | 188967 | SF-63 |

Passive guide axes FDG-ZR-RF, without drive

Accessories

| Ordering data – Inductive proximity sensors M8 | | | | | | Technical data → Internet: sien | |
|---|-----------------------|---------|---------------|-----|------------------|---------------------------------|-----------------|
| | Electrical connection | | Switch output | LED | Cable length [m] | Part No. | Type |
| | Cable | Plug M8 | | | | | |
| NO contact | | | | | | | |
|  | 3-core | – | PNP | ■ | 2.5 | 150386 | SIEN-M8B-PS-K-L |
|  | – | 3-pin | PNP | ■ | – | 150387 | SIEN-M8B-PS-S-L |
| NC contact | | | | | | | |
|  | 3-core | – | PNP | ■ | 2.5 | 150390 | SIEN-M8B-PO-K-L |
|  | – | 3-pin | PNP | ■ | – | 150391 | SIEN-M8B-PO-S-L |

| 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 | | | |
| | | | | | 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 |

Festo - Your Partner in Automation



1 Festo Inc.
5300 Explorer Drive
Mississauga, ON L4W 5G4
Canada

Festo Customer Interaction Center
Tel: 1 877 463 3786
Fax: 1 877 393 3786
Email: customer.service.ca@festo.com

2 Festo Pneumatic
Av. Ceylán 3,
Col. Tequesquináhuac
54020 Tlalnepantla,
Estado de México

Multinational Contact Center
01 800 337 8669
ventas.mexico@festo.com

3 Festo Corporation
1377 Motor Parkway
Suite 310
Islandia, NY 11749

Festo Customer Interaction Center
1 800 993 3786
1 800 963 3786
customer.service.us@festo.com

4 Regional Service Center
7777 Columbia Road
Mason, OH 45040

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