


Three-point grippers HGD

FESTO



-  - Type discontinued
Available up until 2011

Three-point grippers HGD

Key features

FESTO



At a glance

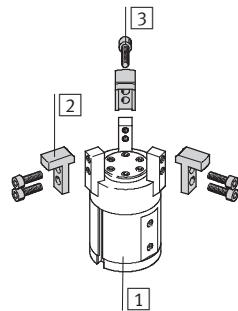
- Double-acting piston drive
- Self-centring
- Variable gripping action:
 - External/internal gripping
- Versatility thanks to externally adaptable gripper fingers
- Wide range of options for mounting on drive units
- Maximum precision
- High holding force
- Sensor technology:
 - Adaptable proximity sensors on the small grippers
 - Integral proximity sensors for medium and large grippers


-  - Note

Sizing software
Gripper selection
➔ www.festo.com

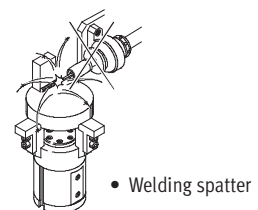
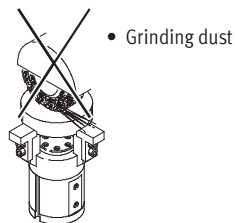
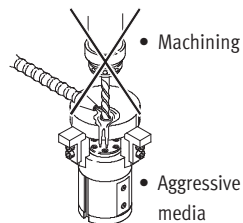
Mounting options for external gripper fingers (customer-specific)

- 1 Three-point gripper
- 2 External gripper fingers
- 3 Mounting screws



-  - Note

Grippers should always be used with exhaust air flow control. They are not suitable for the following, or for similar applications:

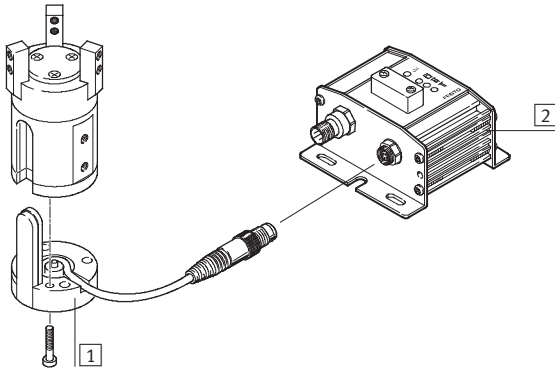


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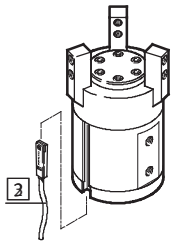
Peripherals overview and type codes

Peripherals overview

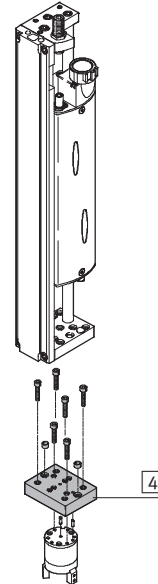
HGD-16



HGD-32/-50



System product for handling and assembly technology



| Accessories | | | |
|-------------|----------------------------|---|--|
| Type | Brief description | → Page/Internet | |
| 1 | Position sensor SMH-S1 | Adaptable and integratable sensor technology, for sensing the piston position | |
| 2 | Evaluation unit SMH-AE1 | For position sensor SMH-S1 | |
| 3 | Proximity sensor SME/SMT-8 | For sensing the piston position | |
| 4 | - | Drive/gripper connections | |
| | | adapter kit | |

Type codes

| | | | | | |
|-------------------------|-----------------------|---|----|---|---|
| | HGD | - | 16 | - | A |
| Type | | | | | |
| HGD | Three-point gripper | | | | |
| Size | | | | | |
| Position sensing | | | | | |
| A | For proximity sensing | | | | |

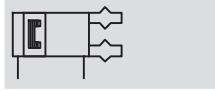
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Three-point grippers HGD

Technical data

Function
Double-acting



 www.festo.com

Wearing parts kits
→ 9



- Ø - Size
16 ... 50 mm

- | - Stroke
5 ... 12 mm

| General technical data | | | | | |
|---|-----------------------------------|--------------------------------------|-----|------|----|
| Size | | 16 | 32 | 50 | |
| Design | | Lever mechanism | | | |
| Mode of operation | | Double-acting | | | |
| Gripper function | | 3-point | | | |
| Number of gripper jaws | | 3 | | | |
| Max. weight force per external gripper finger ¹⁾ | [N] | 0.08 | 0.3 | 0.75 | |
| Stroke | per gripper jaw | [mm] | 2.5 | 3.9 | 6 |
| | smallest gripping Ø ²⁾ | [mm] | 23 | 33.2 | 50 |
| | largest gripping Ø ²⁾ | [mm] | 28 | 41 | 62 |
| Pneumatic connection | | M3 | M5 | G1/8 | |
| Repetition accuracy ³⁾ | [mm] | ≤ 0.04 | | | |
| Max. interchangeability | [mm] | 0.2 | | | |
| Max. operating frequency | [Hz] | 4 | | | |
| Position sensing | | For proximity sensing | | | |
| Type of mounting | | With female thread and locating hole | | | |

- 1) Valid for unthrottled operation
2) Without external gripper fingers
3) Concentric to the central shaft

| Operating and environmental conditions | | |
|--|-------|---|
| Min. operating pressure | [bar] | 2 |
| Max. operating pressure | [bar] | 8 |
| Operating medium | | Filtered compressed air, lubricated or unlubricated |
| Ambient temperature | [°C] | +5 ... +60 |
| Corrosion resistance class CRC ¹⁾ | | 2 |

- 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 normal industrial environment or media such as coolants or lubricating agents

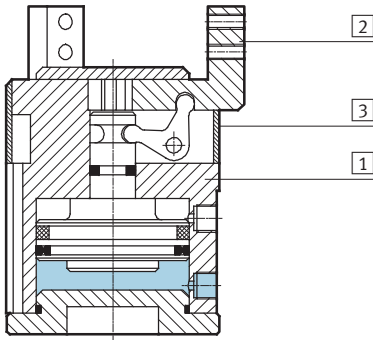
| Weights [g] | | | | |
|-------------|--|-----|-----|-----|
| Size | | 16 | 32 | 50 |
| HGD | | 110 | 300 | 985 |

Three-point grippers HGD

Technical data

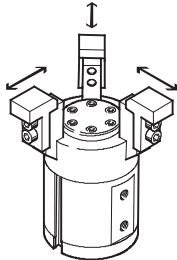
Materials

Sectional view



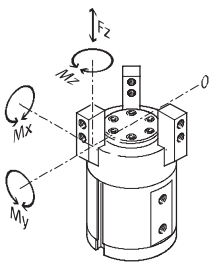
| Three-point gripper | | |
|---------------------|-------------------|--|
| 1 | Body | Nickel-plated aluminium |
| 2 | Gripper jaw | High-alloy steel, nickel plated |
| 3 | Cover cap | Polyacetate |
| - | Note on materials | Copper, PTFE and silicone-free Conforms to RoHS |

Gripping force [N] at 6 bar



| Size | 16 | 32 | 50 |
|--------------------------------|-----|-----|-----|
| Gripping force per gripper jaw | | | |
| Opening | 40 | 137 | 323 |
| Closing | 30 | 120 | 293 |
| Total gripping force | | | |
| Opening | 120 | 410 | 970 |
| Closing | 90 | 360 | 880 |

Characteristic load values at the gripper jaws



The indicated permissible forces and torques apply to a single gripper jaw. Static forces and torques relate to additional applied loads caused by

the workpiece or external gripper fingers, as well as forces which occur during handling. The zero co-ordinate

line (gripper jaws point of rotation) must be taken into consideration for the calculation of torques.

| Size | 16 | 32 | 50 | |
|-------------------------------|------|-----|-----|-----|
| Max. permissible force F_z | [N] | 34 | 90 | 173 |
| Max. permissible torque M_x | [Nm] | 0.5 | 1.6 | 4.7 |
| Max. permissible torque M_y | [Nm] | 0.8 | 2.8 | 8.1 |
| Max. permissible torque M_z | [Nm] | 0.5 | 1.9 | 5.3 |

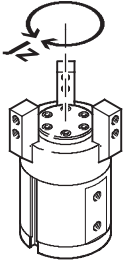
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Technical data

Mass moment of inertia [$\text{kgm}^2 \times 10^{-4}$]



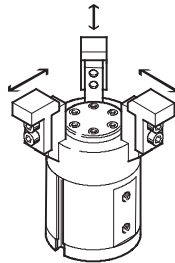
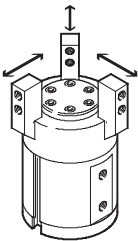
Mass moment of inertia [$\text{kgm}^2 \times 10^{-4}$] for three-point grippers in relation to the central axis, without external gripper fingers, without load.

| Size | 16 | 32 | 50 |
|------|------|------|------|
| HGD | 0.14 | 0.79 | 6.10 |

Opening and closing times [ms] at 6 bar

Without external gripper fingers

With external gripper fingers



The indicated opening and closing times [ms] have been measured at room temperature and 6 bar operating pressure without external gripper fingers.

The grippers must be throttled for greater applied loads. Opening and closing times must then be adjusted accordingly.

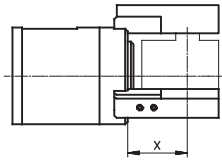
| Size | | 16 | 32 | 50 |
|---|---------|----|-----|-----|
| Without external gripper fingers | | | | |
| HGD | Opening | 5 | 10 | 10 |
| | Closing | 5 | 10 | 10 |
| With external gripper fingers (as a function of weight force) | | | | |
| HGD | 0.08 N | 5 | – | – |
| | 0.11 N | 10 | – | – |
| | 0.15 N | 20 | – | – |
| | 0.30 N | 50 | – | – |
| | 0.50 N | – | 100 | – |
| | 0.75 N | – | 200 | – |
| | 1.00 N | – | 300 | 100 |
| | 1.50 N | – | – | 200 |
| | 2.00 N | – | – | 300 |

Three-point grippers HGD

Technical data

Gripping force F per gripper as a function of operating pressure and the lever arm x

Gripping forces

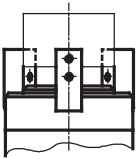


Gripping torques can be determined with the following diagrams for the various sizes in relation to operating

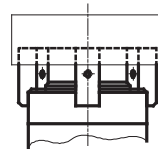
pressure and lever arm (distance from the zero co-ordinate line shown above

to the pressure point at which the external fingers grip the workpiece).

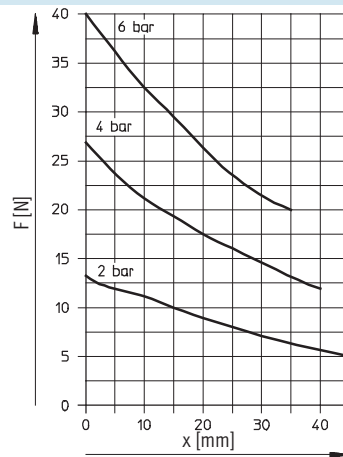
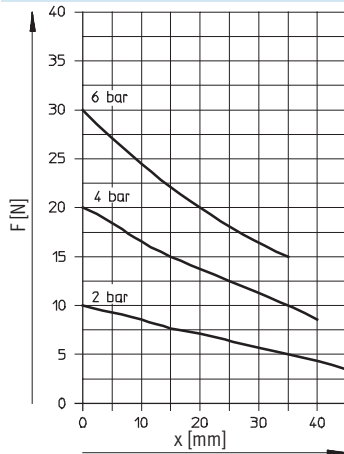
External gripping (closing)



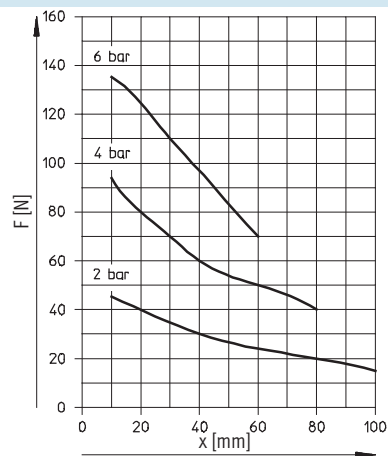
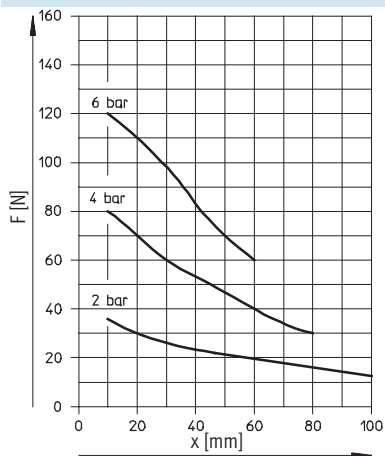
Internal gripping (opening)



HGD-16-A



HGD-32-A



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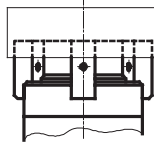
Technical data

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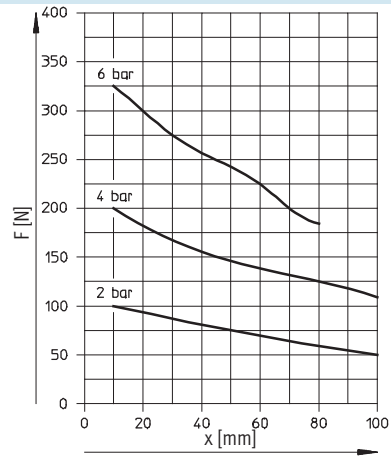
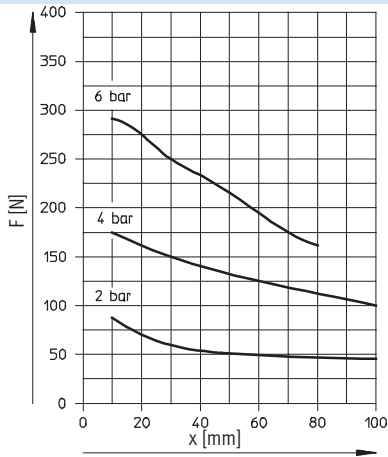
Gripping force F per gripper as a function of operating pressure and the lever arm x

External gripping (closing)

Internal gripping (opening)



HGD-50-A



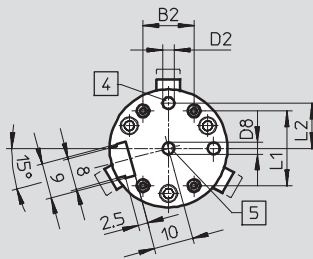
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Technical data

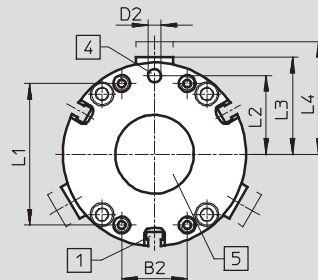
Dimensions

Download CAD data → www.festo.com

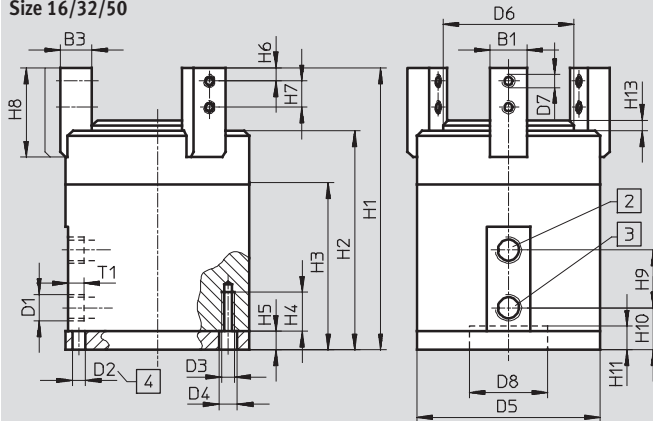
Size 16



Size 32/50



Size 16/32/50



- 1 Sensor slot for proximity sensor SME/SMT-8 (not with HGD-16-A)
- 2 Compressed air connection, closing
- 3 Compressed air connection, opening
- 4 Drilled hole for locating pin (locating pins not included in scope of delivery)
- 5 Centring hole (user configured)

| Size | B1 | B2 | B3 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | H1 | H2 |
|------|-------|----|-------------|------|---------|----|-----|----|------|----|---------------|-------|------|
| [mm] | -0.02 | | -0.02/-0.05 | | ∅ H8 | | ∅ | ∅ | ∅ | | ∅ | | |
| 16 | 6 | 13 | 7 | M3 | 3 | M3 | 3.2 | 30 | 21 | M3 | 3 H7 | 60 | 46 |
| 32 | 10 | 13 | 8 | M5 | 4 | M3 | 3.7 | 45 | 32.4 | M3 | 20+0.02/+0.05 | 78 | 62 |
| 50 | 14 | 25 | 12 | G1/8 | 5 | M5 | 6 | 70 | 49.4 | M5 | 30+0.02/+0.05 | 107.5 | 83.5 |

| Size | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | H11 | H13 | L1 | L2 | L3 | L4 | T1 |
|------|------|----|-----|-----|-----|------|----|------|-----|-----|----|-------|------|------|------|
| [mm] | | +1 | | | | | | | | | | ±0.02 | | | -0.5 |
| 16 | 32.6 | 8 | 4.5 | 3 | 6 | 21 | 12 | 11 | 4.5 | 2 | 19 | 11.5 | 17.5 | 20 | 4 |
| 32 | 44 | 10 | 6.5 | 3.5 | 6.5 | 22.5 | 16 | 11.8 | 8 | 3 | 36 | 19 | 24.6 | 28.5 | 4 |
| 50 | 56 | 16 | 7 | 5 | 10 | 34 | 22 | 16 | 9 | 4 | 54 | 30 | 37 | 43 | 6 |

Ordering data

| Size | Double-acting | |
|------|---------------|----------|
| [mm] | Part No. | Type |
| 16 | 174 819 | HGD-16-A |
| 32 | 161 837 | HGD-32-A |
| 50 | 161 838 | HGD-50-A |

Ordering data – Wearing parts kits

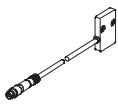

| Size | Wearing parts kits | |
|------|--------------------|----------|
| [mm] | Part No. | Type |
| 16 | 378 535 | HGD-16-A |
| 32 | 125 694 | HGD-32-A |
| 50 | 125 695 | HGD-50-A |

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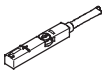

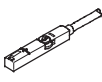
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

Accessories



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| Ordering data | | | | | | |
|---|----------|------------|-----------------------------------|-----------------|------------------|--|
| Type | For size | Weight [g] | Part No. | Type | PU ¹⁾ | |
| Position sensor SMH-S1 | | | Technical data → Internet: smh-s1 | | | |
|  | 16 | 30 | 175 713 | SMH-S1-HGD16 | 1 | |
| Evaluation unit SMH-AE1 | | | Technical data → Internet: smh-ae | | | |
|  | 16 | 170 | 175 708 | SMH-AE1-PS3-M12 | 1 | |
| | | | 175 709 | SMH-AE1-NS3-M12 | | |

1) Packaging unit quantity

| Ordering data – Proximity sensors for T-slot, magneto-resistive | | | | | | | Technical data → Internet: sm | |
|---|--|---------------|-----------------------|------------------|----------|-------------------------|-------------------------------|--|
| | 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 | PNP | Cable, 3-wire | 2.5 | 543 867 | SMT-8M-PS-24V-K-2,5-OE | | |
| | | | Plug M8x1, 3-pin | 0.3 | 543 866 | SMT-8M-PS-24V-K-0,3-M8D | | |
| | | NPN | Plug M12x1, 3-pin | 0.3 | 543 869 | SMT-8M-PS-24V-K-0,3-M12 | | |
| | | | Cable, 3-wire | 2.5 | 543 870 | SMT-8M-NS-24V-K-2,5-OE | | |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | PNP | Plug M8x1, 3-pin | 0.3 | 543 871 | SMT-8M-NS-24V-K-0,3-M8D | | |
| | | | Cable, 3-wire | 2.5 | 175 436 | SMT-8-PS-K-LED-24-B | | |
| | | | Plug M8x1, 3-pin | 0.3 | 175 484 | SMT-8-PS-S-LED-24-B | | |
| N/C contact | | | | | | | | |
|  | Insertable in the slot from above, flush with cylinder profile | PNP | Cable, 3-wire | 7.5 | 543 873 | SMT-8M-PO-24V-K7,5-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 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-O-K-LED-24 | | |

| Ordering data – Connecting cables | | | | | Technical data → Internet: nebu | |
|---|-------------------------------|------------------------------|------------------|----------|---------------------------------|--|
| | Electrical connection, left | Electrical connection, right | Cable length [m] | Part No. | Type | |
|  | Straight socket, M8x1, 3-pin | Cable, open end, 3-wire | 2.5 | 541 333 | NEBU-M8G3-K-2.5-LE3 | |
| | | | 5 | 541 334 | NEBU-M8G3-K-5-LE3 | |
| | Straight socket, M12x1, 5-pin | Cable, open end, 3-wire | 2.5 | 541 363 | NEBU-M12G5-K-2.5-LE3 | |
| | | | 5 | 541 364 | NEBU-M12G5-K-5-LE3 | |
|  | Angled socket, M8x1, 3-pin | Cable, open end, 3-wire | 2.5 | 541 338 | NEBU-M8W3-K-2.5-LE3 | |
| | | | 5 | 541 341 | NEBU-M8W3-K-5-LE3 | |
| | Angled socket, M12x1, 5-pin | Cable, open end, 3-wire | 2.5 | 541 367 | NEBU-M12W5-K-2.5-LE3 | |
| | | | 5 | 541 370 | NEBU-M12W5-K-5-LE3 | |