# Swivel/gripper units HGDS-B

FESTO

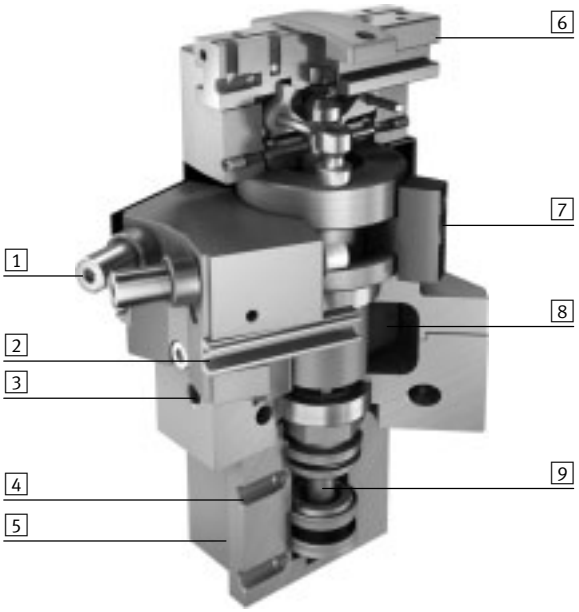
# Swivel/gripper units HGDS-B

Key features

## At a glance

- Combination of parallel gripper with T-slot guide and swivel module on the basis of swivel module DSM
- Infinitely adjustable swivel angle (max. 210°)
- Supply ports and position sensing outside the swivel range
- High performance (torque, mass moment of inertia)
- All connections accessible from one side
- Compact design and low weight

## The technology in detail




1 Three types of cushioning for swivel motion:
- Flexible cushioning elements (P)
- Adjustable flexible cushioning components with metal fixed stop (P1)
- Shock absorbers with metal fixed stop (YSRT)

2 Slot for proximity sensor SME/SMT-10 for sensing the swivel position

3 Supply port for swivelling function

4 Supply port for gripping function

5 Slot for proximity sensor SME/SMT-10 for sensing the gripping position

6 Gripper jaw with T-slot guide

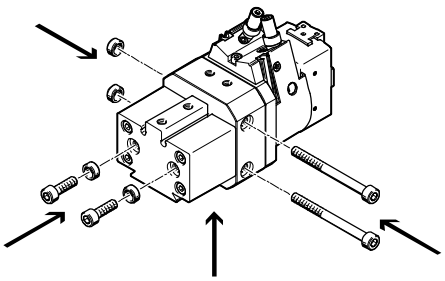
7 Adjustable stop cams for adjusting the swivel motion

8 Rotary vane

9 Piston rod for gripping motion

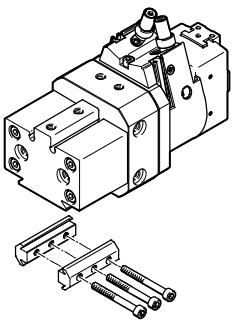
## Mounting options

Direct mounting



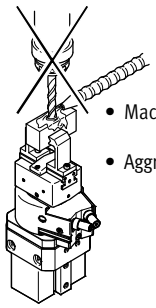
The swivel/gripper unit can be mounted on four sides.

Dovetail connection

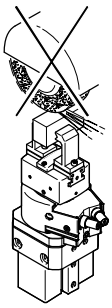


Note

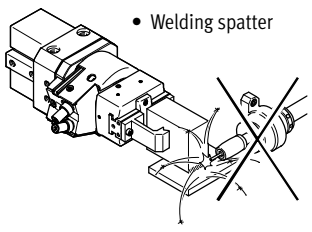
Swivel/gripper units are not suitable for the following or similar applications:



- Machining
- Aggressive media



- Grinding dust



- Welding spatter

# Swivel/gripper units HGDS-B

Peripherals overview and type codes

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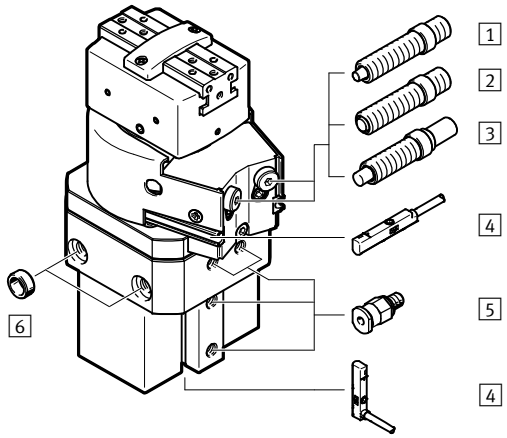
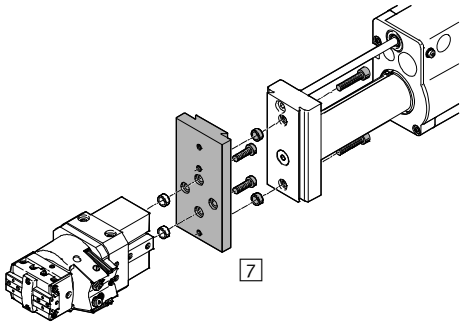
## Peripherals overview




## System product for handling and assembly technology




**Accessories**

| | Type | Description | ➔ Page/Internet |
|---|---|---|---|
| 1 | Cushioning<br>P | Flexible cushioning components at both ends | 14 |
| 2 | Cushioning<br>P1 | Adjustable flexible cushioning components at both ends, with metal fixed stop | 14 |
| 3 | Cushioning<br>YSRT | Self-adjusting shock absorbers at both ends, with metal fixed stop | 14 |
| 4 | Proximity sensor<br>SME/SMT-10 | For sensing the gripping and swivelling position | 16 |
| 5 | Push-in fitting<br>QS | For connecting compressed air tubing with standard O.D. | qs |
| 6 | Centring sleeve<br>ZBH | For centring the gripper when mounting<br>(2 included in the scope of delivery) | 16 |
| 7 | Adapter kit<br>HAVB, HMSV, HMVA | Drive/gripper connections | 15 |

## Type codes

HGDS – PP – 16 – YSRT – A – B

| Type | |
|---|---|
| HGDS | Swivel/gripper unit |

| Gripper function | |
|---|---|
| PP | Parallel gripper |

| Size |
|---|

| Cushioning | |
|---|---|
| P | Flexible cushioning components at both ends |
| P1 | Adjustable flexible cushioning components at both ends |
| YSRT | Self-adjusting shock absorbers at both ends |

| Position sensing | |
|---|---|
| A | Via proximity sensor |

| Generation | |
|---|---|
| B | B series |

# Swivel/gripper units HGDS-B

Technical data

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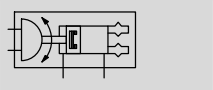
Function
Swivelling/gripping



www.festo.com

Size
12, 16, 20 mm

Stroke
5, 9, 14 mm

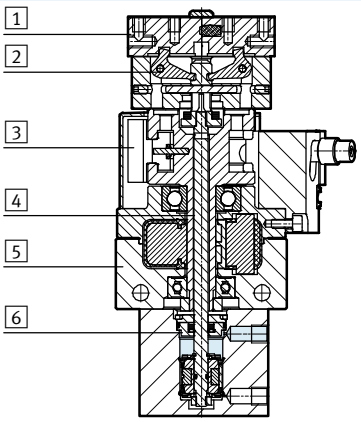
| General technical data | | | | |
|---|---|---|---|---|
| Size | | 12 | 16 | 20 |
| Design | | Parallel gripper | | |
| | | Swivel module | | |
| | | Gripper module | | |
| Mode of operation | | Double-acting | | |
| Pneumatic connection | | M5 | | |
| Type of mounting | | Via female thread and centring sleeve | | |
| | | Via through-hole and centring sleeve | | |
| | | Via dovetail slot | | |
| Cushioning | | | | |
| P cushioning | | Flexible cushioning at both ends components | | |
| P1 cushioning | | Adjustable flexible cushioning components at both ends | | |
| YSRT cushioning | | Self-adjusting shock absorbers at both ends | | |
| Mounting position | | Any | | |
| Relubrication intervals of guide | | 10 million switching cycles | | |
| Product weight | [g] | 505 | 730 | 1260 |
| Technical data – swivelling | | ➔ 5 | | |
| Technical data – gripping | | ➔ 8 | | |

| Operating and environmental conditions | | |
|---|---|---|
| Operating pressure | [bar] | 3 ... 8 |
| Operating medium | | Compressed air in accordance with ISO 8573-1:2010 [7:4:4] |
| Note on operating/pilot medium | | Operation with lubricated medium possible (in which case lubricated operation will always be required) |
| Ambient temperature[1)] | [°C] | +5 ... +60 |
| Corrosion resistance class CRC[2)] | | 2 |

1) Note operating range of proximity sensors
2) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. 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.

## Materials

Sectional view




| Swivel/gripper unit | | |
|---|---|---|
| 1 | Gripper jaw | Stainless steel |
| 2 | Lever | Hardened steel |
| 3 | Stop | Stainless steel |
| 4 | Piston rod | Stainless steel |
| 5 | Housing | Wrought aluminium alloy |
| 6 | Piston | Nitrile rubber, polyurethane |
| – | Rubber buffer | Nitrile rubber |

# Swivel/gripper units HGDS-B

Technical data

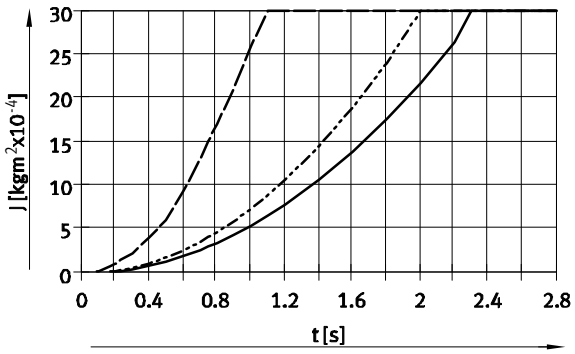
## Technical data – Swivelling

| Size | | 12 | 16 | 20 |
|---|---|---|---|---|
| Swivel angle | [°] | 0 ... 210 | | |
| Theoretical torque[1)] | [Nm] | 0.85 | 1.25 | 2.5 |
| Repetition accuracy[1)] | | | | |
| P cushioning | [°] | < 0.2 | | |
| P1 cushioning | [°] | < 0.02 | | |
| YSRT cushioning | [°] | < 0.02 | | |
| Max. swivel frequency[1)] | | | | |
| P cushioning | [Hz] | 2 | | |
| P1 cushioning | [Hz] | 2 | | |
| YSRT cushioning | [Hz] | 1.5 | | |
| Position sensing | | Via proximity sensor | | |

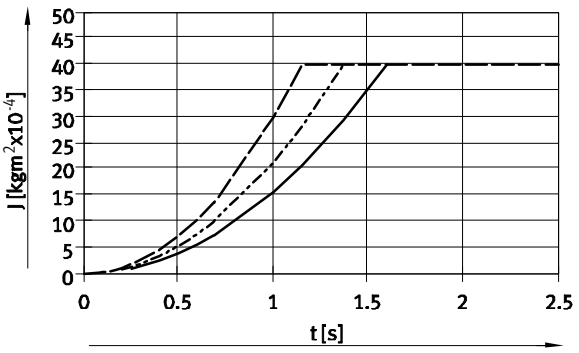
1) At an operating pressure of 6 bar

## Mass moments of inertia J at 6 bar as a function of swivel time t and swivel angle

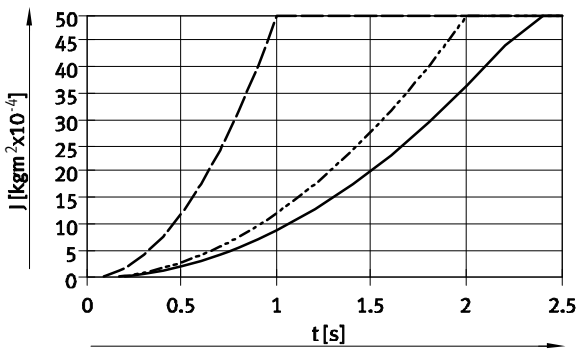
HGDS-PP-12-P-A-B



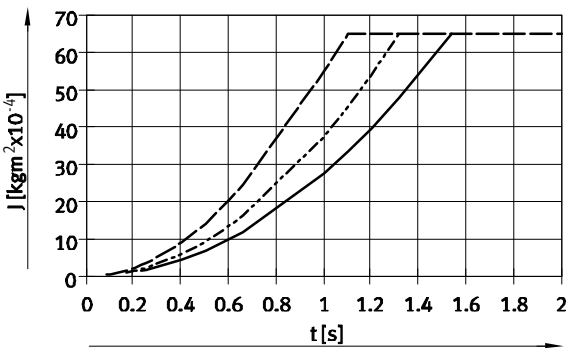

HGDS-PP-12-P1-A-B



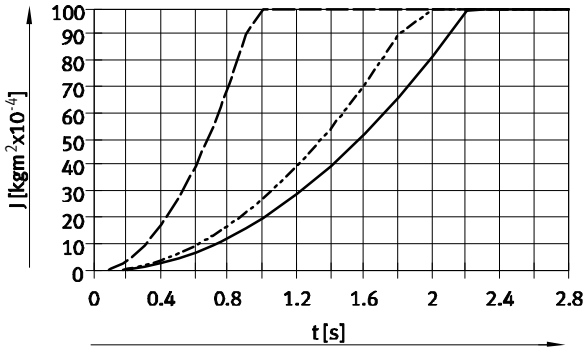

HGDS-PP-16-P-A-B



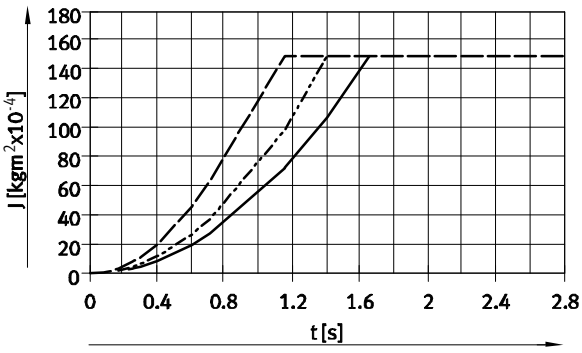

HGDS-PP-16-P1-A-B




HGDS-PP-20-P-A-B



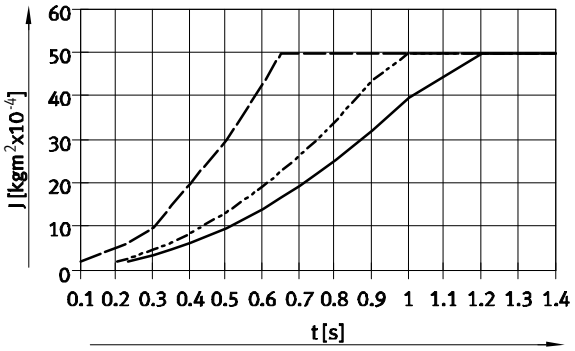

HGDS-PP-20-P1-A-B



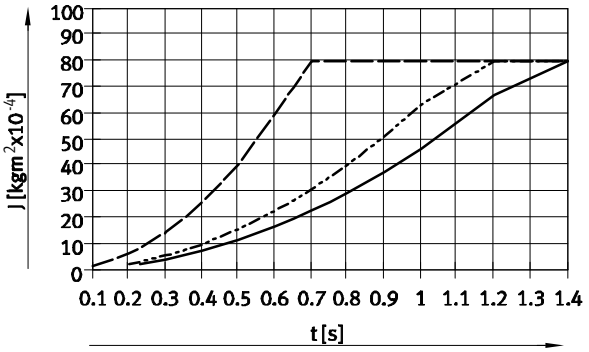

Swivel angle 210°
Swivel angle 90°
Swivel angle 180°

## Mass moments of inertia J at 6 bar as a function of swivel time t and swivel angle

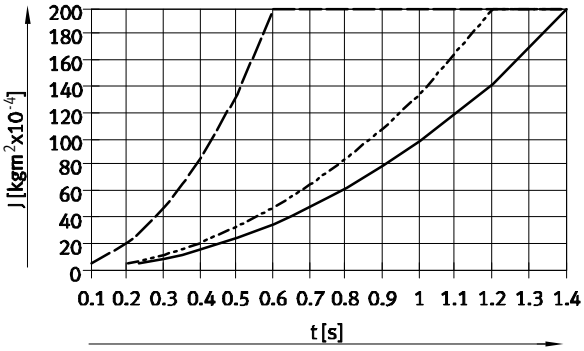
HGDS-PP-12-YSRT-A-B

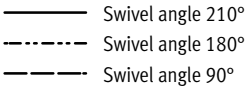



HGDS-PP-16-YSRT-A-B




HGDS-PP-20-YSRT-A-B




## Dependency between operating pressure and swivel time

Reducing the operating pressure reduces the gripping force.
To ensure that the gripper's jaws do not open during swivelling, the swivel time must be increased by 15% per bar of operating pressure (same mass moment of inertia).

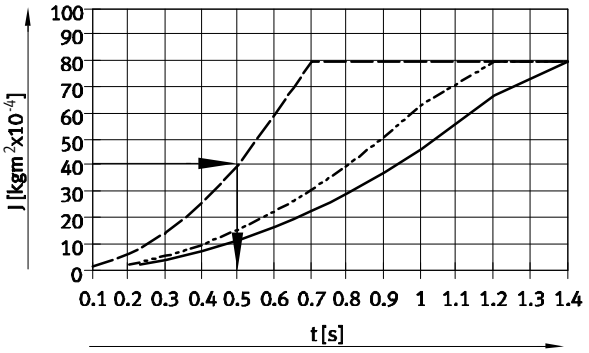
Example:
Given:
HGDS-PP-16-YSRT-A-B
Operating pressure 6 bar
Swivel angle 90°
J = 40 $kgm^2x10^{-4}$

To be calculated:
Swivel time at an operating pressure of 4 bar

Swivel time at 6 bar = 0.5 s, see graph opposite

Swivel time at 4 bar:
t = 0.5 + 2x 15% = 0.65 s
Cushioning time of the shock absorber = 0.1 s

This yields a total swivel time of
$t_{tot.}$ = 0.65 s + 0.1 s = 0.75 s

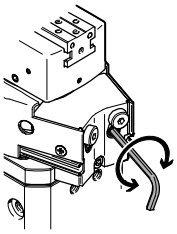


## Precision adjustment of the swivel angle

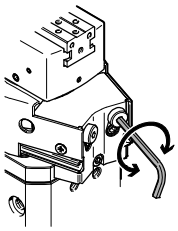
The swivel angle can be roughly adjusted by moving the cam stops ➔ 2.
The procedure for precision adjustment is the same for all cushioning variants (P, P1 and YSRT).

The swivel angle can be precisely adjusted by unscrewing or screwing in the cushioning component.
Swivelling to a metal stop enables high repetition accuracy.

1) Loosen the locking screw underneath the cushioning component.



2) Adjust the cushioning component as required. Note the adjustment range.



| Size | | 12 | 16 | 20 |
|---|---|---|---|---|
| Precision adjustment range | | | | |
| P cushioning | [°] | –6 | | |
| P1 cushioning | [°] | –6 | | |
| YSRT cushioning | [°] | –2.5 | | |
| Adjustment range of the cushioning component | | | | |
| P cushioning | [mm] | 2 | 2.6 | 2.8 |
| P1 cushioning | [mm] | 2 | 2.6 | 2.8 |
| YSRT cushioning | [mm] | 1 | 1.3 | 1.4 |

# Swivel/gripper units HGDS-B

Technical data

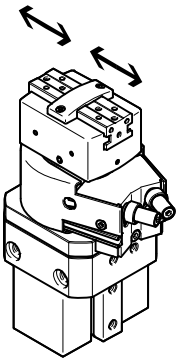
## Technical data – Gripping

| Size | | 12 | 16 | 20 |
|---|---|---|---|---|
| Gripper function | | Parallel | | |
| Number of gripper jaws | | 2 | | |
| Max. load per external gripper finger[1)] | [g] | 30 | 50 | 100 |
| Stroke per gripper jaw | [mm] | 2.5 | 4.5 | 7 |
| Max. gripper jaw backlash | [mm] | 0.02 | | |
| Max. gripper jaw angular play | [°] | 0.1 | | |
| Repetition accuracy | [mm] | ±0.01 | | ±0.015 |
| Max. operating frequency | [Hz] | 4 | | |
| Position sensing | | Via proximity sensor | | |

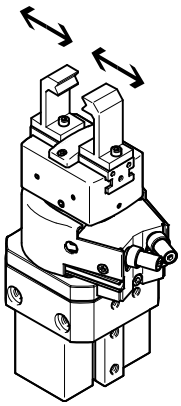
1) Valid for unthrottled operation

## Opening and closing times [ms] at 6 bar

Without external gripper fingers



With external gripper fingers

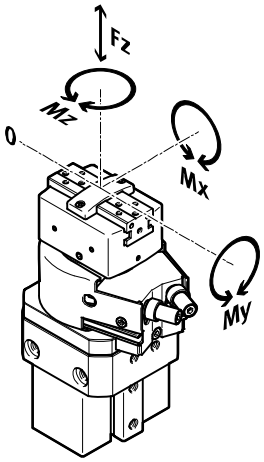


The indicated opening and closing times [ms] have been measured at room temperature and 6 bar operating pressure with vertically mounted swivel/gripper unit without additional gripper fingers. The grippers must be throttled for greater loads [g]. Opening and closing times must then be adjusted accordingly.

| With external gripper fingers as a function of the load | | | | |
|---|---|---|---|---|
| Size | | 12 | 16 | 20 |
| Max. load | | 30 g | 50 g | 100 g |
| Unthrottled | Opening | 40 | 40 | 60 |
| | Closing | 60 | 60 | 70 |

| With external gripper fingers as a function of the load | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | | 12 | | 16 | | 20 | |
| Load | | 100 g | 200 g | 100 g | 200 g | 100 g | 200 g |
| Throttled | Closing | 100 | 150 | 100 | 200 | 100 | 250 |

## Static characteristic load values per gripper jaw




The indicated permissible forces and torques apply to a single gripper jaw. The indicated values include the lever arm, additional applied loads caused by the workpiece or external gripper fingers, as well as forces which occur during movement.

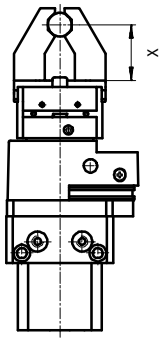
The zero coordinate line (gripper finger guide) must be taken into consideration for the calculation of torques.

| Size | | 12 | 16 | 20 |
|---|---|---|---|---|
| Max. permissible force $F_z$ | [N] | 90 | 150 | 250 |
| Max. permissible torque $M_x$ | [Nm] | 6 | 11 | 22 |
| Max. permissible torque $M_y$ | [Nm] | 6 | 11 | 22 |
| Max. permissible torque $M_z$ | [Nm] | 6 | 11 | 22 |

| **Gripping force [N] at 6 bar with a lever arm of 25 mm** | | | |
|---|---|---|---|
| Size | 12 | 16 | 20 |
| Gripping force per gripper jaw | | | |
| Opening | 42 | 58 | 96 |
| Closing | 37 | 51 | 84 |
| | | | |
| Total gripping force | | | |
| Opening | 84 | 116 | 192 |
| Closing | 74 | 102 | 168 |

## Gripping force $F_H$ per gripper jaw as a function of operating pressure p

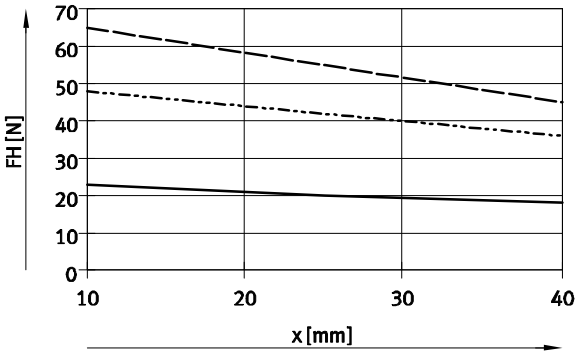
Gripping forces as a function of operating pressure and lever arm can be determined for the various sizes using the following graphs.



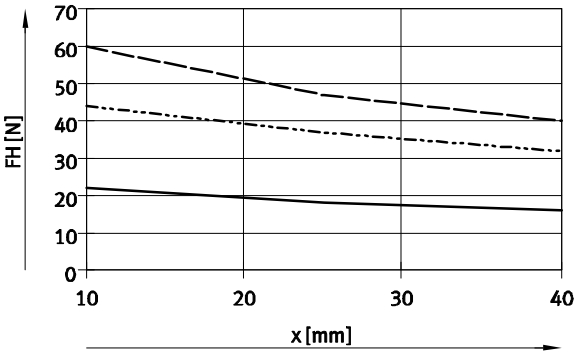

3 bar
6 bar
8 bar

HGDS-12

Opening

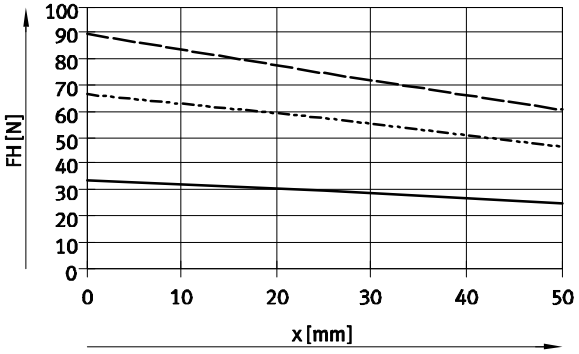



Closing

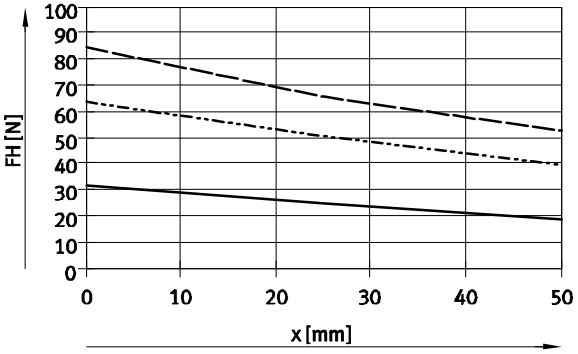



HGDS-16

Opening

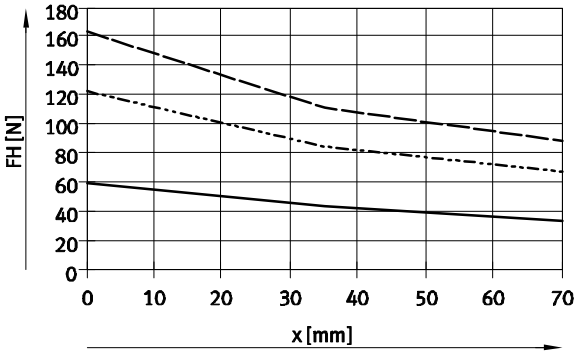



Closing

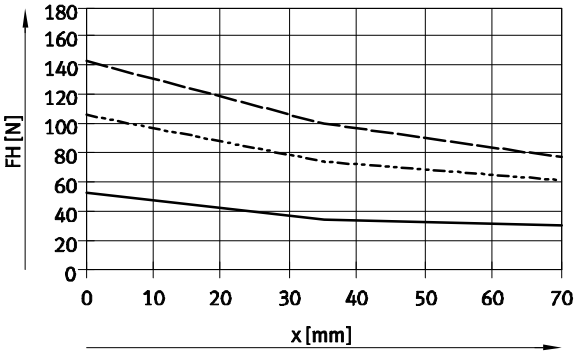



HGDS-20

Opening



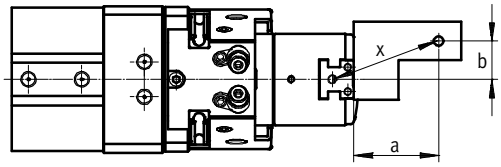

Closing



## Gripping force $F_H$ per gripper jaw at 6 bar as a function of lever arm x and eccentricity a and b

The following formula must be used to calculate the lever arm x with eccentric gripping:

$$x = \sqrt{a^2 + b^2}$$




The gripping force $F_H$ can be read from the graphs (➔ from page 10) using the calculated value x.

### Calculation example

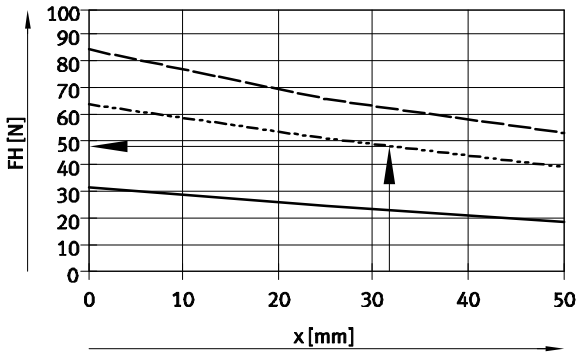
Given:
Distance a = 25 mm
Distance b = 20 mm
To be calculated:
The gripping force at 6 bar,
with an HGDS-16,
used as an external gripper

Procedure:
Calculating the lever arm x

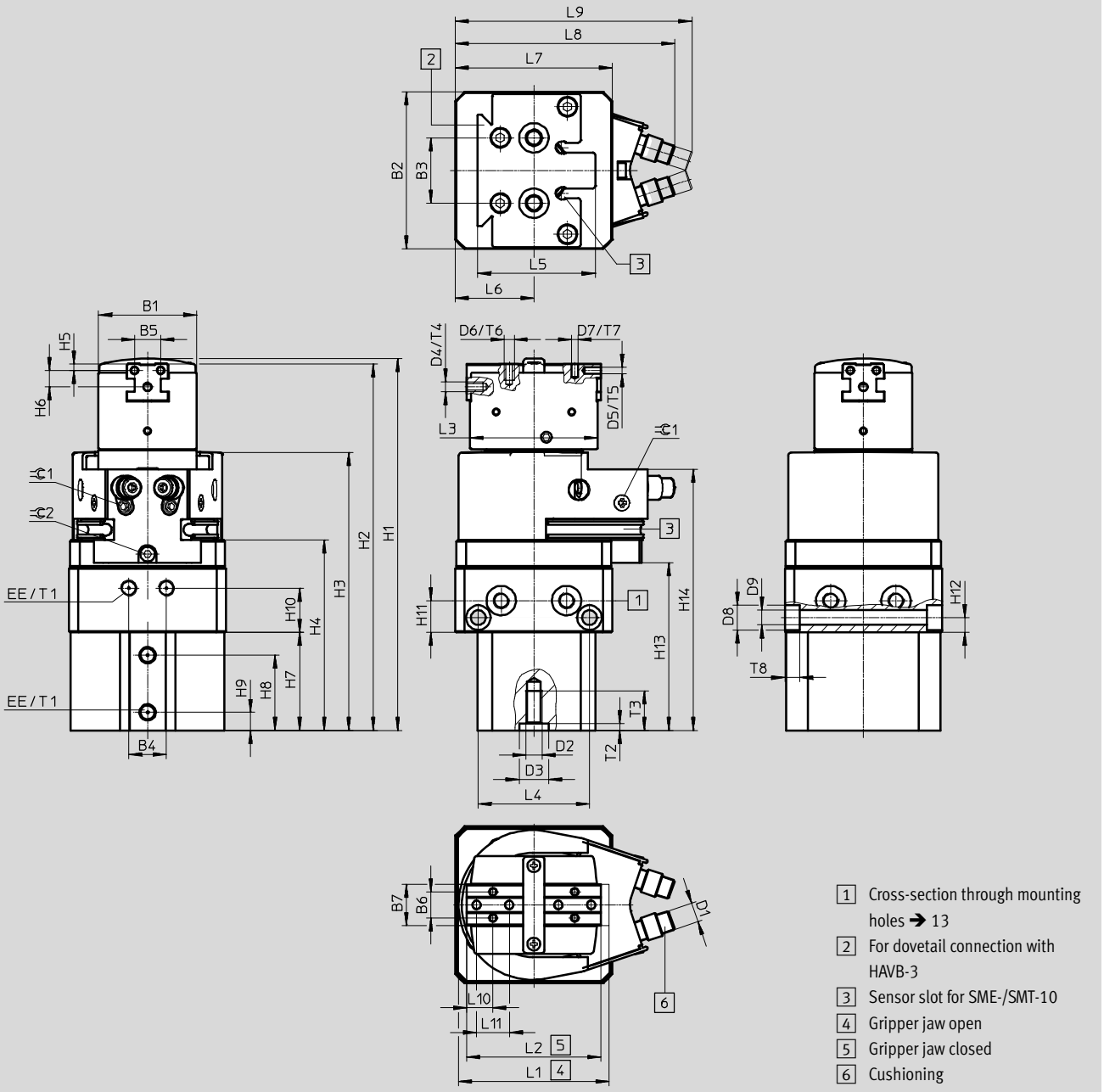
$$x = \sqrt{25^2 + 20^2}$$

x = 32 mm

The graph (➔ 10) gives a value of $F_H$ = 47 N for the gripping force.

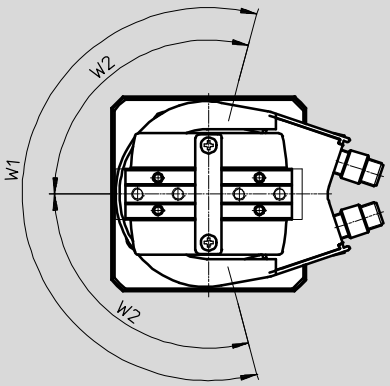


**Dimensions** Download CAD data ➔ **www.festo.com**




1 Cross-section through mounting holes ➔ 13
2 For dovetail connection with HAVB-3
3 Sensor slot for SME-/SMT-10
4 Gripper jaw open
5 Gripper jaw closed
6 Cushioning

Swivel angle

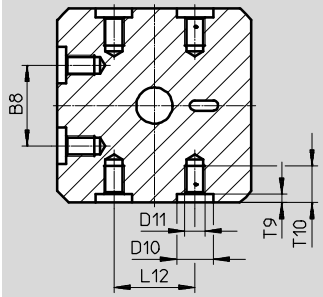


# Swivel/gripper units HGDS-B

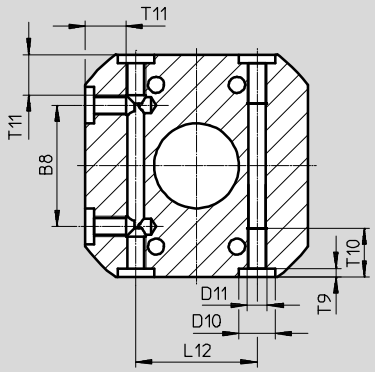
Technical data

Cross-section at 1 ➔ 12

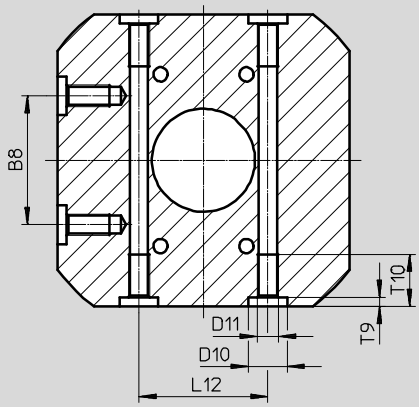
**Size 12**




**Size 16**




**Size 20**




| Size<br>[mm] | B1 | B2<br>±0.03 | B3<br>±0.02 | B4 | B5<br>±0.02 | B6<br>±0.02 | B7<br>±0.1 | B8[1] | D1 | D2 | D3<br>∅<br>H7 | D4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 30 | 48 | 20 | 11.5 | 8 | 8 | 12.5 | 20 | M6x0.5 | M5 | 9 | M3 |
| 16 | 34 | 55 | 30 | 13 | 10 | 10 | 16 | 30 | M8x1 | M5 | 9 | M3 |
| 20 | 40 | 67.4 | 30 | 16 | 12 | 12 | 20 | 30 | M10x1 | M5 | 9 | M4 |

| Size<br>[mm] | D5<br>∅<br>H8 | D6 | D7<br>∅<br>H8 | D8<br>∅<br>H13 | D9<br>∅<br>H13 | D10<br>∅<br>H7 | D11 | EE | H1<br>+1/−0.6 | H2<br>+0.8/−0.4 | H3<br>+1.3/−0.2 | H4<br>+0.8/−0.2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 2 | M3 | 2 | 7.5 | 4.5 | 9 | M5 | M5 | 113.4 | 111.9 | 85 | 58.2 |
| 16 | 2 | M3 | 2 | – | 4.2 | 9 | M5 | M5 | 121.7 | 120.1 | 92.3 | 64.3 |
| 20 | 2.5 | M4 | 2.5 | – | 4.2 | 9 | M5 | M5 | 154.8 | 152.8 | 112.3 | 81.7 |

| Size<br>[mm] | H5<br>±0.02 | H6<br>±0.12 | H7<br>±0.1 | H8<br>±0.1 | H9 | H10 | H11<br>−0.1 | H12 | H13<br>+1/−0.2 | H14<br>+1/−0.2 | L1<br>±0.5 | L2<br>±0.5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 2 | 5 | 30 | 23 | 7.5 | 13.5 | 9.7 | 4.5 | 51.3 | 79.8 | 46 | 41 |
| 16 | 3 | 5 | 34.5 | 26 | 6.3 | 14 | 8 | – | 58.2 | 86.7 | 58 | 49 |
| 20 | 3 | 7 | 43 | 34.6 | 5.3 | 19 | 9 | – | 73.1 | 105.6 | 78 | 64 |

| Size | L3 | L4 | L5 | L6 | L7 | L8 | L9 ±1 | | L10 | L11 | L12[1] | T1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ±1 | | | | | | |
| [mm] | ±0.5 | ±0.1 | | ±0.05 | ±0.03 | P | P1 | YSRT | ±0.02 | | | min. |
| 12 | 39 | 34 | 36 | 24 | 48 | 67 | 72.4 | 72.4 | 8 | 10 | 20 | 5.3 |
| 16 | 47 | – | 40.5 | 27.5 | 55 | 80.2 | 81.6 | 81.6 | 8 | 10 | 30 | 5 |
| 20 | 61 | – | 40.5 | 34 | 67.4 | 93.3 | 97 | 97 | 12 | 14 | 30 | 6 |

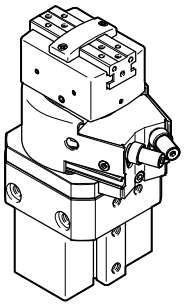
| Size<br>[mm] | T2<br>+0.1 | T3 | T4<br>±0.4 | T5<br>max. | T6<br>min. | T7<br>max. | T8 | T9<br>+0.1 | T10 | T11 | W1 | W2 | ⌯ 1 | ⌯ 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 2.1 | 12.1 | 6 | 5 | 3.5 | 6 | 4.6 | 2.1 | 10 | – | 210° | 105° | 2 | 2 |
| 16 | 2.1 | 12.1 | 6 | 6 | 4.5 | 6 | – | 2.1 | 12.1 | 10 | 210° | 105° | 2.5 | 2.5 |
| 20 | 2.1 | 12.1 | 9 | 8 | 6 | 7.5 | – | 2.1 | 12.1 | – | 210° | 105° | 3 | 2.5 |

1) Tolerance for centring holes ∅9 H7, tolerance for thread M5 ±0.1 mm

# Swivel/gripper units HGDS-B

Technical data

**Ordering data**

| | Size [mm] | Part No. | Type |
|---|---|---|---|
|  | With cushioning P | | |
| | 12[1)] | **1187955** | **HGDS-PP-12-P-A-B** |
| | 16[1)] | **1187958** | **HGDS-PP-16-P-A-B** |
| | 20[1)] | **1187961** | **HGDS-PP-20-P-A-B** |
| | | | |
| | With cushioning P1 | | |
| | 12[1)] | **1187956** | **HGDS-PP-12-P1-A-B** |
| | 16[1)] | **1187959** | **HGDS-PP-16-P1-A-B** |
| | 20[1)] | **1187962** | **HGDS-PP-20-P1-A-B** |
| | | | |
| | With cushioning YSRT | | |
| | 12[1)] | **1187957** | **HGDS-PP-12-YSRT-A-B** |
| | 16[1)] | **1187960** | **HGDS-PP-16-YSRT-A-B** |
| | 20[1)] | **1187963** | **HGDS-PP-20-YSRT-A-B** |

1) Two centring sleeves are included in the scope of delivery of the swivel/gripper unit.

**Adapter kit**
**HMVA, HMSV, HAVB**

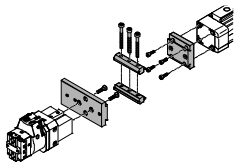
Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

- Note

The kit includes the individual mounting interface as well as the necessary mounting material.

**Permissible drive/gripper combinations with adapter kit**

Download CAD data ➔ **www.festo.com**

| Combination | Drive | Gripper | Mounting option | | Adapter kit | | |
|---|---|---|---|---|---|---|---|
| | Size | Size |  |  | CRC[1)] | Part No. | Type |
| DGP..., DGE-..., DGEA/HGDS | DG... | HGDS | | | HMSV, HMVA | | |
|  | DGP...-25<br>DGE-25<br>DGEA-18 | 12, 16, 20 | ■ | ■ | 2 | **177653**<br>**534290**<br>**196788** | **HMSV-7**<br>**HMSV-38**<br>**HMVA-DLA18/25** |
| | DGP...-40<br>DGE-40 | 12, 16, 20 | ■ | ■ | 2 | **177653**<br>**534290**<br>**196790** | **HMSV-7**<br>**HMSV-38**<br>**HMVA-DLA40** |

1) 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.

| Ordering data | | | | | |
|---|---|---|---|---|---|
| | For size | Brief description | Part No. | Type | PU[1] |
| Cushioning kit for P/P1/YSRT cushioning | | | | | |
|  | 12 | P cushioning:<br>– Flexible cushioning component | **1731537** | **HGDS-12-P-B** | 1 |
| | 16 | | **1731540** | **HGDS-16-P-B** | |
| | 20 | | **1731544** | **HGDS-20-P-B** | |
|  | 12 | P1 cushioning:<br>– Flexible cushioning component<br>– Adjustable<br>– With metal fixed stop | **1731536** | **HGDS-12-P1-B** | |
| | 16 | | **1731539** | **HGDS-16-P1-B** | |
| | 20 | | **1731542** | **HGDS-20-P1-B** | |
| | | | | | |
|  | 12 | YSRT cushioning:<br>– Shock absorber<br>– Self-adjusting<br>– With metal fixed stop | **1731538** | **HGDS-12-YSRT-B** | 1 |
| | 16 | | **1731541** | **HGDS-16-YSRT-B** | |
| | 20 | | **1731545** | **HGDS-20-YSRT-B** | |
| | | | | | |

1) Packaging unit

| Ordering data | | | | | Technical data ➔ Internet: zbh |
|---|---|---|---|---|---|
| | For size | Weight [g] | Part No. | Type | PU[1] |
| Centring sleeve ZBH | | | | | |
|  | 12, 16, 20 | 1 | **150927** | **ZBH-9** | 10 |

1) Packaging unit

| Ordering data – Proximity sensors for C-slot, magneto-resistive | | | | | | Technical data ➔ Internet: smt |
|---|---|---|---|---|---|---|
| | Type of mounting | Electrical connection, connection direction | Switching output | Cable length [m] | Part No. | Type |
| N/O contact | | | | | | |
|  | Insertable in the slot from above | Cable, 3-wire, in-line | PNP | 2.5 | **551373** | **SMT-10M-PS-24V-E-2,5-L-OE** |
| | | Plug M8x1, 3-pin, in-line | | 0.3 | **551375** | **SMT-10M-PS-24V-E-0,3-L-M8D** |
|  | | Cable, 3-wire, lateral | | 2.5 | **551374** | **SMT-10M-PS-24V-E-2,5-Q-OE** |
| | | Plug M8x1, 3-pin, lateral | | 0.3 | **551376** | **SMT-10M-PS-24V-E-0,3-Q-M8D** |
| | | | | | | |

| Ordering data – Proximity sensors for C-slot, magnetic reed | | | | | | Technical data ➔ Internet: sme |
|---|---|---|---|---|---|---|
| | Type of mounting | Electrical connection, connection direction | Switching output | Cable length [m] | Part No. | Type |
| N/O contact | | | | | | |
|  | Insertable in the slot from above | Cable, 3-wire, in-line | Contacting | 2.5 | **551365** | **SME-10M-DS-24V-E-2,5-L-OE** |
| | | Cable, 2-wire, in-line | | 2.5 | **551369** | **SME-10M-ZS-24V-E-2,5-L-OE** |
| | | Plug M8x1, 3-pin, in-line | | 0.3 | **551367** | **SME-10M-DS-24V-E-0,3-L-M8D** |
|  | | Cable, 3-wire, lateral | | 2.5 | **551366** | **SME-10M-DS-24V-E-2,5-Q-OE** |
| | | Cable, 2-wire, lateral | | 2.5 | **551370** | **SME-10M-ZS-24V-E-2,5-Q-OE** |
| | | Plug M8x1, 3-pin, lateral | | 0.3 | **551368** | **SME-10M-DS-24V-E-0,3-Q-M8D** |

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