

Angle grippers DHWS

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Angle grippers DHWS

Key features

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At a glance

General information

- Improved gripper jaw guide
- Slotted guide system
- Max. repetition accuracy
- Gripping force retention
- Internal fixed flow control
- Wide range of options for mounting on drive units

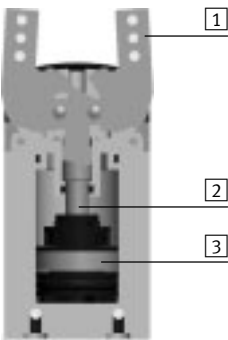
- Sensor technology:
 - Adaptable position sensor for the small gripper sizes
 - Integratable proximity sensors for the medium and large gripper sizes

Flexible range of applications

- Can be used as a double-acting and single-acting gripper
- Compression spring for supplementary or retaining gripping forces
- Suitable for external and internal gripping

The technology in detail

Gripper closed



Gripper open



- 1 Gripper jaw
- 2 Slotted guide plate
- 3 Piston with magnet

-  - Note

Gripper selection
sizing software
→ www.festo.com

Position sensing/force control

With position transmitter SMAT-8M, SDAT



Analogue positional feedback possible

- Analogue output
 - 0 ... 10 V
 - 4 ... 20 mA

With proportional pressure regulator VPPM



Infinite adjustment of the gripping force possible

- Setpoint input
 - 0 ... 10 V
 - 4 ... 20 mA

With proximity sensor SMT-8G



Multiple positions can be sensed:

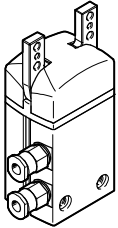
- Open
- Closed
- Workpiece gripped

Angle grippers DHWS

Key features

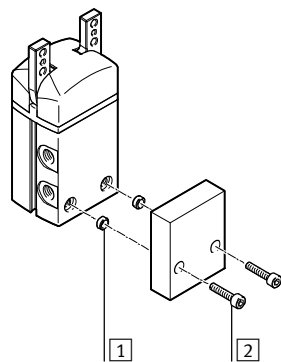
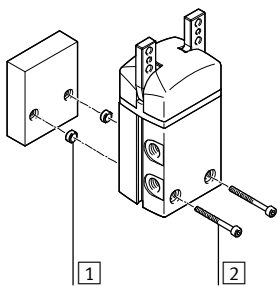
Supply ports

At the side

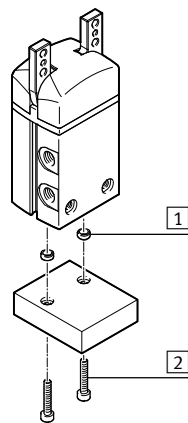


Mounting options

At the side

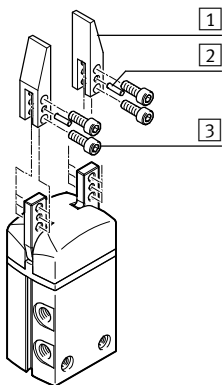


From underneath



- 1 Centring sleeves
- 2 Mounting screws

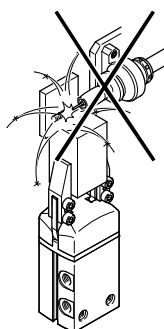
Mounting options for external gripper fingers



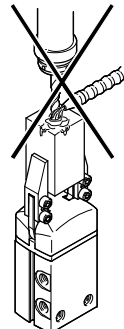
- 1 Gripper fingers
- 2 Centring pins
- 3 Mounting screws

Note

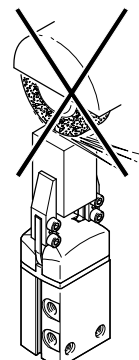
These grippers are not designed for the following or similar sample applications:



- Welding spatter



- Machining
- Aggressive media



- Grinding dust

Angle grippers DHWS

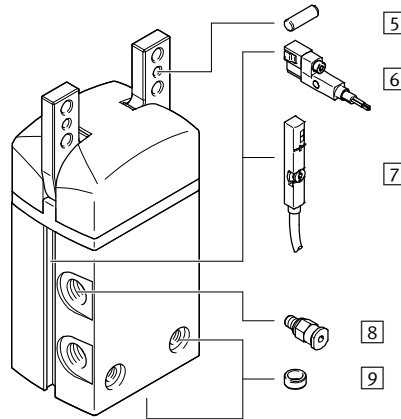
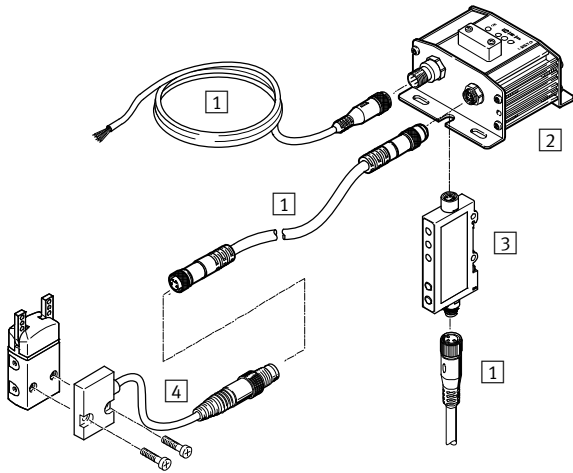
Peripherals overview

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Peripherals overview

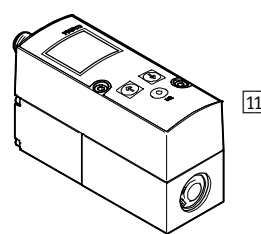
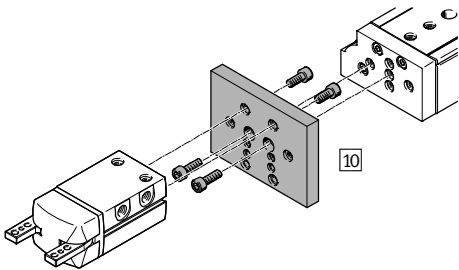
DHWS-10

DHWS-16 ... 40



System product for handling and assembly technology

Proportional pressure regulator VPPM



Angle grippers DHWS

Peripherals overview

| Accessories | | | | |
|-------------|---|-----------|---|-----------------|
| | Type | Size | Description | → Page/Internet |
| 1 | Connecting cable NEBU | 10 ... 40 | For connecting evaluation unit and signal converter | 21 |
| 2 | Evaluation unit SMH-AE1 | 10 | <ul style="list-style-type: none"> For evaluating signals for position sensor SMH-S1 | 21 |
| 3 | Signal converter SVE4 | 10 | <ul style="list-style-type: none"> For evaluating signals for position sensor SMH-S1 | 21 |
| 4 | Position sensor SMH-S1 | 10 | <ul style="list-style-type: none"> Adaptable and integratable sensor technology, for sensing the piston position | 21 |
| 5 | Centring pin | 10 ... 40 | For centring the gripper fingers on the gripper jaws | – |
| 6 | Proximity sensor SMT-8G | 16 ... 40 | <ul style="list-style-type: none"> For sensing the piston position Proximity sensor does not project past the housing at the bottom | 22 |
| 7 | Position transmitter SMAT-8M | 16 ... 40 | <ul style="list-style-type: none"> Continuously senses the position of the piston. Has an analogue output with an output signal in proportion to the piston position | 22 |
| | Position transmitter SDAT | 32, 40 | | |
| 8 | Push-in fitting QS | 10 ... 40 | For connecting compressed air tubing with standard O.D. | quick star |
| 9 | Centring sleeve ZBH | 10 ... 40 | <ul style="list-style-type: none"> For centring the gripper during mounting The scope of delivery of the gripper includes 2 centring sleeves | 21 |
| 10 | Adapter kit DHAA, HMSV, HAPG, HAPS, HMVA | 10 ... 40 | Connecting plate between drive and gripper | 16 |
| 11 | Proportional pressure regulator VPPM | 10 ... 40 | For infinite adjustment of the gripping force | vppm |

Angle grippers DHWS

Type codes

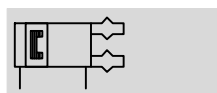
| | | | | | | | | |
|---------------------------------|----------------------|------|---|----|---|---|---|--|
| | | DHWS | - | 16 | - | A | - | |
| Type | | | | | | | | |
| DHWS | Angle gripper | | | | | | | |
| Size | | | | | | | | |
| Position sensing | | | | | | | | |
| A | Via proximity sensor | | | | | | | |
| Gripping force retention | | | | | | | | |
| NC | Closing | | | | | | | |

Angle grippers DHWS

Technical data

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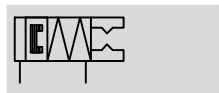
Function
Double-acting
DHWS-...-A



- - Size
10 ... 40 mm
- - Opening angle
40°

- - www.festo.com

Function – Variants
Single-acting or
with gripping force retention ...
... closing DHWS-...-NC



| General technical data | | | | | |
|-----------------------------------|---------------------------------------|----|--|------|------|
| Size | 10 | 16 | 25 | 32 | 40 |
| Design | Lever | | | | |
| Mode of operation | Double-acting | | | | |
| Gripper function | Angle | | | | |
| Guide | Plain-bearing guide | | | | |
| Gripping force retention | - | NC | NC | NC | NC |
| Number of gripper jaws | 2 | | | | |
| Opening angle per gripper jaw | [°] 20 | | | | |
| Pneumatic connection | M3 | M3 | M5 | G1/8 | G1/8 |
| Repetition accuracy ¹⁾ | [mm] ≤ 0.04 | | | | |
| Max. interchangeability | [mm] ≤ 0.2 | | | | |
| Max. operating frequency | [Hz] 4 | | 3 | | |
| Rotational symmetry | [mm] < Ø 0.2 | | | | |
| Position sensing | Via position sensor | | Via proximity sensor, position transmitter | | |
| Type of mounting | Via through-hole and centring sleeve | | | | |
| | Via female thread and centring sleeve | | | | |
| Mounting position | Any | | | | |

1) End-position drift under constant conditions of use with 100 consecutive strokes in the direction of movement of the gripper jaws

| Operating and environmental conditions | | | | | |
|--|--|----|----|----|----|
| Size | 10 | 16 | 25 | 32 | 40 |
| Min. operating pressure | | | | | |
| DHWS-...-A | [bar] 2 | | | | |
| DHWS-...-A-NC | [bar] - | 4 | | | |
| Max. operating pressure | [bar] 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⁾ | 1 | | | | |

1) Note operating range of proximity sensors

2) 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).

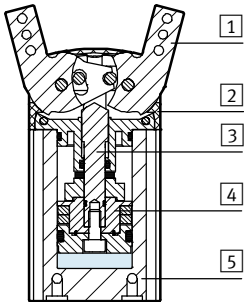
| Weight [g] | | | | | |
|---------------|----|-----|-----|-----|-----|
| Size | 10 | 16 | 25 | 32 | 40 |
| DHWS-...-A | 40 | 110 | 258 | 452 | 775 |
| DHWS-...-A-NC | - | 114 | 265 | 462 | 790 |

Angle grippers DHWS

Technical data

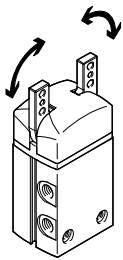
Materials

Sectional view



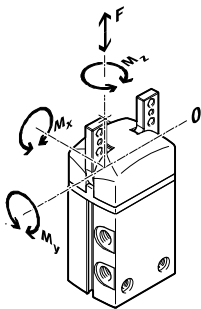
| Angle gripper | | |
|---------------|---------------------|---|
| 1 | Gripper jaw | High-alloy stainless steel |
| 2 | Cover cap | Polyamide |
| 3 | Slotted guide plate | Tempered steel |
| 4 | Piston | Polyacetal |
| 5 | Housing | Hard anodised wrought aluminium alloy |
| - | Seals | Nitrile rubber |
| - | Note on materials | Free of copper and PTFE RoHS-compliant |

Total gripping torque [Ncm] at 6 bar



| Size | | 10 | 16 | 25 | 32 | 40 |
|------------|---------|----|-----|-----|-----|------|
| DHWS-...-A | Opening | 43 | 129 | 386 | 810 | 1497 |
| | Closing | 30 | 114 | 356 | 746 | 1362 |

Static characteristic load values at the gripper jaws



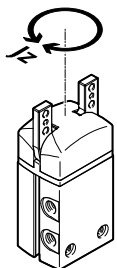
The indicated permissible forces and torques apply to a single gripper jaw. They include the lever arm, additional applied loads due to the workpiece or external gripper fingers and accelera-

tion forces occurring during movement.

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

| Size | | 10 | 16 | 25 | 32 | 40 |
|-------------------------------|------|-----|-----|-----|-----|-----|
| Max. permissible force F_z | [N] | 25 | 50 | 90 | 120 | 200 |
| Max. permissible torque M_x | [Nm] | 0.6 | 1.6 | 3.6 | 6 | 13 |
| Max. permissible torque M_y | [Nm] | 0.6 | 1.6 | 3.6 | 6 | 13 |
| Max. permissible torque M_z | [Nm] | 0.6 | 1.6 | 3.6 | 6 | 13 |

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



Mass moment of inertia of the angle gripper in relation to the central axis, without external gripper fingers, without load.

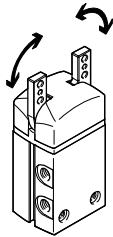
| Size | | 10 | 16 | 25 | 32 | 40 |
|---------------|--|------|------|------|------|------|
| DHWS-...-A | | 0.03 | 0.14 | 0.62 | 1.60 | 3.81 |
| DHWS-...-A-NC | | - | 0.15 | 0.64 | 1.63 | 3.87 |

Angle grippers DHWS

Technical data

Opening and closing times [ms] at 6 bar

Without external gripper fingers



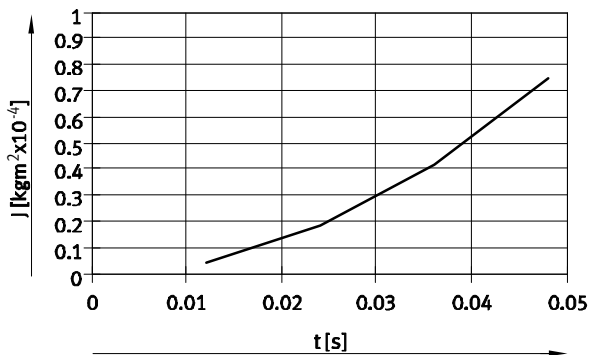
The indicated opening and closing times [ms] were measured at room temperature at an operating pressure of 6 bar with horizontally mounted grippers without additional gripper

fingers (average values). The grippers must be throttled for greater applied loads. Opening and closing times must then be adjusted accordingly.

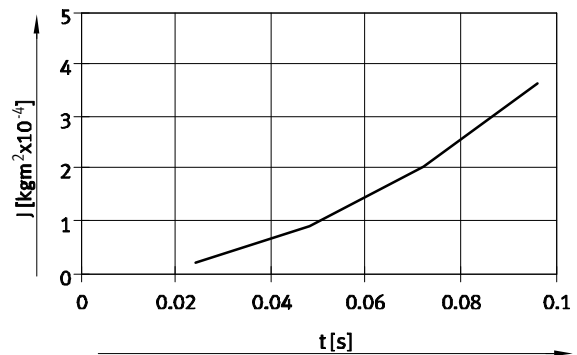
| Size | | 10 | 16 | 25 | 32 | 40 |
|----------------------------------|---------|----|----|-----|----|----|
| Without external gripper fingers | | | | | | |
| DHWS-...-A | Opening | 10 | 44 | 64 | 46 | 63 |
| | Closing | 22 | 52 | 80 | 77 | 96 |
| DHWS-...-A-NC | Opening | - | 62 | 106 | 88 | 99 |
| | Closing | - | 36 | 59 | 55 | 69 |

Opening and closing times t to be set at 6 bar as a function of mass moment of inertia of the gripper fingers

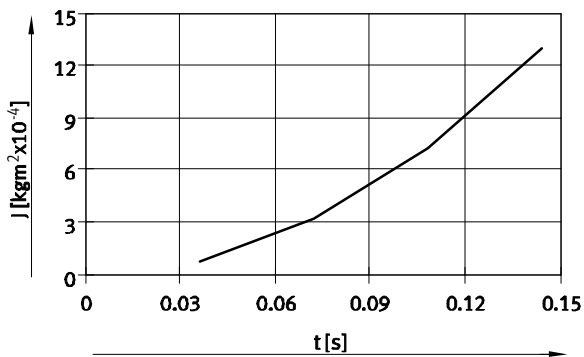
DHWS-10



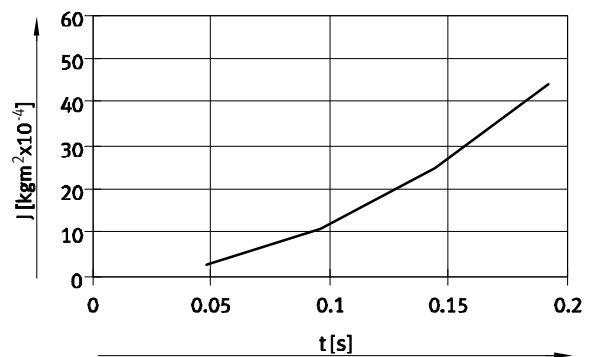
DHWS-16



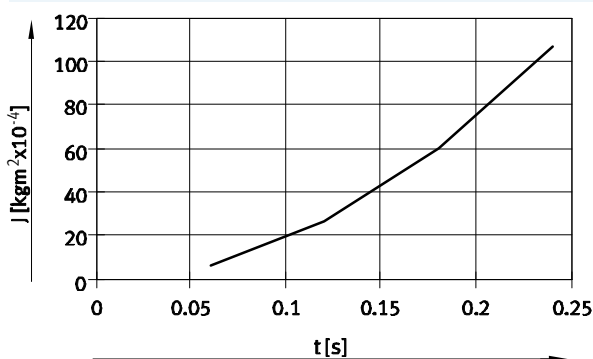
DHWS-25



DHWS-32



DHWS-40

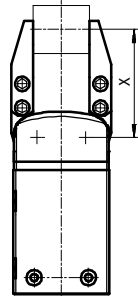


Angle grippers DHWS

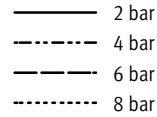
Technical data

Gripping force F_H per gripper jaw as a function of operating pressure and lever arm x

The gripping forces as a function of operating pressure and lever arm can be determined from the following graphs.

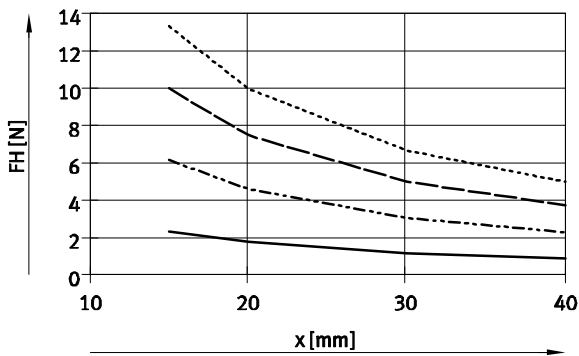


Note
Gripper selection
sizing software
→ www.festo.com

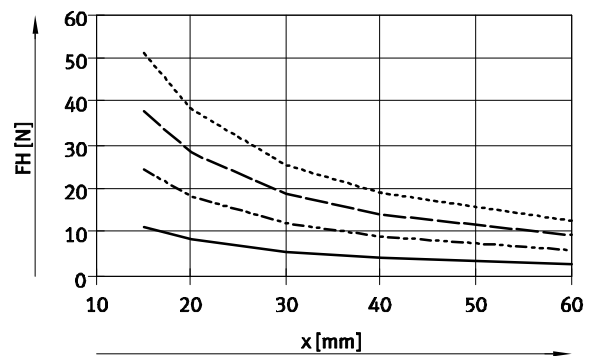


External gripping (closing)

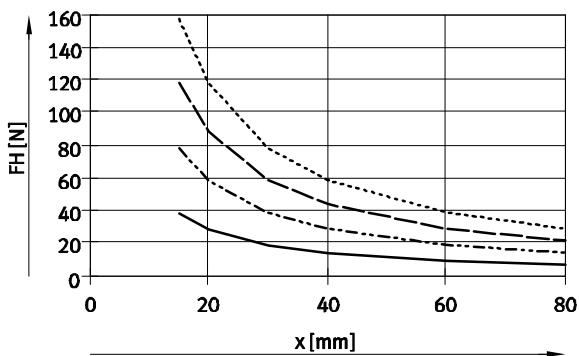
DHWS-10



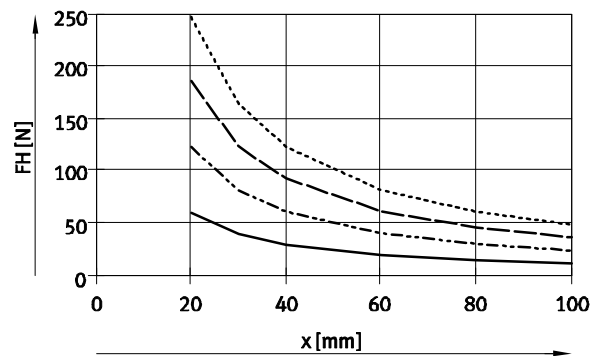
DHWS-16



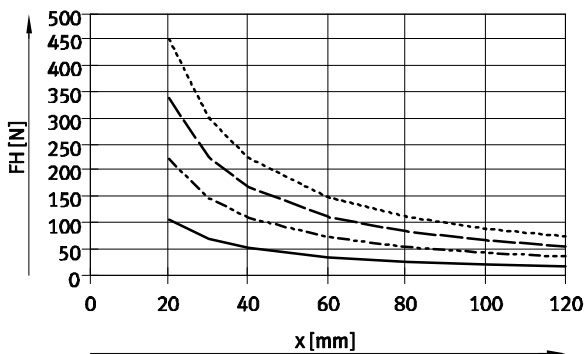
DHWS-25



DHWS-32



DHWS-40

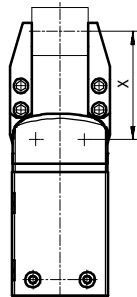


Angle grippers DHWS

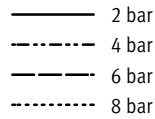
Technical data

Gripping force F_H per gripper jaw as a function of operating pressure and lever arm x

The gripping forces as a function of operating pressure and lever arm can be determined from the following graphs.

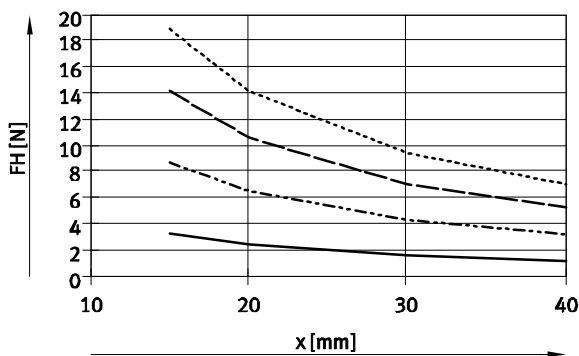


Note
Gripper selection
sizing software
→ www.festo.com

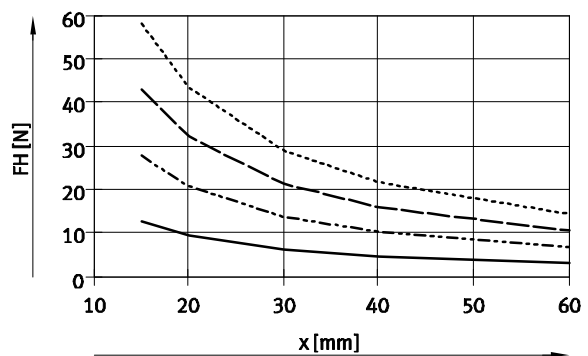


Internal gripping (opening)

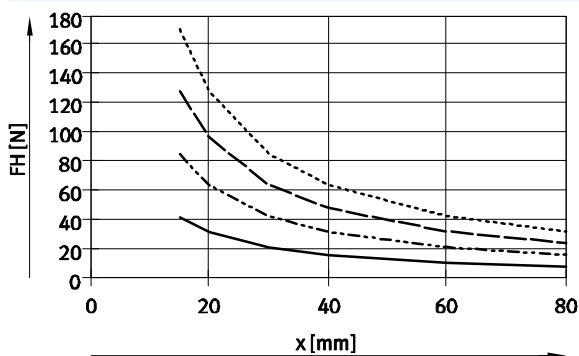
DHWS-10



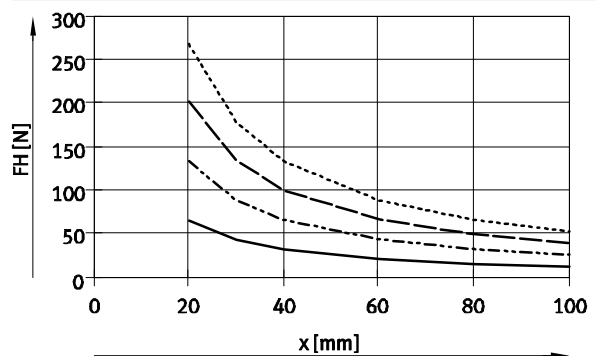
DHWS-16



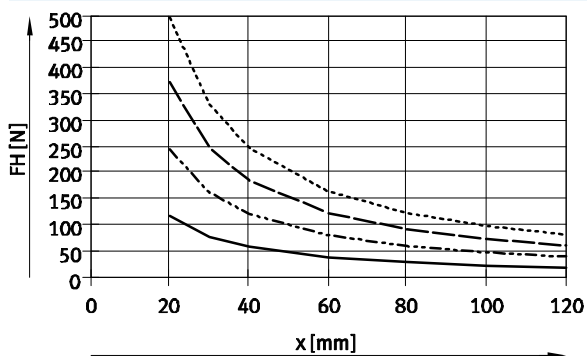
DHWS-25



DHWS-32



DHWS-40



Angle grippers DHWS

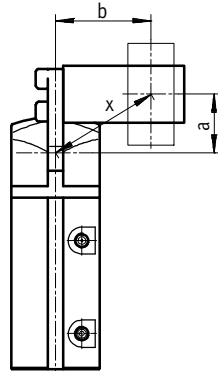
Technical data

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 (→ 10/11) using the calculated value x .



Calculation example

Given:

Distance $a = 20$ mm

Distance $b = 25$ mm

To be calculated:

The gripping force at 6 bar, with a DHWS-16, used as an external gripper

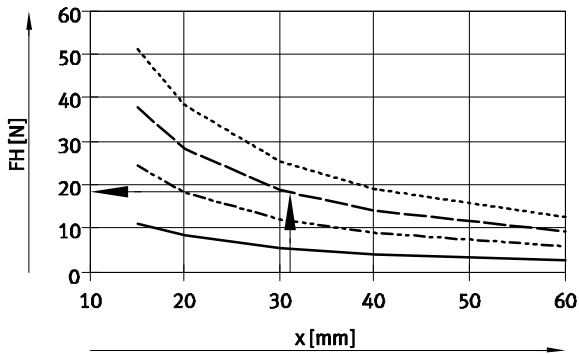
Procedure:

Calculating the lever arm x

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

$$x = 32 \text{ mm}$$

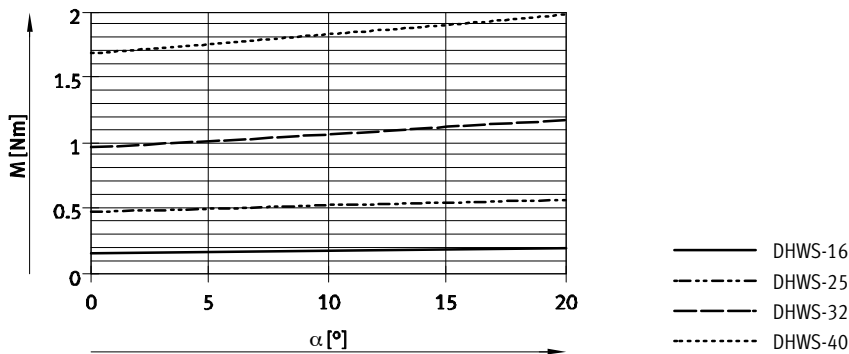
The graph (→ 10) gives a value of $F_H = 18$ N for the gripping force.



Angle grippers DHWS

Technical data

Spring torque M_F as a function of opening angle α



Determination of the actual gripping torques $M_{Grtotal}$ for DHWS-...-NC as a function of application

The angle gripper with integrated spring type DHWS-...-NC (closing gripping force retention) can be used as:

- single-acting grippers
- grippers with supplementary gripping force and
- grippers with gripping force retention depending on requirements.

In order to calculate the available gripping torque $M_{Grtotal}$ (per gripper jaw), the data from the graphs for the

gripping force F_H (→ 10/11) and the spring torque M_F (→ 13) must be combined accordingly.

$$M_{Gr} = F_H * x$$

M_{Gr} Gripping torque
 F_H Gripping force
 x Lever arm

Application

Single-acting

- Gripping with spring force:
 $M_{Grtotal} = M_F$
- Gripping with pressure force:
 $M_{Grtotal} = M_{Gr} - M_F$

Supplementary gripping force

- Gripping with pressure and spring force:
 $M_{Grtotal} = M_{Gr} + M_F$

Gripping force retention

- Gripping with spring force:
 $M_{Grtotal} = M_F$

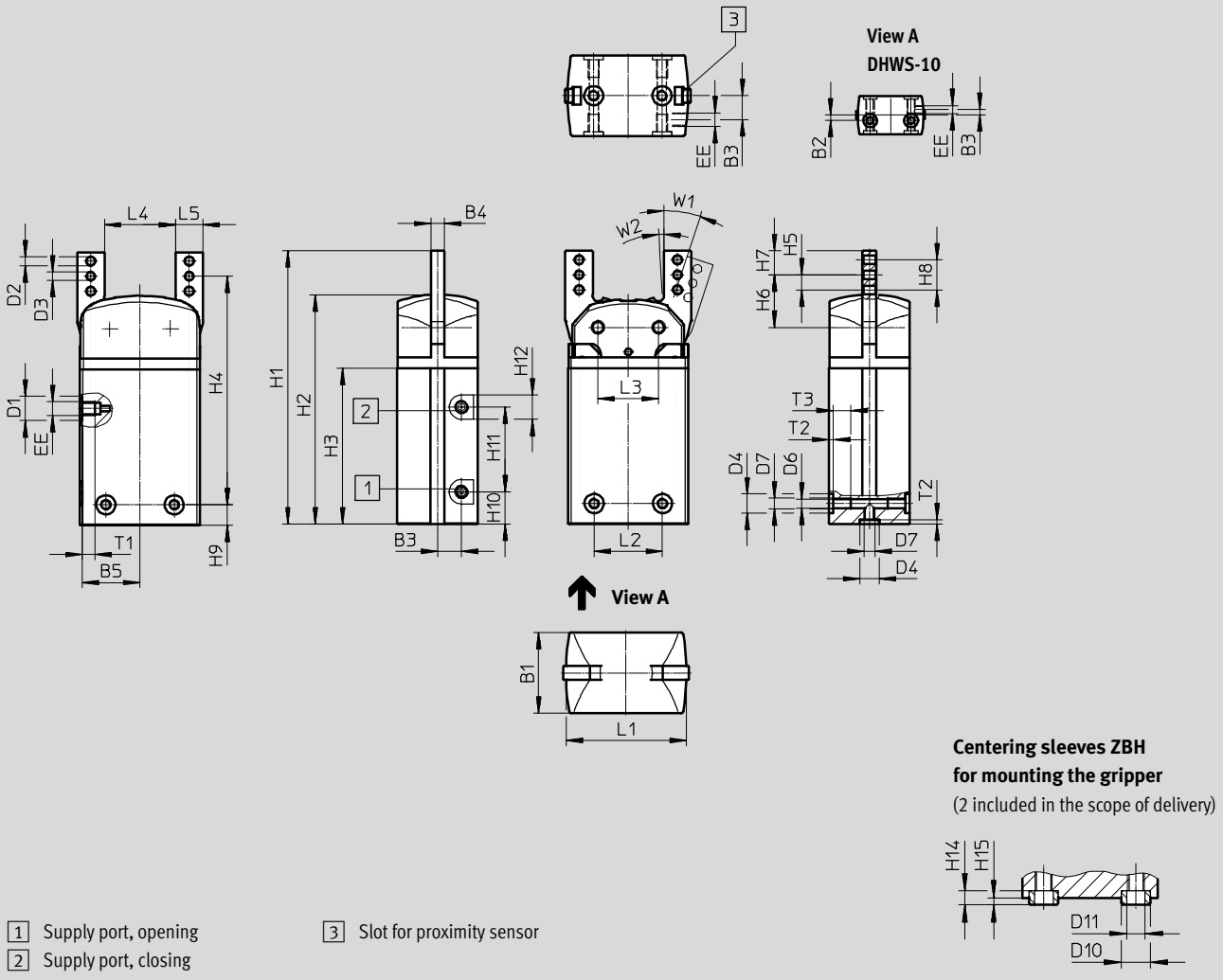
Angle grippers DHWS

Technical data

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Dimensions

Download CAD data → www.festo.com



| Size | B1 | B2 ¹⁾ | B3 | B4 | B5 | D1 | D2 | D3 | D4 | D6 | D7 |
|------|-------|------------------|------|-----------------|------|----|-----------|---------|------------|------|----|
| [mm] | ±0.05 | | | -0.03/ -0.05 | | ∅ | ∅ ±0.1 | ∅ H8 | ∅ H8/h7 | +0.1 | |
| 10 | 14 | 2 | 2 | 3 | 11.6 | 7 | 2.2 | 2 | 5 | 2.4 | M3 |
| 16 | 19 | - | 5.8 | 4 | 16 | - | 3.2 | 2.5 | 5 | 2.5 | M3 |
| 25 | 29.5 | - | 8.75 | 5 | 21 | 9 | 3.2 | 3 | 7 | 3.3 | M4 |
| 32 | 38 | - | 11 | 6 | 24 | 15 | 4.3 | 3 | 9 | 5.1 | M6 |
| 40 | 49 | - | 11 | 8 | 28.4 | 15 | 5.3 | 4 | 12 | 6.4 | M8 |

| Size | D10 | D11 | EE | H1 | H2 | H3 | H4 | H5 | H6 | H7 |
|------|---------|------|-----------------|------|-------|------|-------|-----|-------|------|
| [mm] | ∅ h7 | ∅ | | | | | ±0.2 | | ±0.05 | |
| 10 | 5 | 3.2 | M3 | 56.3 | 46 | 30.8 | 38.25 | 3.5 | 10.95 | 5.75 |
| 16 | 5 | 3.2 | M3 | 81 | 67 | 45.5 | 66 | 4.5 | 15.5 | 7.5 |
| 25 | 7 | 5.3 | M5 | 100 | 84 | 57 | 83.7 | 5.5 | 19.2 | 8.8 |
| 32 | 9 | 6.4 | G $\frac{1}{8}$ | 116 | 96.2 | 65 | 100.5 | 6.5 | 22.5 | 11 |
| 40 | 12 | 10.3 | G $\frac{1}{8}$ | 129 | 108.4 | 71.5 | 99.5 | 7 | 24.5 | 12 |

1) Tolerance for centring hole ±0.02 mm; tolerance for thread ±0.1 mm

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Technical data

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| Size [mm] | H8 | H9 ²⁾ | H10 | H11 | H12 | H14 | H15 | L1 | L2 ¹⁾ |
|--------------|----|------------------|-------|-----|-----|------|------|-------|------------------|
| | | | | | | -0.2 | -0.3 | ±0.05 | |
| 10 | 7 | 12.3 | 8.8 | 16 | 7 | 2.4 | 1.2 | 24 | 15 |
| 16 | 9 | 7.5 | 12.25 | 23 | 7 | 2.4 | 1.2 | 34 | 16 |
| 25 | 11 | 7.5 | 11.8 | 31 | 9 | 3 | 1.4 | 44 | 25 |
| 32 | 13 | 11 | 20 | 25 | 15 | 4 | 1.9 | 53 | 29 |
| 40 | 14 | 17.5 | 9 | 46 | 15 | 5 | 2.4 | 59 | 33 |

| Size [mm] | L3 | L4 | L5 -0.02/ -0.05 | T1 | T2 | T3 | W1 | W2 |
|--------------|-------|----|-----------------------|------|------|---------|---------|-----|
| | ±0.02 | | | +0.5 | +0.1 | +1 | +3°/-1° | ±1° |
| 10 | 12.4 | 14 | 5.5 | 3.5 | 1.2 | through | 18 | 3 |
| 16 | 17 | 18 | 8 | 4.5 | 1.2 | 5.8 | 18 | 3 |
| 25 | 22.2 | 26 | 10 | 4.5 | 1.6 | 6.4 | 18 | 3 |
| 32 | 25.8 | 29 | 12 | 7.5 | 2.1 | 12.9 | 18 | 3 |
| 40 | 30 | 32 | 15 | 6 | 2.6 | 13.4 | 18 | 3 |

1) Tolerance for centring hole ±0.02 mm; tolerance for thread ±0.1 mm

2) Tolerance for centring hole -0.05 mm; tolerance for thread ±0.1 mm

Ordering data

| Size [mm] | Double-acting without compression spring | | Single-acting or with gripping force retention | |
|--------------|---|------------------|--|---------------------|
| | Part No. | Type | Closing Part No. | Type |
| 10 | 1310177 | DHWS-10-A | - | |
| 16 | 1310178 | DHWS-16-A | 1310179 | DHWS-16-A-NC |
| 25 | 1310180 | DHWS-25-A | 1310181 | DHWS-25-A-NC |
| 32 | 1310182 | DHWS-32-A | 1310183 | DHWS-32-A-NC |
| 40 | 1310184 | DHWS-40-A | 1310185 | DHWS-40-A-NC |


Angle grippers DHWS



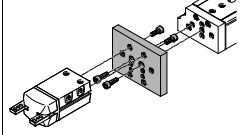
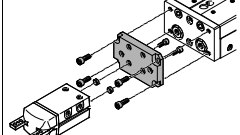
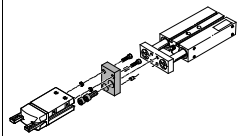
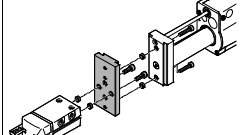
Accessories

FESTO

Adapter kit
HMSV, HAPG, HAPS, HMVA, DHAA

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 Size | Gripper Size | Mounting option | | Adapter kit | | |
| | | |  |  | CRC ¹⁾ | Part No. | Type |
| | | | | | | | |
|  | DGSL | DHWS | | | HMSV | | |
| | 8, 10 | 10 | ■ | ■ | 2 | 548784 | HMSV-54 |
| | 12, 16 | 16 | ■ | ■ | | 548785 | HMSV-55 |
| | 20, 25 | 25, 32 | ■ | ■ | | 548786 | HMSV-56 |
|  | SLT | DHWS | | | HAPS | | |
| | 10 | 10 | ■ | – | 2 | 178448 | HAPS-2 |
| | 16 | 16 | ■ | – | | 178449 | HAPS-3 |
| | 20 | 25 | ■ | – | | 178450 | HAPS-4 |
| | 25 | 32 | ■ | – | | 178451 | HAPS-5 |
|  | DPZ | DHWS | | | HAPG | | |
| | 10, 16 | 16 | ■ | – | 2 | 163250 | HAPG-1 |
| | 16 | 25 | ■ | – | | 163251 | HAPG-2 |
| | 20 | 25 | ■ | – | | 163252 | HAPG-3 |
| | 25, 32 | 32 | ■ | – | | 163253 | HAPG-4 |
|  | HMP | DHWS | | | HMSV | | |
| | Direct mounting | | | | 2 | | |
| | 16, 20 | 16 | ■ | ■ | | 177666 | HMSV-20 |
| | 16, 20, 25 | 25 | ■ | ■ | | 177761 | HMSV-21 |
| | 16, 20, 25, 32 | 32 | ■ | ■ | | 177762 | HMSV-22 |
| | 25 | 40 | ■ | ■ | | 177763 | HMSV-23 |
| | 32 | 40 | ■ | ■ | | 177764 | HMSV-24 |
| | Dovetail mounting | | | | 2 | | |
| | 16, 20 | 16 | ■ | ■ | | 177767 | HMSV-27 |
| | 16, 20, 25 | 25 | ■ | ■ | | 177768 | HMSV-28 |
| | 16, 20, 25, 32 | 32 | ■ | ■ | | 177769 | HMSV-29 |
| | 25 | 40 | ■ | ■ | | 177770 | HMSV-30 |
| 32 | 40 | ■ | ■ | 178211 | | HMSV-31 | |

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.


Angle grippers DHWS



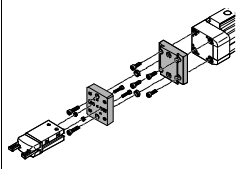
Accessories



Adapter kit
HMSV, HAPG, HAPS, HMVA, DHAA

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 Size | Gripper Size | Mounting option | | Adapter kit | | |
| | | |  |  | CRC ¹⁾ | Part No. | Type |
| | | | | | | | |
| DGP..., DGE..., DGEA/DHWS | DG... | DHWS | | | | HMVA, HAPG, HMSV | |
|  | Direct mounting | | | | | | |
| | 18 ²⁾ , 25 ³⁾ | 10 | <input type="checkbox"/> | <input type="checkbox"/> | 2 | 196788 | HMVA-DIA18/25 |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | | 192706 | HAPG-37-S1 |
| | 40 ³⁾ | 10 | <input type="checkbox"/> | <input type="checkbox"/> | | 196790 | HMVA-DIA40 |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | | 192706 | HAPG-37-S1 |
| | 18 ²⁾ , 25 ³⁾ | 16 | <input type="checkbox"/> | <input type="checkbox"/> | | 196788 | HMVA-DIA18/25 |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | | 192705 | HAPG-36-S1 |
| | 40 ³⁾ | 16 | <input type="checkbox"/> | <input type="checkbox"/> | | 196790 | HMVA-DIA40 |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | | 192705 | HAPG-36-S1 |
| | 18 ²⁾ , 25 ³⁾ | 25 | <input type="checkbox"/> | <input type="checkbox"/> | | 196788 | HMVA-DIA18/25 |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | | 193922 | HAPG-37-S4 |
| | 40 ³⁾ | 25 | <input type="checkbox"/> | <input type="checkbox"/> | | 196790 | HMVA-DIA40 |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | | 193922 | HAPG-37-S4 |
| | Dovetail mounting | | | | | | |
| | 18 ²⁾ , 25 | 16 | <input type="checkbox"/> | <input type="checkbox"/> | 2 | 196788 | HMVA-DIA18/25 |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | | 177767 | HMSV-27 |
| | 40 | 16 | <input type="checkbox"/> | <input type="checkbox"/> | | 196790 | HMVA-DIA40 |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | | 177767 | HMSV-27 |
| 18 ²⁾ , 25 | 25 | <input type="checkbox"/> | <input type="checkbox"/> | 196788 | | HMVA-DIA18/25 | |
| | | <input type="checkbox"/> | <input type="checkbox"/> | 177768 | | HMSV-28 | |
| 40 | 25 | <input type="checkbox"/> | <input type="checkbox"/> | 196790 | | HMVA-DIA40 | |
| | | <input type="checkbox"/> | <input type="checkbox"/> | 177768 | | HMSV-28 | |
| 40 | 32 | <input type="checkbox"/> | <input type="checkbox"/> | 196790 | | HMVA-DIA40 | |
| | | <input type="checkbox"/> | <input type="checkbox"/> | 177769 | | HMSV-29 | |
| 40 | 40 | <input type="checkbox"/> | <input type="checkbox"/> | 196790 | | HMVA-DIA40 | |
| | | <input type="checkbox"/> | <input type="checkbox"/> | 177770 | | HMSV-30 | |

- 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.
- 2) Only for DGEA-...
- 3) Only for DGE.../DGP...


Angle grippers DHWS



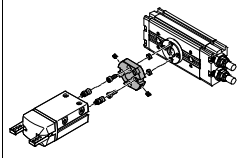
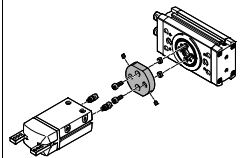
Accessories

FESTO

Adapter kit
HMSV, HAPG, HAPS, HMVA, DHAA

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 Size | Gripper Size | Mounting option | | Adapter kit | | | | |
| | | |  |  | CRC ¹⁾ | Part No. | Type | | |
| | | | | | | | | | |
|  | DRQD-...-FW | DHWS | | | 2 | HAPG | | | |
| | 6, 8, 12 | 10 | ■ | ■ | | 187568 | HAPG-34 | | |
| | 16 ²⁾ | 10 | ■ | ■ | | 187566 | HAPG-SD2-12 | | |
| | 16 ²⁾ | 16 | ■ | ■ | | 184477 | HAPG-SD2-1 | | |
| | 16 ²⁾ | 25 | ■ | ■ | | 184478 | HAPG-SD2-2 | | |
| | 20 ²⁾ | 25 | ■ | ■ | | 184479 | HAPG-SD2-3 | | |
| | 20 ²⁾ | 32 | ■ | ■ | | 184480 | HAPG-SD2-4 | | |
| | 25 ³⁾ | 25 | ■ | ■ | | 184482 | HAPG-SD2-6 | | |
| | 25 ³⁾ | 32 | ■ | ■ | | 184483 | HAPG-SD2-7 | | |
| | 32 ³⁾ | 32 | ■ | ■ | | 184485 | HAPG-SD2-9 | | |
| | 32 ³⁾ | 40 | ■ | ■ | | 184486 | HAPG-SD2-10 | | |
| | 40, 50 | 40 | ■ | ■ | | 526027 | HAPG-SD2-21 | | |
| | DRQD-...-ZW | DHWS | | | | 2 | HAPG | | |
| | 16 | 16 | ■ | ■ | | | 163267 | HAPG-18 | |
| | 16 | 25 | ■ | ■ | | | 163268 | HAPG-19 | |
| | 20 | 25 | ■ | ■ | | | 163269 | HAPG-20 | |
| | 20 | 32 | ■ | ■ | | | 163270 | HAPG-21 | |
| | 25 | 32 | ■ | ■ | | | 163271 | HAPG-22 | |
| |  | DRRD | DHWS | | | | 2 | DHAA | |
| | | 8 | 10 | ■ | | ■ | | 2816591 | DHAA-G-Q11-8-B2/B3-10 |
| 10 | | 10 | ■ | ■ | 2816068 | DHAA-G-Q11-10-B2/B3-10 | | | |
| 12 | | 10 | ■ | ■ | 2814790 | DHAA-G-Q11-12-B2/B3-10 | | | |
| 12 | | 16 | ■ | ■ | 2811183 | DHAA-G-Q11-12-B2/B3-16 | | | |
| 16 | | 16 | ■ | ■ | 1979085 | DHAA-G-Q11-16-B2/B3-16 | | | |
| 16 | | 25 | ■ | ■ | 1978889 | DHAA-G-Q11-16-B2/B3-25 | | | |
| 20 | | 25 | ■ | ■ | 1978443 | DHAA-G-Q11-20-B2/B3-25 | | | |
| 20 | | 32 | ■ | ■ | 1979912 | DHAA-G-Q11-20-B2/B3-32 | | | |
| 25 | | 25 | ■ | ■ | 1801802 | DHAA-G-Q11-25-B2/B3-25 | | | |
| 25 | | 32 | ■ | ■ | 1802969 | DHAA-G-Q11-25-B2/B3-32 | | | |
| 32 | | 32 | ■ | ■ | 1979992 | DHAA-G-Q11-32-B2/B3-32 | | | |
| 32 | | 40 | ■ | ■ | 1980014 | DHAA-G-Q11-32-B2/B3-40 | | | |
| 35, 40 | | 40 | ■ | ■ | 1980059 | DHAA-G-Q11-35/40-B2/B3-40 | | | |

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.

2) Possible in combination with DRQD-...-E422 (flanged shaft with energy through-feed).

3) Possible in combination with DRQD-...-E444 (flanged shaft with energy through-feed).


Angle grippers DHWS

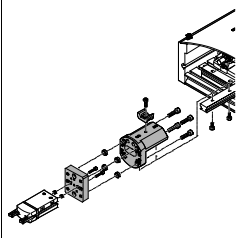
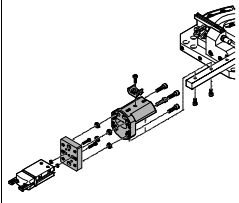
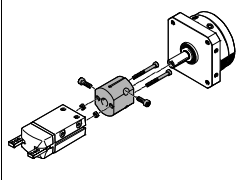
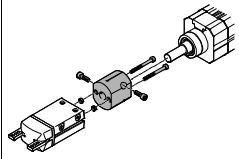
Accessories

FESTO

Adapter kit
HMSV, HAPG, HAPS, HMVA, DHAA

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 |
| | | | | | | | |
| HSP/DHWS | HSP | DHWS | | | HAPG | | |
|  | 12 | 10 | ■ | – | 2 | 192709 | HAPG-60-S1 |
| | | | | | | 540881 | HAPG-70-B |
| | 16 | 10 | ■ | – | | 192706 | HAPG-37-S1 |
| | | | | | | 540882 | HAPG-71-B |
| | 16 | 16 | ■ | – | | 192705 | HAPG-36-S1 |
| | | | | 540882 | HAPG-71-B | | |
| | 25 | 16 | ■ | – | 192705 | HAPG-36-S1 | |
| | | | | | 540883 | HAPG-72-B | |
| | 25 | 25 | ■ | – | 193922 | HAPG-37-S4 | |
| | | | | | 540883 | HAPG-72-B | |
| HSW/DHWS | HSW | DHWS | | | HAPG | | |
|  | 12, 16 | 10 | ■ | – | 2 | 192706 | HAPG-37-S1 |
| | | | | | | 540882 | HAPG-71-B |
| | 12, 16 | 16 | ■ | – | | 192705 | HAPG-36-S1 |
| | | | | | 540882 | HAPG-71-B | |
| DSM/DHWS | DSM:…-FW | DHWS | | | HAPG | | |
|  | 6, 8, 10 | 10 | ■ | ■ | 2 | 187568 | HAPG-34 |
| | DSM:… | DHWS | | | HAPG | | |
| | 12 | 16 | ■ | ■ | 2 | 163266 | HAPG-17 |
| | 16 | 16 | ■ | ■ | | 163267 | HAPG-18 |
| | 16 | 25 | ■ | ■ | | 163268 | HAPG-19 |
| | 25 | 25 | ■ | ■ | | 163269 | HAPG-20 |
| | 25 | 32 | ■ | ■ | | 163270 | HAPG-21 |
| | 32 | 32 | ■ | ■ | | 163271 | HAPG-22 |
| DSL/DHWS | DSL | DHWS | | | HAPG | | |
|  | 16 | 16 | ■ | ■ | 2 | 163266 | HAPG-17 |
| | 20 | 16 | ■ | ■ | | 163267 | HAPG-18 |
| | 20 | 25 | ■ | ■ | | 163268 | HAPG-19 |
| | 25 | 25 | ■ | ■ | | 163269 | HAPG-20 |
| | 25 | 32 | ■ | ■ | | 163270 | HAPG-21 |
| | 32 | 32 | ■ | ■ | | 163271 | HAPG-22 |

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.


Angle grippers DHWS



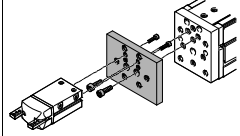
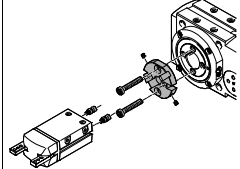
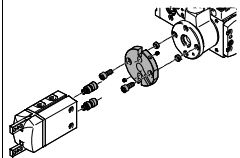
Accessories

FESTO

Adapter kit
HMSV, HAPG, HAPS, HMVA, DHAA

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 Size | Gripper Size | Mounting option | | Adapter kit | | | |
| | | |  |  | CRC ¹⁾ | Part No. | Type | |
| | | | | | | | | |
| EGSL/DHWS | EGSL | DHWS | | | HMSV | | | |
|  | 35 | 10 | ■ | ■ | 2 | 548784 | HMSV-54 | |
| | 45, 55 | 16 | ■ | ■ | | 1088262 | HMSV-70 | |
| | 75 | 25, 32 | ■ | ■ | | 548785 | HMSV-55 | |
| | | | ■ | ■ | | 548786 | HMSV-56 | |
| ERMB/DHWS | ERMB | DHWS | | | HAPG | | | |
|  | 20 | 25 | ■ | ■ | 2 | 184479 | HAPG-SD2-3 | |
| | 25 | 25 | ■ | ■ | | 184482 | HAPG-SD2-6 | |
| | 20 | 32 | ■ | ■ | | 184480 | HAPG-SD2-4 | |
| | 25 | 32 | ■ | ■ | | 184483 | HAPG-SD2-7 | |
| | 32 | 32 | ■ | ■ | | 184485 | HAPG-SD2-9 | |
| | 32 | 40 | ■ | ■ | | 184486 | HAPG-SD2-10 | |
| | | | ■ | ■ | | | | |
| EHMB/DHWS | EHMB | DHWS | | | HAPG | | | |
|  | 20 | 32 | ■ | ■ | 2 | 184485 | HAPG-SD2-9 | |
| | 20 | 40 | ■ | ■ | | 184486 | HAPG-SD2-10 | |
| | 25, 32 | 40 | ■ | ■ | | 526027 | HAPG-SD2-21 | |
| | | | ■ | ■ | | | | |

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.

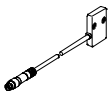
Angle grippers DHWS

Accessories

FESTO

| Ordering data | | | | | | |
|---|---------------|--|------------|----------|--------|------------------|
| | For size [mm] | Description | Weight [g] | Part No. | Type | PU ¹⁾ |
| Centring sleeve ZBH Technical data → Internet: zbh | | | | | | |
|  | 10, 16 | For centring the gripper during mounting | 1 | 189652 | ZBH-5 | 10 |
| | 25 | | 1 | 186717 | ZBH-7 | |
| | 32 | | 1 | 150927 | ZBH-9 | |
| | 40 | | 1 | 189653 | ZBH-12 | |

1) Packaging unit



| Ordering data | | | | | | |
|---|----------|--|------------|----------|--------------|--|
| Type | For size | | Weight [g] | Part No. | Type | |
| Position sensor SMH-S1 Technical data → Internet: smh-s1 | | | | | | |
|  | 10 | | 20 | 175711 | SMH-S1-HGW10 | |

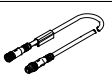
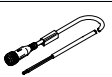
Signal converter/evaluation unit for position sensor SMH-S1

Signal converter SVE4

Evaluation unit SMH-AE1

- Converts analogue signals into switching points
- Switching function freely programmable with teach-in
- Threshold value, hysteresis or window comparator
- Converts analogue signals into switching points
- With 3 potentiometers for setting 3 switching points



| Ordering data | | | | | | |
|--|----------|--------------------|-------------------|------------------|------------|----------------------------|
| Type | For size | Input connection | Output connection | Switching output | Weight [g] | Part No. Type |
| Signal converter SVE4 Technical data → Internet: sve4 | | | | | | |
|  | 10 | Socket M8x1, 4-pin | Plug M8x1, 4-pin | 2x PNP | 19 | 544216 SVE4-HS-R-HM8-2P-M8 |
| | | | | 2x NPN | | 544219 SVE4-HS-R-HM8-2N-M8 |
| Evaluation unit SMH-AE1 Technical data → Internet: smh-ae | | | | | | |
|  | 10 | Socket M8x1, 4-pin | Plug M12x1, 5-pin | 3x PNP | 170 | 175708 SMH-AE1-PS3-M12 |
| | | | | 3x NPN | | 175709 SMH-AE1-NS3-M12 |

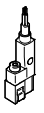
| Ordering data – Connecting cables | | | | | | Technical data → Internet: nebu |
|---|-------------------------------|------------------------------|------------------|----------|----------------------|---------------------------------|
| | Electrical connection, left | Electrical connection, right | Cable length [m] | Part No. | Type | |
| Connection between position sensor and signal converter/evaluation unit | | | | | | |
|  | Straight socket, M8x1, 4-pin | Straight plug, M8x1, 4-pin | 2.5 | 554035 | NEBU-M8G4-K-2.5-M8G4 | |
| | | | | | | |
| Connection between evaluation unit and controller | | | | | | |
|  | Straight socket, M12x1, 5-pin | Cable, open end, 5-wire | 2.5 | 541330 | NEBU-M12G5-K-2.5-LE5 | |
| | | | 5 | 541331 | NEBU-M12G5-K-5-LE5 | |



Angle grippers DHWS

Accessories

FESTO

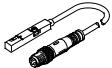
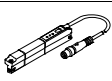
| Ordering data – Connecting cables | | | | Technical data → Internet: nebu | |
|---|------------------------------|------------------------------|------------------|---------------------------------|---------------------|
| | Electrical connection, left | Electrical connection, right | Cable length [m] | Part No. | Type |
| Connection between signal converter and controller | | | | | |
|  | Straight socket, M8x1, 4-pin | Cable, open end, 4-wire | 2.5 | 541342 | NEBU-M8G4-K-2.5-LE4 |
| | | | 5 | 541343 | NEBU-M8G4-K-5-LE4 |
|  | Angled socket, M8x1, 4-pin | Cable, open end, 4-wire | 2.5 | 541344 | NEBU-M8W4-K-2.5-LE4 |
| | | | 5 | 541345 | NEBU-M8W4-K-5-LE4 |

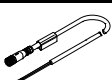
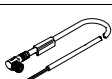
| Proximity sensor for size 16 ... 40 | | | | | |
|---|-----------------------------------|---|------------------|--------------------------------|---------------------------------|
| Ordering data – Proximity sensors for T-slot, magneto-resistive | | | | Technical data → Internet: smt | |
| | Type of mounting | Electrical connection, connection direction | Switching output | Cable length [m] | Part No. Type |
| N/O contact | | | | | |
|  | Insertable in the slot lengthwise | Cable, 3-wire, lateral | PNP | 2.5 | 547859 SMT-8G-PS-24V-E-2,5Q-OE |
| | | Plug M8x1, 3-pin, lateral | | 0.3 | 547860 SMT-8G-PS-24V-E-0,3Q-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 | 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 |

Position transmitter

The position transmitter continuously senses the position of the piston. It has an analogue output with an output signal in proportion to the piston position.

| Ordering data – Position transmitters for T-slot | | | | | | Technical data → Internet: position transmitter | | | |
|---|-----------|--------------------------|-----------------|----------|-------------------------------|---|------------------|----------|-----------------------------|
| | For size | Position measuring range | Analogue output | | Type of mounting | Electrical connection | Cable length [m] | Part No. | Type |
| | | | [V] | [mA] | | | | | |
|  | 16 ... 40 | 0 ... 40 | 0 ... 10 | – | Insertable in slot from above | Plug M8x1, 4-pin, in-line | 0.3 | 553744 | SMAT-8M-U-E-0,3-M8D |
|  | 32, 40 | 0 ... 50 | – | 4 ... 20 | Insertable in slot from above | Plug M8x1, 4-pin, in-line | 0.3 | 1531265 | SDAT-MHS-M50-1L-SA-E-0.3-M8 |

| Ordering data – Connecting cables | | | | Technical data → Internet: nebu | |
|---|------------------------------|------------------------------|------------------|---------------------------------|---------------------|
| | Electrical connection, left | Electrical connection, right | Cable length [m] | Part No. | Type |
|  | Straight socket, M8x1, 4-pin | Cable, open end, 4-wire | 2.5 | 541342 | NEBU-M8G4-K-2.5-LE4 |
| | | | 5 | 541343 | NEBU-M8G4-K-5-LE4 |
|  | Angled socket, M8x1, 4-pin | Cable, open end, 4-wire | 2.5 | 541344 | NEBU-M8W4-K-2.5-LE4 |
| | | | 5 | 541345 | NEBU-M8W4-K-5-LE4 |