

## Angle grippers DHWS

**FESTO**



# Angle grippers DHWS

Key features

## 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

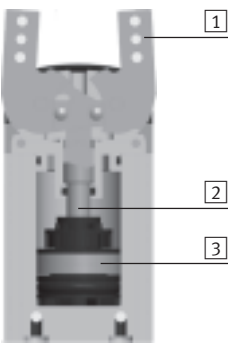
- Sensor technology:
  - Adaptable position sensor for the small gripper sizes
  - Integratable proximity sensors for the medium and large gripper sizes

### 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](http://www.festo.com)

## Position sensing/force control

### With position transmitter SMAT-8M



Infinite position sensing possible

- Analogue output 0 ... 10 V

### 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:

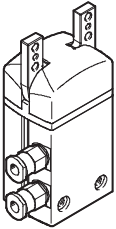
- Open
- Closed
- Workpiece gripped

# Angle grippers DHWS

Key features

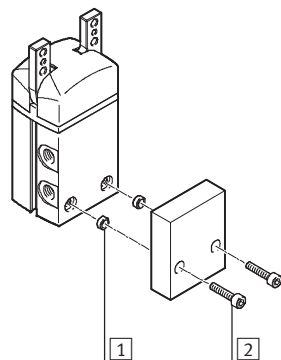
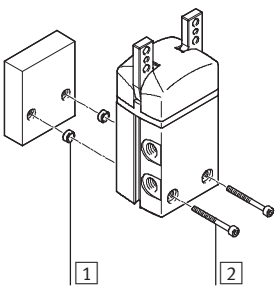
## Supply ports

At the side

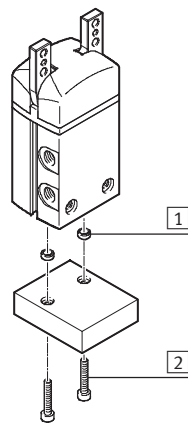


## Mounting options

At the side

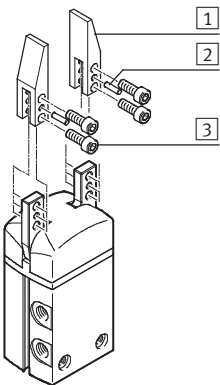


From underneath



- 1 Centring sleeves
- 2 Mounting screws

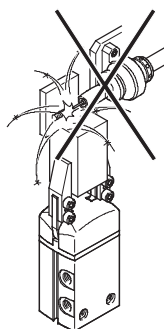
## Mounting options for external gripper fingers



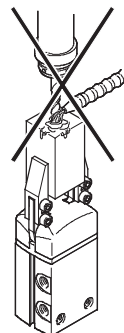
- 1 Gripper fingers
- 2 Centring pins
- 3 Mounting screws

### Note

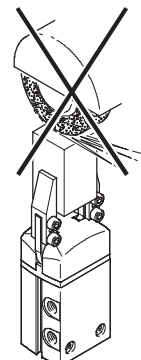
These grippers are not designed for the following or similar sample applications:



- Welding spatter



- Machining
- Aggressive media



- Grinding dust

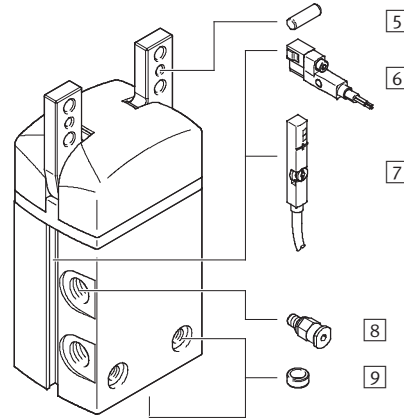
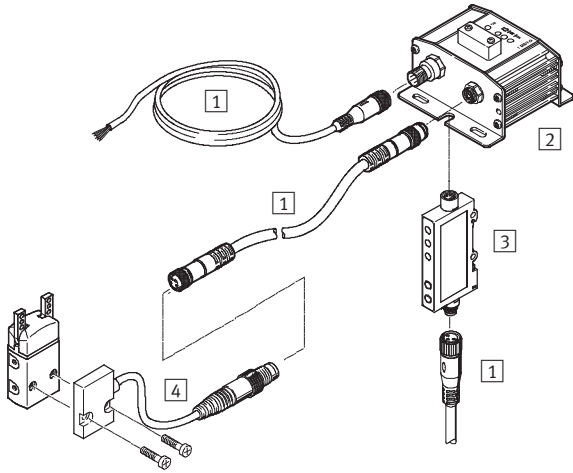
# Angle grippers DHWS

Peripherals overview

**Peripherals overview**

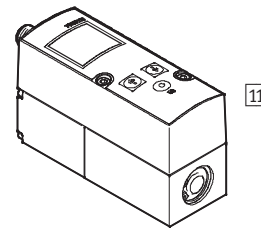
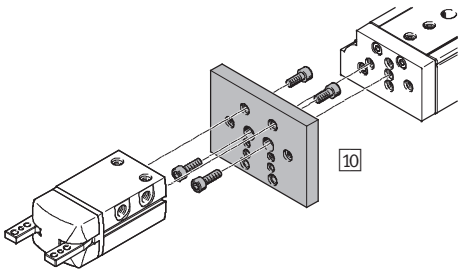
DHWS-10

DHWS-16 ... 40



**System product for handling and assembly technology**

**Proportional pressure regulator VPPM**



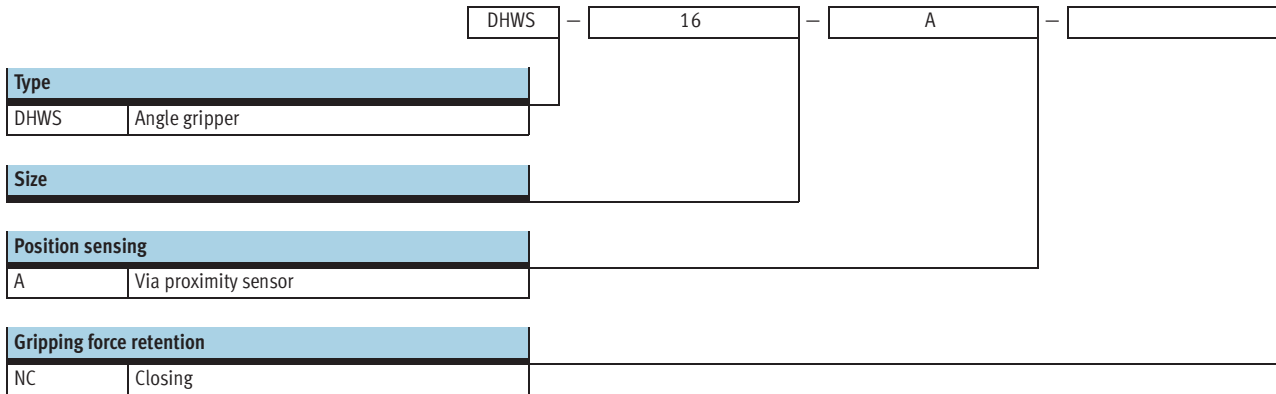
## Angle grippers DHWS

Peripherals overview

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

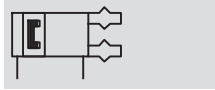
# Angle grippers DHWS

Type codes



# Angle grippers DHWS

Technical data

 Function  
 Double-acting  
 DHWS-...-A

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

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

[www.festo.com/en/](http://www.festo.com/en/)  
[Spare\\_parts\\_service](#)

General technical data		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	G <sup>1</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>8</sub>
Repetition accuracy <sup>1)</sup>	[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		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 <sup>1)</sup>	[°C]	+5 ... +60				
Corrosion resistance class CRC <sup>2)</sup>		1				

1) Note operating range of proximity sensors

2) Corrosion resistance class 1 according to Festo standard 940 070

Components subject to low corrosion stress. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

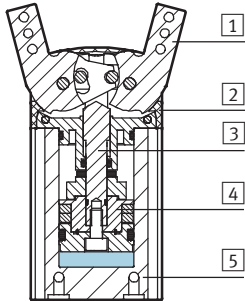
Weight [g]		10	16	25	32	40
DHWS-...-A		40	110	258	452	775
DHWS-...-A-NC		–	114	265	462	790

# Angle grippers DHWS

Technical data

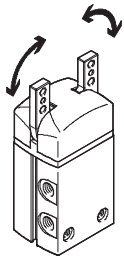
## Materials

Sectional view



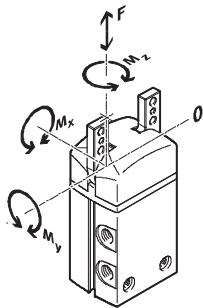
Angle gripper		
1	Gripper jaw	High-alloy stainless steel
2	Cover cap	Polyamide
3	Slotted guide plate	Tempered steel
4	Piston	Polyacetal
5	Housing	Hard anodised wrought aluminium alloy
-	Seals	Nitrile rubber
-	Note on materials	Free of copper and PTFE RoHS-compliant

## Total gripping torque [Ncm] at 6 bar



Size		10	16	25	32	40
DHWS-...-A	Opening	43	129	386	810	1,497
	Closing	30	114	356	746	1,362

## Static characteristic load values at the gripper jaws

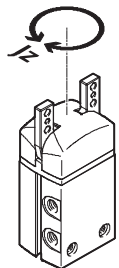


The indicated permissible forces and torques apply to a single gripper jaw. They include the lever arm, additional applied loads due to the workpiece or external gripper fingers and acceleration forces occurring during

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



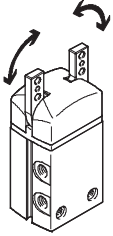
# Angle grippers DHWS

Technical data

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

Without external gripper fingers



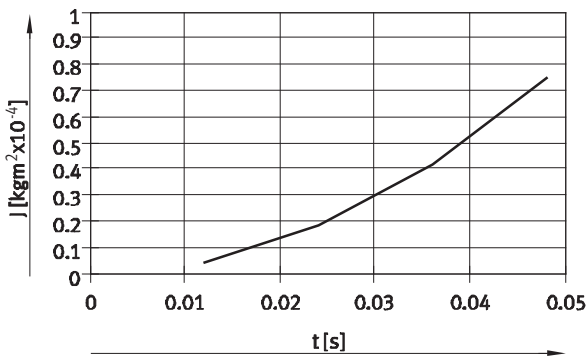
The indicated opening and closing times [ms] were measured at room temperature at an operating pressure of 6 bar with horizontally mounted grippers without additional gripper

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

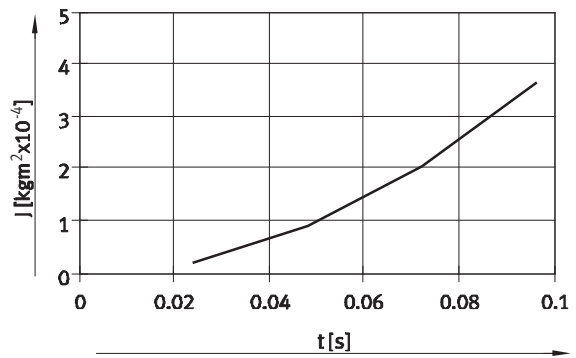
Size		10	16	25	32	40
Without external gripper fingers						
DHWS-...-A	Opening	10	44	64	46	63
	Closing	22	52	80	77	96
DHWS-...-A-NC	Opening	-	62	106	88	99
	Closing	-	36	59	55	69

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

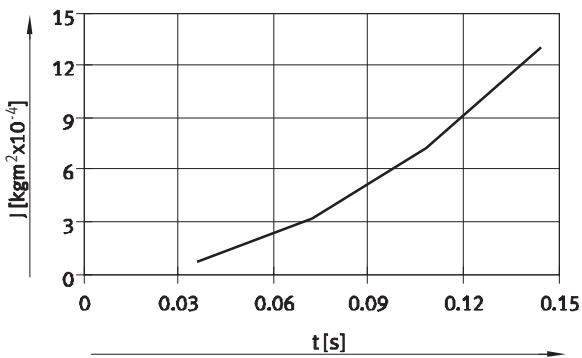
DHWS-10



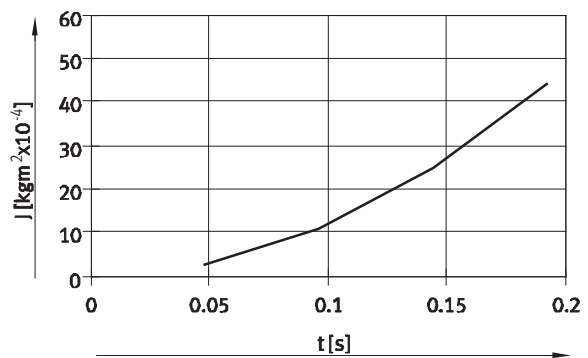
DHWS-16



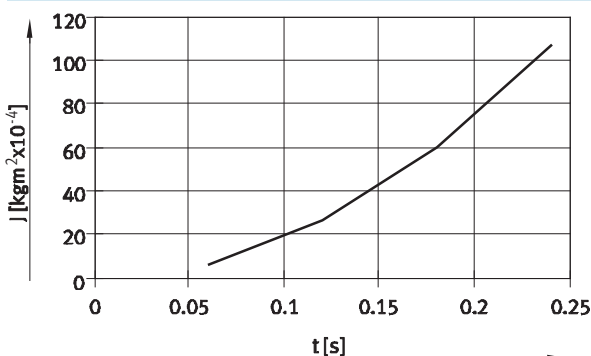
DHWS-25



DHWS-32



DHWS-40

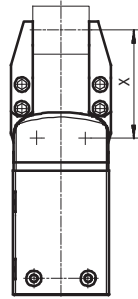


# Angle grippers DHWS

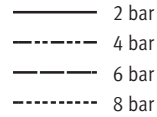
Technical data

## 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.

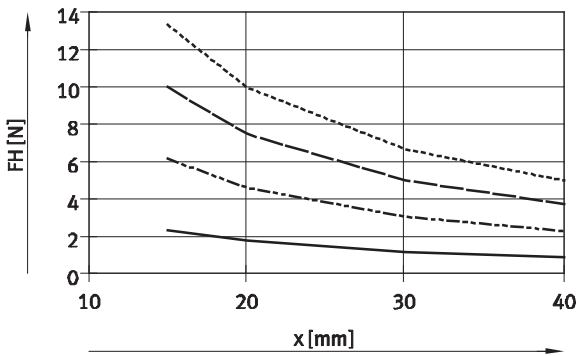


**Note**  
Gripper selection  
sizing software  
➔ [www.festo.com](http://www.festo.com)

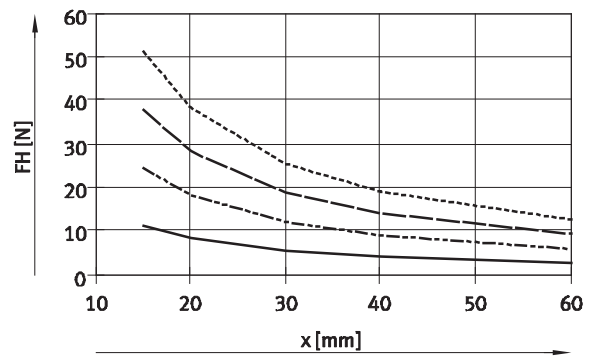


### External gripping (closing)

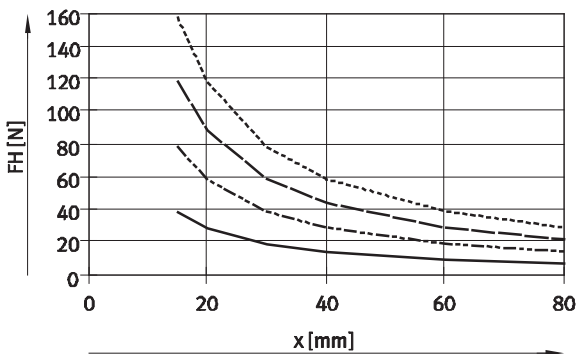
DHWS-10



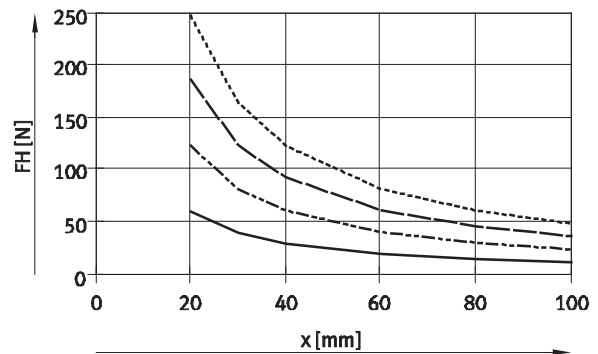
DHWS-16



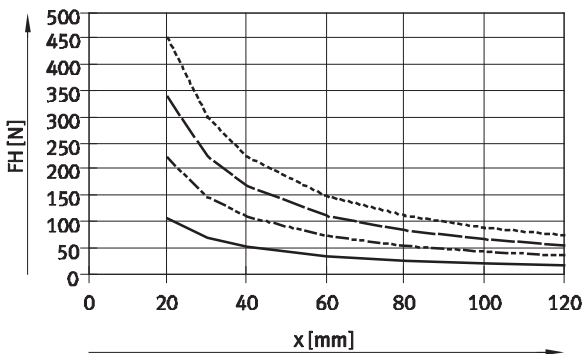
DHWS-25



DHWS-32



DHWS-40

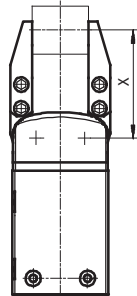


# Angle grippers DHWS

Technical data

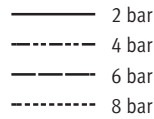
## Gripping force $F_H$ per gripper jaw as a function of operating pressure and lever arm $x$

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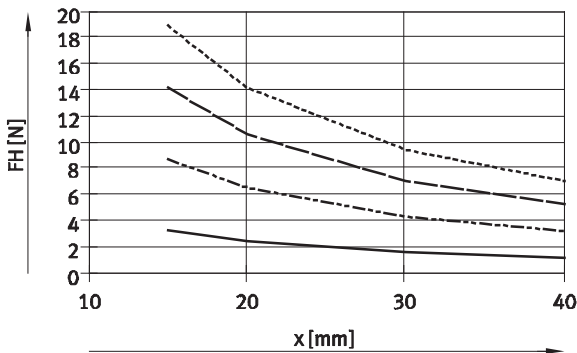
**Note**

Gripper selection sizing software  
 → [www.festo.com](http://www.festo.com)

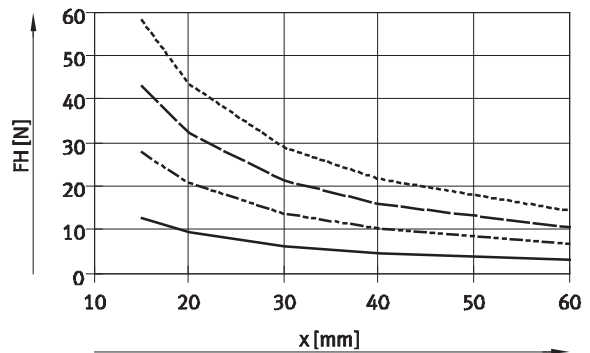


### Internal gripping (opening)

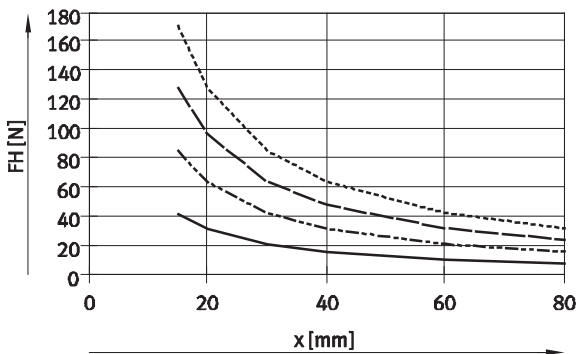
DHWS-10



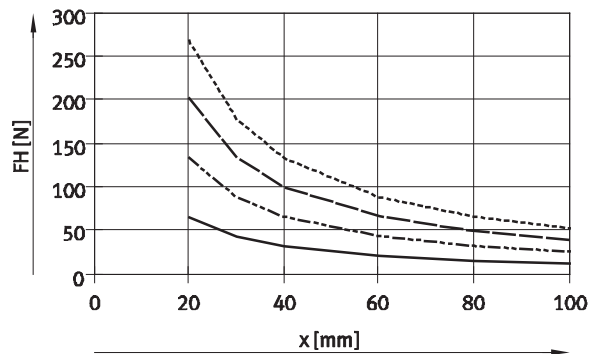
DHWS-16



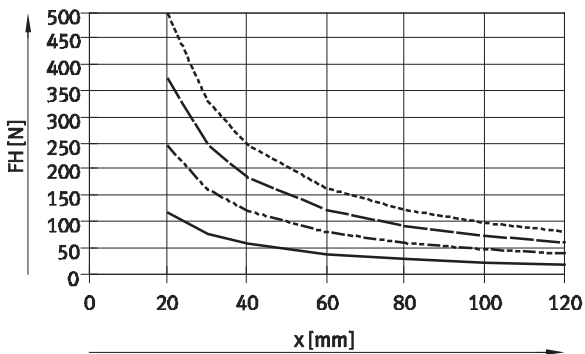
DHWS-25



DHWS-32



DHWS-40



# Angle grippers DHWS

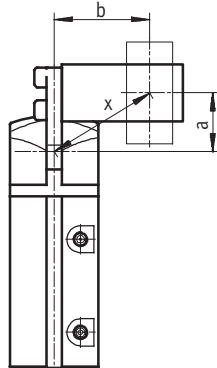
Technical data

## 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

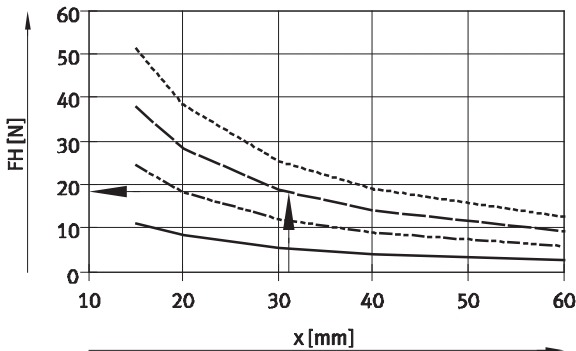
Procedure:

Calculating the lever arm  $x$

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

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

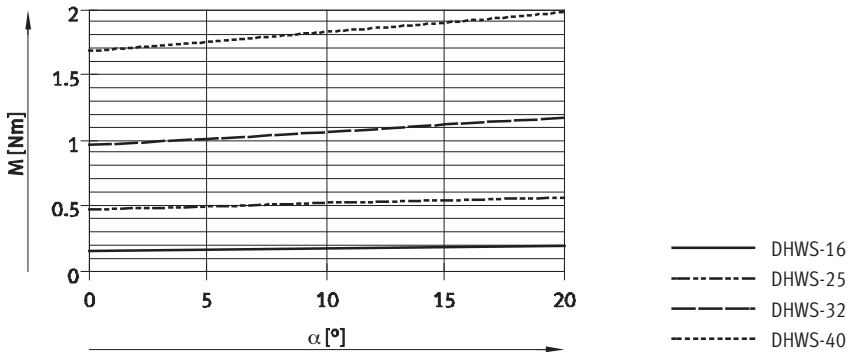
The graph (→ 10) gives a value of  $F_H = 18$  N for the gripping force.



# Angle grippers DHWS

Technical data

## Spring torque $M_F$ as a function of opening angle $\alpha$



## 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.

$$M_{Gr} = F_H \cdot x$$

$M_{Gr}$  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

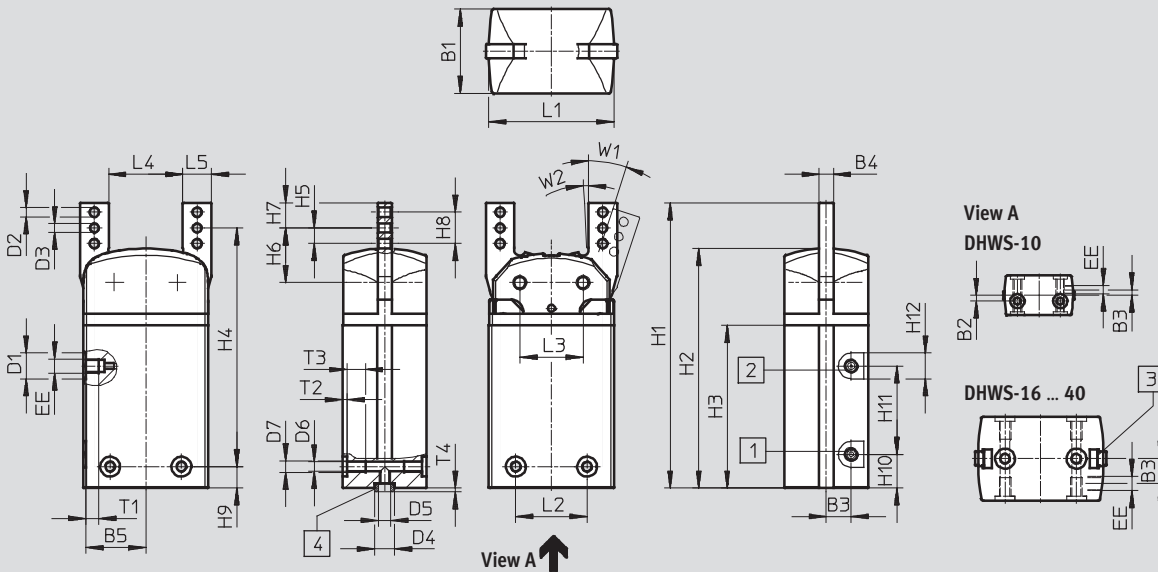
- Gripping with spring force:  
 $M_{Grtotal} = M_F$

# Angle grippers DHWS

Technical data

**Dimensions**

Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)



- 1 Supply port, opening
- 2 Supply port, closing
- 3 Slot for proximity sensor
- 4 Centring sleeves ZBH  
(2 included in the scope of delivery)

Size	B1	B2 <sup>1)</sup>	B3	B4	B5	D1	D2	D3	D4	D5
[mm]	±0.05			-0.03/-0.05		∅	∅ ±0.1	∅ H8	∅ H8/h7	∅
10	14	2	2	3	11.6	7	2.2	2	5	3.2
16	19	-	5.8	4	16	-	3.2	2.5	5	3.2
25	29.5	-	8.75	5	21	9	3.2	3	7	5.3
32	38	-	11	6	24	15	4.3	3	9	6.4
40	49	-	11	8	28.4	15	5.3	4	12	10.3

Size	D6	D7	EE	H1	H2	H3	H4	H5	H6
[mm]	+0.1						±0.2		±0.05
10	2.4	M3	M3	56.3	46	30.8	38.25	3.5	10.95
16	2.5	M3	M3	81	67	45.5	66	4.5	15.5
25	3.3	M4	M5	100	84	57	83.7	5.5	19.2
32	5.1	M6	G1/8	116	96.2	65	100.5	6.5	22.5
40	6.4	M8	G1/8	129	108.4	71.5	99.5	7	24.5

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

## Angle grippers DHWS

Technical data

Size [mm]	H7	H8	H9 <sup>2)</sup>	H10	H11	H12	L1 ±0.05	L2 <sup>1)</sup>	L3 ±0.02
10	5.75	7	12.3	8.8	16	7	24	15	12.4
16	7.5	9	7.5	12.25	23	7	34	16	17
25	8.8	11	7.5	11.8	31	9	44	25	22.2
32	11	13	11	20	25	15	53	29	25.8
40	12	14	17.5	9	46	15	59	33	30

Size [mm]	L4	L5 -0.02/ -0.05	T1 +0.5	T2 +0.1	T3 +1	T4 -0.2	W1 +3°/-1°	W2 ±1°
10	14	5.5	3.5	1.2	through	1.2	18	3
16	18	8	4.5	1.2	5.8	1.2	18	3
25	26	10	4.5	1.6	6.4	1.4	18	3
32	29	12	7.5	2.1	12.9	1.9	18	3
40	32	15	6	2.6	13.4	2.4	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	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



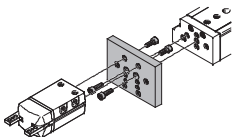
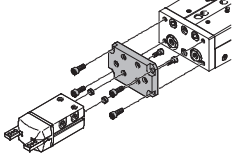
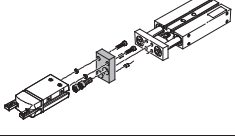
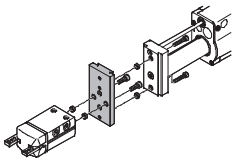
Accessories

**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 → <a href="http://www.festo.com/us/cad">www.festo.com/us/cad</a>	
Combination	Drive Size	Gripper Size	Mounting option		Adapter kit	
					CRC <sup>1)</sup>	Part No. Type
<b>DGSL/DHWS</b>	DGSL	DHWS			HMSV	
	8, 10	10	■	■	2	548784 HMSV-54
	12, 16	16	■	■		548785 HMSV-55
	20, 25	25, 32	■	■		548786 HMSV-56
<b>SLT/DHWS</b>	SLT	DHWS			HAPS	
	10	10	■	–	2	178448 HAPS-2
	16	16	■	–		178449 HAPS-3
	20	25	■	–		178450 HAPS-4
	25	32	■	–		178451 HAPS-5
<b>DPZ/DHWS</b>	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
<b>HMP/DHWS</b>	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 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.



# Angle grippers DHWS



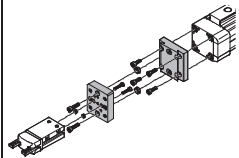
Accessories

**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 → <a href="http://www.festo.com/us/cad">www.festo.com/us/cad</a>		
Combination	Drive Size	Gripper Size	Mounting option		Adapter kit CRC <sup>1)</sup>	Part No.	Type
							
DGP..., DGE..., DGEA/DHWS	DG...	DHWS			HMVA, HAPG, HMSV		
	<b>Direct mounting</b>						
	18 <sup>2)</sup> , 25 <sup>3)</sup>	10	<input type="checkbox"/>	<input type="checkbox"/>	2	196788	HMVA-DLA18/25
			<input type="checkbox"/>	<input type="checkbox"/>		192706	HAPG-37-S1
	40 <sup>3)</sup>	10	<input type="checkbox"/>	<input type="checkbox"/>		196790	HMVA-DLA40
			<input type="checkbox"/>	<input type="checkbox"/>		192706	HAPG-37-S1
	18 <sup>2)</sup> , 25 <sup>3)</sup>	16	<input type="checkbox"/>	<input type="checkbox"/>		196788	HMVA-DLA18/25
			<input type="checkbox"/>	<input type="checkbox"/>		192705	HAPG-36-S1
	40 <sup>3)</sup>	16	<input type="checkbox"/>	<input type="checkbox"/>		196790	HMVA-DLA40
			<input type="checkbox"/>	<input type="checkbox"/>		192705	HAPG-36-S1
	18 <sup>2)</sup> , 25 <sup>3)</sup>	25	<input type="checkbox"/>	<input type="checkbox"/>		196788	HMVA-DLA18/25
			<input type="checkbox"/>	<input type="checkbox"/>		193922	HAPG-37-S4
	40 <sup>3)</sup>	25	<input type="checkbox"/>	<input type="checkbox"/>		196790	HMVA-DLA40
			<input type="checkbox"/>	<input type="checkbox"/>		193922	HAPG-37-S4
	<b>Dovetail mounting</b>						
18 <sup>2)</sup> , 25	16	<input type="checkbox"/>	<input type="checkbox"/>	2		196788	HMVA-DLA18/25
		<input type="checkbox"/>	<input type="checkbox"/>		177767	HMSV-27	
40	16	<input type="checkbox"/>	<input type="checkbox"/>		196790	HMVA-DLA40	
		<input type="checkbox"/>	<input type="checkbox"/>		177767	HMSV-27	
18 <sup>2)</sup> , 25	25	<input type="checkbox"/>	<input type="checkbox"/>		196788	HMVA-DLA18/25	
		<input type="checkbox"/>	<input type="checkbox"/>		177768	HMSV-28	
40	25	<input type="checkbox"/>	<input type="checkbox"/>		196790	HMVA-DLA40	
		<input type="checkbox"/>	<input type="checkbox"/>		177768	HMSV-28	
40	32	<input type="checkbox"/>	<input type="checkbox"/>		196790	HMVA-DLA40	
		<input type="checkbox"/>	<input type="checkbox"/>		177769	HMSV-29	
40	40	<input type="checkbox"/>	<input type="checkbox"/>		196790	HMVA-DLA40	
		<input type="checkbox"/>	<input type="checkbox"/>		177770	HMSV-30	

- 1) 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.
- 2) Only for DGEA...
- 3) Only for DGE.../DGP...

# Angle grippers DHWS



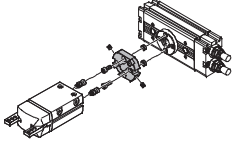
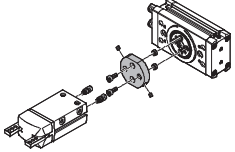
Accessories

**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 → <a href="http://www.festo.com/us/cad">www.festo.com/us/cad</a>			
Combination	Drive	Gripper	Mounting option		Adapter kit			
					CRC <sup>1)</sup>	Part No.	Type	
<b>DRQD/DHWS</b>	<b>DRQD-...-FW</b>	<b>DHWS</b>			<b>HAPG</b>			
	6, 8, 12	10	■	■	2	187568	HAPG-34	
	16 <sup>2)</sup>	10	■	■		187566	HAPG-SD2-12	
	16 <sup>2)</sup>	16	■	■		184477	HAPG-SD2-1	
	16 <sup>2)</sup>	25	■	■		184478	HAPG-SD2-2	
	20 <sup>2)</sup>	25	■	■		184479	HAPG-SD2-3	
	20 <sup>2)</sup>	32	■	■		184480	HAPG-SD2-4	
	25 <sup>3)</sup>	25	■	■		184482	HAPG-SD2-6	
	25 <sup>3)</sup>	32	■	■		184483	HAPG-SD2-7	
	32 <sup>3)</sup>	32	■	■		184485	HAPG-SD2-9	
	32 <sup>3)</sup>	40	■	■		184486	HAPG-SD2-10	
	40, 50	40	■	■		526027	HAPG-SD2-21	
	<b>DRQD-...ZW</b>	<b>DHWS</b>				<b>HAPG</b>		
	16	16	■	■		2	163267	HAPG-18
	16	25	■	■			163268	HAPG-19
20	25	■	■	163269	HAPG-20			
20	32	■	■	163270	HAPG-21			
25	32	■	■	163271	HAPG-22			
<b>DRRD/DHWS</b>	<b>DRRD</b>	<b>DHWS</b>			<b>DHAA</b>			
	16	16	■	■	2	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 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.
- 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).



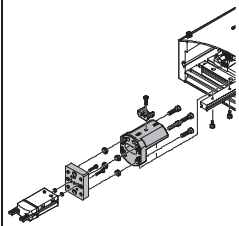
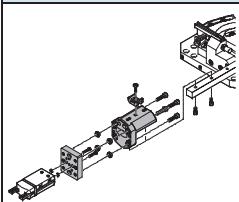
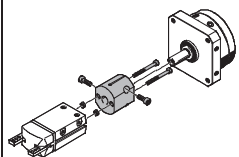
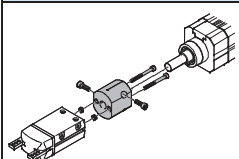
# Angle grippers DHWS

Accessories

**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 → <a href="http://www.festo.com/us/cad">www.festo.com/us/cad</a>	
Combination	Drive	Gripper	Mounting option		Adapter kit	
			Size	Size	CRC <sup>1)</sup>	Part No. Type
						
	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			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-...-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			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 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.

# Angle grippers DHWS



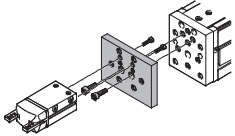
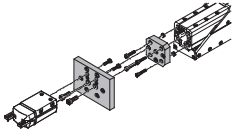
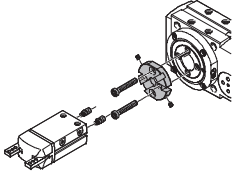
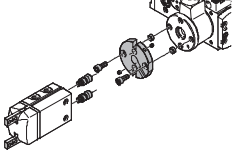
Accessories

**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 → <a href="http://www.festo.com/us/cad">www.festo.com/us/cad</a>		
Combination	Drive	Gripper	Mounting option		Adapter kit		
					CRC <sup>1)</sup>	Part No.	Type
<b>EGSL/DHWS</b>	<b>EGSL</b>	<b>DHWS</b>			<b>HMSV</b>		
	35	10	■	■	2	548784	HMSV-54
	45, 55	16	■	■		1088262	HMSV-70
	75	25, 32	■	■		548785	HMSV-55
			■	■		548786	HMSV-56
<b>EGSA/DHWS</b>	<b>EGSA</b>	<b>DHWS</b>			<b>HMSV</b>		
	50	16	■	■	2	560017	HMSV-61
	60	16	■	■		548785	HMSV-55
	60	25, 32	■	■		560019	HMSV-63
■			■	177666	HMSV-20		
			■	■	560018	HMSV-62	
			■	■	548786	HMSV-56	
<b>ERMB/DHWS</b>	<b>ERMB</b>	<b>DHWS</b>			<b>HAPG</b>		
	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
<b>EHMB/DHWS</b>	<b>EHMB</b>	<b>DHWS</b>			<b>HAPG</b>		
	20	32	■	■	2	184485	HAPG-SD2-9
	20	40	■	■		184486	HAPG-SD2-10
	25, 32	40	■	■		526027	HAPG-SD2-21

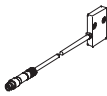
1) Corrosion resistance class 2 according to Festo standard 940 070  
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

# Angle grippers DHWS

Accessories

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

1) Packaging unit



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



### 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	<b>544216 SVE4-HS-R-HM8-2P-M8</b>
				2x NPN		<b>544219 SVE4-HS-R-HM8-2N-M8</b>
Evaluation unit SMH-AE1						
Technical data → Internet: smh-ae						
	10	Socket M8x1, 4-pin	Plug M12x1, 5-pin	3x PNP	170	<b>175708 SMH-AE1-PS3-M12</b>
				3x NPN		<b>175709 SMH-AE1-NS3-M12</b>


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

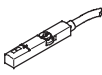
## Angle grippers DHWS

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



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 – Position transmitters for T-slot				Technical data → Internet: smat	
	Type of mounting	Electrical connection, connection direction	Analogue output [V]	Cable length [m]	Part No. Type
	Insertable in the slot from above	Plug M8x1, 3-pin, in-line	0 ... 10	0.3	553744 SMAT-8M-U-E-0,3-M8D

### Note

#### Mode of operation:

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 – 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

# Product Range and Company Overview

## A Complete Suite of Automation Services

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



**Custom Automation Components**  
Complete custom engineered solutions



**Custom Control Cabinets**  
Comprehensive engineering support and on-site services



**Complete Systems**  
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With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.



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Electromechanical actuators, motors, controllers & drives



**Pneumatics**  
Pneumatic linear and rotary actuators, valves, and air supply



**PLCs and I/O Devices**  
PLC's, operator interfaces, sensors and I/O devices

## Supporting Advanced Automation... As No One Else Can!

Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 12,000 employees in 56 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

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Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.



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