

Angle grippers DHWS

FESTO



Angle grippers DHWS

Key features

At a glance

General information

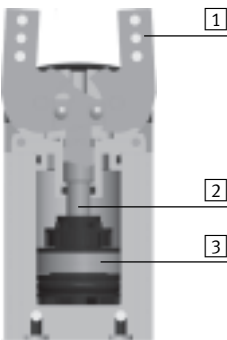
- Improved gripper jaw guide
- Slotted guide system
- Max. repetition accuracy
- Gripping force retention
- Internal fixed flow control
- Wide range of options for mounting on drive units

Flexible range of applications

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



- 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



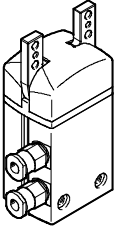
- Multiple positions can be sensed:
- Open
 - Closed
 - Workpiece gripped

Angle grippers DHWS

Key features

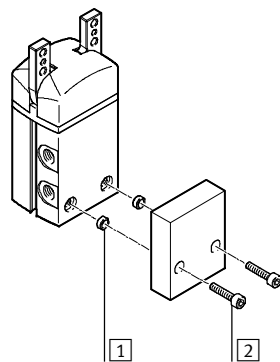
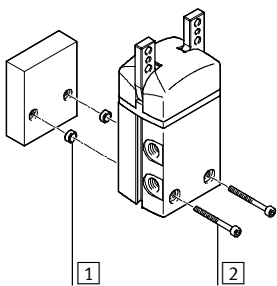
Supply ports

At the side

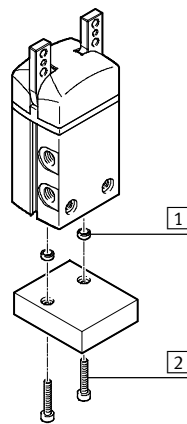


Mounting options

At the side

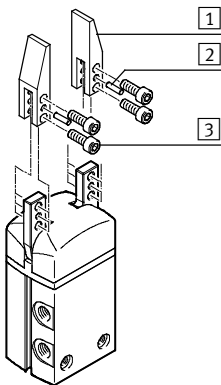


From underneath



- 1 Centring sleeves
- 2 Mounting screws

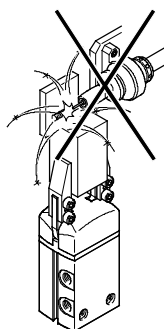
Mounting options for external gripper fingers



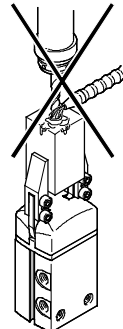
- 1 Gripper fingers
- 2 Centring pins
- 3 Mounting screws

 Note

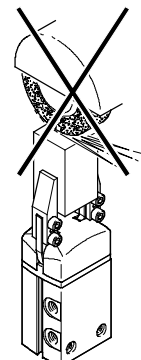
These grippers are not designed for the following or similar sample applications:



- Welding spatter



- Machining
- Aggressive media



- Grinding dust

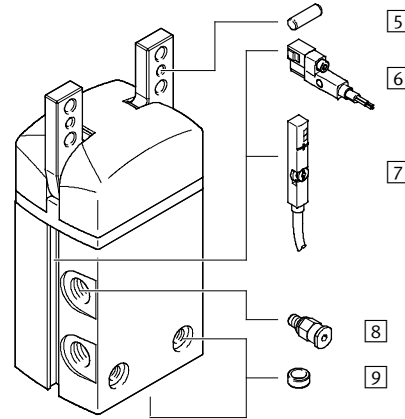
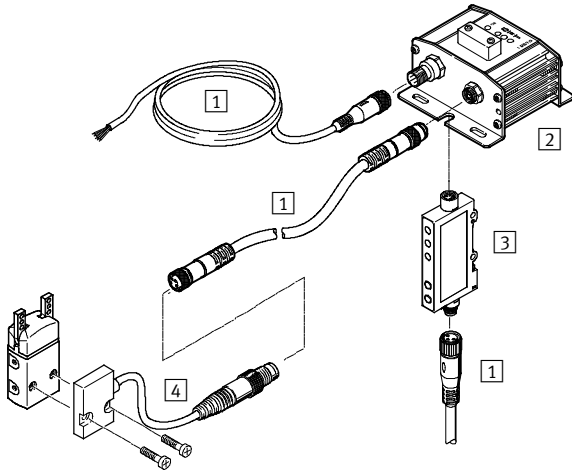
Angle grippers DHWS

Peripherals overview

Peripherals overview

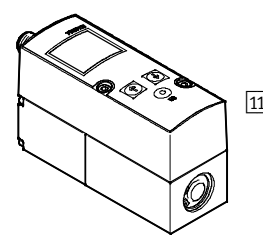
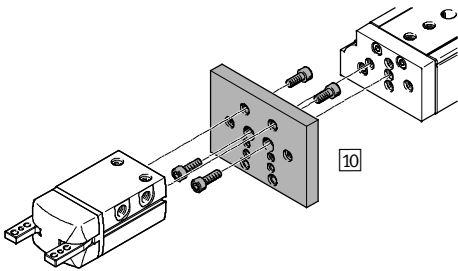
DHWS-10

DHWS-16 ... 40



System product for handling and assembly technology

Proportional pressure regulator VPPM



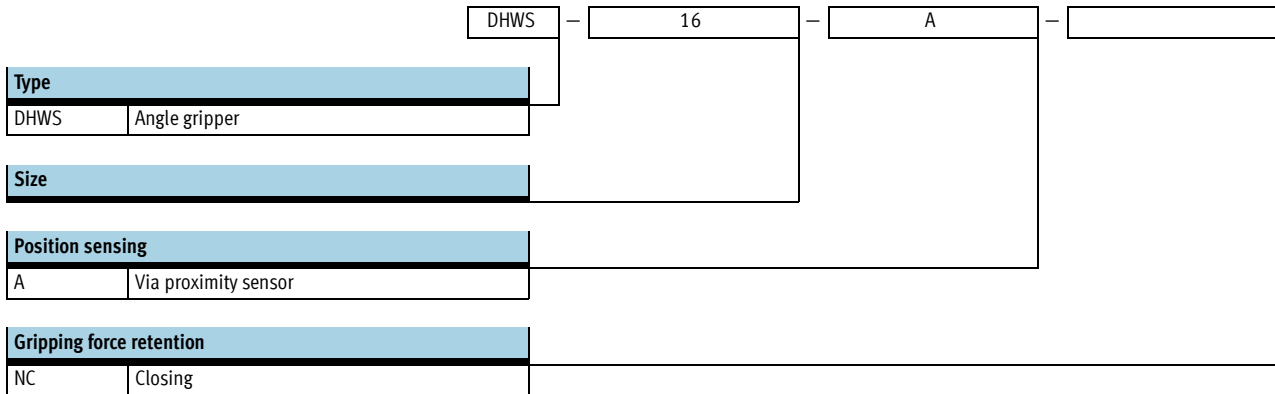
Angle grippers DHWS

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"> For evaluating signals for position sensor SMH-S1 For size 10 	21
3	Signal converter SVE4	<ul style="list-style-type: none"> For evaluating signals for position sensor SMH-S1 For size 10 	21
4	Position sensor SMH-S1	<ul style="list-style-type: none"> Adaptable and integratable sensor technology, for sensing the piston position For size 10 	21
5	Centring pin	For centring the gripper fingers on the gripper jaws	–
6	Proximity sensor SMT-8G	<ul style="list-style-type: none"> For sensing the piston position Proximity sensor does not project past the housing at the bottom For size 16 ... 40 	22
7	Position transmitter SMAT-8M	<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 For size 16 ... 40 	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"> For centring the gripper during mounting The scope of delivery of the gripper includes 2 centring sleeves 	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

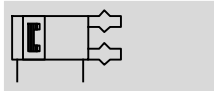
Angle grippers DHWS

Type codes



Angle grippers DHWS

Technical data

 Function
 Double-acting
 DHWS-...-A


-  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 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.

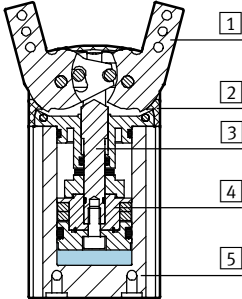
Weight [g]					
Size	10	16	25	32	40
DHWS-...-A	40	110	258	452	775
DHWS-...-A-NC	–	114	265	462	790

Angle grippers DHWS

Technical data

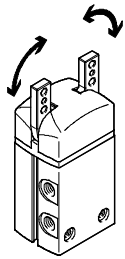
Materials

Sectional view



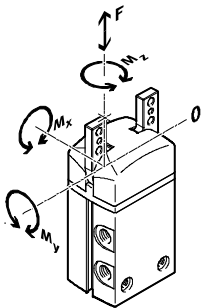
Angle gripper		
1	Gripper jaw	High-alloy stainless steel
2	Cover cap	Polyamide
3	Slotted guide plate	Tempered steel
4	Piston	Polyacetal
5	Housing	Hard anodised wrought aluminium alloy
-	Seals	Nitrile rubber
-	Note on materials	Free of copper and PTFE RoHS-compliant

Total gripping torque [Ncm] at 6 bar



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

Static characteristic load values at the gripper jaws



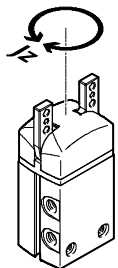
The indicated permissible forces and torques apply to a single gripper jaw. They include the lever arm, additional applied loads due to the workpiece or external gripper fingers and

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.

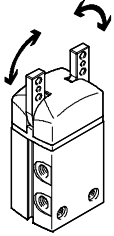
Size		10	16	25	32	40
DHWS-...-A		0.03	0.14	0.62	1.60	3.81
DHWS-...-A-NC		-	0.15	0.64	1.63	3.87

Angle grippers DHWS

Technical data

Opening and closing times [ms] at 6 bar

Without external gripper fingers



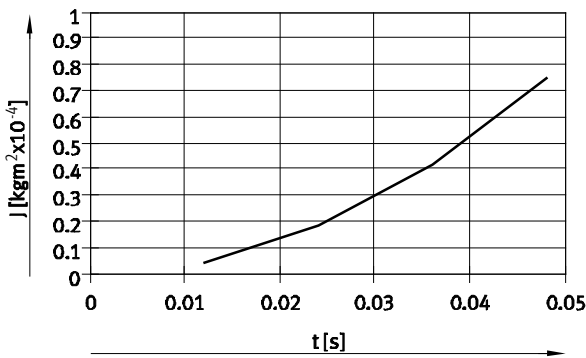
The indicated opening and closing times [ms] were measured at room temperature at an operating pressure of 6 bar with horizontally mounted grippers without additional gripper

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

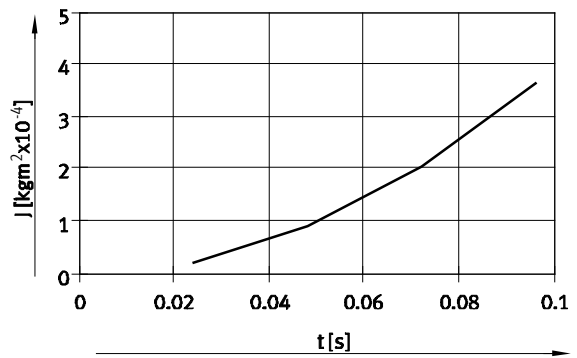
Size		10	16	25	32	40
Without external gripper fingers						
DHWS-...-A	Opening	10	44	64	46	63
	Closing	22	52	80	77	96
DHWS-...-A-NC	Opening	-	62	106	88	99
	Closing	-	36	59	55	69

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

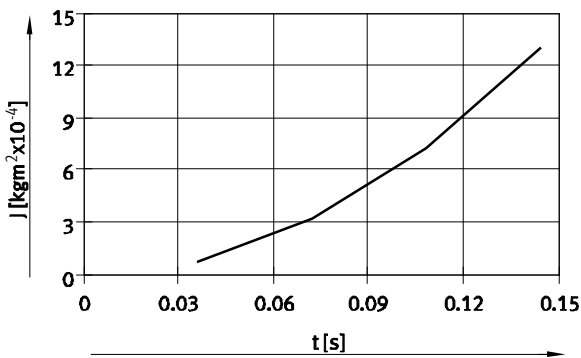
DHWS-10



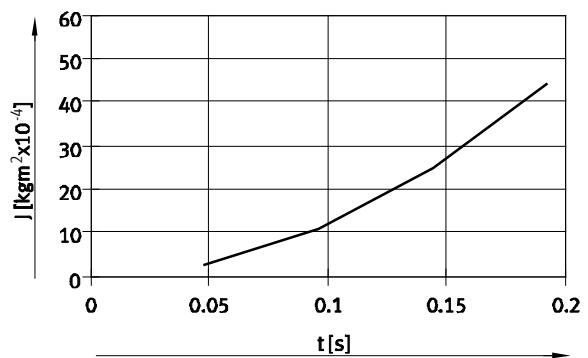
DHWS-16



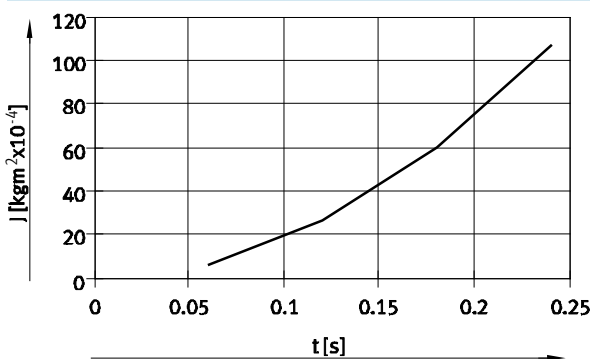
DHWS-25



DHWS-32



DHWS-40

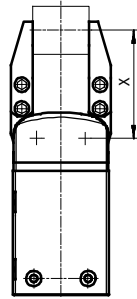


Angle grippers DHWS

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.

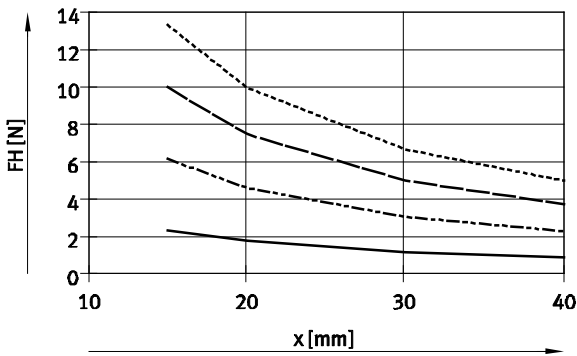


 **Note**
 Gripper selection
 sizing software
 → www.festo.com

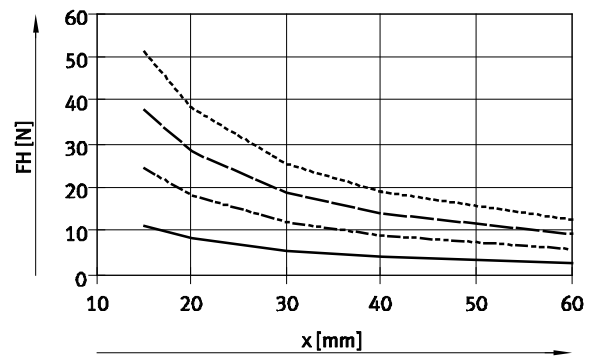
- 2 bar
- - - 4 bar
- · - 6 bar
- · - · 8 bar

External gripping (closing)

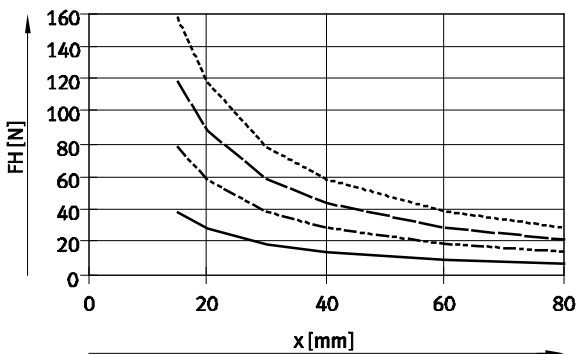
DHWS-10



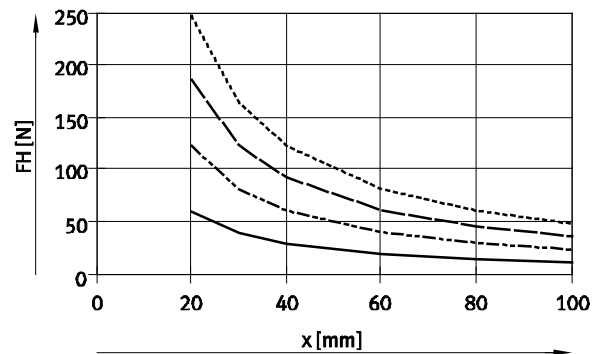
DHWS-16



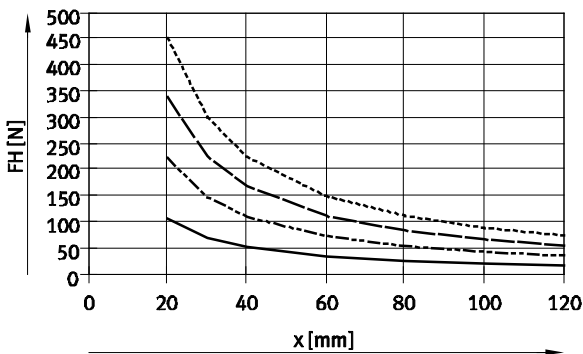
DHWS-25



DHWS-32



DHWS-40

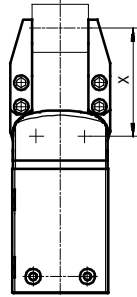


Angle grippers DHWS

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.

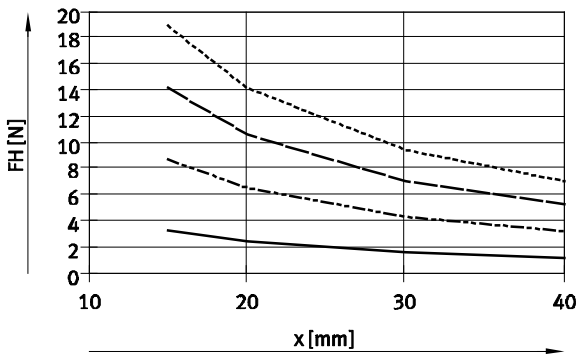


 Note
Gripper selection
sizing software
→ www.festo.com

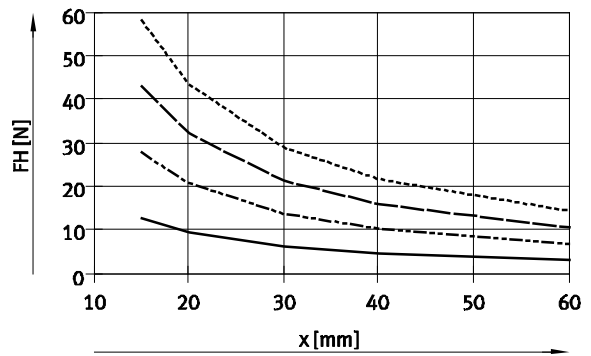
- 2 bar
- - - 4 bar
- · - 6 bar
- · - · 8 bar

Internal gripping (opening)

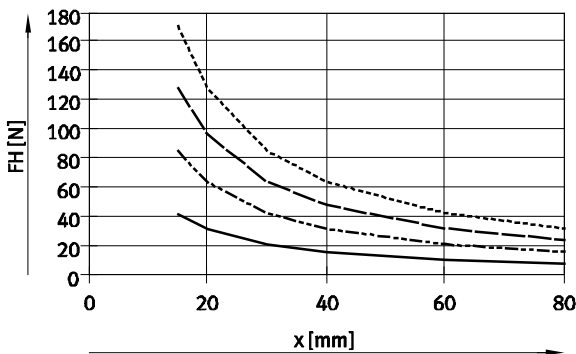
DHWS-10



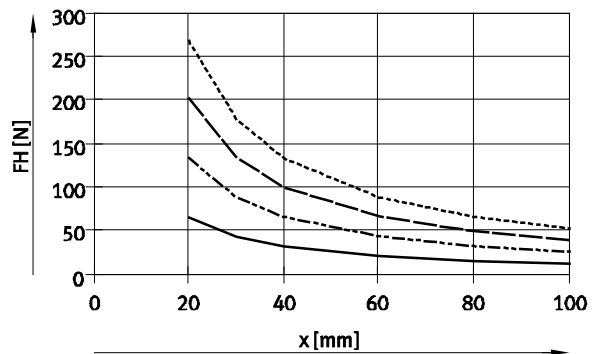
DHWS-16



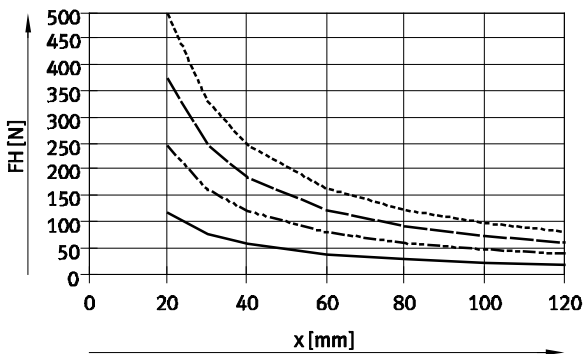
DHWS-25



DHWS-32



DHWS-40



Angle grippers DHWS

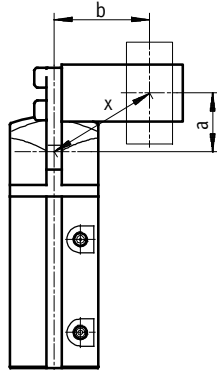
Technical data

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

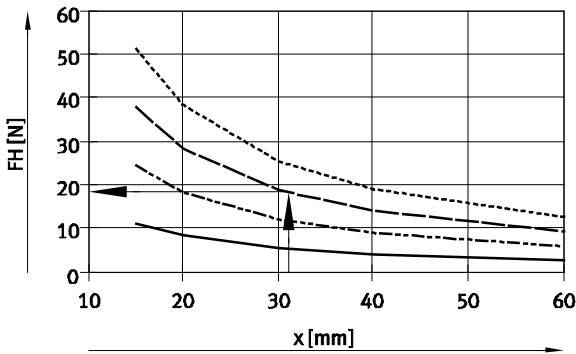
Procedure:

Calculating the lever arm x

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

$$x = 32$$
 mm

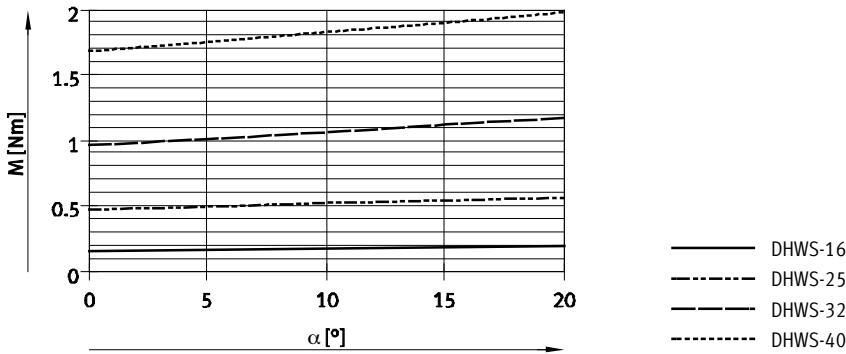
The graph (→ 10) gives a value of $F_H = 18$ N for the gripping force.



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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Size [mm]	H7	H8	H9 ²⁾	H10	H11	H12	L1 ±0.05	L2 ¹⁾	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
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



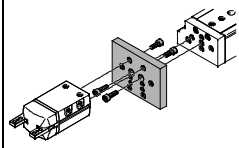
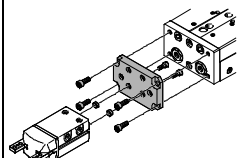
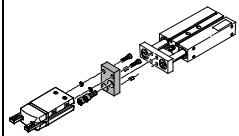
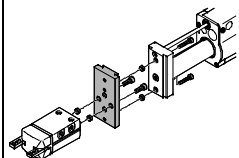
Angle grippers DHWS

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 → www.festo.com	
Combination	Drive Size	Gripper Size	Mounting option		Adapter kit			
					CRC ¹⁾	Part No.	Type	
DGSL/DHWS	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	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	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	HMP	DHWS			HMSV			
	Direct mounting							
	16, 20	16	■	■	2	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							
	16, 20	16	■	■	2	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.



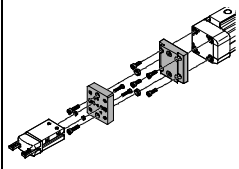
Angle grippers DHWS

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 → 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	■	■	2	196788 HMVA-DLA18/25 192706 HAPG-37-S1	
	40 ³⁾	10	■	■		196790 HMVA-DLA40 192706 HAPG-37-S1	
	18 ²⁾ , 25 ³⁾	16	■	■		196788 HMVA-DLA18/25 192705 HAPG-36-S1	
	40 ³⁾	16	■	■		196790 HMVA-DLA40 192705 HAPG-36-S1	
	18 ²⁾ , 25 ³⁾	25	■	■		196788 HMVA-DLA18/25 193922 HAPG-37-S4	
	40 ³⁾	25	■	■		196790 HMVA-DLA40 193922 HAPG-37-S4	
	Dovetail mounting						
	18 ²⁾ , 25	16	■	■		2	196788 HMVA-DLA18/25 177767 HMSV-27
	40	16	■	■			196790 HMVA-DLA40 177767 HMSV-27
	18 ²⁾ , 25	25	■	■			196788 HMVA-DLA18/25 177768 HMSV-28
	40	25	■	■			196790 HMVA-DLA40 177768 HMSV-28
	40	32	■	■			196790 HMVA-DLA40 177769 HMSV-29
	40	40	■	■			196790 HMVA-DLA40 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...

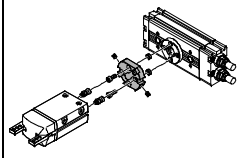
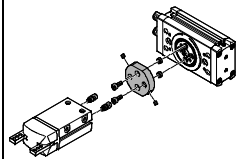
Angle grippers DHWS

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 → www.festo.com		
Combination	Drive	Gripper	Mounting option		Adapter kit		
			Size	Size	CRC ¹⁾	Part No.	Type
	DRQD-...-FW	DHWS			HAPG		
	6, 8, 12	10	■	■	2	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			HAPG		
	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	
		DRRD	DHWS			DHAA	
		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).

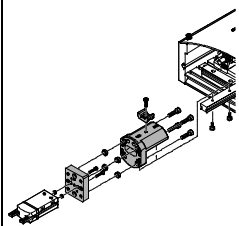
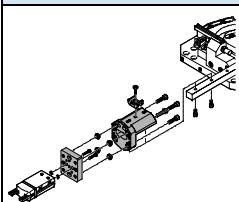
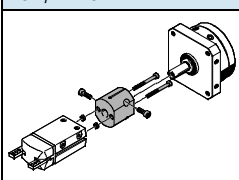
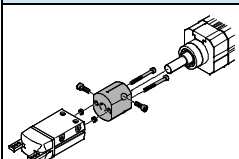
Angle grippers DHWS

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 → www.festo.com	
Combination	Drive	Gripper	Mounting option		Adapter kit		
			Size	Size	CRC ¹⁾	Part No.	Type
	HSP	DHWS			HAPG		
	12	10	■	–	2	192709	HAPG-60-S1
	16	10	■	–		540881	HAPG-70-B
	16	16	■	–		192706	HAPG-37-S1
	25	16	■	–		540882	HAPG-71-B
	25	25	■	–		192705	HAPG-36-S1
						540882	HAPG-71-B
						192705	HAPG-36-S1
						540883	HAPG-72-B
						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.



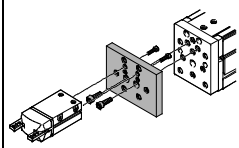
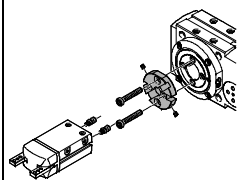
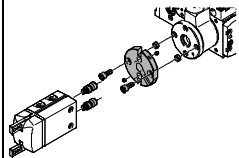
Angle grippers DHWS

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 → 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	

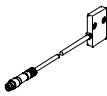
1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Angle grippers DHWS

Accessories

Ordering data						
	For size [mm]	Description	Weight [g]	Part No.	Type	PU 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

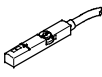
Ordering data – Connecting cables					Technical data → Internet: nebu
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
Connection between position sensor and signal converter/evaluation unit					
	Straight socket, M8x1, 4-pin	Straight plug, M8x1, 4-pin	2.5	554035	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



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