Angle grippers DHWS

Angle grippers DHWS

Key features

At a glance

General information

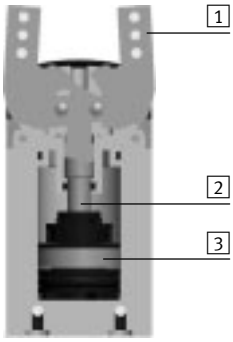
- Improved gripper jaw guide
- Slotted guide system
- Max. repetition accuracy
- Gripping force retention
- Internal fixed flow control
- Wide range of options for mounting on drive units
- Sensor technology:
  - Adaptable position sensor for the small gripper sizes
  - Integratable proximity sensors for the medium and large gripper sizes

Flexible range of applications

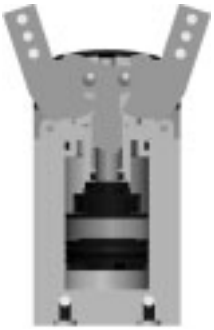
- Can be used as a double-acting and single-acting gripper
- Compression spring for supplementary or retaining gripping forces
- Suitable for external and internal gripping

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

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:

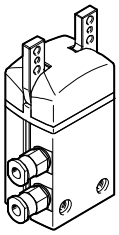
- Open
- Closed
- Workpiece gripped

Angle grippers DHWS

Key features

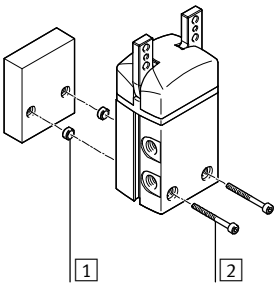
Supply ports

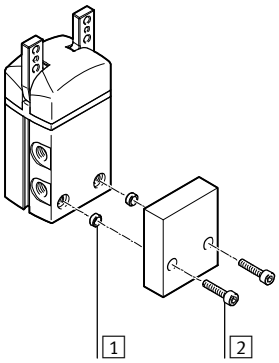
At the side



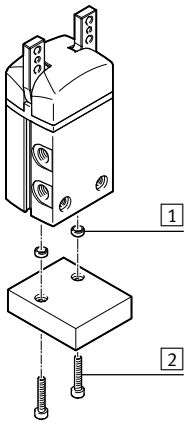
Mounting options

At the side



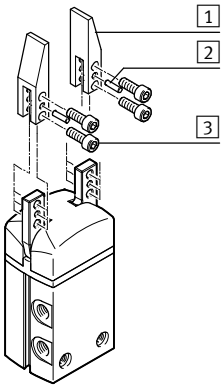


From underneath



1 Centring sleeves
2 Mounting screws

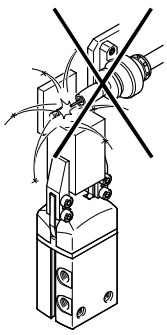
Mounting options for external gripper fingers



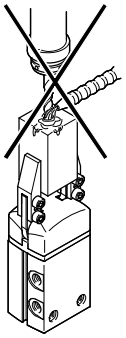
1 Gripper fingers
2 Centring pins
3 Mounting screws

Note

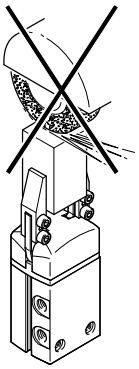
These grippers are not designed for the following or similar sample applications:



- Welding spatter



- Machining
- Aggressive media



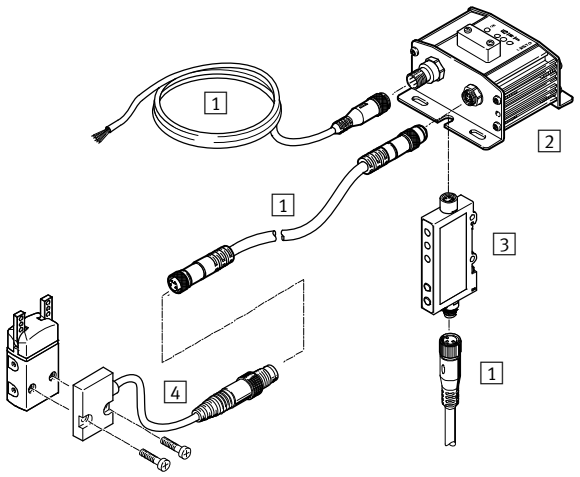
- Grinding dust

Angle grippers DHWS

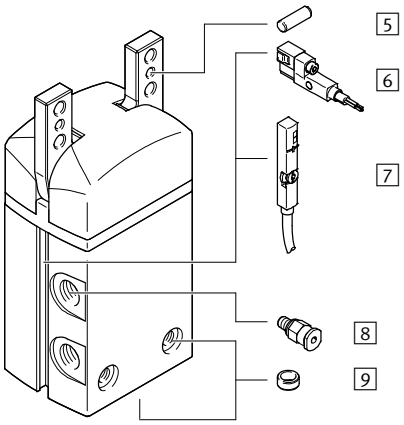
Peripherals overview

Peripherals overview

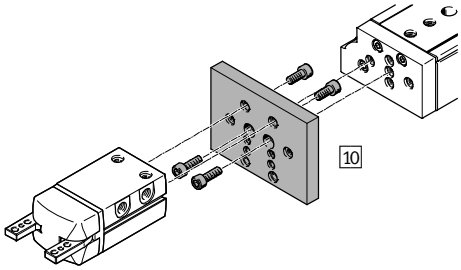
DHWS-10



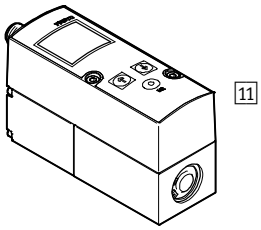
DHWS-16 ... 40



System product for handling and assembly technology



Proportional pressure regulator VPPM



Angle grippers DHWS

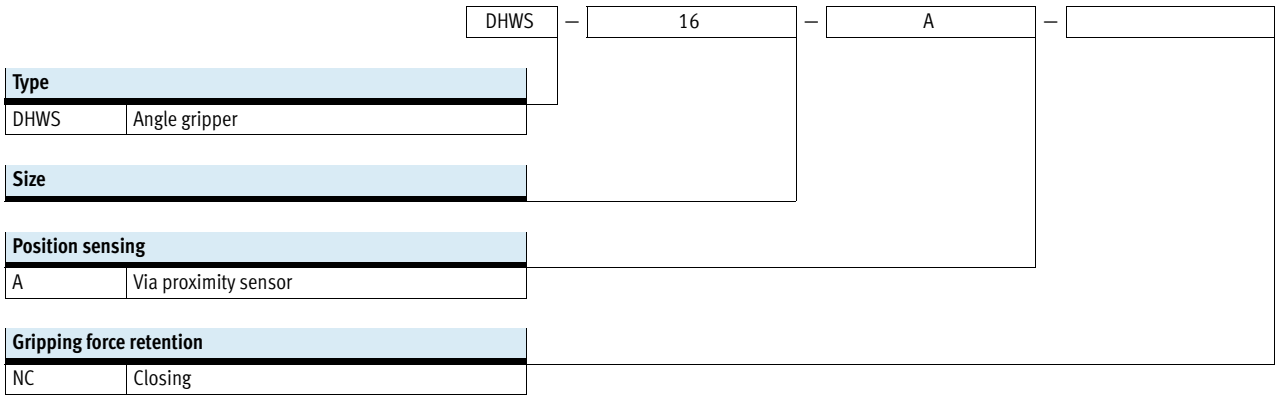
Peripherals overview

FESTO

Accessories				
	Type	Size	Description	➔ Page/Internet
1	Connecting cable NEBU	10 … 40	For connecting evaluation unit and signal converter	20
2	Evaluation unit SMH-AE1	10	• For evaluating signals for position sensor SMH-S1	20
3	Signal converter SVE4	10	• For evaluating signals for position sensor SMH-S1	20
4	Position sensor SMH-S1	10	• Adaptable and integratable sensor technology, for sensing the piston position	20
5	Centring pin	10 … 40	For centring the gripper fingers on the gripper jaws	–
6	Proximity sensor SMT-8G	16 … 40	• For sensing the piston position • Proximity sensor does not project past the housing at the bottom	21
7	Position transmitter SMAT-8M	16 … 40	• Continuously senses the position of the piston. Has an analogue output with an output signal in proportion to the piston position	21
	Position transmitter SDAT	32, 40		
8	Push-in fitting QS	10 … 40	For connecting compressed air tubing with standard O.D.	qs
9	Centring sleeve ZBH	10 … 40	• For centring the gripper during mounting • The scope of delivery of the gripper includes 2 centring sleeves	20
10	Adapter kit 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



Type	
DHWS	Angle gripper

Size

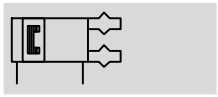
Position sensing	
A	Via proximity sensor

Gripping force retention	
NC	Closing

Angle grippers DHWS

Technical data

Function
Double-acting
DHWS-...-A



Size
10 ... 40 mm

Opening angle
40°

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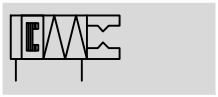
Function – Variants
Single-acting or
with gripping force retention ...
... closing DHWS-...-NC



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]	< ∅ 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).

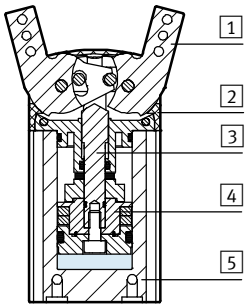
Weight [g]						
Size		10	16	25	32	40
DHWS-...-A		40	110	258	452	775
DHWS-...-A-NC		–	114	265	462	790

Angle grippers DHWS

Technical data

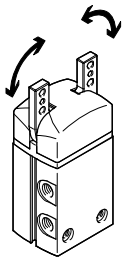
Materials

Sectional view



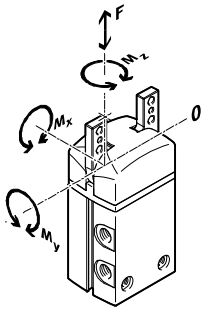
Angle gripper		
1	Gripper jaw	High-alloy stainless steel
2	Cover cap	Polyamide
3	Slotted guide plate	Tempered steel
4	Piston	Polyacetal
5	Housing	Hard anodised wrought aluminium alloy
–	Seals	Nitrile rubber
–	Note on materials	Free of copper and PTFE
		RoHS-compliant

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

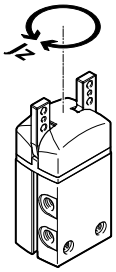


The indicated permissible forces and torques apply to a single gripper jaw. They include the lever arm, additional applied loads due to the workpiece or external gripper fingers and acceleration forces occurring during movement.

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 [kgm²x10⁻⁴]

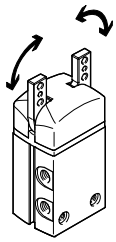


Mass moment of inertia of the angle gripper in relation to the central axis, without external gripper fingers, without load.

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

Opening and closing times [ms] at 6 bar

Without external gripper fingers

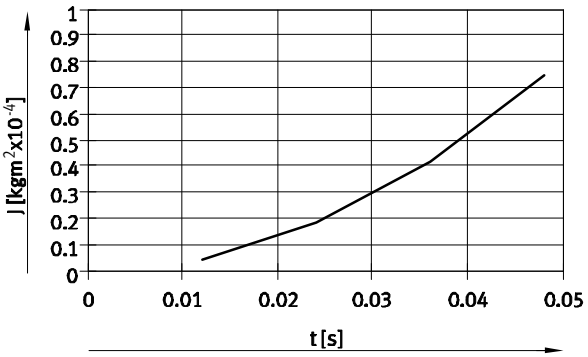


The indicated opening and closing times [ms] were measured at room temperature at an operating pressure of 6 bar with horizontally mounted grippers without additional gripper fingers (average values). The grippers must be throttled for greater applied loads. Opening and closing times must then be adjusted accordingly.

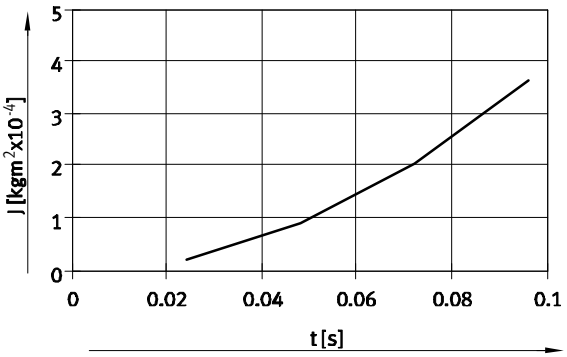
Size		10	16	25	32	40
Without external gripper fingers						
DHWS-...-A	Opening	10	44	64	46	63
	Closing	22	52	80	77	96
DHWS-...-A-NC	Opening	–	62	106	88	99
	Closing	–	36	59	55	69

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

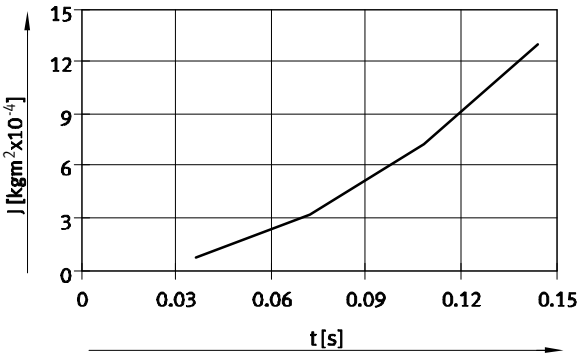
DHWS-10



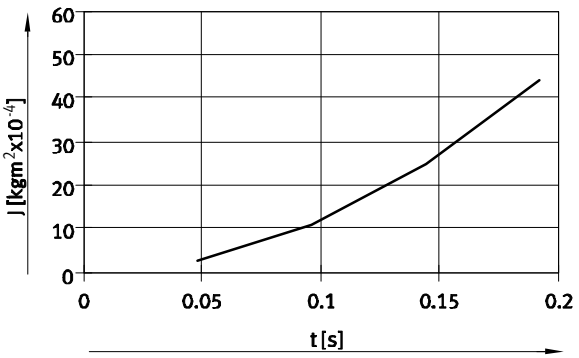
DHWS-16



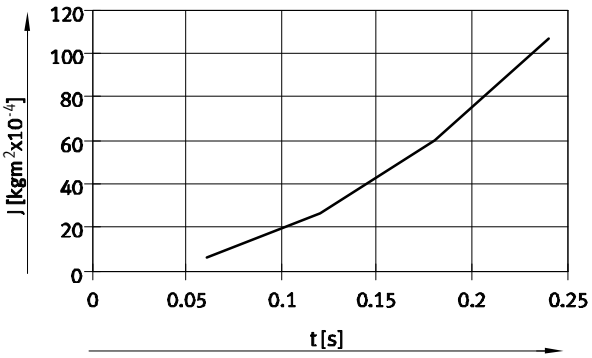
DHWS-25



DHWS-32



DHWS-40

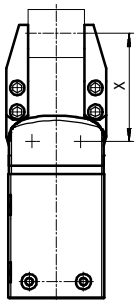


Angle grippers DHWS

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.



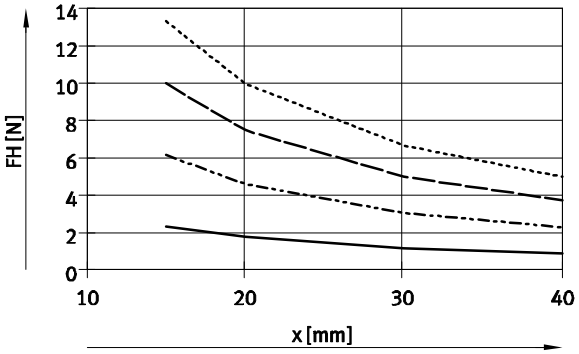
2 bar
4 bar
6 bar
8 bar

- Note

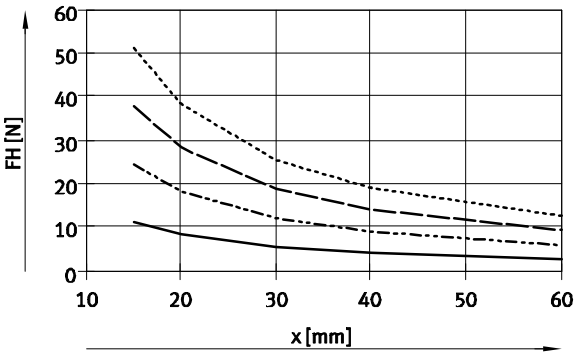
Gripper selection sizing software
➔ www.festo.com

External gripping (closing)

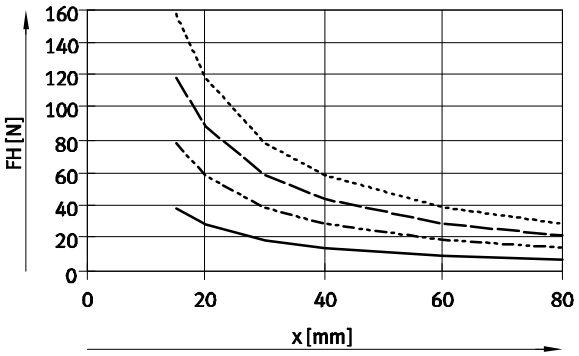
DHWS-10



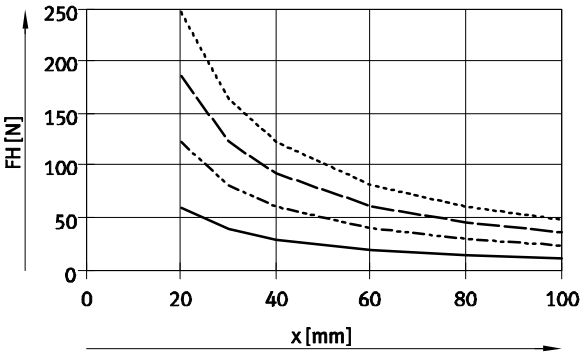
DHWS-16



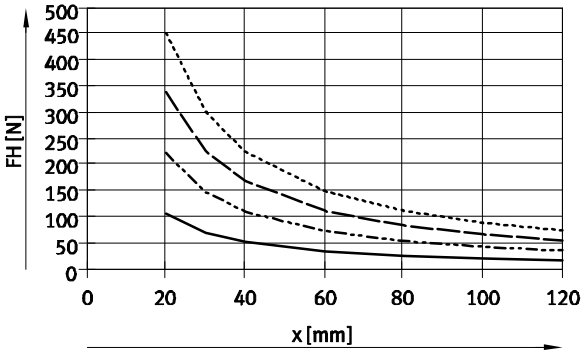
DHWS-25



DHWS-32

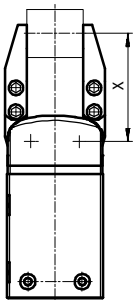


DHWS-40



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.



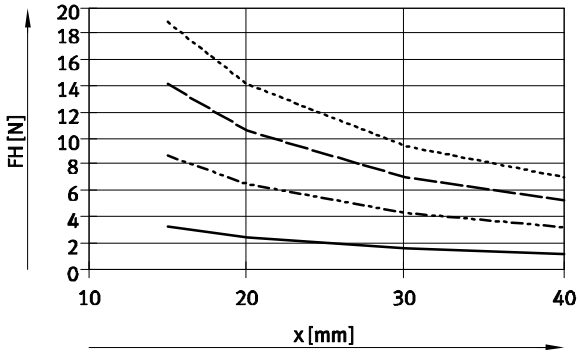
2 bar
4 bar
6 bar
8 bar

- Note

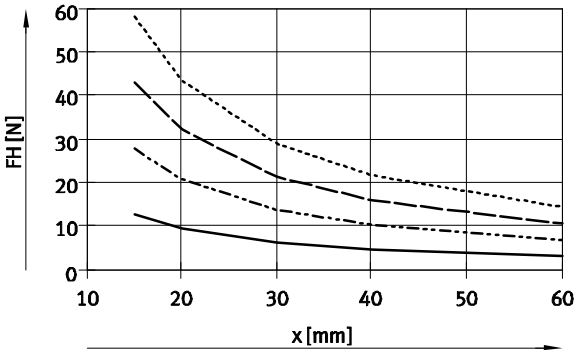
Gripper selection sizing software
➔ www.festo.com

Internal gripping (opening)

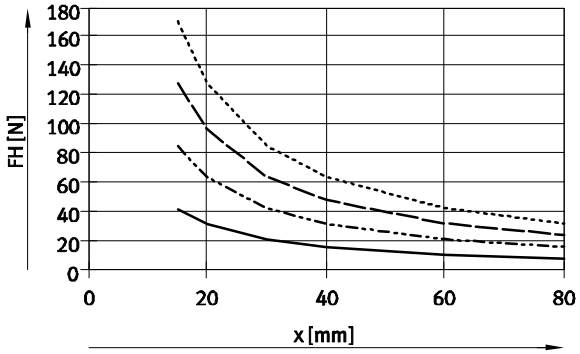
DHWS-10



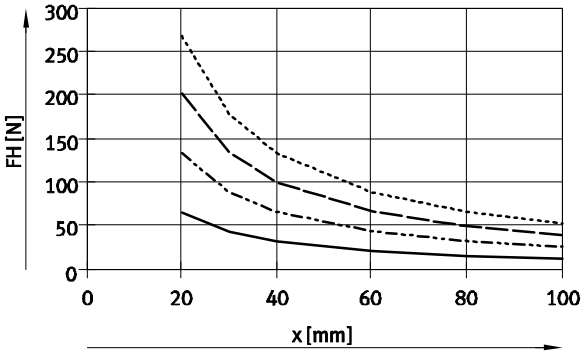
DHWS-16



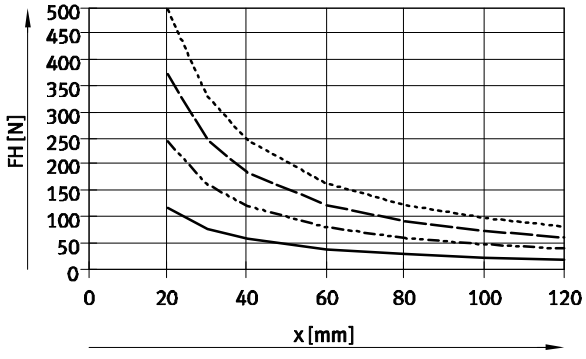
DHWS-25



DHWS-32



DHWS-40

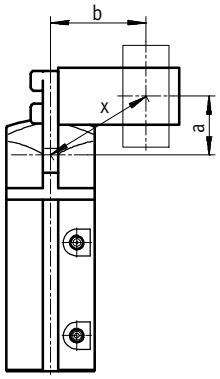


Gripping force F_H per gripper jaw at 6 bar as a function of lever arm x and eccentricity a and b

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

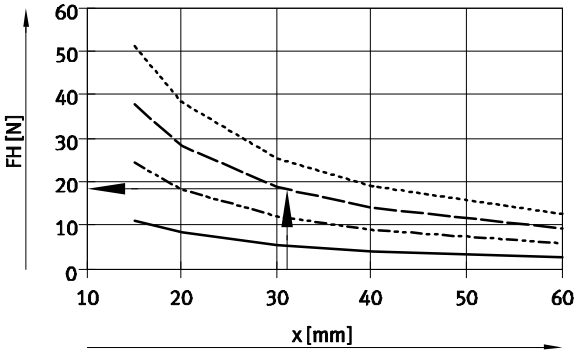
Given:
Distance a = 20 mm
Distance b = 25 mm
To be calculated:
The gripping force at 6 bar,
with a DHWS-16,
used as an external gripper

Procedure:
Calculating the lever arm x

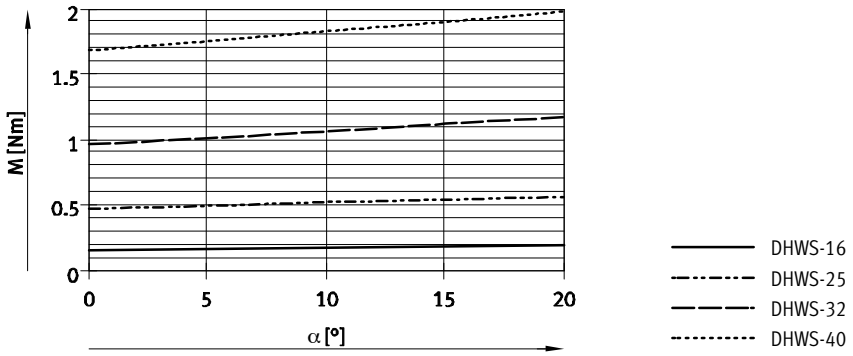
$$x = \sqrt{20^2 + 25^2}$$

x = 32 mm

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



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.

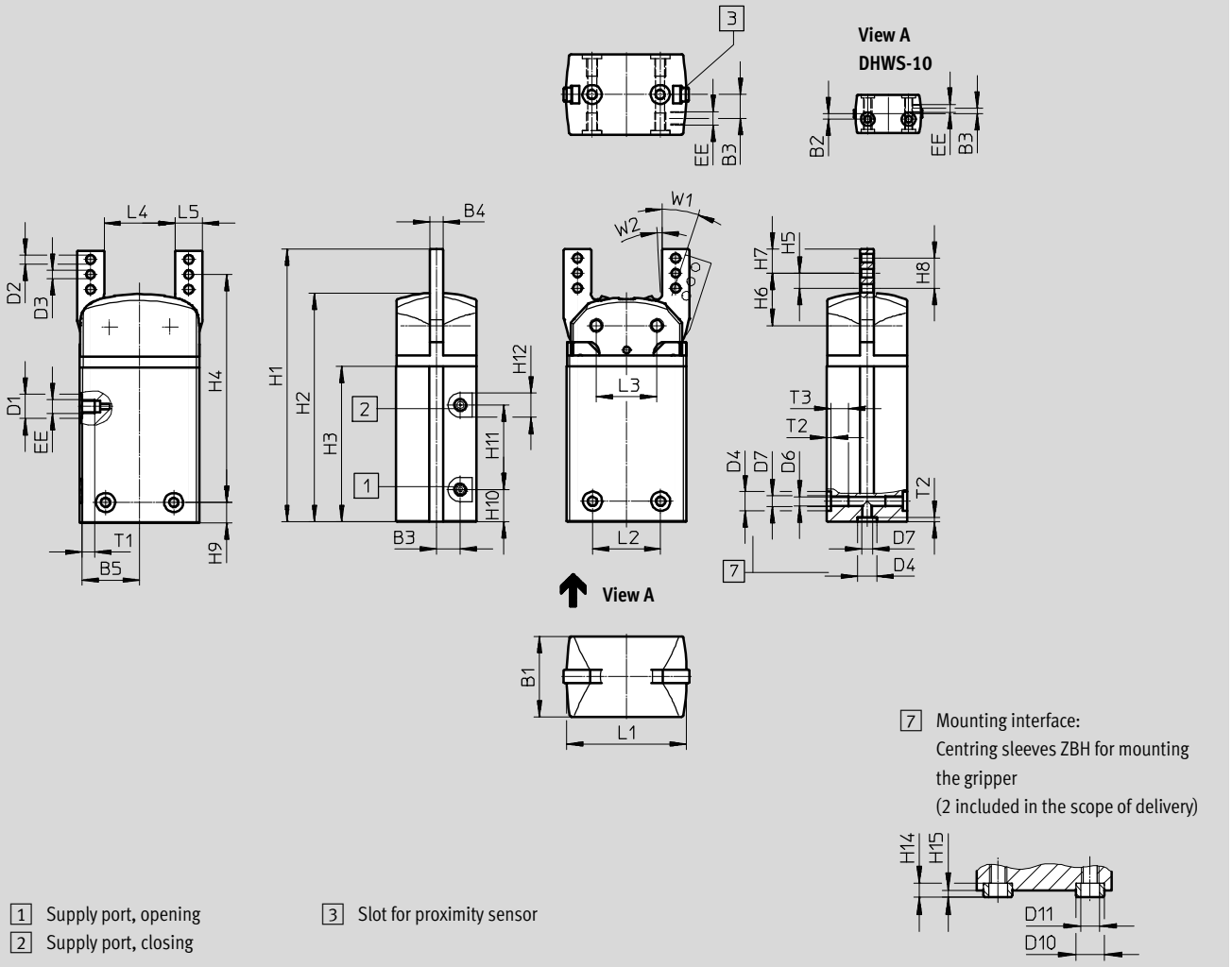
$M_{Gr} = F_H * x$

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

Application

Single-acting	Supplementary gripping force	Gripping force retention
• Gripping with spring force: $M_{Grtotal} = M_F$ • Gripping with pressure force: $M_{Grtotal} = M_{Gr} - M_F$	• Gripping with pressure and spring force: $M_{Grtotal} = M_{Gr} + M_F$	• Gripping with spring force: $M_{Grtotal} = M_F$

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



Size [mm]	B1 ±0.05	B2[1]	B3	B4 −0.03/−0.05	B5	D1 ∅	D2 ∅ ±0.1	D3 ∅ H8	D4 ∅ H8/h7	D6 +0.1	D7
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 [mm]	D10 ∅ h7	D11 ∅	EE	H1	H2	H3	H4 ±0.2	H5	H6 ±0.05	H7
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	G⅛	116	96.2	65	100.5	6.5	22.5	11
40	12	10.3	G⅛	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

Angle grippers DHWS

Technical data

Size [mm]	H8	H9[2]	H10	H11	H12	H14 −0.2	H15 −0.3	L1 ±0.05	L2[1]
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 ±0.02	L4	L5 −0.02/ −0.05	T1 +0.5	T2 +0.1	T3 +1	W1 +3°/−1°	W2 ±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	Double-acting without compression spring		Single-acting or with gripping force retention Closing	
[mm]	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

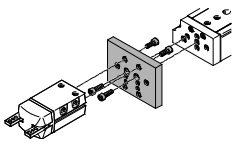
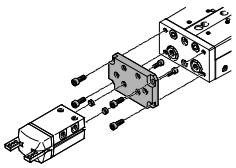
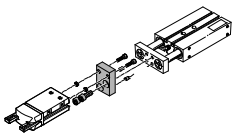
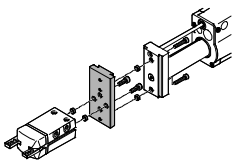
Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

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
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 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.

Adapter kit
HMSV, HAPG, HMVA, DHAA

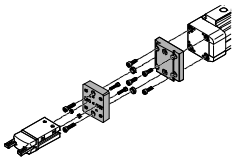
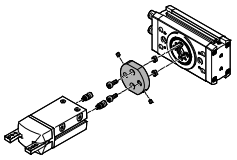
Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

- 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
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**
DRRD/DHWS	DRRD	DHWS			DHAA		
	8	10	■	■	2	**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) Only for DGEA-...
3) Only for DGE.../DGP...

Angle grippers DHWS

Accessories

Adapter kit
HAPG

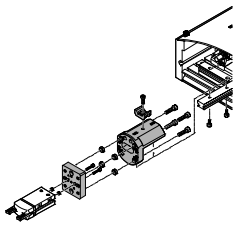
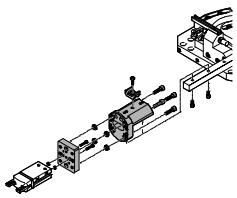
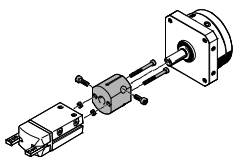
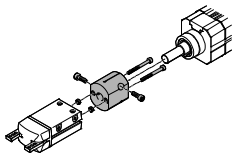
Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

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.

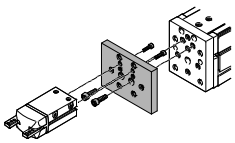
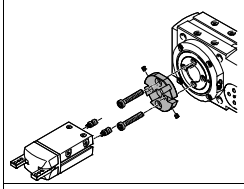
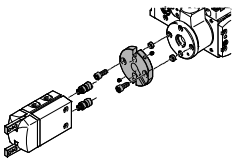
Adapter kit
HMSV, HAPG

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
EGSL/DHWS	EGSL	DHWS			HMSV		
	35	10	■	■	2	**548784**	**HMSV-54**
						1088262	**HMSV-70**
	45, 55	16	■	■		**548785**	**HMSV-55**
	75	25, 32	■	■		**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

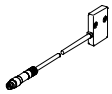
FESTO

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

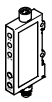
Signal converter SVE4

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

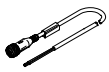
Evaluation unit SMH-AE1

- Converts analogue signals into switching points
- With 3 potentiometers for setting 3 switching points

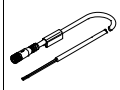
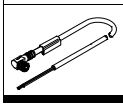
Ordering data

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

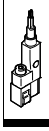
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
Connection between position sensor and signal converter/evaluation unit					
	Straight socket, M8x1, 4-pin	Straight plug, M8x1, 4-pin	2.5	**554035**	**NEBU-M8G4-K-2.5-M8G4**
Connection between evaluation unit and 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**

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

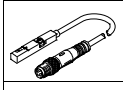
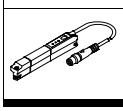
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541333**	**NEBU-M8G3-K-2.5-LE3**
			5	**541334**	**NEBU-M8G3-K-5-LE3**
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541338**	**NEBU-M8W3-K-2.5-LE3**
			5	**541341**	**NEBU-M8W3-K-5-LE3**

Position transmitter

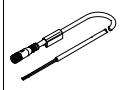
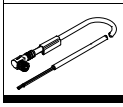
The position transmitter continuously senses the position of the piston.

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 [V]	Analogue output [mA]	Type of mounting	Electrical connection	Cable length [m]	Part No.	Type
	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**