Radial grippers DHRS

Radial grippers DHRS

Key features

At a glance

General information

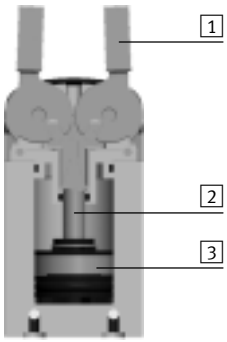
- Lateral gripper jaw support for high torque loads
- Self-centring
- Gripper jaw centring options
- Max. repetition accuracy
- Gripping force retention
- Internal fixed flow control
- Wide range of options for mounting on drive units
- Sensor technology:
  - Adaptable position sensor for the small gripper sizes
  - Integratable proximity sensors for the medium and large gripper sizes

Flexible range of applications

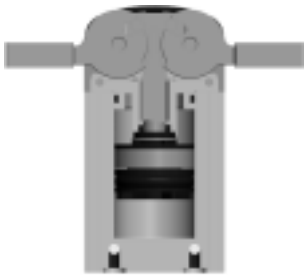
- Can be used as a double-acting and single-acting gripper
- Compression spring for supplementary or retaining gripping forces
- Suitable for external and internal gripping

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:

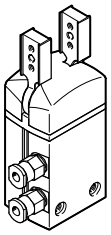
- Open
- Closed
- Workpiece gripped

Radial grippers DHRS

Key features

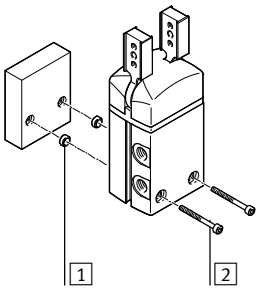
Supply ports

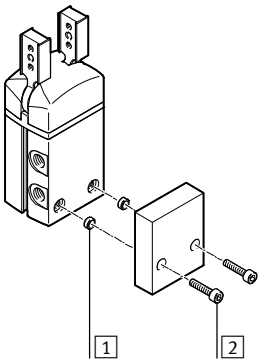
At the side



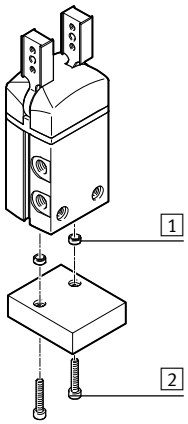
Mounting options

At the side



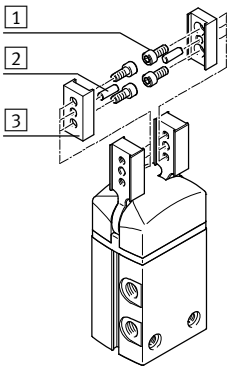


From underneath



1 Centring sleeves
2 Mounting screws

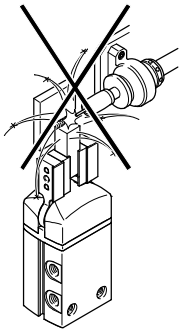
Mounting options for external gripper fingers



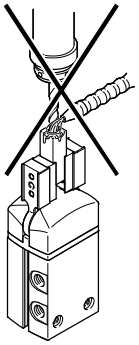
1 Mounting screws
2 Centring pins
3 Gripper fingers

Note

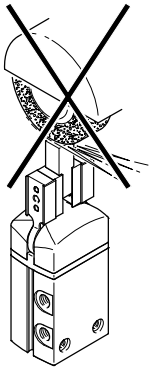
These grippers are not designed for the following or similar sample applications:



- Welding spatter



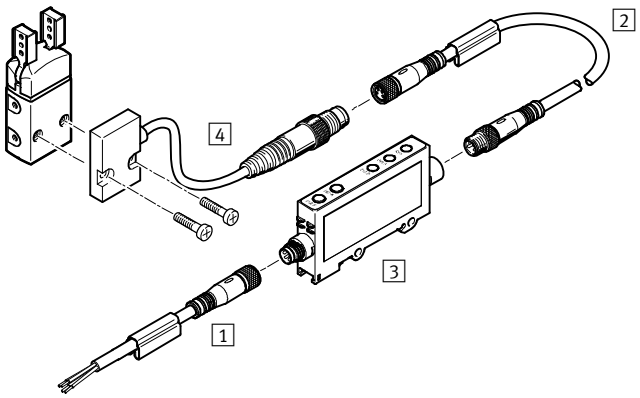
- Machining
- Aggressive media



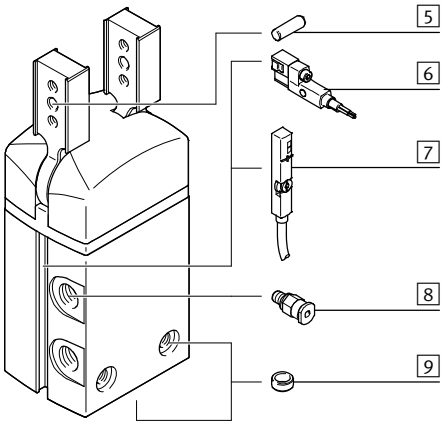
- Grinding dust

Peripherals overview

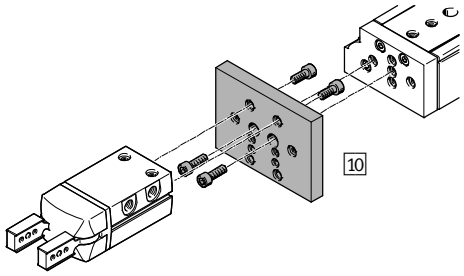
DHRS-10



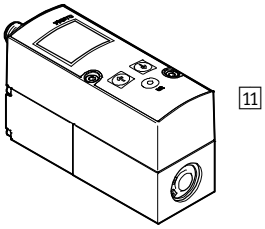
DHRS-16 ... 40



System product for handling and assembly technology



Proportional pressure regulator VPPM



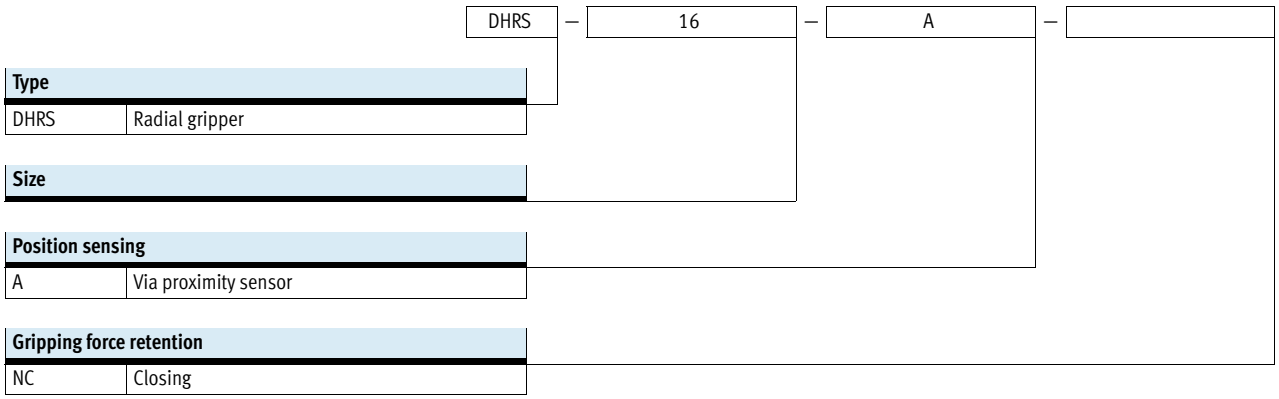
Radial grippers DHRS

Peripherals overview

Accessories				
	Type	Size	Description	➔ Page/Internet
1	Connecting cable NEBU	10	• Connection between signal converter and controller	20
2	Connecting cable NEBU	10	• Connection between position sensor and signal converter	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 DHAA, HMSV, HAPG, HAPS, HMVA	10 … 40	• Connecting plate between drive and gripper	16
11	Proportional pressure regulator VPPM	10 … 40	• For infinite adjustment of the gripping force	vppm

Radial grippers DHRS

Type codes



Type	
DHRS	Radial gripper

Size

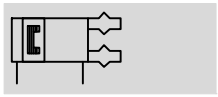
Position sensing	
A	Via proximity sensor

Gripping force retention	
NC	Closing

Radial grippers DHRS

Technical data

Function
Double-acting
DHRS-...-A



Size
10 ... 40 mm

Opening angle
180°

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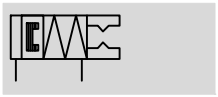
Function – Variants
Single-acting or
with gripping force retention ...
... closing DHRS-...-NC



General technical data						
Size		10	16	25	32	40
Design		Forced motion sequence				
Mode of operation		Double-acting				
Gripper function		Radial				
Guide		Plain-bearing guide				
Gripping force retention		–	NC	NC	NC	NC
Number of gripper jaws		2				
Opening angle per gripper jaw	[°]	90				
Pneumatic connection		M3	M3	M5	G1/8	G1/8
Repetition accuracy[1]	[mm]	≤ 0.1				
Max. interchangeability	[mm]	≤ ±0.2				
Max. operating frequency	[Hz]	4		3		2
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

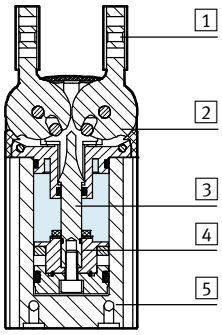
Operating and environmental conditions						
Size		10	16	25	32	40
Min. operating pressure						
DHRS-...-A	[bar]	2				
DHRS-...-A-NC	[bar]	–	4			
Max. operating pressure	[bar]	8				
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]				
Note on operating/pilot medium		Operation 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
DHRS-...-A		44	114	270	480	829
DHRS-...-A-NC		–	118	277	490	844

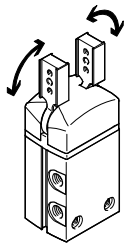
Materials

Sectional view



Radial 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

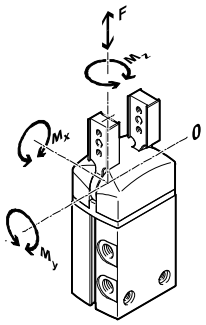
Total gripping torque [Ncm] at 6 bar



The gripping torque is not constant within the opening angle ➔ page 12.

Size		10	16	25	32	40
DHRS-...-A	Opening	21	62	233	423	725
	Closing	15	55	215	390	660

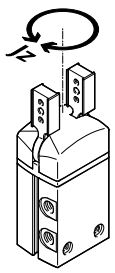
Static characteristic load values at the gripper jaws



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]	30	40	75	120	200
Max. permissible torque M_x	[Nm]	0.8	1.3	3.2	6.2	14
Max. permissible torque M_y	[Nm]	0.8	1.3	3.2	6.2	14
Max. permissible torque M_z	[Nm]	0.8	1.3	3.2	6.2	14

Mass moment of inertia [kgm²x10⁻⁴]

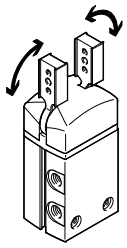


Mass moment of inertia of the radial gripper in relation to the central axis, without external gripper fingers, without load.

Size	10	16	25	32	40
DHRS-...-A	0.03	0.14	0.69	1.66	4.18
DHRS-...-A-NC	–	0.15	0.71	1.69	4.24

Opening and closing times [ms] at 6 bar

Without external gripper fingers

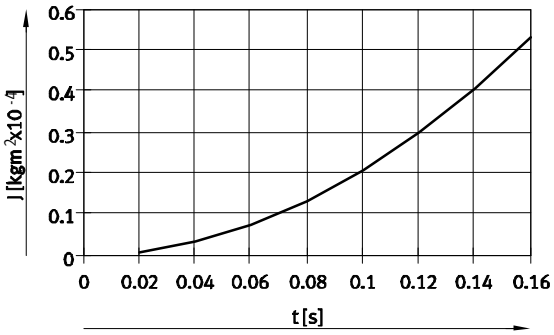


The indicated opening and closing times [ms] were measured at room temperature at an operating pressure of 6 bar with horizontally mounted grippers without additional gripper fingers (average values). The grippers must be throttled for greater applied loads. Opening and closing times must then be adjusted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

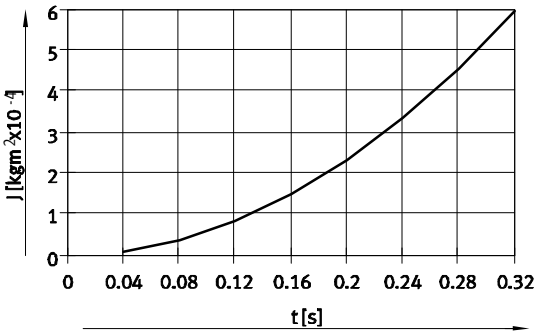
Size		10	16	25	32	40
Without external gripper fingers						
DHRS-...-A	Opening	35	61	102	111	113
	Closing	91	63	105	119	142
DHRS-...-A-NC	Opening	–	75	150	131	151
	Closing	–	43	96	88	110

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

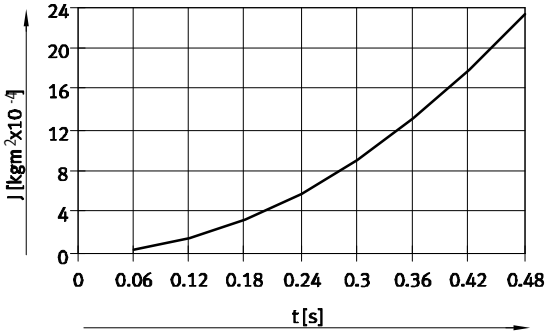
DHRS-10



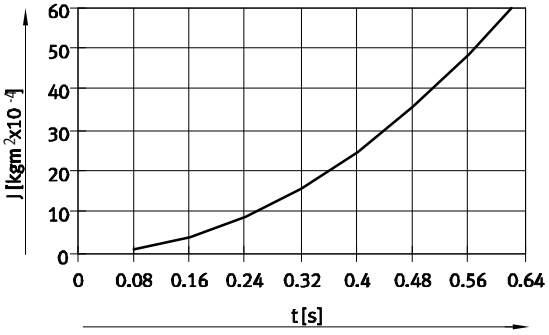
DHRS-16



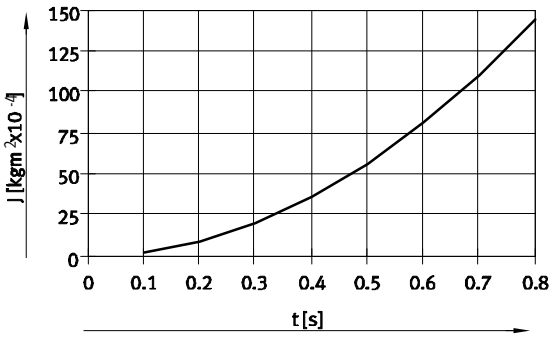
DHRS-25



DHRS-32

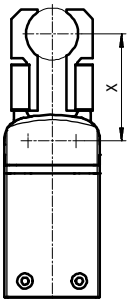


DHRS-40



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.
The gripping torque is not constant within the opening angle ➔ page 12.



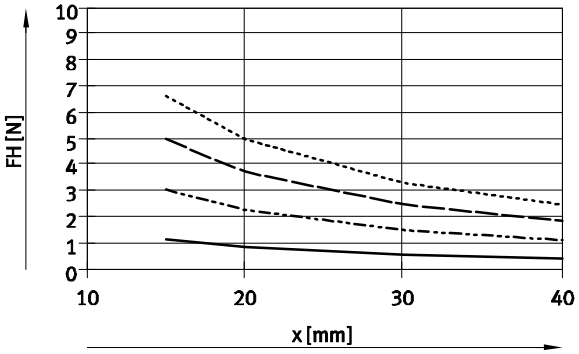
2 bar
4 bar
6 bar
8 bar

- Note

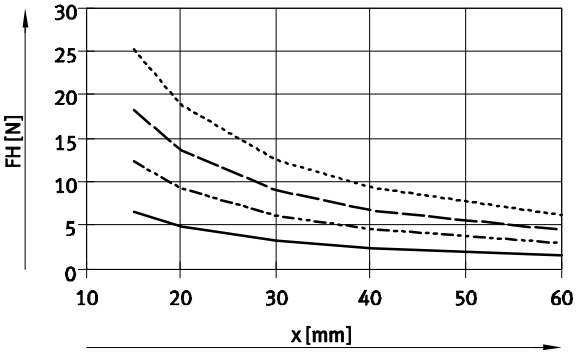
Gripper selection sizing software
➔ www.festo.com

External gripping (closing)

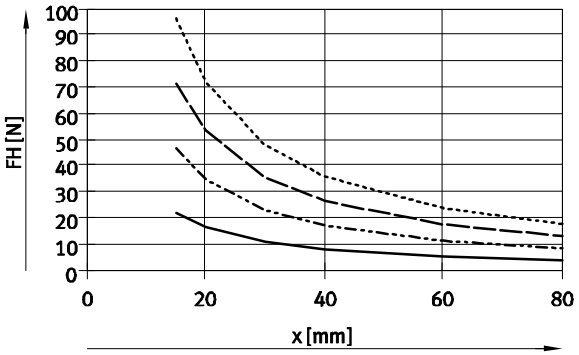
DHRS-10



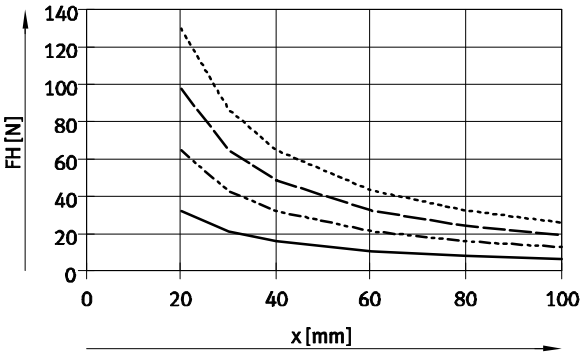
DHRS-16



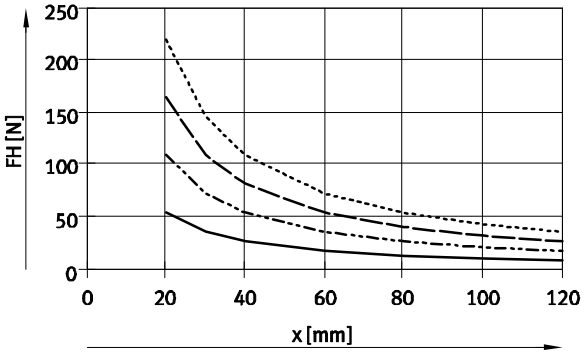
DHRS-25



DHRS-32



DHRS-40



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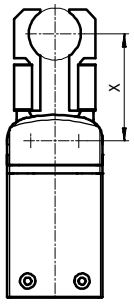
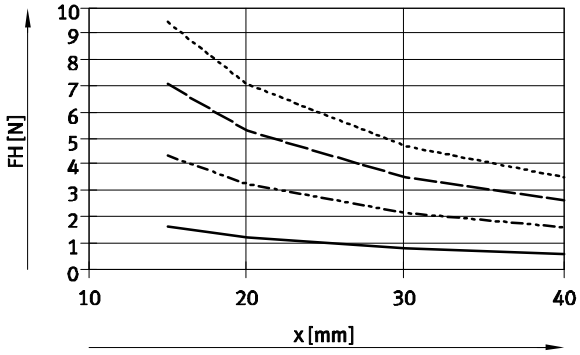


2 bar
4 bar
6 bar
8 bar

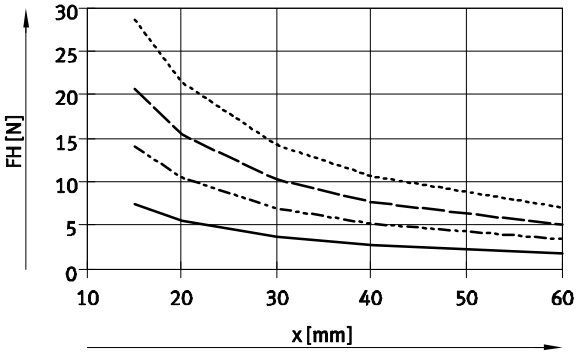
- Note
Gripper selection sizing software
➔ www.festo.com

Internal gripping (opening)

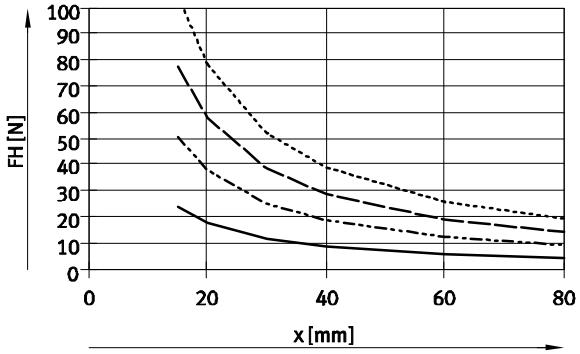
DHRS-10



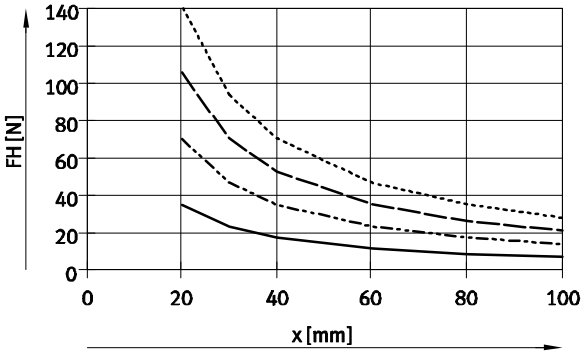
DHRS-16



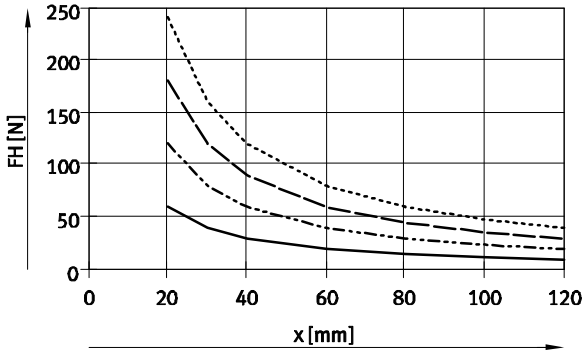
DHRS-25



DHRS-32



DHRS-40

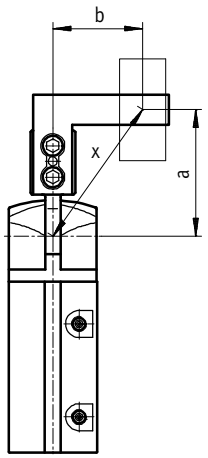


Gripping force F_H per gripper jaw at 6 bar as a function of lever arm x and eccentricity a and b

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 (➔ page 10/11) using the calculated value x.



Calculation example

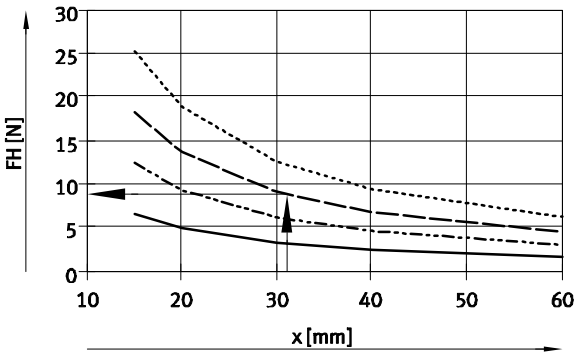
Given:
Distance a = 25 mm
Distance b = 20 mm
To be calculated:
The gripping force at 6 bar,
with a DHRS-16,
used as an external gripper

Procedure:
Calculating the lever arm x

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

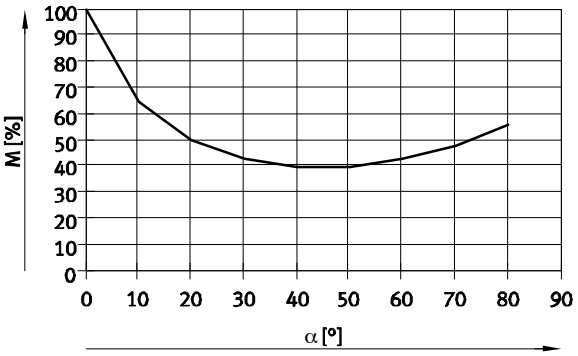
x = 32 mm

The graph (➔ page 10) gives a value of F_H = 8 N for the gripping force.

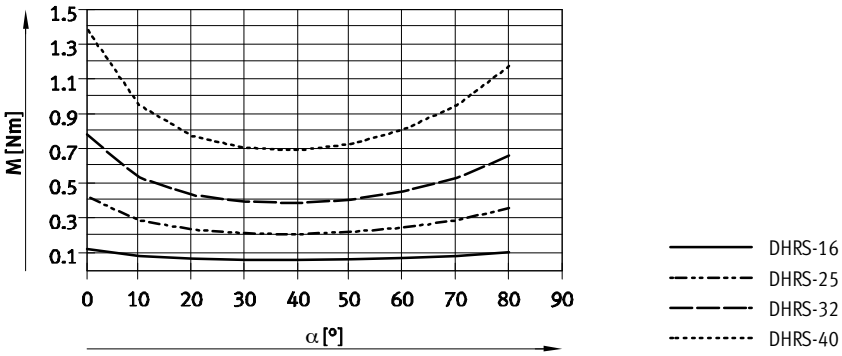


Torque curve M as a function of opening angle α

The drive principle of the gripper jaws means that the torque is not constant within the opening angle. The percentage of torque available in each case can be seen in the graph.
An opening angle of 0° means a parallel gripper jaw position.



Spring torque M_F as a function of opening angle α



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

The radial gripper with integrated spring type DHRS-...-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 (➔ page 10/11), the torque curve (➔ page 12) and the spring torque M_F (➔ page 13) must be combined accordingly.

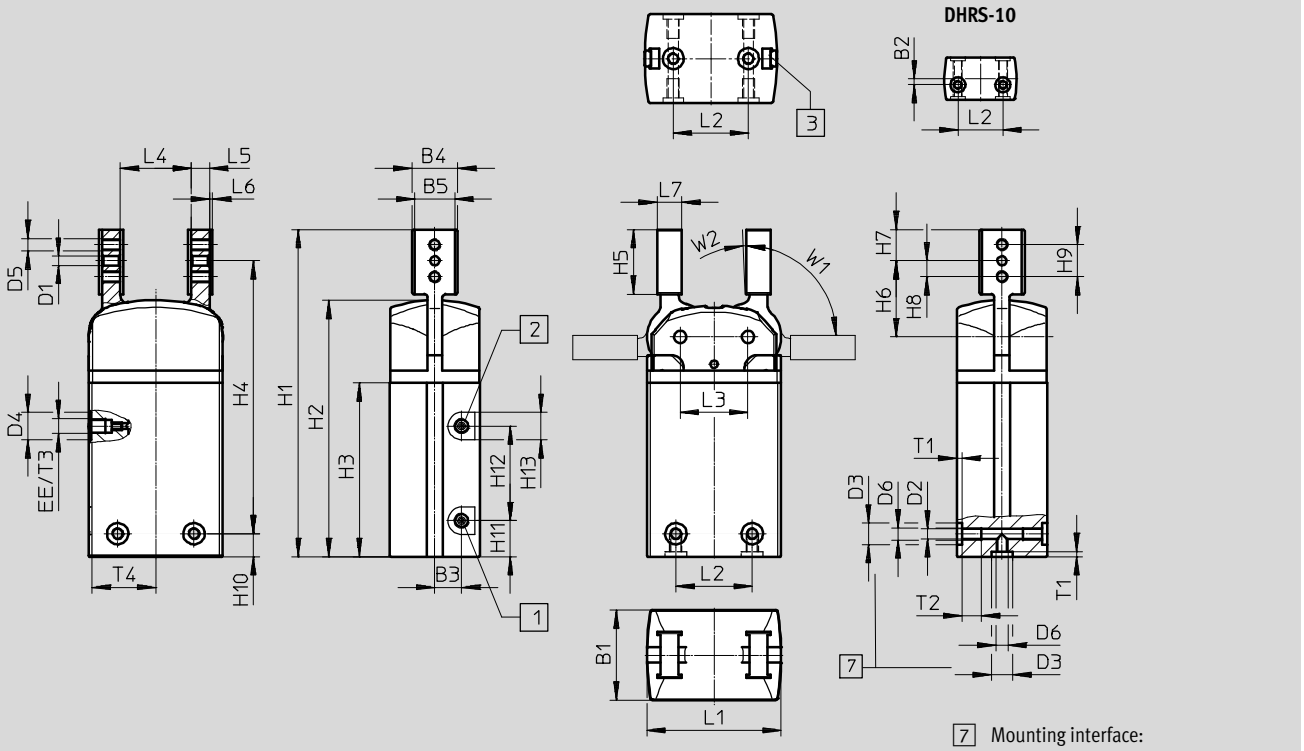
$M_{Gr} = F_H * x * M$ [%]

M_{Gr} Gripping torque
F_H Gripping force
x Lever arm
M Torque curve

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**



1 Supply port, opening
2 Supply port, closing
3 Slot for proximity sensor
7 Mounting interface:
Centring sleeves ZBH for mounting the gripper
(2 included in the scope of delivery)

Size [mm]	B1 ±0.05	B2[1)]	B3	B4	B5 +0.03/ +0.01	D1 ∅ H8	D2 ∅ +0.1	D3 ∅ H8/h7	D4 ∅	D5	D6
10	14	2	2	8.5	6.5	2	2.4	5	7	M2.5	M3
16	19	–	5.8	14	10	2	2.5	5	–	M3	M3
25	29.5	–	8.75	15	13	3	3.3	7	9	M4	M4
32	38	–	11	16	14	4	5.1	9	15	M5	M6
40	49	–	11	24	20	5	6.4	12	15	M6	M8

Size [mm]	D10 ∅ h7	D11 ∅	EE	H1	H2	H3	H4 ±0.25	H5 ±0.2	H6 ±0.05	H7 –0.1
10	5	3.2	M3	60.8	46	30.8	42.25	13.8	14.95	6.25
16	5	3.2	M3	88.2	70.5	49	73.7	16.5	19.7	7
25	7	5.3	M5	107.2	84	57	89.45	21.2	24.95	10.25
32	9	6.4	G1/8	128.5	96.2	65	103.5	29.5	32	14
40	12	10.3	G1/8	140	108.4	71.5	108.7	29.5	33.7	13.8

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

Radial grippers DHRS

Technical data

Size [mm]	H8	H9	H10[2]	H11	H12	H13	H14 –0.2	H15 –0.3	L1 ±0.05	L2[1]	L3 ±0.02
10	4	8	12.3	8.8	16	7	2.4	1.2	24	15	12.4
16	4	8	7.5	12.25	23	7	2.4	1.2	33.4	16	17
25	5.25	10.5	7.5	11.8	31	9	3	1.4	44	25	22.2
32	7	14	11	20	25	15	4	1.9	51	29	25.8
40	8	16	17.5	9	46	15	5	2.4	59	33	30

Size [mm]	L4	L5 ±0.05	L6	L7	T1 +0.1	T2 +1	T3 +0.5	T4	W1 ±2°	W2 +3°
10	12	4	0.5	5	1.2	through	3.5	11.6	90	2
16	21	4	1	6	1.2	5.8	4.5	16	90	2
25	23.2	6	1	8	1.6	6.4	4.5	21	90	2
32	24.8	8	1	10	2.1	12.9	6.5	24	90	2
40	29.6	10	1	12	2.6	13.4	6	28.4	90	2

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	**1310159**	**DHRS-10-A**	**–**	
16	**1310160**	**DHRS-16-A**	**1310161**	**DHRS-16-A-NC**
25	**1310162**	**DHRS-25-A**	**1310163**	**DHRS-25-A-NC**
32	**1310164**	**DHRS-32-A**	**1310165**	**DHRS-32-A-NC**
40	**1310166**	**DHRS-40-A**	**1310167**	**DHRS-40-A-NC**

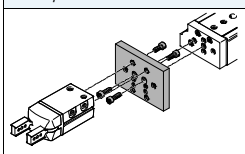
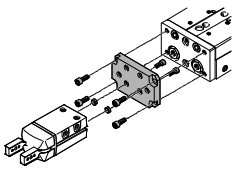
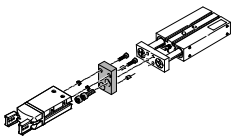
Adapter kit
HAPG, HAPS, HMSV

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/DHRS	DGSL	DHRS			HMSV		
	8, 10	10	■	■	2	**548784**	**HMSV-54**
	12, 16	16	■	■		**548785**	**HMSV-55**
	20, 25	25, 32	■	■		**548786**	**HMSV-56**
SLT/DHRS	SLT	DHRS			HAPS		
	10	10	■	–	2	**178448**	**HAPS-2**
	16	16	■	–		**178449**	**HAPS-3**
	20	25	■	–		**178450**	**HAPS-4**
	25	32	■	–		**178451**	**HAPS-5**
DPZ/DHRS	DPZ	DHRS			HAPG		
	10, 16	16	■	–	2	**163250**	**HAPG-1**
	16	25	■	–		**163251**	**HAPG-2**
	20	25	■	–		**163252**	**HAPG-3**
	25, 32	32	■	–		**163253**	**HAPG-4**

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
DHAA, HAPG, HMSV, HMVA,

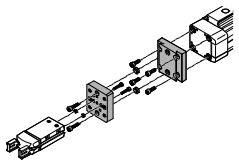
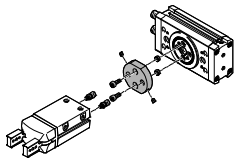
Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

- 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/DHRS	DG...	DHRS			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/DHRS	DRRD	DHRS			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

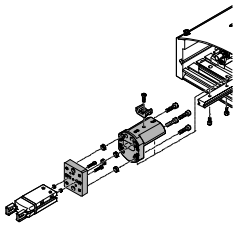
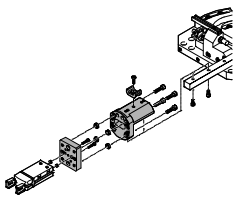
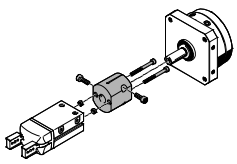
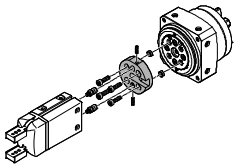
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Only for DGEA-...
3) Only for DGE.../DGP

Adapter kit
DHAA, 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/DHRS	HSP	DHRS			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/DHRS	HSW	DHRS			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/DHRS	DSM-...-FW	DHRS			HAPG		
	6, 8, 10	10	■	■	2	**187568**	**HAPG-34**
	DSM-...	DHRS			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**
DSM-...-HD/DHRS	DSM-...-HD	DHRS			DHAA		
	12	16	■	■	2	**8072157**	**DHAA-G-R3-12-B18-10**
	12	10	■	■		**8072172**	**DHAA-G-R3-12-B20-10**
	16	16	■	■		**8071917**	**DHAA-G-R3-16-B18-10**
	16	25	■	■		**8079173**	**DHAA-G-R3-16-B18-16**
	25	25	■	■		**8071956**	**DHAA-G-R3-25-B18-16**
	25	32	■	■		**8079201**	**DHAA-G-R3-25-B20-32**
	32	32	■	■		**8079208**	**DHAA-G-R3-32-B18-25**
	32	40	■	■		**8079212**	**DHAA-G-R3-32-B20-40**

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.

Adapter kit
HAPG, HMSV

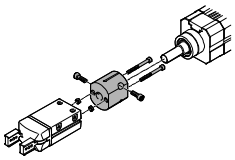
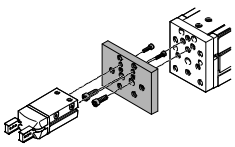
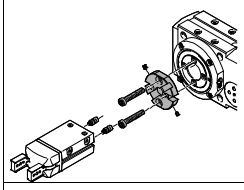
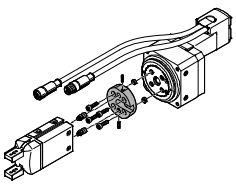
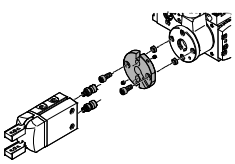
Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

- 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
DSL/DHRS	DSL	DHRS			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**
EGSL/DHRS	EGSL	DHRS			HMSV		
	35	10	■	■	2	**548784** **1088262**	**HMSV-54** **HMSV-70**
	45, 55	16	■	■		**548785**	**HMSV-55**
	75	25, 32	■	■		**548786**	**HMSV-56**
ERMB/DHRS	ERMB	DHRS			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**
ERMO/DHRS	ERMO	DHRS			DHAA		
	12	16	■	■	2	**8072157**	**DHAA-G-R3-12-B18-10**
	12	10	■	■		**8072172**	**DHAA-G-R3-12-B20-10**
	16	16	■	■		**8071917**	**DHAA-G-R3-16-B18-10**
	16	25	■	■		**8079173**	**DHAA-G-R3-16-B18-16**
	25	25	■	■		**8071956**	**DHAA-G-R3-25-B18-16**
	25	32	■	■		**8079201**	**DHAA-G-R3-25-B20-32**
	32	32	■	■		**8079208**	**DHAA-G-R3-32-B18-25**
	32	40	■	■		**8079212**	**DHAA-G-R3-32-B20-40**
EHMB/DHRS	EHMB	DHRS			HAPG		
	20	32	■	■	2	**184485**	**HAPG-SD2-9**
	20	40	■	■		**184486**	**HAPG-SD2-10**
	25, 32	40	■	■		**526027**	**HAPG-SD2-21**

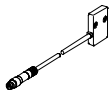
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

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

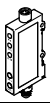
Ordering data

Type	For size	Weight [g]	Part No.	Type
Position sensor SMH-S1				Technical data ➔ Internet: smh-s1
	10	20	**175712**	**SMH-S1-HGR10**

Signal converter SVE4 for position sensor SMH-S1

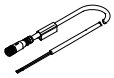
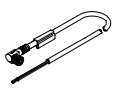
- Converts analogue signals into switching points
- Switching function freely programmable with teach-in
- Threshold value, hysteresis or window comparator

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**

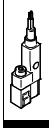
Ordering data – Connecting cables

Technical data ➔ Internet: nebu

	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
Connection between position sensor and signal converter					
	Straight socket, M8x1, 4-pin	Straight plug, M8x1, 4-pin	2.5	**554035**	**NEBU-M8G4-K-2.5-M8G4**
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**
		Cable, 3-wire, lateral	NPN	2.5	**8065028**	**SMT-8G-NS-24V-E-2,5Q-OE**
		Plug M8x1, 3-pin, lateral		0.3	**8065027**	**SMT-8G-NS-24V-E-0,3Q-M8D**

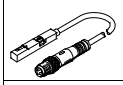
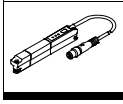
Ordering data – Connecting cables — Technical data ➔ Internet: nebu

	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**

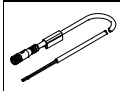
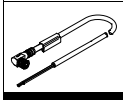
Position transmitter

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**