



- Economical and versatile
- Self-centring

# Three-point grippers HGD

Key features

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## At a glance

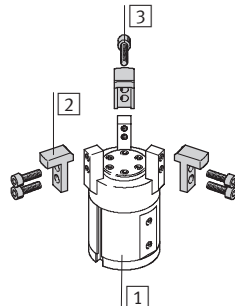
- Double-acting piston drive
- Self-centring
- Variable gripping action:
  - External/internal gripping
- Versatility thanks to externally adaptable gripper fingers
- Wide range of options for mounting on drive units
- Maximum precision
- High holding force
- Sensor technology:
  - Adaptable proximity sensors on the small grippers
  - Integral proximity sensors for medium and large grippers



Gripper selection software  
[www.festo.com/en/engineering](http://www.festo.com/en/engineering)

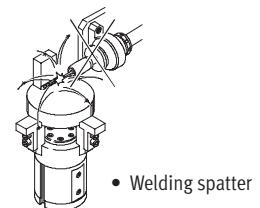
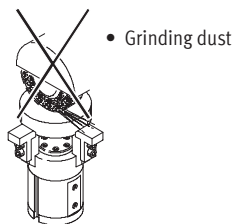
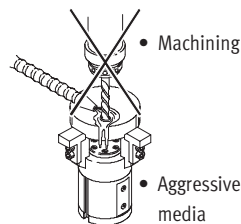
## Mounting options for external gripper fingers (customer-specific)

- 1 Three-point gripper
- 2 External gripper fingers
- 3 Mounting screws



- - Note

Grippers should always be used with exhaust air flow control. They are not suitable for the following, or for similar applications:

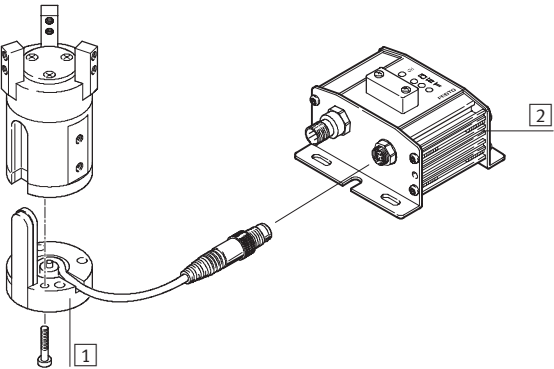


# Three-point grippers HGD

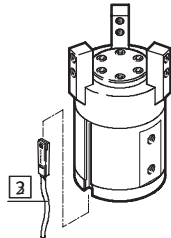
Peripherals overview and type codes

## Peripherals overview

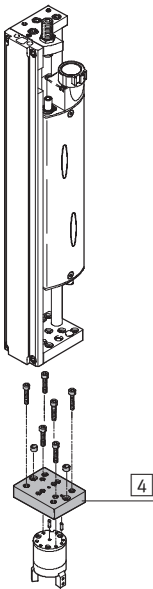
HGD-16



## HGD-32/-50



## System product for handling and assembly technology



Accessories			
Type	Brief description		→ Page
1	Position sensor SMH-S1	Adaptable and integratable sensor technology, for sensing the piston position	1 / 7.5-24
2	Evaluation unit SMH-AE1	For position sensor SMH-S1	1 / 7.5-24
3	Proximity sensor SME/SMT-8	For sensing the piston position	1 / 7.5-24
4	–	Drive/gripper connections	Volume 5

## Type codes

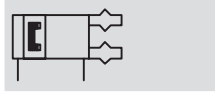
		HGD	–	16	–	A
Type						
HGD	Three-point gripper					
Size						
Position sensing						
A	For proximity sensing					

# Three-point grippers HGD

Technical data

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Function  
Double-acting



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

Wearing parts kits  
→ 1 / 7.5-23



- Ø - Size  
16 ... 50 mm
- I - Stroke  
5 ... 12 mm

General technical data					
Size			16	32	50
Design			Lever mechanism		
Mode of operation			Double-acting		
Gripper function			3-point		
Number of gripper jaws			3		
Max. applied load per external gripper finger <sup>1)</sup> [N]			0.08	0.3	0.75
Stroke	per gripper jaw	[mm]	2.5	3.9	6
	smallest gripping Ø <sup>2)</sup>	[mm]	23	33.2	50
	largest gripping Ø <sup>2)</sup>	[mm]	28	41	62
Pneumatic connection			M3	M5	G1/8
Repetition accuracy <sup>3)</sup>		[mm]	≤ 0.04		
Max. interchangeability		[mm]	0.2		
Max. operating frequency		[Hz]	4		
Position sensing			For proximity sensing		
Type of mounting			With female thread and locating hole		

- 1) Valid for unthrottled operation
- 2) Without external gripper fingers
- 3) Concentric to the central shaft

Operating and environmental conditions	
Min. operating pressure	[bar] 2
Max. operating pressure	[bar] 8
Operating medium	Filtered compressed air, lubricated or unlubricated
Ambient temperature	[°C] +5 ... +60
Corrosion resistance class CRC <sup>1)</sup>	2

- 1) Corrosion resistance class 2 according to Festo standard 940 070  
Components requiring moderate corrosion resistance. 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

Weights [g]			
Size	16	32	50
HGD	110	300	985

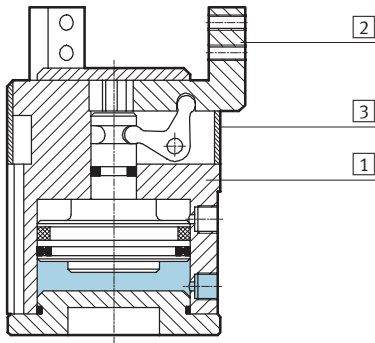
# Three-point grippers HGD

Technical data

FESTO

## Materials

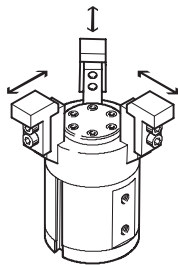
### Sectional view



### Three-point gripper

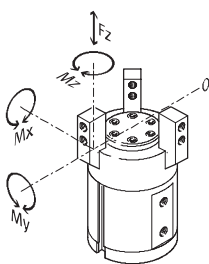
1	Body	Nickel-plated aluminium
2	Gripper jaw	High-alloy steel, nickel plated
3	Cover cap	Polyacetate
–	Note on materials	Copper, PTFE and silicone-free

### Gripping force [N] at 6 bar



Size	16	32	50
Gripping force per gripper jaw			
Opening	40	137	323
Closing	30	120	293
Total gripping force			
Opening	120	410	970
Closing	90	360	880

### Characteristic load values at the gripper jaws



The indicated permissible forces and torques apply to a single gripper jaw. Static forces and torques relate to additional applied loads caused by

the workpiece or external gripper fingers, as well as forces which occur during handling. The zero co-ordinate

line (gripper jaws point of rotation) must be taken into consideration for the calculation of torques.

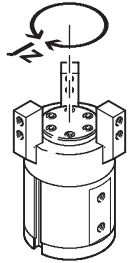
Size		16	32	50
Max. permissible force $F_z$	[N]	34	90	173
Max. permissible torque $M_x$	[Nm]	0.5	1.6	4.7
Max. permissible torque $M_y$	[Nm]	0.8	2.8	8.1
Max. permissible torque $M_z$	[Nm]	0.5	1.9	5.3

# Three-point grippers HGD

Technical data

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## Mass moment of inertia [kgm<sup>2</sup>x10<sup>-4</sup>]



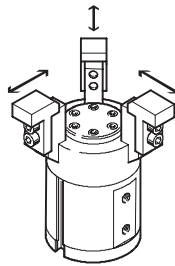
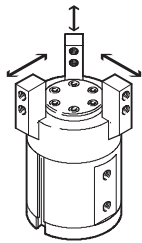
Mass moment of inertia [kgm<sup>2</sup>x10<sup>-4</sup>]  
for three-point grippers in relation to  
the central axis, without external  
gripper fingers, without load.

Size	16	32	50
HGD	0.14	0.79	6.10

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

Without external gripper fingers

With external gripper fingers



The indicated opening and closing  
times [ms] have been measured at  
room temperature and 6 bar operating  
pressure without external gripper  
fingers.

The grippers must be throttled for  
greater applied loads. Opening and  
closing times must then be adjusted  
accordingly.

Size		16	32	50
Without external gripper fingers				
HGD	Opening	5	10	10
	Closing	5	10	10
With external gripper fingers (as a function of applied load)				
HGD	0.08 N	5	–	–
	0.11 N	10	–	–
	0.15 N	20	–	–
	0.30 N	50	–	–
	0.50 N	–	100	–
	0.75 N	–	200	–
	1.00 N	–	300	100
	1.50 N	–	–	200
	2.00 N	–	–	300

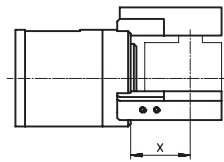
# Three-point grippers HGD

Technical data

FESTO

## Gripping force F per gripper as a function of operating pressure and the lever arm x

### Gripping forces

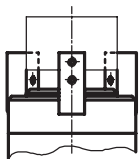


Gripping torques can be determined with the following diagrams for the various sizes in relation to operating

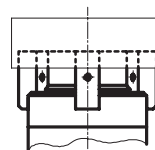
pressure and lever arm (distance from the zero co-ordinate line shown above

to the pressure point at which the external fingers grip the workpiece).

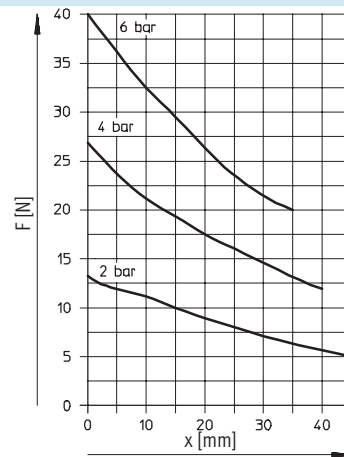
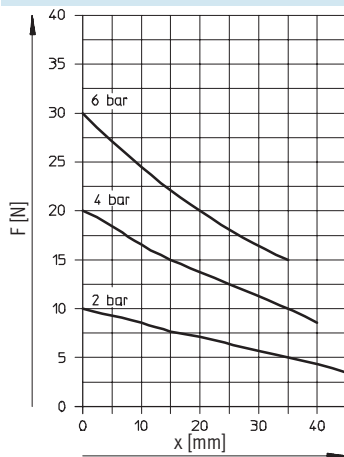
### External gripping (closing)



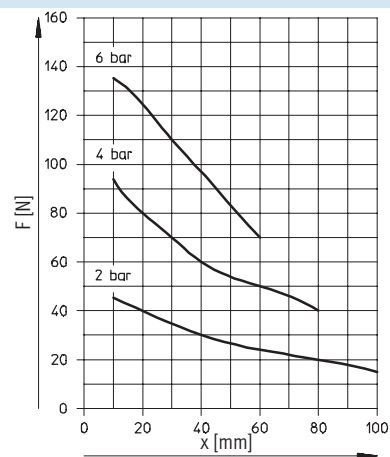
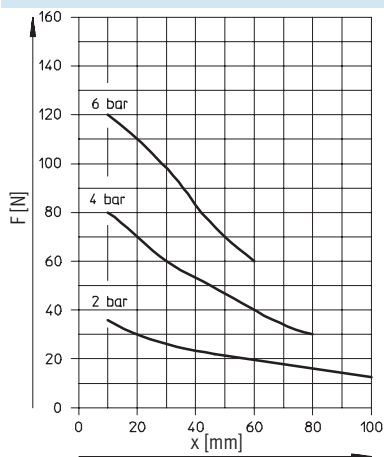
### Internal gripping (opening)



## HGD-16-A



## HGD-32-A



# Three-point grippers HGD

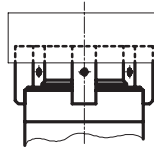
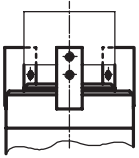
Technical data

FESTO

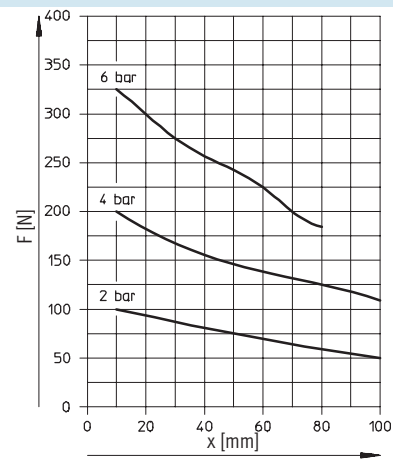
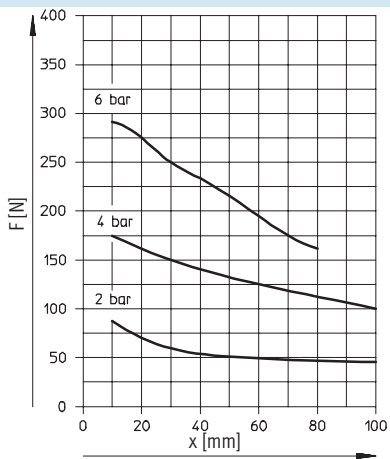
## Gripping force $F$ per gripper as a function of operating pressure and the lever arm $x$

External gripping (closing)

Internal gripping (opening)



### HGD-50-A





# Three-point grippers HGD

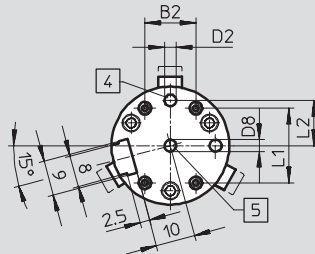
Technical data

FESTO

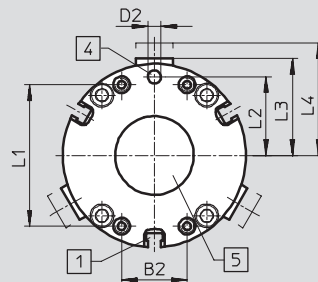
## Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

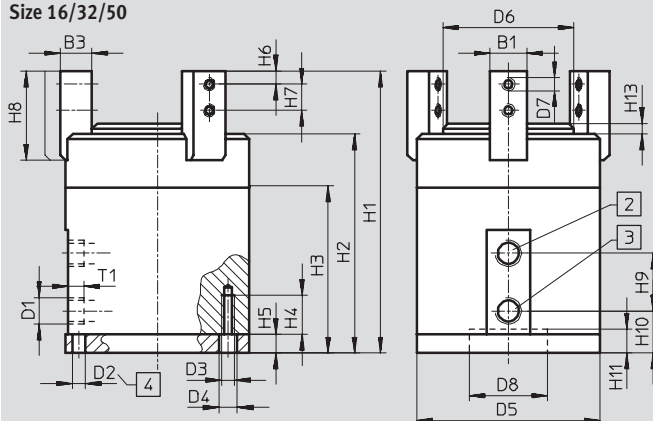
### Size 16



### Size 32/50



### Size 16/32/50



- 1 Sensor slot for proximity sensor SME/SMT-8 (not with HGD-16-A)
- 2 Compressed air connection, closing
- 3 Compressed air connection, opening
- 4 Drilled hole for locating pin (locating pins not included in scope of delivery)
- 5 Centring hole (user configured)

Size	B1	B2	B3	D1	D2	D3	D4	D5	D6	D7	D8	H1	H2
[mm]	-0.02		-0.02/-0.05		Ø 8		Ø	Ø	Ø		Ø		
16	6	13	7	M3	3	M3	3.2	30	21	M3	3 H7	60	46
32	10	13	8	M5	4	M3	3.7	45	32.4	M3	20+0.02/+0.05	78	62
50	14	25	12	G1/8	5	M5	6	70	49.4	M5	30+0.02/+0.05	107.5	83.5

Size	H3	H4	H5	H6	H7	H8	H9	H10	H11	H13	L1	L2	L3	L4	T1
[mm]		+1										±0.02			-0.5
16	32.6	8	4.5	3	6	21	12	11	4.5	2	19	11.5	17.5	20	4
32	44	10	6.5	3.5	6.5	22.5	16	11.8	8	3	36	19	24.6	28.5	4
50	56	16	7	5	10	34	22	16	9	4	54	30	37	43	6

## Ordering data

Size	Double-acting
[mm]	Part No. Type
16	174 819 HGD-16-A
32	161 837 HGD-32-A
50	161 838 HGD-50-A

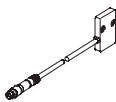

## Ordering data – Wearing parts kits

Size	
[mm]	Part No. Type
16	378 535 HGD-16-A
32	125 694 HGD-32-A
50	125 695 HGD-50-A




# Three-point grippers HGD




Accessories

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Ordering data					
Type	For size	Weight [g]	Part No.	Type	PU <sup>1)</sup>
Position sensor SMH-S1			Technical data → 1 / 10.2-107		
	16	30	175 713	SMH-S1-HGD16	1
Evaluation unit SMH-AE1			Technical data → 1 / 10.2-110		
	16	170	175 708	SMH-AE1-PS3-M12	1
			175 709	SMH-AE1-NS3-M12	

1) Packaging unit quantity





Ordering data – Proximity sensors for T-slot, magneto-resistive							Technical data ➔ 1 / 10.2-13	
	Assembly	Switch output	Electrical connection			Cable length [m]	Part No.	Type
			Cable	M8 plug	M12 plug			
N/O contact								
	Insertable from above	PNP	3-wire	–	–	2.5	525 898	SMT-8F-PS-24V-K2,5-OE
		NPN					525 909	SMT-8F-NS-24V-K2,5-OE
		–	2-wire	–	–	2.5	525 908	SMT-8F-ZS-24V-K2,5-OE
		PNP	–	3-pin	–	0.3	525 899	SMT-8F-PS-24V-K0,3-M8D
		NPN					525 910	SMT-8F-NS-24V-K0,3-M8D
		PNP	–	–	3-pin	0.3	525 900	SMT-8F-PS-24V-K0,3-M12
	Insertable from end, flush with the cylinder profile	PNP	3-wire	–	–	2.5	175 436	SMT-8-PS-K-LED-24-B
			–	3-pin	–	0.3	175 484	SMT-8-PS-S-LED-24-B
N/C contact								
	Insertable from above	PNP	3-wire	–	–	7.5	525 911	SMT-8F-PO-24V-K7,5-OE

Ordering data – Proximity sensors for T-slot, magnetic reed					Technical data➔ 1 / 10.2-18	
	Assembly	Electrical connection		Cable length [m]	Part No.	Type
		Cable	M8 plug			
N/O contact						
	Insertable from above	3-wire	–	2.5	525 895	SME-8F-DS-24V-K2,5-OE
				5.0	525 897	SME-8F-DS-24V-K5,0-OE
		2-wire	–	2.5	525 907	SME-8F-ZS-24V-K2,5-OE
		–	3-pin	0.3	525 896	SME-8F-DS-24V-K0,3-M8D
	Insertable from end, flush with the cylinder profile	3-wire	–	2.5	150 855	SME-8-K-LED-24
		–	3-pin	0.3	150 857	SME-8-S-LED-24
N/C contact						
	Insertable from end, flush with the cylinder profile	3-wire	–	7.5	160 251	SME-8-O-K-LED-24

# Three-point grippers HGD

Accessories

**FESTO**

Ordering data – Plug sockets with cable						Technical data➔ 1 / 10.2-114	
	Assembly	Switch output		Connection	Cable length [m]	Part No.	Type
		PNP	NPN				
Straight plug socket							
	M8 union nut	■	■	3-pin	2.5	159 420	SIM-M8-3GD-2,5-PU
					5	159 421	SIM-M8-3GD-5-PU
	M12 union nut	■	■	3-pin	2.5	159 428	SIM-M12-3GD-2,5-PU
					5	159 429	SIM-M12-3GD-5-PU
Angled plug socket							
	M8 union nut	■	■	3-pin	2.5	159 422	SIM-M8-3WD-2,5-PU
					5	159 423	SIM-M8-3WD-5-PU
	M12 union nut	■	■	3-pin	2.5	159 430	SIM-M12-3WD-2,5-PU
					5	159 431	SIM-M12-3WD-5-PU

