

Three-point grippers HGD

FESTO



Three-point grippers HGD

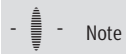
Key features

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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

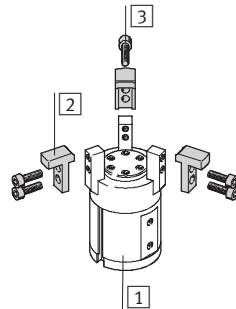


Note

Sizing software
Gripper selection
→ www.festo.com

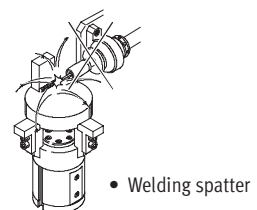
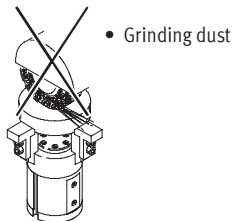
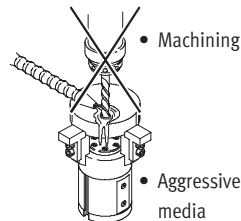
Mounting options for external gripper fingers (customer-specific)

- 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:



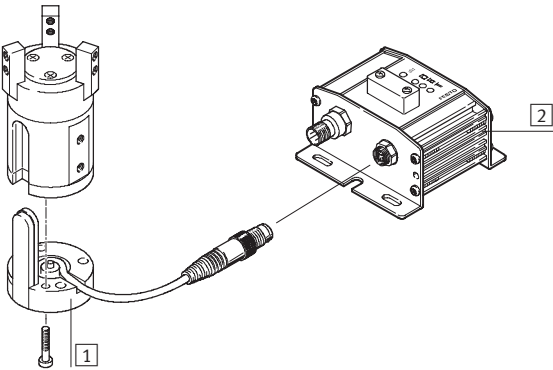
Three-point grippers HGD

Peripherals overview and type codes

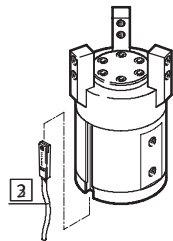


Peripherals overview

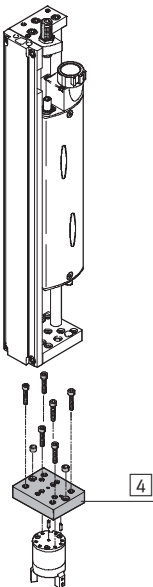
HGD-16



HGD-32/-50



System product for handling and assembly technology



Accessories			
Type	Brief description		→ Page/Internet
1	Position sensor SMH-S1	Adaptable and integratable sensor technology, for sensing the piston position	10
2	Evaluation unit SMH-AE1	For position sensor SMH-S1	10
3	Proximity sensor SME/SMT-8	For sensing the piston position	10
4	–	Drive/gripper connections	adapter kit

Type codes

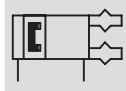
		HGD	–	16	–	A
Type						
HGD	Three-point gripper					
Size						
Position sensing						
A	For proximity sensing					

Three-point grippers HGD

Technical data

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Function
Double-acting



www.festo.com

Wearing parts kits
→ 9



Ø - Size
16 ... 50 mm

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 ¹⁾ [N]		0.08	0.3	0.75
Stroke	per gripper jaw [mm]	2.5	3.9	6
	smallest gripping Ø ²⁾ [mm]	23	33.2	50
	largest gripping Ø ²⁾ [mm]	28	41	62
Pneumatic connection		M3	M5	G1/8
Repetition accuracy ³⁾ [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 ¹⁾		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

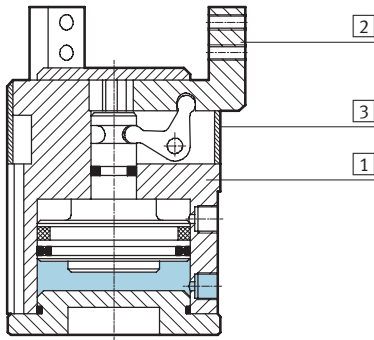
Three-point grippers HGD

Technical data

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Materials

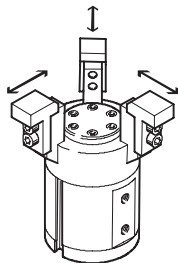
Sectional view



Three-point gripper

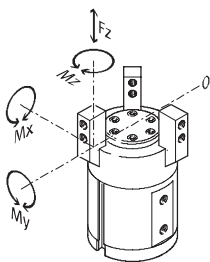
1	Body	Nickel-plated aluminium
2	Gripper jaw	High-alloy steel, nickel plated
3	Cover cap	Polyacetate
–	Note on materials	Copper, PTFE and silicone-free
		Conforms to RoHS

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.

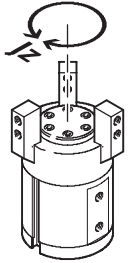
Size		16	32	50
Max. permissible force F_z	[N]	34	90	173
Max. permissible torque M_x	[Nm]	0.5	1.6	4.7
Max. permissible torque M_y	[Nm]	0.8	2.8	8.1
Max. permissible torque M_z	[Nm]	0.5	1.9	5.3

Three-point grippers HGD

Technical data

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Mass moment of inertia [$\text{kgm}^2 \times 10^{-4}$]



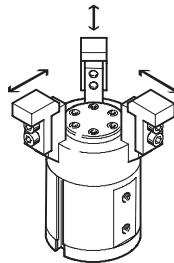
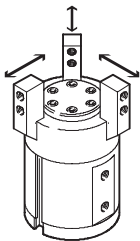
Mass moment of inertia [$\text{kgm}^2 \times 10^{-4}$]
for three-point grippers in relation to
the central axis, without external
gripper fingers, without load.

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

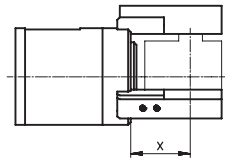
Three-point grippers HGD

Technical data

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

Gripping forces

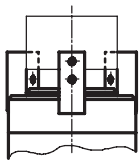


Gripping torques can be determined with the following diagrams for the various sizes in relation to operating

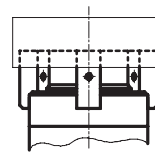
pressure and lever arm (distance from the zero co-ordinate line shown above

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

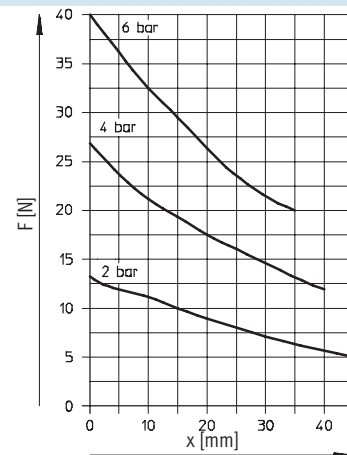
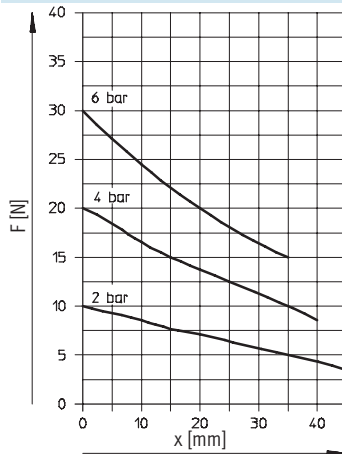
External gripping (closing)



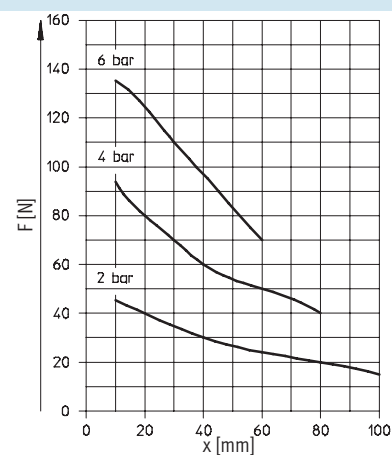
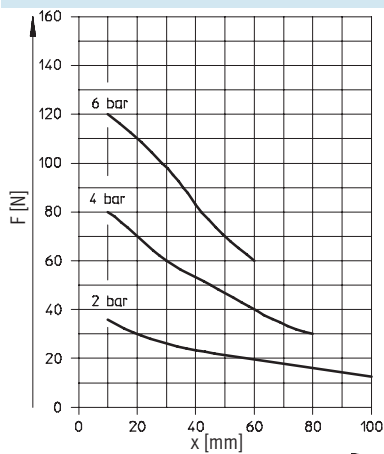
Internal gripping (opening)



HGD-16-A



HGD-32-A



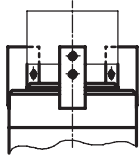
Three-point grippers HGD

Technical data

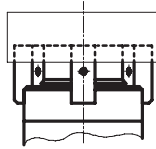
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Gripping force F per gripper as a function of operating pressure and the lever arm x

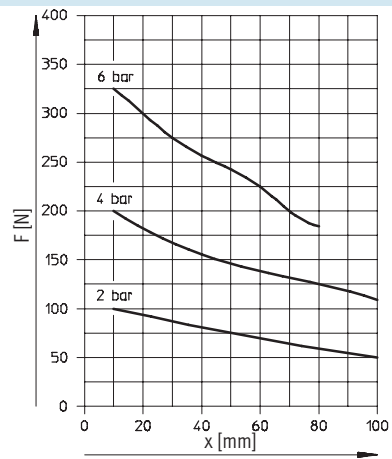
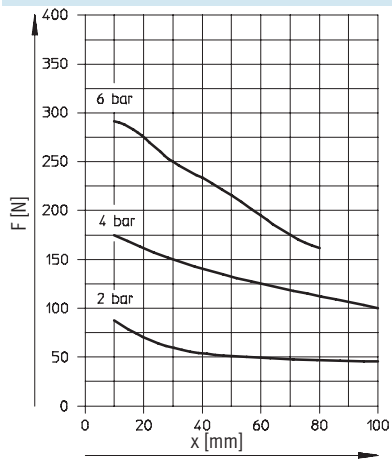
External gripping (closing)



Internal gripping (opening)



HGD-50-A



Three-point grippers HGD

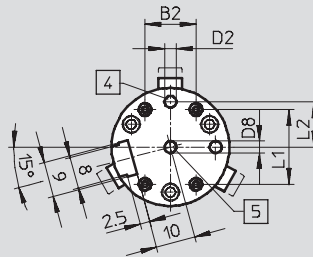
Technical data

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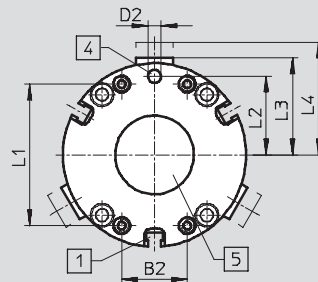
Dimensions

Download CAD data → www.festo.com

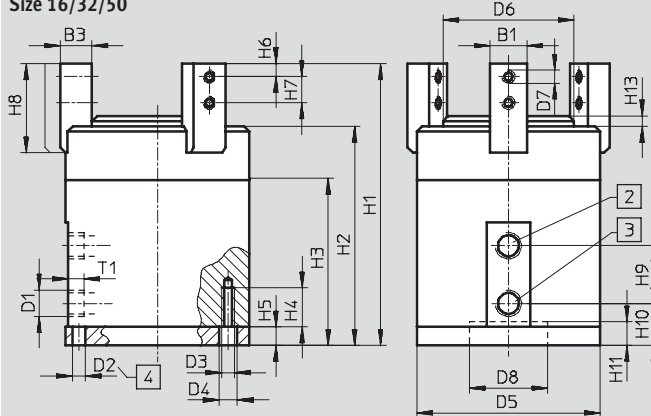
Size 16



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 H8		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

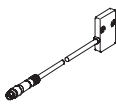

Ordering data – Wearing parts kits

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

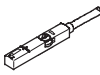

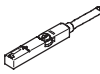
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


Accessories

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Ordering data					
Type	For size	Weight [g]	Part No.	Type	PU ¹⁾
Position sensor SMH-S1			Technical data → Internet: smh-s1		
	16	30	175 713	SMH-S1-HGD16	1
Evaluation unit SMH-AE1			Technical data → Internet: smh-ae		
	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 → Internet: sm
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	2.5	543 867	SMT-8M-PS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543 866	SMT-8M-PS-24V-K-0,3-M8D
			Plug M12x1, 3-pin	0.3	543 869	SMT-8M-PS-24V-K-0,3-M12
	Insertable in the slot lengthwise, flush with the cylinder profile	NPN	Cable, 3-wire	2.5	543 870	SMT-8M-NS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543 871	SMT-8M-NS-24V-K-0,3-M8D
			Cable, 3-wire	2.5	175 436	SMT-8-PS-K-LED-24-B
			Plug M8x1, 3-pin	0.3	175 484	SMT-8-PS-S-LED-24-B
N/C contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	7.5	543 873	SMT-8M-PO-24V-K7,5-OE

Ordering data – Proximity sensors for T-slot, magnetic reed					Technical data → Internet: sme	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	Contacting	Cable, 3-wire	2.5	543 862	SME-8M-DS-24V-K-2,5-OE
				5.0	543 863	SME-8M-DS-24V-K-5,0-OE
			Cable, 3-wire	2.5	543 872	SME-8M-ZS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543 861	SME-8M-DS-24V-K-0,3-M8D
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	150 855	SME-8-K-LED-24
			Plug M8x1, 3-pin	0.3	150 857	SME-8-S-LED-24
N/C contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	160 251	SME-8-O-K-LED-24

Three-point grippers HGD

Accessories

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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	541 333	NEBU-M8G3-K-2.5-LE3
			5	541 334	NEBU-M8G3-K-5-LE3
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541 363	NEBU-M12G5-K-2.5-LE3
			5	541 364	NEBU-M12G5-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 338	NEBU-M8W3-K-2.5-LE3
			5	541 341	NEBU-M8W3-K-5-LE3
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541 367	NEBU-M12W5-K-2.5-LE3
			5	541 370	NEBU-M12W5-K-5-LE3