

Parallel grippers HGP, with protective dust cap

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Parallel grippers HGP, with protective dust cap

Key features

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At a glance

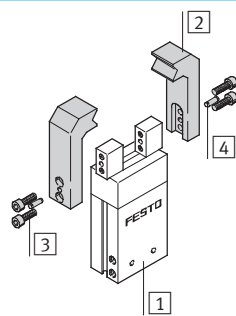
- Double-acting piston drive
- Self-centring
- Variable gripping action:
 - External/internal gripping
- Versatility thanks to externally adaptable gripper fingers
- Wide range of options for mounting on drive units
- High gripping force and compact size
- Max. repetition accuracy
- Gripping force retention
- Internal fixed flow control
- With protective dust cap for use in dusty environments (protection class IP54)
- 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

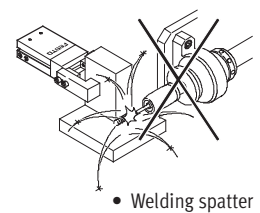
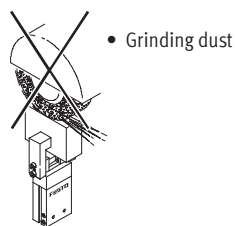
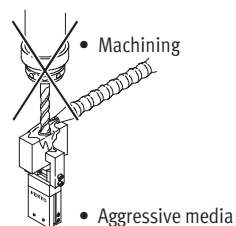
Mounting options for external gripper fingers (customer-specific)

- 1 Parallel gripper
- 2 External gripper fingers
- 3 Mounting screws
- 4 Centring pins



Note

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

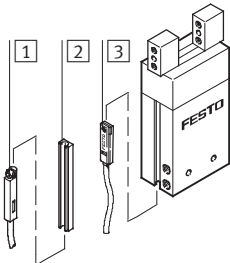


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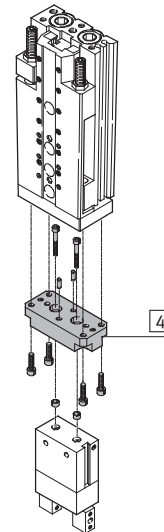
Peripherals overview and type codes

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Peripherals overview



System product for handling and assembly technology



Accessories			
Type	Brief description		→ Page/Internet
1 Proximity sensor SME/SMT-10	For sensing the piston position		10
2 Bondable sensor rail HGP-SL	Allows the use of proximity sensors SME/SMT-10		9
3 Proximity sensor SME/SMT-8	For sensing the piston position		9
4 –	Drive/gripper connections		adapter kit

Type codes

		HGP	–	16	–	A	–	B	–	SSK
Type										
HGP	Parallel gripper									
Size										
Position sensing										
A	For proximity sensing									
Generation										
B	B series									
Protective dust cap										
SSK	Protective dust cap									

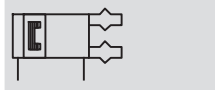
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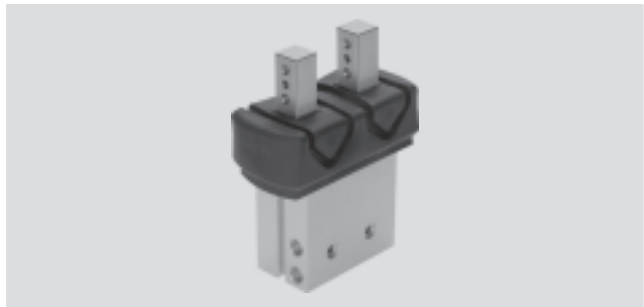
Technical data

Function
Double-acting

[www.festo.com/en/
Spare_parts_service](http://www.festo.com/en/Spare_parts_service)



-N- Size
16, 25 mm
-T- Stroke
10, 14 mm



General technical data		
Size	16	25
Design	Lever mechanism	
Mode of operation	Double-acting	
Gripper function	Parallel	
Number of gripper jaws	2	
Max. weight force per external gripper finger ¹⁾ [N]	0.4	0.8
Stroke per gripper jaw [mm]	5	7.5
Pneumatic connection	M3	G1/8
Repetition accuracy ²⁾ [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 centring sleeve	
	Via through-holes and centring sleeve	
Weight [g]	197	737

1) Valid for unthrottled operation

2) End position drift under constant conditions of use with 100 consecutive strokes in the direction of movement of the gripper jaws

Note: This product conforms to ISO 1179-1 and ISO 228-1

Operating and environmental conditions		
Min. operating pressure [bar]	2	
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 [°C]	+5 ... +60	
Corrosion resistance class CRC ¹⁾	1	

1) Corrosion resistance class 1 according to Festo standard 940 070

Components subject to low corrosion stress. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

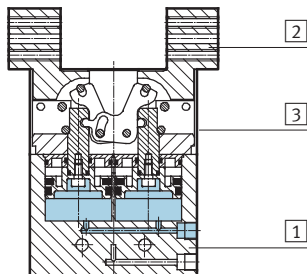
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Technical data

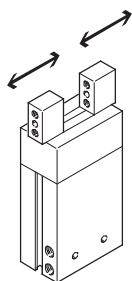
Materials

Sectional view



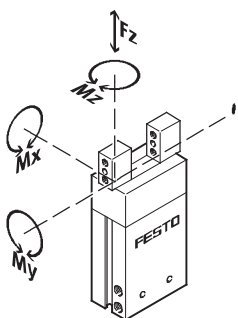
Parallel gripper	
1 Body	Hard anodised aluminium
2 Gripper jaw	High-alloy steel
3 Cover cap	Polyamide
– Protective dust cap SSK	Thermoplastic vulcanizate
– Note on materials	Copper, PTFE and silicone-free Conforms to RoHS

Gripping force [N] at 6 bar



Size	16	25
Gripping force per gripper jaw		
Opening	70	185
Closing	80	170
Total gripping force		
Opening	140	370
Closing	160	340

Characteristic load values per gripper jaw



The indicated permissible forces and torques apply to a single gripper jaw. The indicated values include the lever arm, additional applied loads caused

by the workpiece or external gripper fingers, as well as forces which occur during movement. The zero co-ordinate line (gripper jaw

guide) must be taken into consideration for the calculation of torques.

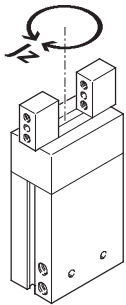
Size	16	25
Max. permissible force F_z [N]	90	240
Max. permissible torque M_x [Nm]	3.3	11
Max. permissible torque M_y [Nm]	3.3	11
Max. permissible torque M_z [Nm]	3.3	11

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Mass moment of inertia [kgm²x10⁻⁴]



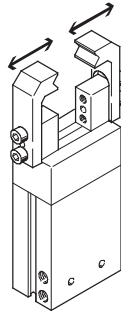
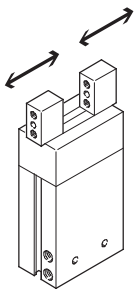
Mass moment of inertia [kgm²x10⁻⁴]
for parallel grippers in relation to the
central axis, without external gripper
fingers, without load.

Size	16	25
HGP-...	0.47	3.83

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	25
Without external gripper fingers			
HGP-...	Opening	44	47
	Closing	60	50
With external gripper fingers (as a function of weight force)			
HGP-...	1.00 N	100	–
	1.50 N	200	100
	2.00 N	300	200
	3.00 N	–	300

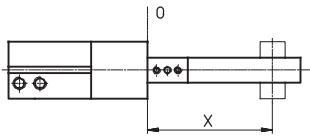
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Technical data

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Gripping force F_{Grip} per gripper jaw as a function of operating pressure and lever arm x

External and internal gripping (closing and opening)

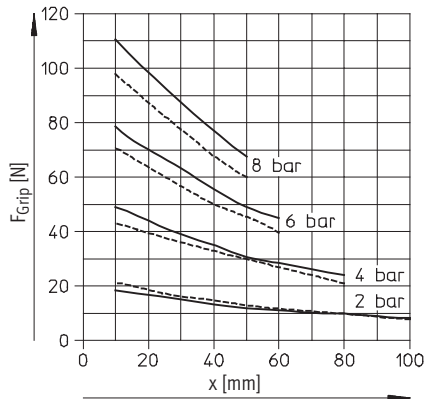


Gripping forces can be determined with the following diagrams for the various sizes in relation to operating

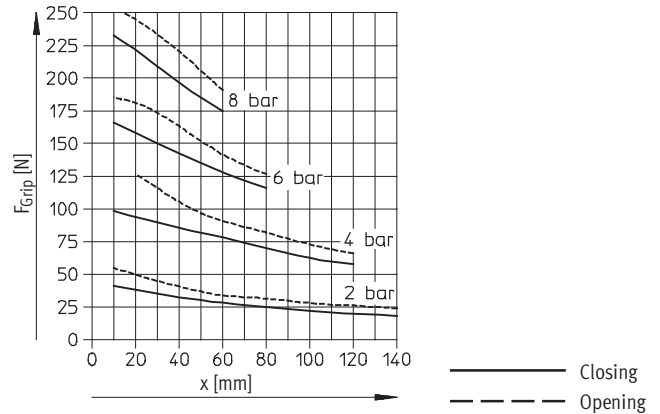
pressure and lever arm (distance from the zero co-ordinate line shown

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

HGP-16-...

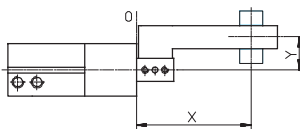


HGP-25-...



Gripping force F_{Grip} per gripper jaw at 6 bar as a function of lever arm x and eccentricity y

External and internal gripping (closing and opening)



Gripping forces can be determined with the following diagrams for the various sizes at 6 bar in relation to eccentric application of force (distance

from the zero co-ordinate line shown opposite to the pressure point at which the fingers grip the workpiece)

and the maximum permissible off-centre point at which force is applied.

Calculation example

Given:

HGP-16-A-B

Lever arm $x = 20$ mm

Eccentricity $y = 22$ mm

To be found:

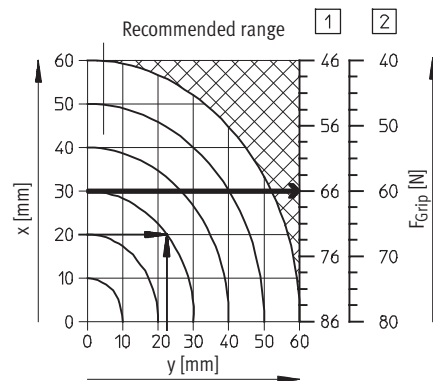
Gripping force at 6 bar

Procedure:

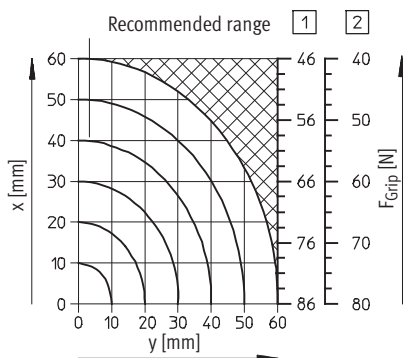
- Determine the intersection xy between lever arm x and eccentricity y in the graph for HGP-16-A-B
- Draw an arc (with centre at origin) through intersection xy
- Determine the intersection between the arc and the X axis
- Read the gripping force

Result:

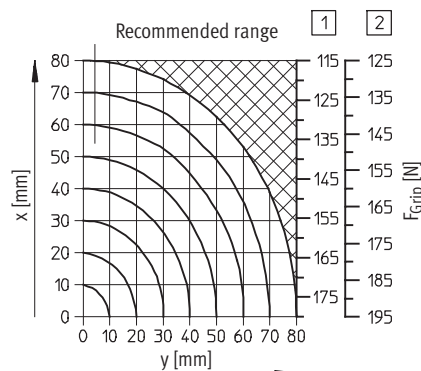
Gripping force = approx. 66 N



HGP-16-...



HGP-25-...



1 Closing
2 Opening

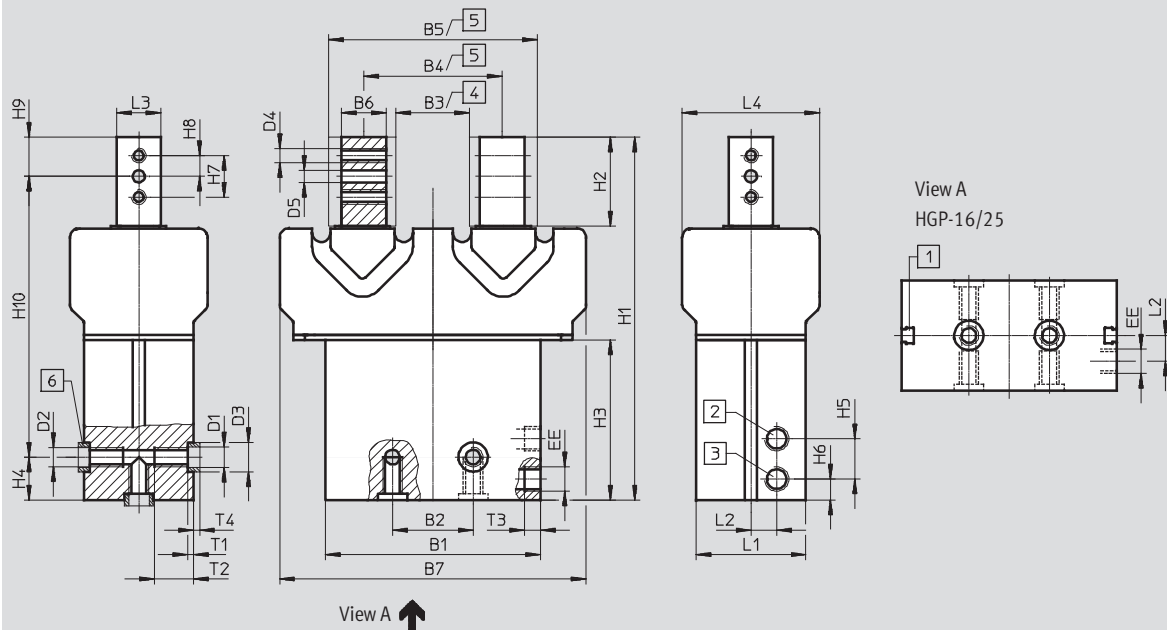
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Technical data

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Dimensions

Download CAD Data → www.festo.com/us/cad



1 Sensor slot for proximity sensor SME/SMT-8 (not with HGP-06-A). Proximity sensors SME/SMT-10 can also be used in combination with the sensor strip HGP-SL-... (can be glued into place).

2 Compressed air connection, opening
3 Compressed air connection, closing
4 Closed
5 Open
6 Centring sleeves ZBH (2 included in scope of delivery)

Due to the distance H5 between the two air connections on types HGP-06/-10/-16 which measures 7 mm, only the following tube fittings can be used

- QSM-M3-3
- QSML-M3-3
- QSMLL-M3-3
- CN-M3-PK-3
- LCN-M3-PK-3

Size	B1	B2 ¹⁾	B3	B4	B5	B6	B7	D1	D2	D3	D4	D5	EE	H1	H2	H3
[mm]		±0,1	±0,5	±0,5	±0,5	-0,03	±0,5	∅		∅		∅				
16	47	25	16.4	26.4	46.4	10	67	5.3	M4	7	M4	3	M3	83	20.5	38.1
25	68.2	29	21	36	66	15	101	6.4	M6	9	M5	4	G ³ / ₈	126.8	31.5	58.8

Size	H4 ²⁾	H5	H6	H7	H8	H9	H10	L1	L2	L3	L4	T1	T2	T3	T4
[mm]	±0,1						±0,2			-0,03		+0,1	+1	+0,5	-0,3
16	7.5	7	4	11	5.5	10	65.5	22	5.7	10	30	1.6	7.5	3.5	1.4
25	17.5	16.5	8.3	16	8	15	94.3	37	10.5	15	47	2.1	15	6.5	1.9

1) Tolerance for centring hole: ±0.02

2) Tolerance for centring hole: -0.05

Note: This product conforms to ISO 1179-1 and ISO 228-1

Ordering data

Size	Part No.	Type
[mm]		
16	539 636	HGP-16-A-B-SSK
25	539 635	HGP-25-A-B-SSK

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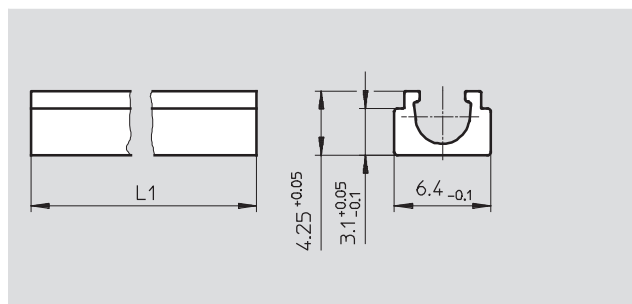
Accessories

Sensor rail HGP-SL

can be glued into place

Material:

Wrought aluminium alloy



Dimensions and ordering data				
For size [mm]	L1	Weight [g]	Part No.	Type
16	38	1.5	535 583	HGP-SL-10-16
25	58	2.3	535 585	HGP-SL-10-25

Ordering data					
Type	For size	Weight [g]	Part No.	Type	PU ¹⁾
Centring sleeve ZBH					
	16	1	186 717	ZBH-7	10
	25		150 927	ZBH-9	

1) Packaging unit quantity

Ordering data – Proximity sensors for T-slot, magneto-resistive					Technical data → Internet: smt	
	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
		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
	Insertable in the slot lengthwise, flush with the cylinder profile	PNP	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	

Parallel grippers HGP, with protective dust cap

Accessories

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Ordering data – Proximity sensors for C-slot, magneto-resistive					Technical data → Internet: smt	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above	PNP	Cable, 3-wire, in-line	2.5	551 373	SMT-10M-PS-24V-E-2,5-L-OE
			Plug M8x1, 3-pin, in-line	0.3	551 375	SMT-10M-PS-24V-E-0,3-L-M8D
			Plug M8x1, 3-pin, lateral	0.3	551 376	SMT-10M-PS-24V-E-0,3-Q-M8D

Ordering data – Proximity sensors for C-slot, magnetic reed					Technical data → Internet: sme	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above	Contacting	Plug M8x1, 3-pin, in-line	0.3	551 367	SME-10M-DS-24V-E-0,3-L-M8D
			Cable, 3-wire, in-line	2.5	551 365	SME-10M-DS-24V-E-2,5-L-OE
			Cable, 2-wire, in-line	2.5	551 369	SME-10M-ZS-24V-E-2,5-L-OE
	Insertable in the slot lengthwise	Contacting	Plug M8x1, 3-pin, in-line	0.3	173 212	SME-10-SL-LED-24
			Cable, 3-wire, in-line	2.5	173 210	SME-10-KL-LED-24

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

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