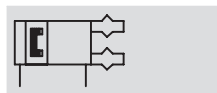


## Parallel grippers HGPC

Technical data

Function  
Double-acting  
HGPC-...-A



Single-acting or  
with gripping force retention  
closed HGPC-...-G2



-  - Size  
12, 16, 20 mm
-  - Stroke  
6 ... 14 mm



General technical data			
Size	12	16	20
Constructional design	Wedge-shaped drive		
	Guided motion sequence		
Mode of operation	Double-acting		
Gripper function	Parallel		
Number of gripper jaws	2		
Max. applied load per external gripper finger <sup>1)</sup> [N]	0.2	0.5	0.8
Stroke per gripper jaw [mm]	3	5	7
Pneumatic connection	M5		
Repetition accuracy <sup>2)</sup> [mm]	≤ 0.05		
Max. interchangeability [mm]	≤ 0.2		
Max. gripper jaw backlash <sup>3)</sup> [mm]	0		
Max. gripper jaw angular backlash <sup>4)</sup> [°]	0		
Max. operating frequency [Hz]	4		
Rotational symmetry [mm]	< Ø 0.2		
Position sensing	For proximity sensing		
Type of mounting	With female thread and centring sleeve		
Mounting position	Any		

- 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
- 3) Perpendicular to the direction of motion of the gripper jaws
- 4) Pretensioned, backlash-free ball bearing guide

Operating and environmental conditions			
Min. operating pressure	HGPC-...-A	[bar]	2
	HGPC-...-G2	[bar]	4
Max. operating pressure		[bar]	8
Operating medium	Filtered compressed air, lubricated or unlubricated		
Ambient temperature <sup>1)</sup>		[°C]	+5 ... +60
Corrosion resistance class CRC <sup>2)</sup>	2		

- 1) Note operating range of proximity sensors
- 2) 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

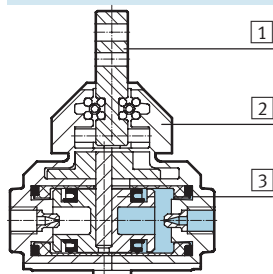
Weights [g]			
Size	12	16	20
HGPC-...-A	152	241	473
HGPC-...-G2	154	244	477

# Parallel grippers HGPC

Technical data

## Materials

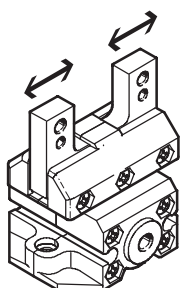
Sectional view



## Parallel gripper

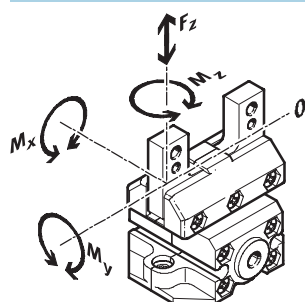
1	Gripper jaw	High-alloy steel
2	Housing	Die-cast zinc
3	Piston	Polyamide
–	Seals	Polyurethane, nitrile rubber
	Note on materials	Copper, PTFE and silicone-free

## Gripping force [N] at 6 bar



Size	12	16	20
Gripping force per gripper jaw			
Opening	22	41.5	63
Closing	22	41.5	63
Total gripping force			
Opening	44	83	126
Closing	44	83	126

## Static characteristic load values at the gripper jaws



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 coordinate line (gripper finger guide) must be taken into consideration for the calculation of torques.

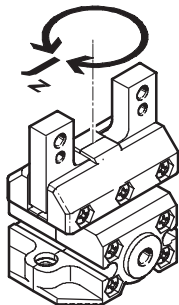
Size		12	16	20
Max. permissible force $F_z$	[N]	40	80	120
Max. permissible torque $M_x$	[Nm]	1	2,5	5
Max. permissible torque $M_y$	[Nm]	1	2,5	5
Max. permissible torque $M_z$	[Nm]	1	2,5	5

## Parallel grippers HGPC

Technical data

**FESTO**

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



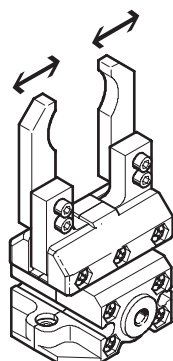
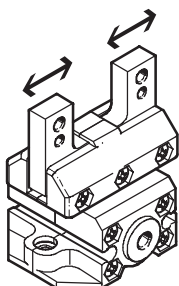
Mass moment of inertia [kgm<sup>2</sup>x10<sup>-4</sup>]  
of the parallel gripper in relation to  
the central axis with no load.

Size	12	16	20
HGPC-...-A	0.272	0.679	2.095
HGPC-...-G2	0.274	0.683	2.105

### 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 at 6 bar  
operating pressure with horizontally  
mounted gripper without additional

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

Size		12	16	20
without external gripper fingers				
HGPC-...-A	Opening	30	60	90
	Closing	30	60	90
HGPC-...-G2	Opening	30	70	105
	Closing	30	50	75
with external gripper fingers as a function of applied load				
HGPC-...	0.4 N	40	–	–
	0.5 N	60	–	–
	0.6 N	80	–	–
	0.7 N	–	80	–
	1.0 N	–	100	–
	1.2 N	–	–	100

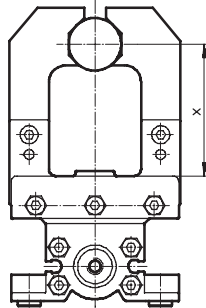
## Parallel grippers HGPC

Technical data

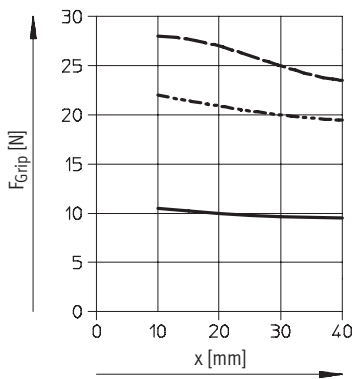
FESTO

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

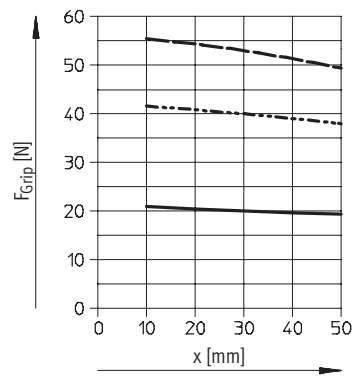
Gripping forces as a function of the operating pressure and the lever arm can be determined for the size using the following graph.



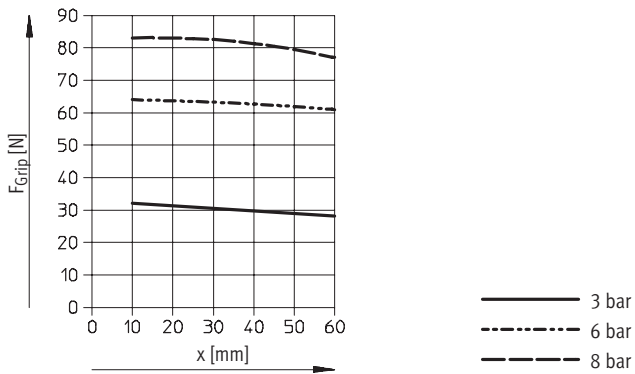
HGPC-12-A



HGPC-16-A



HGPC-20-A



## Parallel grippers HGPC

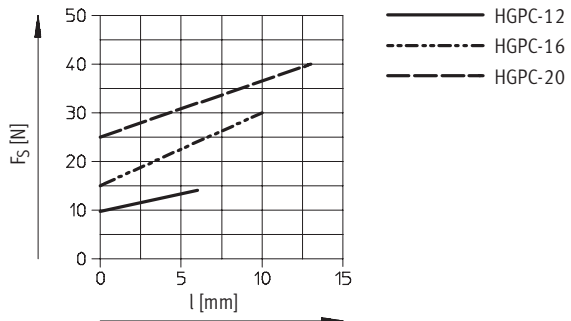
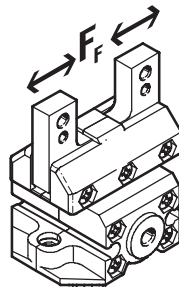
Technical data

**FESTO**

### Spring force $F_S$ as a function of the gripper size and the overall stroke $l$

Gripping force retention for HGPC-...-G2

Spring forces  $F_S$  as a function of the gripper size and the overall stroke  $l$  for various gripper types (HGPC-...-G2) can be determined using the following graphs.



The lever arm  $x$  must be taken into consideration when determining the actual spring force  $F_{S\text{total}}$ . The formulae for calculating the spring force are provided in the table opposite.

Size	$F_{S\text{total}} =$
12	$-0.02 \cdot x + 0.5 \cdot F_S$
16	$-0.05 \cdot x + 0.5 \cdot F_S$
20	$-0.05 \cdot x + 0.5 \cdot F_S$

### Determination of the actual gripping forces $F_{Gr}$ for HGPC-...-G2 depending on the application

Parallel grippers with integrated spring type HGPC-...-G2 (closing gripping force retention) can be used as:

- single-acting grippers

- grippers with supplementary gripping force
- grippers with gripping force retention

In order to calculate available gripping forces  $F_{Gr}$  (per gripper jaw), the gripping force ( $F_{Grip}$ ) and spring

force ( $F_{S\text{total}}$ ) must be combined accordingly.

#### Application

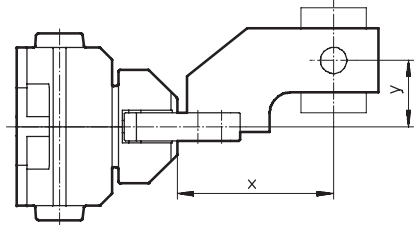
Single-acting	Supplementary gripping force	Gripping force retention
<ul style="list-style-type: none"> <li>Gripping with spring force: <math>F_{Gr} = F_{S\text{total}}</math></li> <li>Gripping with pressure force: <math>F_{Gr} = F_{Grip} - F_{S\text{total}}</math></li> </ul>	<ul style="list-style-type: none"> <li>Gripping with pressure and spring force: <math>F_{Gr} = F_{Grip} + F_{S\text{total}}</math></li> </ul>	<ul style="list-style-type: none"> <li>Gripping with spring force: <math>F_{Gr} = F_{S\text{total}}</math></li> </ul>

# Parallel grippers HGPC

Technical data

FESTO

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



Gripping forces at 6 bar dependent upon eccentric application of force and the maximum permissible off-centre point of force application can be determined for the size using the following graph.

### Calculation example

Given:

Lever arm  $x = 20$  mm

Eccentricity  $y = 22$  mm

To be found:

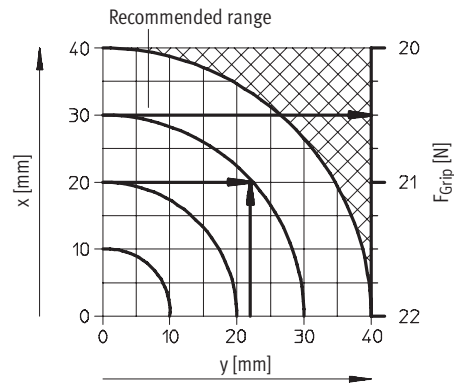
Gripping force at 6 bar

Procedure:

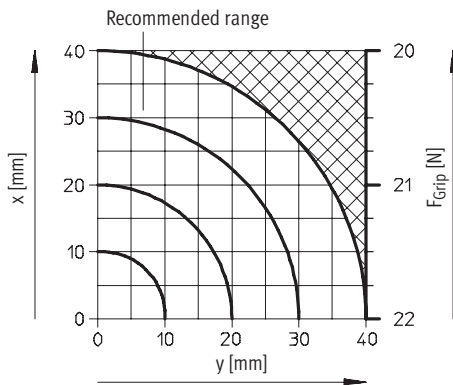
- Determine the intersection  $xy$  between lever arm  $x$  and eccentricity  $y$  in the graph for HGPC-12-A...
- Draw an arc (with centre at origin) through intersection  $xy$ .
- Determine the intersection between the arc and the X axis.
- Read the gripping force.

Result:

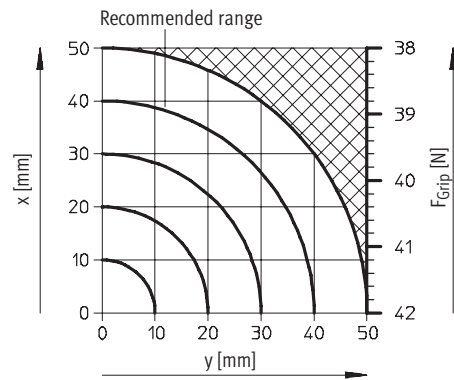
Gripping force  $F = \text{approx. } 20.5$  N



### HGPC-12-A



### HGPC-16-A



### HGPC-20-A

