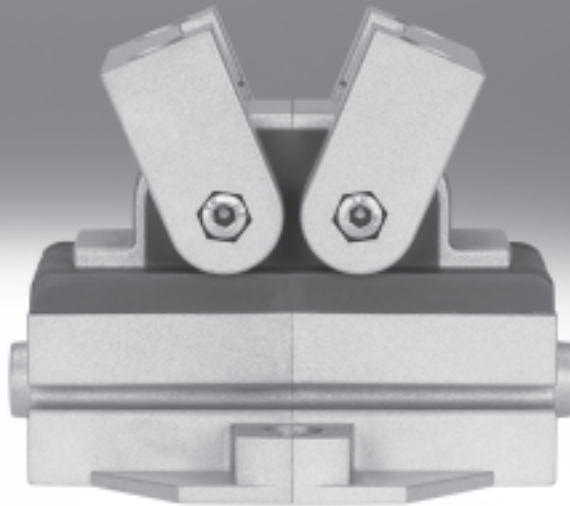


## Angle grippers HGWC

**FESTO**



# Angle grippers HGWC

Key features

## At a glance

### General information

The compact and cost-optimised angle gripper consists of a two-part mirror-symmetrical housing made of die-cast zinc. The force generated by the linear motion of the piston is translated into the gripper jaw movement via a pneumatic piston, which acts directly on the gripper jaws installed in the

housing by means of a moment compensator in accordance with the rack and pinion principle. To ensure a low-backlash plain-bearing guide for the gripper jaws, appropriate guide elements are fitted in the housing and pretensioned by means of socket head screws.

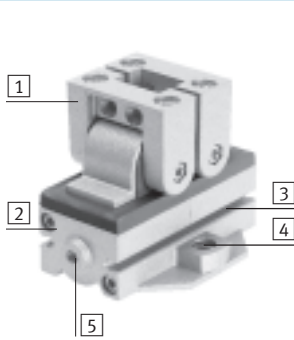
- Double-acting gripper
- Internal fixed flow control, does away with the need for external flow control in 90% of applications
- High force with minimal volume
- Suitable for external and internal gripping

- Opening angle of 30°, 80°
- Wide range of options for mounting on drives
- Repetition accuracy of 0.05 mm
- Slot for proximity sensor SME/SMT-10

### Note

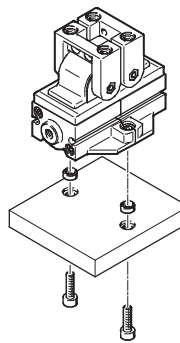
Sizing software for gripper selection  
 → [www.festo.com](http://www.festo.com)

## Details

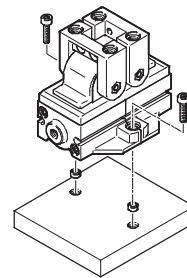


- 1 Gripper jaw
- 2 Housing based on half-shell principle
- 3 Slot for proximity sensor, for sensing the piston position
- 4 Mounting option
- 5 Supply port

## Mounting option from underneath

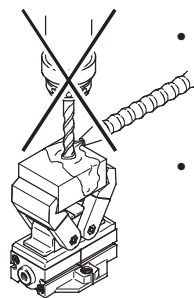


## from above



### Note

Angle grippers are not designed for the following sample applications:



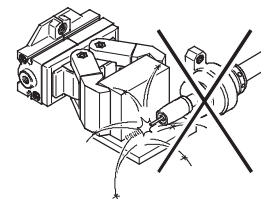
• Machining

• Aggressive media



• Grinding dust

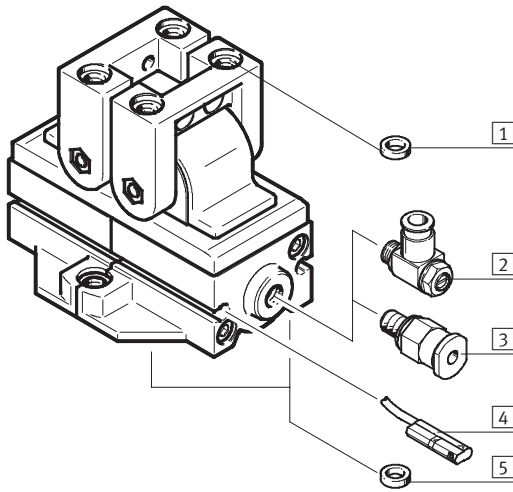
• Welding spatter



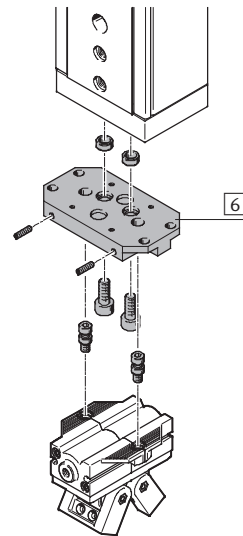
# Angle grippers HGWC

Peripherals overview and type codes

**Peripherals overview**



**System product for handling and assembly technology**



Accessories		
Type	Brief description	→ Page/Internet
1 Centring sleeve ZBH	<ul style="list-style-type: none"> <li>For centring when attaching gripper fingers</li> <li>4 included in the scope of delivery of the gripper</li> </ul>	10
2 One-way flow control valve GRLA	For regulating speed	grla
3 Push-in fitting QS	For connecting compressed air tubing with standard O.D.	quick star
4 Proximity sensor SME/SMT-10	For sensing the piston position	10
5 Centring sleeve ZBH	<ul style="list-style-type: none"> <li>For centring when attaching to a drive or plate</li> <li>2 included in the scope of delivery of the gripper</li> </ul>	10
6 -	Drive/gripper connections	adapter kit

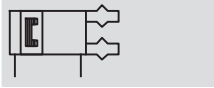
**Type codes**

		HGWC	-	12	-	40	-	A
<b>Type</b>								
HGWC	Angle gripper							
<b>Size</b>								
<b>Opening angle per gripper jaw</b>								
15	15°							
40	40°							
<b>Position sensing</b>								
A	Via proximity sensor							

# Angle grippers HGWC

Technical data

Function  
Double-acting  
HGWC-...-A



-  - Size  
12, 16, 20 mm
-  - Opening angle  
30° and 80°



General technical data			
Size	12	16	20
Design	Rack and pinion Force-guided motion sequence		
Mode of operation	Double-acting		
Gripper function	Angle		
Number of gripper jaws	2		
Max. opening angle	[°] 30, 80		
Pneumatic connection	M5		
Repetition accuracy <sup>1)</sup>	[mm] ≤ 0.05		
Max. interchangeability	[mm] ≤ 0.2		
Max. gripper jaw backlash <sup>2)</sup>	[mm] ≤ 0.1		
Max. gripper jaw angular backlash <sup>3)</sup>	[°] ≤ 0.5		
Max. operating frequency	[Hz] ≤ 4		
Rotational symmetry	[mm] ≤ ∅ 0.2		
Position sensing	Via proximity sensor		
Type of mounting	Via female thread and centring sleeve		
Mounting position	Any		
Product weight	[g] 200	350	700

1) End-position drift under constant operating conditions with 100 consecutive strokes in the direction of movement of the gripper jaws

2) Perpendicular to the direction of motion of the gripper jaws

3) Pretensioned, backlash-free ball bearing guide

Operating and environmental conditions	
Operating pressure	[bar] 2 ... 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

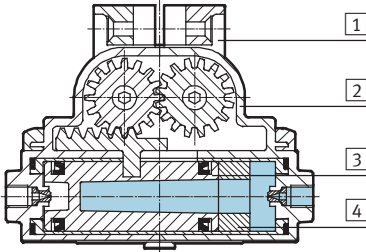
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

# Angle grippers HGWC

Technical data

## Materials

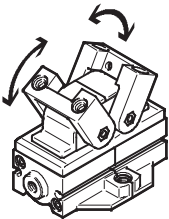
Sectional view



## Angle gripper

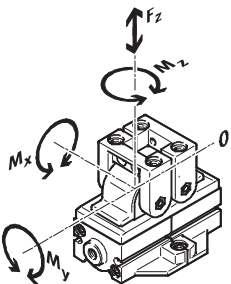
1	Gripper jaw	Die-cast zinc, painted
2	Housing	Die-cast zinc, painted
3	Piston	Polyamide
4	Distance sleeve	Polyurethane
-	Seals	Polyurethane, nitrile rubber
-	Note on materials	Free of copper, PTFE and silicone
		RoHS-compliant

## Total gripping torque at 6 bar



Size		12	16	20
Opening	[Ncm]	22	72	144
Closing	[Ncm]	22	72	144

## Static characteristic load values at the gripper jaws



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.

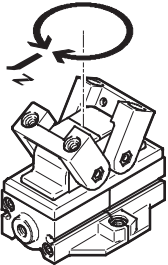
The zero co-ordinate line (gripper jaw guide) must be taken into consideration for the calculation of torques.

Size		12	16	20
Max. permissible force $F_z$	[N]	40	60	80
Max. permissible torque $M_x$	[Nm]	2.5	4	8
Max. permissible torque $M_y$	[Nm]	0.6	1	1.9
Max. permissible torque $M_z$	[Nm]	2	3.2	6.7

# Angle grippers HGWC

Technical data

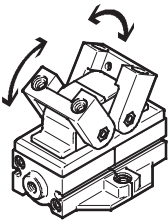
## Mass moment of inertia



Mass moment of inertia [ $\text{kgm}^2 \times 10^{-4}$ ] of the angle gripper in relation to the central axis with no load.

Size	12	16	20
HGWC-...-A [ $\text{kgm}^2 \times 10^{-4}$ ]	0.52	1.35	4.31

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



The indicated opening and closing times [ms] have been measured at room temperature and an operating pressure of 6 bar with vertically mounted gripper and without additional gripper fingers.

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

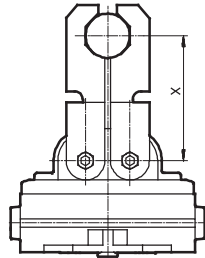
Size		12-15	12-40	16-15	16-40	20-15	20-40
Without external gripper fingers							
HGWC-...-A	Opening	50	70	50	85	50	90
	Closing	35	50	35	70	35	75

# Angle grippers HGWC

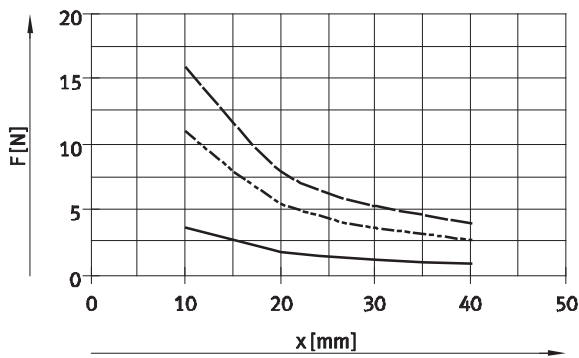
Technical data

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

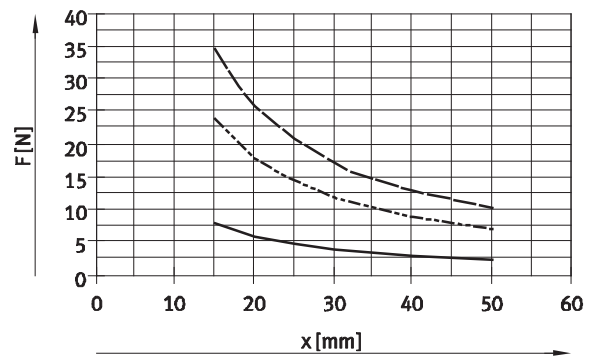
Gripping forces as a function of the operating pressure and the lever arm can be determined for the size using the following graph.



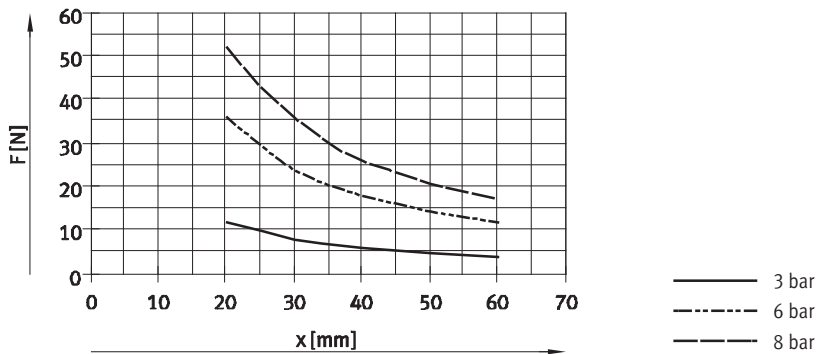
HGWC-12-A



HGWC-16-A



HGWC-20-A



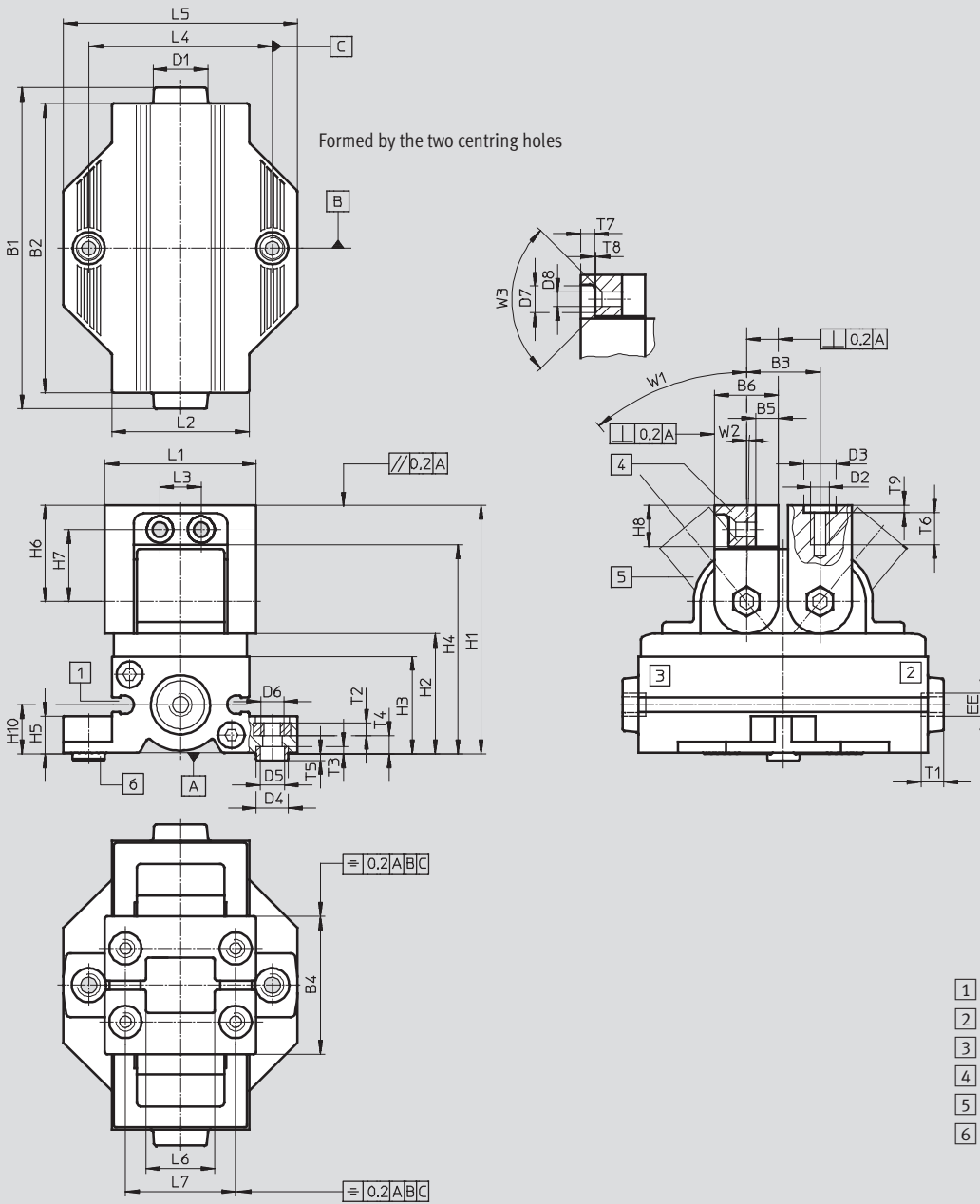
- 3 bar
- - - 6 bar
- · - 8 bar

# Angle grippers HGWC

Technical data

Dimensions

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



- 1 Sensor slot for proximity sensor
- 2 Supply port, opening
- 3 Supply port, closing
- 4 Gripper jaw closed
- 5 Gripper jaw open
- 6 Centring sleeves ZBH  
(2 included in the scope of delivery)



# Angle grippers HGWC

Technical data

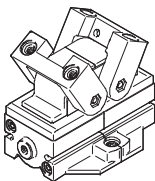
Type	B1	B2	B3 ±0.05	B4 +0.25 -0.05	B5 +0.5	B6 +0.1	D1	D2	D3 +0.05 -0.02	D4 F10/h7	D5
HGWC-12	57	52	12	23	4	11	12	M3	5	7	5.3
HGWC-16	70	63	16	30	5.5	14	12	M4	7	7	5.3
HGWC-20	86	79	20	38	6	18	12	M5	9	9	6.4

Type	D6	D7	D8	EE	H1 ±0.5	H2	H3	H4	H5	H6 ±0.2	H7
HGWC-12	M4	4.8	2.6	M5	43.2	20.7	18.2	35.2	6.9	17	12.5
HGWC-16	M5	5.8	3.2	M5	54.2	26.2	21.2	44.7	8.2	21	15.7
HGWC-20	M6	8.1	4.4	M5	68.2	32.7	27	55.7	10.2	26.5	19.5

Type	H8	H10	L1 ±0.2	L2	L3 ±0.1	L4 <sup>1)</sup>	L5	L6 +0.25 -0.05	L7 <sup>1)</sup>	T1 min.
HGWC-12	7.5	9.2	27.5	25.5	6	33	42	12	20	4.5
HGWC-16	9	10.7	33	30	9	40	51	15	24	5
HGWC-20	12	13.7	45	38	12	50	65	21	33	5

Type	T2	T3 ±0.1	T4 +0.4 -0.3	T5 +0.1 -0.3	T6 min.	T7 +0.2	T8	T9 +0.1	W1 ±2	W2 ±3	W3
HGWC-12-15	2.2	1.7	3.1	1.3	6	1.7	0.5	1.3	15°	1°	90°
40°											
HGWC-16-15	2.7	1.8	3.8	1.2	7	3	0.3	1.6	15°	1°	90°
HGWC-16-40									40°		
HGWC-20-15	3.2	2.3	5.2	1.7	9	3.5	0.5	2.1	15°	1°	90°
HGWC-20-40									40°		

1) Tolerance for centring hole ±0.03  
Tolerance for thread ±0.2

Ordering data			
	Size	Opening angle [°]	Double-acting
			Part No. Type
	12	30	<b>565135</b> HGWC-12-15-A
		80	<b>565141</b> HGWC-12-40-A
	16	30	<b>565137</b> HGWC-16-15-A
		80	<b>565143</b> HGWC-16-40-A
	20	30	<b>565139</b> HGWC-20-15-A
		80	<b>565145</b> HGWC-20-40-A

# Angle grippers HGWC

Accessories

Ordering data – Centring sleeves			Technical data → Internet: zbh	
For size [mm]	Part No.		Type	PU <sup>1)</sup>
	For attaching to a drive or plate			
12, 16	<b>186717</b>	<b>ZBH-7</b>		10
20	<b>150927</b>	<b>ZBH-9</b>		10
For attaching gripper fingers				
12	<b>189652</b>	<b>ZBH-5</b>		10
16	<b>186717</b>	<b>ZBH-7</b>		10
20	<b>150927</b>	<b>ZBH-9</b>		10

1) Packaging unit quantity

Ordering data – Proximity sensors for C-slot, in-line connecting cable					
Assembly	Electrical connection		Cable length [m]	Part No.	Type
	Cable	Plug M8			
N/O contact, magneto-resistive <span style="float: right;">Technical data → Internet: smt</span>					
Insertable in the slot from above	3-wire	–	2.5	<b>551373</b>	<b>SMT-10M-PS-24V-E-2,5-L-OE</b>
	–	3-pin	0.3	<b>551375</b>	<b>SMT-10M-PS-24V-E-0,3-L-M8D</b>
N/O contact, magnetic reed <span style="float: right;">Technical data → Internet: sme</span>					
Insertable from end	3-wire	–	2.5	<b>173210</b>	<b>SME-10-KL-LED-24</b>
	–	3-pin	0.3	<b>173212</b>	<b>SME-10-SL-LED-24</b>

Ordering data – Proximity sensors for C-slot, lateral connecting cable					
Assembly	Electrical connection		Cable length [m]	Part No.	Type
	Cable	Plug M8			
N/O contact, magneto-resistive <span style="float: right;">Technical data → Internet: smt</span>					
Insertable in the slot from above	3-wire	–	2.5	<b>551374</b>	<b>SMT-10M-PS-24V-E-2,5-Q-OE</b>
	–	3-pin	0.3	<b>551376</b>	<b>SMT-10M-PS-24V-E-0,3-Q-M8D</b>
N/O contact, magnetic reed <span style="float: right;">Technical data → Internet: sme</span>					
Insertable from end	3-wire	–	2.5	<b>173211</b>	<b>SME-10-KQ-LED-24</b>
	–	3-pin	0.3	<b>173213</b>	<b>SME-10-SQ-LED-24</b>

Ordering data – Proximity sensors for C-slot, short design					
Assembly	Electrical connection		Cable length [m]	Part No.	Type
	Cable	Plug M8			
N/O contact, magneto-resistive <span style="float: right;">Technical data → Internet: smt</span>					
Insertable from end	3-wire	–	2.5	<b>547862</b>	<b>SMT-10G-PS-24V-E-2,5Q-OE</b>
	–	3-pin	0.3	<b>547863</b>	<b>SMT-10G-PS-24V-E-0,3Q-M8D</b>

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	<b>541333</b>	<b>NEBU-M8G3-K-2.5-LE3</b>	
		5	<b>541334</b>	<b>NEBU-M8G3-K-5-LE3</b>	
Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	<b>541338</b>	<b>NEBU-M8W3-K-2.5-LE3</b>	
		5	<b>541341</b>	<b>NEBU-M8W3-K-5-LE3</b>	