

Radial grippers HGRC

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Radial grippers HGRC

Key features

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At a glance

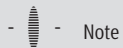
General information

The compact and cost-optimised radial 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 180°
- Repetition accuracy of 0.05 mm
- Slot for proximity sensor SMT/SMT-10
- Wide range of options for mounting on drives

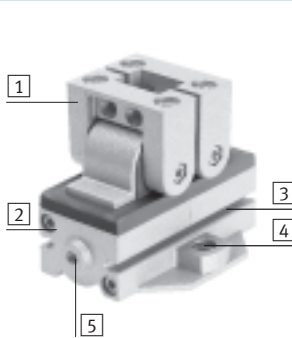


Note

Sizing software for gripper selection

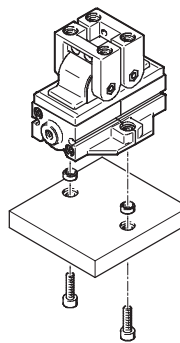
➔ www.festo.com

Details

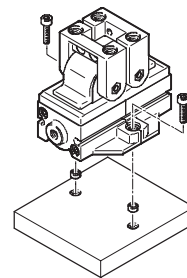


- 1 Gripper jaw
- 2 Housing based on half-shell principle
- 3 Slot for proximity sensor, for sensing the piston position
- 4 Mounting option
- 5 Supply port

Mounting option from underneath

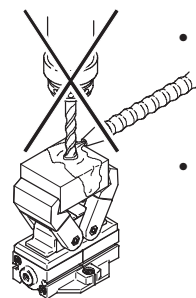


from above



Note

Radial grippers are not designed for the following sample applications:



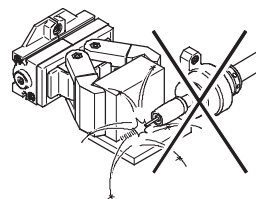
• Machining

• Aggressive media



• Grinding dust

• Welding spatter

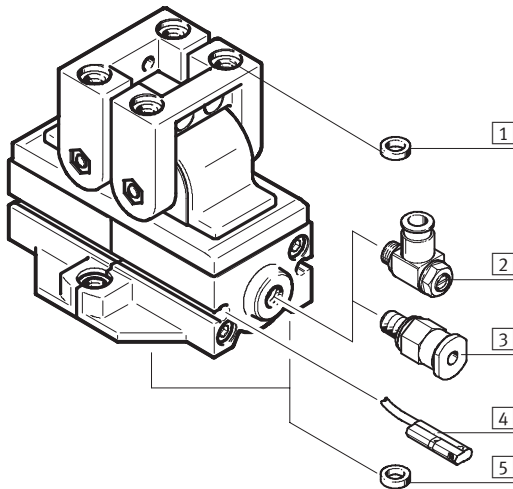


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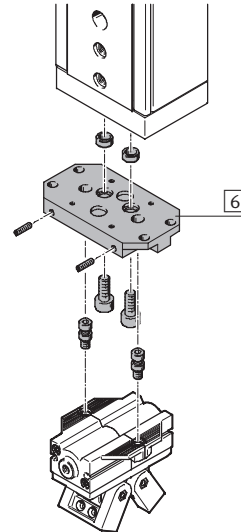
Peripherals overview and type codes

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Peripherals overview



System product for handling and assembly technology



Accessories			
Type	Brief description		→ Page/Internet
1 Centring sleeve ZBH	- For centring when attaching gripper fingers 4 included in the scope of delivery of the gripper		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	- For centring when attaching to a drive or plate 2 included in the scope of delivery of the gripper		10
6 –	Drive/gripper connections		adapter kit

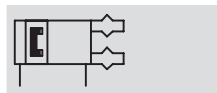
Type codes

		HGRC	–	12	–	A
Type						
HGRC	Radial gripper					
Size						
Position sensing						
A	Via proximity sensor					

Radial grippers HGRC

Technical data

Function
Double-acting
HGRC-...-A



 Size
12, 16, 20 mm
 Opening angle
180°



General technical data			
Size	12	16	20
Design	Rack and pinion Force-guided motion sequence		
Mode of operation	Double-acting		
Gripper function	Radial		
Number of gripper jaws	2		
Max. opening angle [°]	180		
Pneumatic connection	M5		
Repetition accuracy ¹⁾ [mm]	≤ 0.05		
Max. interchangeability [mm]	≤ 0.2		
Max. gripper jaw backlash ²⁾ [mm]	≤ 0.1		
Max. gripper jaw angular backlash ³⁾ [°]	≤ 0.5		
Max. operating frequency [Hz]	≤ 4		
Rotational symmetry [mm]	≤ Ø 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 ¹⁾ [°C]	+5 ... +60
Corrosion resistance class CRC ²⁾	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

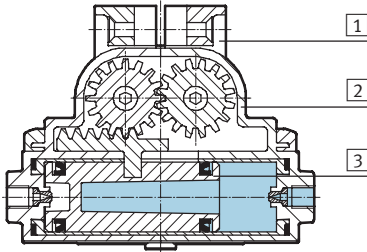
Radial grippers HGRC

Technical data

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Materials

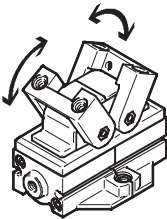
Sectional view



Radial gripper

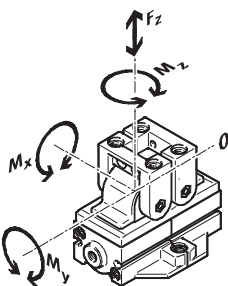
1	Gripper jaw	Die-cast zinc, painted
2	Housing	Die-cast zinc, painted
3	Piston	Polyamide
-	Seals	Polyurethane, nitrile rubber
-	Note on materials	Free of copper, PTFE and silicone
		RoHS-compliant

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.

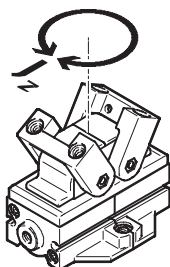
Size		12	16	20
Max. permissible force F_z	[N]	40	60	80
Max. permissible torque M_x	[Nm]	2.5	4	8
Max. permissible torque M_y	[Nm]	0.6	1	1.9
Max. permissible torque M_z	[Nm]	2	3.2	6.7

Radial grippers HGRC

Technical data

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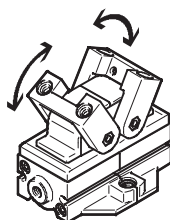
Mass moment of inertia



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

Size	12	16	20
HGRC-...-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.

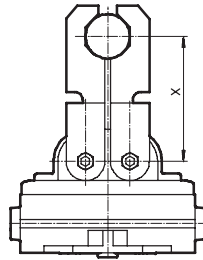
Size		12	16	20
Without external gripper fingers				
HGRC-...-A	Opening	120	160	170
	Closing	100	150	160

Radial grippers HGRC

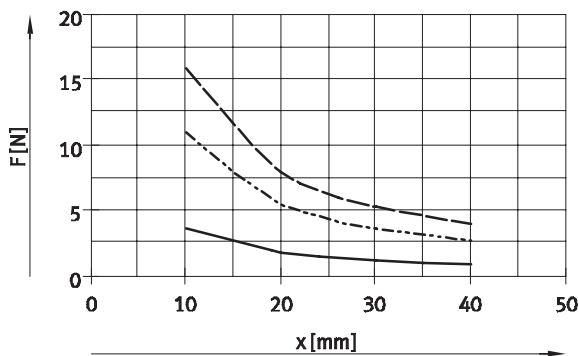
Technical data

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

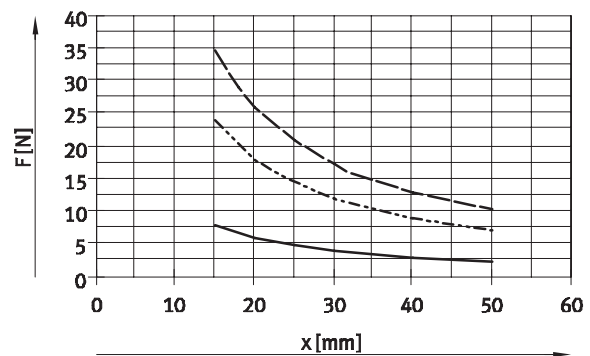
Gripping forces as a function of the operating pressure and the lever arm can be determined for the size using the following graph.



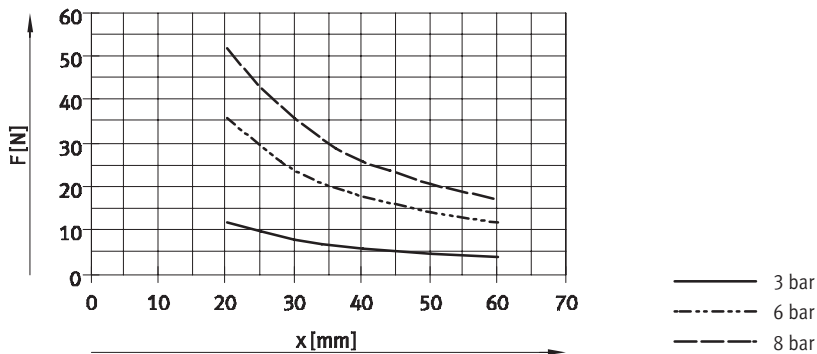
HGRC-12-A



HGRC-16-A



HGRC-20-A



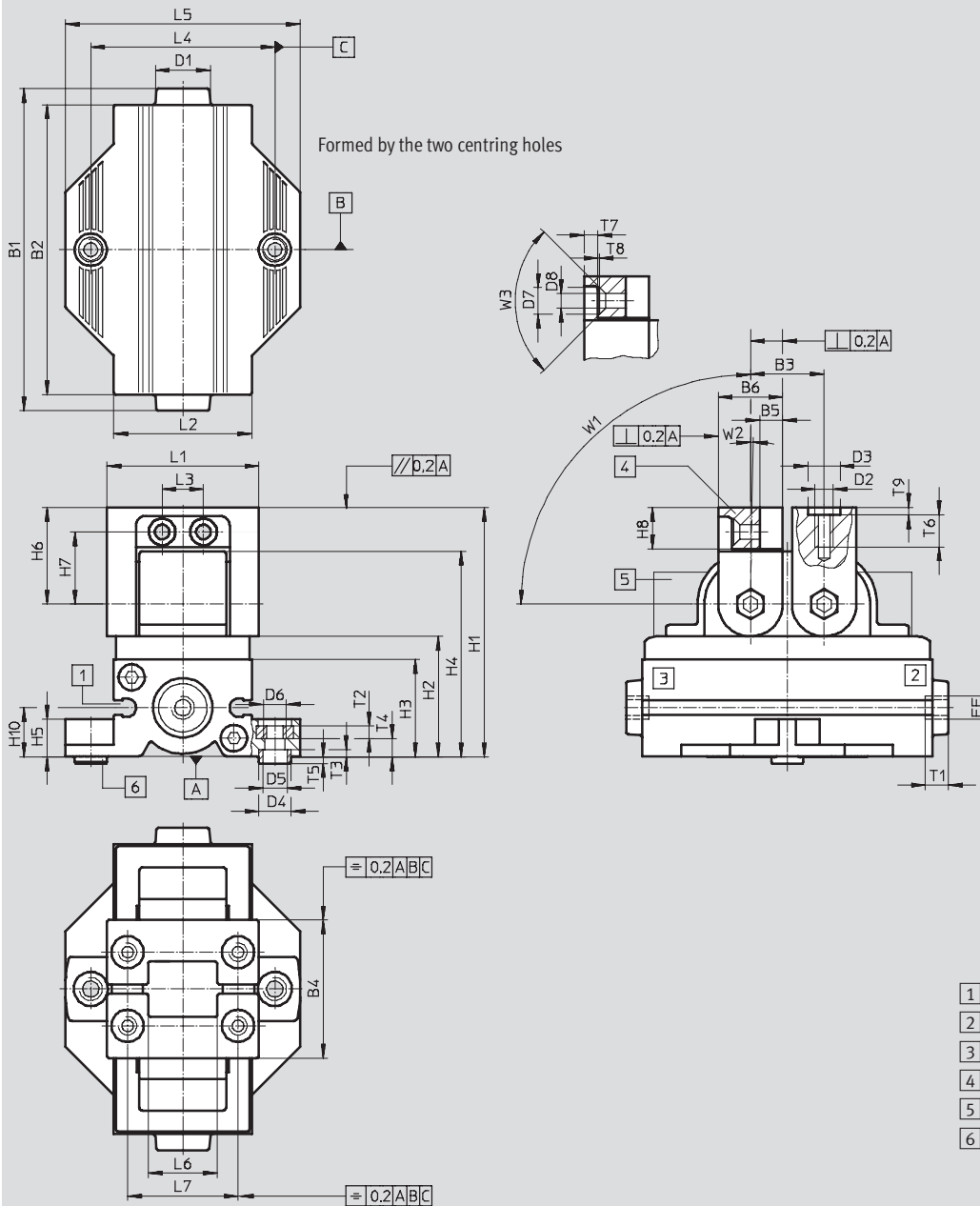
Radial grippers HGRC

Technical data

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Dimensions

Download CAD data → 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)

Radial grippers HGRC

Technical data

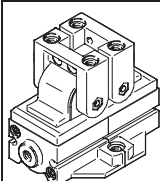
Type	B1	B2	B3 ±0.05	B4 +0.25 -0.05	B5 +0.5	B6 +0.1	D1	D2	D3 +0.05 -0.02	D4 F10/h7	D5
HGRC-12	57	52	12	23	4	11	12	M3	5	7	5.3
HGRC-16	70	63	16	30	5.5	14	12	M4	7	7	5.3
HGRC-20	86	79	20	38	6	18	12	M5	9	9	6.4

Type	D6	D7	D8	EE	H1 ±0.5	H2	H3	H4	H5	H6 ±0.2	H7
HGRC-12	M4	4.8	2.6	M5	43.2	20.7	18.2	35.2	6.9	17	12.5
HGRC-16	M5	5.8	3.2	M5	54.2	26.2	21.2	44.7	8.2	21	15.7
HGRC-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 ¹⁾	L5	L6 +0.25 -0.05	L7 ¹⁾	T1 min.
HGRC-12	7.5	9.2	27.5	25.5	6	33	42	12	20	4.5
HGRC-16	9	10.7	33	30	9	40	51	15	24	5
HGRC-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
HGRC-12	2.2	1.7	3.1	1.3	6	1.7	0.5	1.3	90°	1°	90°
HGRC-16	2.7	1.8	3.8	1.2	7	3	0.3	1.6	90°	1°	90°
HGRC-20	3.2	2.3	5.2	1.7	9	3.5	0.5	2.1	90°	1°	90°

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

Ordering data		
	Size [mm]	Double-acting Part No. Type
	12	565129 HGRC-12-A
	16	565131 HGRC-16-A
	20	565133 HGRC-20-A

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Accessories

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Ordering data – Centring sleeves				Technical data → Internet: zbh	
	For size [mm]	Part No.	Type	PU ¹⁾	
	For attaching to a drive or plate				
	12, 16	186717	ZBH-7	10	
	20	150927	ZBH-9	10	
	For attaching gripper fingers				
	12	189652	ZBH-5	10	
	16	186717	ZBH-7	10	
	20	150927	ZBH-9	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				Technical data → Internet: smt	
	Insertable from end	3-wire	–	2.5	173218	SMT-10-PS-KL-LED-24
		–	3-pin	0.3	173220	SMT-10-PS-SL-LED-24
	N/O contact, magnetic reed				Technical data → Internet: sme	
	Insertable from end	3-wire	–	2.5	173210	SME-10-KL-LED-24
		–	3-pin	0.3	173212	SME-10-SL-LED-24

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					Technical data → Internet: smt
	Insertable from end	3-wire	–	2.5	173219	SMT-10-PS-KQ-LED-24
		–	3-pin	0.3	173221	SMT-10-PS-SQ-LED-24
	N/O contact, magnetic reed					Technical data → Internet: sme
	Insertable from end	3-wire	–	2.5	173211	SME-10-KQ-LED-24
		–	3-pin	0.3	173213	SME-10-SQ-LED-24

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					Technical data → Internet: smt
	Insertable from end	3-wire	–	2.5	547862	SMT-10G-PS-24V-E-2,5Q-OE
		–	3-pin	0.3	547863	SMT-10G-PS-24V-E-0,3Q-M8D

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