

DHPC
Parallel gripper

FESTO
Festo SE & Co. KG
Ruiter Straße 82
73734 Esslingen
Deutschland
+49 711 347-0
www.festo.com
Operating instructions
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Translation of the original instructions
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1 Applicable Documents

All available documents for the product -> www.festo.com/sp.

2 Safety

2.1 Safety Instructions

- Take into consideration the ambient conditions at the location of use.
- Only use the product in original status without unauthorised modifications.
- Observe labelling on the product.
- Store the product in a cool, dry, UV-protected and corrosion-protected environment. Ensure that storage times are kept to a minimum.
- Prior to mounting, installation and maintenance work: Switch off compressed air supply and secure it from being switched back on.
- Observe tightening torques. Unless otherwise specified, the tolerance is ± 20 %.

2.2 Intended use

The intended use of the product is to grip and hold payloads (workpieces) using custom-designed gripper fingers attached by the customer.

2.3 Training of qualified personnel

Installation, commissioning, maintenance and disassembly should only be conducted by qualified personnel. The specialized personnel must be familiar with the installation and operation of electrical and pneumatic control systems.

3 Additional information

- Contact the regional Festo contact if you have technical problems -> www.festo.com.
- Accessories and spare parts -> www.festo.com/catalogue.

4 Product overview

4.1 Function

- Alternating pressurisation of the supply ports causes a piston in the gripper to move (double-acting).
- A gripper with integrated spring return is used to exert the gripper force. When exhausting the single-acting gripper: the spring return moves the gripper jaws to the initial position.
 - N/O contact: NO (normally open)
 - N/C contact: NC (normally closed)
- The piston movement is transmitted mechanically to the gripper jaws. Gripper fingers are fastened to the gripper jaws. Closing or opening the gripper fingers clamps the payload to the outer contour (external gripping) or the inner contour (internal gripping).
- The gripping force is adjusted by external regulation of the operating pressure.
- The gripper has integrated fixed flow restrictors. If the max. gripper finger weights and the max. gripper finger lengths are in compliance, an external flow control is not required.

4.2 Structure

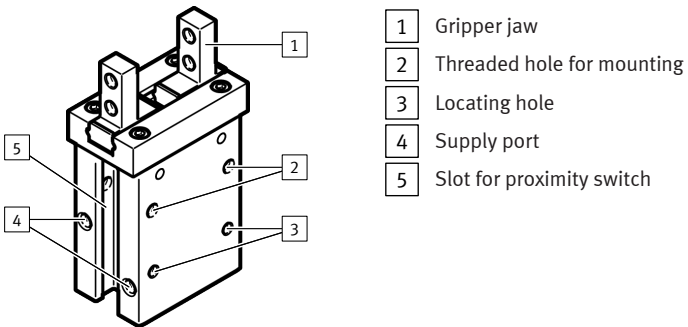


Fig. 1: Structure

5 Assembly

5.1 Preparing the gripper fingers

The gripper fingers are not included in the delivery.

- Requirements for the gripper fingers -> 11 Technical data:
- Observe the max. permissible forces and max. permissible torques at the gripper jaw.
 - Observe the max. length and max. weight.
 - Use gripper fingers that are as short and light as possible.
 - Manufacture gripper fingers that are suitable for the payload and type of gripping action.

Table with 4 columns: Size, 6, 10, 16. Row 1: Width at gripper jaws [mm]. Values: 4.3-0.05, 5.4-0.05, 7-0.05.

Tab. 1: Width of gripper jaws

Table with 5 columns: Size, 20, 25, 32, 40. Row 1: Width at gripper jaws [mm]. Values: 8.3-0.05, 12-0.05, 15.2-0.05, 18-0.05.

Tab. 2: Width of gripper jaws

5.2 Mounting the gripper fingers

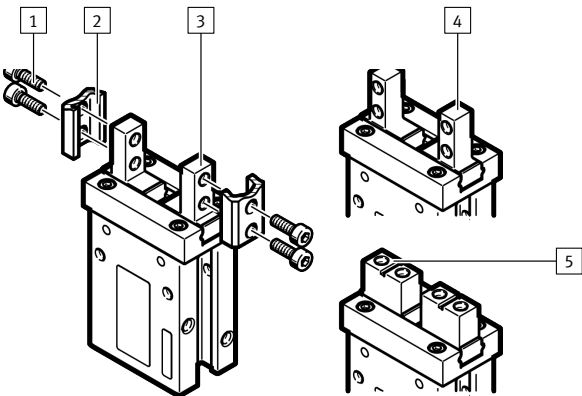


Fig. 2: Mounting the gripper fingers

- 1 Screw
- 2 Gripper finger
- 3 Gripper jaw A
- 4 Gripper jaw A-...-1
- 5 Gripper jaw A-...-2

- Position the prepared gripper fingers [2] on the gripper jaws [3], [4], [5] and fasten each one with two screws [1]. Fix the gripper jaws in place during mounting and use the specified tightening torque.

Table with 6 columns: DHPC, -6-..., -10-..., A, A-...-1, A-...-2. Rows: Screw, Tightening torque [Nm].

Tab. 3: Dimensions and tightening torque

Table with 6 columns: DHPC, -16-..., -20-..., A, A-...-1, A-...-2. Rows: Screw, Tightening torque [Nm].

Tab. 4: Dimensions and tightening torque

DHPC	-25-...			-32-...		
	A	A-...-1	A-...-2	A	A-...-1	A-...-2
Screw	M5			M6		
Tightening torque [Nm]	2.8			4.9		

Tab. 5: Dimensions and tightening torque

DHPC	-40-...		
	A	A-...-1	A-...-2
Screw	M8		
Tightening torque [Nm]	11.8		

Tab. 6: Dimensions and tightening torque

5.3 Mounting gripper

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If necessary, mount the proximity switches before mounting the gripper. When using proximity switches for sensing the end position, take the following into account:

- Interference from ferritic attachments, e.g. retaining screws made of ferritic steel.
- Projecting proximity switches, if applicable.
- Cable outlet direction of the proximity switches.
- Sufficient space for the connection components.
- When sensing from both end positions: use separate slots for the proximity switches.

Vertical mounting

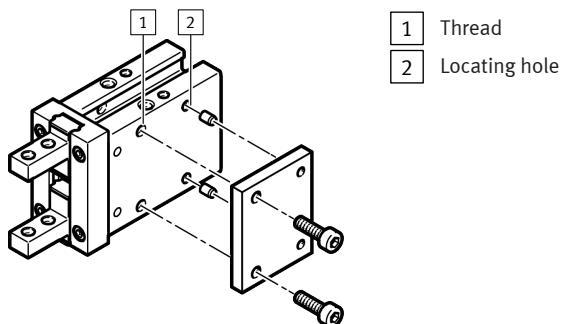


Fig. 3: Direct mounting via thread in the housing

Size	6	10	16	20	25	32	40
Thread [1]	M3		M4	M5	M6		M8
Depth of thread	10	4.75	6.75	9.6	13	15	18
Tightening torque [Nm]	0.88	0.69	2.1	4.3	7.9	10	18
Locating hole ø for centring pin [2]	–	2 ^{H9}	3 ^{H9}	4 ^{H9}		5 ^{H9}	
Depth of locating hole	–	3		4		5	

Tab. 7: Direct mounting via thread in the housing

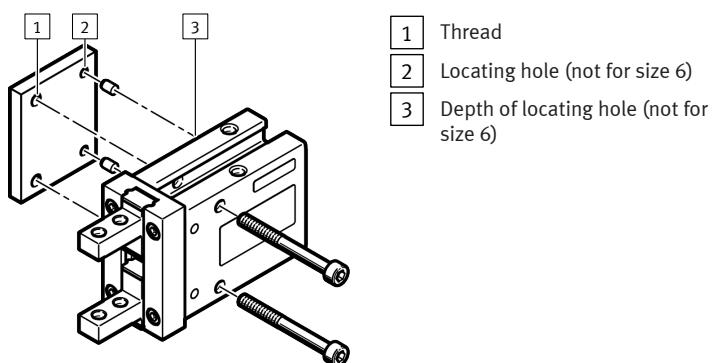


Fig. 4: Direct mounting via through-hole

Size	6	10	16	20	25	32	40
Thread [1]	M2.5	M2.5	M3	M4	M5		M6
Tightening torque [Nm]	0.49	0.49	0.88	2.1	4.3		7.3
Locating hole ø for centring pin [2]	–	2 ^{H9}	3 ^{H9}	4 ^{H9}		5 ^{H9}	
Depth of locating hole [3]	–	3		4		5	

Tab. 8: Direct mounting via through-hole

Horizontal mounting

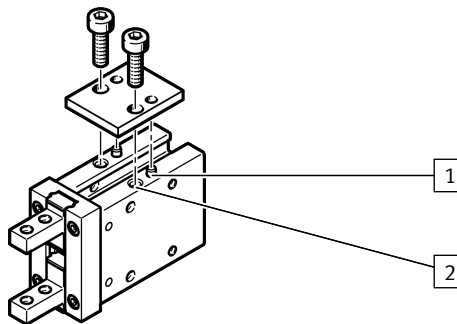


Fig. 5: Horizontal mounting

- 1 Locating hole (not for size 6) 2 Thread

Size	6	10	16	20	25	32	40
Thread [2]	M2	M3	M4	M5	M6		M8
Thread depth [mm]	4.5	4	4.5	7.5	10		13
Tightening torque [Nm]	0.15	0.9	1.6	3.3	5.9		13.7
Locating hole ø for centring pin [1]	–	2 ^{H9}	3 ^{H9}	4 ^{H9}		5 ^{H9}	
Depth of locating hole [mm]	–	3	3	4		5	

Tab. 9: Horizontal mounting

Mounting on the bottom

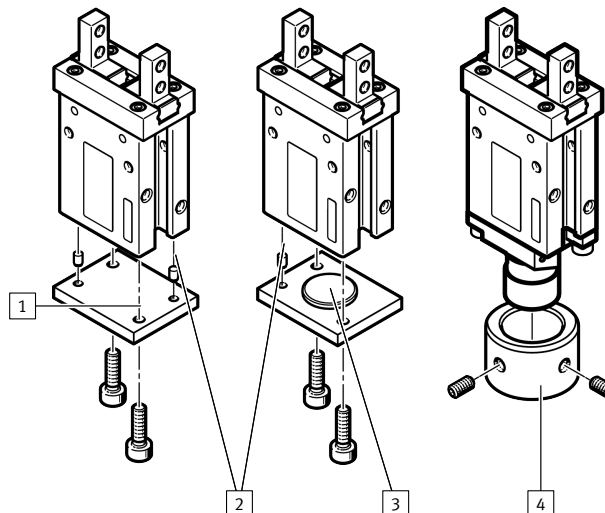


Fig. 6: Mounting on the bottom

- 1 Thread 2 Locating hole (not for size 6) 3 Positioning via base provided by customer 4 Axial mounting by customer

Size	6	10	16	20	25	32	40
Thread [1]	–	M3	M4	M5	M6		M8
Thread depth [mm]	–	4	6	10	12	13	17
Tightening torque [Nm]	–	0.88	2.1	4.3	7.3	7.9	17.7
Locating hole ø for centring pin [2]	–	2 ^{H9}	3 ^{H9}	4 ^{H9}		5 ^{H9}	
Depth of locating hole [mm]	–	3		4		5	
Positioning via base provided by customer [3]							
Locating hole ø	–	12 ^{H9}	17 ^{H8}	21 ^{H8}	26 ^{H8}	33 ^{H9}	41 ^{H9}
Depth of locating hole [mm]	–	1.5	2	3	3.5	4	
Axial mounting by customer [4]							
Clamping surface ø	8 _{f8}	12 _{f8}	16 _{f8}	20 _{f8}	25 _{f8}		32 _{f8}
Clamping surface height	10	15	18	20	23		

Tab. 10: Mounting on the bottom

6 Installation

6.1 Pneumatic installation

NOTICE

Loss of function due to contamination in the connections.

- Keep ports and tubing lines free from dirt particles and foreign matter.

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The use of a check valve prevents the payload from dropping in the event of a sudden pressure drop. The use of a one-way flow control valve also permits adjustment of the opening and closing time.

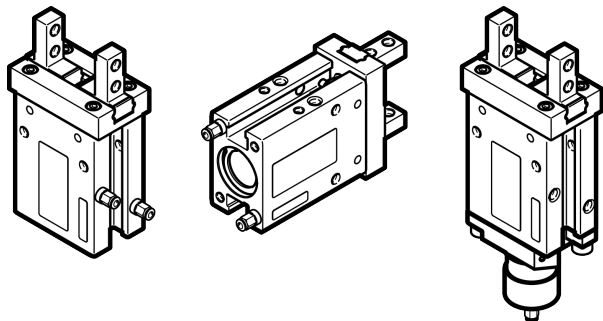


Fig. 7: Connection options

- Connect the compressed air supply to the supply port.

7 Commissioning

⚠ WARNING

Risk of injury due to falling loads.

- Before exhausting remove the payload.

1. Slowly pressurise gripper.
2. Set the opening and closing time with an upstream one-way flow control valve: screw in the flow control screw completely and then unscrew it one turn.
3. Perform a test run without payload.
Check the following:
 - Allocation of the supply ports
 - The reliable function of the proximity switches (if installed)
 - Stop noise of the piston: the piston stop must be soft, that means not audibly hard or metallic.

Piston stop	Insight/conclusion
soft	The gripper speed is correct or can be increased. With upstream one-way flow control valve: unscrew the flow control screw slightly. → The gripper speed increases.
hard/metallic	The gripper speed is too high. With an upstream one-way flow control valve: screw in the flow control screw until the piston stop is no longer audibly hard or metallic. → The gripper speed is reduced.

4. Perform a test run with payload.
 - ↳ The gripper must hold the payload securely.
5. After successful test runs:
 - Remove the payload or lock to prevent it from falling.
 - Exhaust the gripper.

8 Maintenance

8.1 Safety

⚠ WARNING

Risk of injury due to unexpected movement of the gripper fingers or falling payload.

- Before exhausting: remove the payload at the gripper.
- Disconnect gripper from the compressed air supply.

8.2 Cleaning

Clean the product only with non-abrasive cleaning agents and soft cloths.

9 Malfunctions

9.1 Fault clearance

Error description	Cause	Remedy
Gripper does not hold payload securely.	Insufficient operating pressure.	Increase the operating pressure. Observe the max. permissible value.
	The pressure point of the gripper fingers is too far outwards.	Move the pressure point inwards.
	The payload is too heavy.	Select a larger gripper.
	Gripping only with return spring force with incorrect gripping direction.	Use the intended gripping direction.
The gripper does not open/close.	No compressed air.	Check the supply ports.
	The gripper is faulty.	Replace the faulty parts → www.festo.com/spareparts . Replace the gripper → 9.2 Repair.
The proximity switch does not indicate the gripper status.	The proximity switch is incorrectly adjusted.	Check and adjust the position of the proximity switch → www.festo.com/sp .
	The connecting cable is disconnected.	Replace the connecting cable or proximity switch → .

Tab. 11: Fault clearance

9.2 Repair

Send the product to the Festo repair service for repair.

10 Disassembly

⚠ WARNING

Risk of injury due to unexpected movement of the gripper fingers or falling payload.

- Before exhausting: remove the payload at the gripper.
- Disconnect gripper from the compressed air supply.

1. Disconnect the gripper from the compressed air supply.
2. Remove the supply ports and retaining screws.

11 Technical data

Size		6	10	16
Pneumatic port		M3	M3	M3
Mounting position		any		
Medium				
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Notes on the operating/pilot medium		lubricated operation possible, in which case lubricated operation will always be required		
Temperature				
Ambient temperature	[°C]	−10 ... +60		
Storage temperature	[°C]	−10 ... +80		
Operating pressure				
DHPC-...-A	[MPa]	0.15 ... 0.8	0.2 ... 0.8	0.1 ... 0.8
	[bar]	1.5 ... 8	2 ... 8	1 ... 8
	[psi]	22 ... 116	30 ... 116	15 ... 116
DHPC-L-...-A	[MPa]	–	0.2 ... 0.8	0.1 ... 0.8
	[bar]	–	2 ... 8	1 ... 8
	[psi]	–	30 ... 116	15 ... 116
DHPC-...-A-NO/-NC	[MPa]	0.35 ... 0.8	0.35 ... 0.8	0.25 ... 8
	[bar]	3.5 ... 8	3.5 ... 8	2.5 ... 8
	[psi]	51 ... 116	51 ... 116	37 ... 116
Total gripping force at 0.6 MPa (6 bar, 90 psi)				
DHPC-...-A				
Open	[N]	14.6	51.2	125.4
Close	[N]	11	43	107.8
DHPC-...-A-NO				
Close	[N]	7.8	32.8	86.8
DHPC-...-A-NC				
Open	[N]	10.4	39.2	101

Tab. 12: Technical data

Size		20	25	32	40
Pneumatic port		M5	M5	M5	M5
Mounting position		any			
Medium					
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Notes on the operating/pilot medium		lubricated operation possible, in which case lubricated operation will always be required			
Temperature					
Ambient temperature	[°C]	−10 ... +60			
Storage temperature	[°C]	−10 ... +80			
Operating pressure					
DHPC-...-A	[MPa]	0.1 ... 0.8	0.1 ... 0.8	0.1 ... 0.8	0.1 ... 0.8
	[bar]	1 ... 8	1 ... 8	1 ... 8	1 ... 8
	[psi]	15 ... 116	15 ... 116	15 ... 116	15 ... 116
DHPC-L-...-A	[MPa]	0.1 ... 0.8	0.1 ... 0.8	–	–
	[bar]	1 ... 8	1 ... 8	–	–
	[psi]	15 ... 116	15 ... 116	–	–
DHPC-...-A-NO/-NC	[MPa]	0.25 ... 0.8	0.25 ... 0.8	0.25 ... 0.8	0.25 ... 0.8
	[bar]	2.5 ... 8	2.5 ... 8	2.5 ... 8	2.5 ... 8
	[psi]	37 ... 116	37 ... 116	37 ... 116	37 ... 116
Total gripping force at 0.6 MPa (6 bar, 90 psi)					
DHPC-...-A					
Open	[N]	192.6	305.3	493.7	777.2
Close	[N]	159.5	255.6	442.6	717.2
DHPC-...-A-NO					
Close	[N]	139.4	241.3	415.2	675
DHPC-...-A-NC					
Open	[N]	170.9	291.4	465.9	733.5

Tab. 13: Technical data