

DHRC
Radial gripper

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Operating instructions
8159517
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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

- Only use the product in its original condition without unauthorised modifications.
- Take into account the ambient conditions at the location of use.
- Only use the product if it is in perfect technical condition.
- Store the product in a cool, dry environment protected from UV and corrosion. Keep storage times short.
- Before working on the product, switch off the compressed air supply and lock it to prevent it from being switched on again.

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

Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers. The qualified personnel have knowledge and experience in dealing with pneumatic drives and pneumatic axes.

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 Function

- Alternating pressurisation of the supply ports moves a piston in the gripper. This results in a double-acting function.
- 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 attached to the gripper jaws. Closing or opening the gripper fingers clamps the payload by the outer contour or the inner contour.
- The gripping force is adjusted by external regulation of the operating pressure.
- The gripper has integrated fixed flow restrictors. If the maximum gripper finger weights and the maximum gripper finger lengths are in compliance, external flow control is not required.

5 Product design

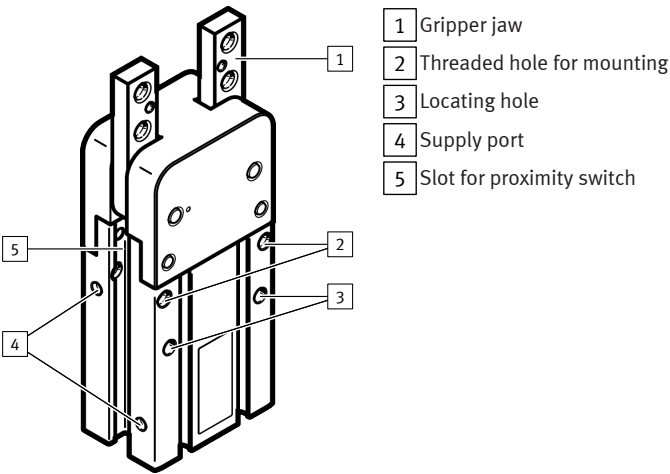


Fig. 1: Product design

6 Assembly

6.1 Preparing the gripper fingers

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The gripper fingers are not included in the delivery.

Requirements for the gripper fingers -> 12 Technical data:

- Observe the maximum permissible forces and maximum permissible torques at the gripper jaw.
- Observe the maximum length and 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 7 columns: DHRC, -6, -10, -16, -20, -25, -32. Row 1: Width at gripper jaws [mm] with values 2.2, 3, 4.4, 5.6, 6.6, 8.6.

Tab. 1: Width of gripper jaws

6.2 Mounting gripper finger

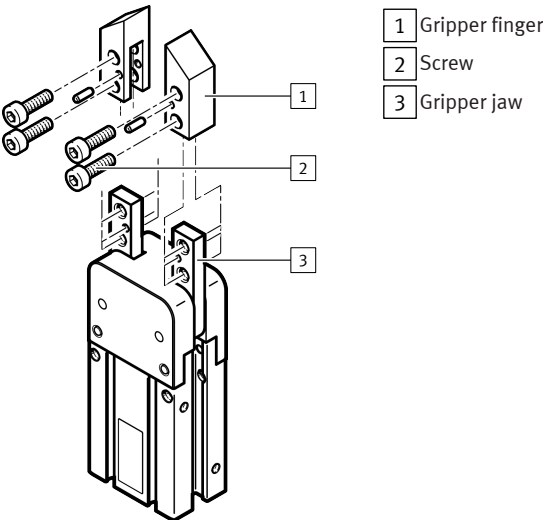


Fig. 2: Mounting gripper finger

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

Table with 7 columns: DHRC, -6, -10, -16, -20, -25, -32. Rows include Screw, Drilled hole, Locating hole for centring pin [mm], and Tightening torque [Nm] with specific values for each model.

Tab. 2: Dimensions and tightening torque

## 6.3 Mounting gripper

**i**

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

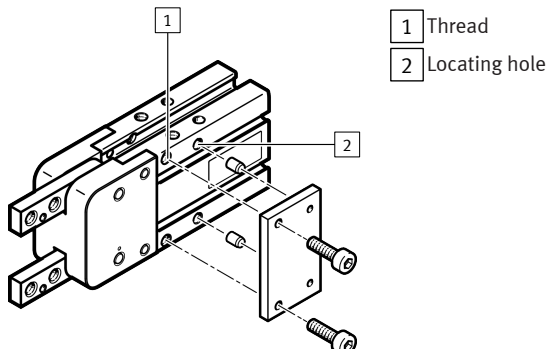


Fig. 3: Direct fastening via thread in the housing

| DHRC                               | -6   | -10               | -16               | -20               | -25 | -32               |
|------------------------------------|------|-------------------|-------------------|-------------------|-----|-------------------|
| Thread [1]                         | M3   |                   | M4                | M5                | M6  |                   |
| Thread depth [mm]                  | 10   | 4.75              | 6.75              | 8.67              | 13  | 15                |
| Tightening torque [Nm]             | 0.88 | 0.68              | 2.5               | 4.3               | 7.8 | 10                |
| Locating hole for centring pin [2] | –    | Ø 2 <sup>H9</sup> | Ø 3 <sup>H9</sup> | Ø 4 <sup>H9</sup> |     | Ø 5 <sup>H9</sup> |
| Depth of locating hole [mm]        | –    | 3                 |                   | 4                 |     | 5                 |

Tab. 3: Direct fastening via thread on the housing

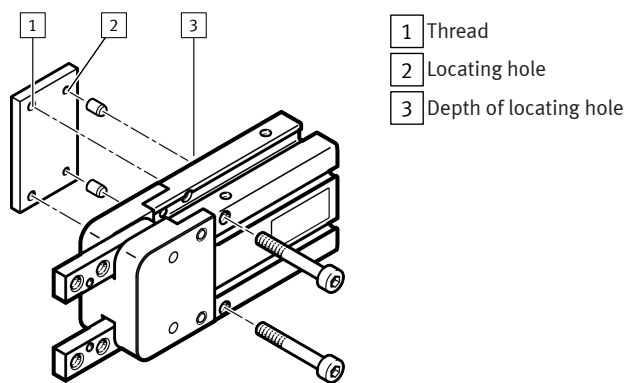


Fig. 4: Direct fastening via through-hole

| DHRC                               | -6   | -10               | -16               | -20               | -25 | -32               |
|------------------------------------|------|-------------------|-------------------|-------------------|-----|-------------------|
| Thread [1]                         | M2.5 | M2.5              | M3                | M4                | M5  | M5                |
| Tightening torque [Nm]             | 0.5  | 0.5               | 0.88              | 2.1               | 4.3 | 4.3               |
| Locating hole for centring pin [2] | –    | Ø 2 <sup>H9</sup> | Ø 3 <sup>H9</sup> | Ø 4 <sup>H9</sup> |     | Ø 5 <sup>H9</sup> |
| Depth of locating hole [3]         | –    | 3                 |                   | 4                 |     | 5                 |

Tab. 4: Direct fastening via through-hole

### Horizontal mounting

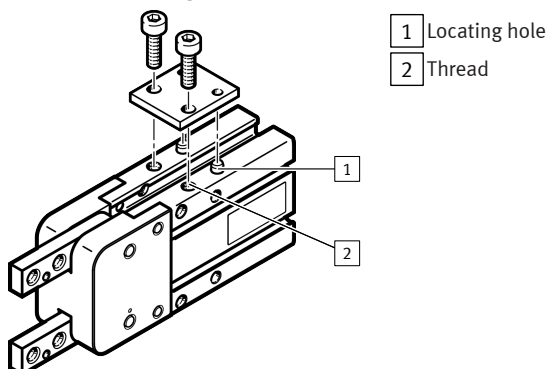


Fig. 5: Horizontal mounting

| DHRC                               | -6 | -10               | -16               | -20               | -25 | -32               |
|------------------------------------|----|-------------------|-------------------|-------------------|-----|-------------------|
| Thread [2]                         | –  | M3                | M4                | M5                | M6  |                   |
| Thread depth [mm]                  | –  | 4                 | 4.5               | 8                 | 10  |                   |
| Tightening torque [Nm]             | –  | 0.8               | 1.6               | 3.3               | 5.8 | 5.8               |
| Locating hole for centring pin [1] | –  | Ø 2 <sup>H9</sup> | Ø 3 <sup>H9</sup> | Ø 4 <sup>H9</sup> |     | Ø 5 <sup>H9</sup> |
| Depth of locating hole [mm]        | –  | 3                 |                   | 4                 |     | 5                 |

Tab. 5: Horizontal mounting

### Mounting on the bottom

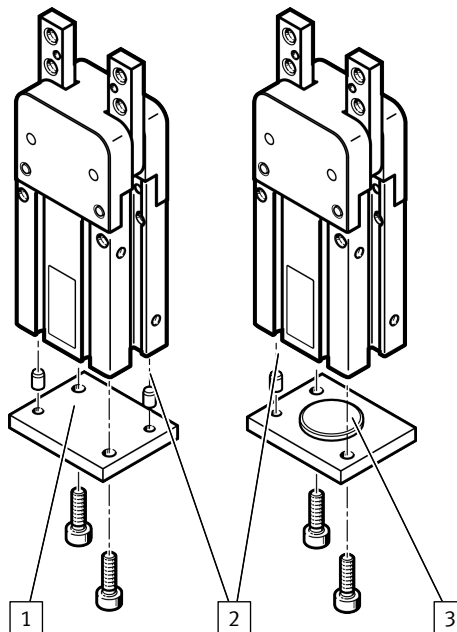


Fig. 6: Mounting on the bottom

- 1 Thread
- 2 Locating hole
- 3 Positioning via base provided by customer

| DHRC                                      | -6                | -10                | -16                | -20                | -25                | -32                |
|-------------------------------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Thread                                    | –                 | M3                 | M4                 | M5                 | M6                 |                    |
| Thread depth [mm]                         | –                 | 4                  | 6                  | 10                 | 12                 | 13                 |
| Tightening torque [Nm]                    | –                 | 0.88               | 2.1                | 4.3                | 7.3                | 7.8                |
| Locating hole for centring pin [mm]       | –                 | Ø 2 <sup>H9</sup>  | Ø 3 <sup>H9</sup>  | Ø 4 <sup>H9</sup>  |                    | Ø 5 <sup>H9</sup>  |
| Depth of locating hole [mm]               | –                 | 3                  |                    | 4                  |                    | 5                  |
| Positioning via base provided by customer |                   |                    |                    |                    |                    |                    |
| Locating hole [mm]                        | Ø 8 <sup>H8</sup> | Ø 12 <sup>H8</sup> | Ø 17 <sup>H8</sup> | Ø 21 <sup>H8</sup> | Ø 26 <sup>H8</sup> | Ø 25 <sup>H8</sup> |
| Depth of locating hole [mm]               | 1.5               |                    | 2                  |                    |                    |                    |

Tab. 6: Mounting on the bottom

## 7 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 times.

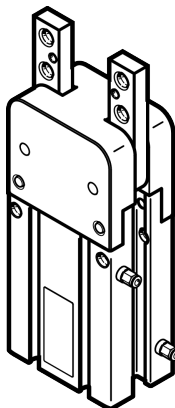


Fig. 7: Connection options

- Connect the compressed air supply to the supply port.

8 Commissioning

⚠ WARNING

Risk of injury due to falling loads.

- Before exhausting remove the payload.

- Slowly pressurise gripper.
- Set the opening and closing times with an upstream one-way flow control valve: screw in the flow control screw completely and then unscrew it one turn.
- Perform a test run without payload.  
Check the following:
  - Allocation of the supply ports
  - The reliable function of the proximity switches (if installed)
  - The 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 an upstream one-way flow control valve: unscrew the flow control screw a little → 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. |

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

9 Maintenance

9.1 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.

9.2 Clean product

- Clean the outside of the product with a soft cloth as required. Cleaning agents include all non-abrasive media.

10 Fault clearance

| Error description                                          | Cause                                                                     | Remedy                                                                                                                         |
|------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| The gripper does not hold the payload securely.            | The operating pressure is too low.                                        | 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 specified gripping direction.                                                                                          |
| The gripper does not open/close.                           | No compressed air.                                                        | Check the supply ports.                                                                                                        |
|                                                            | The gripper is faulty.                                                    | Replace the faulty parts<br>→ <a href="http://www.festo.com/spareparts">www.festo.com/spareparts</a> .<br>Replace the gripper. |
| The proximity switch does not indicate the gripper status. | The proximity switch is incorrectly adjusted.                             | Check and adjust the position of the proximity switch<br>→ <a href="http://www.festo.com/sp">www.festo.com/sp</a> .            |
|                                                            | The connecting cable is disconnected.                                     | Replace the connecting cable or the proximity switch<br>→ <a href="http://www.festo.com/sp">www.festo.com/sp</a> .             |

Tab. 7: Fault clearance

11 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.

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

12 Technical data

| DHRC              | -6  | -10 | -16 |
|-------------------|-----|-----|-----|
| Pneumatic port    | M3  | M3  | M3  |
| Mounting position | any |     |     |

| DHRC                                            |       | -6                                                                                        | -10         | -16   |
|-------------------------------------------------|-------|-------------------------------------------------------------------------------------------|-------------|-------|
| 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                              |       |                                                                                           |             |       |
| DHRC-...-A                                      | [MPa] | 0.25 ... 0.8                                                                              | 0.1 ... 0.8 |       |
|                                                 | [bar] | 2.5 ... 8                                                                                 | 1 ... 8     |       |
|                                                 | [psi] | 37 ... 116                                                                                | 15 ... 116  |       |
| DHRC-...-AS-NO                                  | [MPa] | –                                                                                         | 0.2 ... 0.8 |       |
|                                                 | [bar] | –                                                                                         | 2 ... 8     |       |
|                                                 | [psi] | –                                                                                         | 30 ... 116  |       |
| Total gripping force at 0.6 MPa (6 bar; 90 psi) |       |                                                                                           |             |       |
| DHRC-...-A                                      |       |                                                                                           |             |       |
| Open                                            | [Nm]  | 0.067                                                                                     | 0.253       | 0.811 |
| Close                                           | [Nm]  | 0.048                                                                                     | 0.204       | 0.668 |
| DHRC-...-AS-NO                                  |       |                                                                                           |             |       |
| Close                                           | [Nm]  | –                                                                                         | 0.158       | 0.503 |

Tab. 8: Technical data

| DHRC                                            |       | -20                                                                                       | -25   | -32   |
|-------------------------------------------------|-------|-------------------------------------------------------------------------------------------|-------|-------|
| Pneumatic port                                  |       | 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                              |       |                                                                                           |       |       |
| DHRC-...-A                                      | [MPa] | 0.1 ... 0.8                                                                               |       |       |
|                                                 | [bar] | 1 ... 8                                                                                   |       |       |
|                                                 | [psi] | 15 ... 116                                                                                |       |       |
| DHRC-...-AS-NO                                  | [MPa] | 0.15 ... 0.8                                                                              |       |       |
|                                                 | [bar] | 1.5 ... 8                                                                                 |       |       |
|                                                 | [psi] | 22 ... 116                                                                                |       |       |
| Total gripping force at 0.6 MPa (6 bar; 90 psi) |       |                                                                                           |       |       |
| DHRC-...-A                                      |       |                                                                                           |       |       |
| Open                                            | [Nm]  | 1.662                                                                                     | 3.436 | 7.256 |
| Close                                           | [Nm]  | 1.343                                                                                     | 2.775 | 6.001 |
| DHRC-...-AS-NO                                  |       |                                                                                           |       |       |
| Close                                           | [Nm]  | 1.120                                                                                     | 2.395 | 5.391 |

Tab. 9: Technical data