

Quick start guide

Finger gripper mGrip Circular

Note

The Operating instructions were originally written in German. Store in a safe place for future reference. Subject to technical changes without notice. No responsibility is taken for printing or other types of errors.

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1 Important Information

1.1 The technical documentation is part of the product

1. For problem-free and safe operation, follow the instructions in the documents.
 2. Keep the technical documentation in close proximity to the product. The documentation must be accessible to personnel at all times.
 3. Pass on the technical documentation to subsequent users.
- ⇒ Failure to follow the instructions in these Operating instructions may result in injuries!
- ⇒ Schmalz is not liable for damage or malfunctions that result from failure to heed these instructions.

If you still have questions after reading the technical documentation, contact Schmalz Service at:

www.schmalz.com/services

1.2 Symbols



This symbol indicates useful and important information.

- ✓ This symbol represents a prerequisite that must be met before an action is performed.
- ▶ This symbol represents an action to be performed.
- ⇒ This symbol represents the result of an action.

Actions that consist of more than one step are numbered:

1. First action to be performed.
2. Second action to be performed.

2 Fundamental Safety Instructions

2.1 Intended Use

The finger gripper mgrip Circular gripper is designed and manufactured in a hygienic design for industrial transport tasks. For Circular configurations with 3, 4, 5 and 6 fingers.

It is intended to be used in combination with a robot or a handling system for gripping and holding sensitive products of the maximum specified size, including products in the food industry. The size depends on the dimensions of the products and the type of gripping.

The finger gripper is an incomplete machine as defined by the Machinery Directive 2006/42/EC. It must only be operated in combination with a robot or handling system.

The product is intended for industrial use.

Intended use includes observing the technical data and the installation and operating instructions in this manual.

2.2 Non-Intended Use

Schmalz accepts no liability for damages caused by the use of the product for purposes other than those described under "Intended Use." The use of the product for loads that are not specified in the order confirmation or have different physical properties than those specified in the order confirmation shall be considered non-intended use.

2.3 Personnel Qualifications


Unqualified personnel cannot recognize dangers and are therefore exposed to higher risks!

1. Task only qualified personnel to perform the tasks described in these Operating instructions.
2. The product must be operated only by persons who have undergone appropriate training.

These Operating instructions are intended for fitters who are trained in handling the product and who can operate and install it.

2.4 Warnings in This Document

Warnings warn against hazards that may occur when handling the product. The signal word indicates the level of danger.

| Signal word | Meaning |
|--|---|
|  CAUTION | Indicates a low-risk hazard that could result in minor or moderate injury if not avoided. |
| NOTE | Indicates a danger that leads to property damage. |

2.5 Residual Risks



CAUTION

Noise pollution caused by exhaust air or leakage during operation

Hearing damage!

- ▶ In the event of leakage, check connections and lines and remedy leakages.
- ▶ Wear ear protection.



CAUTION

Risk of a gripping finger bursting if the air pressure is too high when the gripping fingers are activated.

Risk of injury

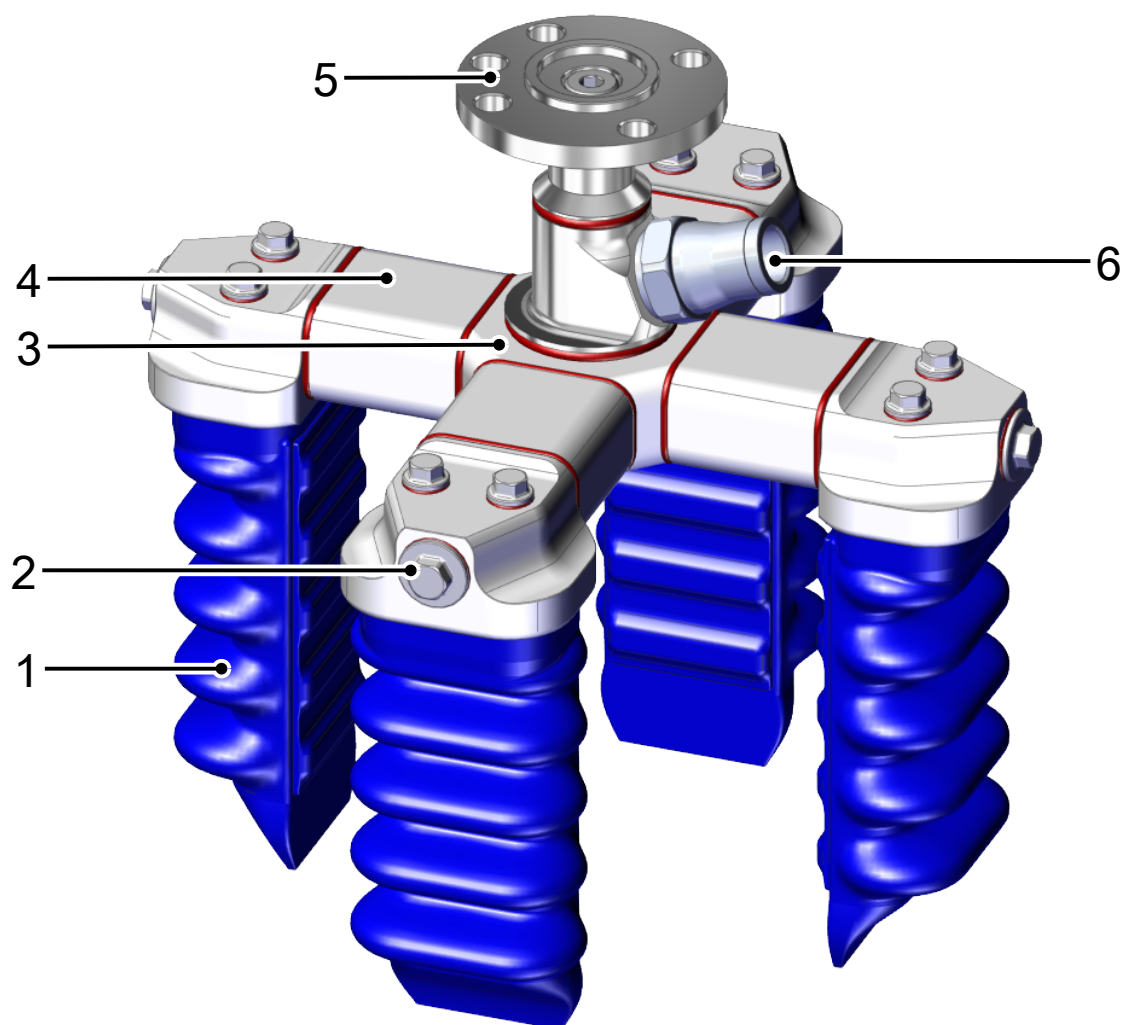
- ▶ Ensure that the pneumatic connection is operated with a maximum air pressure of 1.6 bar.
- ▶ Wear ear plugs and protective glasses.

2.6 Modifications to the Product

Schmalz assumes no liability for consequences of modifications over which it has no control:

1. The product must be operated only in its original condition as delivered.
2. Use only original spare parts from Schmalz.
3. The product must be operated only in perfect condition.

3 Product Design



- | | |
|---|--|
| 1 | Finger modules (FING-MOD) |
| 2 | Threaded nut Threaded rod (TIE-ROD) |
| 3 | Distributor (HUB) |

- | | |
|---|------------------------|
| 4 | Spacer (SPACER) |
| 5 | Robot adapter (ROB-AD) |
| 6 | Pneumatic Connection |

4 Configurations

Circular with 3 fingers EOAT (End Of Arm Tool)

| | Traditional finger modules | | Compact finger modules | |
|------------------------|----------------------------|-----------------------------|------------------------|-----------------------------|
| Gripping distance [mm] | Size of spacer [mm] | Length of threaded rod [mm] | Size of spacer [mm] | Length of threaded rod [mm] |
| 30 | — | — | none | 40 |
| 40 | — | — | 5 | 45 |
| 50 | none | 45 | 10 | 50 |
| 60 | 5 | 50 | 15 | 55 |
| 70 | 10 | 55 | 20 | 60 |
| 80 | 15 | 60 | 25 | 65 |
| 90 | 20 | 65 | 30 | 70 |
| 100 | 25 | 70 | 35 | 75 |
| 110 | 30 | 75 | 40 | 80 |
| 120 | 35 | 80 | — | — |
| 130 | 40 | 85 | — | — |

Circular with 4 fingers EOAT (End Of Arm Tool)

| | Traditional finger modules | | Compact finger modules | |
|------------------------|----------------------------|-----------------------------|------------------------|-----------------------------|
| Gripping distance [mm] | Size of spacer [mm] | Length of threaded rod [mm] | Size of spacer [mm] | Length of threaded rod [mm] |
| N/A | Dummy plate | 25 | Dummy plate | 25 |
| 45 | — | — | none | 45 |
| 55 | — | — | 5 | 50 |
| 65 | none | 50 | 10 | 55 |
| 75 | 5 | 55 | 15 | 60 |
| 85 | 10 | 60 | 20 | 65 |
| 95 | 15 | 65 | 25 | 70 |
| 105 | 20 | 70 | 30 | 75 |
| 115 | 25 | 75 | 35 | 80 |
| 125 | 30 | 80 | 40 | 85 |
| 135 | 35 | 85 | — | — |
| 145 | 40 | 90 | — | — |

| Circular with 5 fingers EOAT (End Of Arm Tool) | | | | |
|--|----------------------------|-----------------------------|------------------------|-----------------------------|
| | Traditional finger modules | | Compact finger modules | |
| Gripping distance [mm] | Size of spacer [mm] | Length of threaded rod [mm] | Size of spacer [mm] | Length of threaded rod [mm] |
| N/A | Dummy plate | 30 | Dummy plate | 30 |
| 55 | — | — | none | 50 |
| 65 | — | — | 5 | 55 |
| 75 | none* | 55 | 10 | 60 |
| 85 | 5 | 60 | 15 | 65 |
| 95 | 10 | 65 | 20 | 70 |
| 105 | 15 | 70 | 25 | 75 |
| 115 | 20 | 75 | 30 | 80 |
| 125 | 25 | 80 | 35 | 85 |
| 135 | 30 | 85 | 40 | 90 |
| 145 | 35 | 90 | — | — |
| 155 | 40 | 95 | — | — |

| Circular with 6 fingers EOAT (End Of Arm Tool) | | | | |
|--|----------------------------|-----------------------------|------------------------|-----------------------------|
| | Traditional finger modules | | Compact finger modules | |
| Gripping distance [mm] | Size of spacer [mm] | Length of threaded rod [mm] | Size of spacer [mm] | Length of threaded rod [mm] |
| N/A | Dummy plate | 35 | Dummy plate | 35 |
| 65 | — | — | none** | — |
| 75 | — | — | 5 | 60 |
| 85 | none* | 60 | 10 | 65 |
| 95 | 5* | 65 | 15 | 70 |
| 105 | 10 | 70 | 20 | 75 |
| 115 | 15 | 75 | 25 | 80 |
| 125 | 20 | 80 | 30 | 85 |
| 135 | 25 | 85 | 35 | 90 |
| 145 | 30 | 90 | 40 | 95 |
| 155 | 35 | 95 | — | — |
| 165 | 40 | 100 | — | — |

* Only compatible with the traditional mini finger module; ** Not possible

5 Technical Parameters

| | |
|-----------------------|---|
| Max. load | ≤ 10 kg ¹⁾ |
| Operating pressure | - 0.69 to 0.97 bar |
| Operating medium | Compressed air, oiled or unoled in accordance with ISO 8573-1:2001, class 7-4-4 |
| Operating temperature | from -20 to 45 °C |
| Workpiece width | 20 to 300 mm (more through special configurations) |
| Workpiece temperature | from -40 to 100 °C |
| Protection class | IP69K |
| Materials | Finger: Silicone Gripper in food-safe design: POM, stainless-steel, silicone Grippers in industrial design: POM, aluminum, silicone |

¹⁾ Depending on the application

6 Transportation and Storage

6.1 Checking the Delivery

The scope of delivery can be found in the order confirmation. The weights and dimensions are listed in the delivery notes.

1. Compare the entire delivery with the supplied delivery notes to make sure nothing is missing.
2. Damage caused by defective packaging or occurring in transit must be reported immediately to the carrier and J. Schmalz GmbH.

6.2 Storage



NOTE

The effects of ozone, light (especially UV), heat, oxygen, humidity as well as mechanical influences can reduce the service life of rubber products.

Damage to the finger gripper due to incorrect storage!

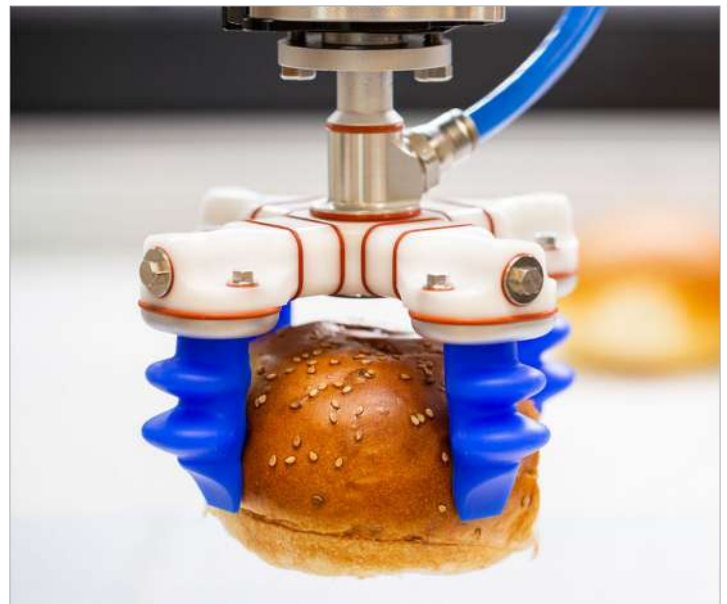
- ▶ Store the finger gripper in a cool place (0° C to +15°C, max. 25° C) that is dark, dry, low in dust and offers protection from the weather, ozone and drafts. It should also be free of tension (e.g. stacked appropriately to avoid deformation).

- ▶ Close all openings with adhesive tape.

7 Description of the Function

The finger gripper operates using the air pressure inside the gripping fingers.

In order for the gripping fingers to move, one side of the material is designed in such a way that it is less stretchy or does not stretch at all. When the pressure inside increases, the finger therefore bends around this side. When the pressure is released, the finger retracts. The gripping fingers are made from soft, stretchy plastic to ensure optimum gripping force.



8 Installation

8.1 Installation Instructions



CAUTION

Compressed air or vacuum in direct contact with the eye

Severe eye injury!

- ▶ Wear eye protection.
- ▶ Do not look into compressed air openings.
- ▶ Do not look into vacuum openings, e.g. suction cups.



CAUTION

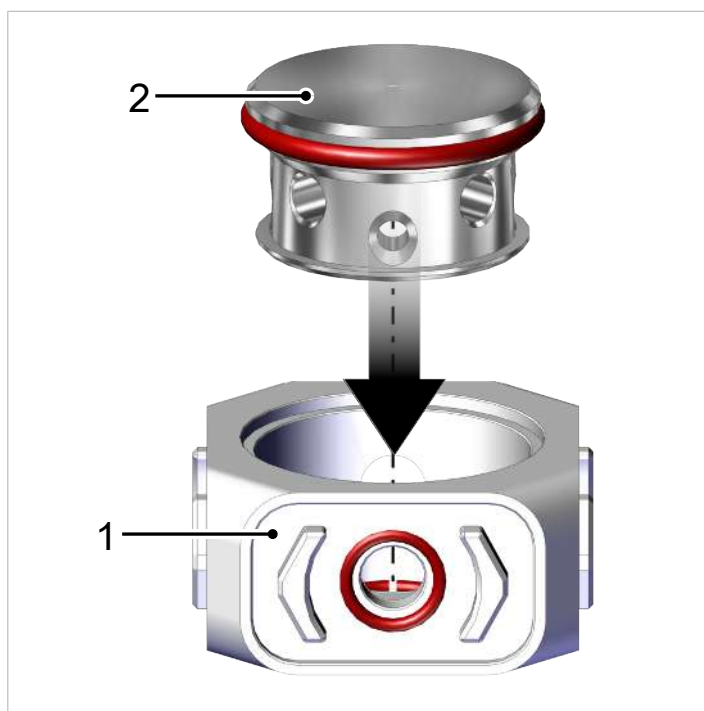
Noise pollution caused by exhaust air or leakage during operation

Hearing damage!

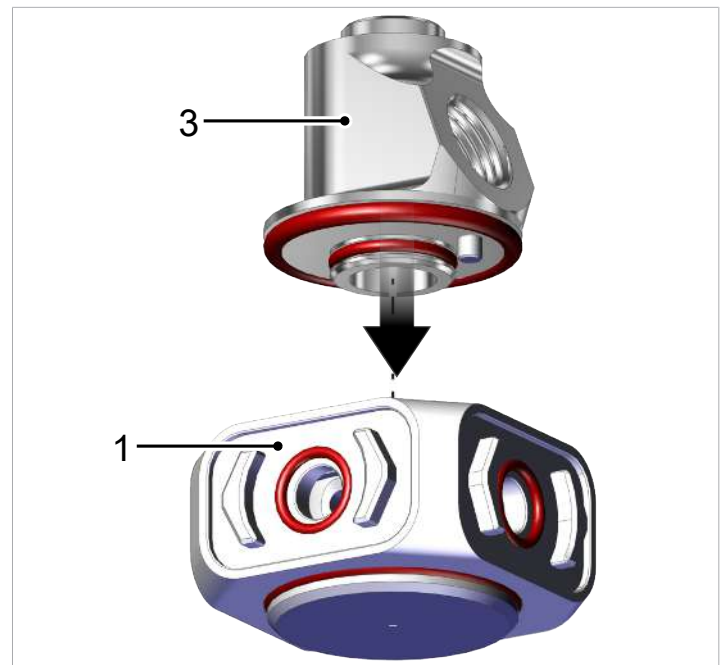
- ▶ In the event of leakage, check connections and lines and remedy leakages.
- ▶ Wear ear protection.

8.2 Mounting

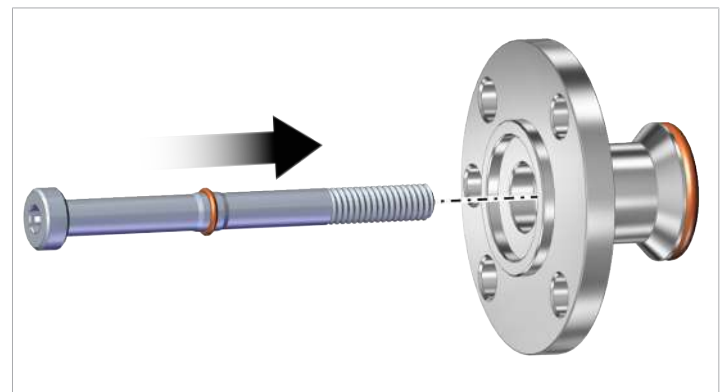
1. For the 3-finger configuration, proceed to step 4.
Mount the lower hub bracket (2) in the distributor (1) if it is not already installed.



2. Mount the upper hub bracket (3) including the O-rings in the distributor (1) in the correct position. Make sure the contact surfaces are clean and dry.

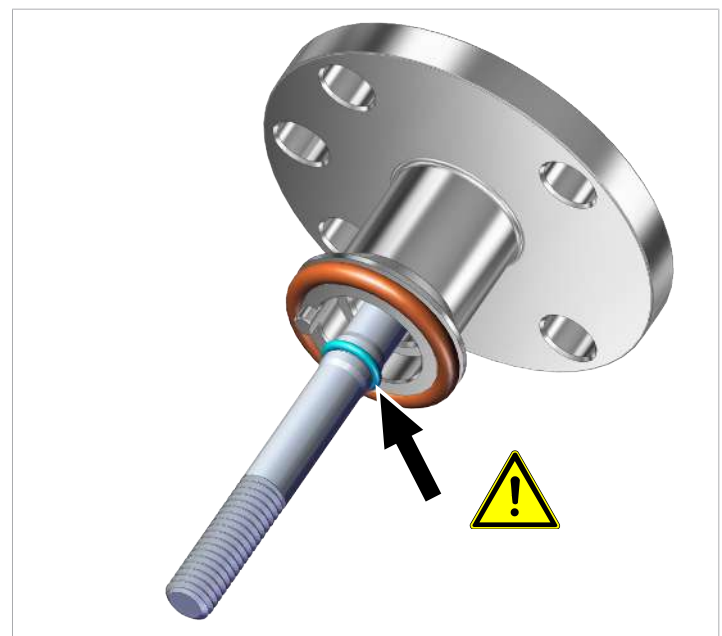


3. Mount the hub bolt in the robot adapter.

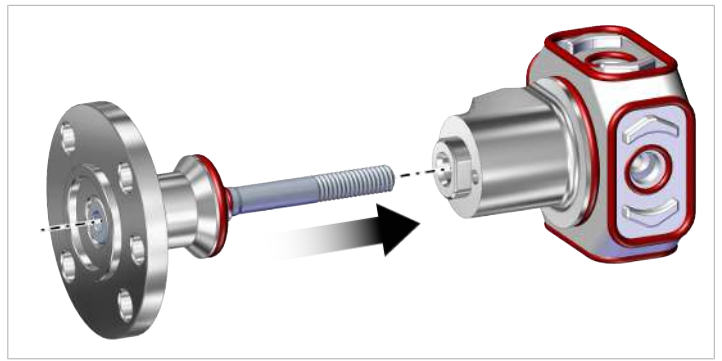


4. Make sure the small O-ring is properly mounted on the hub bolt after the bolt is mounted in the robot adapter.

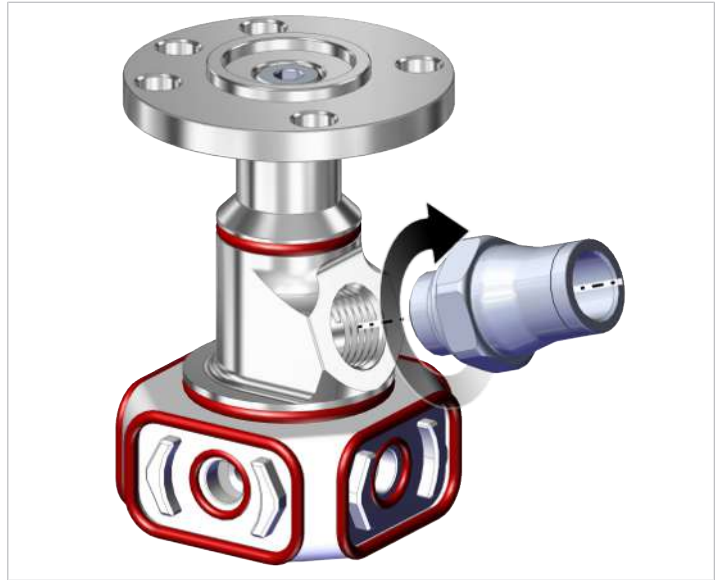
Note: We recommend grease for the O-ring and anti-seize gel for the bolt.



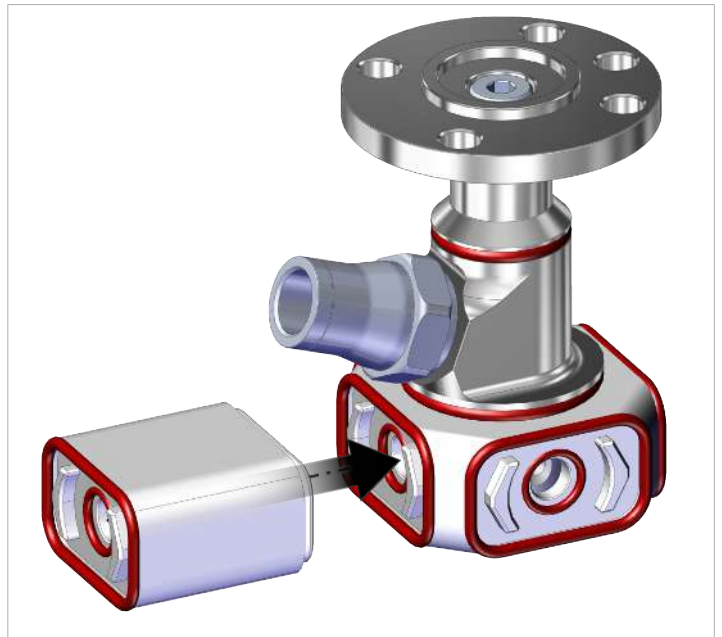
5. Mount the robot adapter in the correct position (note the cam position) and flat on the upper hub bracket. Make sure the contact surfaces are clean and dry. Tighten the hub bolt to 7.4 Nm.



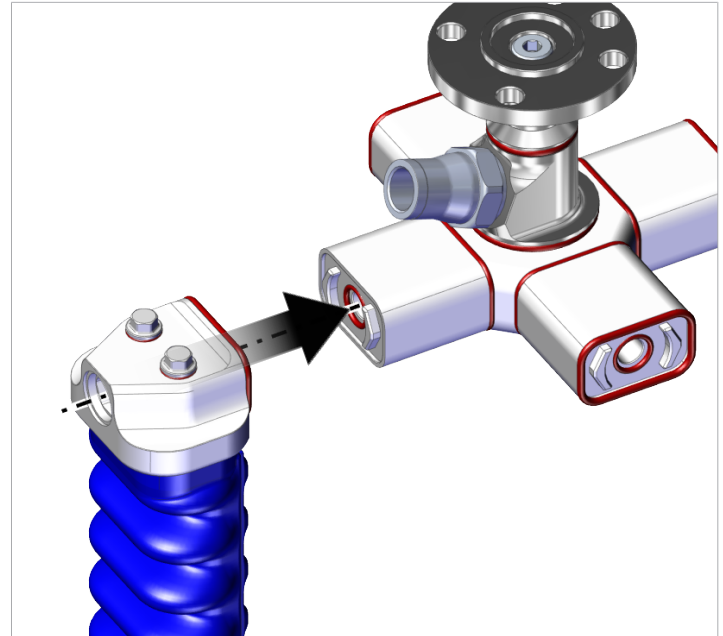
6. Mount the plug-in screw union in the upper hub bracket, and tighten it to 6 Nm.
Note: This does not apply to the 3-finger configuration.



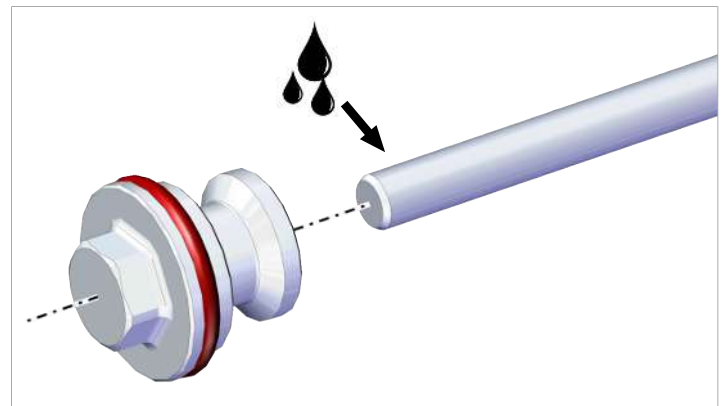
7. Mount the selected spacers correctly on the distributor (if required) and press them firmly into place.



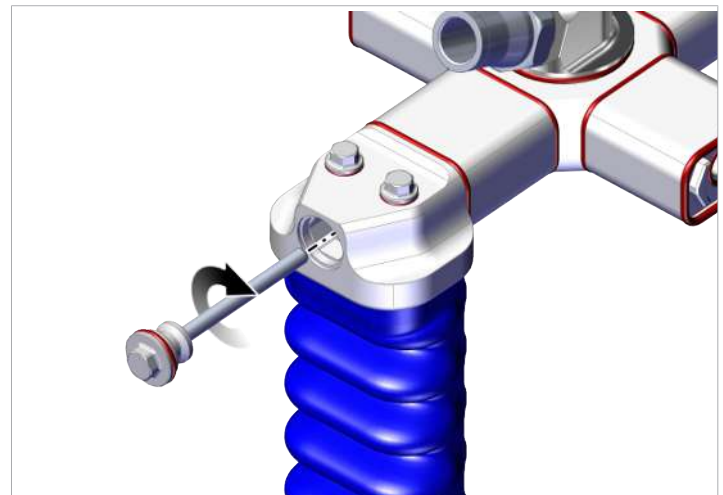
8. Mount the finger module on the spacer.
Note: If no spacers are used, the fingers can be mounted directly on the distributor.



9. Apply anti-seize gel to the end of the threaded rod, and tighten the hexagonal nut on the threaded rod.
Note: Use the threaded rod and spacer table ([See ch. 4 Configurations, p. 5](#)) to determine which threaded rod is best for your gripper.

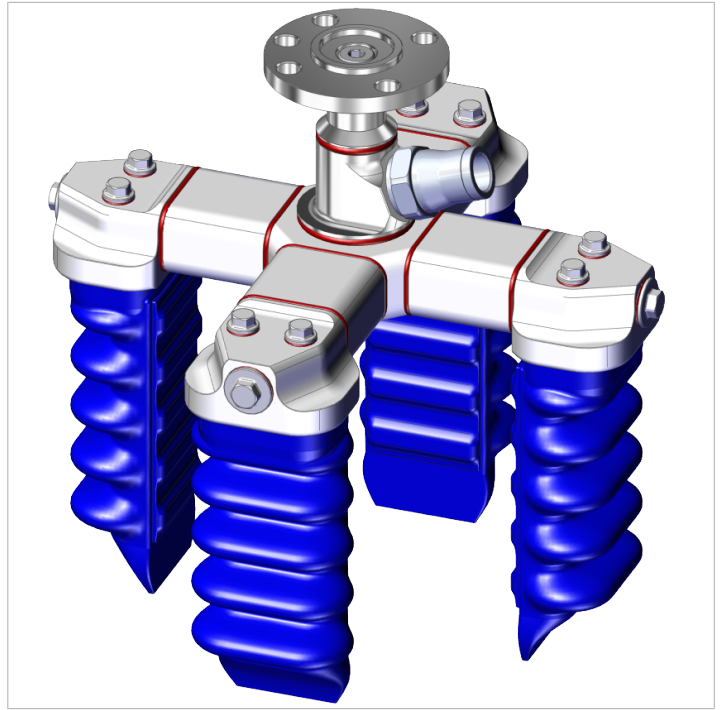


10. To attach to the hub, thread the threaded rod through the installed finger module and spacer (if installed). Tighten the hexagonal nut on the threaded rod to 2.2 Nm.



11. **Note:** If dummy plates are used, follow steps 6, 8, and 9.

12. Repeat steps 7 through 9 to attach the other finger module to the circular distributor.



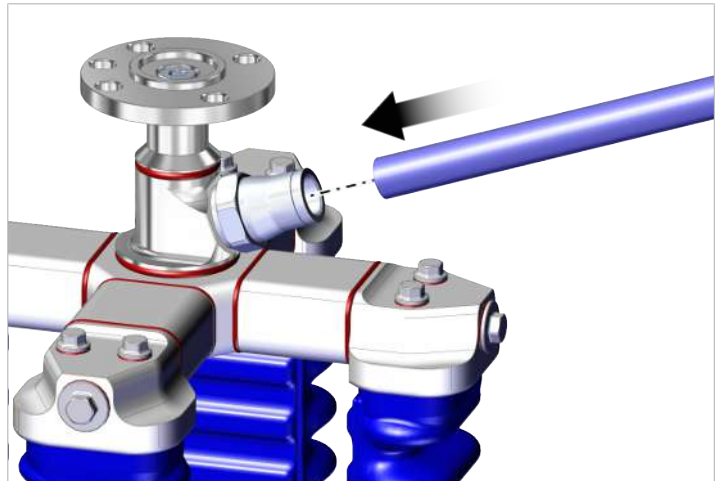
13. After the gripper has been in its operating environment for at least 8 hours, tighten the center hub bolt with a torque of 7.4 Nm.

8.3 Pneumatic connection

The vacuum hose is mounted on the pneumatic connection.

- ✓ The appropriate hose (OD = 8 mm, ID = 6 mm) is ready to hand.

1. Push the hose into plug-in screw union as far as possible.



2. Manually check the hose for tightness in the plug-in screw union by pulling on the hose.

8.4 Maintenance Plan and Cleaning



Schmalz stipulates the following checks and inspection intervals. The operator must comply with the legal regulations and safety regulations applicable at the location of use. These intervals apply to single-shift operation. For heavier use such as multi-shift operation, the intervals must be shortened accordingly.

| Maintenance task | Daily | Weekly | Monthly | Every six months | Yearly |
|---|-------|--------|---------|------------------|--------|
| Check the supply hose and gripping fingers (vacuum/compressed air): <ul style="list-style-type: none">• Material not brittle• No kinks• Not chafed• Airtightness | | | X | | X |
| The operating instructions are available, legible, and can be accessed by personnel. | | | | | X |

To safely clean the product, its materials must not react with the cleaning agent and antimicrobial chemicals (disinfectants).



NOTE

Incorrectly cleaning the product and its components

Damage to the product or individual components due to aggressive cleaning agents or excessive temperatures!

- ▶ For cleaning, use only cleaning agents that do not corrode or damage the materials used.
- ▶ Do not use sharp-edged objects (wire brushes, sandpaper, etc.).
- ▶ Do not exceed the specified max. temperature during cleaning.

When cleaning the parts, a maximum temperature of 60° C must be observed.



The type and frequency of cleaning is the responsibility of the operating company.

9 Disposing of the Product

Recover the disassembled parts for recycling or reuse (provided no agreement on return or disposal has been made).

1. Dispose of the product properly after replacement or decommissioning.
2. Observe the country-specific guidelines and legal obligations for waste prevention and disposal.