

Assembly and operating instructions

BSWS-M

Quick-change jaw system

Original operating instructions

Hand in hand for tomorrow

Imprint

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We reserve the right to make technical improvements.

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Dear Customer

Dear Customer,

Thank you for putting your trust in our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. We look forward to your challenging questions. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management

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Please read the operating manual in full and keep it close to the product.

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1 General

1.1 About this Manual

This manual contains important information for the safe, correct use of the product.

The manual is an integral part of the product and must be kept accessible by personnel at all times.

Personnel must have read and understood this manual before beginning any work. The observance of all safety notes in this manual is the precondition for all safe working.

Besides this manual, other documents which apply are those listed under ▶ 1.1.3 [6].

NOTE: The illustrations in this manual are intended to provide a basic understanding and may deviate from the actual version.

1.1.1 Illustration of safety notes

To make risks clear, the following signal words and symbols are used for safety notes.



⚠ DANGER

Danger to individuals!

Ignoring a safety note such as this will certainly lead to irreversible injury and even death.



⚠ WARNING

Danger to individuals!

Ignoring a safety note such as this can lead to irreversible injury and even death.



⚠ CAUTION

Danger to individuals!

Non-observance can cause minor injuries.

NOTICE

Material damage!

Information about avoiding material damage.

1.1.2 Definition of Terms

The term "product" replaces the product name on the title page in this manual.

1.1.3 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *
- Assembly and operating manual of the gripper *

The documents labeled with an asterisk (*) can be downloaded from schunk.com/downloads.

1.1.4 Sizes

This manual applies to the following sizes:

- BSWS 50
- BSWS 64
- BSWS 80
- BSWS 100
- BSWS 125
- BSWS 160
- BSWS 200
- BSWS 240
- BSWS 300

1.1.5 Variants

This operating manual applies to the following variations:

- BSWS-BM
- BSWS-URM
- BSWS-ABRM
- BSWS-A
- BSWS-AR

1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the date of delivery from the production facility under the following conditions:

- Observance of the specified maintenance and lubrication intervals
- Observance of the ambient conditions and operating conditions

Parts touching the workpiece and wearing parts are not part of the warranty.

1.3 Scope of delivery

The scope of delivery includes:

Quick-change jaw system jawQuick-change jaw system (BSWS-M)

- Per BSWS-M in the ordered model:
 - 2x adapters
- Per BSWS-M in the ordered model:
 - 1x base with changing system
- Per BSWS-M in the ordered model:
 - 2x adapters
- Per BSWS-M in the ordered model:
 - 1x aluminum attachment jaw with interchangeable system
- Per BSWS-M in the ordered model:
 - 1x Kit interchangeable system for installation in customer-specific attachment jaw
- Safety information (product-specific instructions available online)

1.4 Accessories

For the kit for customer-specific attachment jaws:

- BSWS-AR adapter

For information regarding which accessory articles can be used with the corresponding product variants, see catalog data sheet.

2 Basic safety notes

2.1 Intended use

The product has been designed for the quick manual change of gripper top jaws. The product can also be used as a stationary changing system or in fixture construction.

- The product may only be used within the scope of its technical data, ▶ 3 [11].
- The product is intended for installation in a machine/ automated system. The applicable guidelines for the machine/ automated system must be observed and complied with.
- The product is intended for industrial use.
- Appropriate use of the product includes compliance with all instructions in this manual.

2.2 Inappropriate use

Inappropriate use includes using the product as a press tool, punching tool, lifting equipment, tool guide, cutting tool, clamping device, or drilling tool, for example.

- Any use that exceeds or differs from the appropriate use is regarded as misuse.

2.3 Structural changes

Implementation of structural changes

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- Structural changes should only be made with the written approval of SCHUNK.

2.4 Spare parts

Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Use only original spare parts and spares authorized by SCHUNK.

2.5 Gripper fingers

Requirements of gripper fingers

Accumulated energy can make the product unsafe and risk the danger of serious injuries and considerable material damage.

- Only change gripper fingers if no residual energy can be released.
- Make sure that the product and the gripper finger are sufficient in size for the workpiece.

2.6 Ambient conditions and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

- Make sure that the product is only used within its defined application parameters, ▶ 3 [11].

2.7 Personnel qualification

- All work must be carried out by qualified personnel.
- Before working on the product, personnel must have read and understood the complete installation and operating instructions.

2.8 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff in the event of a danger that may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.

2.9 Fundamental dangers

General

- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

2.9.1 Notes on safe operation

Incorrect manner of working by personnel

An incorrect manner of working can make the product unsafe and risk the danger of serious injuries and considerable material damages.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. Products for special ambient conditions are excluded.
- Rectify malfunctions as soon as they occur.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention, and environmental protection regulations for the application field of the product.

2.9.2 Protection during commissioning and operation

Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

3 Technical data

Weight

Size	BSWS-A Weight [kg]	BSWS-BM Weight [kg]
50	0.002	0.02
64	0.005	0.04
80	0.011	0.07
100	0.024	0.13
125	0.046	0.20
160	0.077	0.42
200	0.16	0.85
240	0.3	1.3
300	0.41	1.52

Size	BSWS-AR Weight [kg]	BSWS-ABRM Weight [kg]	BSWS-URM Weight [kg]
50	0.01	0.08	0.006
64	0.015	0.14	0.011
80	0.03	0.25	0.021
100	0.06	0.47	0.038
125	0.1	0.86	0.048
160	0.19	1.67	0.146

Ambient conditions and operating conditions

Ambient temperature [°C]

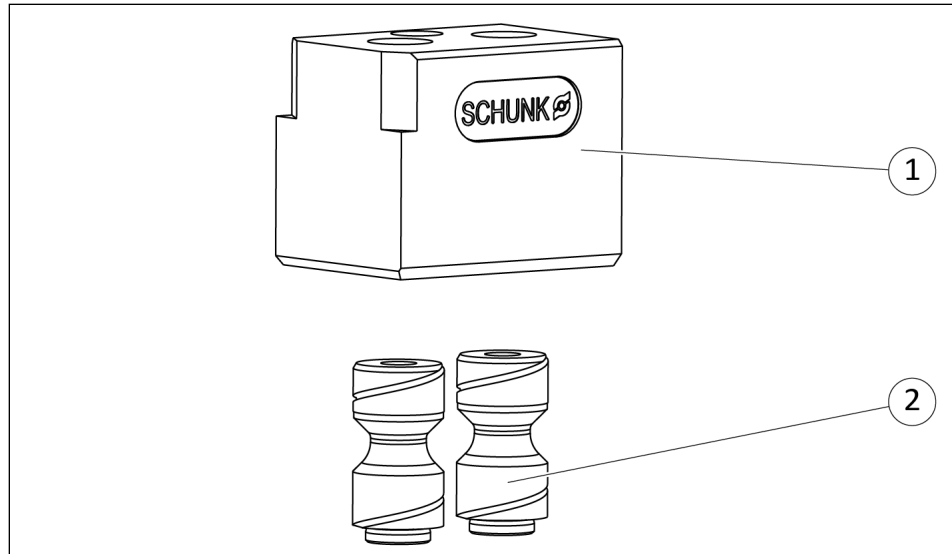
min.	+5
max.	+130

Protection class IP	64
---------------------	----

More technical data is included in the catalog data sheet.
Whichever is the latest version.

4 Design and description

4.1 Quick-change jaw system (BSWS-A with BSWS-BM)



Quick-change jaw system

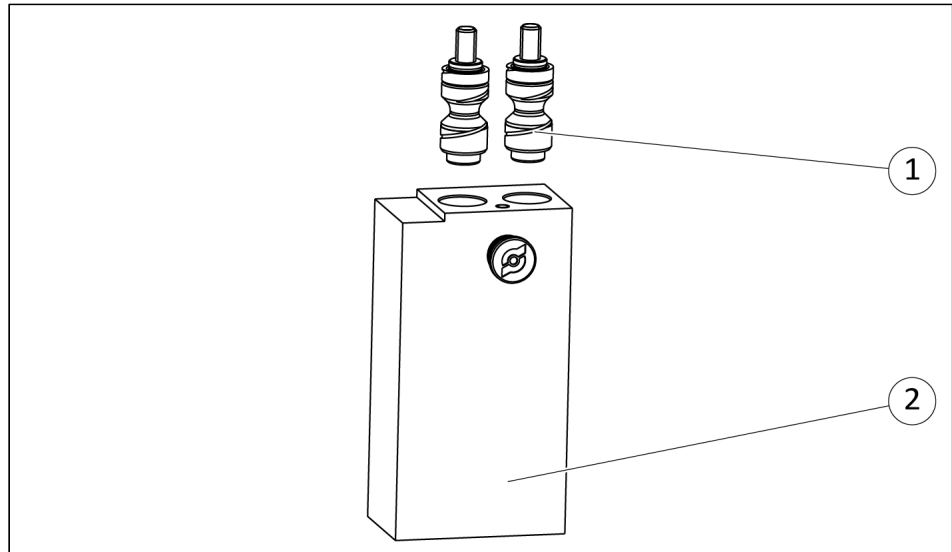
- | | |
|---|------------------|
| 1 | Base (BSWS-BM) |
| 2 | Adapter (BSWS-A) |

The quick-change jaw system consists of two adapters (BSWS-A) and one base with a change system (BSWS-BM) per base jaw on the gripper, ▶ 1.3 [7].

NOTE

The base (BSWS-BM) **cannot** be combined with the adapters (BSWS-AR).

4.2 Quick-change jaw system without height extension (BSWS-AR with BSWS-ABRM)



BSWS-M without height extension

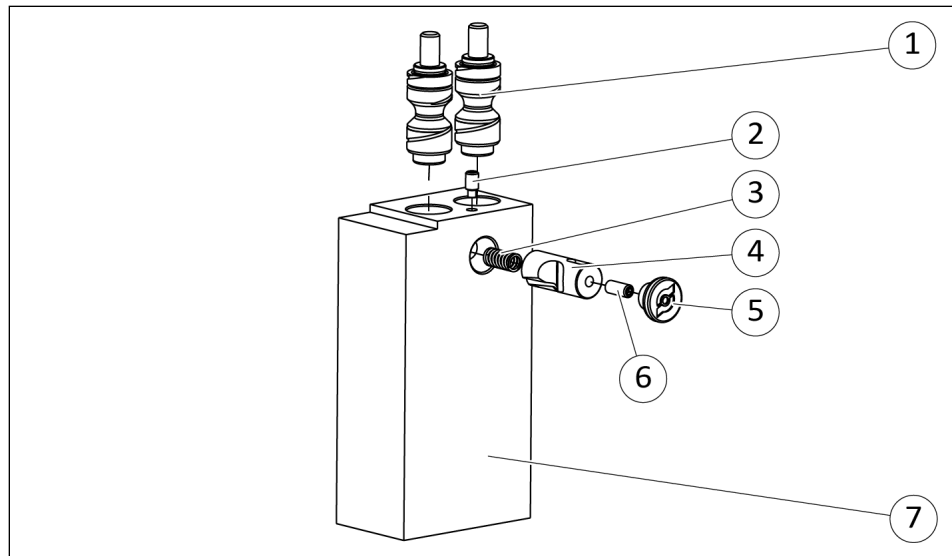
- | | |
|---|--|
| 1 | Adapter (BSWS-AR) |
| 2 | Attachment jaw with aluminum quick-change system (BSWS-ABRM) |

The quick-change jaw system without height extension consists of two adapters (BSWS-AR) and one attachment jaw with aluminum exchange system (BSWS-ABRM) per base jaw on the gripper, ► 1.3 [7].

NOTE

The attachment jaw with aluminum exchange system (BSWS-ABRM) **cannot** be combined with the adapters (BSWS-A).

4.3 Kit for customer-specific attachment jaws (BSWS-UR)



Kit for customer-specific attachment jaws

1	Adapter (BSWS-AR)	7	Customized attachment jaw
Kit (BSWS-URM), consisting of:			
2	Threaded pin with spigot	5	Release button
3	Compression spring	6	Threaded pin
4	Locking bolt		

The kit for customer-specific attachment jaws consists of a kit (BSWS-URM) and one customer-specific attachment jaw per base jaw on the gripper, ▶ 1.3 [7].

Two adapters (BSWS-AR) are required for mounting on the gripper, ▶ 1.4 [7].

NOTE

The customer-specific attachment jaw with the kit (BSWS-URM) **cannot** be combined with the adapters (BSWS-A).

5 Assembly

NOTE

Assembly is explained using the PGN-plus P gripper as an example. Assembly on other grippers is done in the same way.



⚠ WARNING

Risk of crushing due to improper assembly!

Fingers and hands may be crushed when assembling the product.

- Proceed carefully when assembling.
-

NOTICE

Property damage due to incorrect top jaws!

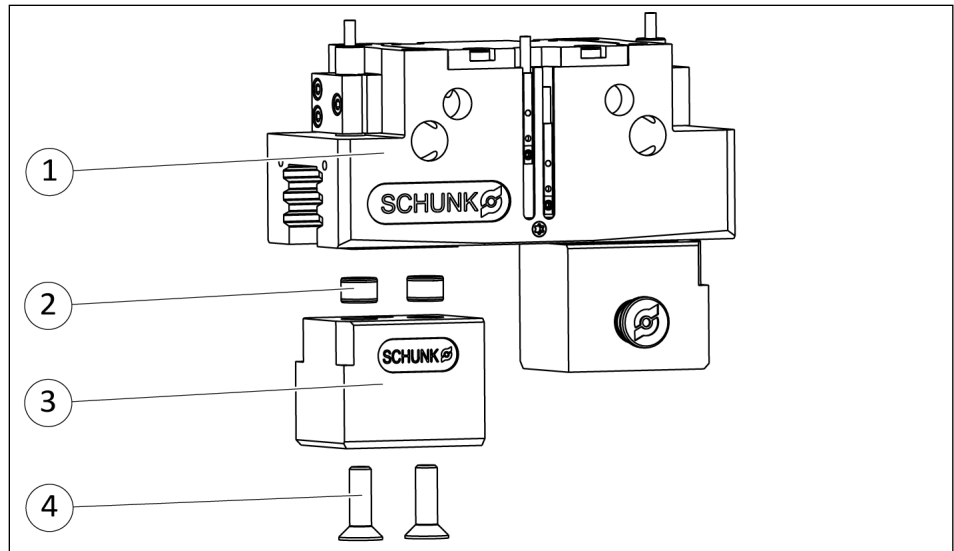
When using top jaws, the maximum permissible length and the maximum weight must not be exceeded.

- Observe the catalog data sheet.
-

5.1 Installation of quick-change jaw system

To assemble the quick-change jaw system, two adapters (BSWS-A) and one base (BSWS-BM) are required for each basic jaw of the gripper.

5.1.1 Mount base on gripper



Mounting the base on the gripper

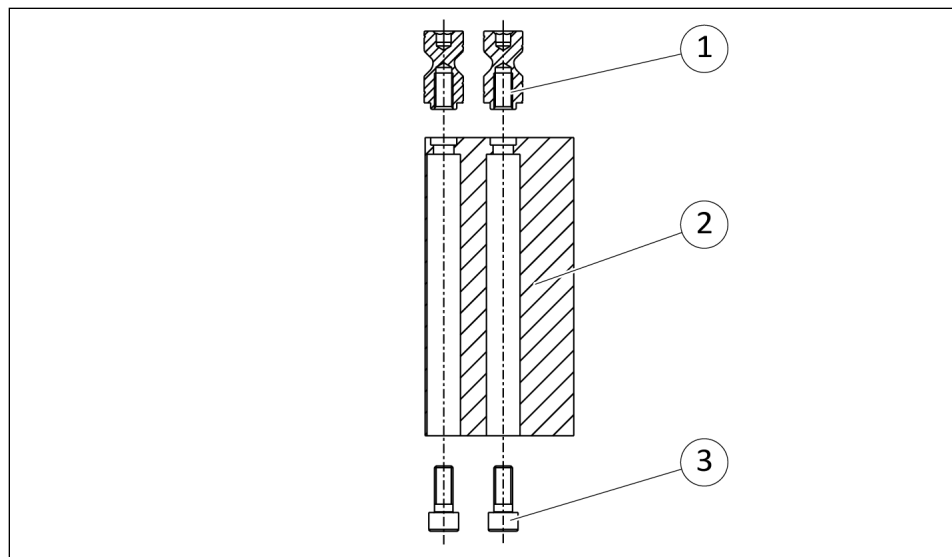
- Fix the base (3) to the base jaw of the gripper (1) using the centering sleeves (2) and screw it in place with the fastening screws (4).
⇒ Observe the tightening torque.

Tightening torque

Size	Tightening torque [Nm]
50	1.2
64	3.1
80	6.1
100	10
125	10
160	49
200	150
240	150
300	360

Tab.: Mounting screws, base

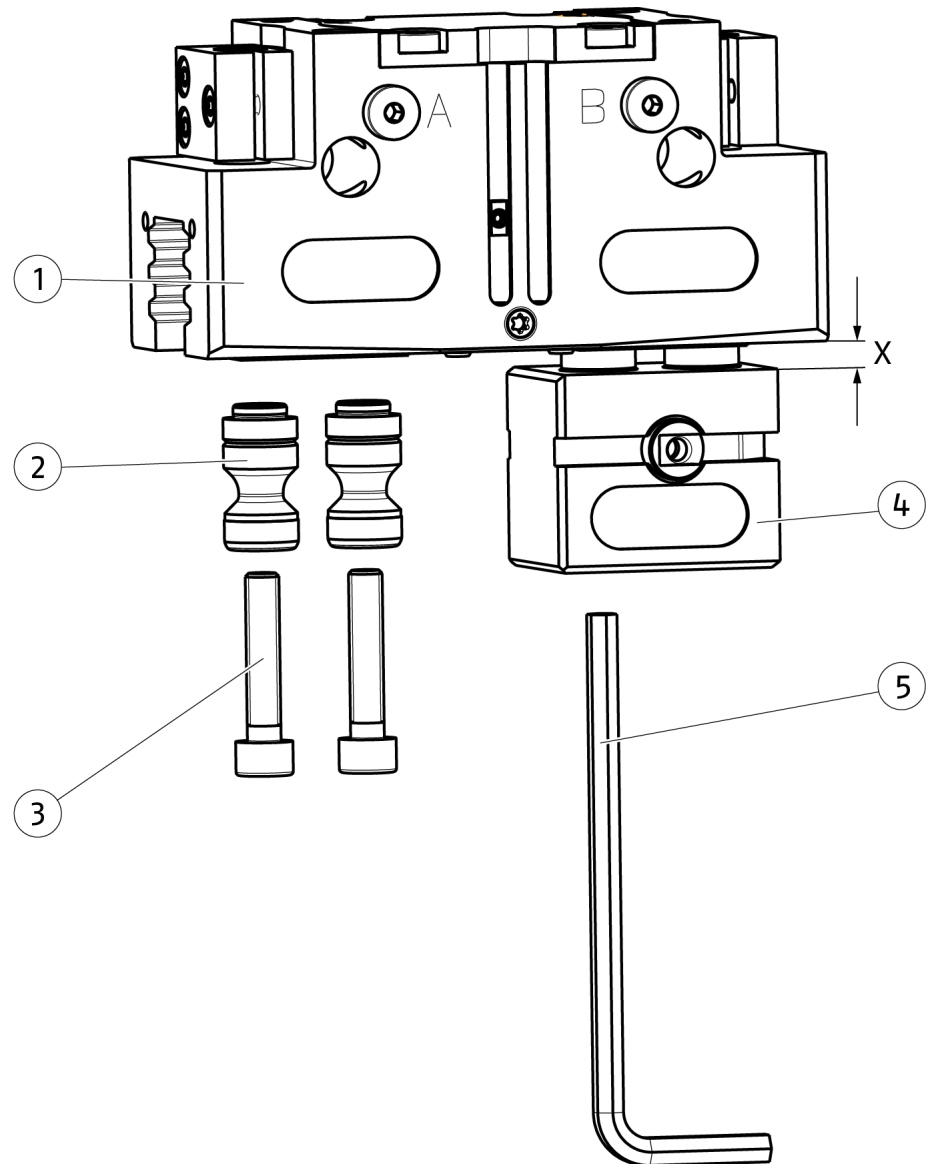
5.1.2 Assembling the adapter on the top jaw



Assembling the adapter on the top jaw

- Fasten both adapters (1) to the top jaw (2) with screws (3).
 - ⇒ Secure the screws with Loctite No. 243.
 - ⇒ Observe the tightening torque.

5.1.3 Mount the adapter bolt (BSWS-AR) on the gripper



1. Fix the adapter bolts (2) to the base jaws of the gripper (1) and secure them with screws (3). Do not tighten the screws.
2. Align the adapter bolts (2). To do this, insert the base (4) until it is $X = 2$ mm above the adapter bolts (2). The lock must not engage.
3. Tighten the screws (3) through the base (4) using a suitable tool (5).
 - ⇒ Secure the screws with Loctite No. 243.
 - ⇒ Observe the tightening torque.

NOTE

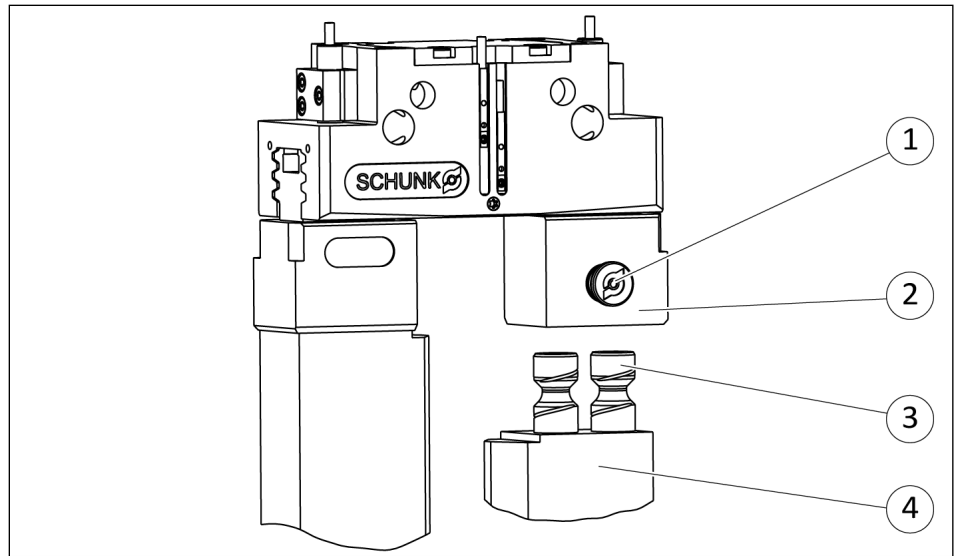
It is not possible to combine the BSWS-AR adapter bolts with "SD" (dustproof) grippers.

Tightening torque

Size	Tightening torque [Nm]
50	2,1
64	5,3
80	11
100	18
125	18
160	85
200	150
240	150
300	360

Tab.: Mounting screws, adapter

5.1.4 Mounting the attachment jaw on the base



Mounting the attachment jaw on the base

- 1.** Treat all greased areas with lubricant. ▶ 6.2 [26]
- 2.** Press the release button (1) into the base (2) as far as it will go and hold it down.
- 3.** Push the adapter (3) on the attachment jaw (4) into the base (2) as far as it will go.
- 4.** Release the release button (1) again, pressing against the spring force, and slowly return it to its original position.
Note: If the release button (1) snaps back to its original position uncontrollably due to the spring force, more force is required to press it again.
- 5. Optional:** Unscrew the release button (1) if the protrusion causes space problems or to prevent unintentional activation.

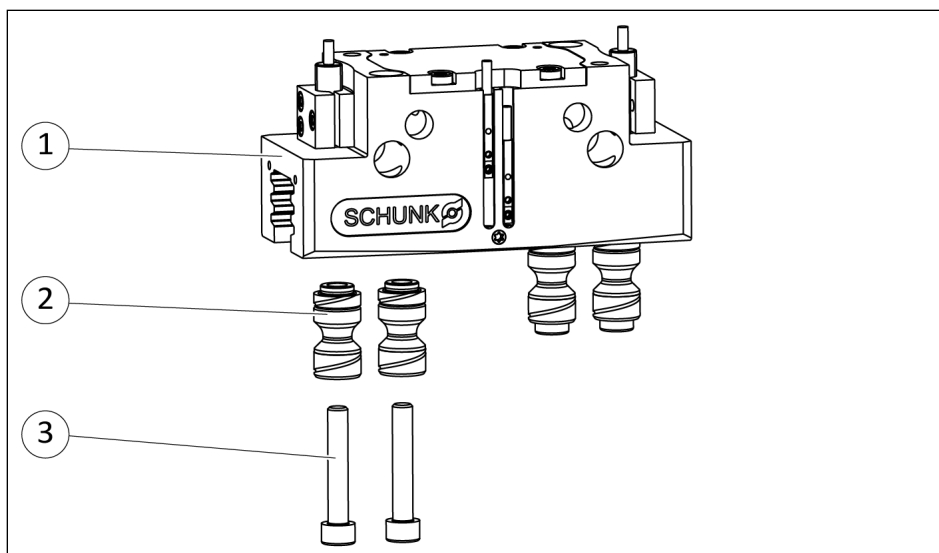
NOTE

The base (2) includes a dowel pin (not shown in the illustration) that can be used to prevent the two attachment jaws on the gripper from being mixed up. To do this, only one base is equipped with the dowel pin and the corresponding attachment jaw with the appropriate hole.

5.2 Installation of quick-change jaw system without height extension

To mount the quick-change jaw system without height extension, two adapters (BSWS-AR) and one attachment jaw (BSWS-ABRM) are required for each base jaw of the gripper.

5.2.1 Mounting the adapter on the gripper



Mounting the adapter on the gripper

- Fix both adapters (2) to the base jaw of the gripper (1) and secure with screws (3).
 - ⇒ Secure the screws with Loctite No. 243.
 - ⇒ Observe the tightening torque.

NOTE

For the "SD" (dustproof) gripper variant, the screws are too short.

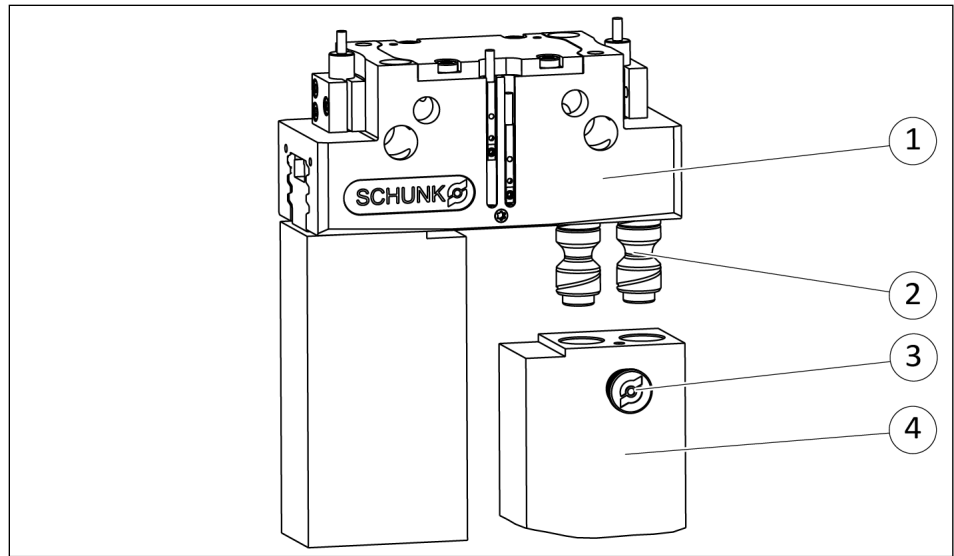
- Use longer screws for variant "SD". These are not included in the scope of delivery.

Tightening torque

Size	Tightening torque [Nm]
50	2.1
64	5.3
80	11
100	18
125	18
160	35
200	85
240	85
300	210

Tab.: Mounting screws, adapter

5.2.2 Mounting the attachment jaw on the gripper



Mounting the attachment jaw on the gripper

1. Treat all greased areas with lubricant. ▶ 6.2 [26]
2. Press the release button (3) into the attachment jaw (4) as far as it will go and hold it down.
3. Push the attachment jaw (4) onto the adapter (2) on the gripper (1) until it stops.
4. Release the release button (3) again, pressing against the spring force, and slowly return it to its original position.
Note: If the release button (3) snaps back to its original position uncontrollably due to the spring tension, more force is required to press it again.
5. **Optional:** Unscrew the release button (3) if the protrusion causes space problems or to prevent unintentional activation.

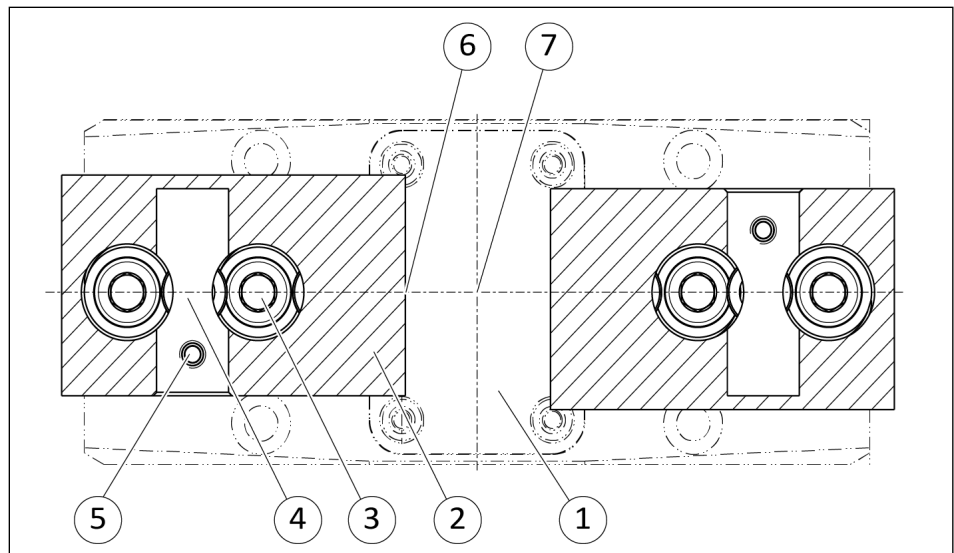
5.3 Assembly kit for customer-specific attachment jaws

To assemble the kit for custom-made attachment jaws, two adapters (BSWS-AR) and a custom-made attachment jaw with the kit (BSWS-URM) are required for each basic jaw of the gripper.

5.3.1 Manufacturing instructions for customer-specific attachment jaws

When manufacturing specific attachment jaws, please note that the holes on all attachment jaws must be made to the same manufacturing dimensions.

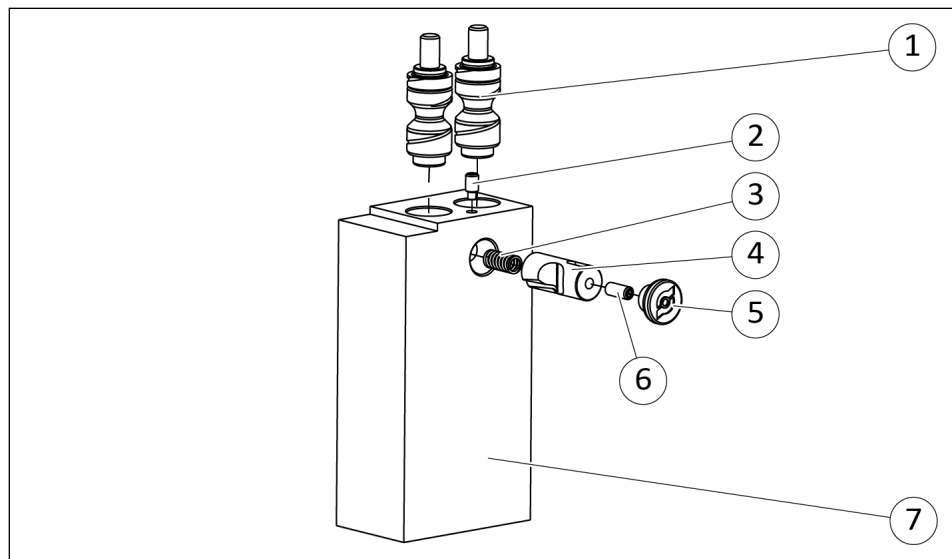
When manufacturing customer-specific attachment jaws in-house, the manufacturing dimensions from the catalog data sheet must be used. The catalog data sheet can be downloaded at schunk.com. A 3D CAD template can be downloaded at schunk.com in the *CAD data service* section.



Sectional drawing of customer-specific attachment jaw

1	Gripper	5	Hole for threaded pin with tang
2	Attachment jaw	6	Attachment jaw Side of gripper center
3	Adapter	7	Tool center point
4	Bore Locking bolt		

5.3.2 Install locking mechanism in attachment jaw



Install locking mechanism in attachment jaw

1. Treat all grease areas with lubricant ▶ 6.2 [26].
2. **Sizes 50–125:** Apply Loctite No. 222 to the threaded pin (6).
Sizes 160–300: Apply Loctite No. 243 to the threaded pin (6).
3. Screw the threaded pin (6) into the locking bolt (4) as far as it will go.
4. Screw the release button (5) onto the threaded pin (6) until it stops.
5. Insert the pressure spring (3) into the locking bolt (4).
6. Insert the locking bolt (4) with the pressure spring (3) into the blank attachment jaw (7). Align the locking bolt (4) so that the groove faces the hole for the threaded pin (2).
7. **All sizes:** Apply Loctite No. 243 to the threaded pin (2).
8. Carefully screw in the threaded pin (2) until it stops and then turn it back a quarter turn.
 - ⇒ The threaded pin (2) remains countersunk in the hole.
 - ⇒ Make sure that no Loctite gets into the hole for the locking bolt.

5.3.3 Assembling the adapter on the gripper

The adapter is assembled on the gripper in the same way as for the quick-change jaw system without additional height, ▶ 5.2.1 [📄 21].

5.3.4 Assembling the top jaw on the gripper

The top jaws are assembled on the gripper in the same way as for the quick-change jaw system without additional height, ▶ 5.2.2 [📄 22].

6 Maintenance

6.1 Maintenance and lubrication intervals

NOTICE

Material damage due to hardened lubricants!

Lubricants harden more quickly at temperatures above 60 °C, leading to possible product damage.

- Reduce maintenance interval accordingly.

Maintenance- and lubrication interval

Interval [cycles] *	1000
---------------------	------

* One cycle corresponds to one replacement process.

6.2 Lubricants/lubrication points

During maintenance, treat the following parts with lubricant:

- Locking bolts
- Adapter bolts
- Spring

Apply a thin film of lubricant using a lint-free cloth.

Lubricant point	Lubricant
Metallic sliding surfaces	SCHUNK grease 1

Tab.: Recommended lubricants

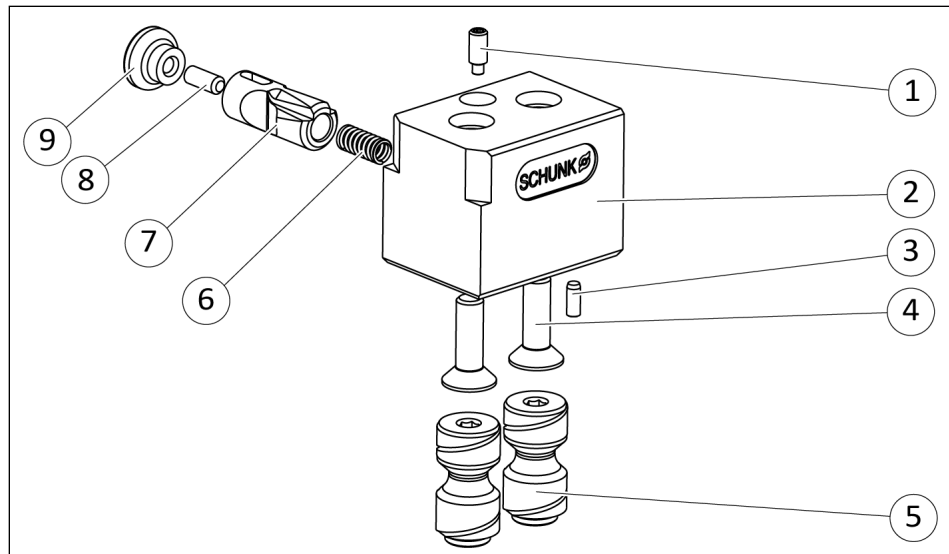
Details regarding SCHUNK lubricant designations are available at schunk.com/lubricants.

The product contains food-compliant lubricants as standard.

The requirements of standard EN 1672-2:2020 are not fully met.

6.3 Maintenance of quick-change jaw system

6.3.1 Disassemble base



Disassemble the base

1. Press and hold the release button (9).
2. Remove the attachment jaw with adapter (5).
3. Release the release button (9).
4. Unscrew the screws (4) and remove the base (2) from the gripper.
5. Press the release button (9) lightly and hold it in the position between the end stops.
6. Unscrew the threaded pin with the pin (1).
7. Pull out the release button (9). Make sure that the spring (6) is not lost.
8. Unscrew the adapter (5) from the attachment jaw.

6.3.2 Maintain and assemble the base

Maintenance

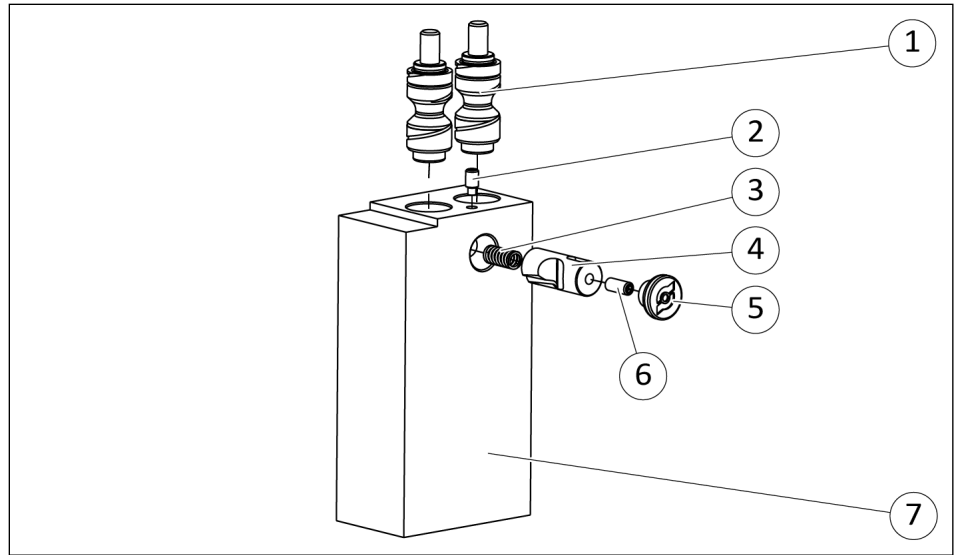
- Clean all parts thoroughly, check for damage and wear
- Replace all damaged parts.
- Treat all grease areas with lubricant ▶ 6.2 [□ 26].

Assembly

- **All sizes:** Apply Loctite No. 243 to the threaded pin with spigot (1).
- **Sizes 50–125:** Apply Loctite No. 222 to the threaded pin (8).
Sizes 160–300: Apply Loctite No. 243 to the threaded pin (8).
- Assemble the product and mount it on the gripper, ▶ 5.1 [□ 16].

6.4 Maintenance of quick-change jaw system without additional height

6.4.1 Disassemble the attachment jaw



Disassemble the attachment jaw

1. Press and hold the release button (5)
2. Pull the attachment jaw (7) off the adapters (1).
3. Press the release button (5) lightly and hold it in the position between the end stops.
4. Unscrew the threaded pin with the pin (2)
5. Pull out the release button (5). Make sure that the spring (3) is not lost.
6. Unscrew the adapter (1) from the attachment jaw (7).

6.4.2 Maintain and assemble the attachment jaw

Maintenance

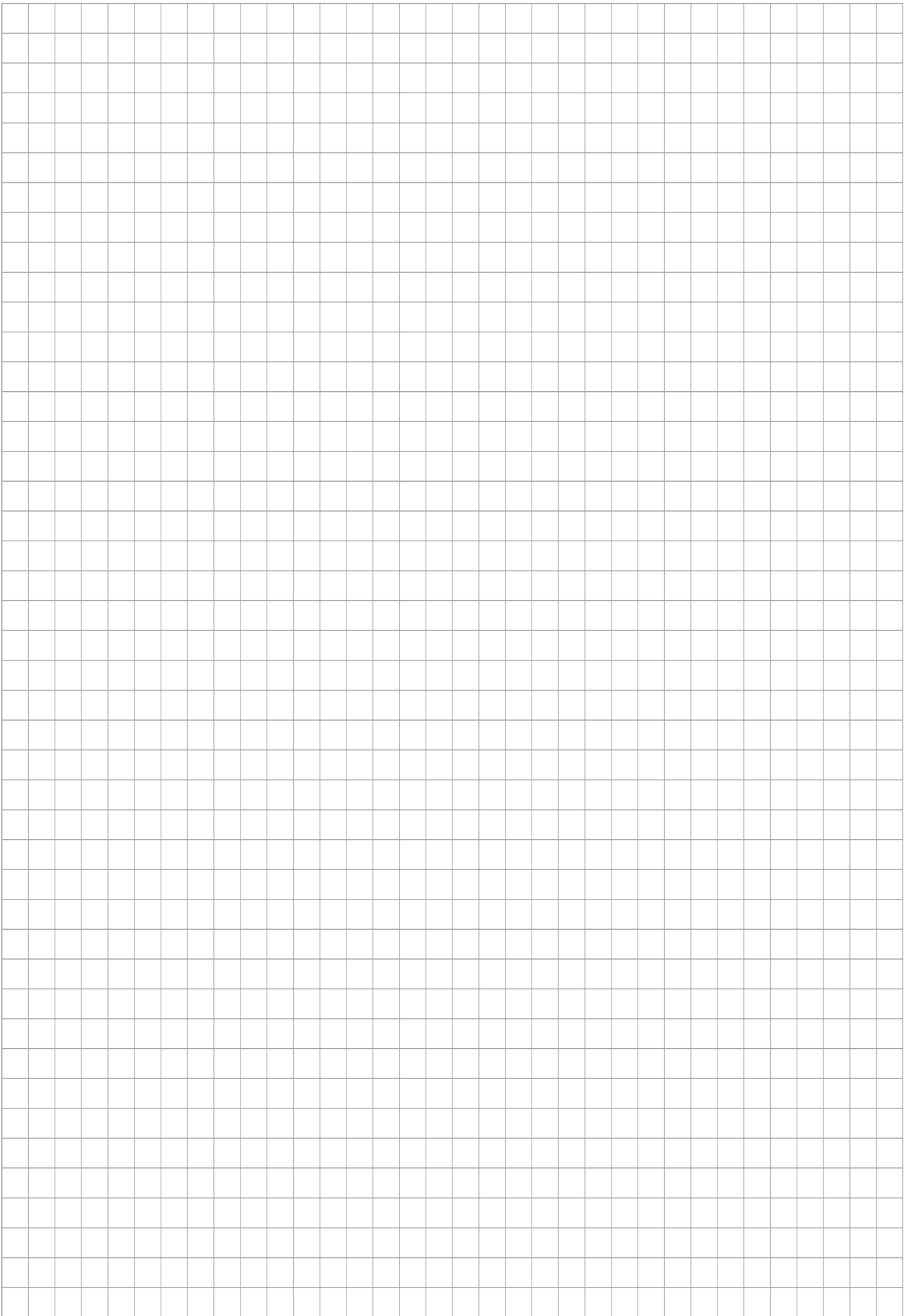
- Clean all parts thoroughly, check for damage and wear
- Replace all damaged parts.
- Treat all grease areas with lubricant ▶ 6.2 [□ 26].

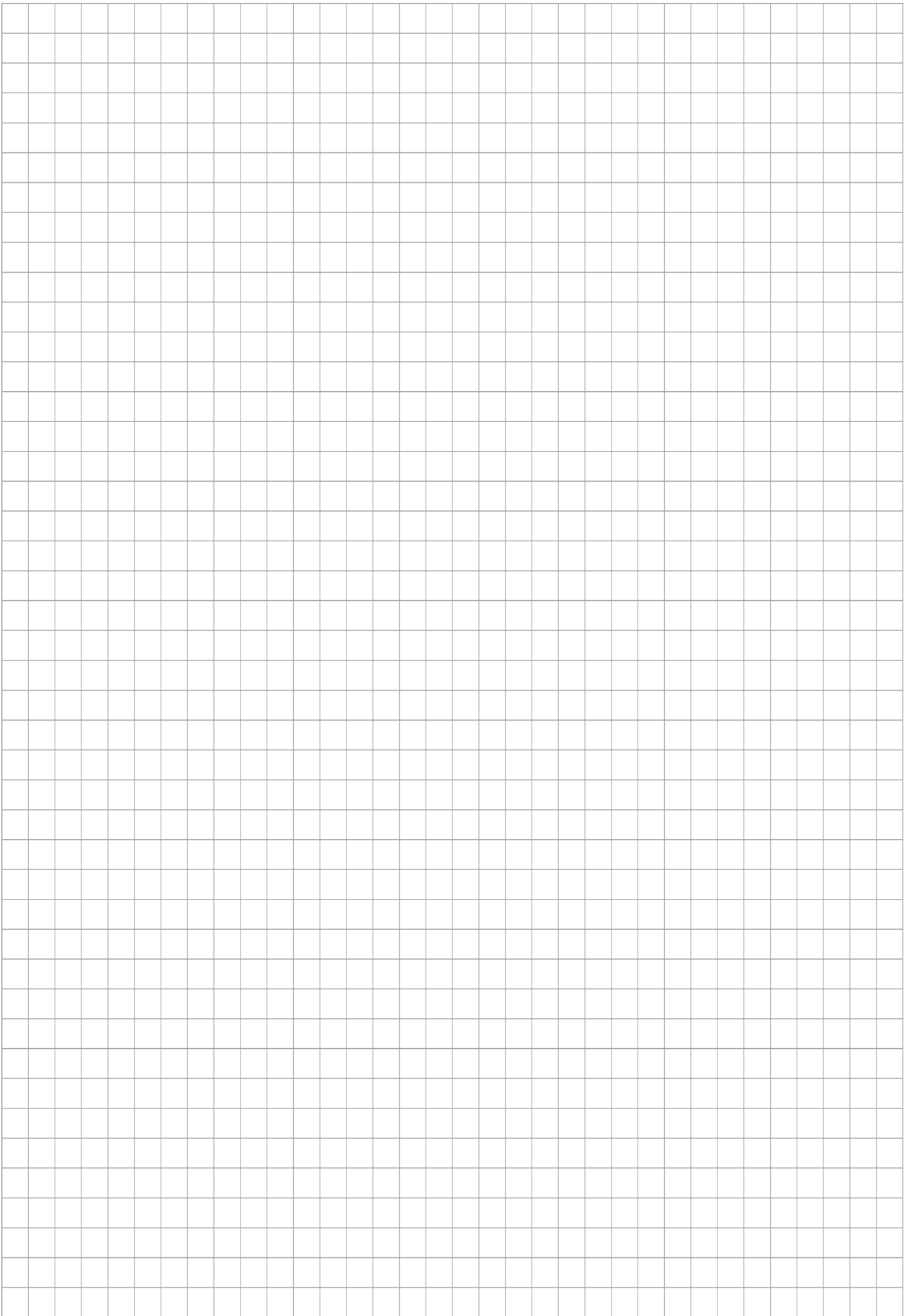
Assembly

- **All sizes:** Apply Loctite No. 243 to the threaded pin with lug (2).
- **Sizes 50–125:** Apply Loctite No. 222 to the threaded pin (6).
Sizes 160–300: Apply Loctite No. 243 to the threaded pin (6).
- Assemble the product and mount it on the gripper, ▶ 5.2 [□ 21].

6.5 Maintenance of the kit for customer-specific top jaws

The top jaws are disassembled, serviced and assembled in the same way as for the jaw quick-change system without additional height, ▶ 6.4 [□ 28].









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