

Assembly and Operating Manual

BSWS-M

Jaw quick-change system

Translation of Original Operating
Manual

Hand in hand for tomorrow

Imprint

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Dear Customer,

Thank you for trusting 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. Ask us questions and challenge us. 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 a safe and appropriate use of the product.

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

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

In addition to these instructions, the documents listed under ▶ 1.1.3 [6] are applicable.

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

1.1.1 Presentation of Warning Labels

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



⚠ DANGER

Dangers for persons!

Non-observance will inevitably cause irreversible injury or death.



⚠ WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.



⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

CAUTION

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](https://www.schunk.com).

1.1.4 Sizes

This operating 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 ex-works delivery date under the following conditions:

- Observe the specified maintenance and lubrication intervals
- Observe the ambient conditions and operating conditions

Parts touching the workpiece and wear parts are not included in the warranty.

1.3 Scope of delivery

Depending on the variant, the scope of delivery includes:

- BSWS-A:
 - 2 adapters
- BSWS-BM:
 - 1 base with changing system
- BSWS-AR:
 - 2 adapters
- BSWS-ABRM:
 - 1 aluminum top jaw with changing system
- BSWS-URM:
 - 1 changing system kit for installation in customer-specific top jaw

1.4 Accessories

For the kit for customer-specific top jaws:

- Adapter BSWS-AR

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 Not intended use

It is not intended use if the product is used, for example, as a pressing tool, stamping tool, lifting gear, guide for tools, cutting tool, clamping device or a drilling tool.

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

2.3 Constructional 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 or 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.

- Execute the gripper fingers in such a way that the product reaches either the "open" or "closed" position in a de-energized state.
- Only change gripper fingers if no residual energy can be released.
- Make sure that the product and the top jaws are a sufficient size for the application.

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 used only in the context of its defined application parameters, ▶ 3 [📄 11].

2.7 Personnel qualification

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.

2.8 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff against danger which 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 handling of the personnel

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- 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. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

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]

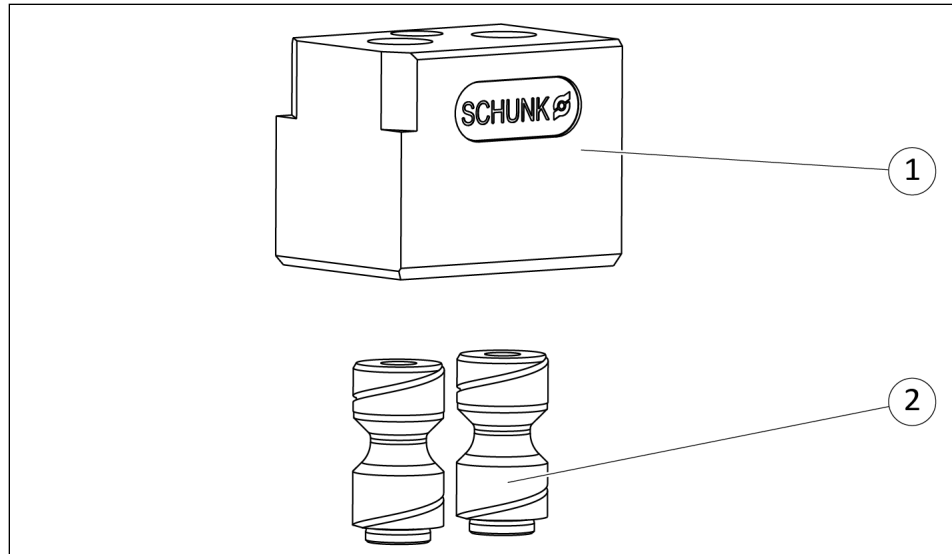
min. +5
max. +130

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 Jaw quick-change system (BSWS-A with BSWS-BM)



Jaw quick-change system

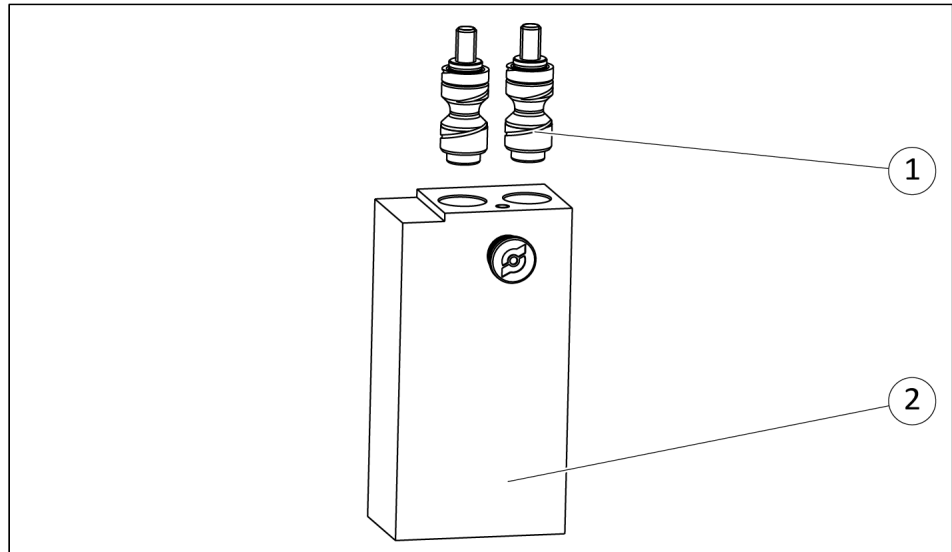
- | | |
|---|------------------|
| 1 | Base (BSWS-BM) |
| 2 | Adapter (BSWS-A) |

The jaw quick-change system consists of two adapters (BSWS-A) and a base with a changing 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 Jaw quick-change system without additional height (BSWS-AR with BSWS-ABRM)



BSWS-M without additional height

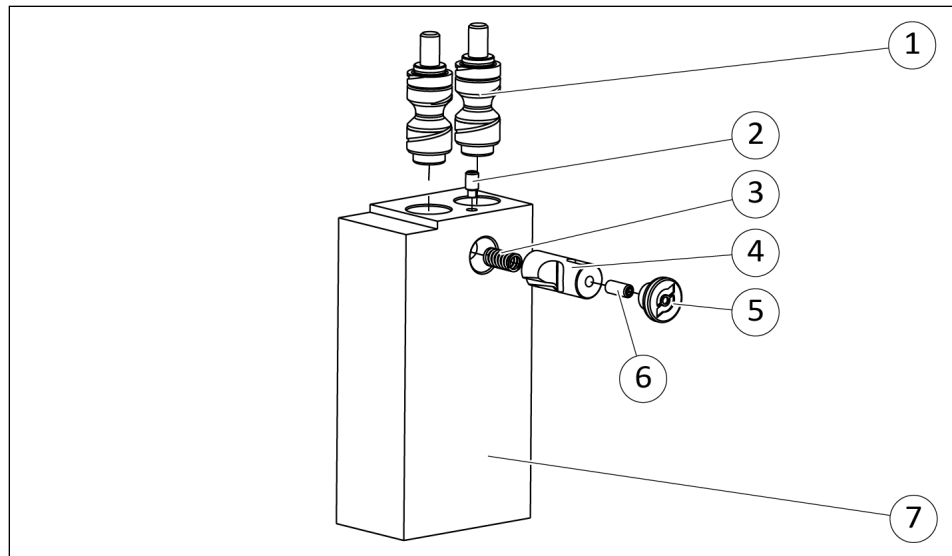
- | | |
|---|--|
| 1 | Adapter (BSWS-AR) |
| 2 | Top jaw with changing system in aluminum (BSWS-ABRM) |

The jaw quick-change system without additional height consists of two adapters (BSWS-AR) and a top jaw with changing system made of aluminum (BSWS-ABRM) per base jaw on the gripper, ▶ 1.3 [7].

NOTE

The top jaw with changing system made of aluminum (BSWS-ABRM) **cannot** be combined with the adapters (BSWS-A).

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



Kit for customer-specific top jaws

1	Adapter (BSWS-AR)	7	Top jaw, customer-specific
---	-------------------	---	----------------------------

Kit (BSWS-URM), consisting of:

2	Set-screw with pin	5	Unlocking button
3	Compression spring	6	Set-screw
4	Lock bolt		

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

For mounting on the gripper, two adapters (BSWS-AR) are necessary, ▶ 1.4 [□ 7].

NOTE

The customer-specific top 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.
-

CAUTION

Property damage due to incorrect top jaws!

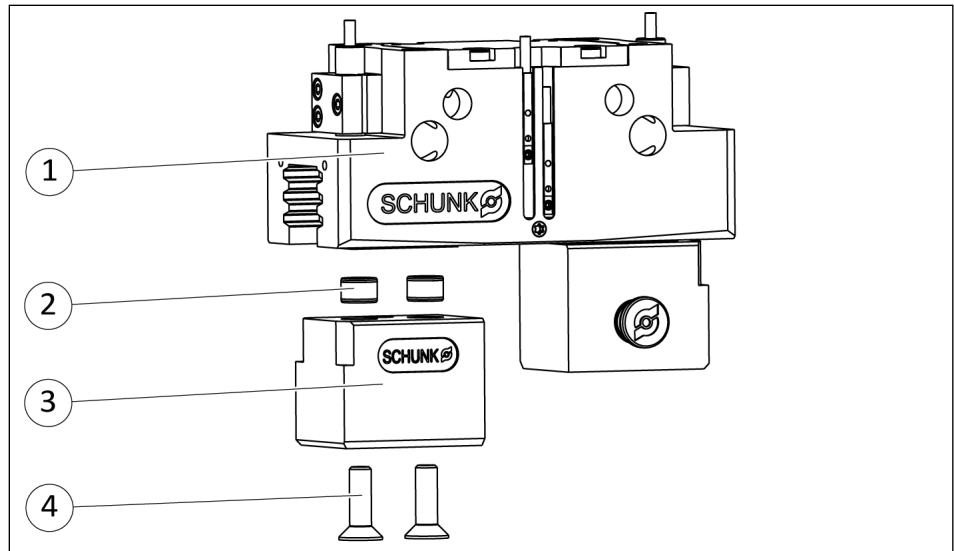
When using top jaws, the maximum permissible length and the maximum weight must not be exceeded.

- Observe the catalog data sheet.
-

5.1 Assembly of quick-change jaw system

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

5.1.1 Assembling the base on the gripper



Assembling the base on the gripper

- Secure the base (3) via the centering sleeves (2) on the base jaw of the gripper (1) and screw it on using the mounting screws (4).
⇒ Observe the tightening torque.

NOTE

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

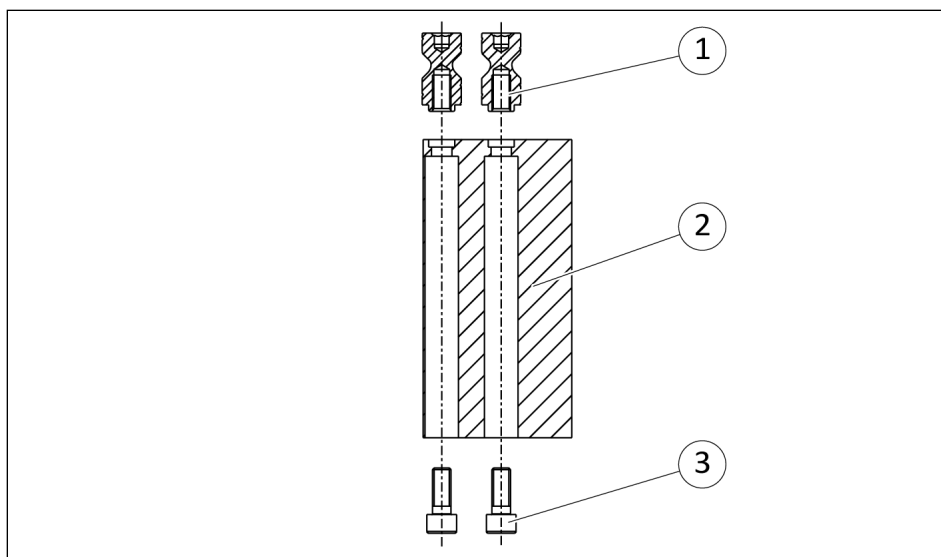
- Use longer screws for variant "SD". These are not included in the scope of delivery.

Tightening torque

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

Tab.: Mounting screws, base

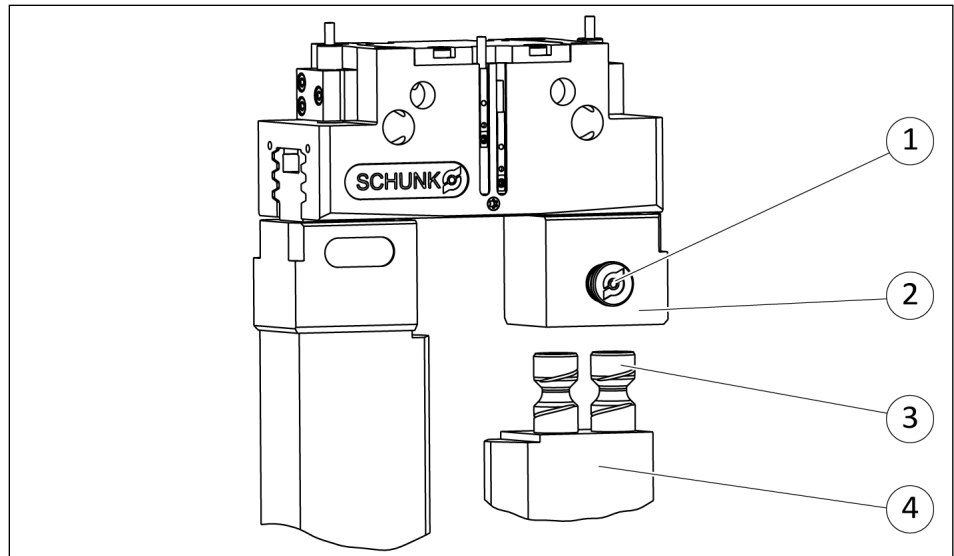
5.1.2 Assembling the adapter on the top jaw



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 Assembling the top jaw on the base



Assembling the top jaw on the base

1. Treat all greased areas with lubricant. ▶ 6.2 [24]
2. Press the unlocking button (1) up to the stop in the base (2) and hold it down.
3. Push the adapter (3) on the top jaw (4) up to the stop in the base (2).
4. Release the unlocking button (1) again, pressing against the spring pre-tensioning force and slowly returning it to the starting position.

Note: If the unlocking button (1) flicks to the initial position in an uncontrolled way due to the spring pre-tensioning force, increased force is required when actuating it again.

5. **Optional:** Unscrew the unlocking button (1) if the projection causes space problems or if unintentional actuation is to be prevented.

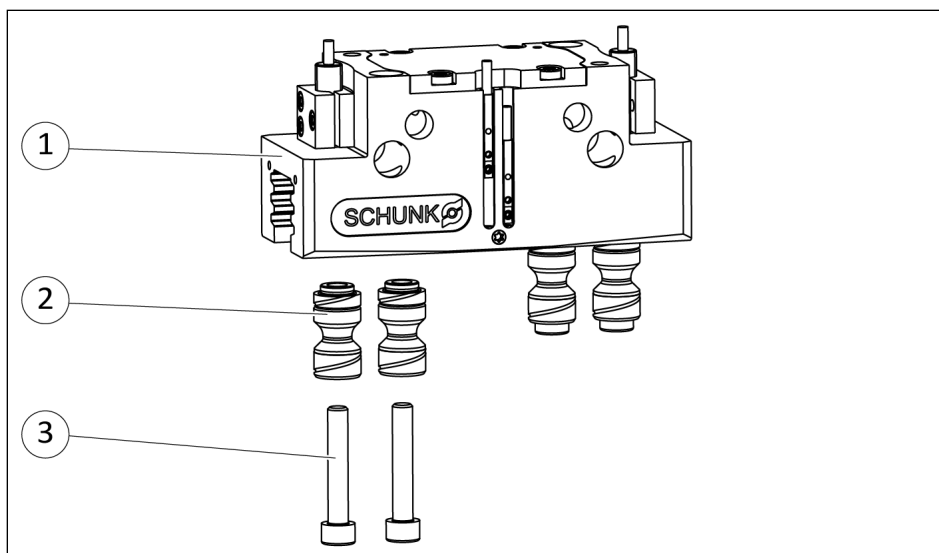
NOTE

The base (2) includes an alignment pin (not shown in the illustration) which can be used to prevent the two top jaws on the gripper from being mixed up. For this purpose, only one base is equipped with the alignment pin and the corresponding top jaw with the corresponding bore hole.

5.2 Assembly of quick-change jaw system without additional height

To mount the jaw quick-change system without additional height, each base jaw of the gripper requires two adapters (BSWS-AR) and a top jaw (BSWS-ABRM).

5.2.1 Assembling the adapter on the gripper



Assembling 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.

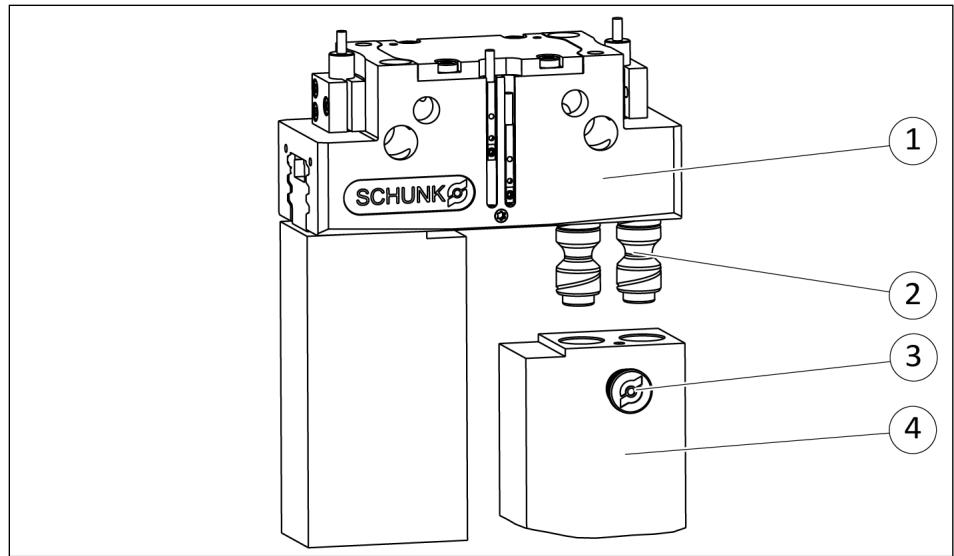
- Use longer screws for variant "SD". These are not included in the scope of delivery.

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 Assembling the top jaw on the gripper



Assembling the top jaw on the gripper

- 1.** Treat all greased areas with lubricant. ▶ [6.2](#) [24]
- 2.** Press the unlocking button (3) up to the stop in the top jaw (4) and hold it down.
- 3.** Push the top jaw (4) up to the stop on the gripper (1) on the adapter (2).
- 4.** Release the unlocking button (3) again, pressing against the spring pre-tensioning force and slowly returning it to the starting position.
 Note: If the unlocking button (3) flicks to the initial position in an uncontrolled way due to the spring pre-tensioning force, increased force is required when actuating it again.
- 5. Optional:** Unscrew the unlocking button (3) if the projection causes space problems or if unintentional actuation is to be prevented.

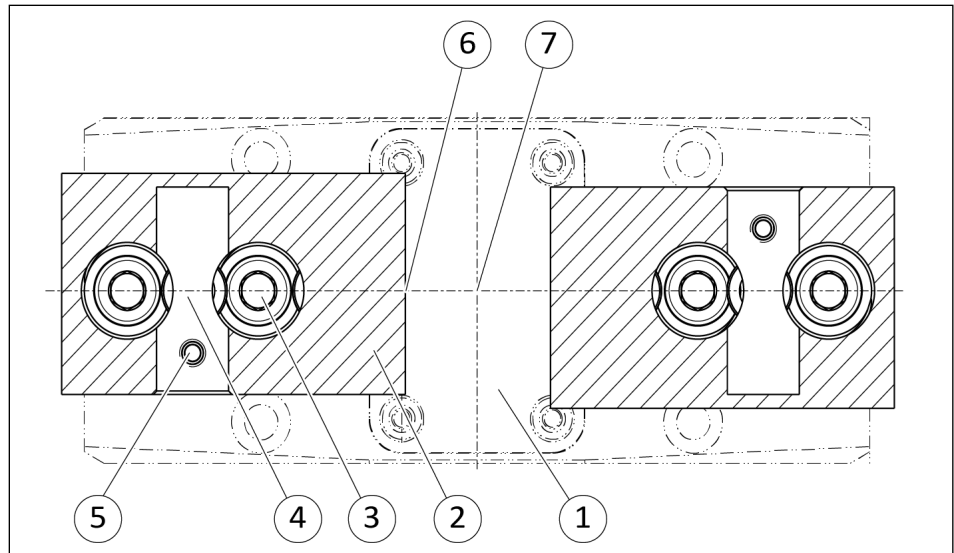
5.3 Assembly of the kit for customer-specific top jaws

To mount the kit for customer-specific top jaws, each base jaw of the gripper requires two adapters (BSWS-AR) and an in-house manufactured top jaw with the kit (BSWS-URM).

5.3.1 Notes on producing customer-specific top jaws

When producing specific top jaws, ensure that the bore holes on all top jaws are produced according to the same production dimensions.

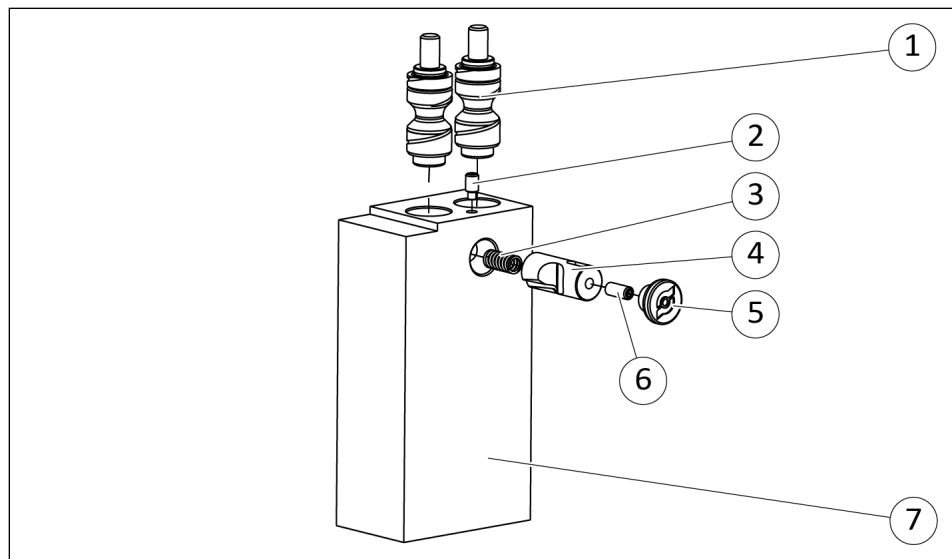
The production dimensions in the catalog data sheet must be used for the in-house production of customer-specific top jaws. The catalog data sheet can be downloaded at schunk.com. A 3D CAD template can be downloaded at schunk.com under *CAD data service*.



Sectional drawing of a customer-specific top jaw

1	Gripper	5	Bore hole set-screw with pin
2	Top jaw	6	Top jaw, gripper center face
3	Adapter	7	Tool center point
4	Bore hole, lock bolt		

5.3.2 Assembling the locking mechanism in the top jaw



Assembling the locking mechanism in the top jaw

1. Treat all grease areas with lubricant, ► 6.2 [24].
2. **Size 50–125:** Apply Loctite No. 222 to the set-screw (2).
Size 160–300: Apply Loctite No. 243 to the set-screw (2).
3. Screw the set screw (6) into the lock bolt (4) up to the stop.
4. Screw the unlocking button (5) onto the set-screw (6) up to the stop.
5. Insert the compression spring (3) into the lock bolt (4).
6. Insert the lock bolt (4) with compression spring (3) into the top jaw blank (7). Align the lock bolt (4) so that the groove points towards the bore hole for the set-screw (2).
7. **All sizes:** Apply Loctite No. 243 to the set-screw (2).
8. Carefully screw in the set-screw (2) to the stop and turn back by a quarter turn.
 - ⇒ Gewindestift (2) bleibt dabei in der Bohrung versenkt.
 - ⇒ Darauf achten, dass kein Loctite in die Bohrung des Verriegelungsbolzen gelangt.

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 [📄 19].

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 [📄 20].

6 Maintenance

6.1 Maintenance and lubrication intervals

CAUTION

Material damage due to hardening lubricants!

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

- Reduce the lubricant intervals accordingly.

Maintenance- and lubrication interval

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

* One cycle corresponds to one change procedure.

6.2 Lubricants/Lubrication points

Bei der Wartung folgende Teile mit Schmierstoff behandeln:

- Locking pin
- Adapter pin
- Spring

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

Lubricant point	Lubricant
Metallic sliding surfaces	SCHUNK grease 1

Tab.: Recommended lubricants

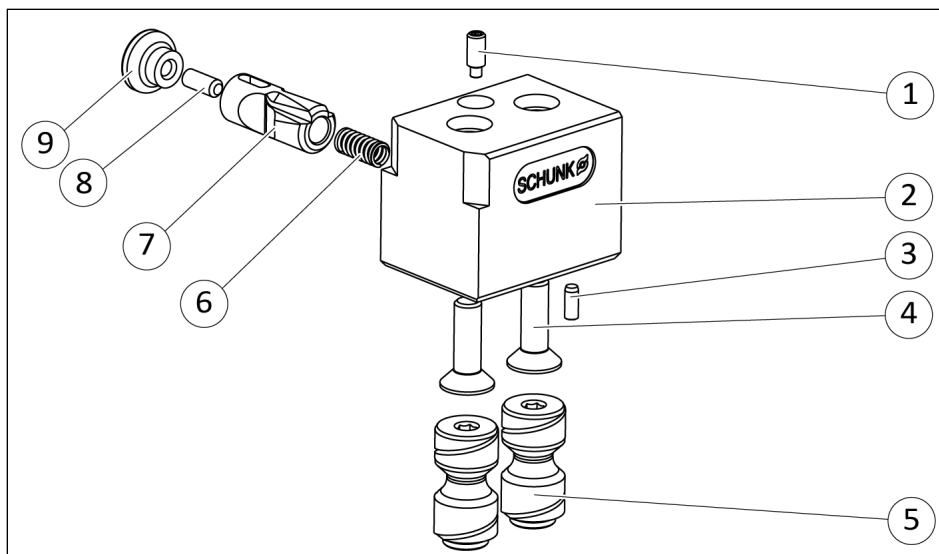
Details on the SCHUNK lubricant designations are available at schunk.com/lubricants

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 Disassembling the base



Disassembling the base

1. Press and hold down the unlocking button (9).
2. Remove the top jaw with adapter (5).
3. Release the unlocking button (9) again.
4. Unscrew the screws (4) and remove the base (2) from the gripper.
5. Press the unlocking button (9) slightly and hold it in the position between the end stops.
6. Unscrew the set-screw with pin (1).
7. Pull out the unlocking button (9). Take care not to lose the spring (6).
8. Unscrew the adapter (5) from the top jaw.

6.3.2 Servicing and assembling the base

Maintenance

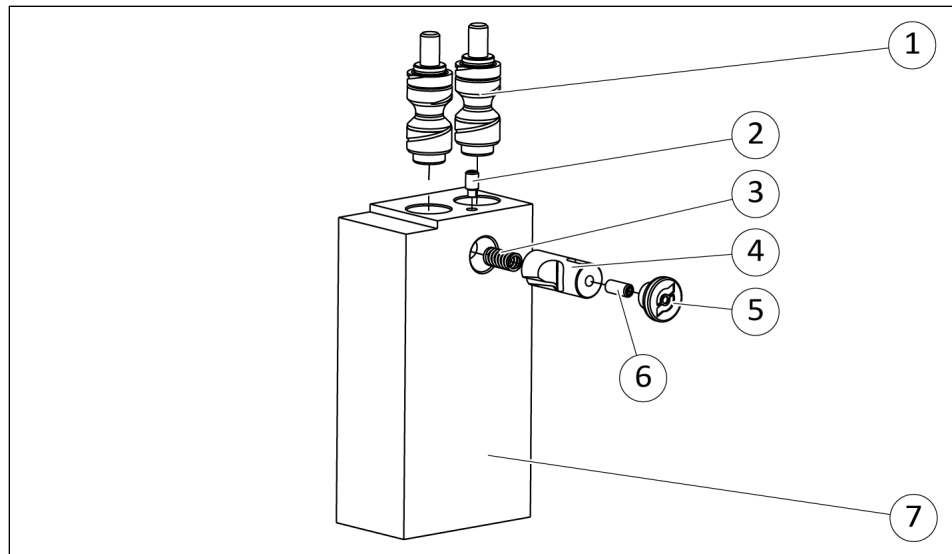
- Clean all parts thoroughly, check for damage and wear
- Replace all damaged parts.
- Treat all grease areas with lubricant, ▶ 6.2 [24].

Assembly

- **All sizes:** Apply Loctite No. 243 to the set-screw with pin (1).
- **Size 50-125:** Apply Loctite No. 222 to the set-screw (8).
- **Baugröße 160-300:** Apply Loctite No. 243 to the set-screw (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 Disassembling the top jaw



Disassembling the top jaw

1. Press and hold down the unlocking button (5)
2. Pull the top jaw (7) off the adapters (1).
3. Press the unlocking button (5) slightly and hold it in the position between the end stops.
4. Unscrew the set-screw with pin (2)
5. Pull out the unlocking button (5). Take care not to lose the spring (3).
6. Unscrew the adapter (1) from the top jaw (7).

6.4.2 Servicing and assembling the top jaw

Maintenance

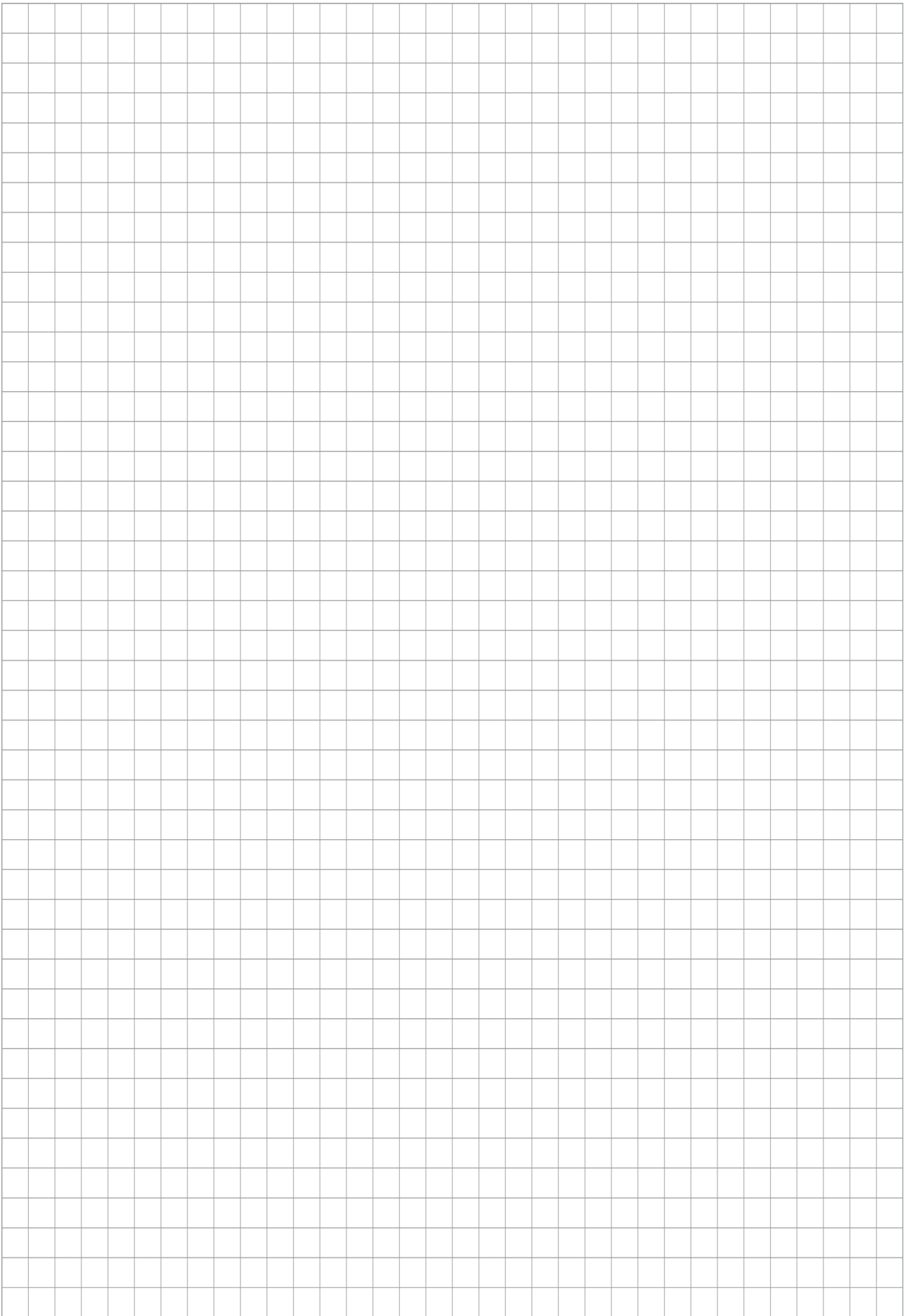
- Clean all parts thoroughly, check for damage and wear
- Replace all damaged parts.
- Treat all grease areas with lubricant, ▶ 6.2 [24].

Assembly

- **All sizes:** Apply Loctite No. 243 to the set-screw with pin (2).
- **Size 50-125:** Apply Loctite No. 222 to the set-screw (6).
- **Size 160-300:** Apply Loctite No. 243 to the set-screw (6).
- Assemble the product and mount it on the gripper, ▶ 5.2 [19].

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 [26].





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Automation Technology

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