

Assembly and operating instructions

BSWS-R

Quick-change jaw system

Original operating instructions

Hand in hand for tomorrow

Imprint

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Technical changes:

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 ▶ 1.1.4 [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" or "module" replaces the product name on the title page in this manual.

1.1.3 Symbol definition

The following symbols are used in this manual:

■ Prerequisite for an action

1. Action 1

2. Action 2

⇒ Intermediate results

⇒ Final results

▶ 1.1.3 [📄 6]: chapter number and [page number] in hyperlinks

1.1.4 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.

1.1.5 Sizes

This manual applies to the following sizes:

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

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:

- Per adapter bolt (BSWS-AR) in the ordered model:
 - 2x adapter bolts
 - Mounting screws
- Per base (BSWS-BR) in the ordered model:
 - 1x base with interchangeable system
 - Accessory pack (mounting material, screw for inductive sensing)
- Per storage station (BSWS-SR) in the ordered model:
 - 1x storage station
- Safety information (product-specific instructions available online)

1.4 Accessories

Accessories include mounting kits for proximity switches, which are mounted on the storage station (BSWS-SR).

Contents

- Sensor bracket
- Accessory pack (mounting hardware)

Ident number

Mounting kit for IN 40 inductive proximity switches	
BSWS-SR	Ident number
50	1561455
64	1561455
80	1561458
100	1561458
Mounting kit for IN 80 inductive proximity switches	
BSWS-SR	Ident number
125	1561467
160	1561467
200	1561469
240	1561481
300	1561481

The sensors are not included in the scope of delivery of the mounting kit and must be ordered separately. See the catalog data sheet for available types.

2 Basic safety notes

2.1 Intended use

The product is used for the automated replacement of gripper fingers on a gripper and the storage of the replacement system with the gripper fingers in a storage system.

- The product may only be used within the scope of its technical data, ▶ 3 [12].
- 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 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.

2.3 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.

2.4 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.

2.5 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 [12].

2.6 Personnel qualification

Inadequate qualification of personnel

Work on the product by inadequately qualified personnel can lead to serious injuries and considerable material damage.

- Order all work to be performed only by appropriately qualified personnel.
- Personnel must have read and understood the complete manual before beginning any work on the product.
- Observe national accident prevention regulations and the general safety notes.

The following personnel qualifications are required for the various types of work on the product:

Trained electrician

Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.

Qualified personnel

Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.

Instructed person

Instructed persons have been instructed by the user regarding the tasks entrusted to them and the potential dangers of inappropriate behavior.

Manufacturer's service personnel

The manufacturer's service personnel have the specialized training, knowledge, and experience to perform the work entrusted to them and to recognize and avoid potential dangers.

2.7 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.

2.8 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 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 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.

2.9.2 Protection against dangerous movements

Unexpected movements

If the system still retains residual energy, serious injuries can be caused while working on the product.

- Switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.
- Never rely solely on the response of the monitoring function to avert danger. Until the installed monitors become effective, it must be assumed that the drive movement is faulty, with its action being dependent on the control unit and the current operating condition of the drive. Perform maintenance work, modifications, and attachments outside the danger zone defined by the movement range.
- To avoid accidents and/or material damage, human access to the movement range of the machine must be restricted. Limit/prevent accidental access for people in this area through technical safety measures. The protection cover and protective fence must be rigid enough to withstand the maximum possible movement energy. EMERGENCY STOP switches must be easily and quickly accessible. Before commissioning the machine or automated system, check that the EMERGENCY STOP system is working. Prevent operation of the machine if this protective equipment does not function correctly.

3 Technical data

Weight [kg]

Size	Base (BSWS-BR)	Storage station (BSWS-SR)	Adapter bolt (BSWS-AR)
50	0.03	0.06	0.01
64	0.05	0.07	0.015
80	0.07	0.13	0.03
100	0.15	0.26	0.06
125	0.22	0.26	0.1
160	0.46	0.37	0.19
200	0.97	0.79	0.45
240	1.49	1.48	0.71
300	1.98	1.5	1.06

Ambient conditions and operating conditions

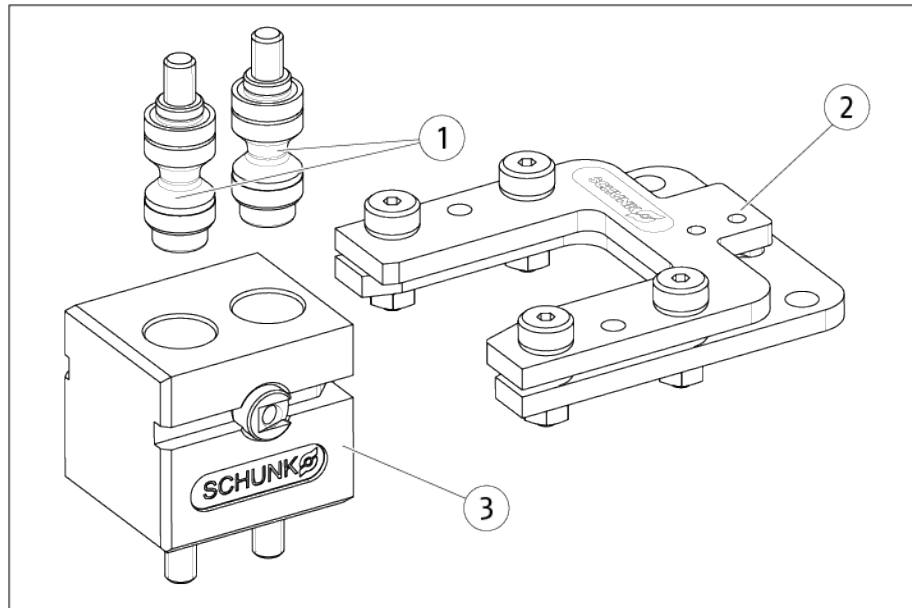
Designation	BSWS-R
Ambient temperature [°C]	
min.	+5
max.	+130
Protection class IP	64

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

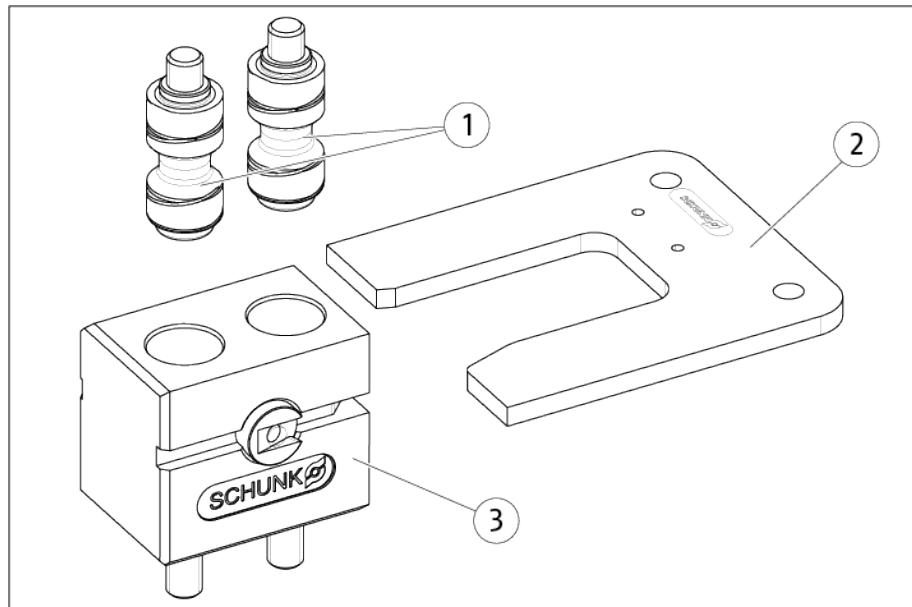
4 Design and description

4.1 Structure

Size 50 – 100



Size 125



- | | |
|---|---------------------------|
| 1 | Adapter bolt (BSWS-AR) |
| 2 | Storage station (BSWS-SR) |
| 3 | Base (BSWS-BR) |

4.2 Description

The BSWS-R consists of a storage station (BSWS-SR), a base (BSWS-BR) that is attached to the gripper fingers to be changed, and two adapter bolts (BSWS-AR) that are firmly screwed to the gripper.

The form-fitting locking mechanism ensures that the gripper fingers can be changed quickly.

Two adapter bolts (= one set of BSWS-AR), one base (BSWS-BR), and one storage station (BSWS-SR) are required per gripper jaw.

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

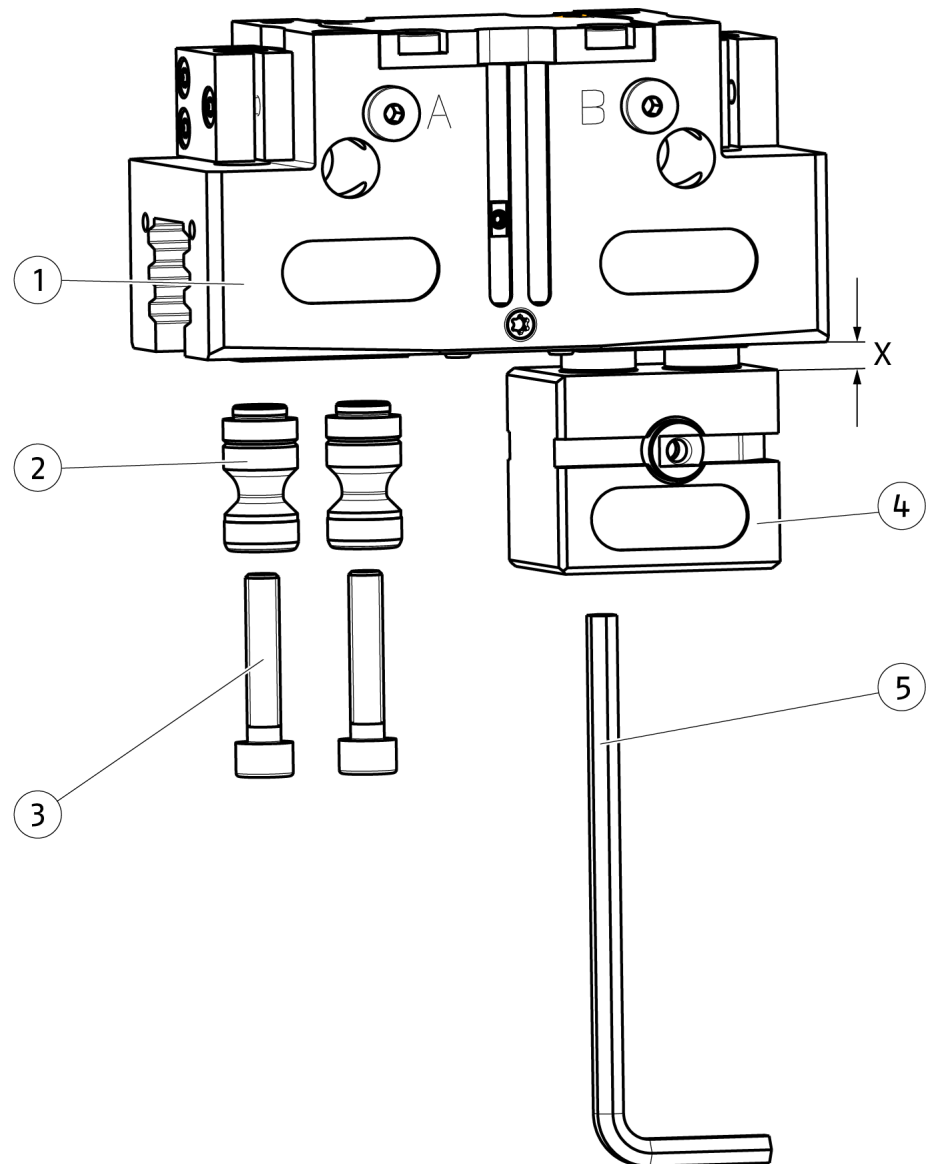
Property damage due to incorrect top jaws!

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

- Observe the catalog data sheet.
-

To mount the product on the gripper, 2 adapter bolts (1x BSWS-AR consists of 2 adapter bolts) and one base (1x BSWS-BR) are required for each base jaw.

5.1 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.

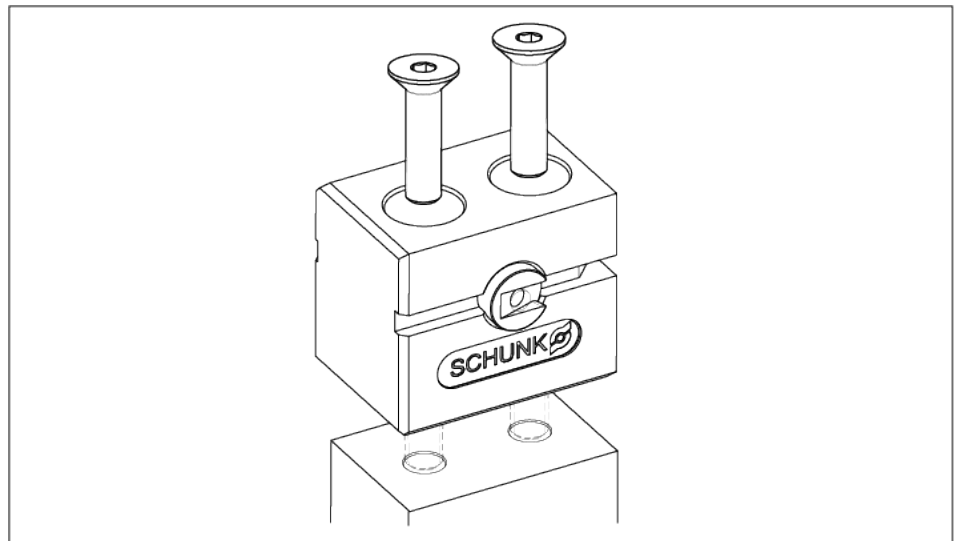
NOTE

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

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

5.2 Mounting the gripper fingers at the base (BSWS-BR)



BSWS-BR	Screw Ø [mm]	Max. screw-in depth into the gripper fingers [mm]
50	M3	7.4
64	M4	9.6
80	M5	10.5
100	M6	16.4
125	M6	16.4
160	M10	22.2
200	M12	22.0
240	M12	25.5
300	M16	32.0

NOTICE

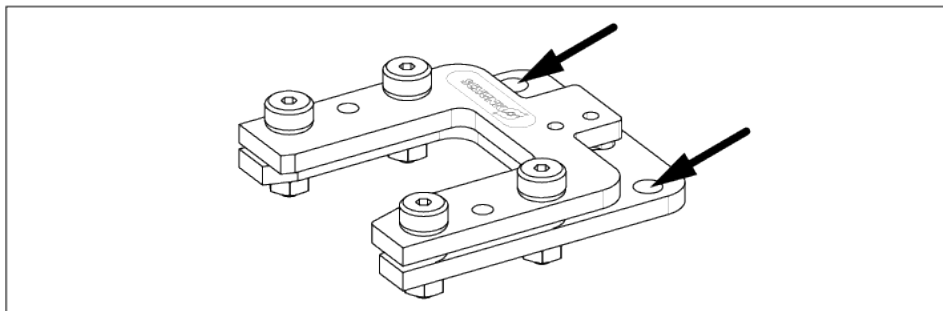
Property damage due to incorrect installation!

- Secure screws with Loctite No. 243.
- Select the tightening torque according to the material of the mating part.

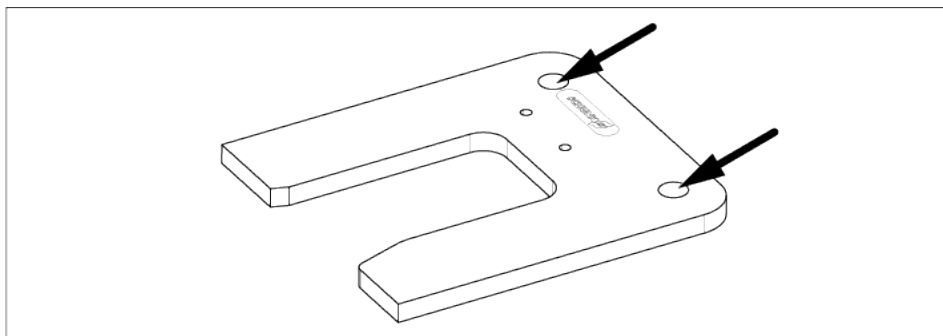
5.3 Mounting the storage station (BSWS-SR)

- Mount the storage station on a solid surface so that it cannot move or bend during the storage process.
- Mounting screws are not included in the scope of delivery.
- Observe the mounting direction (labeling in the direction of the gripper).
- Mount horizontally or vertically (opening facing upwards).
- Production dimensions for customer-specific storage stations are included in the catalog data sheet.

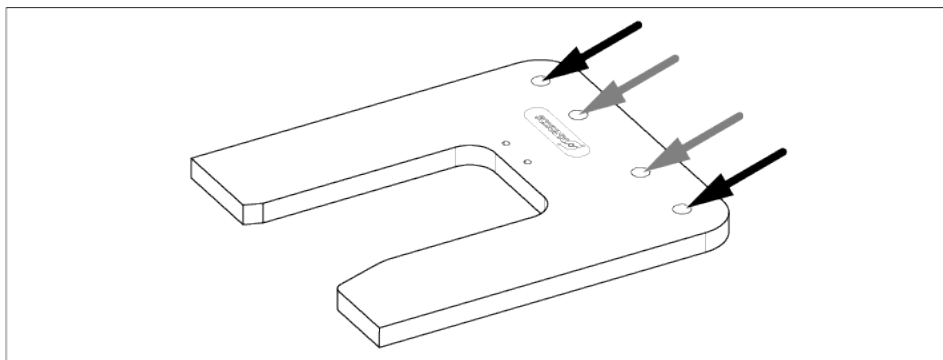
Size 50 - 100



Size 125 - 200



Size 240 - 300

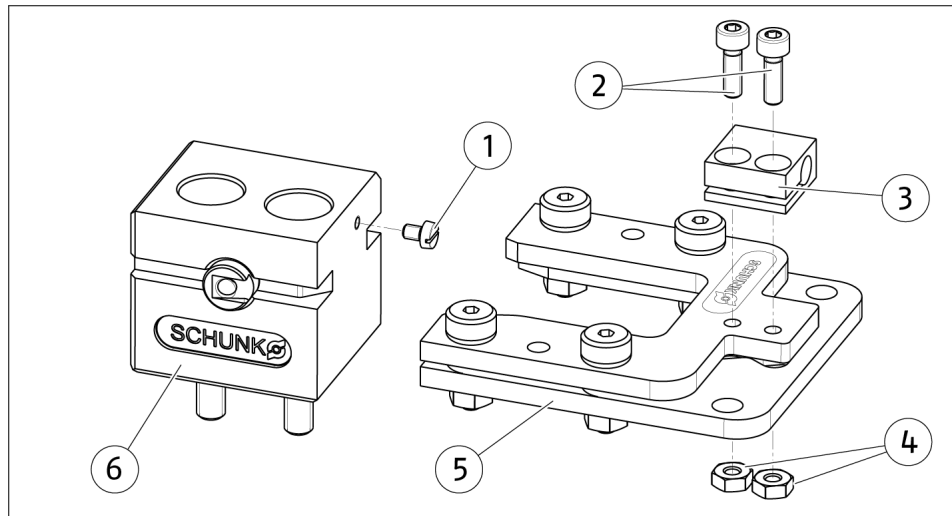


BSWS-SR	Amount	diameter [mm]
50	2	4.3
64	2	4.3
80	2	5.3
100	2	6.5
125	2	6.5
160	2	8.5
200	2	8.5
240	2 - 4	8.5
300	2 - 4	8.5

Tab.: Connection holes

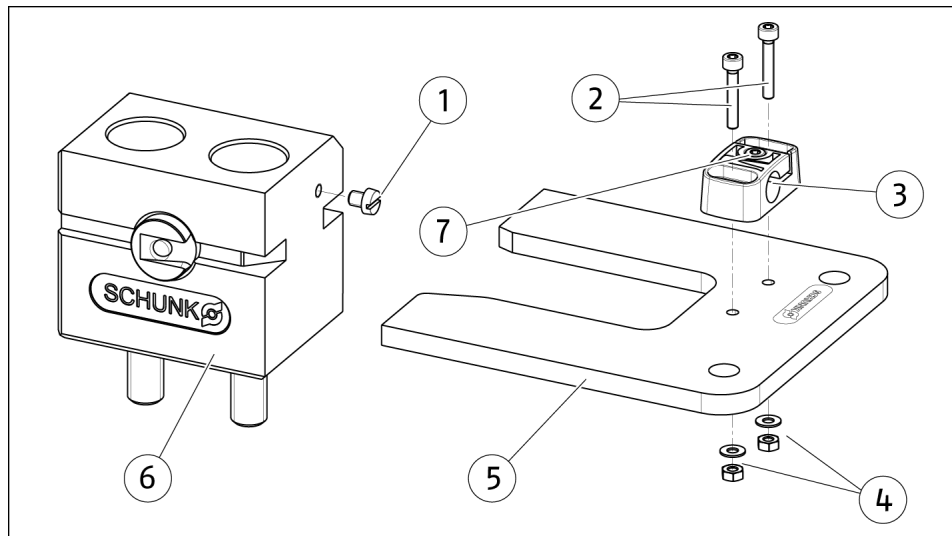
6 Mounting kit for IN proximity switch (optional)

Size 50 – 100



Mounting kit IN40

Size 125



Mounting kit IN80

Mount sensor holder

- The sensor screw (1) is included in the BSWS-BR accessory pack.
 - The fastening material (2) and (4) for the sensor holder (3) is included in the accessory pack for the mounting kit.
1. Attach the IN40 sensor holder to the storage station (5) using screws and nuts. The nuts are locked in place by a contour in the storage station.
 2. Attach the IN80 sensor holder to the storage station (5) using screws, washers, and nuts. Only tighten the screws loosely so that the sensor holder can still be moved.
 3. Mount the sensor screw (1) on the base (6).

Sensor IN40
Size 50 - 100

Mount and adjust the sensor

- The sensor screw (1) is screwed into the hole in the base (6).
 - Sensor holders (3) are firmly connected to the storage station (5).
1. Push base (6) into storage station (5)
 2. Insert the sensor into the sensor holder (3) and push it toward the sensor screw (1) until the sensor emits a signal (if necessary, slightly loosen the screws (2) on the holder).
 3. Clamp the sensor in the sensor holder (3) (tighten the screws (2) on the holder).
 4. Check sensor function: Pull the base (6) slightly out of the storage station (5) and push it back in again.

Sensor IN80
Size 125 - 300

- Sensor screw (1) is screwed into the hole in the base (6).
 - Sensor holder (3) is loosely connected to the storage station (5) (can still be moved).
1. Push the sensor into the sensor holder (3) as far as it will go and secure it with the middle screw (7).
 2. Push the base (6) into the storage station (5).
 3. Push the sensor holder (3) toward the sensor screw (1) until the sensor emits a signal.
 4. Tighten the screws (2) on the sensor holder (3) to fix the sensor holder in position.
 5. Check the sensor function: Pull the base (6) slightly out of the storage station (5) and push it back in again.

7 Teaching routine

NOTICE

Risk of collision

When changing with centric grippers, note the following:

- To prevent the storage station (BSWS-SR) from colliding with an adjacent base (BSWS-BR), the gripper must be in the "open" position when entering the storage station.

-
- Adapter bolts (BSWS-A) are mounted on the gripper.
 1. Manually push the base into the storage station until it stops.
 2. Move the base jaws of the gripper to the "open" position.
 3. Move the gripper mounted on the robot with the adapter bolts vertically into the base located in the storage station until it is fully inserted.

NOTICE! Ensure that the adapter bolts are precisely aligned with the mounting holes in the base.

4. Move the gripper mounted on the robot horizontally out of the storage station.

If the storage station is mounted vertically, adjust the teach process accordingly.

NOTE

After a collision, the teach process must be repeated.

8 Maintenance

8.1 Maintenance and lubrication intervals

NOTICE

Material damage due to hardened lubricants!

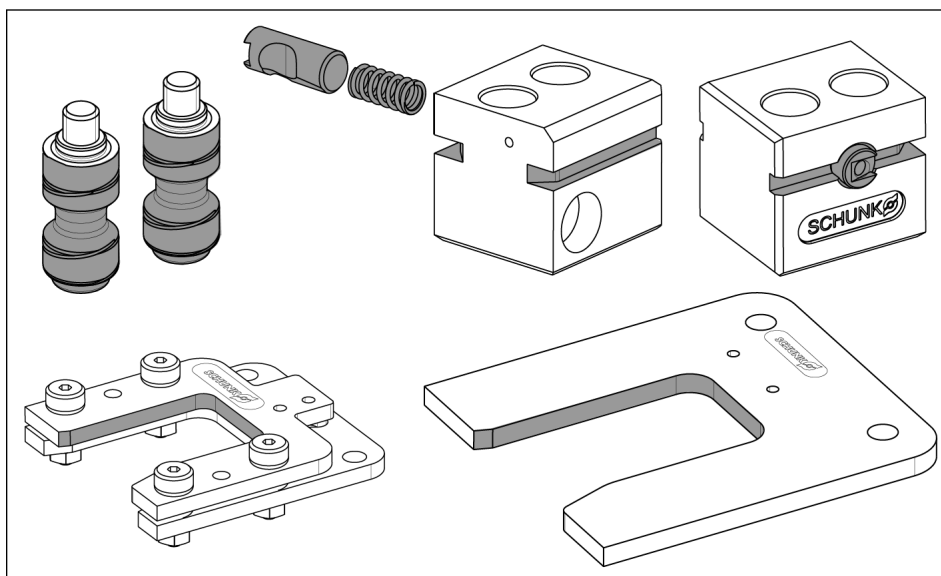
Lubricants harden more quickly at temperatures above 60 °C, leading to possible product damage.

- Reduce maintenance interval accordingly.

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

* One cycle corresponds to one replacement process.

8.2 Lubricants/lubrication points



Lubrication points

Treat all grease areas with lubricant.

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

Lubricant point	Lubricant
<ul style="list-style-type: none"> • Pressure bolt • Adapter bolts • Spring • Grooves at the base • Inner surfaces of the storage station 	SCHUNK grease 1

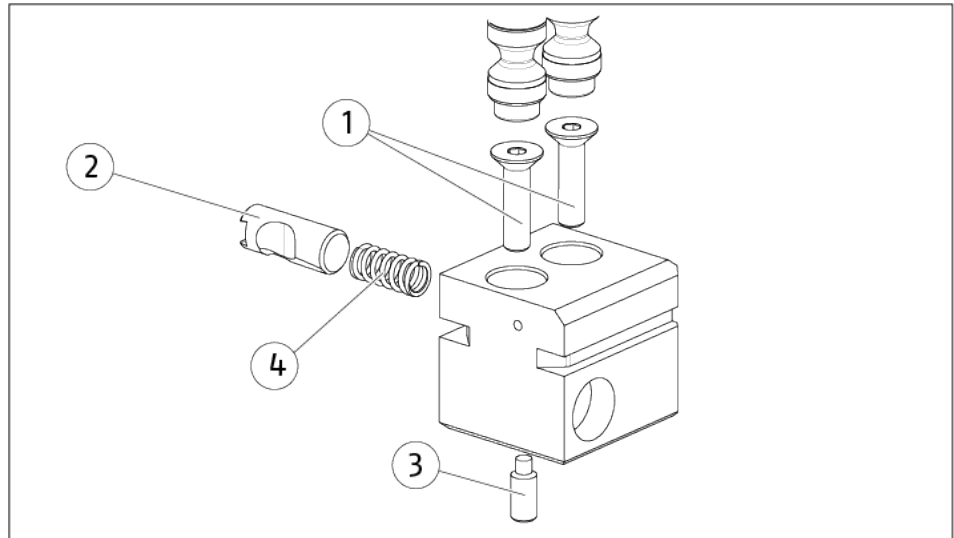
Details regarding SCHUNK lubricant designations are available at [schunk.com/lubricants](https://www.schunk.com/lubricants).

The product contains food-compliant lubricants as standard.

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

8.3 Maintenance of quick-change jaw system

8.3.1 Disassemble base (BSWS-BR)



1. Place the base (BSWS-BR) in the storage station (BSWS-SR) and disconnect it from the gripper.
2. Manually pull the base (BSWS-BR) out of the storage station (BSWS-SR).
3. Unscrew the screws (1) and remove the attachment jaws from the base (BSWS-BR).
4. Press the pressure bolt (2) firmly and hold it in position between the end stops.
5. Unscrew the threaded pin (3).
6. **CAUTION! Spring (4) is under spring tension! Pull out CAUTION! the pressure bolt (2), taking care not to lose the spring (4).**

8.3.2 Maintain and assemble base (BSWS-BR)

Maintenance

- Clean all parts thoroughly, check for damage and wear
- Replace all damaged parts.
- Treat all grease areas with lubricant ▶ 8.2 [□ 23].

Assembly

1. Assemble the base (BSWS-BR).
2. Apply Loctite No. 243 to the threaded pin (3).
3. Mount the gripper jaws on the base (BSWS-BR), ▶ 5.2 [□ 18].
4. Manually insert the base (BSWS-BR) into the storage station (BSWS-SR).

9 Translation of the original declaration of incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1 Section B.

Manufacturer/
Distributor SCHUNK SE & Co. KG
Spanntechnik | Greiftechnik | Automatisierungstechnik
Bahnhofstr. 106 – 134
D-74348 Lauffen/Neckar

We hereby declare that the partly completed machine described below

Product designation: Quick-change jaw system / BSWS-R /
ID number 1555889, 1555914, 1555917, 1555933, 1555937, 1555940, 1555942,
1555943, 1555944, 1555948, 1555950, 1555951, 1555959, 1555972,
1555974, 1555976, 1555978, 1555982

meets the following basic occupational health and safety of the Machinery Directive 2006/42/EC:
No. 1.1.1, No. 1.1.2, No. 1.1.3, No. 1.1.5, No. 1.3.2, No. 1.5.3, No. 1.5.4, No. 1.5.6, No. 1.5.8,
No. 1.5.10, No. 1.5.11, No. 1.5.13

The partly completed machinery may not be put into operation until it has been confirmed that the machine into which the partly completed machinery is to be installed complies with the provisions of the Machinery Directive (2006/42/EC). The declaration shall be rendered invalid if modifications are made to the product.

Applied harmonized standards, especially:

EN ISO 12100:2010 Safety of machinery – General principles for design –
Risk assessment and risk reduction

The special technical documentation according to Annex VII, Part B, belonging to the partly completed machine, has been created.

Person authorized to compile the technical documentation:
Stefanie Walter Address: refer to manufacturer's address

Signature: see original declaration

Lauffen/Neckar, January 2024

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

11 Information on the RoHS Directive, REACH Regulation and Substances of Very High Concern (SVHC)

RoHS Directive

SCHUNK products are classified as "large-scale stationary installations" or as "large-scale stationary industrial tools" within the meaning of Directive 2011/65/EU and its extension 2015/863/EU "on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)", or fulfill their intended function only as part of one. Therefore products from SCHUNK do not fall within the scope of the directive at this time.

REACH Regulation

Products from SCHUNK fully comply with the regulations of Regulation (EC) No. 1907/2006 "concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)" and its amendment 2022/477. SCHUNK attaches great importance to completely avoiding chemicals of concern to humans and the environment wherever possible.

Only in rare exceptional cases do SCHUNK products contain SVHC substances on the candidate list with a mass content above 0.1%. In accordance with Article. 33 (1) of Regulation (EC) No. 1907/2006, SCHUNK complies with its duty to "communicate information on substances in articles" and lists the components concerned and the substances used in an overview that can be viewed at schunk.com/SVHC.

Signature: see original declaration

Lauffen/Neckar, January 2024

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation



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Spanntechnik | Greiftechnik | Automatisierungstechnik

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