Assembly and Operating Manual

HWS

Manual changing system

Superior Clamping and Gripping

Imprint

Technical changes:

We reserve the right to make alterations for the purpose of technical improvement.

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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

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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.

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

In addition to these instructions, the documents listed under Applicable documents [▶ 5] are applicable.

1.1.1 Presentation of Warning Labels

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

⚠ DANGER

Danger 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.

NOTICE

Material damage!

Information about avoiding material damage.

1.1.2 Applicable documents

- General terms of business*
- Catalog data sheet of the purchased product *

The documents marked with an asterisk (*) can be downloaded on our homepage **schunk.com**

1.1.3 Sizes

This operating manual applies to the following sizes:

- HWS 40
- HWS 50
- HWS 63
- HWS 80
- HWS 100
- HWS 125

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

The scope of delivery includes

- Manual changing head HWK in the version ordered
- Manual changing adapter HWA in the version ordered

1.4 Accessories

A wide range of accessories are available for this product

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 manual quick change system HWS – consisting of a manual quick change head (HWK) and a manual quick change adapter (HWA) – is intended for rapid changing of parts and automation components on a robot.

- The product may only be used within the scope of its technical data, Technical data [▶ 13].
- When implementing and operating components in safety-related parts of the control systems, the basic safety principles in accordance with DIN EN ISO 13849-2 apply. The proven safety principles in accordance with DIN EN ISO 13849-2 also apply to categories 1, 2, 3 and 4.
- The product is intended for installation in a machine/system. The applicable guidelines must be observed and complied with.
- The product is intended for industrial and industry-oriented 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

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- 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 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, Technical data [▶ 13].
- Make sure that the product is a sufficient size for the application.
- Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. Exceptions are products that are designed especially for contaminated environments.

2.6 Personnel qualification

Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- 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.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to 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 were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.
Service personnel of the manufacturer	Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

2.7 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.

2.8 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 Transport

Handling during transport

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

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

2.10 Malfunctions

Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

2.11 Disposal

Handling of disposal

The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

2.12 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.

2.12.1 Protection during handling and assembly

Incorrect handling and assembly

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

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

2.12.2 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.

2.13 Notes on particular risks

⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.

⚠ WARNING

Risk of injury from objects falling and being ejected!

Falling and ejected objects during operation can lead to serious injury or death.

- Take appropriate protective measures to secure the danger zone.

3 Technical data

Size	40	50	63	80	100	125
Pitch diameter [mm]	40	50	63	80	100	125
Weight [kg] HWK Weight [kg] HWA	0.12 0.06	0.23 0.12	0.4 0.2	0.6 0.3	1.2 0.9	2.4 1.5
Repeatability [mm]	0.01	0.01	0.01	0.01	0.015	0.02
Max. torsion [Nm]	45	75	150	195	345	990
Max. bending [Nm]	30	75	150	300	450	960
Max. tensile force [N]	700	900	1000	1200	1500	2500
Locking moment [Nm]	1-3.5	1.5-4.5	1.5-6	2-10	2-15	3-22
Maximum locking stroke [mm]	5	6	8	8	8	10
Pneumatic feed-through (max. 7 bar)	2xM5	4xM5	4xG1/8"	5xG1/8"	6xG1/8"	6xG1/4"

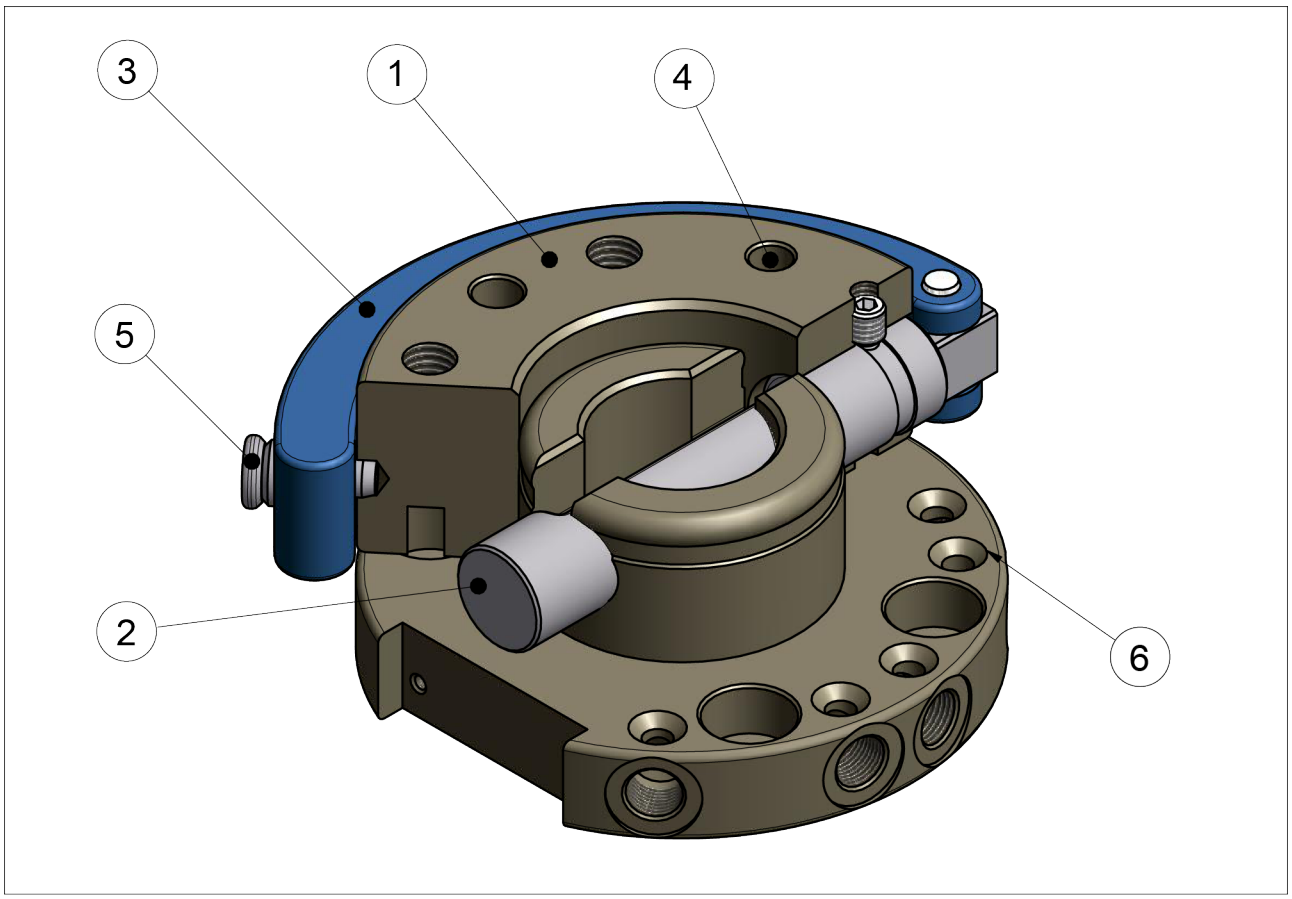
Permissible load assuming the following conditions:

Size	40	50	63	80	100	125
Distance from center of mass [mm]	80	100	125	125	160	250
Max. acceleration [m/s^2]	10	10	10	10	10	10
Load [kg] (at above values)	**8**	**12**	**20**	**24**	**30**	**54**

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

4 Design and description

4.1 Structure



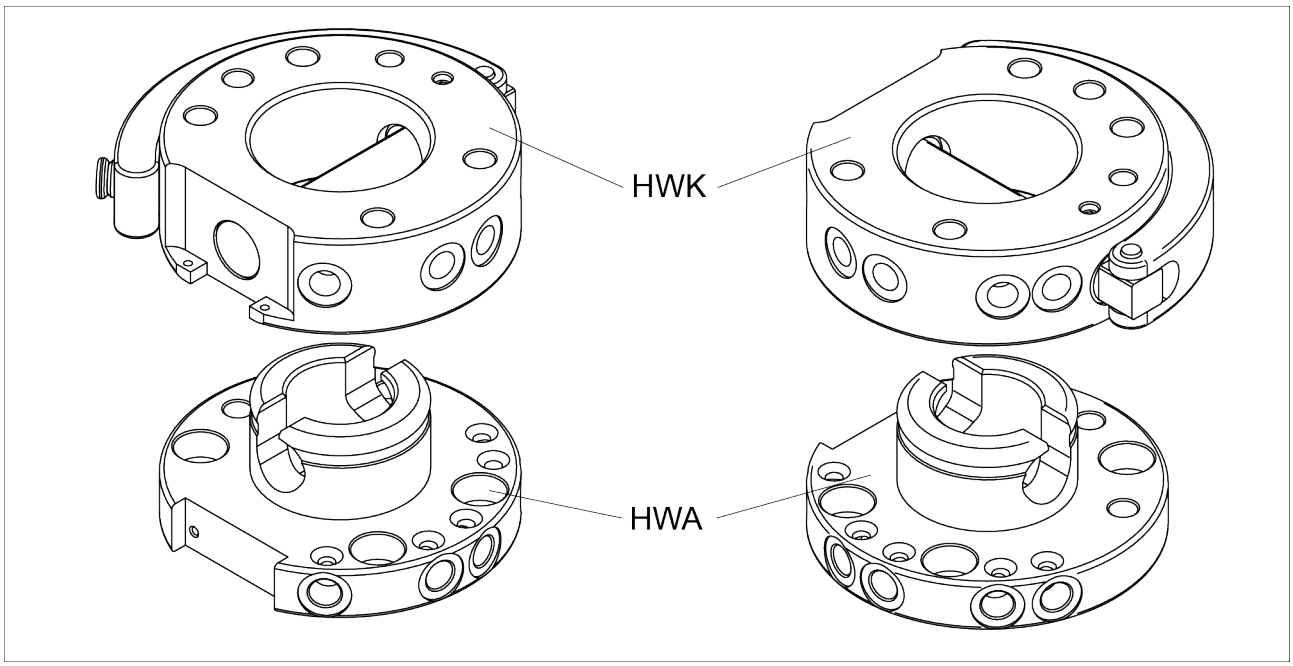
1	HWK manual quick change head (robot side)	4	Fitting for dowel pin
2	Semi-cylindrical locking bolt	5	Locking bolt
3	Hand lever	6	HWA manual quick change adapter (tool side)

4.2 Description

The HWS manual quick change system can be locked and unlocked with a handle. The locking bolt is operated via the hand lever to lock the HWK and HWA fast, positively and without play.
Integrated pneumatic feed-throughs reliably supply the tool with compressed air.

5 Assembly

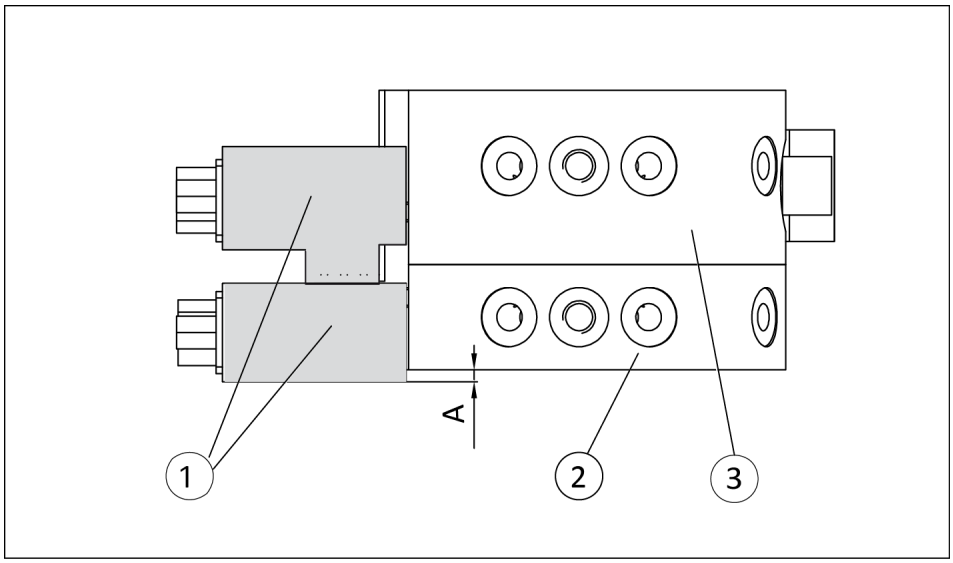
5.1 Screw connection according to ISO-9409



Drill pattern according to ISO

Size	HWK $L_{K\ ISO-9409}$	HWA $L_{K\ ISO-9409}$
40	Ø40 mm, countersink M6 (4x), DIN 74 Type **K**	Ø40 mm, countersink M6 (4x), DIN 74 Type **H**
50	Ø50 mm, countersink M6 (4x), DIN 74 Type **K**	Ø50 mm, countersink M6 (4x), DIN 74 Type **H**
63	Ø63 mm, countersink M6 (4x), DIN 74 Type **K**	
80	Ø80 mm, countersink M8 (4x), DIN 74 Type **K**	
100	Ø100 mm, countersink M8 (4x), DIN 74 Type **K**	
125	Ø125 mm, countersink M10 (6x), DIN 74 Type **K**	

5.2 Attachment option for electric modules



Attachment option for electric modules

1	Electric module
2	HWA manual change adapter
3	HWK manual change head

NOTE

When attaching electrical modules, it can be that the module (1) does not connect flush with the manual change adapter (2). In this case, a corresponding adapter plate must be made that compensates for any projection "A".

6 Operating of the manual changing system HWS

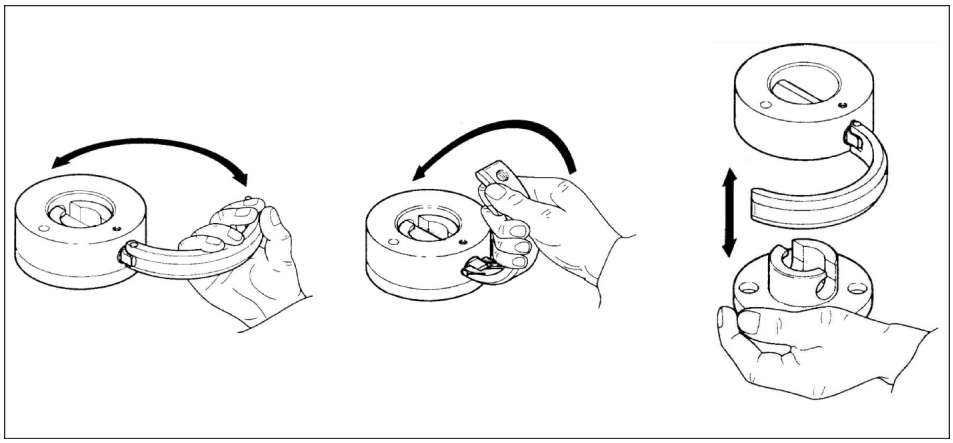
⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.

The HWS manual change system is locked or unlocked as follows:



- ➢ Open the hand lever of the HWK max. 90°. Do not open the hand lever fully so that the semi-cylindrical shaft can be turned more easily (use greatest possible lever arm).
- ➢ Turn the hand lever of the HWK 180° anti-clockwise until it stops (unlock).
  - ✓ HWK and HWA can be pulled apart in the axial direction.
- ➢ Move the hand lever (3) to the "opened" position. It cannot snap in when in this position. The HWK and HWA can be pushed inside one another in this position.
- ➢ Turn the hand lever of the HWK 180° clockwise until it stops (lock).
  - ✓ Locking becomes effective.
- ➢ Turn the hand lever of the HWK 90° and allow it to snap in.

⚠ WARNING

Risk of injury due to the gripped load falling

- Only actuate product if no load is gripped.
- Secure unit from falling down when product is actuated.

➢ Hold the unit steady and open the hand lever of the HWK by max. 90°.

➢ Turn the hand lever of the HWK 180° anti-clockwise until it stops (unlock).

➢ Remove the gripping unit.

7 Maintenance

7.1 Maintenance intervals

Maintenance interval	Maintenance work
regularly (on each change)	Perform a visual inspection. The product must be free of dirt.
50000 changing processes *	Clean all parts thoroughly, check for damage and wear, if necessary replace seals. Oil or grease external steel parts. Grease suspended bolts at the contact surfaces to HWK and HWA.
If required	Send damaged products to SCHUNK for repair.

* Information refers to use under normal operating and ambient conditions.

7.2 Spare and wear parts

Original spare parts

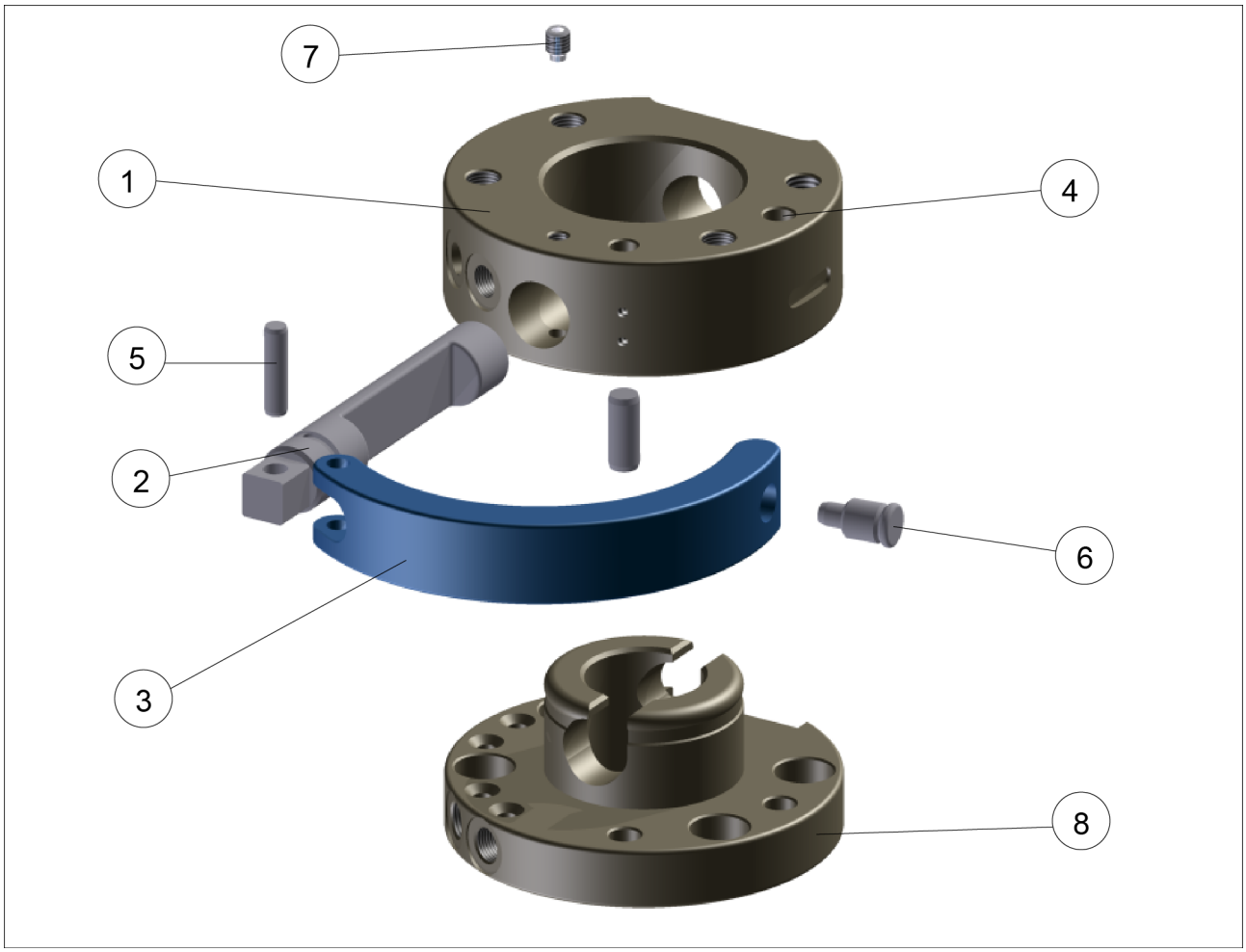
Use only original spare parts of SCHUNK when replacing spare and wear parts.

Wear parts

	HWS					
	40	**50**	**63**	**80**	**100**	**125**
Designation	SealM5	SealM5	Seal G1/8"	Seal G1/8"	Seal G1/8"	Seal G1/4"
Ident number	1007941	1007941	9937283	9937283	9937283	9941122
Amount	2	4	4	5	6	6

7.3 Assembly drawing

The following figure is an example image.
It serves for illustration and assignment of the spare parts.
Variations are possible depending on size and variant.



Assembly