Chuck quick-change
ROTA FSW

Assembly and Operating Manual

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 (☞ 1.1.2, Page 6) 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 *
- Calculation of the jaw centrifugal forces, "Technology" chapter in the lathe chuck catalog *
- Quick guide

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:

- FSW 220-A8
- FSW 290-A11
- FSW 400-A15

1.2 Warranty

The warranty period is 24 months from works delivery, 250 000 clamping cycles* of the flexible adapter and the draw tube adapter when used as intended under the following conditions:

- Observe the applicable documents (☞ 1.1.2, Page 6)
- Observe the ambient conditions and operating conditions, (☞ 2.5, Page 8)
- Observe the specified maintenance and lubrication intervals, (☞ 8, Page 32)

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

* A cycle consists of a complete clamping process ("Open" and "Close").

1.3 Scope of delivery

1	**ROTA FSW Chuck Quick-change**
1	**Clamping device and machine-specific attachment**
1	**Actuation key**
1	**Eye bolt**
1	**Assembly and Operating Manual**
1	**Short operating manual**

2 Basic safety notes

2.1 Intended use

The product acts exclusively as an interface between the machine spindle and clamping device in the machine tool.

- The product may only be used within the scope of its technical data, (☞ 3, Page 17).
- The product is intended for industrial and industry-oriented use.
- Appropriate use of the product includes compliance with all instructions in this manual.

The maximum speed of the design and the maximum actuating force of the clamped clamping device must be determined by the operator for each clamping task in accordance with the valid standards or technical specifications of the manufacturer.

2.2 Not intended use

The product is not being used as intended if, for example,

- the clamping device is not positioned and clamped properly in the chuck quick-change.
- the intended use of the clamping device is ignored. (See the Assembly and Operating Manual of the respective clamping device.)
- it is used under working environment conditions that are not permissible.
- The technical data for use of the product specified are exceeded. (☞ 3, Page 17)
- if the product is used for machines or clamping devices for which it was not intended.
- if the product is operated without protective equipment.

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 Environmental 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, Page 17).
- Make sure that the product is a sufficient size for the application.
- Only use high-quality cooling emulsions with anti-corrosive additives during processing.

See also

Maintenance (☞ 8, Page 32)

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 d anger 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.

2.12.3 Protection against dangerous movements

Unexpected movements

Residual energy in the system may cause serious injuries while working with 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 due through technical safety measures. The protective 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 starting up 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.

2.12.4 Notes on particular risks

DANGER

Possible risk of fatal injury to operating personnel if a jaw breaks or if the ROTA FSW chuck quick-change or the clamping device fails because the technical data has been exceeded and a workpiece is released or parts fly off.

- The technical data specified by the manufacturer for using the ROTA FSW chuck quick-change must never be exceeded.
- The ROTA FSW chuck quick-change may only be used on machines and equipment that fulfill the minimum requirements of the EC Machinery Directive; specifically, they must have effective technical measures to protect against possible mechanical hazards.

DANGER

Possible risk of fatal injury to operating personnel due to ROTA FSW chuck quick-change failure if the maintenance and servicing instructions for the ROTA FSW chuck quick-change and the toolholder are disregarded!

- The servicing instructions specified by the manufacturer must be complied with to ensure safe operation of the ROTA FSW chuck quick-change.
- Work must be carried out by qualified specialist personnel with the relevant safety training.

⚠ DANGER

Possible risk of fatal injury to operating personnel from clothing or hair being caught on the ROTA FSW chuck quick-change and/or clamping device and being dragged into the machine.
Loose clothing or long hair may become caught on projecting parts of the ROTA FSW chuck quick-change or clamping device and be drawn into the machine.

- The machines and equipment must fulfill the minimum requirements of the EC Machinery Directive; specifically, they must have effective technical measures to protect against potential mechanical hazards.
- Always wear tight-fitting clothing and a hairnet when working on the machine and the ROTA FSW chuck quick-change or clamping device.

⚠ WARNING

Risk of injury due to dropping the ROTA FSW chuck quick-change during transport, installation or removal

- Take special care in the danger zone when transporting, installing or removing the ROTA FSW chuck quick-change or clamping device.
- Note the relevant load securing regulations for working safely with cranes, ground conveyors, lifting gear and load-handling equipment.

⚠ CAUTION

Risk of slipping or falling if the ROTA FSW chuck quick-change's operational environment is not clean (e.g. contaminated with cooling lubricants or oil).

- Ensure that the working environment is clean before starting assembly and installation work.
- Wear suitable safety boots.
- Follow the safety and accident-prevention regulations when operating the ROTA FSW chuck quick-change, especially when working with machine tools and other technical equipment.

⚠ CAUTION

Danger of limbs being crushed when manually attaching the ROTA FSW chuck quick-change and assembling and dismantling the clamping device.

- Use a crane to install the ROTA FSW chuck quick-change and clamping device.
- Wear personal protective equipment.
- Do not reach between the spindle nose and the ROTA FSW chuck quick-change.
- Do not reach between the ROTA FSW chuck quick-change and clamping device.
- Follow the safety and accident-prevention regulations when operating the ROTA FSW chuck quick-change, especially when working with machine tools and other technical equipment.

⚠ CAUTION

Risk of burns due to workpieces with high temperatures.

- Wear protective gloves when removing the workpieces and the clamping device.
- Automatic loading of workpieces and clamping devices is to be preferred.

⚠ CAUTION

Danger of damage due to incorrectly set clamping positions of the clamping slides when changing the clamping devices.
If an incorrect clamping position is chosen for the clamping slides relative to the clamping device, the ROTA FSW chuck quick-change and clamping device may be damaged.

- Ensure that the clamping slides are locked/unlocked securely before or after changing the clamping devices with the ROTA FSW chuck quick-change.

⚠ CAUTION

Hazard from vibration due to imbalanced rotating parts and noise generation.

Physical and mental strains due to imbalanced workpieces and noise during the machining process on the clamped and rotating workpiece.

- Ensure that the ROTA FSW chuck quick-change and the clamped clamping device run true, both radially and axially.
- Check options for remedying imbalances on special top jaws on the clamping device and workpieces.
- Reduce the speed.
- Wear hearing protection.

3 Technical data

Type ROTA FSW	220-A8	290-A11	400-A15
ID no.	0824200	0824300	0824400
Tightening torque [Nm]	100	150	200
Max. actuating force [kN]	70	133	140
Max. speed of rotation [rpm]	6000	4200	3500
Weight without adapter [kg]	10	20	51
Operating temperature [°C]	15 - 60		
Maximum number of clamping cycles of the flexible adapter and the draw tube adapter.	250.000		
Maximum number of clamping equipment changes of the flexible adapter and the draw tube adapter	5,000		

The maximum permissible actuating force and the maximum permissible RPM for special machining must be calculated by the user based on the permitted data of the ROTA FSW chuck quick-change and the mounted clamping device or toolholder.

3.1 Precision classes

Tolerances for axial and radial run-out accuracy correspond to the Technical Supply Terms per DIN ISO 3089.

3.2 Permissible imbalance

The ROTA FSW/bayonet in ungreased state without a substituted-in lathe chuck corresponds to the balancing quality class 6.3 (according to DIN ISO 21940-11). Residual imbalance risks may arise due to insufficient rotation compensation being achieved (see DIN EN 1550 6.2 e). This applies particularly to high speeds, asymmetrical workpieces or the use of lathe chucks that do not correspond to balancing grade 6.3, as well as uneven application of lubricants. In order to prevent damage resulting from these residual risks, the entire rotor is to be dynamically balanced in accordance with DIN ISO 21940-11.

4 Torques per screw

Tightening torques for mounting screws used to clamp the ROTA FSW Chuck quick-change on lathes or other suitable technical equipment (screw quality 10.9)

Screw size	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
Admissible torque M_A (Nm)	13	28	50	88	120	160	200	290	400	500	1050	1500

5 Mounting

5.1 Installing and connecting

⚠ 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.
- Ensure that no residual energy remains in the system.

⚠ CAUTION

Danger of injury due to sharp edges and rough or slippery surfaces

- Wear personal protective equipment, particularly protective gloves.

1 Checking the holder of the ROTA FSW or the intermediate flange (☞ 5.2, Page 19)

2 Assembly of the ROTA FSW chuck quick-change (☞ 5, Page 19)

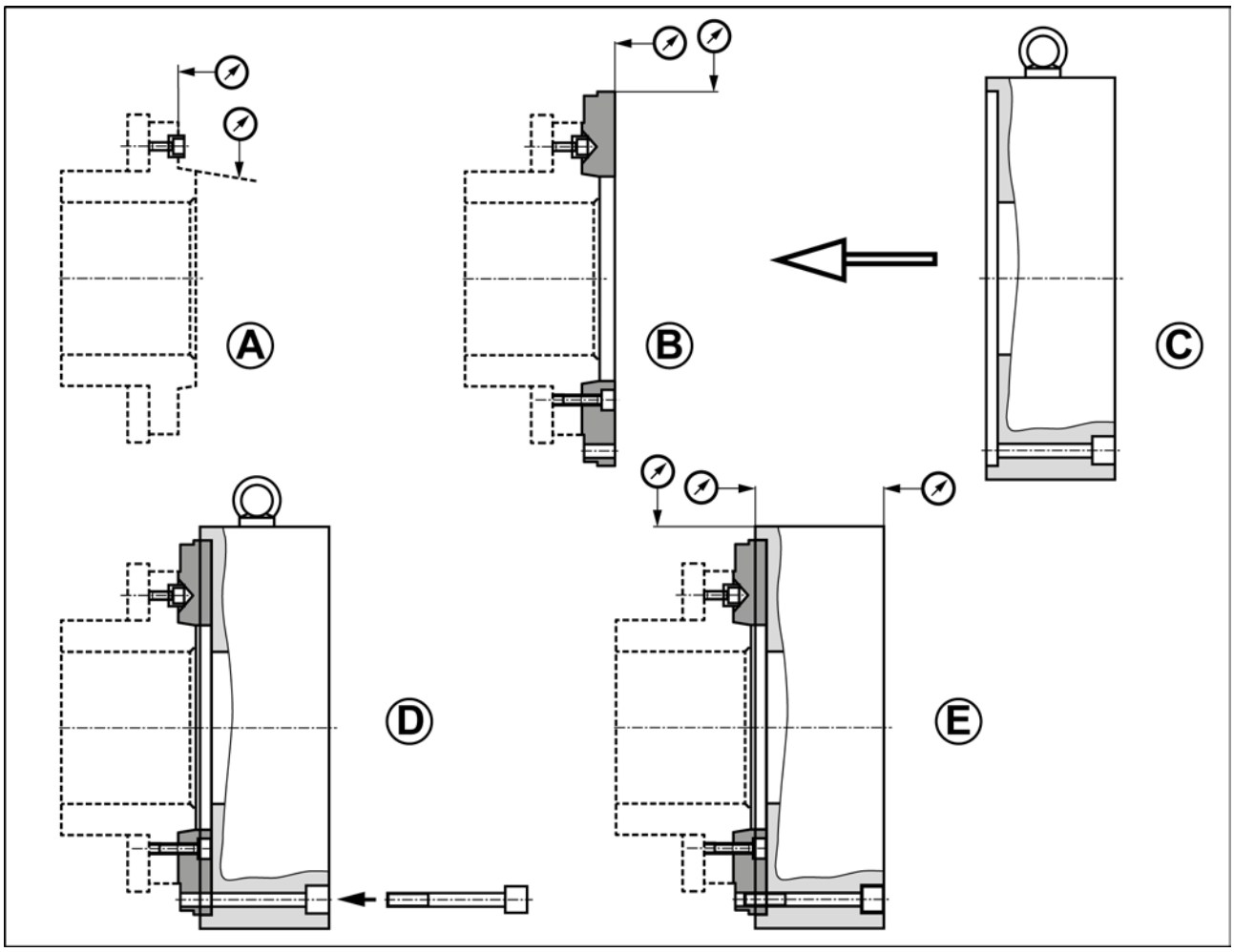
3 Performing a functional check (☞ 6.3, Page 29)

5.2 Checking the spindle nose for mounting the chuck quick-change

For high run-out accuracy of the ROTA FSW chuck quick-change or the substituted-in clamping device, the machine side must be aligned before assembly of the ROTA FSW chuck quick-change or the intermediate flange. To do this, check the contact surfaces on the spindle for axial and concentric run-out using a dial indicator (see Fig. "Assembly of the chuck quick-change or intermediate flange" - A).

There should be a maximum concentricity error in the centering of the mount of 0.005 mm and a maximum axial run-out error in the contact surfaces of 0.005 mm. The flat surface of the spindle must also be checked for flatness using a straight edge.

Make sure that the surface area of the flat surface is chamfered at the bore holes and is clean.



Assembly of the chuck quick-change or intermediate flange

5.3 Assembly of the ROTA FSW Chuck quick-change

5.3.1 Assembly of the ROTA FSW Chuck quick-changes with a reducing or extension flange

(Figure "Assembly of the chuck quick-change or intermediate flange" see chapter "Checking the spindle nose of the holder of the chuck quick-change" (☞ 5.2, Page 19))

If the ROTA FSW chuck quick-change is screwed on with an intermediate flange, the following points must be observed:

- To mount the ROTA FSW chuck quick-change with a reducing or extension flange on the machine spindle with a short taper, a corresponding intermediate flange is fastened to the spindle nose.
- Before assembly of the intermediate flange, remove any dirt or chips from the machine spindle and from the centering mount and contact surface of the flange.

- An intermediate flange produced by the user must be fully machined on the machine spindle and balanced and aligned before assembly of the ROTA FSW chuck quick-change.
- After assembly, ensure that the flange is in contact with the entire surface.
- Then, as described in chapter "Checking the spindle nose of the holder of the chuck quick-change" (☞ 5.2, Page 19), check the radial and axial runout (see fig. "Assembly of the chuck quick-change or the intermediate flange" – B)

After aligning the intermediate flange, the ROTA FSW chuck quick-change is assembled. Remove any impurities on the intermediate flange and the contact surfaces of the ROTA FSW chuck quick-change.

⚠ WARNING

Risk of injury if the ROTA FSW chuck quick-change falls during transport or assembly.

- Use a crane to assemble the ROTA FSW chuck quick-change. This can be fastened on the eye bolt provided (see Fig. 2 "Assembly of the chuck quick-change or intermediate flange" – C). The eye bolt is included in the scope of delivery.

Before commissioning the chuck quick-change ROTA FSW, the eye bolt on the circumference must be removed.

- Push the ROTA FSW chuck quick-change onto the intermediate flange. Ensure that the through-bores for fastening the chuck quick-change line up with the threaded holes of the intermediate flange (see Fig. "Assembly of the chuck quick-change or intermediate flange" – D).
- Insert and slightly tighten the supplied mounting screws. Afterwards check the ROTA FSW chuck quick-change for run-out accuracy on the flex taper and run-out and true running accuracy on the clamping equipment contact surface (see Fig. "Assembly of the chuck quick-change – E) and align at the outer diameter with gentle taps using a plastic hammer. Then tighten the mounting screws on the ROTA FSW chuck quick-change to the specified torque (see chapter "Screw torques" (☞ 4, Page 18)). Then check radial and axial run-out again (see fig. "Assembly of the chuck quick-change or intermediate flange" – E).

5.3.2 Assembly of the ROTA FSW Chuck quick-change with a direct mount

(Figure "Assembly of the chuck quick-change or intermediate flange" see chapter "Checking the spindle nose of the holder of the chuck quick-change" (☞ 5.2, Page 19))

If the ROTA FSW chuck quick-change is mounted directly on the machine spindle without a reducing or an extension flange, the following points must be observed:

- Before assembly of the ROTA FSW chuck quick-change, remove any dirt or chips from the machine spindle and from the centering mount and contact surface of the ROTA FSW chuck quick-change.

⚠ WARNING

Risk of injury if the ROTA FSW chuck quick-change falls during transport or assembly.

- Use a crane to assemble the ROTA FSW chuck quick-change. This can be fastened on the eye bolt provided (see Fig. 2 "Assembly of the chuck quick-change or intermediate flange" – C). The eye bolt is included in the scope of delivery.

- Push the ROTA FSW chuck quick-change onto the machine spindle. Ensure that the through-bores for fastening the chuck quick-change line up with the threaded holes of the spindle nose (see Fig. "Assembly of the chuck quick-change or intermediate flange" – D).
- Insert and slightly tighten the supplied mounting screws. Afterwards check the ROTA FSW chuck quick-change for run-out accuracy on the flex taper and run-out and true running accuracy on the clamping equipment contact surface (see Fig. "Assembly of the chuck quick-change – E) and align at the outer diameter with gentle taps using a plastic hammer. Then tighten the mounting screws on the ROTA FSW chuck quick-change to the specified torque (see chapter "Screw torques" (☞ 4, Page 18)). Then check radial and axial run-out again (see fig. "Assembly of the chuck quick-change or intermediate flange" – E).

The radial and axial run-out accuracy to be reached depend on the diameter of the chuck.
Tolerances for run-out accuracy and axial run-out accuracy correspond to the Technical Supply Terms for lathe chucks as per DIN ISO 3442-3.

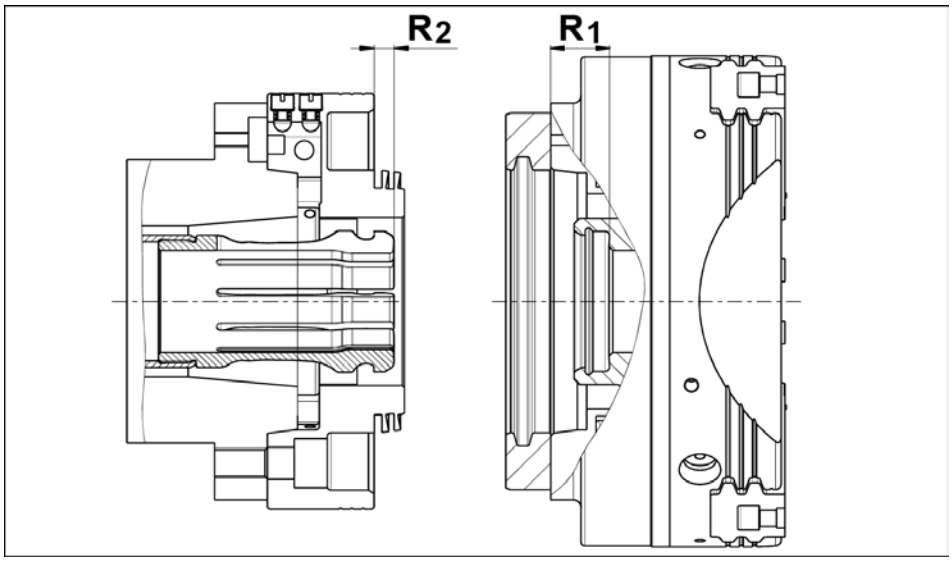
5.4 Assembly of the flexible adapter to the draw tube/drawbar

The item numbers specified for the corresponding individual components relate to chapter drawings.(☞ 10, Page 38)

(Figure "Assembly of the chuck quick-change or intermediate flange" see chapter "Checking the spindle nose of the holder of the chuck quick-change" (☞ 5.2, Page 19))

The flexible adapter must be designed to suit the machine and the changing clamping devices. Only original SCHUNK attachments may be used!

- Remove the flexible adapter (Pos. 9) from the packaging and check it for damage/completeness.
- Ensure that there is either a guide ring for the draw tube/drawbar in the machine spindle, and that it is in perfect condition, so that a maximum axial run-out error of the draw tube/drawbar contact surface of 0.2 mm is observed; or the axial run-out of max. 0.2 mm is already complied with (see Fig. "Assembly of the chuck quick-change or intermediate flange" – E).
- Turn the actuating screw (Pos. 5) carefully clockwise as far as the back stop. The golden indicator pins (Pos. 6) are then level with the housing (Pos. 1).
- Actuate the clamping cylinder to move the draw tube/drawbar to the foremost position and screw the flexible adapter included (Pos. 9) to the draw tube/drawbar on the block.



Piston position

Piston in foremost position

R1 = Push the clamping device piston to its foremost position and measure with a depth gauge

R2 = R1 – 0.5 mm (max. – 2 mm)

Ensure that the clamping device piston can be moved to the foremost (jaw change) position. To do this, ensure that the dimensions for the attachment are complied with.

EXCEPTION: the power chuck of series ROTA NCR.
Contact SCHUNK before using this toolholder type with the ROTA FSW chuck quick-change.

5.4.1 Assembling the retainer ring and draw tube adapter to the clamping device

The clamping devices to be changed are generally already fitted with a retainer ring (Pos. 7) and a draw tube adapter (Pos. 10) and do not require any further assembly steps.

If necessary, a clamping device can also be mounted on-site to the corresponding retainer ring and the corresponding draw tube adapter.

The following steps must also be performed after releasing the retainer ring from a clamping device delivered in an assembled state.

- Remove the clamping device from the packaging box and check for damage/completeness.
- Before assembling the retainer ring and the draw tube adapter to the clamping device, clean dirt and chips from every contact surface.

- Check that an O-ring is fitted in the draw tube adapter (Pos. 11).
- Lay the retainer ring on the locating surface of the chuck so that the bore hole of the positioning block faces the installer, and then tighten slightly using the screws. Then align and check radial run-out (see fig. "Assembly of the chuck quick-change or intermediate flange" – E). Specified value run-out retaining ring diameter inside to the taper surface chuck flange / Clamping device: ≤ 0.03 mm
- Tighten the screws to the specified torque (see chapter "Screw torques" (☞ 4, Page 18)).
- Then check radial run-out again (see fig. "Assembly of the chuck quick-change or intermediate flange" – E).

5.5 Assembly of the clamping device and the ROTA FSW chuck quick-change

The item numbers specified for the corresponding individual components relate to chapter drawings.(☞ 10, Page 38)

- Move the draw tube/drawbar to its foremost position by actuating the clamping cylinder.
- Loosen the actuating screw (Pos. 5) counter-clockwise and then turn further with maximum 50 Nm as far as the back stop. Do not use an impact screwdriver. The golden indicator pin on the clamping device side (Pos. 6) is then level with the housing (Pos. 1).
- Move the draw tube/drawbar to its rearmost position by actuating the clamping cylinder. This warps the flexible adapter radially inwards via the already retracted clamping slides.
- Clean contact surfaces and the interior of the draw tube of the clamping equipment to be substituted in and make sure that the O-Ring (Pos. 11) is fitted in the draw tube adapter.
- Align the clamping device to be fitted (Pos. 23) in the rotary position relative to the ROTA FSW chuck quick-change taking the position of the positioning block into account. Here, a marking in the form of a notch on the housing and on the bracket helps.
- Push the clamping device onto the ROTA FSW chuck quick-change. The flat surface of the clamping device may not be more than 0.5 mm from the flat contact surface of the chuck quick-change housing.
- Tighten the actuating screw clockwise to the torque specified (see chapter "Technical data and chuck quick-change housing" (☞ 3, Page 17)). Do not use an impact screwdriver.

- Ensure that the two golden indicator pins are level with the chuck quick-change housing and the clamping device was tightened against the ROTA FSW chuck quick-change.
- Actuate the clamping cylinder to move the draw tube/drawbar to the foremost position; the flexible adapter then locks into the draw tube adapter of the clamping device. This is indicated by an audible snap.

NOTICE

Damage to the clamping device and ROTA FSW chuck quick-change!
The clamping device may only be disassembled when at a stand-still!

6 Function

The item numbers specified for the corresponding individual components relate to chapter drawings.(☞ 10, Page 38)

6.1 Function of the ROTA FSW Chuck quick-change

The Chuck quick-change has a clamping and release mechanism with manual actuation.

The side of the housing (Item 1) offers access to the actuating screw (Item 5), which is actuated using the enclosed hexagon socket for torque wrenches.
If another socket is used to operate the actuating screw with the torque wrench, it must comply with DIN EN 1550 Par. 5.2.2.

A lever (Item 4) transfers the rotary movement of the actuating screw to the drive ring (Item 2).

The control curves in the drive ring guide the clamping slides (Item 3) into the clamping position.

The clamping and release function of the ROTA FSW Chuck quick-change is purely manual; no additional medium is required for actuation.

6.2 Handling the ROTA FSW Chuck quick-change

Unlocking and removing the changed clamping device

- Move the clamping cylinder into the front position without a workpiece.
- Loosen the side actuating screw (Pos. 5) with the supplied hexagonal socket counter-clockwise and then turn further with maximum 50 Nm as far as the back stop. Do not use an impact screwdriver. In doing so, the clamping device is pressed off at least 0.3 until a few mm from the ROTA FSW chuck quick-change (see fig. "Piston position" (☞ 5.4, Page 23)). The clamping slides (Pos. 3) move radially inwards.
- **Support the clamping device with a crane or other suitable lifting equipment!**
- Move the clamping cylinder into the rearmost position. The flexible adapter (Pos. 9) is unlocked via the clamping slides which were previously moved inwards.

- The clamping device is now exposed and hangs in the lifting equipment.

Locking and inserting the clamping equipment

- Move the clamping cylinder into the foremost position.
- Loosen the side actuating screw (Pos. 5) with a hexagonal socket counter-clockwise and then turn further with maximum 50 Nm as far as the back stop. Do not use an impact screwdriver.
- Move the clamping cylinder into the rearmost position. The flexible adapter (Pos. 9) is unlocked via the clamping slides which were previously moved inwards.
- The clamping device to be substituted in must be prepared in accordance with chapter "Assembly of the chuck quick-change ROTA FSW" (☞ 5, Page 19) and be in an open position.
- Contact surfaces and the interior of the draw tube of the clamping equipment to be substituted in and make sure that the O-Ring (Pos. 11) is fitted in the draw tube adapter.
- Align the clamping device to be fitted (Pos. 23) in the rotary position relative to the ROTA FSW chuck quick-change taking the position of the positioning block into account. Here, a marking in the form of a notch on the housing and on the bracket helps.
- Push the clamping device onto the ROTA FSW chuck quick-change. The flat surface of the clamping device may not be more than 0.5 mm from the flat contact surface of the chuck quick-change housing.
- Tighten the actuating screw clockwise to the torque specified (see chapter "Technical data and label on the chuck quick-change housing" (☞ 3, Page 17)). Do not use an impact screwdriver.
- Ensure that the two golden indicator pins are level with the chuck quick-change housing and the clamping device was tightened against the ROTA FSW chuck quick-change.
- Actuate the clamping cylinder to move the draw tube/drawbar to the foremost position; the flexible adapter then locks into the draw tube adapter of the clamping device. This is indicated by an audible snap.

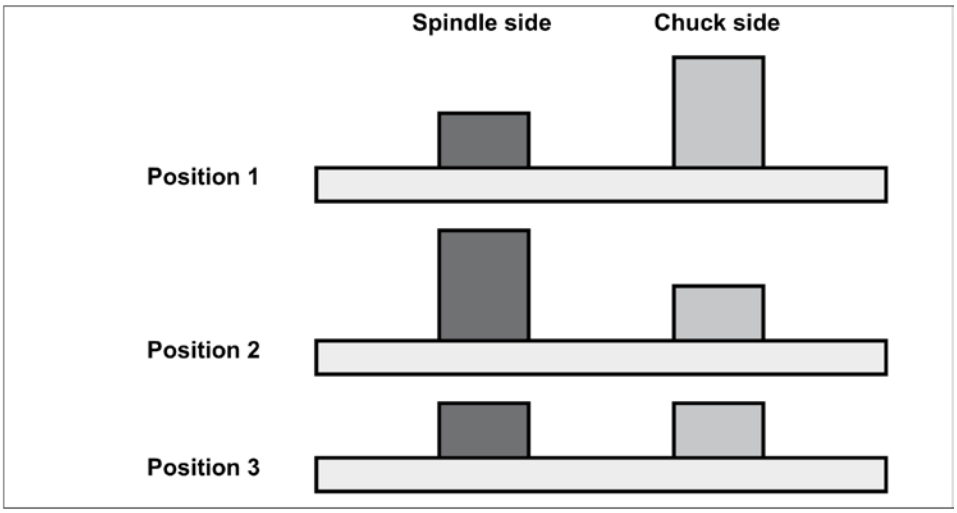
After inserting a new clamping device, the end position monitoring of the machine clamping cylinder must be checked and readjusted!

6.3 Functional testing

Functional test
After installation of the ROTA FSW chuck quick-change, its function must be checked prior to start-up.

Important points are:

- **Smooth running** The actuating screw must turn smoothly and the clamping slides must move smoothly as a result.
- **Stroke control** The clamping slides must have a margin of safety at the inner and outer end positions. The machine spindle must not start up until the lever has passed through the safety margin. Indicator pins are fitted to the circumference of the ROTA FSW chuck quick-change to monitor the margin of safety. They may only be monitored with safety limit sensors compliant with DIN EN 60204-1.



Position 1: Change position, clamping slide inside
- machine is not enabled.

Position 2: Lock position, chuck is locked, not clamped yet
- machine is not enabled.

Position 3: Clamping position, chuck clamped
- machine enabled.

When determining the clamping force required to machine a workpiece, the centrifugal force acting on the chuck jaws must be taken into account (according to VDI 3106).
If the pallet chuck is changed, adjust the machine-side stroke control of the clamping cylinder to the new situation.

7 Commissioning

- Do not start the machine spindle until the clamping device is clamped securely and the optional draw tube is locked into place.
- Do not start the machine spindle until the clamping pressure is built up in the clamping cylinder and the clamping position display of the ROTA FSW chuck quick-change is lowered.
- Unclamping must not be possible until the machine spindle has come to a standstill.
- If the clamping energy fails, the workpiece must remain firmly clamped until the spindle has come to a standstill and the workpiece is secured.
- The safety specifications from the relevant operating manuals must be followed precisely.

Speed

⚠ DANGER

Possible risk of fatal injury to operating personnel if the ROTA FSW chuck quick-change's or clamping device's top speed is exceeded and a workpiece is released or the clamping device and parts fly off!
If the machine tool or technical equipment can reach a higher speed than the ROTA FSW chuck quick-change or clamping device top speed, a reliable speed limiter must be installed and proof must be provided that the speed limiter is effective!

The maximum recommended speed may only be run in conjunction with maximum actuating force and prescribed tightening torque and only with the ROTA FSW chuck quick-change with clamping device in optimal, fully functioning condition. The clamped clamping device must function fully for this.

NOTICE

Damage due to excess tensile force and pressure!
Excessive clamping force or actuating force can cause damage to the clamping device or adapter.

- The maximum tensile force and pressure must not be exceeded.

NOTICE

Property damage due to damaged products!
Damaged, incomplete, or unbalanced clamping devices or adapters could seriously damage or even destroy the machine and the workpiece.

- Only mount undamaged, complete, and fine-balanced products.

8 Maintenance

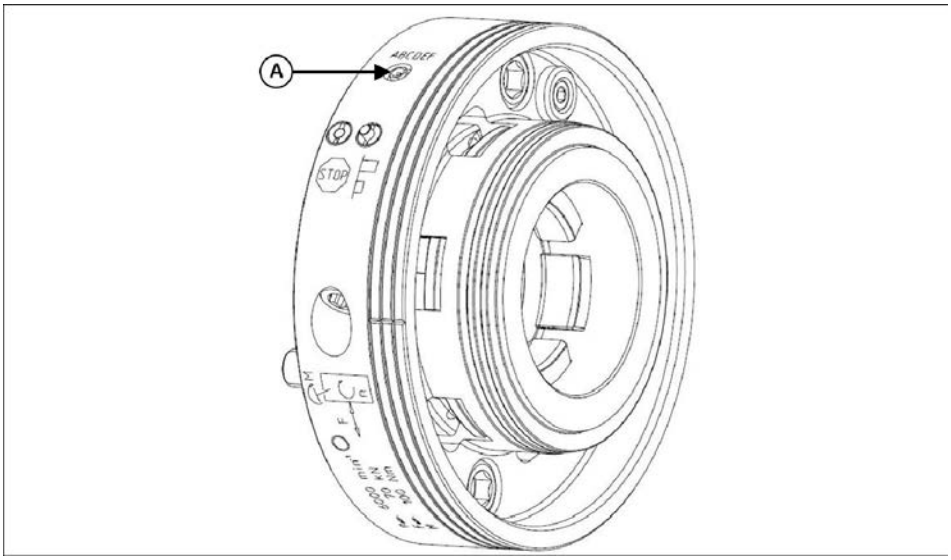
To comply with the radial and axial run-out tolerances, the corresponding back stop and guide diameter must be clean.

Compliance with the maintenance, cleaning and replacement intervals of the flexible adapter is essential.

	***NOTICE*** **Risk of damage to the adapter due to cleaning with compressed air.** When cleaning the adapter with compressed air, metal chips can become trapped in the threads and grooves. That can damage or even destroy the adapter.

8.1 Lubrication

To maintain the safe function and high quality of the chuck quick-change ROTA FSW, it has to be regularly lubricated.



A	Lubrication nipples on the circumference

Turn the chuck quick-change into the open position. Lubricate the chuck at the lubrication nipples (A) using a high-pressure grease gun with 2 - 4 strokes (depending on the chuck side) of SCHUNK LINO MAX special grease.

For optimum grease distribution, the chuck quick-change must be closed and opened several times after lubrication.

Chuck ROTA FSW	220-A8	290-A11	400-A15
Number of strokes	2	3	4

(For product information about LINO MAX, see the "Accessories" chapter of the SCHUNK lathe chuck catalog or contact SCHUNK).

⚠ CAUTION

Allergic reactions due to grease in contact with skin!
Wear gloves.

8.2 Maintenance instructions

The ROTA FSW chuck quick-change's reliability and safety can only be guaranteed if the maintenance instructions are complied with.

- For lubrication, we recommend our tried and tested special grease, LINO MAX 200. Unsuitable lubricants can have a negative impact on the functioning of the chuck quick-change (clamping force, coefficient of friction, wear characteristics). (For product information about LINO MAX 200, see the "Accessories" chapter in the SCHUNK lathe chuck catalog or contact SCHUNK).
- The flexible adapter and draw tube adapter must be replaced every 250,000 clamping cycles or 5,000 clamping device changes at the latest, whichever occurs first. For this purpose, the O.D or I.D. clamping on the fitted clamping device and changes thereof must be documented, monitored reliably and proof must be available. Corresponding counters on the machine must be set up during initial assembly or when changing the flex adapter and the draw tube adapter or the counter readings noted.
  In order to replace the flex adapter and the draw tube adapter, these parts must be ordered from SCHUNK and can be replaced upon request by the SCHUNK service team.

NOTICE

Loss of function in the event of heavy soiling!
It is essential that the cleaning intervals are observed.

To avoid precision errors, connection and adjustment surfaces must be cleaned.
The oiling of flat surfaces and clamping pieces only serves as cor-

rosion protection and is not lubricated depending on the function. Lubrication is only envisaged on the mechanical running surfaces.

To avoid axial and radial concentricity errors:

- Only lubricate the corresponding surfaces lightly.
- Avoid lubricants entering the areas between clamping elements and the guide cone.

Following a collision:

- If the ROTA FSW chuck quick-change and the clamping device are involved in a collision, they must be tested for cracks before using them again. **Damaged parts must be replaced with original SCHUNK spare parts.**
- Replace the mounting screws if there are signs of wear or damage. Only use screws of equivalent quality.
  Tighten the screws with the specified torque (see "Screw torques" chapter.(☞ 4, Page 18)).

8.3 Period of maintenance

Operating hours	Activity
Each time after the clamping device is changed	Visually inspect all parts, taking particular care to check the mounting taper and flat surfaces for damage. Clean and lubricate the flexible adapter and draw tube adapter and contact surfaces. Make sure that the O-ring is fitted in the draw tube adapter.
Every 2 weeks or after 5 clamping tool changes	Perform visual inspection of the entire system and lubrication nipples.
Every 1200 hours, when replacing the flex adapter and draw tube adapter, or as required	Full cleaning with detachment, disassembly, and visual inspection of all individual components of the FSW chuck quick-change

Depending on wear, but at the latest 250,000 or 5,000 changes of the clamping device, the flexible adapter and draw tube adapter must be replaced.

8.4 Storing the ROTA FSW Chuck quick-change

Store the ROTA FSW chuck quick-change in its original packaging under the following conditions:

Do not keep outdoors.
Store in a dry and dust-free place.
Do not expose to any aggressive media.
Protect from sunlight.
Avoid mechanical vibrations.
Stocking temperature: 15 to 35°C.
Relative air humidity: max. 60%.

When storing for longer than 3 months:
Check the general condition of all parts and the packaging regularly.
If required, refresh preservation or renew.

Re-storing the ROTA FSW chuck quick-change

Thoroughly clean the jaw quick-change ROTA FSW before reinserting, oil and/or grease (see chapter "Disassemble and assemble the ROTA FSW chuck quick-change" (☞ 8.5, Page 35)).

Pack ROTA FSW chuck quick-change in air-tight film.

The chuck quick-change ROTA FSW must be stored in a secure position.
If that is not guaranteed, use a suitable container for the ROTA FSW or equip the shelf with a surrounding safety border.

8.5 Disassembling and assembling the ROTA FSW Chuck quick-change

The item numbers specified for the corresponding individual components relate to chapter drawings.(☞ 10, Page 38)

The ROTA FSW chuck quick-change must only be disassembled when not installed.

- Remove the two set-screws (Pos. 8) and remove the compression springs (Pos. 26) and the indicator pins (Pos. 6).
- Use a sliding hammer to remove the cylindrical pin (Pos. 22) from the housing (Pos. 1) via the pulling off thread.
- Rotate the actuating screw (Pos. 5) counter-clockwise from the lever (Pos. 4) and remove it.

- Use a sliding hammer to remove the key (Pos. 25) from the housing via the pulling off thread.
- Remove the lever (Pos. 4).
- Remove the five shoulder screws (Pos. 13) using a hexagonal socket with pins for bolts according to DIN 6912 and remove the drive ring (Pos. 2).
- Remove the six clamping slides (Pos. 3) from the housing.
- Remove the screw (Pos. 24) and remove the positioning block (Pos. 23).

Clean all individual components and check them for damage and wear.

Only original SCHUNK spare parts may be used!

Reverse the procedure to assemble the ROTA FSW chuck quick-change.

Tightening torque for the shoulder screws (Pos. 13):

ROTA FSW	220-A8	290-A11	400-A15
Tightening torque for the shoulder screws [Nm]	50	115	190

Before assembly, lubricate all moving parts with LINO MAX 200 special grease.

The screws must be tightened in accordance with the usual torques with a torque wrench (see chapter "Screw torques" (☞ 4, Page 18)). When tightening the screws, ensure they are tightened evenly to avoid warping parallel to the axis under load and to maintain the rigidity.

9 Spare parts

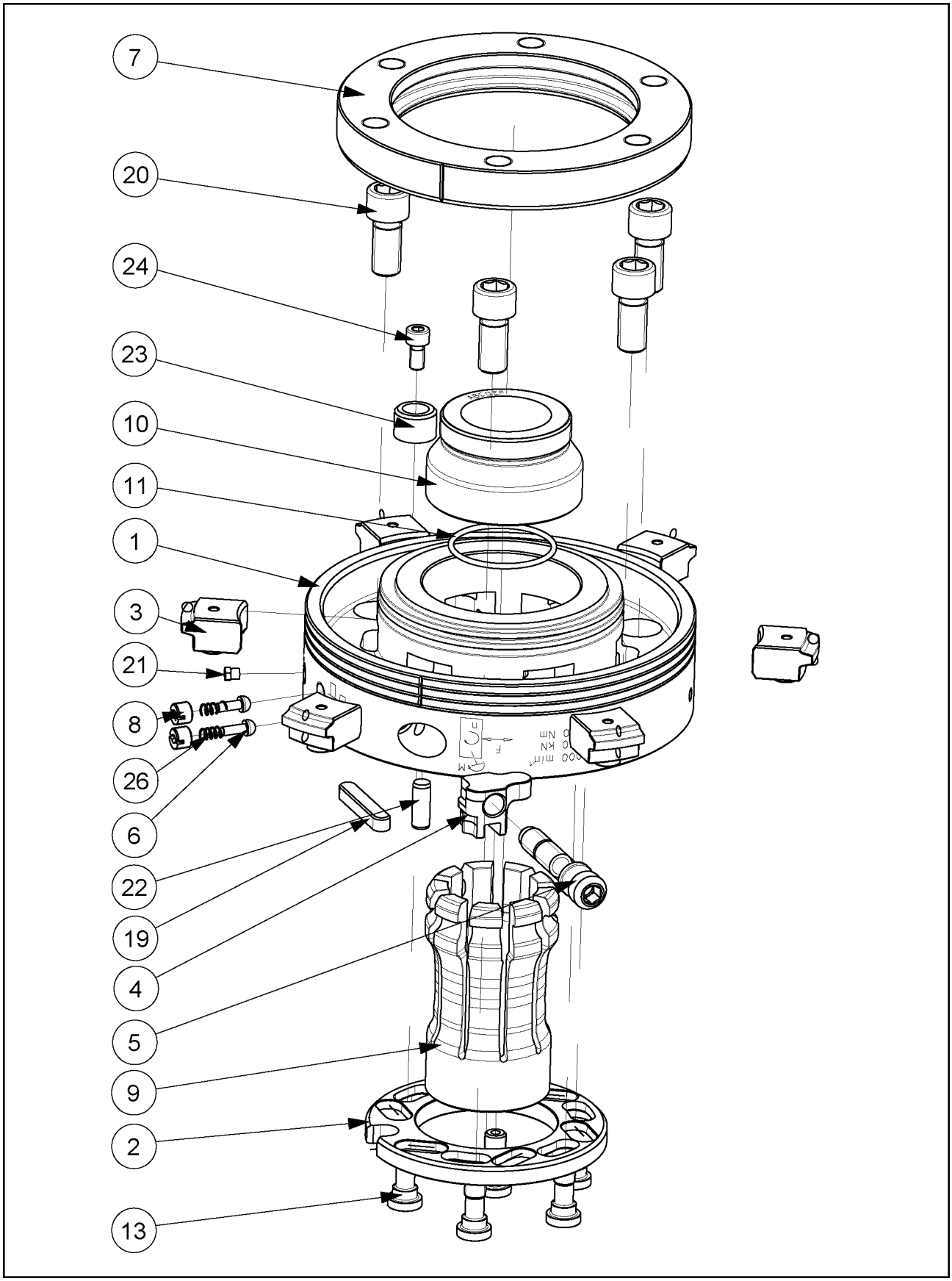
When ordering spare parts, it is imperative to state the type, size, and above all the serial no. of the ROTA FSW chuck quick-change.

Seals, sealing elements, screw connections, springs, bearings, screws, and wiper bars, plus parts coming into contact with the clamping device are not covered by the warranty.

Item	Designation	Quantity
1	Housing	1
2	Drive ring	1
3	Clamping slide	6
4	Lever	1
5	Screw	1
6	Indicator pin	2
7	Retainer ring (specific*)	1
8	Set-screw	2
9	Flexible adapter (specific*)	1
10	Draw tube adapter with O-ring (specific*)	1
11	O-ring	1
13	Shoulder screw	5
20	Screw	5
19	Feather Key	1
21	Lubrication nipple	1
22	Cylindrical pin	1
23	Positioning block	1
24	Screw	1
26	Compression spring	2

* Parts are contained in the machine- or chuck-specific attachment

10 Assembly drawing



11 Translation of original EC declaration of incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1.B of the European Parliament and of the Council on machinery.

Manufacturer/ Distributor	H.-D. SCHUNK GmbH & Co. Spanntechnik KG Lothringer Str. 23 D-88512Mengen

We hereby declare that on the date of the declaration the following partly completed machine complied with all basic safety and health regulations found in the directive 2006/42/EC of the European Parliament and of the Council on machinery. The declaration is rendered invalid if modifications are made to the product.

Product designation:	Manually actuated chuck quick-change with through hole FSW 220-A8, FSW 290-A11, FSW 400-A15
ID number	0824200; 0824300; 0824400; 88035689 / 88036454

The partly completed machine may not be put into operation until conformity of the machine into which the partly completed machine is to be installed with the provisions of the Machinery Directive (2006/42/EC) is confirmed.

Applied harmonized standards, especially:

DIN EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN ISO 1550: 1997+A1:2008	Machine-tools safety – Safety requirements for the design and constructions of work holding chucks

Other related technical standards and specifications:

DIN ISO 702-1:2010-04	Machine tools - Connecting dimensions of spindle noses and work holding chucks - Part 1: Conical connection
DIN ISO 702-2:2010-04	Machine tools - Connecting dimensions of spindle noses and work holding chucks - Part 2: Camlock type
DIN ISO 702-3:2010-04	Machine tools - Connecting dimensions of spindle noses and work holding chucks - Part 3: Bayonet type
VDI 3106:2004-04	Determination of permissible speed (rpm) of lathe chucks (jaw chucks)
DIN EN ISO 23125: 2012-07 +A1:2012	Machine tools - Safety - Turning machines

The manufacturer agrees to forward on demand the relevant technical documentation for the partly completed machinery to state offices.

The relevant technical documentation according to Annex VII, Part B, belonging to the partly completed machinery have been created.

Person authorized to compile the technical documentation:
Philipp Schräder, Address: see manufacturer's address

Signature: see original declaration

Mengen, May 2014 p.p. Philipp Schräder; Director for Development

12 Appendix on Declaration of Incorporation, as per 2006/42/EC, Annex II, No. 1 B

1. Description of the basic safety and health protection requirements, as per 2006/42/EC, Annex I, that apply to and are fulfilled for the scope of the partly completed machinery:

Product designation	Manually actuated chuck quick-change with through-bore			
Type designation	FSW 220-A8, FSW 290-A11, FSW 400-A15			
ID number	0824200; 0824300; 0824400; 88035689 / 88036454			
	To be provided by the System Integrator for the overall machine			⇓
	Fulfilled for the scope of the partly completed machine		⇓	
	Not relevant	⇓		
1.1	**Essential Requirements**			
1.1.1	Definitions		X	
1.1.2	Principles of safety integration		X	
1.1.3	Materials and products		X	
1.1.4	Lighting			X
1.1.5	Design of machinery to facilitate its handling		X	
1.1.6	Ergonomics			X
1.1.7	Operating positions			X
1.1.8	Seating			X
1.2	**Control Systems**			
1.2.1	Safety and reliability of control systems			X
1.2.2	Control devices			X
1.2.3	Starting			X
1.2.4	Stopping			X
1.2.4.1	Normal stop			X
1.2.4.2	Operational stop			X
1.2.4.3	Emergency stop			X
1.2.4.4	Assembly of machinery			X
1.2.5	Selection of control or operating modes			X
1.2.6	Failure of the power supply			X
1.3	**Protection against mechanical hazards**			
1.3.1	Risk of loss of stability		X	
1.3.2	Risk of break-up during operation		X	
1.3.3	Risks due to falling or ejected objects			X
1.3.4	Risks due to surfaces, edges or angles		X	
1.3.5	Risks related to combined machinery			X
1.3.6	Risks related to variations in operating conditions		X	
1.3.7	Risks related to moving parts		X	
1.3.8	Choice of protection against risks arising from moving parts			X
1.3.8.1	Moving transmission parts			X
1.3.8.2	Moving parts involved in the process			X
1.3.9	Risks of uncontrolled movements			X
1.4	**Required characteristics of guards and protective devices**			
1.4.1	General requirements			X
1.4.2	Special requirements for guards			X
1.4.2.1	Fixed guards			X

1.4.2.2	Interlocking movable guards			X
1.4.2.3	Adjustable guards restricting access			X
1.4.3	Special requirements for protective devices			X
1.5	**Risks due to other hazards**			
1.5.1	Electricity supply			X
1.5.2	Static electricity			X
1.5.3	Energy supply other than electricity			X
1.5.4	Errors of fitting		X	
1.5.5	Extreme temperatures		X	
1.45.6	Fire			X
1.5.7	Explosion			X
1.5.8	Noise		X	
1.5.9	Vibrations		X	
1.5.10	Radiation	X		
1.5.11	External radiation	X		
1.5.12	Laser radiation	X		
1.5.13	Emissions of hazardous materials and substances			X
1.5.14	Risk of being trapped in a machine			X
1.5.15	Risk of slipping, tripping or falling			X
1.5.16	Lightning			X
1.6	**Maintenance**			
1.6.1	Machinery maintenance		X	
1.6.2	Access to operating positions and servicing points		X	
1.6.3	Isolation of energy sources			X
1.6.4	Operator intervention			X
1.6.5	Cleaning of internal parts			X
1.7	**Information**			
1.7.1	Information and warnings on the machinery		X	
1.7.1.1	Information and information devices		X	
1.7.1.2	Warning devices			X
1.7.2	Warning of residual risks		X	
1.7.3	Marking of machinery	X		
1.7.4	Instructions	X		
1.7.4.1	General principles for the drafting of instructions		X	
1.7.4.2	Contents of the instructions	X		
1.7.4.3	Sales literature		X	
	The classification from Annex 1 is to be supplemented from here forward.			
2	Supplementary essential health and safety requirements for certain categories of machinery			X
2.1	Foodstuffs machinery and machinery for cosmetics or pharmaceutical products			X
2.2	Portable hand-held and/or guided machinery			X
2.2.1	Portable fixing and other impact machinery			X
2.3	Machinery for working wood and material with similar physical characteristics			X
3	Supplementary essential health and safety requirements to offset hazards due to the mobility of machinery			X
4	Supplementary essential health and safety requirements to offset hazards due to lifting operations			X
5	Supplementary essential health and safety requirements for machinery intended for underground work			X
6	Supplementary essential health and safety requirements for machinery presenting particular hazards due to the lifting of persons			X