

Plastic pneumatic rotary actuator KONEX S 50

Assembly and operating manual



Imprint

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Technical changes:

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

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Dear customer,

congratulations on choosing a SCHUNK product. By choosing SCHUNK, you have opted for the highest precision, top quality and best service.

You are going to increase the process reliability of your production and achieve best machining results – to the customer's complete satisfaction.

SCHUNK products are inspiring.

Our detailed assembly and operation manual will support you.

Do you have further questions? You may contact us at any time – even after purchase.

Kindest Regards

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Reg. No. 003496 QM08



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1 About this manual

This instruction is an integral part of the product and contains important information for a safe and proper assembly, commissioning, operation, maintenance and help for easier trouble shooting.

Before using the product, read and note the instructions, especially the chapter "Basic safety notes".

1.1 Warnings

The following key words and symbols are used to highlight dangers.

1.1.1 Key words

DANGER	Dangers for persons. Non-compliance will inevitably cause irreversible injury or death.
WARNING	Dangers for persons. Non-compliance may cause irreversible injury or death.
CAUTION	Dangers for persons. Non-observance may cause minor injuries.
NOTICE	Information about avoiding material damage

1.1.2 Symbols



Warning about a danger point



Warning about hand injuries



General mandatory sign to prevent material damage

1.2 Applicable documents

- General terms of business
- Catalog data sheet of the purchased product
- Assembly and Operating manuals of the accessories

The documents listed here, can be downloaded on our homepage
www.schunk.com

2 Basic safety notes

2.1 Intended use

The product was designed to swivel permissible attachments or workpieces.

The product is intended for installation in a machine/system. The requirements of the applicable guidelines must be observed and complied with.

The product may be used only in the context of its defined application parameters ([👉 6, Page 12](#)).

The product is designed for industrial use.

To use this unit as intended, it is also essential to observe the technical data and installation and operation notes in this manual and to comply with the maintenance intervals.

2.2 Not intended use

Use which is not specified as an intended use is for instance when the product is for example used as a pressing tool, stamping tool, lifting tool, guide for tools, cutting tool, tensioning mean, boring tool.

2.3 Environmental and operating conditions

- The module may be used only within its defined application parameters.
- Ensure that the environment is clean. Observe the lubrication intervals ([👉 8.2, Page 19](#)).
- Ensure that the environment is free of splashing water and vapors, and also of abrasive dust and process dust. This does not apply to modules designed especially for unclean environments.
- Do not subject the module to excessive vibrations and/or mechanical shocks.
- Strong magnetic fields can impair the function of the module. If the product is to be used in strong magnetic fields, contact your SCHUNK partner.

2.4 Product safety

Dangers arise from the product, if:

- the product is not used in accordance with its intended purpose.
- the product is not installed or maintained properly.
- the safety and installation notes are not observed.

Avoid any manner of working that may interfere with the function and operational safety of the product.

Wear protective equipment.

NOTE

More information are contained in the relevant chapters.

2.4.1 Protective equipment

Provide protective equipment per EC Machinery Directive.

2.4.2 Constructional changes, attachments, or modifications

Additional drill holes, threads, or attachments that are not offered as accessories by SCHUNK may be attached only with permission of SCHUNK.

2.5 Personnel qualification

The assembly, initial commissioning, maintenance, and repair of the product may be performed only by trained specialist personnel. Every person called upon by the operator to work on the product must have read and understood the complete assembly and operating manual, especially the chapter "Basic safety notes" ([👉 2, Page 7](#)). This applies particularly to personnel only used occasionally, such as maintenance personnel.

2.6 Using personal protective equipment

When using this product, observe the relevant industrial safety regulations and use the personal protective equipment (PPE) required!

- Use protective gloves, safety shoes and safety goggles.
- Observe safe distances.
- Minimal safety requirements for the use of equipment.

2.7 Notes on particular risks

Generally valid:

- Remove the energy supplies before installation, modification, maintenance, or adjustment work.
- Make sure that no residual energy remains in the system.
- Do not move parts by hand when the energy supply is connected.
- Do not reach into the open mechanism or the movement area of the unit.
- Perform maintenance, modifications, and additions outside the danger zone.
- Secure the product during all operations against uncontrolled activation.
- Take a precautionary approach by maintenance and disassembly.
- Only specially trained staff should disassemble the product.



WARNING

Risk of injury from objects falling and being ejected

- The danger zone must be surrounded by a safety fence during operation.



WARNING

Risk of injury due to rotating components!

3 Warranty

The warranty is valid for 24 months from the delivery date to the production facility under the following conditions:

- Intended use in 1-shift operation
- Observe the mandatory maintenance and lubrication intervals
- Observe the environmental and operating conditions

Parts touching the work piece and wear parts are not part of the warranty.

4 Scope of delivery

The scope of delivery includes:


- Plastic pneumatic rotary actuator KONEX S in the ordered model.
- Accessory pack

5 Accessories

The following accessories that are required for the module must be ordered separately:

- Sensors
- Adapter plate
- Snap connector with removal key


A wide range of accessories are available for this module.

For information about which accessories can be used with the appropriate product version  catalog.

5.1 Sensors

Overview of the compatible sensors

Designation	Type
Magnetic switch	MMS

- Exact type designation of the compatible sensors see  catalog.
- If you require further information on sensor operation, contact your SCHUNK contact person or download information from our homepage.

6 Technical data

Size	KONEX S 50
Torque [Nm]	0.9
Angle of rotation [°]	180.0
End position adjustability [°]	2.0
Max. permissible axial bearing load [N]	800.0
Max. permissible radial bearing load [Nm]	10.4
Weight [kg]	0.53
Noise emission [dB(A)]	≤ 70
IP rating	40
Nominal working pressure [bar]	6.0
Min. pressure [bar]	2.0
Max. pressure [bar]	6.5
Ambient temperature [°C]	
Min. ambient temperature [°C]	+ 5
max. ambient temperature [°C]	+ 60

Further technical data can be found in the catalog data sheet.
The most recent version applies.

7 Assembly

7.1 Mechanical connection

Check the evenness of the bolting surface The values relate to the entire bolting surface.

Requirements for levelness of the bolting surface (Dimensions in mm)

Diameter	Permissible unevenness
< 100	< 0.02
> 100	< 0.05

Mounting the rotary actuator

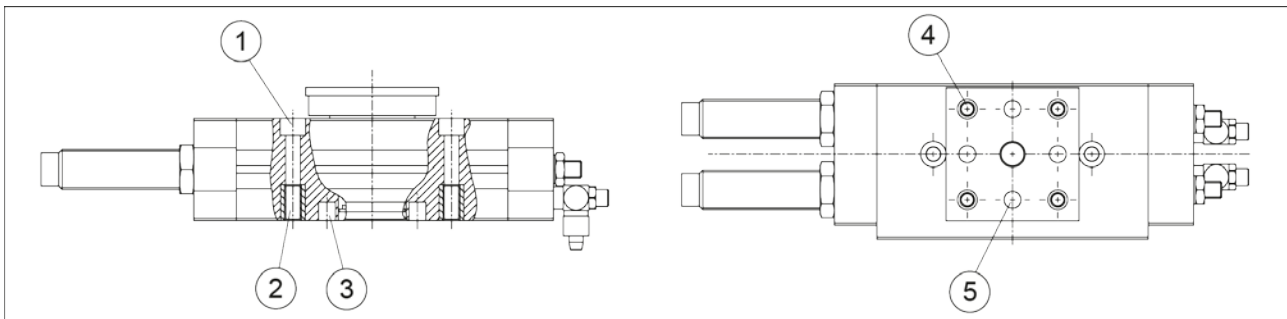


Fig. 1

1	Screw M5x45 (2x)	4	M5 internal thread (4x)
2	M6 thread (2x)	5	Fitting bore $\varnothing 6$ H9 (4x)
3	Cylindrical pin (50) $\varnothing 6$ m6x12		

The rotary actuator can be fastened to two internal threads from below or with two screws from above.

Use the cylindrical pins from the accessory pack for centering.


Assembly of the adapter plates The adapter plate can be fastened with four M5 screws to the internal threads of the pinion.


Use the cylindrical pins (50) from the accessory pack for centering.

Assembly of the snap connectors The KONEX V50 or V55 snap connectors can be clipped onto the pinion or onto the bottom of the housing.

They are removed with the supplied removal key.

7.2 Air connection

	NOTICE
	<p>The maximum permissible mass per jaw is exceeded:</p> <ul style="list-style-type: none"> Attach flow control couplings to the module.

	NOTICE
	<p>Observe the requirements for the air supply. (👉 6, Page 12) "Technical Data"</p>

Position of the position numbers [\(👉 10, Page 24\)](#)

Swivel mode The air connections used to operate the rotary actuator can be found on the face side in the cover (3).
 These connections are equipped with one-way flow control valves (31).
 Always use one-way flow control valves for connection.

Connection	Function
A	Rotary actuator, clockwise rotation
B	Rotary actuator, counter-clockwise rotation

Further information on the hose-free direct connection contains the catalog data sheet.

7.3 Rotating angle adjustment

- 1 Adjust the end position with the set screw (6). The adjustment range is $\pm 2^\circ$.
- 2 Connect the pressure lines to connection A.
- 3 Loosen the lock nut (26B) by the set screw (6B).
- 4 Turn the set screw until the desired end position is reached.
- 5 Re-tighten the lock nut (26B).
- 6 Remove the pressure line from connection A and connect it to connection B.
- 7 Adjust the second rotating angle stop with the set screw (26A).
- 8 Loosen the lock nut (26A) by the set screw (6A).
- 9 Turn the set screw until the desired end position is reached.
- 10 Connect both pressure lines and check them again after swiveling the pinion several times.

7.4 Shock absorber replacement

NOTE

Check the rotating angle after replacing a shock absorber.

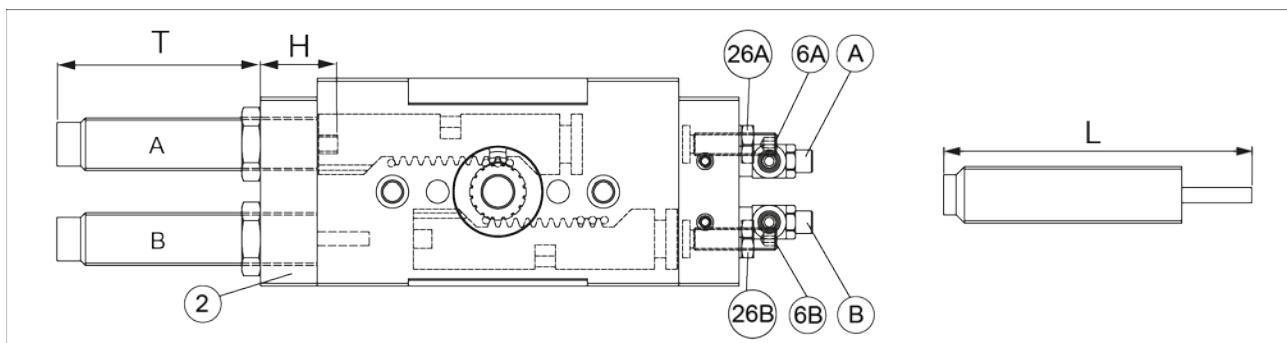


Fig. 2

L= total shock absorber length in extended condition of the new damper

- 1 To replace shock absorber A, connect the pressure line to connection A.
- 2 Loosen the hexagon nut of the shock absorber.
- 3 Unscrew the shock absorber.
- 4 Determine the dimension **H** and remove the pressure line.

- 5 Determine the dimension **L** on the new shock absorber.
- 6 Turn the pinion by hand to move the piston away from the end position until its piston rod is not resting on the piston of the rotary actuator when screwing in the new damper.
- 7 Screw the new shock absorber into the cover (2) up to dimension T.

Dimension T = L - H - 11.5 mm.

- 8 Lock the shock absorber with a hexagon nut.

- 1 To replace shock absorber B, connect the pressure line to connection B.
- 2 Loosen the hexagon nut of the shock absorber.
- 3 Unscrew the shock absorber.
- 4 Determine the dimension **H** and remove the pressure line.
- 5 Determine the dimension **L** on the new shock absorber.
- 6 Turn the pinion by hand to move the piston away from the end position until its piston rod is not resting on the piston of the rotary actuator when screwing in the new damper.
- 7 Screw the new shock absorber into the cover (2) up to dimension T.

Dimension T = L - H - 11.5mm.

7.5 Sensors

The module is prepared for a number of sensors. Other sensors can be used with a mounting kit.

- If you require further information on sensor operation, contact your SCHUNK contact person or download information from our homepage.
- Technical data for the sensors can be found in the data sheets (included in the scope of delivery).

7.5.1 MMS 30 magnetic switch

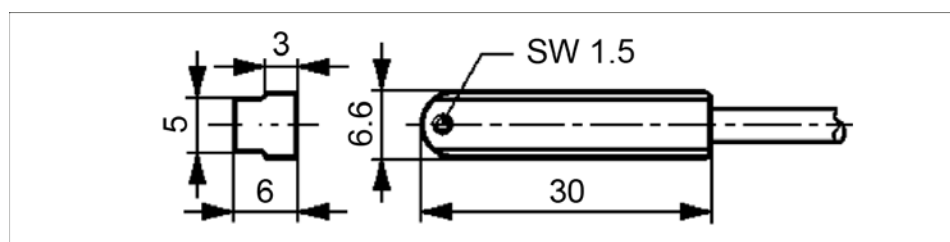


Fig. 3

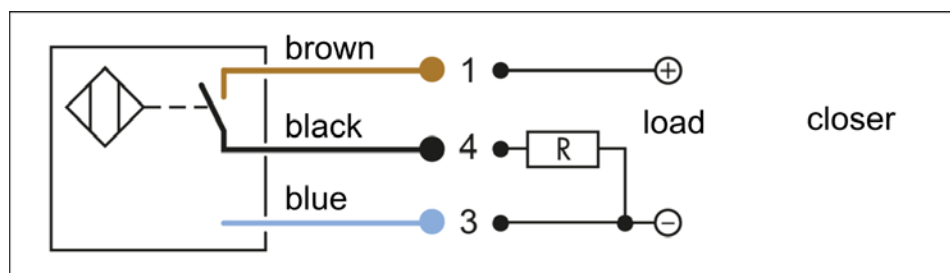



Fig. 4

	NOTICE
	<p>Risk of damage to the sensor during the assembly. Observe a maximum tightening torque of 0.2 Nm for the set-screws.</p>

NOTE

Ferromagnetic material changes the switching positions of the sensor. For example: Adapter plate made of ordinary steel.

At ferromagnetic adapter plates:

- The module must firstly be mounted on the adapter plate
- Then, the positions of the magnetic switch have to be set

**Assembly and
adjustment of the
magnetic switches**

- 1 Actuate the rotary actuator connection until it reaches its end positions.
- 2 Push magnetic switch 1 from above into the intended T-slot with the cable pointing downwards until it switches.
- 3 Mount magnetic switch 1 by tightening the set-screw.
- 4 Swivel the rotary actuator into its other end position in order to test the function.

- 1 Actuate the rotary actuator connection until it reaches its end positions.
- 2 Push magnetic switch 2 from above into the intended T-slot with the cable pointing downwards until it switches.
- 3 Mount magnetic switch 2 by tightening the set-screw.
- 4 Swivel the rotary actuator into its other end position in order to test the function.


8 Maintenance and Care

8.1 Notes

Original spare parts

When replacing damaged parts (wearing parts/spare parts) only use SCHUNK original spares.

8.2 Maintenance and lubrication intervals

	NOTICE
	<p>At ambient temperature above 60°C the lubricants can harden faster.</p> <ul style="list-style-type: none"> Interval decrease accordingly.

Size	50
Interval [Mio. cycles]	2

8.3 Lubricants/Lubrication points (basic lubrication)



We recommend the lubricants listed.

During maintenance, treat all greased areas with lubricant. Thinly apply lubricant with a lint-free cloth.

Lubricant point	Lubricant
Serration of the pinion	Molykote BR 2 plus
All seals	Renolit HLT 2
Metallic sliding surfaces	Renolit HLT 2

8.4 Disassembly of the module

Position of the position numbers ([👉 10, Page 24](#))

	 WARNING
	Risk of injury when the machine/system moves unexpectedly! Remove the energy supplies. Make sure that no residual energy remains in the system.

- 1 Remove the compressed air lines.
- 2 Remove the screws (27) and detach the bottom cover (2/3).
- 3 Remove the O-rings (23).
- 4 Mark the installation position of the pinion (4) and the position of the two pistons (5).
- 5 Remove the shaft retaining ring (30).
- 6 Press the pinion out of the housing from below.
- 7 Push the piston out of the housing in **X** direction.
- 8 Remove all seals.
- 9 Clean all parts and check them for defects and wear.

8.5 Servicing and assembling the module

- Maintenance**
- Clean all parts thoroughly and check for damage and wear.
 - Treat all greased areas with lubricant.
[\(☞ 8.3, Page 19\)](#)
 - Oil or grease bare external steel parts.
 - Replace all wear parts / seals.
 - Position of the wearing parts [\(☞ 10, Page 24\)](#)
 - Seal kit [\(☞ 11, Page 25\)](#)

- Assembly** Assembly takes place in the opposite order to disassembly. Observe the following:
- Unless otherwise specified, secure all screws and nuts with Loctite no. 243 and tighten with the appropriate tightening torque.

8.6 Disposal

The plastics which had been used to manufacture this gripper can be recycled very easily.

You can send it back to SCHUNK

SCHUNK will take care of a proper disposal of the material.

9 Connection technique

9.1 Assembly / Disassembly of the Module

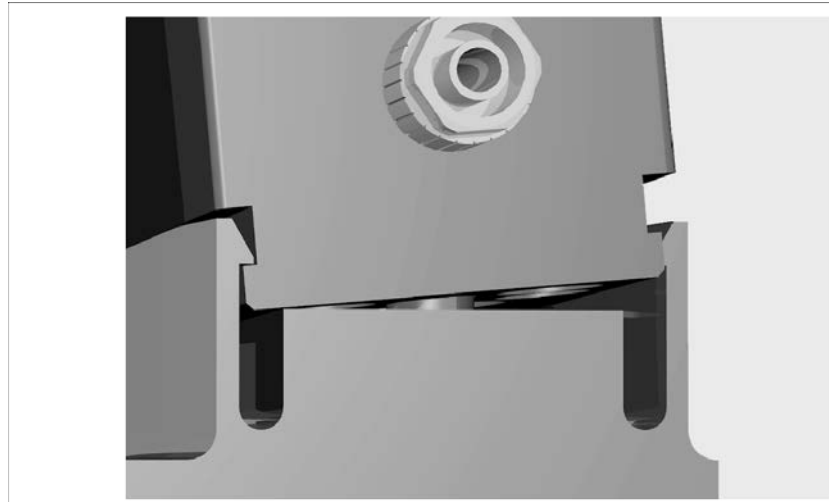


Fig. 5

Every interface of the module is equipped with undercuts, which allow to snap in the connector. Therefore, the modules may be connected 90° offset.

9.2 Connection

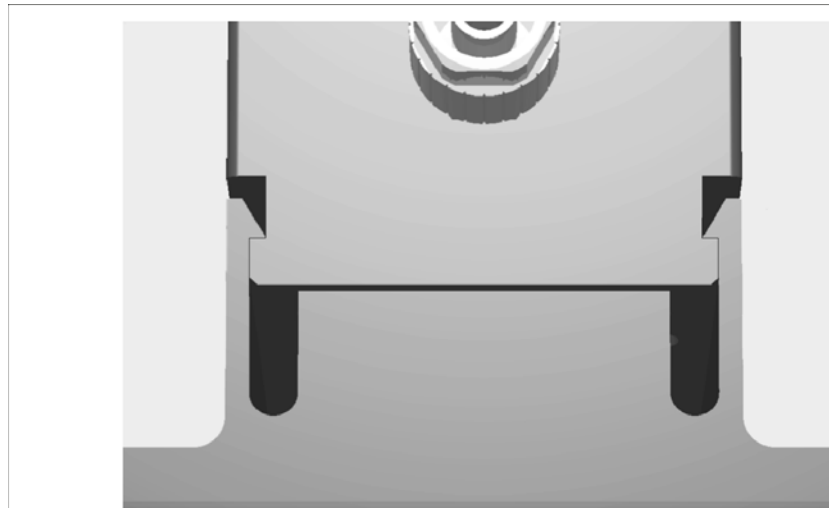


Fig. 6

The snap connector as a component, takes over the functions centering and fastening of the module.

For connection, the components are jammed, until the snap connector snaps into the undercut.

9.3 Loosen the connection in a „one second“- cycle time

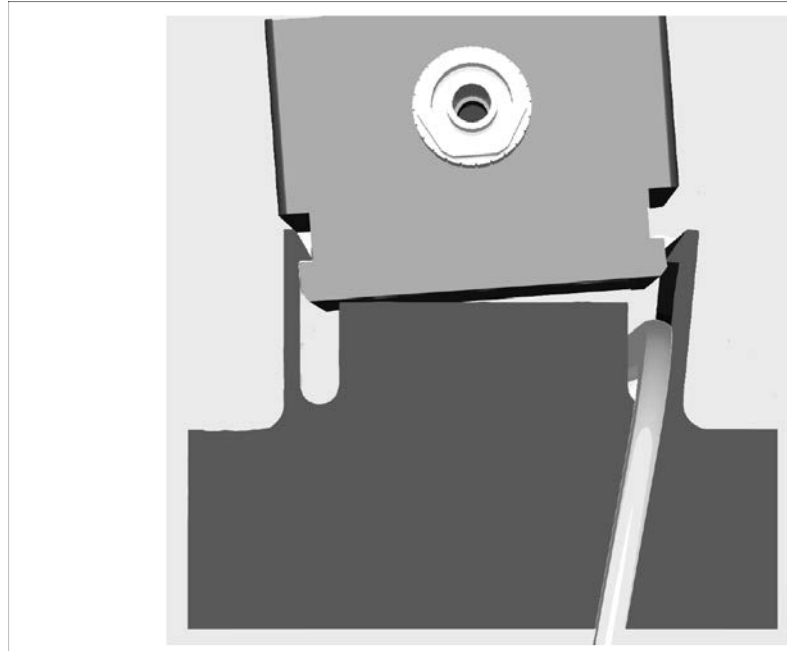


Fig. 7

For disassembling you do not have to cope with damaged or jammed screws.

Just use the tool which is adjusted to the rate of expansion of the snapconnector and that is included in the delivery of every module.

Insert the key into the provided groove of the snap connector and turn the key by 90° in order to loosen the snap connector.

10 Assembly drawing

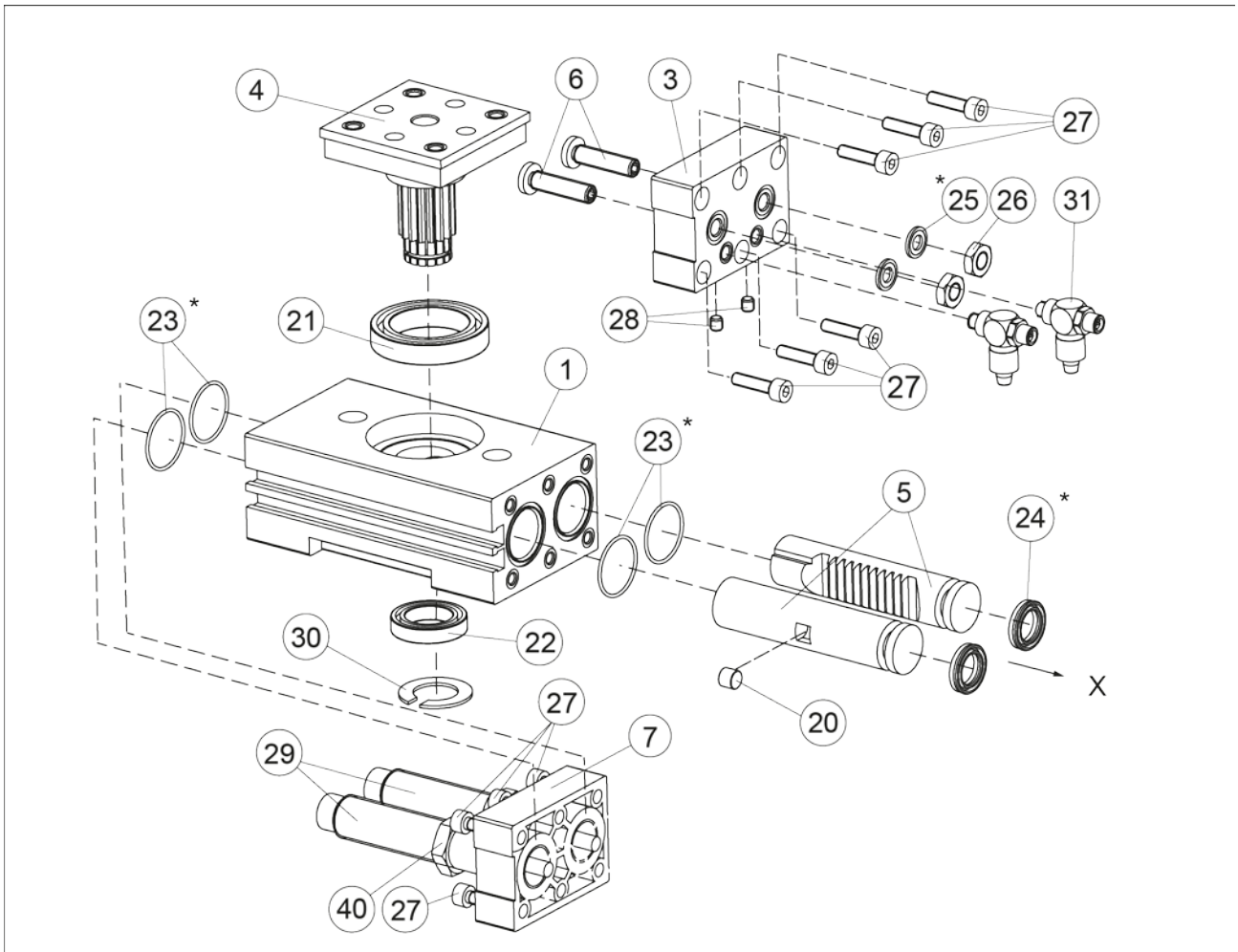


Fig. 8 Assembly

- * Wearing part, replace during maintenance.
Included in the seal kit. Seal kit can only be ordered completely.

11 Seal kit

Content of the sealing kit:

- 2x cylinder seal
- 2x M6 thread seal
- 4x O-ring DIN 3771 18.0x1.0

ID.-No. of the seal kit

Seal kit for	ID number
KONEX S 50	0370787

Contents of the seal kit ([↗ 10, Page 24](#)).

12 Accessory pack

Content of the accessories pack:

- 4x cylindrical pin DIN 6325 - Ø6m6

ID.-No. of the accessory pack

Accessory pack for	ID number
KONEX S 50	5510621

Contents of the accessories pack ([👉 10, Page 24](#)).

13 Translation of original 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/ SCHUNK GmbH & Co. KG Spann- und Greiftechnik
Distributor Bahnhofstr. 106 – 134
D-74348 Lauffen/Neckar

We hereby declare that on the date of the declaration the following incomplete 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: Plastic pneumatic rotary actuator / KONEX S 50 / pneumatic
ID number 0305450

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

Applied harmonized standards, especially:

EN ISO Safety of machinery - General principles for design - Risk assessment
12100:2011-03 and risk reduction

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

The special technical documents according to Appendix VII, Part B belonging to the incomplete machine have been compiled.

Person authorized to compile the technical documentation:
Robert Leuthner, Address: see manufacturer's address

Lauffen/Neckar, January 2014



p.p. Ralf Winkler, Head of Gripping
Systems Development

