

3 finger synthetic angular gripper SGW 40-64

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

Yours SCHUNK GmbH & Co. KG

Spann- und Greiftechnik

Bahnhofstr. 106 – 134

D-74348 Lauffen/Neckar

Tel. +49-7133-103-0

Fax +49-7133-103-2399

info@de.schunk.com

www.schunk.com



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

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

| | |
|---|---|
|  | ! DANGER Danger for persons. Non-compliance will inevitably cause irreversible injury or death. |
|  | ! WARNING Dangers for persons. Ignoring a safety note like this 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. |
|  | ! WARNING Warning about hand injuries |

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 grip and to temporarily and securely hold workpieces and objects.

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 11](#)).

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

- Make sure that the product and the top jaws are a sufficient size for the application.
- Observe Maintenance and lubrication intervals ([👉 9.2, Page 22](#)).
- 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.

2.4 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 Demands on the top jaws

Arrange the top jaws such that when the product is depressurized it can reach one of the end positions either open or closed and therefore no residual energy can be released when changing the top jaws.

2.4.3 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 6](#)). 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.

2.7 Notes on particular risks



The general rule is:



- Remove the energy supplies before installation, modification, maintenance, or adjustment work.
- Ensure 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.
- For all work, secure the product against accidental operation.
- Take particular care during maintenance and disassembly.
- Only qualified personnel may disassemble the product.



| | |
|---|--|
|  |  CAUTION |
| | <p>Possible risk of injury due to electrostatic energy! Components or assembly groups may become electrostatically charged. When touched, the electrostatic discharge can trigger a startle response, which can result in injuries.</p> <ul style="list-style-type: none"> • The operator must ensure that all components and assembly groups are included in the local equipotential bonding in line with the applicable regulations. |

NOTE

- The equipotential bonding must be installed by a specialist electrician in line with the applicable regulations, paying particular attention to the actual conditions in the working environment.
- The effectiveness of the equipotential bonding must be verified by a specialist electrician through regular safety measurements.

| | |
|--|--|
|  |  WARNING |
| | <p>Risk of injury due to squeezing and bumping during movement of the gripper jaws and breaking or loosening of the gripper fingers !</p> |

| | |
|---|--|
|  |  WARNING |
| | <p>Risk of injury from objects falling and being ejected</p> <ul style="list-style-type: none"> • The danger zone must be surrounded by a safety fence during operation. |

| | |
|---|--|
|  |  WARNING |
| | <p>While disassembling uncontrollable moves of parts of the gripper possible!</p> |

3 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:

- 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

- 3 finger synthetic angular gripper SGW in the ordered model.
- Accessory pack

5 Accessories


A wide range of accessories is 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 |
|------------------------------|------|
| Inductive proximity switches | IN |

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



6 Technical Data

| Size | SGW 40 | SGW 50 | SGW 64 |
|---------------------------------------|--|--------|--------|
| Opening angle per jaw [°] | 8° | 8° | 8° |
| About rake angle per jaw up to [°] | 2° | 2° | 2° |
| Weight [kg] | 0.05 | 0.09 | 0.17 |
| Recommended workpiece weight [kg] | 0.3 | 0.6 | 1.3 |
| Max. permissible finger length [mm] | 32 | 40 | 50 |
| Max. permitted weight per finger [kg] | 0.03 | 0.045 | 0.07 |
| Min. pressure [bar] | 4 | 4 | 4 |
| Ambient temperature [°C] | | | |
| Min. | -10 | | |
| Max. | 90 | | |
| Nominal working pressure [bar] | 6 | 6 | 6 |
| Max. pressure [bar] | 7 | 7 | 7 |
| Noise emission [dB(A)] | ≤ 70 | | |
| Pressure medium | Compressed air, compressed air quality according to ISO 8573-1:7 4 4 | | |

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

7 Assembly

7.1 Mechanical Connection

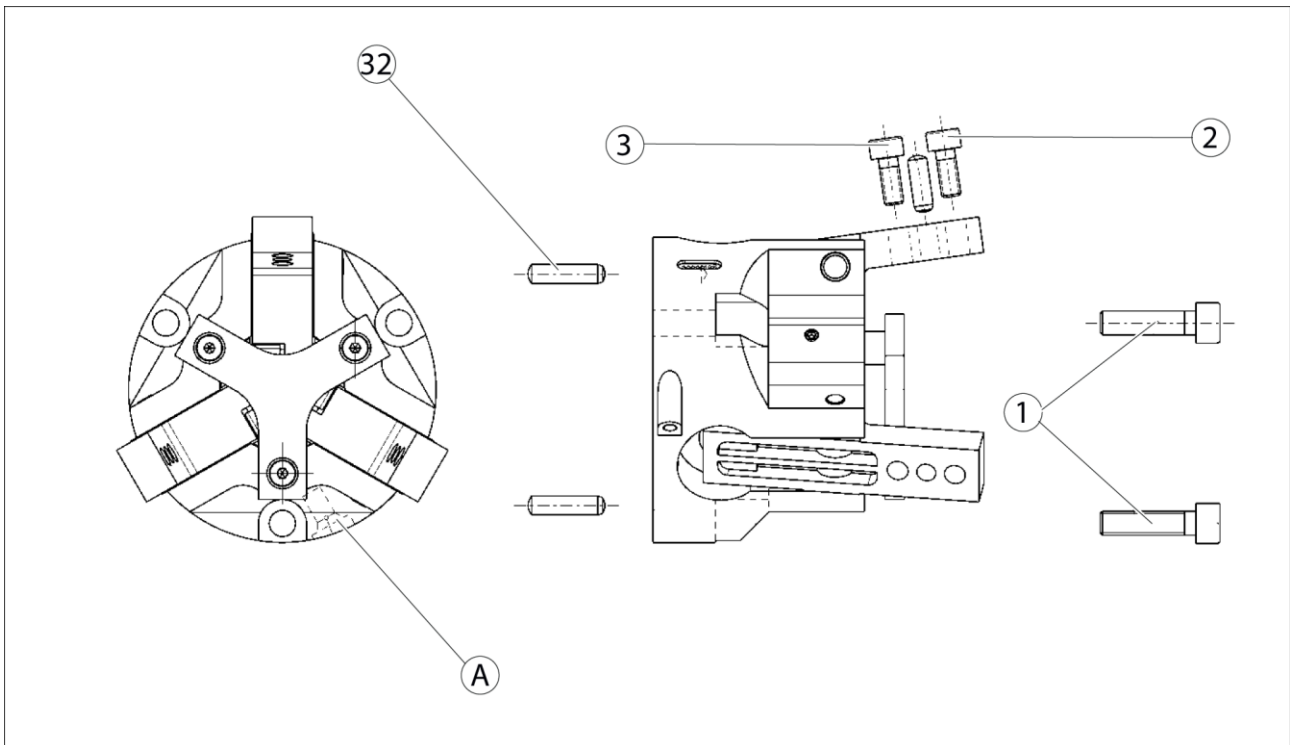
| | |
|---|--|
|  |  WARNING |
| | <p>Warning: Risk of injury when the machine/system moves unexpectedly! Remove the energy supplies before starting with assembly and adjustments. Make sure that no residual energy remains in the system.</p> |

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 module can be mounted from the front or the rear.



Mounting of the Gripper and the Finger



Mounting material


| Item | Size | SGW 40 | SGW 50 | SGW 64 |
|------|---|----------------------------------|-------------------|-------------------|
| 1 | Thread diameter for mounting the gripper (max. tightening torque for fastening screws) | 3x M3 (0.5 Nm) | 3x M3 (1,0 Nm) | 3x M5 (2,0 Nm) |
| 2 | Thread diameter for mounting the finger | M3 | M3 | M4 |
| 3 | Ø of the fixing bores for cylindrical pins | Ø2H7 | Ø3H7 | Ø4H7 |
| A | Hose connection for gripper "CLOSED" | (↪ 7.2, Page 14) | | |


NOTE

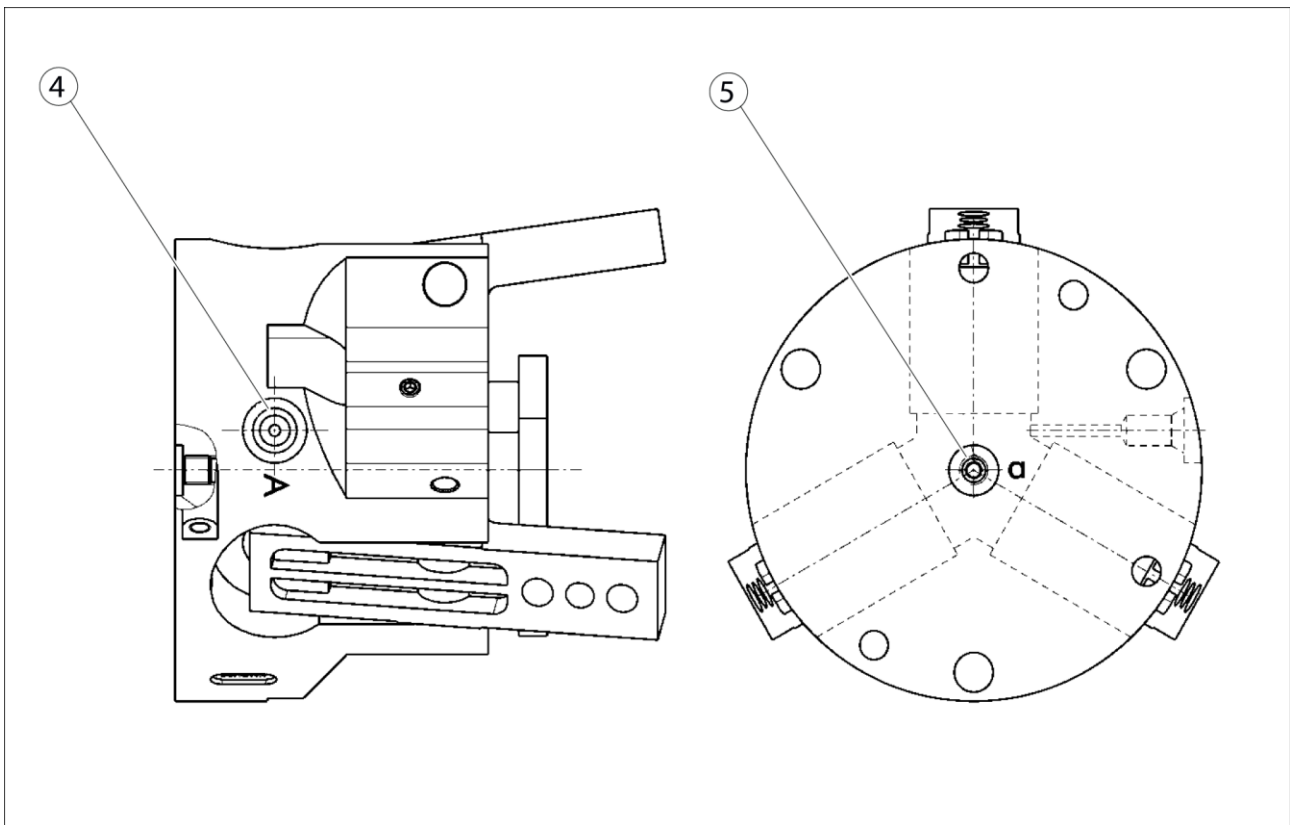
- The cylindrical pins (32) that are required for the fixation of the gripper are contained in the enclosed pack.
- The mounting screws (1, 2) and the fixation of the fingers (3) shown are not included in the scope of delivery.
- When mounting from the back, fasten the module by means of the provided fixing bore.
- Fasten the module using the provided mounting holes.

7.2 Air connection

| | |
|---|--|
|  |  WARNING |
| | <p>Warning: Risk of injury when the machine/system moves unexpectedly! Remove the energy supplies before starting with assembly and adjustments. Make sure that no residual energy remains in the system.</p> |

| | |
|---|--|
|  | NOTICE |
| | <p>Damage to the gripper is possible! If the maximum permissible finger weight or the permissible mass moment of inertia of the fingers is exceeded, the gripper can be damaged.</p> <ul style="list-style-type: none"> A jaw movement always has to be without jerks and bounce. You must therefore implement sufficient reduction and/or damping. Observe the diagrams and information in the catalog data sheet. |

| | |
|---|--|
|  | NOTICE |
| | <p>Observe the requirements for the air supply (👉 6, Page 11).</p> |



Luftanschlüsse

Thread diameter of the air connections

| Item | Connection | SGW 40 | SGW 50 | SGW 64 |
|------|---|--------|--------|--------|
| 4 | Thread diameter Hose connection (A = close) | M3 | M3 | M3 |
| 5 | Thread diameter Hose-free direct connection (A = close) | M3 | M4 | M4 |

- Only open the air connections required.
- Seal air connections not required using the locking screws from the enclosed pack.
- For hose-free direct connections use the two O-rings from the enclosed pack.

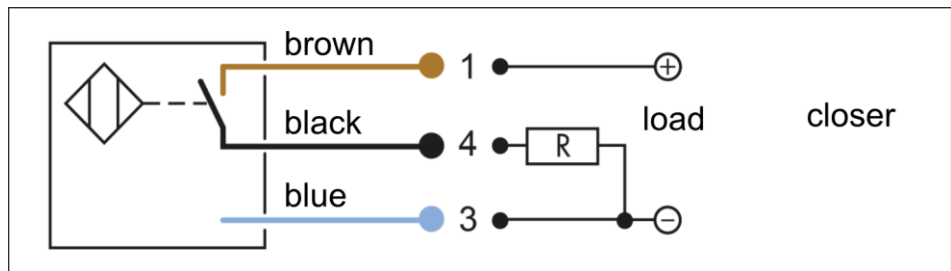
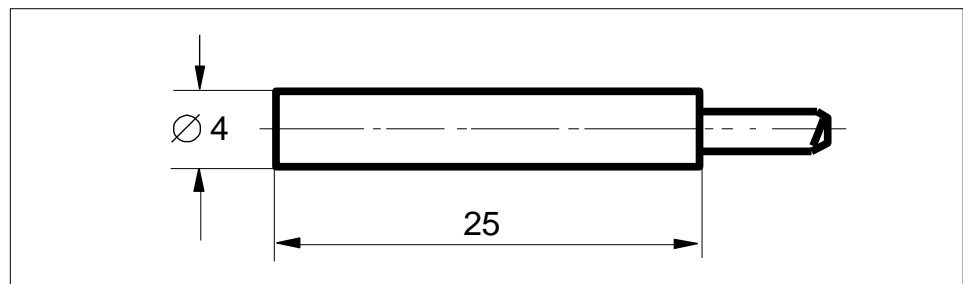
Further information on the hose-free direct connection contains the catalog data sheet.

7.3 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).

7.3.1 IN 40 inductive proximity switch



Types that can be ordered ([👉 catalog](#)):

The inductive proximity switches used are equipped with reverse polarity protection and are short-circuit-proof.

Make sure that you handle the proximity switches properly:

- Do not pull on the cable.
- Do not allow the sensor to dangle from the cable.
- Do not overtighten the mounting screw or mounting clip.
- Please adhere to a permitted bend radius of the cable ([👉 catalog](#)).
- Avoid contact of the proximity switches with hard objects and with chemicals, in particular nitric acid, chromic acid and sulphuric acid.

The inductive proximity switches are electronic components, which can react sensitively to high-frequency interference or electromagnetic fields.

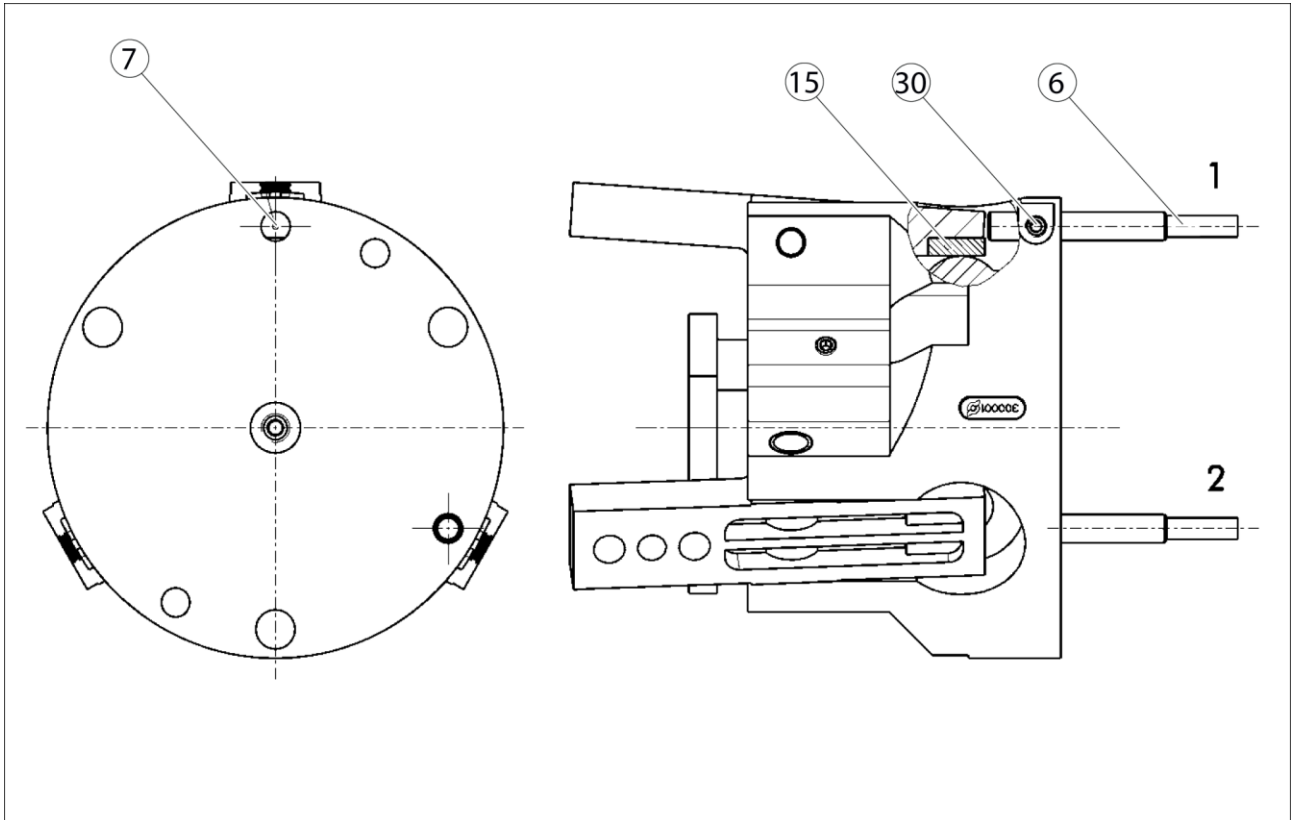
- Check to make sure that the cable is fastened and installed correctly. Provide for sufficient clearance to sources of high-frequency interference and their supply cables.
- Parallel switching of several sensor outputs of the same type (npn, pnp) is permissible, but does not increase the permissible load current.
- Note that the leakage current of the individual sensors (approx. 2 mA) is cumulative.

**Mounting and
adjusting IN 40/S**



NOTICE

The maximum tightening torque of the set screws is 15 Ncm.



Adjustment inductive proximity switch

**Setting of the
switching point
gripper open**

- 1 Push proximity switch 1 (6) gently to the stop of the control cam (15) into the clamping bore (7).
- 2 Pull back the proximity switch 0.5mm.
- 3 Tighten the set screw (30) for fastening.
- 4 Move gripper to "open" position and test the function.

Gripper closed

- 1 Push proximity switch 2 (6) gently to the stop of the control cam (15) into the clamping bore (7).
- 2 Pull back the proximity switch 0.5mm.
- 3 Tighten the set screw (30) for fastening.
- 4 Move gripper to "closed" position and test the function.

8 Trouble shooting

8.1 Module does not move?

| Possible cause | Corrective action |
|---|--|
| Base jaws jam in housing, possible cause: bolting surface not sufficiently level. | Check the levelness of the bolting surface. (☞ 7.1, Page 12) Loosen the mounting screws for the gripper and actuate the gripper again. |
| Pressure drops below minimum. | Check the air supply. (☞ 7.2, Page 14) |
| Compressed air lines switched | Check compressed air lines. (☞ 7.2, Page 14) |
| Proximity switch defective or set incorrect. | Repair the proximity switch. |
| Unused air connections not closed. | Close the unused air connections. |
| Flow control valve closed. | Open the flow control valve. |
| Component is broken, e.g. through over-loading | Replace component or send the module with a repair order to SCHUNK. Ensure that the module was only used within its defined application parameters. If necessary, check the application with the calculation program for gripping modules (SSG). |
| The aperture angle is limited to 0°. | Check the limit of the aperture angle. |

8.2 The module does not travel through the entire stroke?

| Possible cause | Corrective action |
|---|---|
| Dirt deposits between the cover and the piston | Remove the cover, clean the module and relubricate it. (☞ 9, Page 22) |
| Dirt deposits between the base jaws and the guide | Disassemble and clean module. |
| Pressure drops below minimum. | Check the air supply. (☞ 7.2, Page 14) |
| Mounting surface is not even enough | Check the levelness of the bolting surface. (☞ 7.1, Page 12) |
| Component is broken, e.g. through over-loading | Send the module to SCHUNK with a repair order or disassemble module. |
| Opening angle is set incorrectly | Check the limit of the aperture angle. |

8.3 Module opens or closes abruptly?

| Possible cause | Corrective action |
|---|--|
| Too little grease in the mechanical guiding areas of the module | Clean the module and relubricate it. (👉 9, Page 22) |
| Compressed air lines are blocked | Check the compressed air lines for crushing or damage. |
| Mounting surface is not even enough | Check the levelness of the bolting surface. |
| Flow control valve is missing or not set correctly | Install and adjust flow control valve. |
| Load too high | Review permissible weight and length of the jaws. (👉 7.1, Page 12) |

8.4 The gripping force drops?

| Possible cause | Corrective action |
|---|---|
| Compressed air can escape | Check seals, if necessary disassemble module and replace seals. |
| Too much grease in the mechanical motion spaces of the module | Clean the module and relubricate it. (👉 9, Page 22) |
| Pressure drops below minimum. | Check the air supply. (👉 7.2, Page 14) |

8.5 Module does not achieve the opening and closing times?

| Possible cause | Corrective action |
|--|---|
| <p>Compressed air lines are not installed optimally.</p> | <p>If present: Open the flow control couplings on the module to the maximum that the movement of the jaws occurs without bouncing and hitting.</p> <p>Check compressed air lines.</p> <p>Inner diameter of the compressed air lines are sufficiently large relative to the compressed air consumption</p> <p>Compressed air lines between module and control valve should be kept as short as possible.</p> <p>Flow rate of valve is sufficiently large relative to the compressed air consumption.</p> <p>NOTICE! The one-way flow control valves must not be removed even when the gripper has not reached the opening and closing times.</p> <p>If, despite of optimal air connections, the opening and closing times are not achieved according to the catalog, we recommend the use of quick exhaust valves direct at the module.</p> |
| <p>Load too high</p> | <p>Review permissible weight and length of the jaws.</p> |


9 Maintenance and care

9.1 Notes

Original spare parts

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

9.2 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. |

| | |
|------------------------|---|
| Interval [Mio. cycles] | 2 |
|------------------------|---|

9.3 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 |
|---------------------------|-------------------|
| Metallic sliding surfaces | microGleit GP303P |
| All seals | Renolit HLT 2 |
| Bores on the piston | Renolit HLT 2 |

10 Enclosed pack

Content of the accessories pack:

- O-ring
- Set screws
- Cylindrical pins
- Locking screw

11 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/ Distributor SCHUNK GmbH & Co. KG Spann- und Greiftechnik
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: 3 finger synthetic angular gripper / SGW 40 - 64 /
electro-pneumatic

ID number 0305204 / 0305205 / 0305206

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:

DIN 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 in electronic form 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

Signature – see original declaration

Lauffen/Neckar, June 2016

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