

2-finger parallel gripper KTG 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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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
- Calculation program for gripping modules (SSG)

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 13](#)).

SCHUNK assumes that application in question was tested with the calculation program for gripping modules (SSG).

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.
- 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 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 module.
- Perform maintenance, modifications, and additions outside of the danger zone.
- For all work, secure the unit against accidental operation.
- Take a precautionary approach by maintenance and disassembly.
- Only specially trained staff should disassemble the module.

	 WARNING
	Risk of injury due to squeezing and bumping during movement of the gripper jaws and breaking or loosening of the gripper fingers !

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

	 WARNING
	While disassembling uncontrollable moves of parts of the gripper possible!

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.

If necessary, check the application with the calculation program for gripping modules (SSG).

4 Scope of delivery

The scope of delivery includes:

- 2-finger parallel gripper KTG in the ordered model.
- Accessory pack

5 Accessories

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
Inductive proximity switches	IN

- 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.
- For mounting the sensors, mounting kits are partly necessary.

6 Technical data

	KTG 50
Stroke per jaw [mm]	4.5
Max. permissible finger length [mm]	50
Max. permitted weight per finger [kg]	0.04
Closing force [N] / Opening force [N]	13
Closing time [s] / Opening time [s]	0.05
Weight [kg]	0.08
Recommended workpiece weight [kg]	0.07
Air consumption per double stroke [cm ³]	0.23
Min. pressure [bar] Max. pressure [bar]	1 / 7
Nominal working pressure [bar]	6
IP rating	20
Repeatability [mm]	0.02
Min. ambient temperature [°C] max. ambient temperature [°C]	-10 90
Diameter of the center bore [mm]	5
Noise emission [dB(A)]	≤ 70
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:7 4 4

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

7 Assembly

7.1 Mounting and centering the gripper

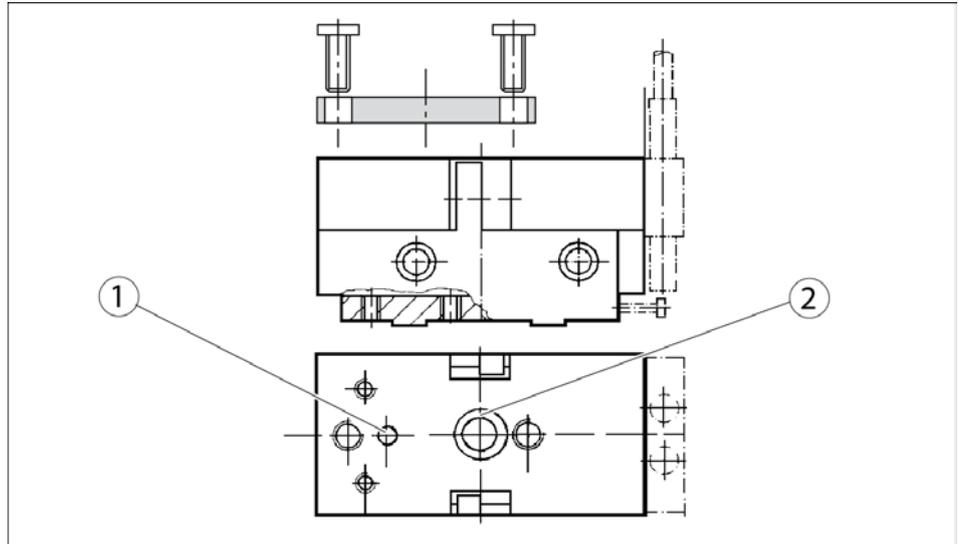


Fig. 1

1	Bore hole for cylindrical pin ($\varnothing 3m6$) *	2	Bore hole for centering sleeve ($\varnothing 8m6$) *
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* Contained in accessory pack.

7.2 Air connection

	NOTICE
	<p>Observe the requirements for the air supply. (👉 6, Page 13) "Technical Data"</p>

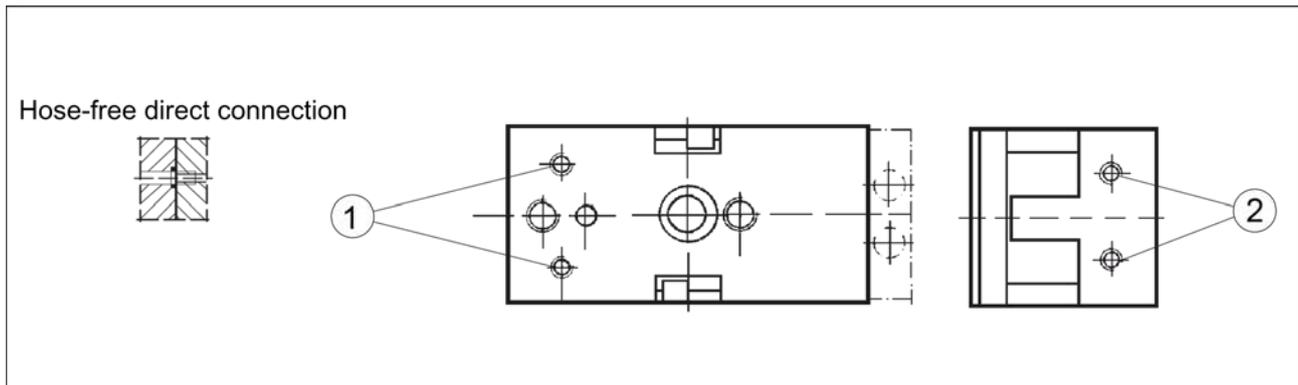


Fig. 2

1	Main connections (Hose connection) (A= open, B = closed)
2	Hose-free direct connection at the side (a= open, b = closed)

- 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 O-rings from the enclosed pack.
- If the maximum permissible finger weight is exceeded a throttle has to be carried out imperatively. The movement has to be without jerks and bounce.

7.3 Opening stroke limitation

	 WARNING
	<p>Danger of crushing when moving the gripper jaws! Do not reach between the gripper jaws during the test.</p>

The opening stroke of 4 mm per jaw can be limited steplessly as required.

The gripper can only be connected on the base side if stroke limitation is used.

- 1 To adjust the stroke, screw the set-screws (DIN 915 - M3 x 10) from the accessory pack into the connection threads on the face side until the stroke is limited as desired.
- 2 Seal and glue in the set-screws.

7.4 Permissible load and max. finger length

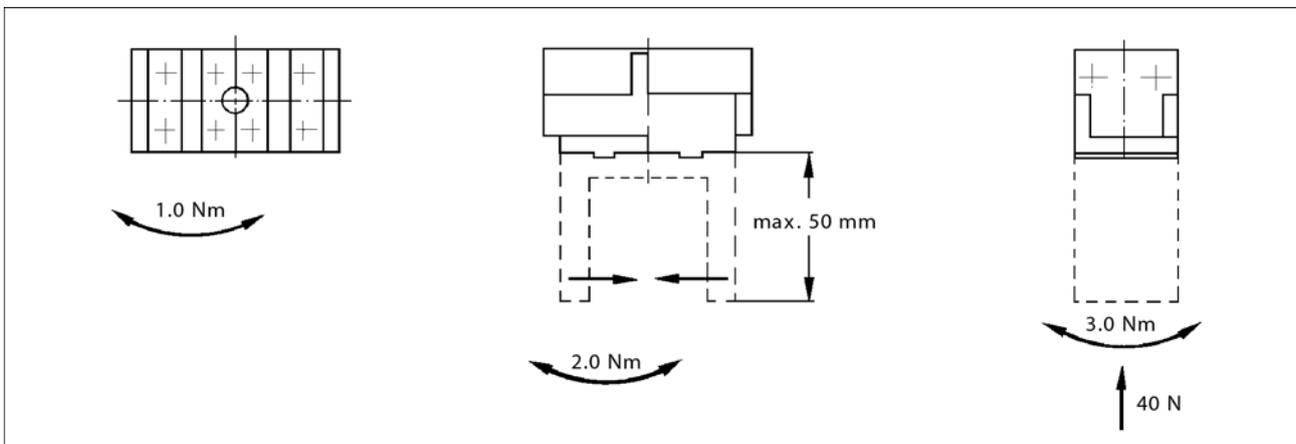


Fig. 3

7.5 Top jaws

The base jaws are each equipped with four M3 threads and a bar. Use at least two threads to fasten your top jaws.

	NOTICE
	<p>Damage to the top jaw blanks due to exceedance of the max. depth of engagement! Observe a max. depth of engagement of 3 mm!</p>

Use the bar to mount the top jaws.

Type	ID number For one set = 2 x
RB 50	0300280

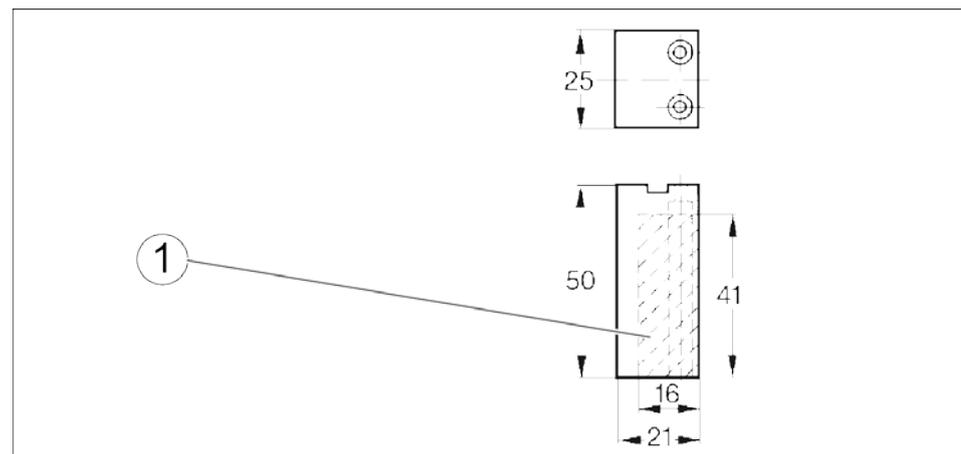


Fig. 4 Jaw blanks

2	Machining area for specific adjustment
---	--

7.6 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).

7.6.1 Inductive proximity switch IN 80

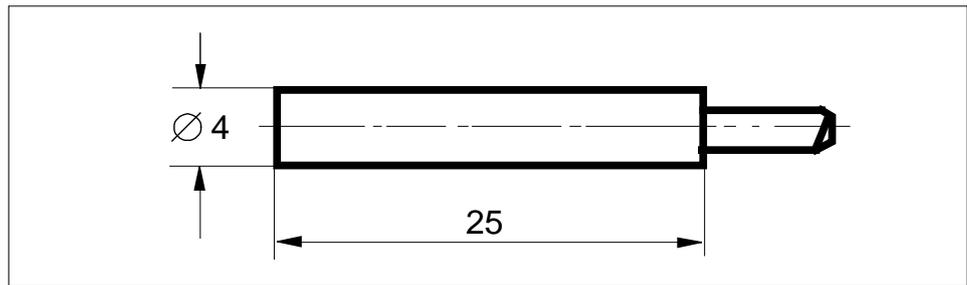


Fig. 5

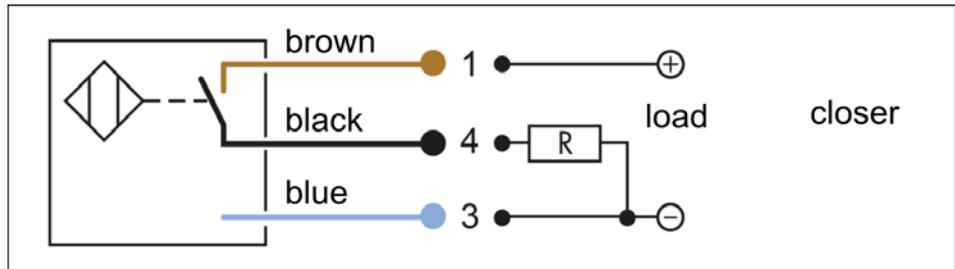


Fig. 6

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.

Assembly and adjustment

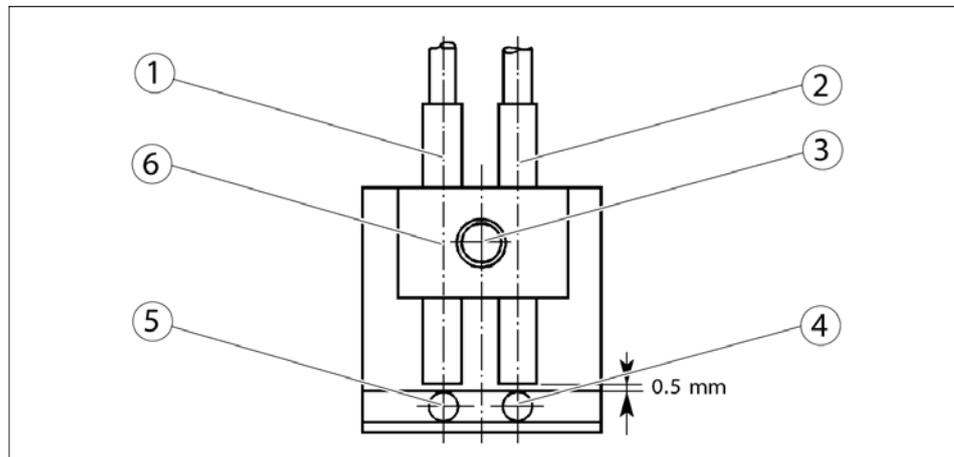


Fig. 7 Proximity switch

1	»OPEN« proximity switch	4	Long switching lug
2	»CLOSED« proximity switch	5	Short switching lug
3	Attachment screw	6	Holder for proximity switch

- 1 Loosen the attachment screw (3) on the bracket.
- 2 Push the proximity switch (1/2) through the bore holes in the bracket (6).
Observe a distance of 0.5 mm to the switching lug.
- 3 Secure the proximity switch by tightening the attachment screw (3) (max. tightening torque of 1 Nm).
- 4 If necessary, adjust the switching lugs (4/5) so that the head of the switching lug is above the center of the respective proximity switch in the desired position of the base jaw.
- 5 To monitor intermediate positions, the long switching lug (5) may have to be replaced with the M2 x 8 screw from the accessory pack.
Secure the switching lug with suitable adhesive.

8 Troubleshooting

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 14) Loosen the mounting screws for the gripper and actuate the gripper again.
Pressure drops below minimum.	Check the air supply. (👉 7.2, Page 15)
Compressed air lines switched	Check compressed air lines.
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 overloading	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).

8.2 The module does not travel through the entire stroke?

Possible cause	Corrective action
Pressure drops below minimum.	Check the air supply. (👉 7.2, Page 15)
Mounting surface is not even enough	Check the levelness of the bolting surface. (👉 7.1, Page 14)
Component is broken, e.g. through overloading	Send the module to SCHUNK with a repair order.

8.3 Module opens or closes abruptly?

Possible cause	Corrective action
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 14)

8.4 The gripping force drops?

Possible cause	Corrective action
Compressed air can escape	Check seals, if necessary disassemble module and replace seals.
Pressure drops below minimum.	Check the air supply. (👉 7.2, Page 15)

9 Maintenance

The gripper is maintenance-free.

Observe the following notes to maintain the function of the gripper:

- Avoid excessive contamination.
- Oil or grease bare external steel parts.

Always use dried air.

- Unless otherwise specified, secure all screws and nuts with Loctite no. 243 and tighten with the appropriate tightening torque.

10 Seal kit

Content of the sealing kit:

- Cylinder seals
- O-rings

ID.-No. of the seal kit

Seal kit for	ID number
KTG 40	5518749

11 Accessories kit

Content of the accessories pack:

- Centering bushing
- Set-screws
- Cylindrical pin
- Screw
- O-rings
- Locking screw

ID.-No. of the accessory pack

Accessory pack for	ID number
KTG 40	5509421

12 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: 2-finger parallel gripper / KTG 50 / pneumatic
ID number 0300275

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