

2-finger angular gripper PWG

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

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 Variants

This operating manual applies for the following variations

- PWG - F (finger version)
- PWG - F (finger version) High-temperature version (HT)
- PWG - B (jaw version)
- PWG - B (jaw version) High-temperature version (HT)

1.3 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 Link Technische Daten.

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.
- Observe Maintenance and lubrication intervals ([👉 9.2, Page 20](#)).
- 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 The use of personal protective equipment

When installing or removing the product, observe the relevant health and safety at work rules and use the required personal protective equipment (protective gloves, safety boots and safety goggles).

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
	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. • 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 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 • 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

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.

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

4 Scope of delivery

The scope of delivery includes

- 2-finger angular gripper PWG 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
Position monitoring	FPS

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

6 Technical data

Size	PWG 65	PWG 90	PWG 130	PWG 170	PWG 230
Closing torque [Nm]	6.44	35.69	125.4	324.9	934.2
Closing moment produced by spring [Nm]	1.7	9	34.2	80.4	237.6
Recommended workpiece weight [kg]	0.8	3.3	8	15.7	35.8
Air consumption per double stroke [cm ³]	8	35	120	320	860
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:7 4 4				
Nominal working pressure [bar]	6				
Min. pressure [bar]	4				
Max. pressure [bar]	8				
Max. permissible finger length [mm]	60	80	125	160	200
Max. permitted weight per finger [kg]	0.15	0.5	1	2.5	4
IP rating	20				
Min. ambient temperature [°C]	-10				
Max. ambient temperature [°C]	90				
Noise emission [dB(A)]	≤ 70				

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

7 Assembly

7.1 Mounting the gripper

The gripper can be fastened on the side, on the finger side and on the bottom.

Screws are included in the accessory pack for lateral and finger-side mounting.

Centering is performed by means of centering sleeves, which are also included in the accessory pack.

7.2 Mounting options on the gripper

The plate (6) can be removed to mount a shaft support, workpiece centering device or the like ([👉 10, Page 22](#)).

Connection dimensions for threads and centering devices [👉 catalog](#).

7.3 Air connection



WARNING

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.



NOTICE

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.

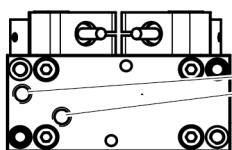
- A jaw movement always has to be without jerks and bounce.
- You must therefore implement sufficient reduction and/or damping.
- Observe the diagrams and information in the catalog data sheet.



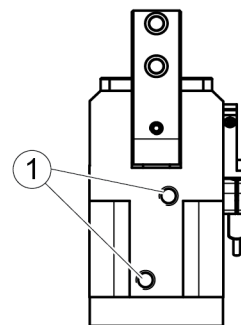
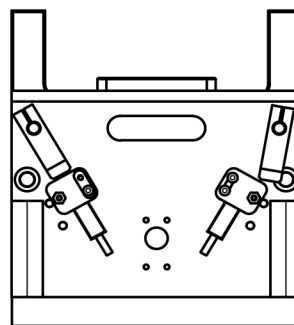
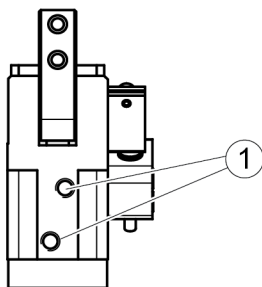
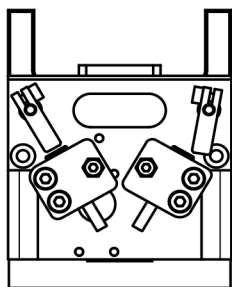
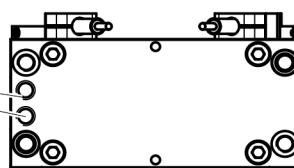
NOTICE

Observe the requirements for the air supply
Link Technische Daten.

PWG 65 / PWG 90



PWG 130 / PWG 170 / PWG 230



1 Main connections
(A= open, B = closed)

2 Direct connection for air purge
(a= open, b = closed)

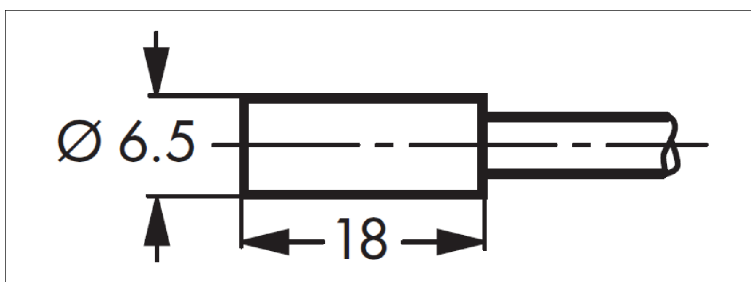
- Open only the air connections that are needed.
- Close unused main air connections using the screw plugs from the enclosed pack.
- For a hose-free direction connection, use the O-rings from the enclosed pack.

7.4 Sensors

- 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).

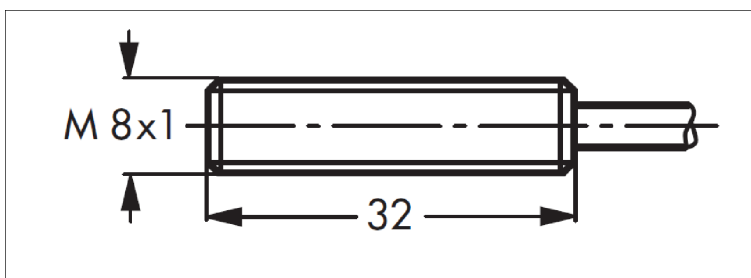
7.4.1 IN inductive proximity switch

PWG 65



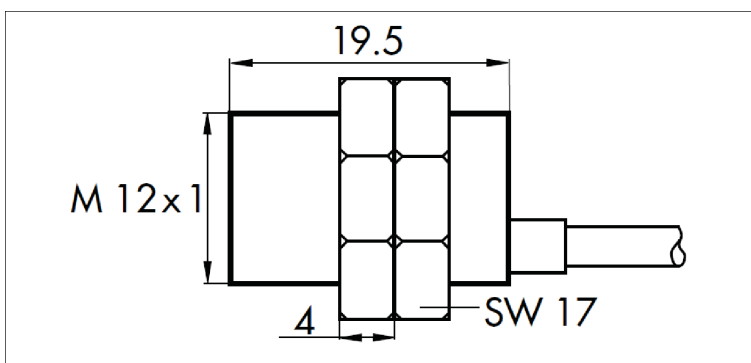
IN 60 inductive proximity switch

PWG 90 - 230



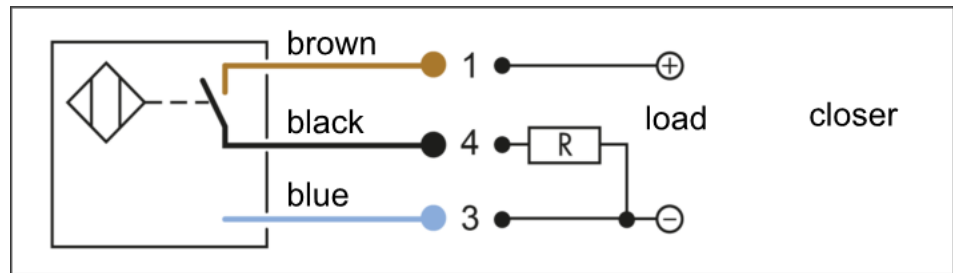
IN 80 inductive proximity switch

Optional for PWG 130
- 230



IN 120 inductive proximity switch

**Switching function:
drawn in undam-
pened condition**



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:

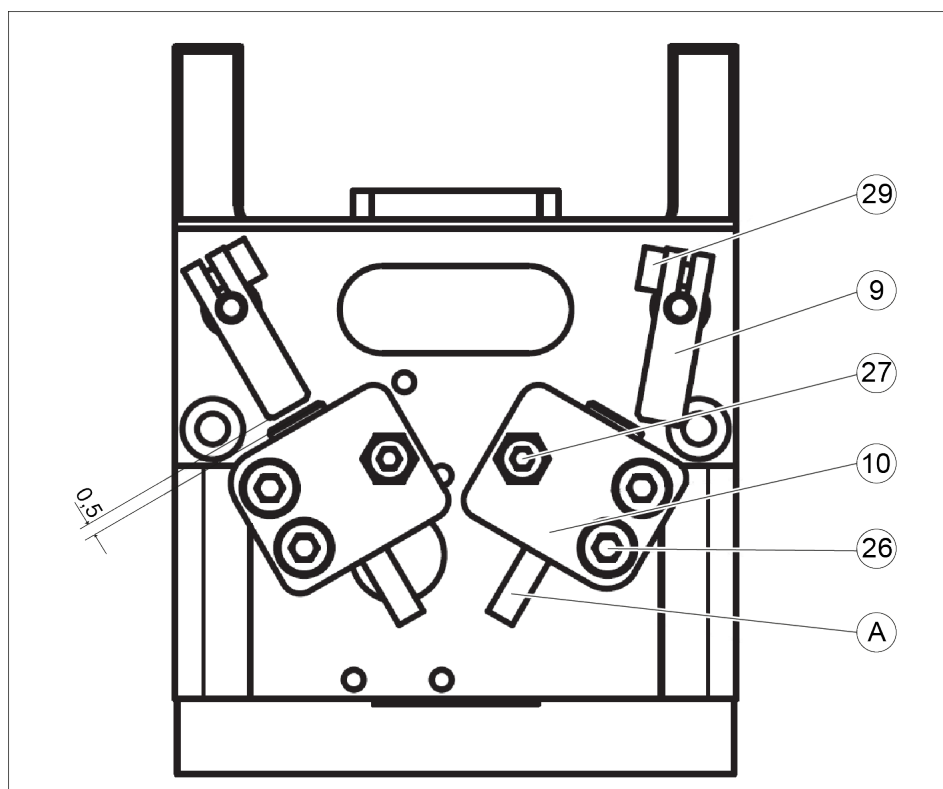
- Do not pull on the cable.
- Do not allow the sensor to dangle from the cable.
- Do not overtighten the mounting screw or mounting clip.
- Please adhere to a permitted bend radius of the cable. (👉 catalog)
- Avoid contact of the proximity switches with hard objects and with chemicals, in particular 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 (ca. 2 mA) is cumulative.

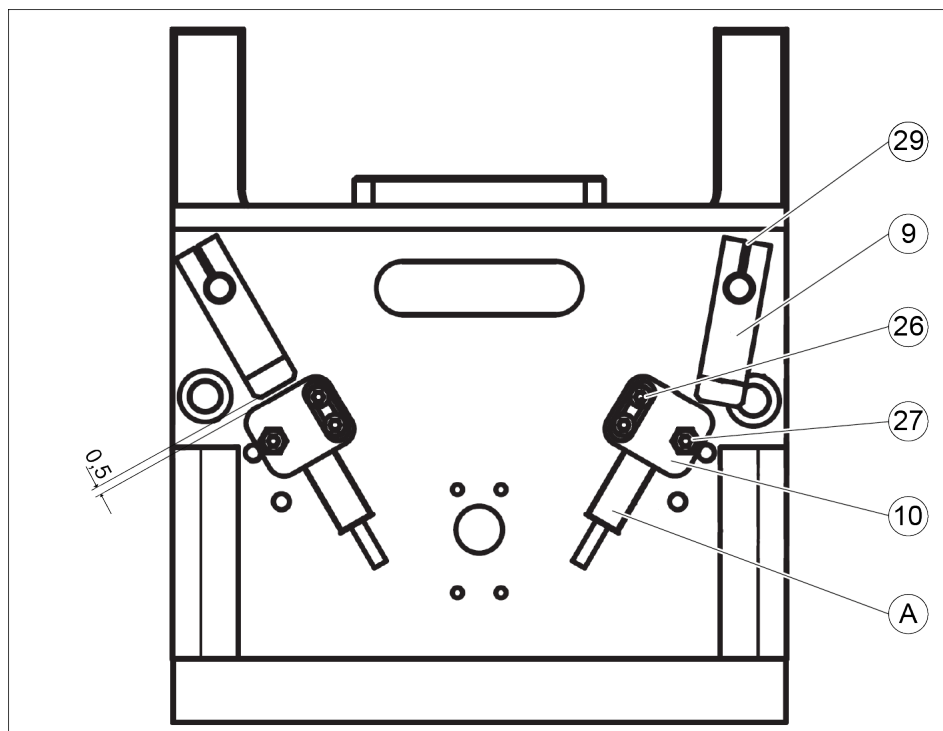
Assembly and adjustment of the proximity switches

PWG 65



A	Proximity switch
---	------------------

PWG 90 - 130



A	Proximity switch
---	------------------

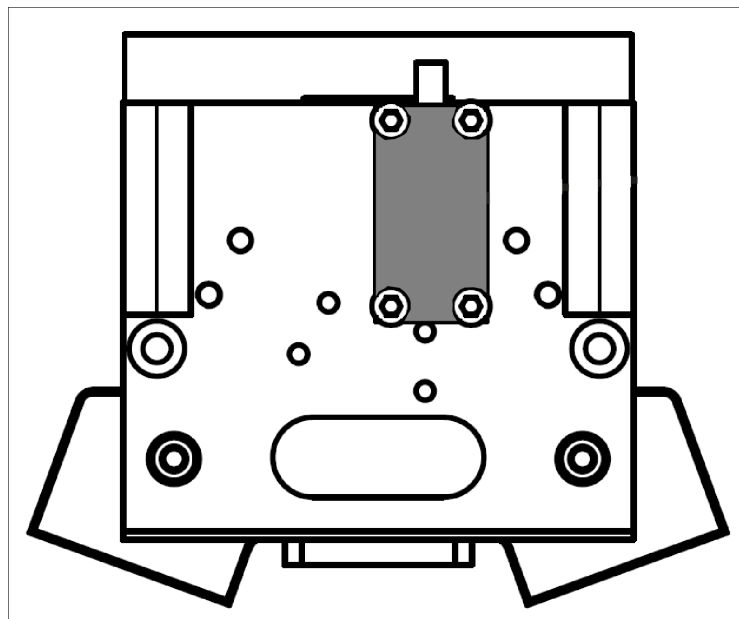
Gripper closed:

- 1 Set the gripper to »CLOSED« position.
- 2 Loosen the screw (29) and turn the switching lug (9) so that it faces towards the proximity switch.
- 3 Re-tighten the screw (29).
- 4 For PWG 65 (INW 60): Carefully push the proximity switch into the bracket (10) until it touches the switching lug. Then pull back the proximity switch approx. 0.5 mm.
For PWG 90 - 230: Carefully push the proximity switch up to the back stop in the bracket (10). The switching distance can be varied as required by loosening the screws (26).
- 5 Mount the proximity switch with the attachment screw (27).
Max. tightening torque of 100 Ncm.
- 6 Connect the proximity switch.
- 7 Test the function by opening and closing the fingers.

Gripper open:

- 1 Set the gripper to »OPEN« position.
- 2 Mount the other proximity switch as described in points 2) to 7).

7.4.2 FPS - S13



The FPS sensor is screwed directly onto the housing.

Use the M2.5 x 8 screws from the accessory pack for this purpose.

8 Trouble shooting

8.1 Module does not move?

Possible cause	Corrective action
Pressure drops below minimum.	Check the air supply. (👉 7.3, Page 14)
Compressed air lines switched	Check compressed air lines. (👉 7.3, 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.

8.2 The module does not travel through the entire stroke?

Pressure drops below minimum.	Check the air supply. (👉 7.3, Page 14)

8.3 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 20)
Pressure drops below minimum.	Check the air supply. (👉 7.3, Page 14)

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
	At ambient temperature above 60°C the lubricants can harden faster. Interval decrease accordingly.

Maintenance- and lubrication interval

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 GP 360
All seals	Renolit HLT 2
Bores on the piston	Renolit HLT 2

9.4 Disassembly of the module

Position of the position numbers ([👉 10, Page 22](#))

	WARNING
	Risk of injury due to spring forces! The lid is under spring tension. Carefully disassemble the module.

- 1 Remove the compressed air line.
- 2 Unscrew the screws (25) and remove the plate (6).
- 3 Loosen the set-screws (30) until the bolt (8) can be pushed out. Mark the installation position of the bolts and the fingers / jaws (7 / 11).
- 4 Remove the fingers / jaws (7 / 11).
- 5 Unscrew the screw (23) and remove the bar (5). If necessary, secure the bar against twisting with a feeler gage tape.
- 6 **WARNING! The housing (1), cover (2) and piston (3) are under spring tension. Clamp the housing and cover between »A« and »B«. Unscrew the screws (22). (With PWG 170 and 230, also unscrew the screws (20)). Unclamp slowly.**
- 7 Remove the piston (3) with piston rod (4) and springs (15). Mark the installation position of the piston and piston rod.
- 8 Loosen the screw (24) and remove the piston rod.

9.5 Servicing and assembling the module

- Maintenance**
- Clean all parts thoroughly and check for damage and wear.
 - Treat all greased areas with lubricant.
([👉 9.3, Page 20](#))
 - Oil or grease bare external steel parts.
 - Replace all wear parts / seals. ([👉 10, Page 22](#))
 - Position of the wearing parts ([👉 10, Page 22](#))
 - Seal kit ([👉 11, Page 24](#))

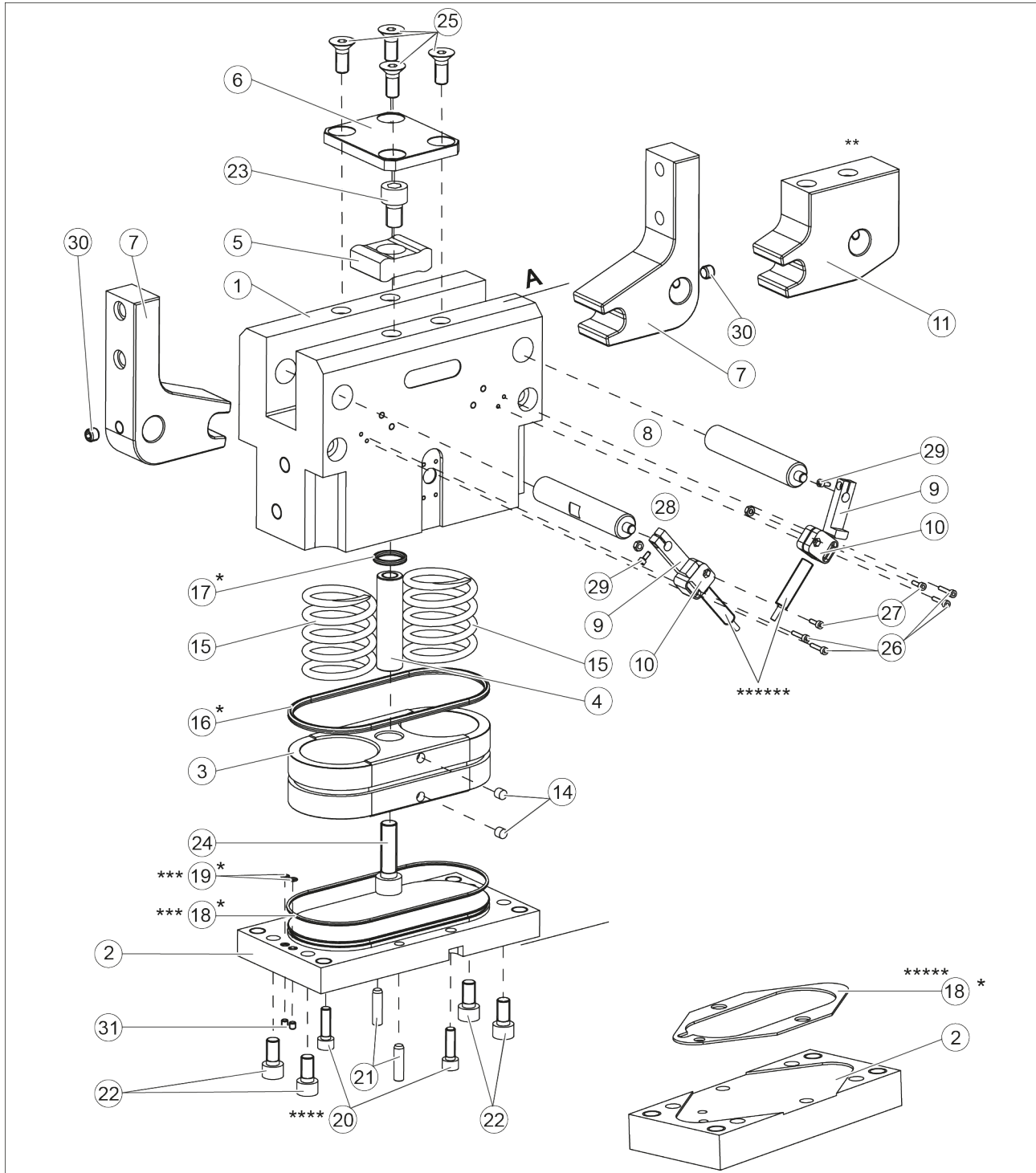
- Assembly** Assembly takes place in the opposite order to disassembly. Observe the following:
- Unless otherwise specified, secure all screws and nuts with Loctite no. 243 and tighten with the appropriate tightening torque.
 - Make sure the seals are not damaged during the assembly.

10 Assembly drawing

The following figure is an example image.

It serves for illustration and assignment of the spare parts.

Variations are possible depending on size and variant.



- * Wearing part, replace during maintenance.
 Included in the seal kit. Seal kit can only be ordered completely.
- ** Only for version B (type of jaw)
- *** Only for PWG 90 - PWG 230
- **** Only for PWG 170 - PWG 230
- ***** Only for PWG 65
- ***** Proximity switch (on special order)

11 Sealing kit

Seal kit for	ID number
PWG 65	0370843
PWG 65 High-temperature version (HT)	0370920
PWG 90	0370844
PWG 90 High-temperature version (HT)	0370921
PWG 130	0370845
PWG 130 High-temperature version (HT)	39370845
PWG 170	0370846
PWG 170 High-temperature version (HT)	39370846
PWG 230	0370847
PWG 230 High-temperature version (HT)	39370847

Contents of the seal kit ([👉 10, Page 22](#)).

12 Accessories kit

Content of the accessories pack:

- Centering sleeves
- O-rings

ID.-No. of the accessory pack

Accessory pack for	ID number
PWG 65	5510828
PWG 65 High-temperature version (HT)	395510828
PWG 90	5510829
PWG 90 High-temperature version (HT)	395510829
PWG 130	5510830
PWG 130 High-temperature version (HT)	395510830
PWG 170	5510831
PWG 170 High-temperature version (HT)	395510831
PWG 230	5510832
PWG 230 High-temperature version (HT)	395510832

13 Mounting kit for proximity switch

HG-PWG 65, ID number 0300764

Item	Quantity	Designation	ID number
50	2	Holder for proximity switch	5510822
51	2	Screw, M2.5 x 8	9660408
52	2	Nut, M2.5	9936008
53	4	Screw, M2.5 x 12	9660409

HG-PWG 130 - 230, ID number 0300763

Item	Quantity	Designation	ID number
50	2	Terminal block, size 12	9936029
51	4	Screw, M4 x 16	9660123

14 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: 2-finger angular gripper / PWG / pneumatic
ID number 0302630 ... 0302639, 39302630 ... 39302639

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

Signature – see original declaration

Lauffen/Neckar, January 2015

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

