
# Assembly and operating manual PWG-plus

## Pneumatic angular gripper

Translation of the original manual

Hand in hand for tomorrow

# 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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**Please read the operating manual in full and keep it close to the product.**

# Table of Contents

# 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.

In addition to these instructions, the documents listed under ▸ 1.1.3 [🗋 7] are applicable.

**NOTE:** The illustrations in this manual are intended to provide a basic understanding and may deviate from the actual version.

### 1.1.1 Presentation of Warning Labels

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

**⚠ DANGER**

**Dangers 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.

***CAUTION***

**Material damage!**

Information about avoiding material damage.

### 1.1.2 Definition of Terms

The term "product" replaces the product name on the title page in this manual.

### 1.1.3 Applicable documents

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

The documents labeled with an asterisk (*) can be downloaded from **schunk.com/downloads**.

### 1.1.4 Sizes

This operating manual applies to the following sizes:

- PWG-plus 50
- PWG-plus 64
- PWG-plus 80
- PWG-plus 100
- PWG-plus 125
- PWG-plus 160
- PWG-plus 200
- PWG-plus 240

### 1.1.5 Variants

This operating manual applies to the following variations:

- PWG-plus without gripping force maintenance
- PWG-plus with gripping force maintenance "O.D. gripping" (AS)
- PWG-plus high-temperature (V/HT)
- PWG-plus force intensification (KVZ)

## 1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:

- Observe the specified maintenance and lubrication intervals
- Observe the ambient conditions and operating conditions

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

## 1.3 Scope of delivery

The scope of delivery includes

- Pneumatic angular gripper PWG-plus in the version ordered
- Safety information (product-specific instructions available online)
- Accessory pack

### 1.3.1 Accessories kit

Content of the accessory pack:

- 6 x Centering sleeves for mounting
- 2 x O-ring for hose-free direct connection
- 2 x screw plug for hose connection

**Tab.: ID.-No. of the accessory pack**

| Accessory pack for | Standard | High-temperature (HT) |
|---|---|---|
| PWG-plus50 | 5521200 | 5521201 |
| PWG-plus64 | 5521202 | 5521203 |
| PWG-plus80 | 5521204 | 5521205 |
| PWG-plus100 | 5521206 | 5521207 |
| PWG-plus125 | 5521208 | 5521209 |
| PWG-plus160 | 5521210 | 5521211 |
| PWG-plus200 | 5521212 | 5521213 |
| PWG-plus240 | 5521214 | 5521215 |

## 1.4 Accessories

A wide range of accessories are available for this product

For information regarding which accessory articles can be used with the corresponding product variants, see catalog data sheet.

### 1.4.1 Seal kit

**Tab.: ID.-No. of the seal kit**

| Seal kit for | Standard | High-temperature (HT) | Force intensified version (KVZ) | High-temperature version with force amplification cylinder |
|---|---|---|---|---|
| PWG-plus 50 | 5521224 | 5521226 | 5521225 | 5521227 |
| PWG-plus 64 | 5521228 | 5521230 | 5521229 | 5521231 |
| PWG-plus 80 | 5521232 | 5521234 | 5521233 | 5521235 |
| PWG-plus 100 | 5521236 | 5521238 | 5521237 | 5521239 |
| PWG-plus 125 | 5521240 | 5521242 | 5521241 | 5521243 |
| PWG-plus 160 | 5521244 | 5521246 | 5521245 | 5521247 |
| PWG-plus 200 | 5521248 | 5521250 | 5521249 | 5521251 |
| PWG-plus 240 | 5521252 | 5521253 | 5522165 | 5522166 |

contents of the sealing kit, ▶ 7.7 [🗋 52].

# 2 Basic safety notes

## 2.1 Intended use

The product is designed exclusively for gripping and temporarily holding workpieces or objects.

- The product may only be used within the scope of its technical data, ▸ 3 [🗋 18].
- The product is intended for installation in a machine/ automated system. The applicable guidelines for the machine/ automated system must be observed and complied with.
- The product is intended for industrial and industry-oriented use. Its use outside enclosed spaces is only permitted if suitable protective measures are taken against outdoor exposure. The product is not suitable for use in salty air.
- The product can be used within the permissible load limits and technical data for holding workpieces during simple machining operations, but is not a clamping device according to EN 1550:1997+A1:2008.
- Appropriate use of the product includes compliance with all instructions in this manual.
- Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

## 2.2 Constructional changes

**Implementation of structural changes**

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- Structural changes should only be made with the written approval of SCHUNK.

## 2.3 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.

## 2.4 Gripper fingers

**Requirements of gripper fingers**

Accumulated energy can make the product unsafe and risk the danger of serious injuries and considerable material damage.

- Execute the gripper fingers in such a way that the product reaches either the "open" or "closed" position in a de-energized state.
- Only change gripper fingers if no residual energy can be released.
- Make sure that the product and the top jaws are a sufficient size for the application.

## 2.5 Ambient conditions 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 [🗋 18].

## 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 danger 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 Protection against electric shock

**Possible electrostatic energy**

Components or assembly groups may become electrostatically charged. When the electrostatic charge is touched, the discharge may trigger a shock reaction leading to injuries.

- The operator must ensure that all components and assembly groups are included in the local potential equalisation in accordance with the applicable regulations.
- While paying attention to the actual conditions of the working environment, the potential equalisation must be implemented by a specialist electrician according to the applicable regulations.
- The effectiveness of the potential equalisation must be verified by executing regular safety measurements.

## 2.13 Notes on particular risks

**⚠ DANGER**

**Risk of fatal injury from suspended loads!**

Falling loads can cause serious injuries and even death.

- Stand clear of suspended loads and do not step within their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.
- Wear suitable protective equipment.

**⚠ WARNING**

**Risk of injury from objects falling and being ejected!**

Falling and ejected objects during operation can lead to serious injury or death.

- Take appropriate protective measures to secure the danger zone.

**⚠ WARNING**

**Risk of injury from sharp edges and corners!**

Sharp edges and corners can cause cuts.

- Use suitable protective equipment.

**⚠ 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.
- Make sure, that no residual energy remains in the system.

**⚠ WARNING**

**Risk of injury from crushing and impacts!**

Serious injury could occur during movement of the base jaw, due to breakage or loosening of the gripper fingers or if the workpiece is lost.

- Wear suitable protective equipment.
- Do not reach into the open mechanism or the movement area of the product.

**⚠ WARNING**

**Risk of injury due to spring forces!**

Parts are under spring tension on products which clamp using spring force or which have gripping force maintenance. While disassembling components can move unexpectedly and cause serious injuries.

- Disassemble the product cautiously.
- Make sure that no residual energy remains in the system.

**⚠ WARNING**

**Risk of injury from objects falling during energy supply failure**

Products with a mechanical gripping force maintenance can, during energy supply failure, still move independently in the direction specified by the mechanical gripping force maintenance.

- Secure the end positions of the product with SCHUNK SDV-P pressure maintenance valves.

# 3 Technical data

| Designation | PWG-plus |
|---|---|
| Pressure medium | Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4] |
| Nominal working pressure [bar] | 6 |
| Min. pressure [bar]<br>without gripping force maintenance<br>with gripping force maintenance | <br>2<br>4 |
| Max. pressure [bar]<br>without gripping force maintenance<br>with gripping force maintenance<br>Force intensified version (KVZ) | <br>8<br>6.5<br>6 |
| Pressure range for air purge [bar] | 0.5 – 1 |

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

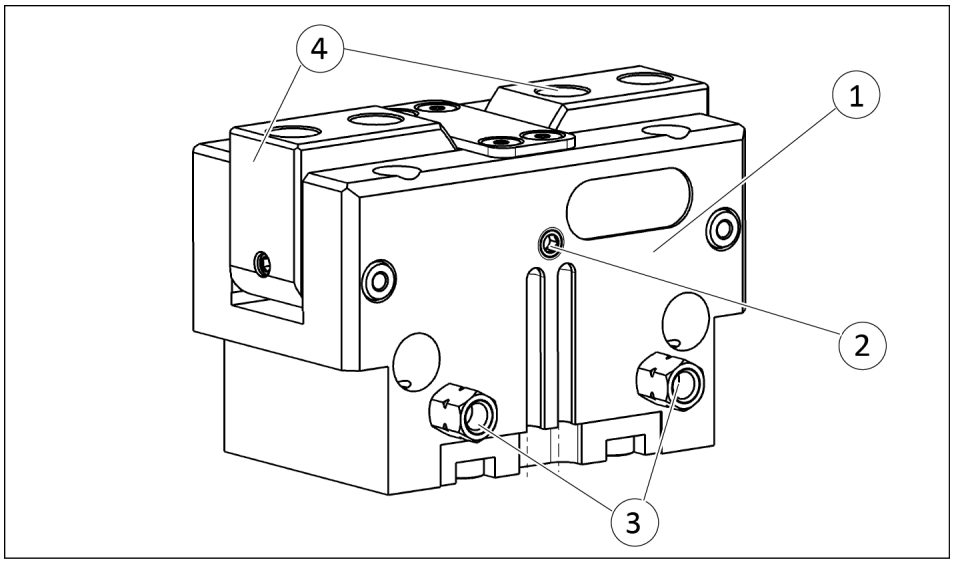
**Ambient conditions and operating conditions**

| Designation | PWG-plus |
|---|---|
| Ambient temperature [°C]<br>min.<br>max. | <br>+5<br>+90 (V/HT: +130) |
| Protection class IP * | 30 |
| Noise emission [dB(A)] | ≤ 70 |

* For use in dirty ambient conditions (e.g. sprayed water, vapors, abrasion or processing dust) SCHUNK offers corresponding product options as standard. SCHUNK also offers customized solutions for special applications in dirty ambient conditions.

# 4 Design and description

## 4.1 Configuration




*Pneumatic angular gripper*

| | |
|---|---|
| 1 | Housing |
| 2 | Air purge connection |
| 3 | Main air connections |
| 4 | Base jaws |

## 4.2 Description

Robust 2-finger angular gripper with oval pistion and bone drive

# 5 Assembly

## 5.1 Connections

### 5.1.1 Mechanical connection

**Evenness of the mounting surface**

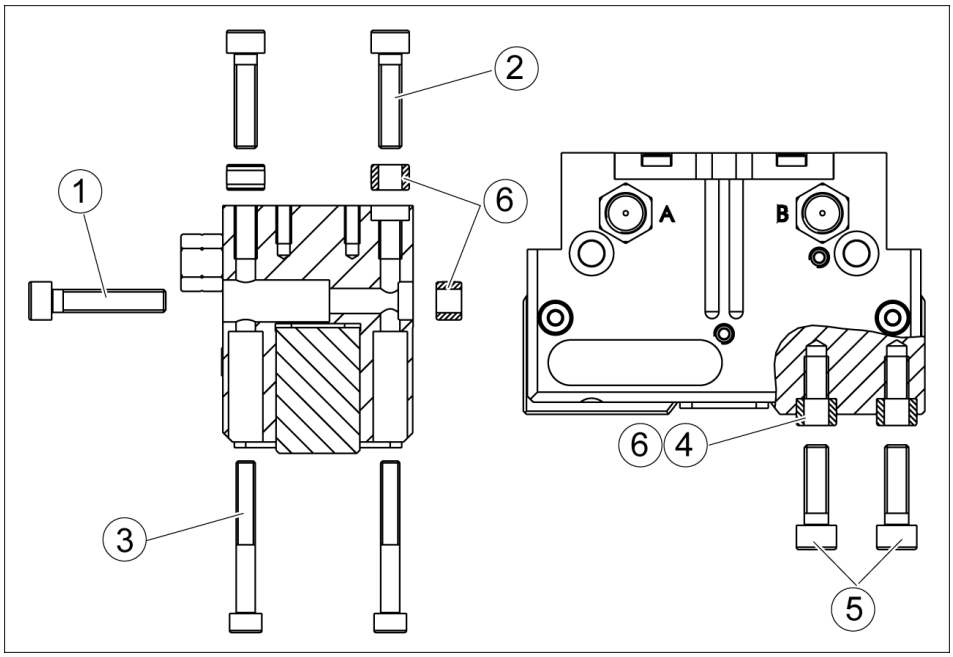
The values apply to the whole mounting surface to which the product is mounted.

| Edge length | Permissible unevenness |
|---|---|
| < 100 | < 0.02 |
| > 100 | < 0.05 |

*Tab.: Requirements for evenness of the mounting surface (Dimensions in mm)*

**Mounting**

The module can be mounted from the front, from the rear or on the side.




| | | | |
|---|---|---|---|
| 1 | Side mounting | 4 | Centering sleeve |
| 2 | Mounting from the rear | 5 | Top jaws |
| 3 | Mounting from the front | 6 | Centering sleeve |

**Tab.: Mounting material**

| Mounting | 50 | 64 | 80 | 100 | 125 | 160 | 200 | 240 |
|---|---|---|---|---|---|---|---|---|
| Thread diameter and max. depth of engagement [mm] for gripper attachment from the rear | M4 11 deep | M5 12 deep | M5 15 deep | M6 14 deep | M8 20 deep | M8 20 deep | M10 20 deep | M12 25 deep |
| Thread diameter and max. depth of engagement [mm] for finger fastening | M3 8 deep | M4 10 deep | M5 10 deep | M6 13 deep | M6 13 deep | M10 17 deep | M12 21 deep | M12 26 deep |
| Max. Tightening torque of screws for finger fastening [Nm] | 1,3 | 3 | 6 | 10 | 10 | 48 | 84 | 84 |

The centering sleeves required for gripper attachment from the front and for finger and gripper fixing are contained in the respective accessory pack.

### 5.1.2 Pneumatic connection

**CAUTION**

**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 information in the catalog data sheet.

**CAUTION**

When using the main air connections "A" and "B" with PWG-plus 50 – 200 the gripper must be throttled by external throttle glands.

- Do not remove pre-assembled fixed throttle fittings

**CAUTION**

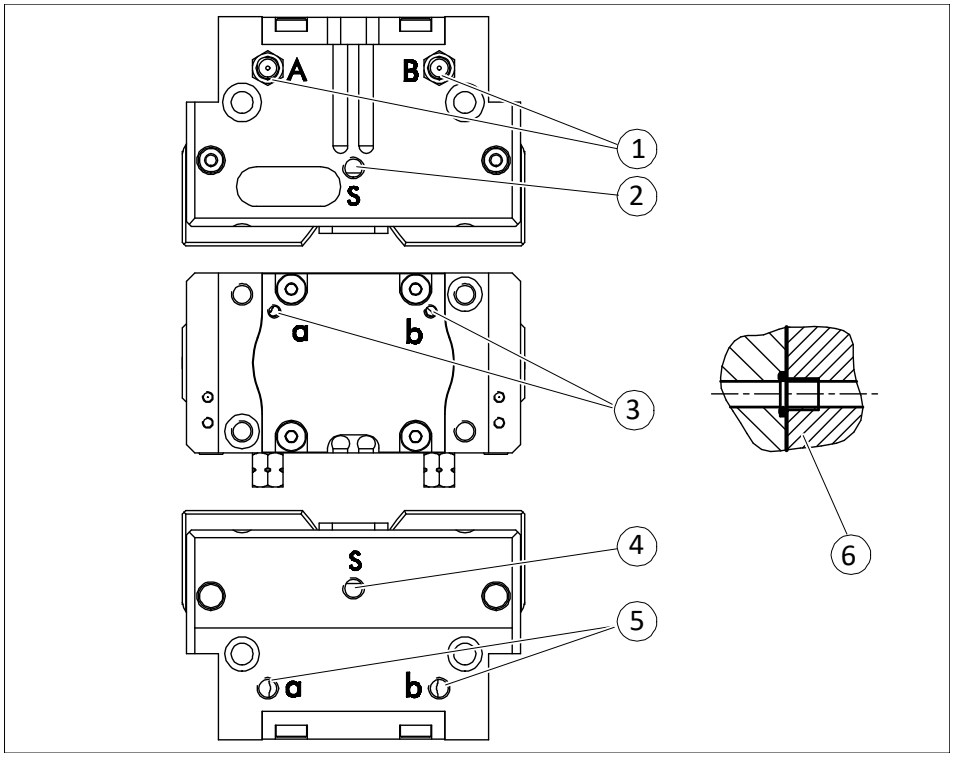
When using the main connection "a" and "b"a throttle for PWG-plus 50 – 200 is not required.

- Attach the supplied fixed throttle screw connection to the connections of the adapter plate.

**NOTE**

- Observe the requirements for the compressed air supply, ▶ 3 [🗋 18].
- In case of compressed air loss (cutting off the energy line), the components lose their dynamic effects and do not remain in a secure position. However, the use of a SDV-P pressure maintenance valve is recommended in this case in order to maintain the dynamic effect for some time. Product variants are also offered with mechanical gripping force via springs, which also ensure a minimum clamping force in the event of a pressure drop.

- 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.
- If the maximum permissible finger weight is exceeded, throttling must be carried out so that the jaw movement is impact and bounce-free. The service life can be reduced.




| | |
|---|---|
| 1 | Main connections (Hose connection)<br>(A = open, B = close) |
| 2 | Air purge connection |
| 3 | Hose-free direct connection at the base<br>(a = open, b = close) |
| 4 | Air purge connection |
| 5 | Hose-free direct connection at the side<br>(a = open, b = close) |
| 6 | Details: Tubeless direct connection |

## 5.2 Mounting the sensor

**NOTE**
Observe the assembly and operating manual of the sensor for mounting and connecting.

The product is prepared for the use of sensors.

- For the exact type designations of suitable sensors, please see catalog datasheet and ▶ 5.2.1 [🗋 23].
- For technical data for the suitable sensors, see assembly and operating manual and catalog datasheet.
  - The assembly and operating manual and catalog datasheet are included in the scope of delivery for the sensors and are available at schunk.com.
- Information on handling sensors is available at schunk.com or from SCHUNK contact persons.

### 5.2.1 Overview of sensors

| Designation | PWG-plus | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 50 | 64 | 80 | 100 | 125 | 160 | 200 | 240 |
| Inductive proximity switch IN 40 | X | X | X | X | X | X | X | X |
| Inductive proximity switch IN 80 | X | X | X | X | X | X | X | X |
| Magnetic switch MMS 22 | X | X | X | X | X | X | X | X |
| Programmable magnetic switch MMS 22-PI1 | X | X | X | X | X | X | X | X |
| Programmable magnetic switch MMS 22-PI2 | - | X | X | X | X | X | - | - |
| Programmable magnetic switch MMS-P 22 | X | X | X | X | X | X | - | - |
| Magnetic switch MMS 22-IOL | X | X | X | X | X | X | - | - |

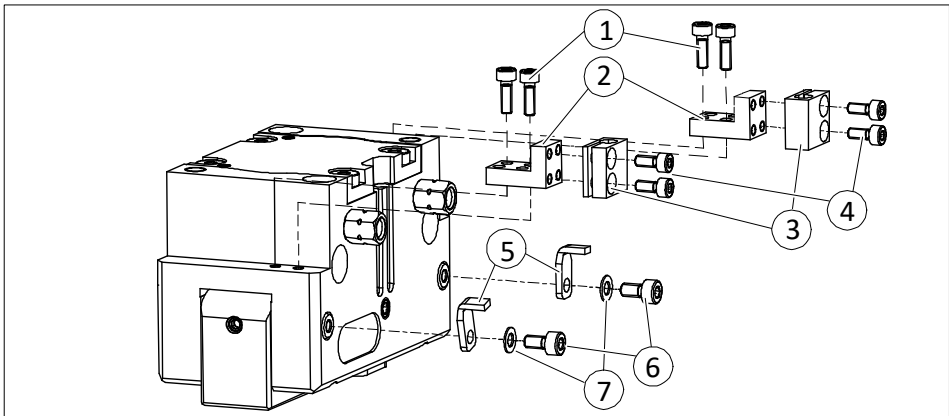
### 5.2.2 Switch-off hysteresis for magnetic switches

The smallest opening angle difference that can be reliably detected is ≤ 20% of the opening angle per jaw.

**Calculation example:** Product with an opening angle of 15° per jaw and a hysteresis value of 20%:
15° x 0.20 = 3°

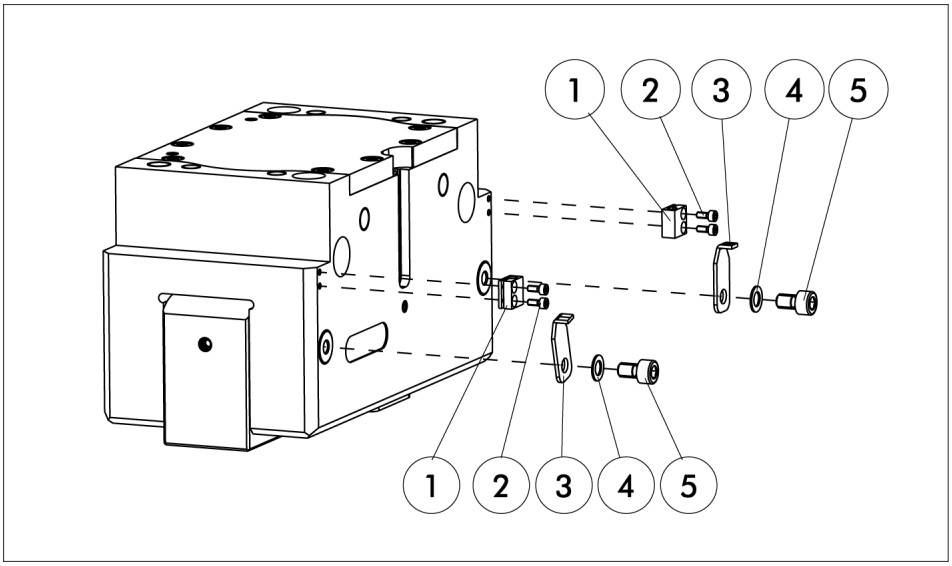
### 5.2.3 IN 40 / IN 80 inductive proximity switch

**Assembly of IN 40 for PWG-plus 50-160 attachment kit**



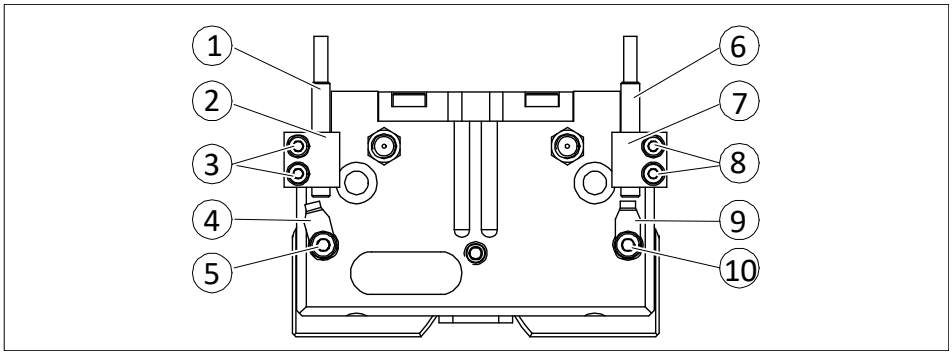

1. Fasten angle (2) to housing using screws (1).
2. Fasten bracket (3) to the angle (2) using screws (4).
3. Fasten the control cams (5) to the rotary bolt using screws (6), place lock washers (7) between control cams and screw head.

**Assembly of IN 40 for PWG-plus 200-240 attachment kit**




1. Fasten bracket (1) to housing using screws (2).
2. Fasten the control cams (3) to the rotary bolt using screws (5), place lock washers (4) between control cams and screw head.

**Assembly of IN 40 proximity switch**



**Gripper open:**

1. Set the gripper to the "Open" position.
2. Undo the screws (5).
3. Turn the control cam (4) so that the lug is parallel to the bracket (2).
4. Fasten the control cam by tightening the screw (5).
5. Carefully push the proximity switch (1) into the bracket (2) until it touches the control cam (4).
6. Pull the proximity switch approx 0.5 mm back.
7. Fasten the proximity switch by tightening the screws (3).
8. Move the gripper to the "Open" position and test functioning.

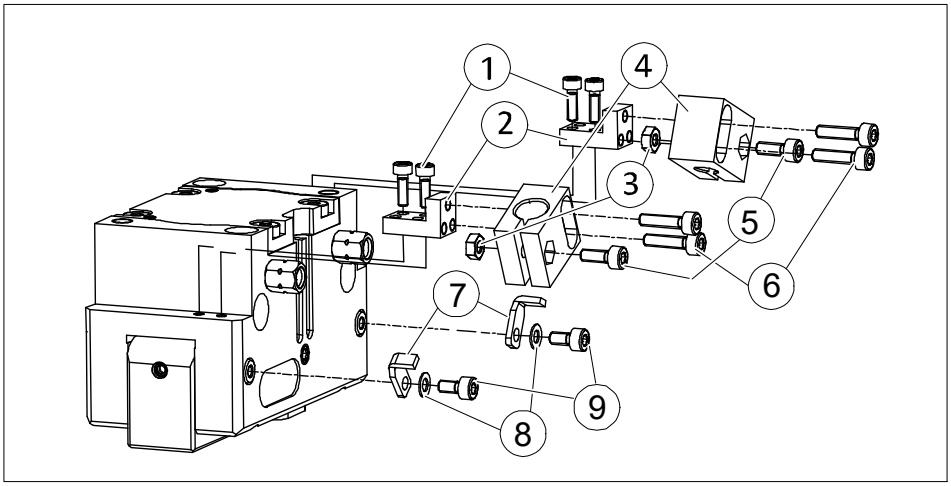
**Gripper closed:**

1. Set the gripper to the "Closed" position.
2. Undo the screws (10).
3. Turn the control cam (9) so that the lug is parallel to the bracket (7).
4. Fasten the control cam by tightening the screw (10).
5. Carefully push the proximity switch (6) into the bracket (7) until it touches the control cam (9).
6. Pull the proximity switch approx 0.5 mm back.
7. Fasten the proximity switch by tightening the screws (8).
8. Move the gripper to the "Closed" position and test functioning.

**Part gripped (O.D. gripping):**

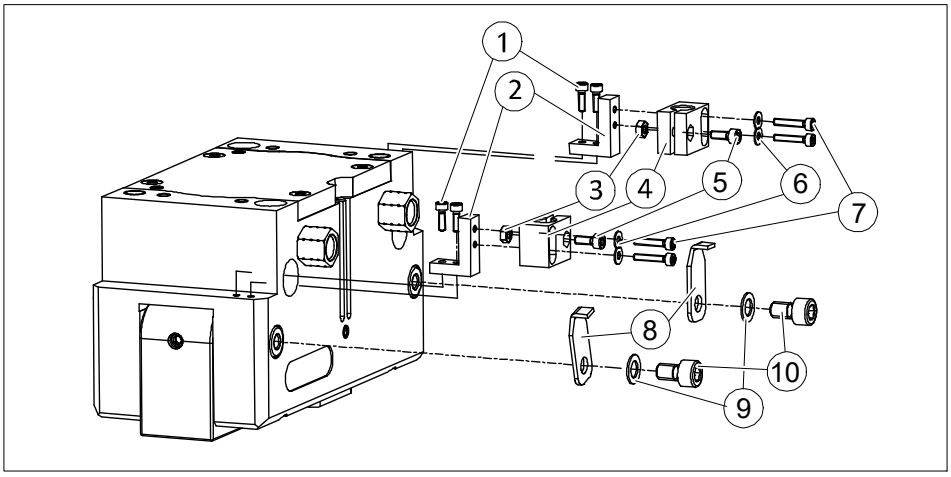
1. Clamp the part to be gripped.
2. Undo the screws (10).
3. Turn the control cam (9) so that the lug is parallel to the bracket (7).
4. Fasten the control cam by tightening the screw (10).
5. Carefully push the proximity switch (6) into the bracket (7) until it touches the control cam (9).
6. Pull the proximity switch approx 0.5 mm back.
7. Fasten the proximity switch by tightening the screws (8).
8. Open the gripper and close it again in order to test its functioning.

### Assembly of IN 80 PWG-plus 50-100 attachment kit



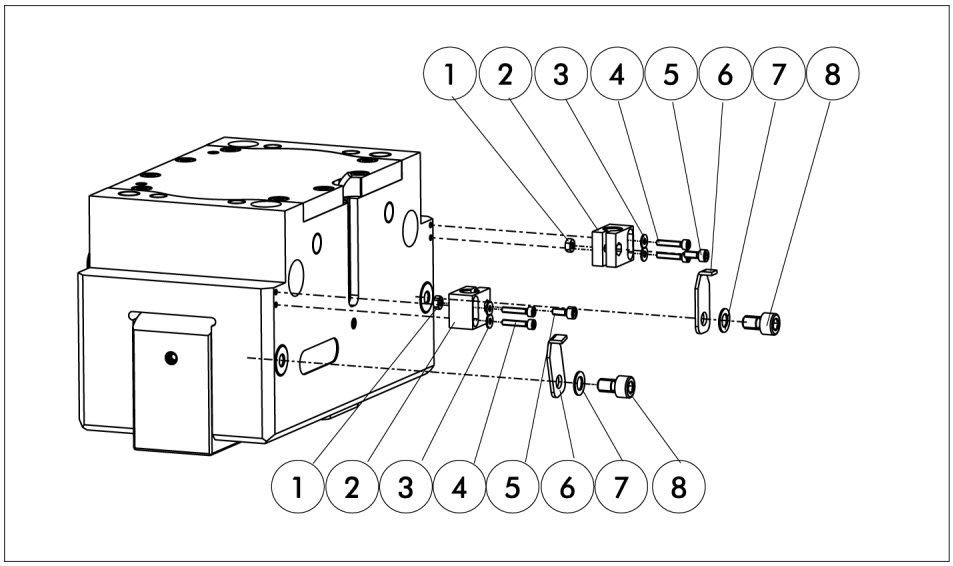

1. Fasten screw (5) and nut (3) to bracket (4).
2. Fasten angle (2) to housing using screws (1).
3. Fasten bracket (4) to the angle (2) using screws (6).
4. Push the brackets down as far as possible (away from the rotary bolt).
5. Fasten the control cams (7) to the rotary bolt using screws (9), place lock washers (8) between control cams and screw head.

### Assembly of IN 80 PWG-plus 125-160 attachment kit



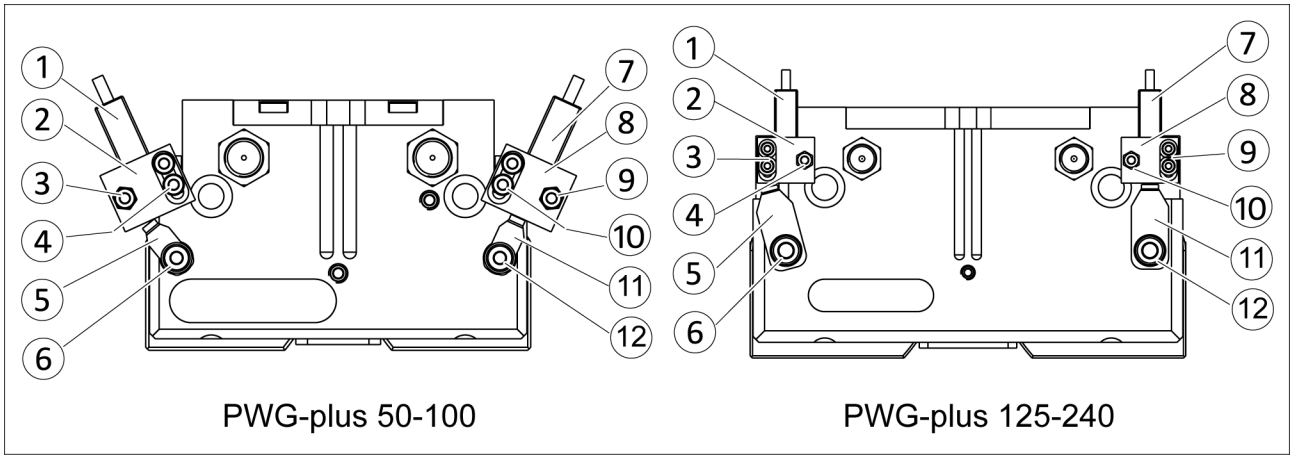

1. Fasten screw (5) and nut (3) to bracket (4).
2. Fasten angle (2) to housing using screws (1).
3. Fasten bracket (4) to the angle (2) using screws (7) and washers (6).
4. Fasten the control cams (8) to the rotary bolt using the screws (10), place lock washers (9) between control cams and screw head.

### Assembly of IN 80 for PWG-plus 200-240 attachment kit




1. Fasten screw (5) and nut (1) to bracket (2).
2. Fasten bracket (2) to housing using screws (4) and disks (3).
3. Fasten the control cams (6) to the rotary bolt using screws (8), place lock washers (7) between control cams and screw head.

### Assembly of IN 80 proximity switch




The switching points of the "open" and "closed" positions must be set by the customer himself.

**Gripper open:**

1. Set the gripper to the "0pen" position.
2. Undo the screws (6).
3. Turn the control cam (5) so that the lug is parallel to the bracket (2).
4. Fasten the control cam by tightening the screw (6).
5. Push the proximity switch (1) to the stop of the bracket (2).
6. Fasten the proximity switch by tightening the screw (3) in the bracket.

7. Undo screws (4) and carefully push bracket (2) to the control cam until it touches the control cam (5).
8. Pull the bracket approx 0.5 mm back.
9. Fasten the bracket by tightening the screws (4).
10. Move the gripper to the "Open" position and test functioning.

**Gripper closed:**

1. Set the gripper to the "Closed" position.
2. Undo the screws (12).
3. Turn the control cam (11) so that the lug is parallel to the bracket (8).
4. Fasten the control cam by tightening the screw (12).
5. Push the proximity switch (7) to the stop of the bracket (8).
6. Fasten the proximity switch by tightening the screw (9) in the bracket.
7. Undo screws (10) and carefully push bracket (8) to the control cam until it touches the control cam (11).
8. Pull the bracket approx 0.5 mm back.
9. Fasten the bracket by tightening the screws (10).
10. Move the gripper to the "Closed" position and test functioning.

**Part gripped (O.D. gripping):**

1. Clamp the part to be gripped.
2. Undo the screws (6).
3. Turn the control cam (5) so that the lug is parallel to the bracket (2).
4. Fasten the control cam by tightening the screw (6).
5. Push the proximity switch (1) to the stop of the bracket (2).
6. Fasten the proximity switch by tightening the screw (3) in the bracket.
7. Undo screws (4) and carefully push bracket (2) to the control cam until it touches the control cam (5).
8. Pull the bracket approx 0.5 mm back.
9. Fasten the bracket by tightening the screws (4).
10. Open the gripper and close it again in order to test the function.

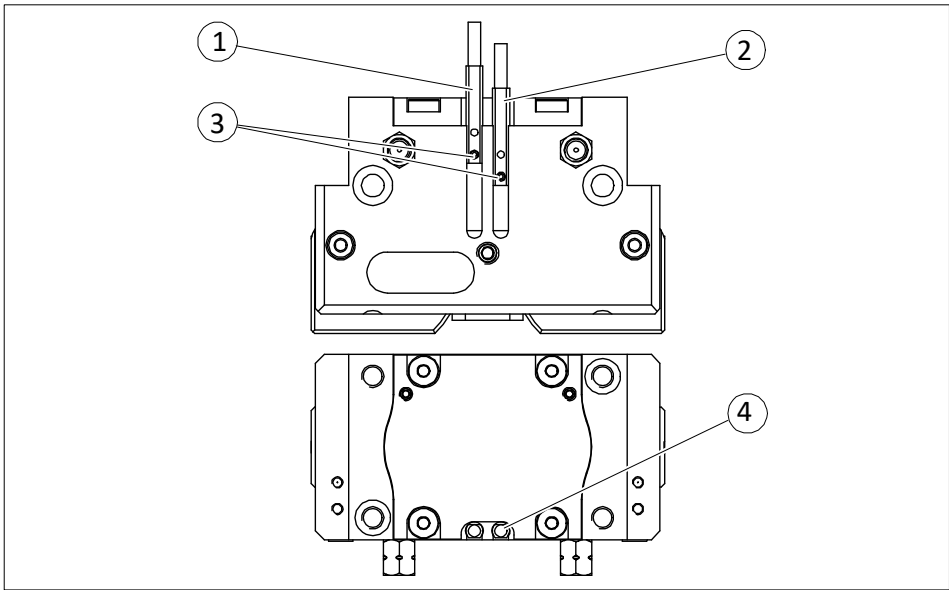
### 5.2.4 Mounting the magnetic switch MMS 22

**CAUTION**

**Risk of damage to the sensor during assembly!**

- Observe the maximal tightening torque.

**Positioning the magnetic switch**



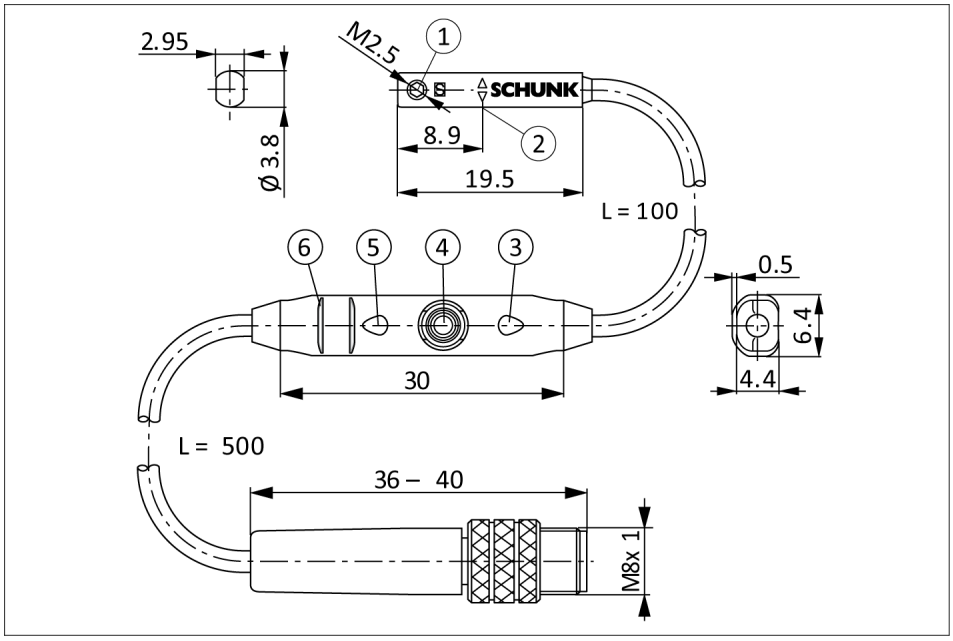

**Position "Gripper open":**

1. Put the product in the desired position.
2. Push the sensor 1 (1) into the groove (4) until it stops at the housing.
3. Pull the sensor 1 (1) back again slowly until it switches.
4. Secure the sensor 1 (1) in this position using the set screw (3).
   ⇨ Max. tightening torque: 10 Ncm
5. Put product into the "gripper open" position and test the function.

**Position "Gripper closed" or "Part gripped (O.D. gripping)":**

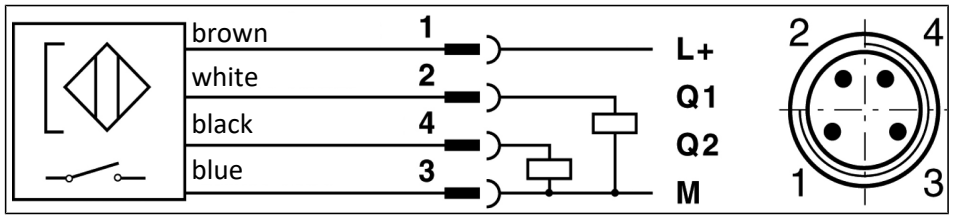
1. Put the product in the desired position.
2. Push the sensor 2 (2) into the groove (4) towards the middle of the gripper until it switches.
3. Secure the sensor 2 (2) in this position using the set screw (3).
   ⇨ Max. tightening torque: 10 Ncm
4. Put product into the "gripper closed" or "part gripped (O.D. gripping)" position and test the function.

### 5.2.5 Programmable magnetic switch (MMS-P)




*MMS-P 22 magnetic switch*

| | | | |
|---|---|---|---|
| 1 | Fastening screw | 4 | Teach button |
| 2 | Center of sensor element | 5 | LED indicator |
| 3 | LED indicator | 6 | Rib for cable tie |




*Connection diagram for PNP-4 conductor (MMS-P 22)*

Types that can be ordered ☞ catalog:

- MMS-P 22-S-M8-PNP
- MMSK-P 22-S-PNP
- V2-M8-4-2XM8-3

The MMSK-P 22-S-PNP features a cable with open wire strands so that it can be connected with terminal contacts.
The V2-M8-4-2xM8-3 distributor serves to convert the 4-pin connector of the MMS-P 22-S-M8-PNP sensor to two standard M8 connectors with 3 pins each.

**Installation of the sensor**

**CAUTION**

**Risk of damage to the sensor during assembly.**

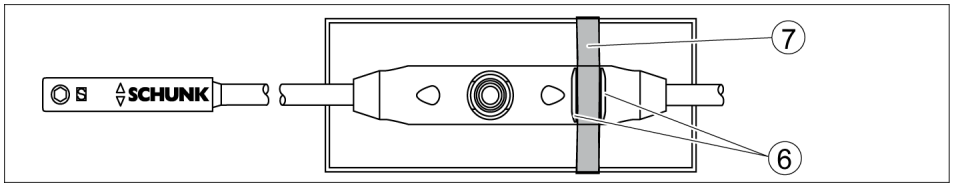
- Observe a maximum tightening torque of 10 Ncm for the set-screws.

## NOTE

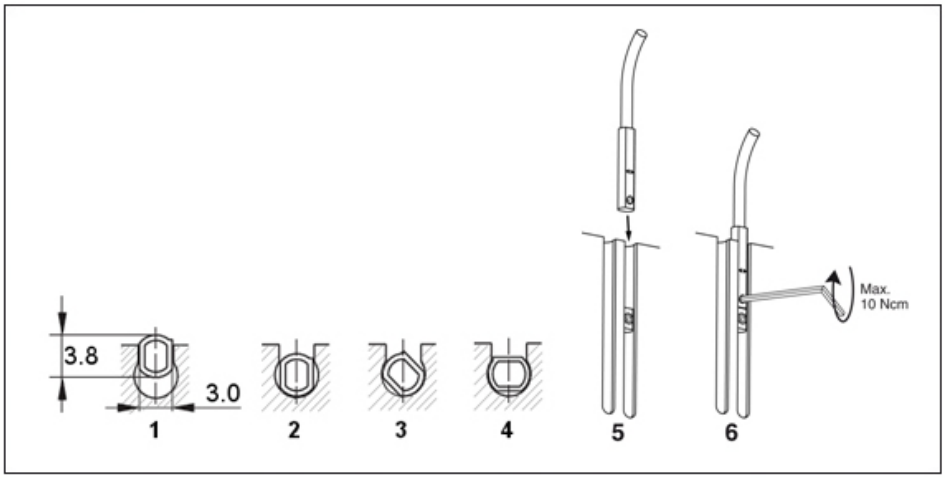
**Ferromagnetic components change the sensor's switching positions. Example: adapter plate made of construction steel.**

For ferromagnetic adapter plates:

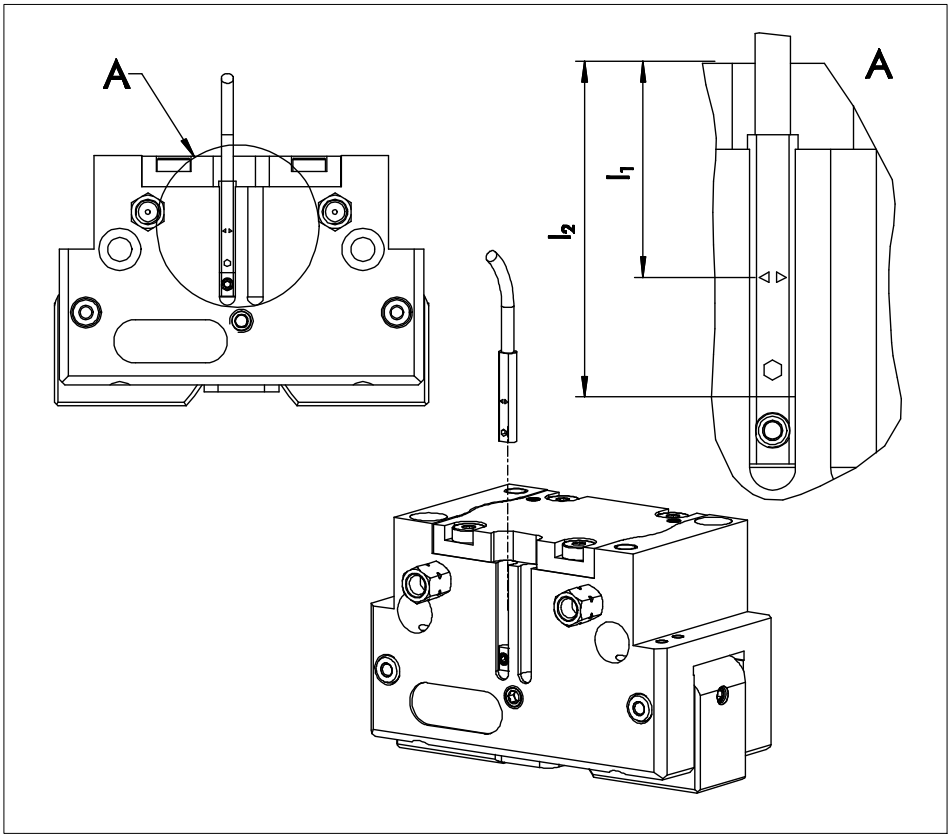
- First mount product to adapter plate
- Then adjust position of the sensors




1. To relieve the cable, the electronics have to be fixed in place using cable ties (7).
   There are ribs (6) in place on the electronics for mounting purposes.




2. Turn in the sensor (1 – 4).
   OR
   Push the sensor axially into the slot until it contacts the stop (5).
3. Fix the sensor with an Allen wrench (6).

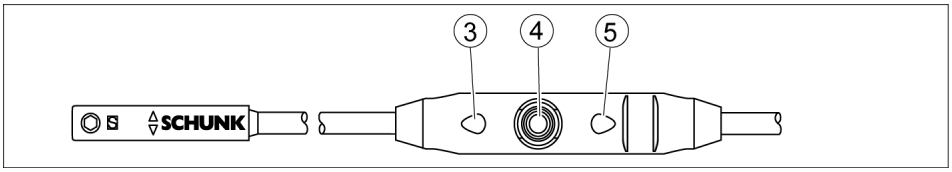



If there is no terminal stop, then slide the magnetic switch according to
dimension l2 (bottom edge of gripper up to front side of sensor)
or
according to dimension l1 (bottom edge of gripper up to double arrow on sensor)
and then clamp with the mounting screw.

**Tab.: Dimensionin mm**

| PWG-plus | Dimension $l_1$ | Dimension $l_2$ | PWG-plus | Dimension $l_1$ | Dimension $l_2$ |
|---|---|---|---|---|---|
| 50 | 13.2 | 22.1 | 100 | 21.8 | 30.7 |
| 50 AS | 16.7 | 25.6 | 100 AS | 14.2 | 23.1 |
| 50-KVZ | 26.0 | 34.9 | 100-KVZ | 42.3 | 51.2 |
| 50 AS-KVZ | 40.1 | 49.0 | 100-AS-KVZ | 67.4 | 76.3 |
| 64 | 12.9 | 21.8 | 125 | 22.5 | 31.4 |
| 64 AS | 13.1 | 22.0 | 125 AS | 53.3 | 62.2 |
| 64-KVZ | 29.7 | 38.6 | 125-KVZ | 50.8 | 59.7 |
| 64 AS-KVZ | 49.1 | 58.0 | 125 AS-KVZ | 80.4 | 89.3 |
| 80 | 16.6 | 25.5 | 160 | 15.2 | 24.1 |
| 80 AS | 13.9 | 22.8 | 160 AS | 64.7 | 73.6 |
| 80-KVZ | 36.3 | 45.2 | 160-KVZ | 64.3 | 73.2 |
| 80 AS-KVZ | 49.9 | 58.8 | 160 AS-KVZ | 104.6 | 113.5 |

## Setting up the switching points

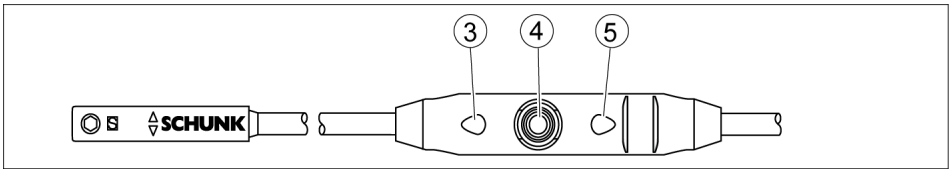



1. Press the Teach button (4) for 2 seconds.
   ⇨ After 2 seconds LED 1 (3) is flashing.
2. Move the gripper into position 1 (e.g. "open").
3. Press the Teach-Button (4) briefly.
   ⇨ LED 1 (3) lights up and LED 2 (5) is flashing.
4. Move the gripper into position 2 (e.g. „-2mm“).
   ⇨ LED 1 (3) should turn out as soon as the switching point 1 is left.
5. Press the Teach-Button (4) briefly.
   ⇨ LED 2 (5) lights up.

⇨ The switching points are set.

## Adjusting the hysteresis

The hysteresis to both switching points will be adjusted automatically corresponding to the characteristics of the magnetic field.
The user can set the switching and trigging points of each position a little bit closer than for the automatic mode. The trigging point is closer to the switching point. At the same time the susceptibility to trouble and damage increases. In the mode of the lowest hysteresis, an error signal (such as jitter or untimely switch off) can be avoided, if the sensor is protected against all types of disturbances (i.e. by shielding). Frequent types of disturbances are change in temperature and electro-magnetic influences.
Within the closest fine-teach mode, SCHUNK cannot guarantee EMC-compatibility any more.
The hysteresis adjustment is used for the manual adjustment of the switching points (if necessary).
In case that the hysteresis automatically determined by the sensor should be too high or too low after “the adjustment of the switching points”, you may correct the value as follows.
The sensor avoids a too small hysteresis during hysteresis adjustment.




1. Press the Teach-button (4) for 5 seconds.
   ⇨ LED 1 (3) will flash up after 2 seconds.

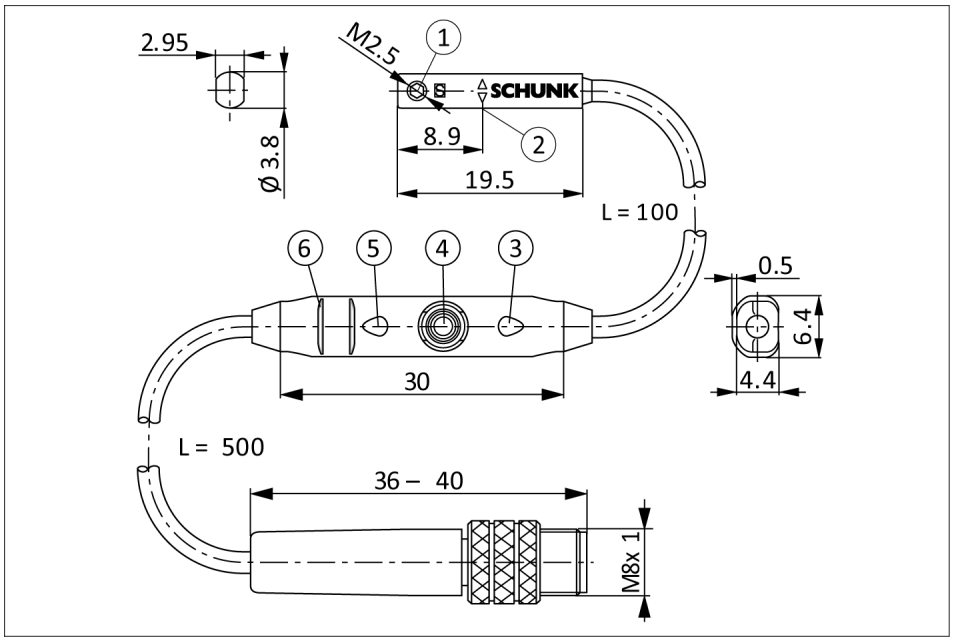
⇨ LED 1 will stop after 5 seconds.

2. Release the Teach-button.
3. Move the gripper to the "switch-off point for switching point 1" position.
4. Press the Teach-Button (4) briefly.LED 1 (3) will light up twice.
5. Move the gripper to the "switch-off point for switching point 2" position.
6. Press the Teach-Button (4) briefly.

⇨ LED 2 (5) will light up twice.

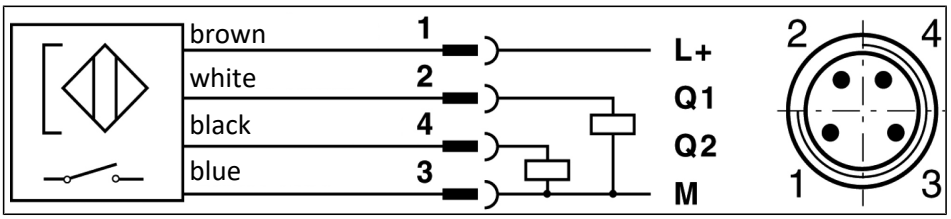
⇨ The mounting of the sensor MMS-P is completed.

### 5.2.6 Programmable magnetic switch (MMS 22-IOL)




*MMS-P 22 magnetic switch*

| | | | |
|---|---|---|---|
| 1 | Fastening screw | 4 | Teach button |
| 2 | Center of sensor element | 5 | LED indicator |
| 3 | LED indicator | 6 | Rib for cable tie |




*Connection diagram for PNP-4 conductor (MMS-P 22)*

Types that can be ordered ☞ catalog:

- MMS-P 22-S-M8-PNP
- MMSK-P 22-S-PNP
- V2-M8-4-2XM8-3

The MMSK-P 22-S-PNP features a cable with open wire strands so that it can be connected with terminal contacts.
The V2-M8-4-2xM8-3 distributor serves to convert the 4-pin connector of the MMS-P 22-S-M8-PNP sensor to two standard M8 connectors with 3 pins each.

## Installation of the sensor

**CAUTION**

**Risk of damage to the sensor during assembly.**

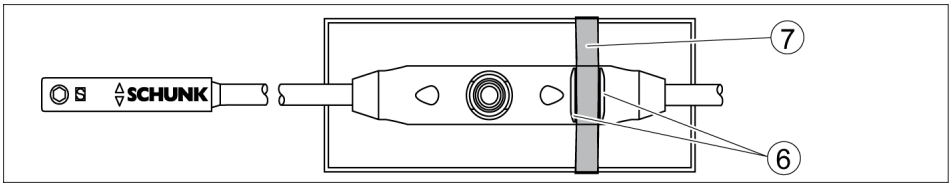
- Observe a maximum tightening torque of 10 Ncm for the set-screws.

**NOTE**

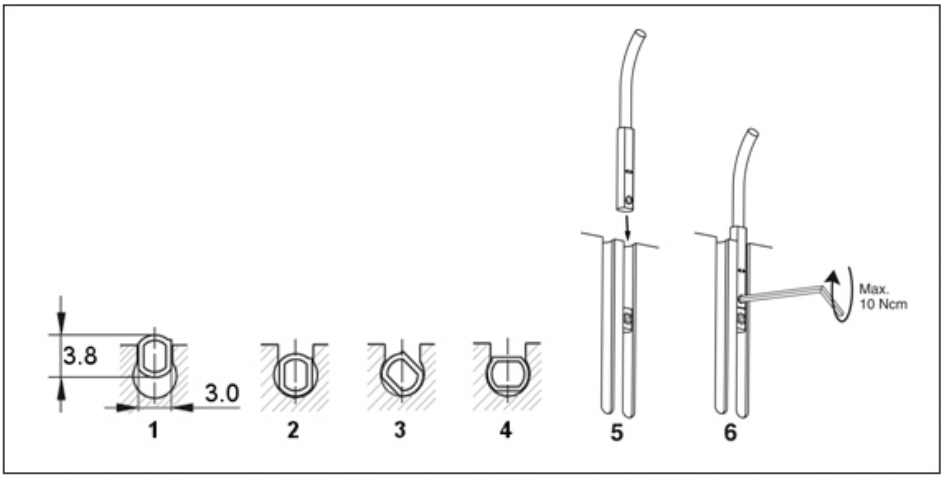
**Ferromagnetic components change the sensor's switching positions. Example: adapter plate made of construction steel.**

For ferromagnetic adapter plates:

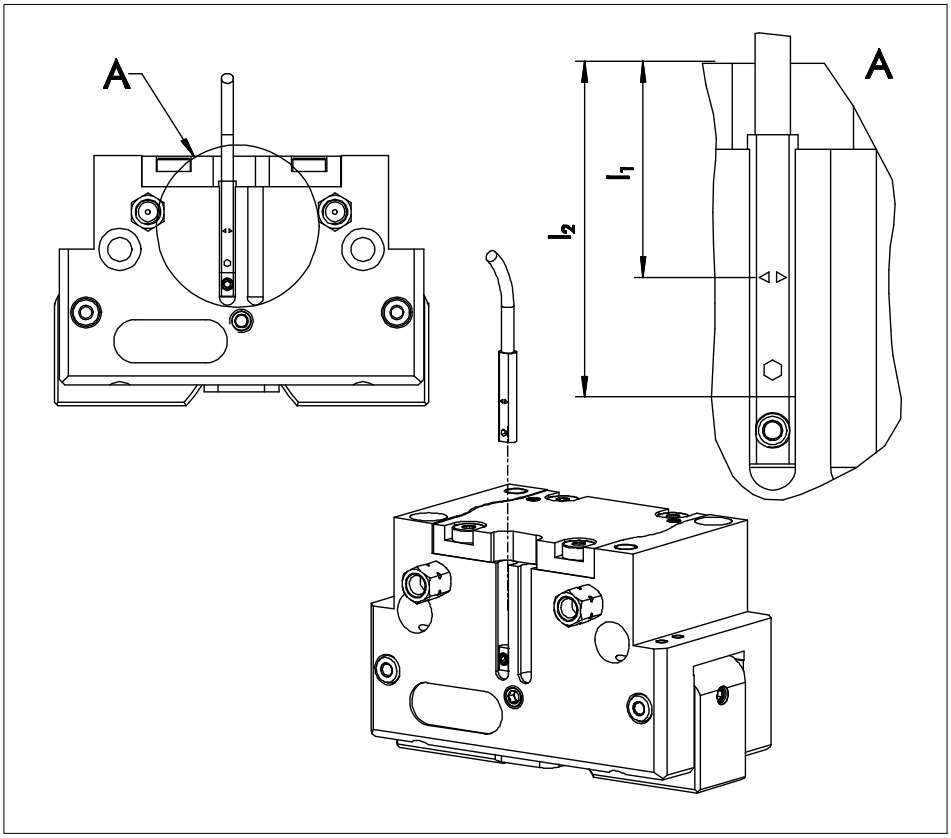
- First mount product to adapter plate
- Then adjust position of the sensors




1. To relieve the cable, the electronics have to be fixed in place using cable ties (7).
   There are ribs (6) in place on the electronics for mounting purposes.



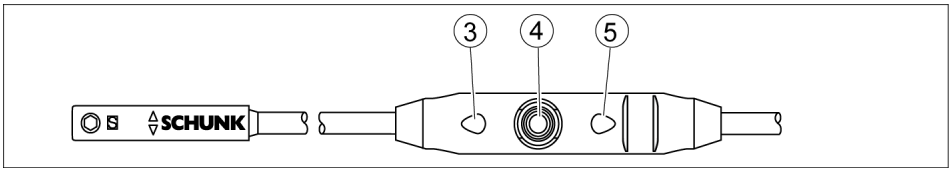

2. Turn in the sensor (1 – 4).
   OR
   Push the sensor axially into the slot until it contacts the stop (5).
3. Fix the sensor with an Allen wrench (6).




If there is no terminal stop, then slide the magnetic switch according to
dimension l2 (bottom edge of gripper up to front side of sensor)
or
according to dimension l1 (bottom edge of gripper up to double arrow on sensor)
and then clamp with the mounting screw.

| PWG-plus | Dimension $l_1$ | PWG-plus | Dimension $l_1$ |
|---|---|---|---|
| 50 | At stop | 100 | 27.9 |
| 50 AS | 22.9 | 100 AS | 21.2 |
| 50-KVZ | At stop | 100-KVZ | 54.4 |
| 50 AS-KVZ | At stop | 100-AS-KVZ | 80.4 |
| 64 | 21.9 | 125 | 21.9 |
| 64 AS | 18.7 | 125 AS | 58.5 |
| 64-KVZ | 40.9 | 125-KVZ | 54.4 |
| 64 AS-KVZ | 58.9 | 125 AS-KVZ | 84.4 |
| 80 | 26.1 | 160 | 34.9 |
| 80 AS | 21.6 | 160 AS | 75.4 |
| 80-KVZ | 48.6 | 160-KVZ | 71.3 |
| 80 AS-KVZ | 66.6 | 160 AS-KVZ | 111.3 |

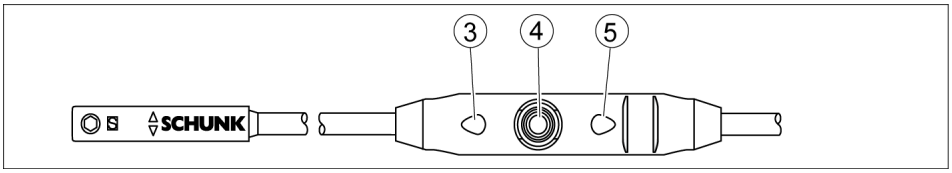
## Setting up the switching points




1. Press the Teach button (4) for 2 seconds.
   ⇨ After 2 seconds LED 1 (3) is flashing.
2. Move the gripper into position 1 (e.g. "open").
3. Press the Teach-Button (4) briefly.
   ⇨ LED 1 (3) lights up and LED 2 (5) is flashing.
4. Move the gripper into position 2 (e.g. „-2mm“).
   ⇨ LED 1 (3) should turn out as soon as the switching point 1 is left.
5. Press the Teach-Button (4) briefly.
   ⇨ LED 2 (5) lights up.

⇨ The switching points are set.

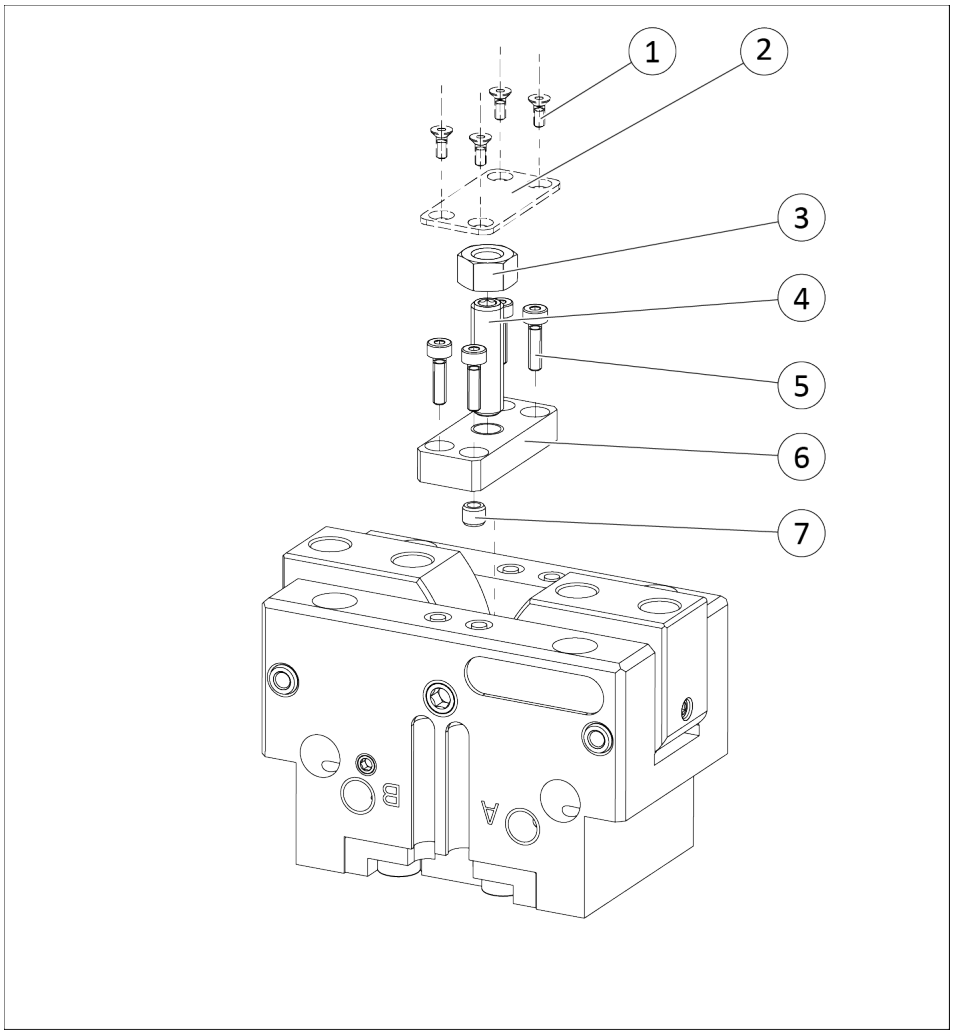
The lowest securely detectable difference in stroke is ≤10 % of the nominal stroke.




1. Press the Teach-button (4) for 5 seconds.
   ⇨ LED 1 (3) will flash up after 2 seconds.
   ⇨ LED 1 will stop after 5 seconds.
2. Release the Teach-button.
3. Move the gripper to the "switch-off point for switching point 1" position.
4. Press the Teach-Button (4) briefly.LED 1 (3) will light up twice.
5. Move the gripper to the "switch-off point for switching point 2" position.
6. Press the Teach-Button (4) briefly.
   ⇨ LED 2 (5) will light up twice.

⇨ The mounting of the sensor MMS-P is completed.

## 5.3 Opening angle limitation attachment kit




| | | | |
|---|---|---|---|
| 1 | Mounting screw | 5 | Mounting screw |
| 2 | Cover plate | 6 | Stroke adjustment |
| 3 | Nut | 7 | Centering sleeve |
| 4 | Cylindrical pin | | |

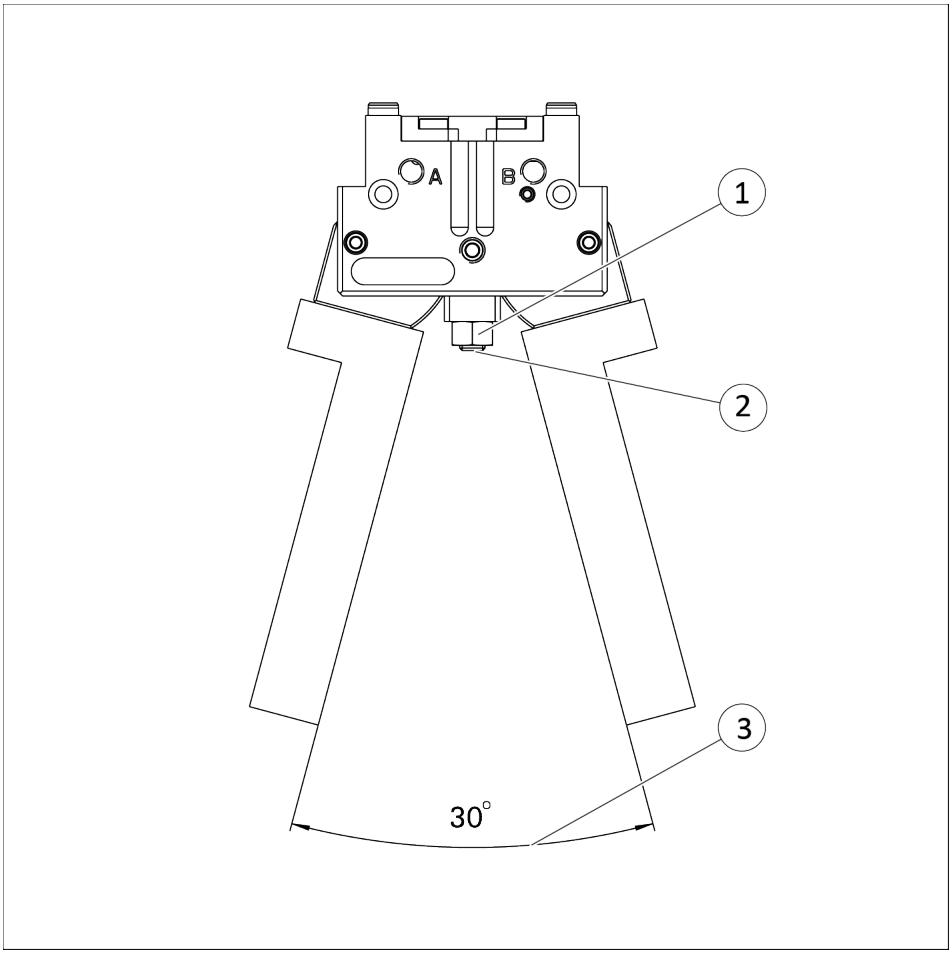
1. Remove the mounting screws (1) and cover plate (2).
2. Attach the stroke adjustment (6) using centering sleeves (7) and screw tight with mounting screws (5).
3. Screw in the cylindrical pin (4).
4. Turn the nut (3) onto the cylindrical pin.

## 5.4 Adjusting the opening angle limitation

Adjust the desired opening angle using the adjusting screw (2). Adjustment range 0° – 30°. After adjusting the setting, secure the adjusting screw with the counter nut (1).

**CAUTION**

**There is a risk of functional impairment if the adjustment range is not observed.**




| | |
|---|---|
| 1 | Counter nut |
| 2 | Adjusting screw |
| 3 | Adjustment range |

# 6 Troubleshooting

## 6.1 Product is not moving

| Possible cause | Corrective action |
|---|---|
| Base jaws jam in housing, e.g. mounting surface is not sufficiently even. | Check the evenness of the mounting surface. ▸ 5.1.1 [🗋 20] |
| | Loosen the mounting screws of the product and actuate the product again. |
| Pressure drops below minimum. | Check air supply. ▸ 5.1.2 [🗋 21] |
| Compressed air lines switched. | Check compressed air lines. ▸ 5.1.2 [🗋 21] |
| Proximity switch defective or set incorrect. | Readjust or change sensor. |
| Unused air connections open. | Close unused air connections. |
| Flow control valve closed. | Open the flow control valve. |
| Component part defective. | Replace component or send it to SCHUNK for repair. |

## 6.2 Product is not executing the complete stroke

| Possible cause | Corrective action |
|---|---|
| Dirt deposits between cover and piston. | Clean and if necessary re-lubricate. |
| Dirt deposits between basic jaws and guidance. | Disassemble and clean the product. |
| Pressure drops below minimum. | Check air supply. ▸ 5.1.2 [🗋 21] |
| Mounting surface is not sufficiently flat. | Check the evenness of the mounting surface. ▸ 5.1.1 [🗋 20] |
| Component part defective. | Replace component or send it to SCHUNK for repair. |

## 6.3 Product opens or closes jerkily

| Possible cause | Corrective action |
|---|---|
| Too little grease in the mechanical guiding areas. | Clean and lubricate product. ▸ 7 [🗋 42] |
| Compressed air lines blocked. | Check compressed air lines of damage. |
| Mounting surface is not sufficiently flat. | Check the evenness of the mounting surface. |

## 6.4 Gripping force is dropping

| Possible cause | Corrective action |
|---|---|
| Compressed air can escape. | Check seals, if necessary, disassemble the product and replace seals. |

| Possible cause | Corrective action |
|---|---|
| Too much grease in the mechanical movement space. | Clean and lubricate product. |
| Pressure drops below minimum. | Check air supply. ▶ 3 [🗋 18] |
| Component part defective. | Replace component or send it to SCHUNK for repair. |

## 6.5 Gripper opens with heavy impacts in the end position

| Possible cause | Corrective action |
|---|---|
| Mass moment of inertia of the top jaw too great. | Use lighter gripper fingers. |
| | Reduce gripper to opening and closing times Air connection according to the catalog., ▶ 5.1.2 [🗋 21] |
| Flow control couplings not attached. | Attach flow control couplings. |

## 6.6 Product does not achieve the opening and closing times

| Possible cause | Corrective action |
|---|---|
| Compressed air lines are not installed optimally. | If present: Open the flow control couplings on the product to the maximum that the movement of the jaws occurs without bouncing and hitting. |
| | Check compressed air lines. |
| | Inner diameters of compressed air lines are of sufficient size in relation to compressed air consumption. |
| | Flow rate of valve is sufficiently large relative to the compressed air consumption. |
| | If you still cannot achieve the open and close times in the latest catalog, we recommend the use of quick-air-vent-valves directly at the product. |
| Compressed air can escape. | Check seals, if necessary, disassemble the product and replace seals. |
| Component part defective. | Replace component or send it to SCHUNK for repair. |
| Too much grease in the mechanical movement space. | Clean and lubricate product. ▶ 7 [🗋 42] |
| Loading too large. | Check permissible weight and length of the gripper fingers. |

# 7 Maintenance

## 7.1 Notes

**⚠ WARNING**

**Risk of burns through contact with hot surfaces!**

Surfaces of components can heat up severely during operation. Skin contact with hot surfaces causes severe burns to the skin.

- For all work in the vicinity of hot surfaces, wear safety gloves.
- Before carrying out any work, make sure that all surfaces have cooled down to the ambient temperature.

**Original spare parts**

Use only original spare parts of SCHUNK when replacing spare and wear parts.

**Maintenance of module with gripping force maintenance "A.D. gripping" (A.D.)**

The pistons have to be aligned using an assembly device. Therefore we recommend to have the module serviced and the seals replaced by SCHUNK.

If this is not possible, you can carry out the maintenance and replace the seals yourself.

## 7.2 Maintenance and lubrication intervals

***CAUTION***

**Material damage due to hardening lubricants!**

Lubricants harden more quickly at temperatures above 60°C, leading to possible product damage.

- Reduce the lubricant intervals accordingly.

| Designation | PWG-plus | |
|---|---|---|
| | 50 - 100 | 125 - 240 |
| Interval [Mio. cycles] | 6 | 4 |

*Tab.: Maintenance- and lubrication interval*

## 7.3 Lubricants/Lubrication points

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

SCHUNK recommends the lubricants listed.

| Greasing area | Lubricant |
|---|---|
| Metallic sliding surfaces | SCHUNK grease 3 |
| Seals and sealing surfaces | SCHUNK grease 1 |
| Bore hole at the piston | SCHUNK grease 1 |

Details regarding SCHUNK lubricant designations are available at **schunk.com/lubricants**.

The product contains food-compliant lubricants as standard. **The requirements of standard EN 1672-2:2020 are not fully met.**

**NOTE**

- Change contaminated food-compliant lubricant.
- Observe information in the safety data sheet from the lubricant manufacturer.

## 7.4 Disassemble the product

### 7.4.1 Variant without maintenance of gripping force

Position of the item numbers: ▸ 7.7.1 [🗋 53]

1. Remove compressed air lines.
2. Remove the cover (6).
3. Unscrew and remove the screws (41) and remove the cover (8).
4. Unscrew screw (40) and remove cylinder piston (60) from the housing (1).
5. Loosen set-screws (21) in the base jaws (2).
6. Remove the bolt (5).
7. Pull the base jaws (2) out of the housing (1).
8. Push the piston assembly (3, 4 and 39) upwards out of the housing (1).

### 7.4.2 Variant with maintenance of gripping force (O.D. gripping)

Position of the item numbers: ▸ 7.7 [🗋 52]

**⚠ WARNING**

**Risk of injury due to spring forces!**

The cover may be ejected due to the high spring forces.

- Dismantle the product carefully.

1. Remove compressed air lines
2. Remove cover (6).
3. **WARNING Risk of injury due to spring forces! The cylinder piston and the cover are under spring tension. Carefully disassemble the product.** Clamp the product between the base jaws (2) and the cover (10) in the vice so that the four screws (46) can still be removed.
4. Unscrew screws (46).
5. Open the vice carefully and remove the lid (10).
6. Instead of the cover (10)▸ 7.6 [🗋 50]place the device (101) (size 50-100) or the device (103) (size 125-240) on the PWG-plus housing (1) using the centering sleeves (19) and screw both parts together with the screws (102) or (104). Sizes 125-240 require a two-piece fixture. Position fixture part 2 (105) in part 1 (103) and screw it together with the screws (106).
7. Unscrew screw (45).

8. For sizes 125–240, unscrew the screws (106) evenly and remove part 2 from the device (105).
9. Unscrew screws (104) (sizes 125–240) or screws (102) (sizes 50–100) evenly and carefully remove the device (103) or (101).
10. Remove the cylinder piston (60) from the case (1).
11. Loosen grub screws (21) in base jaws (2).
12. Remove bolt (5).
13. Pull out base jaws (2) from case (1).
14. Push the piston assembly (3, 4 and 39) out of the case(1) in an upwards motion.

### 7.4.3 Variant of "Force amplification cylinder" (KVZ) without maintenance of gripping force

Position of the item numbers: ▶ 7.7.2 [🗋 54]

1. Remove compressed air lines.
2. Remove the cover (6).
3. Unscrew the screws (41) and remove the cover (8).
4. Unscrew the screw (40) and remove the cylinder piston (60) and the spacer piston (66) from the intermediate housing (65).
5. Unscrew the screws (46) and remove the intermediate housing (65).
6. Remove the second cylinder piston (7) from the housing (1).
7. Loosen set-screws (21) in the base jaws (2).
8. Remove the bolt (5).
9. Pull the base jaws (2) out of the housing (1).
10. Push the piston assembly (3, 4 and 39) upwards out of the housing (1).

### 7.4.4 Variant of "Force amplification cylinder" with maintenance of gripping force "O.D. gripping" (AS-KVZ)

Position of the item numbers: ▶ 7.7.1 [🗋 53] and ▶ 7.7.2 [🗋 54]

**⚠ WARNING**

**Risk of injury due to spring forces!**

The cover may be ejected due to the high spring forces.

- Dismantle the product carefully.

1. Remove compressed air lines.
2. Remove cover (6).

3. **WARNING Risk of injury due to spring forces! The cylinder piston and the cover are under spring tension. Carefully disassemble the product.** Clamp the product between the base jaws (2) and the cover (10) in the vice so that the four screws (46) can still be removed.
4. Unscrew screws (46).
5. Open the vice carefully and remove the lid (10).
6. Instead of the cover (10) ▸ 7.6 [🗋 50]place the device (101) (size 50–100) or the device (103) (size 125–240) on the PWG-plus housing (1) using the centering sleeves (19) and screw both parts together with the screws (102) or (104). Sizes 125–240 require a two-piece fixture. Position fixture part 2 (105) in part 1 (103) and screw it together with the screws (106).
7. Unscrew screw (45).
8. For sizes 125–240, unscrew the screws (106) evenly and remove part 2 from the device (105).
9. Unscrew screws (104) (sizes 125–240) or screws (102) (sizes 50–100) evenly and carefully remove the device (103) or (101).
10. Remove the cylinder piston (60) from the case (1).
11. Remove the spacer piston (66) from the intermediate case (65).
12. Remove the intermediate housing (65).
13. Remove the second cylinder piston (7) from the case (1).
14. Loosen grub screws (21) in the base jaws (2).
15. Remove bolt (5).
16. Pull the base jaws (2) out of the case (1).
17. Push the piston assembly (3, 4 and 39) out of the case(1) in an upwards motion.

## 7.5 Servicing and assembling the product

**Maintenance**

- Clean all parts thoroughly and check for damage and wear.
- Treat all greased areas with lubricant. ▸ 7.3 [🗋 43]
- Oil or grease bare external steel parts.
- Replace all wear parts / seals.▸ 7.7 [🗋 52]
  - Position of the wearing parts ▸ 7.7 [🗋 52]
  - Order no. of the seal kits ▸ 1.4.1 [🗋 9]

**Assembly**

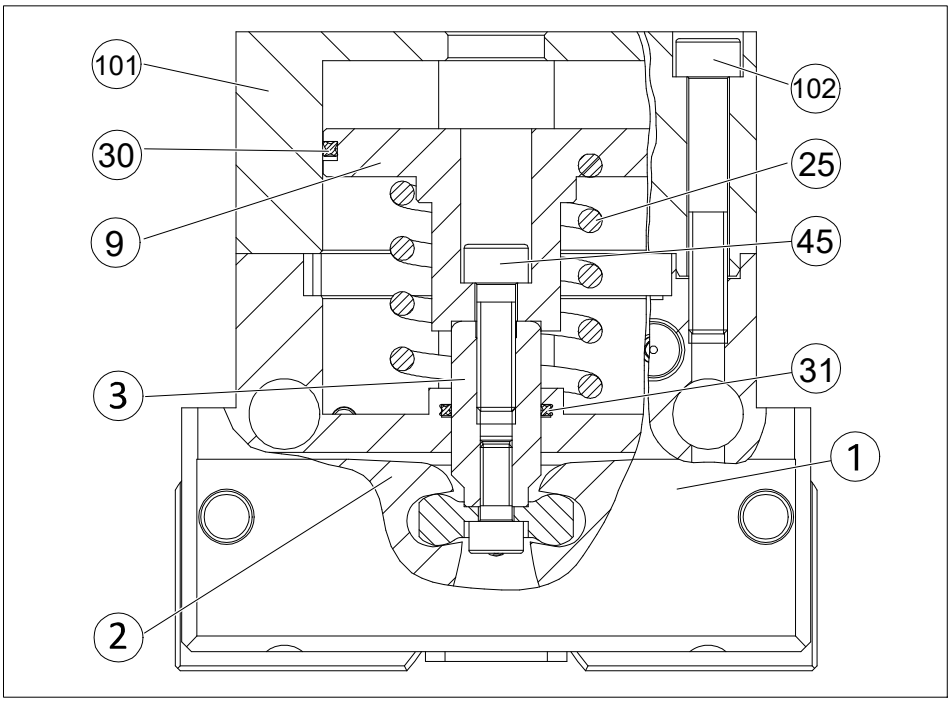
- Unless otherwise specified, secure all screws and nuts with Loctite no. 243 and tighten with the appropriate tightening torque. ▸ 7.5.5 [🗋 49]
- On the variant with maintenance of gripping force "O.D. gripping ", sizes 50–100, mount the cylinder piston with the help of an assembly device ▸ 7.6.1 [🗋 50], with sizes 125–240 mount the cylinder piston with the help of a second assembly device ▸ 7.6.2 [🗋 51].

### 7.5.1 Variant without maintenance of gripping force

Assembly is done in the opposite order of disassembly ▸ 7.4.1 [🗋 44].

### 7.5.2 Variant with maintenance of gripping force "O.D. gripping"

**PWG-plus 50-100**

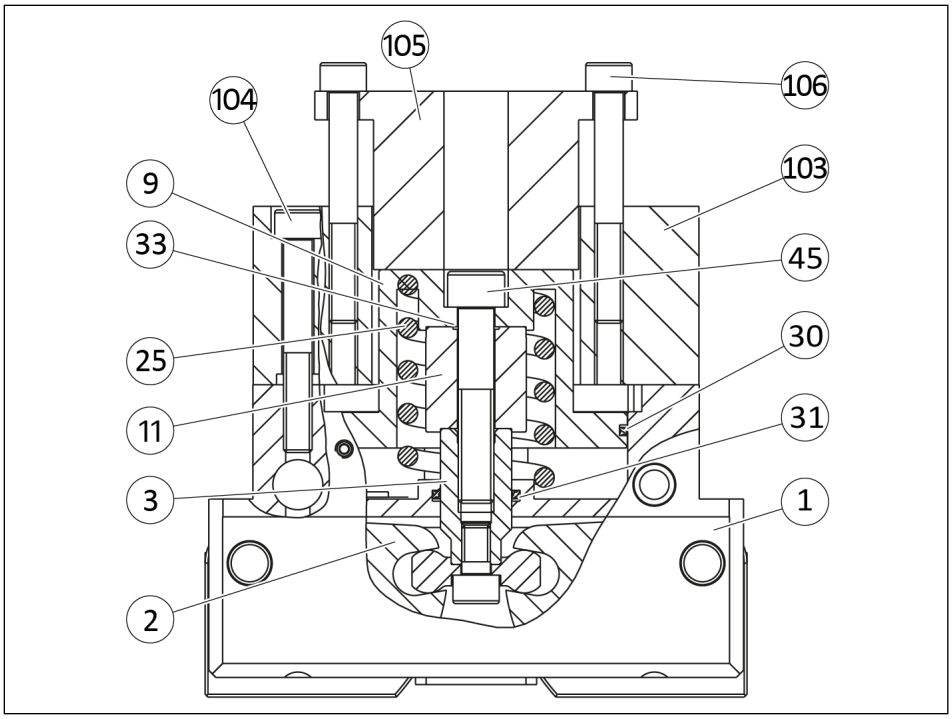



Dimensions of assembly device in chapter ▸ 7.6 [🗋 50]

1. Mount the base jaws (2) and piston (3) with the seal (31) in the housing (1).

2. Insert the compression spring (25) and the cylinder piston (9) with the seal (30) into the housing (1).
3. Carefully pull the device (101) over the cylinder piston (9) and mount onto the housing (1) with the screws (102).
4. Tighten the screw (45).
   ⇨ Observe the maximum tightening torque, ▸ 7.5.5 [🗋 49].
5. Remove the device (101).
6. Reassemble the product. Assembly is done in the reverse order of disassembly, ▸ 7.7 [🗋 52].

**PWG-plus 125-240**




Dimensions of assembly device in chapter ▸ 7.6 [🗋 50]

1. Mount the base jaws (2) and piston (3) with the seal (31) in the housing.
2. Insert the compression spring (25), spacer bolt (11) and cylinder piston (9) with seals (30) and (33) into the housing (1).
3. Carefully pull part 1 (103) over the cylinder piston (9) and mount onto the housing (1) with the screws (104).
4. Position part 2 (105) and evenly screw onto the device part 1 (103) using the screws (106).
5. Insert the screw (45) into the cylinder piston (9) and tighten.
   ⇨ Observe the maximum tightening torque, ▸ 7.5.5 [🗋 49].
6. Remove devices (103) and (105).
7. Reassemble the product. Assembly is done in the reverse order of disassembly, ▸ 7.7 [🗋 52].

### 7.5.3 Variant of "Force amplification cylinder" (KVZ) without maintenance of gripping force

Assembly is done in the opposite order of disassembly ▶ 7.4.3 [🗋 45].

### 7.5.4 Variant of "Force amplification cylinder" with maintenance of gripping force "O.D. gripping" (AS-KVZ)

Assembly is done in the opposite order of disassembly.

Assembly of the compression spring is done as for ▶ 7.5.2 [🗋 47] and using the devices described there.

### 7.5.5 Tightening torque for screws

Position of the item numbers: ▶ 7.7 [🗋 52]

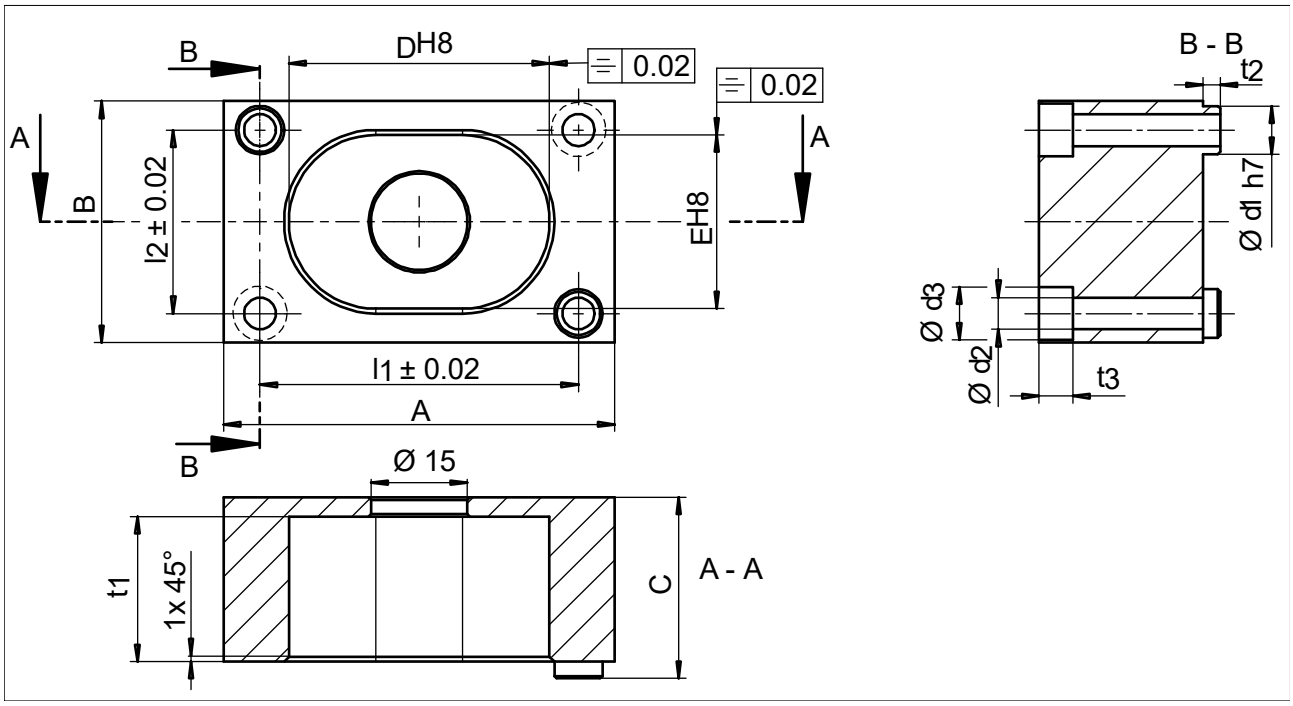
**Tab.: Tightening torque for screws [Nm]**

| Item | PWG-plus | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 50 | 64 | 80 | 100 | 125 | 160 | 200 | 240 |
| 21 | 0.4 | 0.8 | 2 | 2 | 4 | 7.5 | 7.5 | 10 |
| 39 | 1.2 | 5.1 | 5.1 | 10* | 17.4* | 42.2* | 75* | 75* |
| 40 | 1.2 | 5.9 | 10 | 10 | 24 | 48 | 75 | 75 |
| 41 | 1.3 | 1.3 | 3 | 3 | 6 | 6 | 6 | 6 |
| 45 | 2.1 | 10 | 10 | 17 | 41 | 48 | 116 | 116 |
| 46 | 1.3 | 1.3 | 3 | 3 | 6 | 6 | 25 | 50 |
| 66 | 2.1 | 10 | 10 | 10 | 24 | 48 | 75 | 116 |

* Screw must be treated with Loctite Activator No. 7649 in addition to the prescribed tightening torque and glued in place with Loctite Adhesive No. 243.

## 7.6 Assembly device cylinder piston with gripping force maintenance

### 7.6.1 Sizes 50–100




*Cylinder piston assembly device*

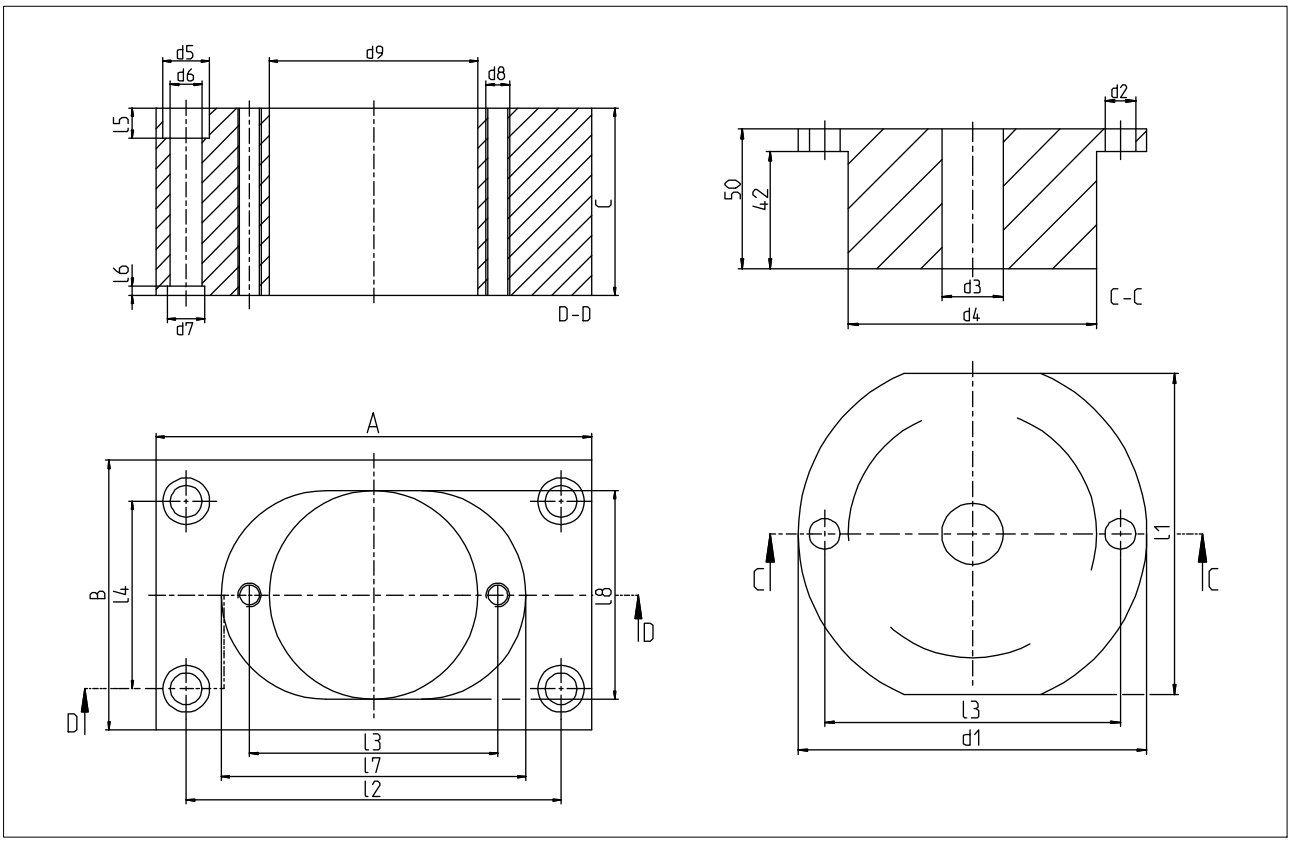
**Tab.: Assembly device cylinder piston – dimensions in mm**

| Size | a | b | c | d | e | l1 | l2 | d1 | d2 | d3 | t1 | t2 | t3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PWG-plus50 | 42 | 30 | 25 | 25 | 19 | 35 | 22 | 6 | 3.5 | 8 | 18 | 2.5 | 6 |
| PWG-plus64 | 52 | 36 | 27 | 31 | 24 | 42 | 27 | 8 | 5.5 | 10 | 23 | 2.5 | 7 |
| PWG-plus80 | 63 | 42 | 32 | 42 | 30 | 52 | 32 | 8 | 5.5 | 10 | 25 | 2.5 | 6 |
| PWG-plus100 | 81 | 50 | 38 | 54 | 36 | 66 | 38 | 10 | 6.6 | 11 | 30 | 3.5 | 7 |

| Designation | PWG-plus | | | |
|---|---|---|---|---|
| | 50 | 64 | 80 | 100 |
| Screw (ISO 4762) | M3 x 25 | M5 x 30 | M5 x 35 | M6 x 40 |

*Tab.: Screw for assembly device*

### 7.6.2 Sizes 125–240




*Assembly device with gripping force maintenance*

**Tab.: Assembly device cylinder piston – dimensions in mm**

| Size | A | B | C | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|---|---|---|
| PWG-plus 125 | 100 | 60 | 50 | 96 | 9 | 15 | 45 | 14 | 9 | 12 |
| PWG-plus 160 | 125 | 72 | 50 | 90.5 | 9 | 18 | 57.5 | 15 | 9 | 12 |
| PWG-plus 200 | 154 | 100 | 65 | 110 | 9 | 20 | 78 | 18 | 11 | 14 |
| PWG-plus 240 | 186 | 115 | 80 | 125 | 11 | 22 | 88 | 20 | 13.5 | 16 |

**Tab.: Assembly device cylinder piston – dimensions in mm**

| Size | d8 | d9 | l1 | l2 | l3 | l4 | l5 | l6 | l7 | l8 |
|---|---|---|---|---|---|---|---|---|---|---|
| PWG-plus 125 | M8 | – | 60 | 82 | 80 | 45 | 9 | 3 | 67 | 46 |
| PWG-plus 160 | M8 | 58.5 | 72 | 100 | 74.5 | 56 | 9 | 3 | – | – |
| PWG-plus 200 | M8 | 79 | 100 | 130 | 95 | 70 | 11 | 4 | – | – |
| PWG-plus 240 | M10 | 89 | 115 | 160 | 106 | 80 | 13 | 4 | – | – |

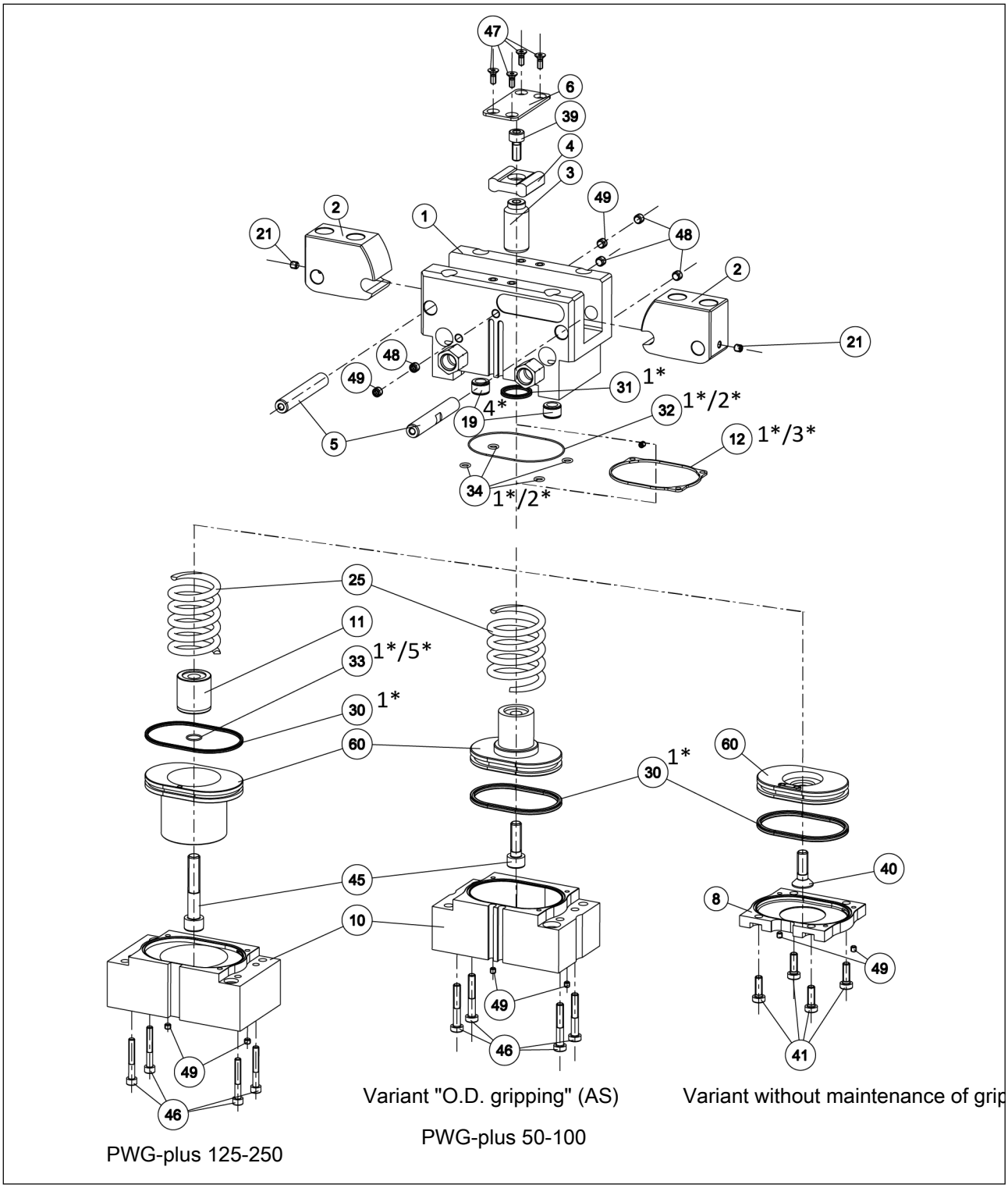
**Tab.: Screws for assembly device cylinder piston**

| Item | PWG-plus | | | |
|---|---|---|---|---|
| | 125 | 160 | 200 | 240 |
| 104 | M8 x 55 | M8 x 60 | M10 x 80 | M12 x 90 |
| 106 | M8 x 60 | M8 x 65 | M8 x 80 | M10 x 95 |

## 7.7 Drawings

The following figures are example images.
They serve for illustration and assignment of the spare parts.
Variations are possible depending on size and variant.

### 7.7.1 Standard




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

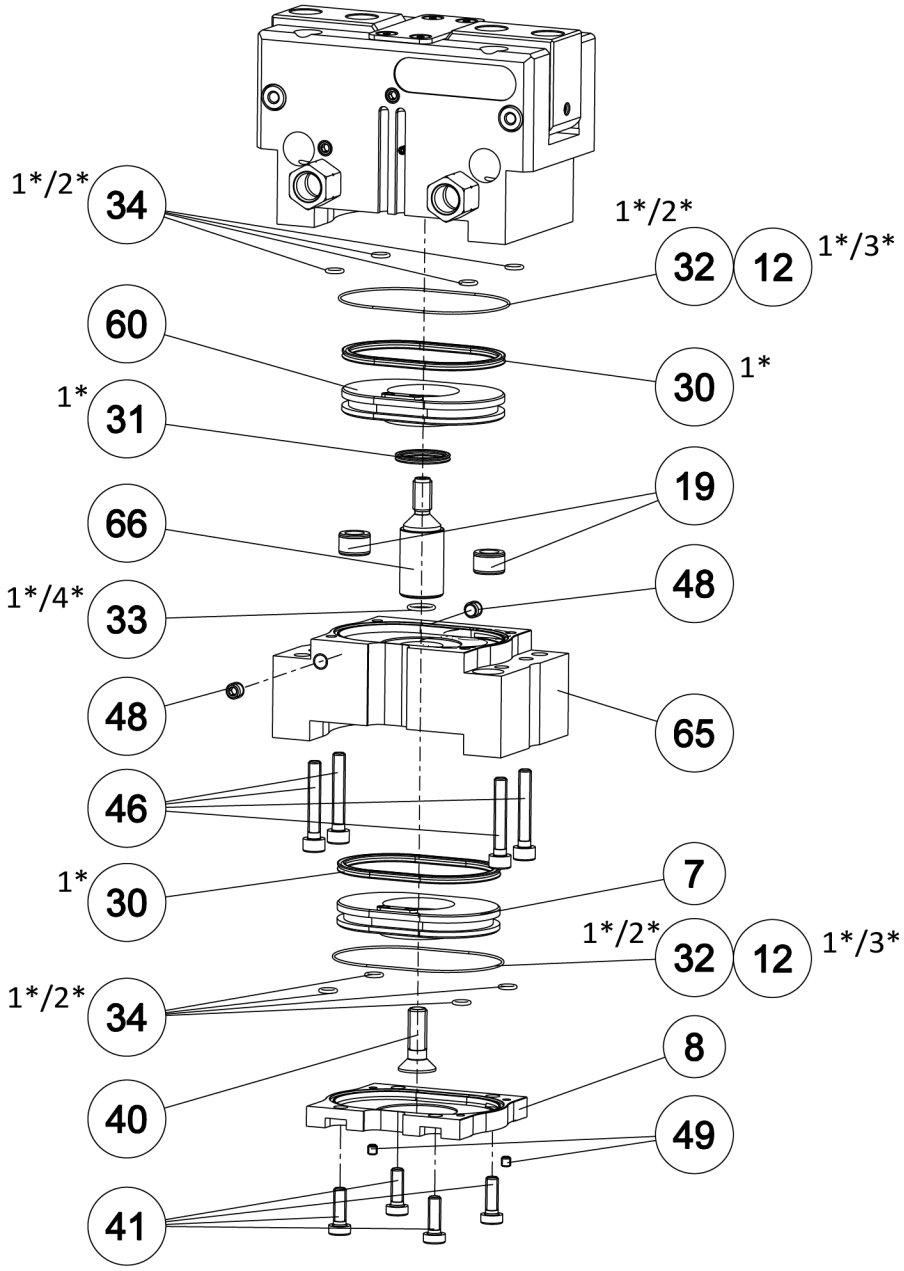
2* not for PWG-plus 50-80

3* not for PWG-plus 100-240

4* not for version without maintenance of gripping force

5* only for PWG-plus 200

### 7.7.2 Variant with force amplification cylinder




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

2* not for PWG-plus 50-80

3* not for PWG-plus 100-240

4* only for PWG-plus 200

# 8 Translation of the original declaration of incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1 Section B.

| | |
|---|---|
| Manufacturer/<br>Distributor | SCHUNK SE & Co. KG<br>Spanntechnik \| Greiftechnik \| Automatisierungstechnik<br>Bahnhofstr. 106 – 134<br>D–74348 Lauffen/Neckar |

We hereby declare that the partly completed machine described below

| | |
|---|---|
| Product designation: | Pneumatic angular gripper / PWG–plus /pneumatic |
| ID number | 0311610 ... 0311686, 39311610 ... 39311686 |

meets the following basic occupational health and safety of the Machinery Directive 2006/42/EC:

No. 1.1.1, No. 1.1.2, No. 1.1.3, No. 1.1.5, No. 1.3.2, No. 1.5.3, No. 1.5.4, No. 1.5.6, No. 1.5.8, No. 1.5.10, No. 1.5.11, No. 1.5.13

The partly completed machinery may not be put into operation until it has been confirmed that the machine into which the partly completed machinery is to be installed complies with the provisions of the Machinery Directive (2006/42/EC). The declaration shall be rendered invalid if modifications are made to the product.

Applied harmonized standards, especially:

| | |
|---|---|
| EN ISO 12100:2010 | Safety of machinery – General principles for design – Risk assessment and risk reduction |

The special technical documentation according to Annex VII, Part B, belonging to the partly completed machine, has been created.

Person authorized to compile the technical documentation:
Stefanie Walter, Address: see manufacturer's address

*Signature: see original declaration*

Lauffen/Neckar, January 2025

Dr.–Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

# 9 UKCA declaration of incorporation

in accordance with the Supply of Machinery (Safety) Regulations 2008.

| | |
|---|---|
| Manufacturer/<br>Distributor | SCHUNK Intec Limited<br>Clamping and gripping technology<br>3 Drakes Mews, Crownhill<br>MK8 0ER Milton Keynes |

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
"Supply of Machinery (Safety) Regulations 2008".
The declaration shall be rendered invalid if modifications are made to the product.

| | |
|---|---|
| Product designation: | Pneumatic angular gripper / PWG-plus / pneumatic |
| ID number | 0311610 ... 0311686, 39311610 ... 39311686 |

The partly completed machine may not be put into operation until it has been confirmed that the machine into which the partly completed machine is to be installed complies with the provisions of the "Supply of Machinery (Safety) Regulations 2008".

Applied harmonized standards, especially:

| | |
|---|---|
| EN ISO 12100:2010 | Safety of machinery – General principles for design – Risk assessment and risk reduction |

The special technical documentation according to Annex VII, Part B, belonging to the partly completed machine, has been created.

Person authorized to compile the technical documentation:
Marcel Machado, address: refer to manufacturer's address

Lauffen/Neckar, January 2025

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

# 10 Information on the RoHS Directive, REACH Regulation and Substances of Very High Concern (SVHC)

### RoHS Directive

SCHUNK products are classified as "large-scale stationary installations" or as "large-scale stationary industrial tools" within the meaning of Directive 2011/65/EU and its extension 2015/863/EU "on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)", or fulfill their intended function only as part of one. Therefore products from SCHUNK do not fall within the scope of the directive at this time.

### REACH Regulation

Products from SCHUNK fully comply with the regulations of Regulation (EC) No. 1907/2006 "concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)" and its amendment 2022/477. SCHUNK attaches great importance to completely avoiding chemicals of concern to humans and the environment wherever possible.

Only in rare exceptional cases do SCHUNK products contain SVHC substances on the candidate list with a mass content above 0.1%. In accordance with Article. 33 (1) of Regulation (EC) No. 1907/2006, SCHUNK complies with its duty to "communicate information on substances in articles" and lists the components concerned and the substances used in an overview that can be viewed at **schunk.com\SVHC**.

*Signature: see original declaration*

Lauffen/Neckar, January 2025

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

**SCHUNK SE & Co. KG**
**Spanntechnik | Greiftechnik | Automatisierungstechnik**

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