



# Assembly and Operating Manual

## PZH-plus

### 3-finger centric gripper

Original operating manual

Hand in hand for tomorrow

## Imprint

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### Technical changes:

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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

Customer Management

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

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# 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 ▶ 1.1.2 [ 6 ] 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.

#### **NOTICE**

**Material damage!**

Information about avoiding material damage.

### 1.1.2 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](https://schunk.com/downloads).

### 1.1.3 Sizes

This operating manual applies to the following sizes:

- PZH-plus 20
- PZH-plus 30
- PZH-plus 50
- PZH-plus 75

## 1.2 Warranty

If the product is used as intended, the warranty is valid for 36 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

- 3-finger centric gripper PZH-plus in the version ordered
- Assembly and Operating Manual
- Accessory pack

### 1.3.1 Accessory pack

Accessory pack for	ID number
PZH-plus 20	5522173
PZH-plus 30	5522174
PZH-plus 50	5522175
PZH-plus 75	5522176

Content of the accessories pack: ▶ 7.6 [📄 39].

## 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

Seal kit for	ID number
PZH-plus 20	5522219
PZH-plus 30	5522220
PZH-plus 50	5522221
PZH-plus 75	5522222

contents of the sealing kit, ► 7.6 [📄 39].

### 1.4.2 Mounting kit for proximity switch IN

Mounting kit for	ID number
PZH-plus	0305364

### 1.4.3 Pressure piece assembly kit

Assembly kit for	ID number
PZH-plus 20	0305363
PZH-plus 30	0305373
PZH-plus 50	0305383
PZH-plus 75	0305393

## 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 [16].
- 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 for the gripper fingers

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

- 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 [16].
- Make sure that the product is 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.

## 2.6 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:

<b>Trained electrician</b>	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.
<b>Qualified personnel</b>	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.
<b>Instructed person</b>	Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.
<b>Service personnel of the manufacturer</b>	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.

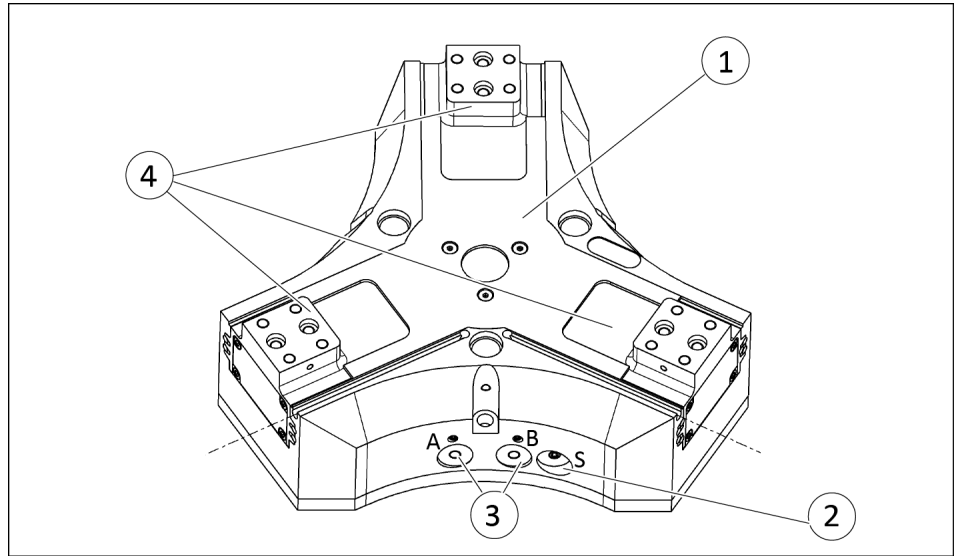
### 3 Technical data

Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]
Nominal working pressure [bar]	6
Min. pressure [bar]	2
Max. pressure [bar]	8
Pressure range for air purge [bar]	0,5 – 1
Noise emission [dB(A)]	≤ 70

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

## 4 Design and description

### 4.1 Design



*3-finger centric gripper*

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

### 4.2 Description

Universal centric gripper with high gripping force and maximum moments due to multi-tooth guidance

## 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)

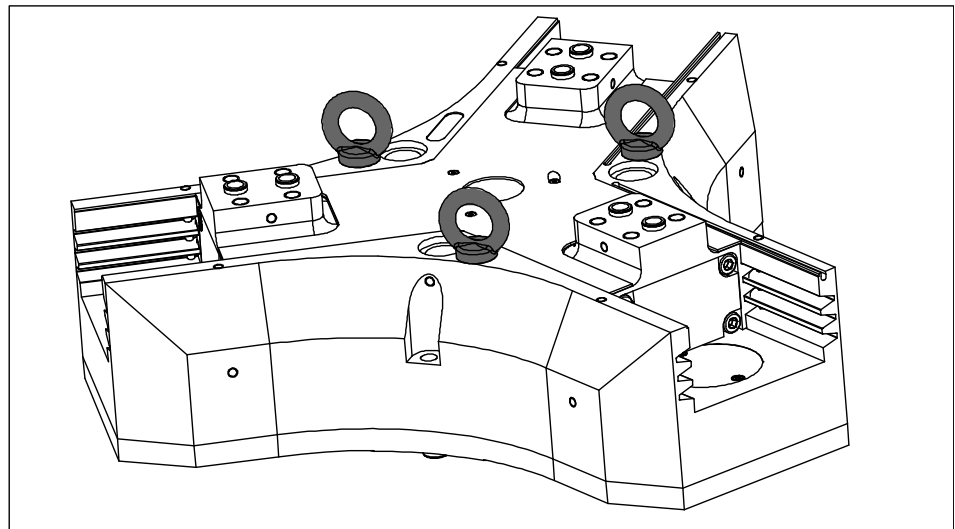


#### **⚠ WARNING**

**Risk of injury if the unit falls during transport or assembly!**

**Handling with large weight for PZH-plus 75 !**

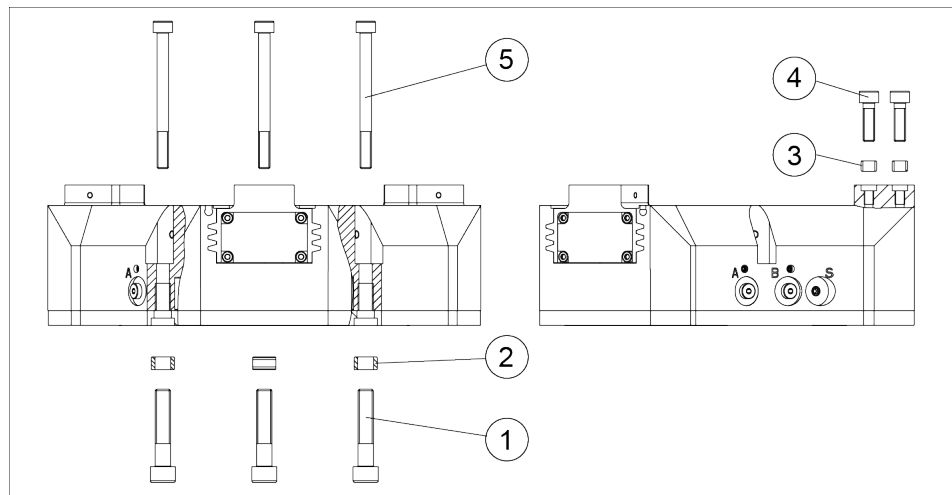
- Secure the unit during transport and assembly by sufficiently large aids.
- The gripper is to be hoisted by the three transport threads.



Eye bolts in the transport threads

## Mounting

The product can be mounted from the front or the rear.



1	Mounting from the rear	4	Finger mounting
2	Centering sleeves	5	Mounting from the front
3	Centering sleeves		

The centering sleeves (2 / 3) are included in the accessory pack.

Tab.: Mounting material

Size	20	30	50	75
Thread diameter and max. depth of engagement for rear mounting	M6 20 deep	M8 26 deep	M10 31 deep	M12 41 deep
Thread diameter and max. depth of engagement for finger mounting	M4 9 deep	M5 10 deep	M6 11 deep	M10 17 deep

### 5.1.1.1 Mounting of the gripper by using a spring loaded pressure-piece



#### ⚠ CAUTION

**The spring-loaded pressure piece is under spring tension.**

The pressure piece can fly out in an uncontrolled fashion and cause contusions.

- During assembly or disassembly, be especially careful with the springs.

When mounting the gripper from the side of the gripper fingers, the assembly of the pressure piece must be done **after** the mounting of the gripper.

Mounting the pressure piece is described in the insert "Installation instructions - pressure piece", which is included in the pressure piece's scope of delivery.

## 5.1.2 Air connection

### **NOTICE**

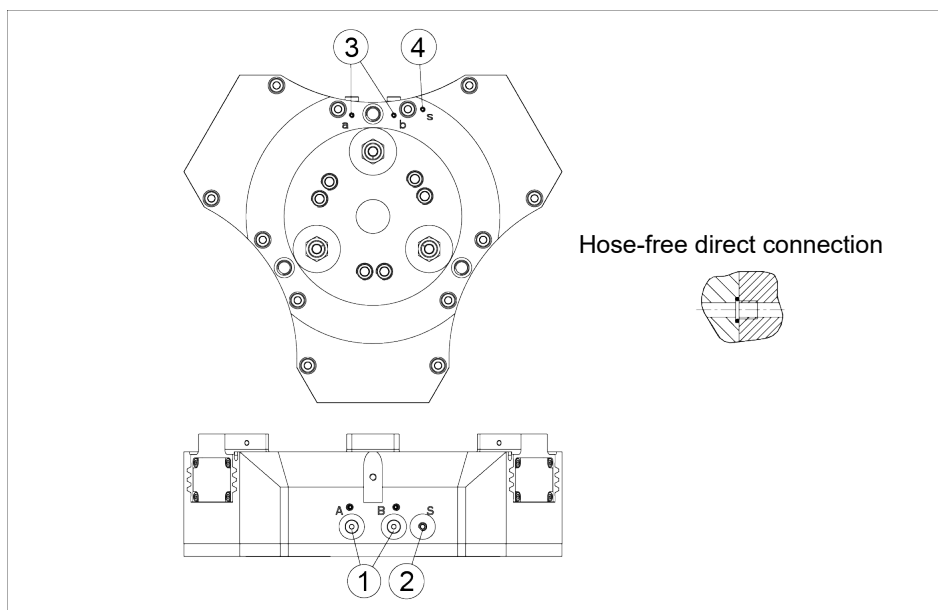
#### **Risk of damage to the gripper!**

If the maximum permissible finger weight or the permissible mass moment of inertia of the fingers is exceeded, the gripper can be damaged.

- As a rule, a jaw movement must take place without impact and bouncing.
  - To do this, carry out sufficient throttling and/or damping if necessary.
  - Observe specifications in the catalog data sheet.
- 

### **NOTE**

- Observe the requirements for the compressed air supply, ▶ 3 [16].
  - 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.
-



*Air connections*

Item	Connection
1	Hose connection (A = open, B = close)
2	Air purge connection
3	Hose-free direct connection (a = open, b = close)
4	Direct connection for air purge

1	Hose connection (A = open, B = close)
---	---------------------------------------

2	Air purge connection
---	----------------------

3	Hose-free direct connection (a = open, b = close)
---	---

4	Direct connection for air purge
---	---------------------------------

- Only open the air connections required.
- For hose-free direct connections, use the O-rings from the accessory pack.
- If the maximum permitted finger weight is exceeded, a reduction is imperative so that the jaw movement occurs without any hitting or bouncing.

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

## 5.2 Mounting the sensor

### NOTE

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

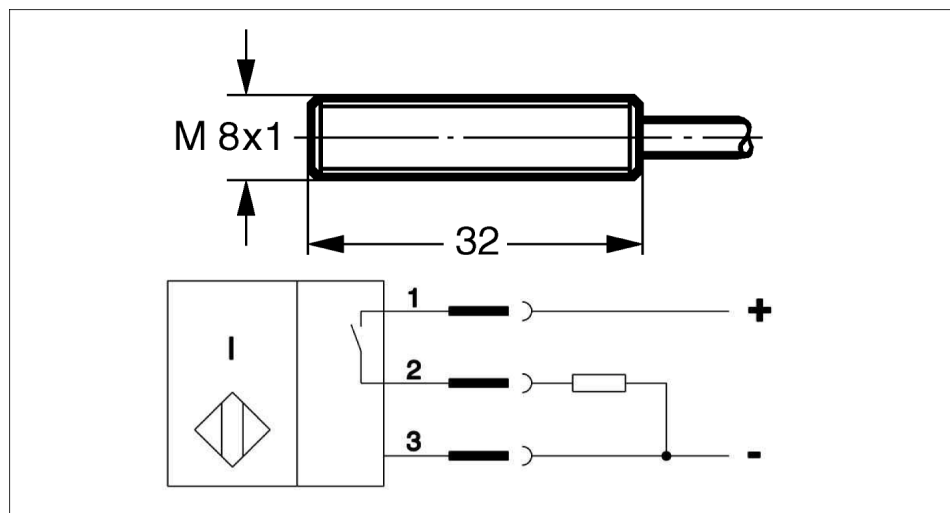
The product is equipped for the use of sensors.

- For the exact type designations of suitable sensors, please see the catalog data sheet.
- For technical data for the suitable sensors, see Assembly and Operating Manual and catalog data sheet.
  - The Assembly and Operating Manual and catalog data sheet are included in the scope of delivery for the sensors and are available at [schunk.com](http://schunk.com).
- Information on handling sensors is available at [schunk.com](http://schunk.com) or from SCHUNK contact persons.

### 5.2.1 Overview of sensors

PZH-plus	IN 80	MMS 22	MMS 22-PI1	MMS 22-PI2	MMS-P 22	BIP
20	✓	✓	✓	✓	✓	✓
30	✓	✓	✓	✓	✓	✓
50	✓	✓	✓	⊘	⊘	✓
75	✓	✓	✓	⊘	⊘	✓

## 5.2.2 IN 80 inductive proximity switch



Connection example for IN 80

1	brown	2	black	3	blue
---	-------	---	-------	---	------

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.

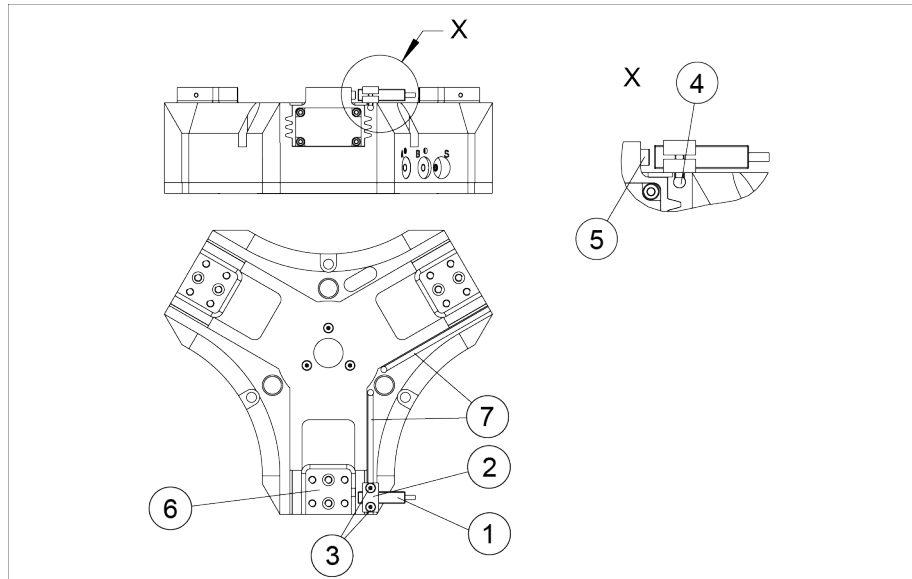
The inductive proximity switches are electronic components, which can react sensitively to high-frequency interference or electromagnetic fields.

- 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 (nnp, 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.

### Mounting kit

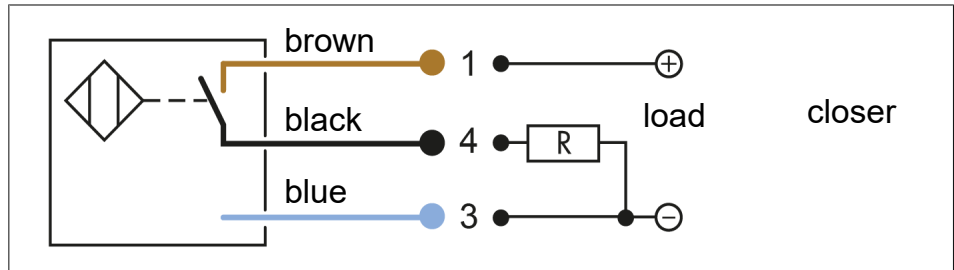
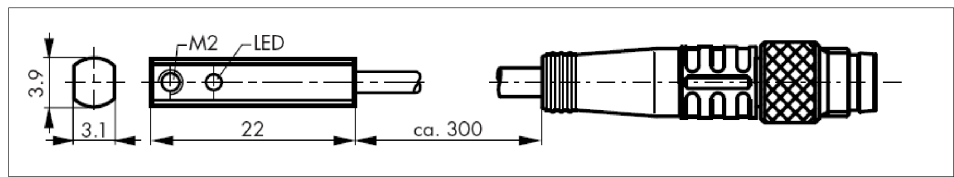
To use the inductive sensor, the gripper has to be retrofitted with a special mounting kit. This mounting kit is available from SCHUNK for the models below.

## Installation of the proximity switch



1. Push the T-nut (4) into the gripper slot (7).
2. Fasten the bracket (2) by tightening the screws (3) at the T-nut (4). Apply the screws only enough that the bracket (2) can still be moved in the gripper slot (7).
3. Screw in and tighten the screw (5) in the base jaw (6).
4. Put the gripper in the position to be monitored (opened / closed / part grasped).
5. Position the bracket (2) in such a way that the gripper slot (7) is aligned with the position of the screw (5).
6. Insert the proximity switch (1) in the bracket (2) and push it as close as possible to the screw (5).
7. Fasten the proximity switch (1) by tightening the screws (3).
8. Open and close the gripper to test its functioning.

### 5.2.3 MMS 22 magnetic switch



#### NOTICE

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

- Observe the maximal tightening torque.

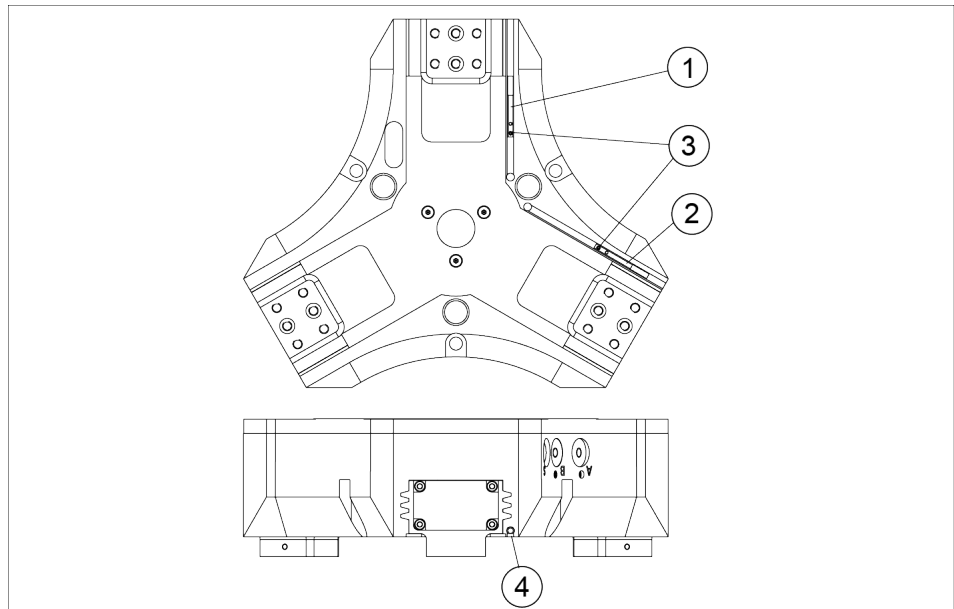
#### NOTE

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

At ferromagnetic adapter plates:

- First mount the product on the adapter plate.
- Then set the position of the magnetic switch.

#### Positioning the magnetic switch



#### Gripper open:

1. Set the gripper to the "Open" position.
2. Push the magnetic switch 1 (1) into the groove until it stops at the end of the groove.

3. Pull the magnetic switch 1 (1) back again slowly until it switches.
4. Tighten the set-screw (3) to clamp the magnetic switch 1 (1) in this position in the groove.
5. Close and close the gripper to test its function.

**Gripper closed:**

1. Set the gripper to the "Closed" position.
2. Push the magnetic switch 2 (2) into the groove towards the middle of the gripper until it switches.
3. Tighten the set-screw (3) to clamp the magnetic switch 2 (2) in this position in the groove.
4. Open and close the gripper to test its function.

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

1. Clamp the part to be gripped.
2. Push the magnetic switch 2 (2) into the groove towards the middle of the gripper until it switches.
3. Tighten the set-screw (3) to clamp the magnetic switch 2 (2) in this position in the groove.
4. Open and close the gripper to test its function.

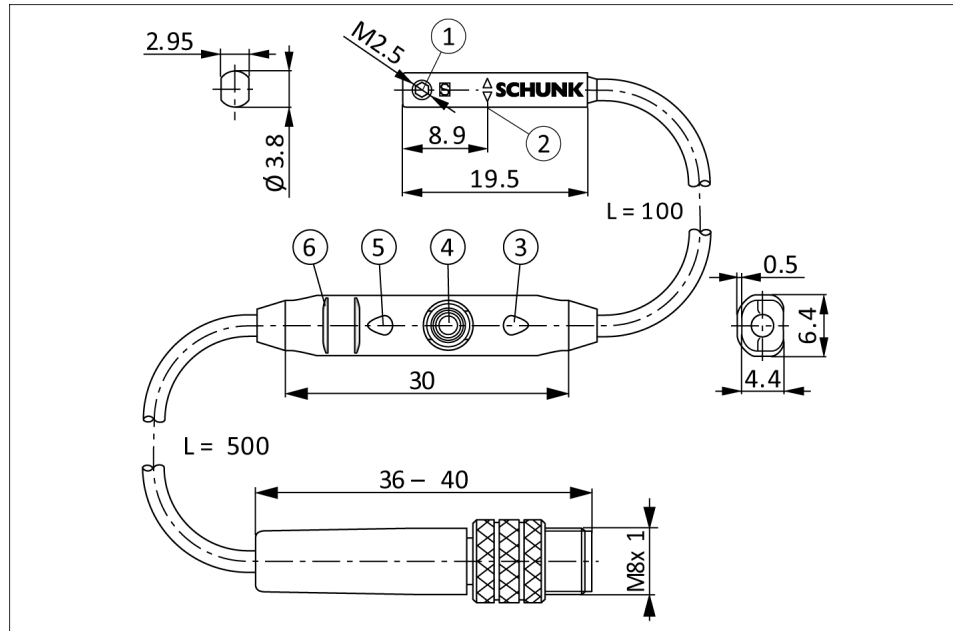
**Part gripped (I.D. gripping):**

1. Clamp the part to be gripped.
2. Push the magnetic switch 1 (1) into the groove until it stops at the end of the groove.
3. Pull the magnetic switch 1 (1) back again slowly until it switches.
4. Tighten the set-screw (3) to clamp the magnetic switch 1 (1) in this position in the groove.
5. Close and close the gripper to test its function.

### 5.2.4 MMS-P programmable magnetic switch

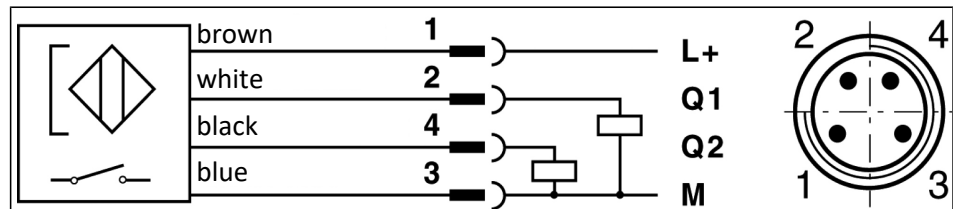
#### NOTE

The MMS-P can only cover the whole range of stroke in the PZH-plus series for PZH-plus 20 and 30.



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

### NOTICE

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

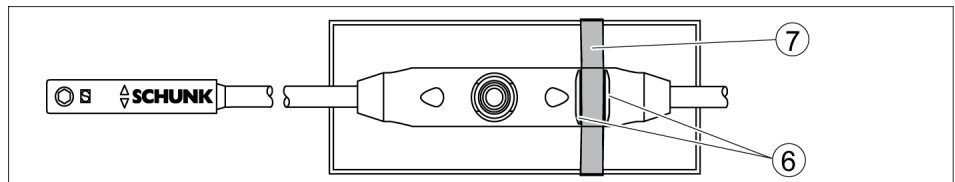
- Observe a maximum tightening torque of 10 Ncm for the set-screws.

### NOTE

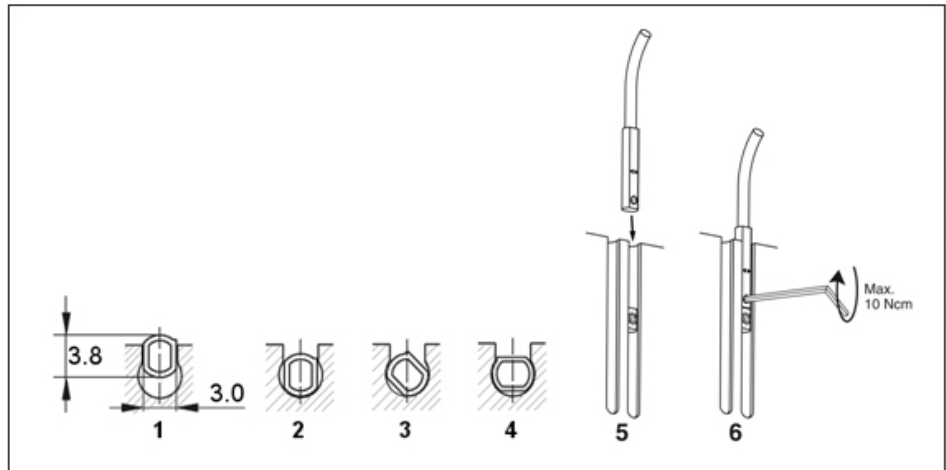
#### Ferromagnetic components change the sensor's switching positions. Example: adapter plate made of construction steel.

For ferromagnetic adapter plates:

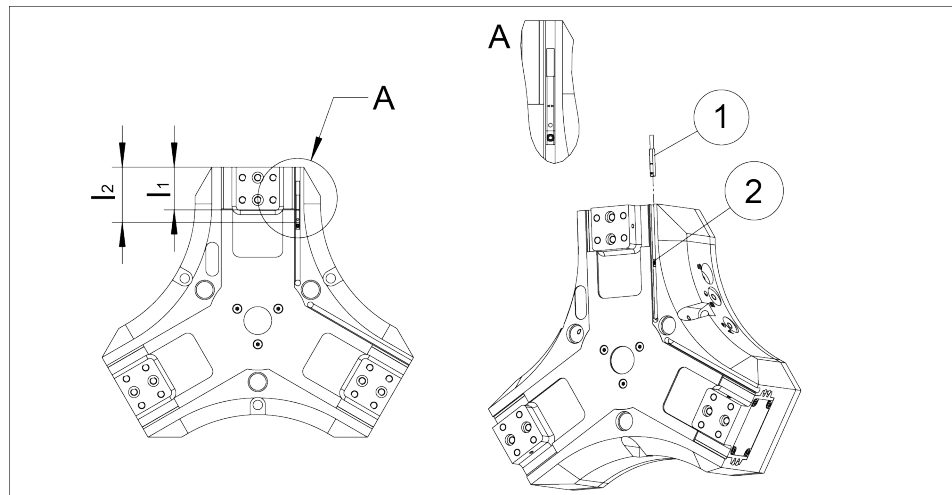
- First mount product to adapter plate
- Then adjust position of the sensors



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.



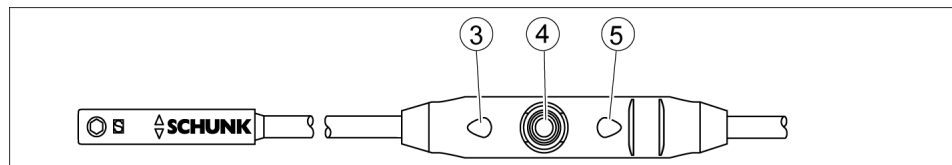
2. Turn in the sensor (1 - 4).  
OR  
Push the sensor axially into the slot until it contacts the stop (5).
3. Fix the sensor with an Allen wrench (6).



Insert the magnetic switch in accordance with dimension  $l_2$  (outer edge of gripper up to the front side of the sensor) or in accordance with dimension  $l_1$  (outer edge of gripper up to the double arrow on the sensor) and then mount with a Allen key.

Size	$l_1$ [mm]	$l_2$ [mm]
PZH-plus 20	49.1	58.0
PZH-plus 30	62.8	71.7

### 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 triggering points of each position a little bit closer than for the automatic mode. The triggering 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.

**Sensors MMS 22, MMS 22-PI1, MMS 22-PI2 and MMS-P 22**

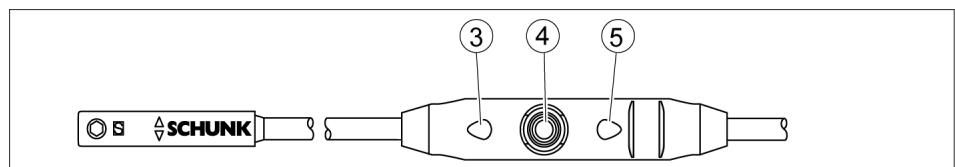
The smallest detectable difference in stroke is defined in the following table:

For products with X mm nominal stroke per jaw	Min. query range per jaw/ min. queried stroke difference per jaw
$X \leq 5 \text{ mm}$	30 % of the nominal stroke per jaw
$X > 5 \text{ mm to } X \leq 10 \text{ mm}$	20 % of the nominal stroke per jaw
$X > 10 \text{ mm}$	10 % of the nominal stroke per jaw

Tab.: The smallest detectable difference in stroke based on the nominal stroke

**Example:** Product with 7 mm nominal stroke per jaw

$7 \text{ mm} * 20\% = 1.4 \text{ mm}$

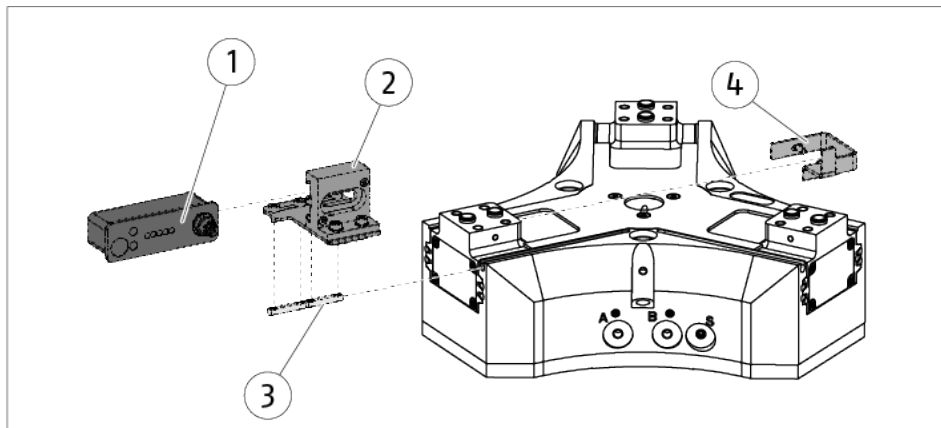


1. Press the "Teach" button (4) for 5 seconds.
    - ⇒ LED 1 (3) flashes from 2nd to 5th second.
    - ⇒ LED 1 goes off after 5 sec.
  2. Release the "Teach" button.
  3. Move the gripper to the "switch-off point for switching point 1" position.
  4. Briefly press the "Teach" button (4). LED 1 (3) flashes twice.
  5. Move the gripper to the "switch-off point for switching point 2" position.
  6. Briefly press the "Teach" button (4).
    - ⇒ LED 2 (5) flashes twice.
- ⇒ The assembly of the MMS-P sensor is completed.

### 5.2.5 Mounting the Balluff BIP inductive analog position sensor

#### Attachment kit

In order to use the inductive analog position sensor, the gripper must be equipped with a special attachment kit. This attachment kit is available from SCHUNK (for types that can be ordered, see catalog).



#### Assembly

The mounting material is included in the scope of delivery of the attachment kit.

1. Fasten the switching cam (4) to a base jaw.
2. Fasten the sensor holder (2) to the gripper using the T-nuts (3).
3. Insert the sensor (1) into the sensor holder (2).
4. Position the sensor (1) in the sensor holder (2) according to the marking on the sensor.
5. Clamp sensor (1) in sensor holder (2).

Information on adjusting the sensor can be found in the operating manual of the sensor (see <http://www.Balluff.com>).

#### Sensor ID number

Sensor designation	SCHUNK	Balluff
BIP 048	1561246	BIP000M
BIP 070	1561247	BIP000C
BIP 103	1561248	BIP000E
BIP 133	1561249	BIP000R

## 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 [ 18]
	Loosen the mounting screws of the product and actuate the product again.
Pressure drops below minimum.	Check air supply. ▶ 5.1.2 [ 20]
Compressed air lines switched.	Check compressed air lines. ▶ 5.1.2 [ 20]
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 The module does not travel through the entire stroke?

Possible cause	Corrective action
Dirt deposits between basic jaws and guidance.	Disassemble and clean the product.
Pressure drops below minimum.	Check air supply. ▶ 5.1.2 [ 20]
Mounting surface is not sufficiently flat.	Check the evenness of the mounting surface. ▶ 5.1.1 [ 18]
Component part defective.	Send product with a SCHUNK repair order or dismantle product.

### 6.3 Product opens or closes abruptly

Possible cause	Corrective action
Too little grease in the mechanical guiding areas.	Clean and lubricate product. ▶ 7 [ 34]
Compressed air lines blocked.	Check compressed air lines of damage.
Mounting surface is not sufficiently flat.	Check the evenness of the mounting surface.
One-way flow control valve is missing or adjustet incorrectly.	Install and adjust one-way flow control valve.
Loading too large.	Check permissible weight and length of the gripper fingers.

## 6.4 Gripping force is dropping

Possible cause	Corrective action
Compressed air can escape.	Check seals, if necessary, disassemble the product and replace seals.
Too much grease in the mechanical movement space.	Clean and lubricate product.
Pressure drops below minimum.	Check air supply. ▶ 3 [ 16]
Component part defective.	Replace component or send it to SCHUNK for repair.

## 6.5 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.
	Keep compressed air lines between the product and directional control valve as short as possible.
	Flow rate of valve is sufficiently large relative to the compressed air consumption.
	<b>NOTICE! The throttle check valve must not be removed, even if the product has not reached the opening and closing times.</b>
Loading too large.	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.
	Check permissible weight and length of the gripper fingers.

## 7 Maintenance

### 7.1 Notes

#### Original spare parts

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

#### Replacement of the housing and base jaws

The base jaws and the guides in the housing are matched to each other. To replace these parts, send the product to SCHUNK with a repair order.

### 7.2 Maintenance and lubrication intervals

#### NOTICE

#### 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.

Size	20 / 30	50 / 75
Interval [Mio. cycles]	5	2

### 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](http://schunk.com/lubricants).

The product contains food-compliant lubricants as standard. Components such as rolling bearings, linear guides, or shock absorbers are not provided with food-compliant lubricants.

**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 Disassembling the product

Position of the item numbers ▶ 7.6 [ 39]

Assembly tools are needed for disassembly ▶ 7.4.1 [ 36]/▶ 7.4.2 [ 37].



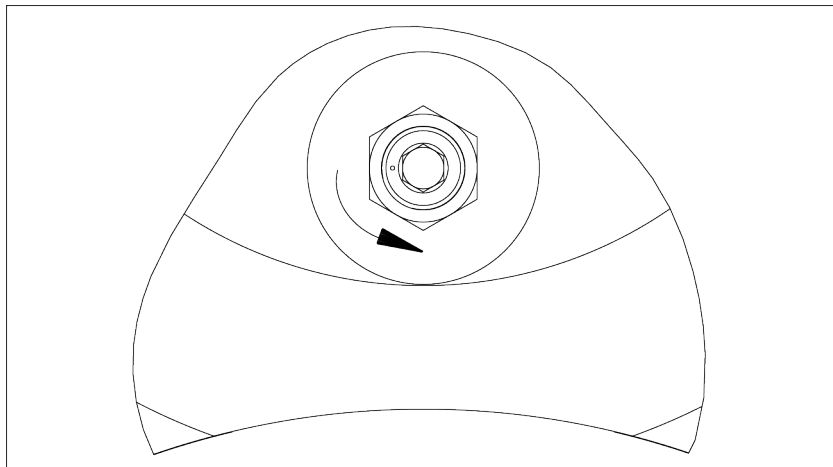
### ⚠ WARNING

#### Risk of injury due to unexpected movements!

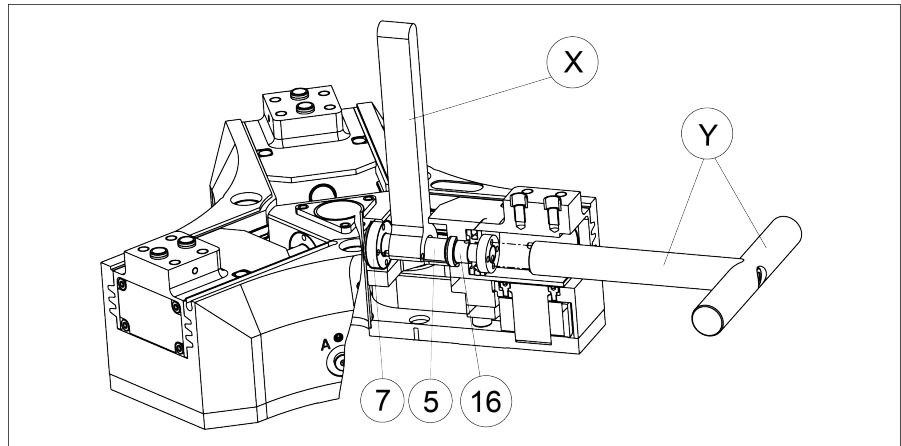
If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- 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.

1. Close the gripper and remove the compressed air lines.

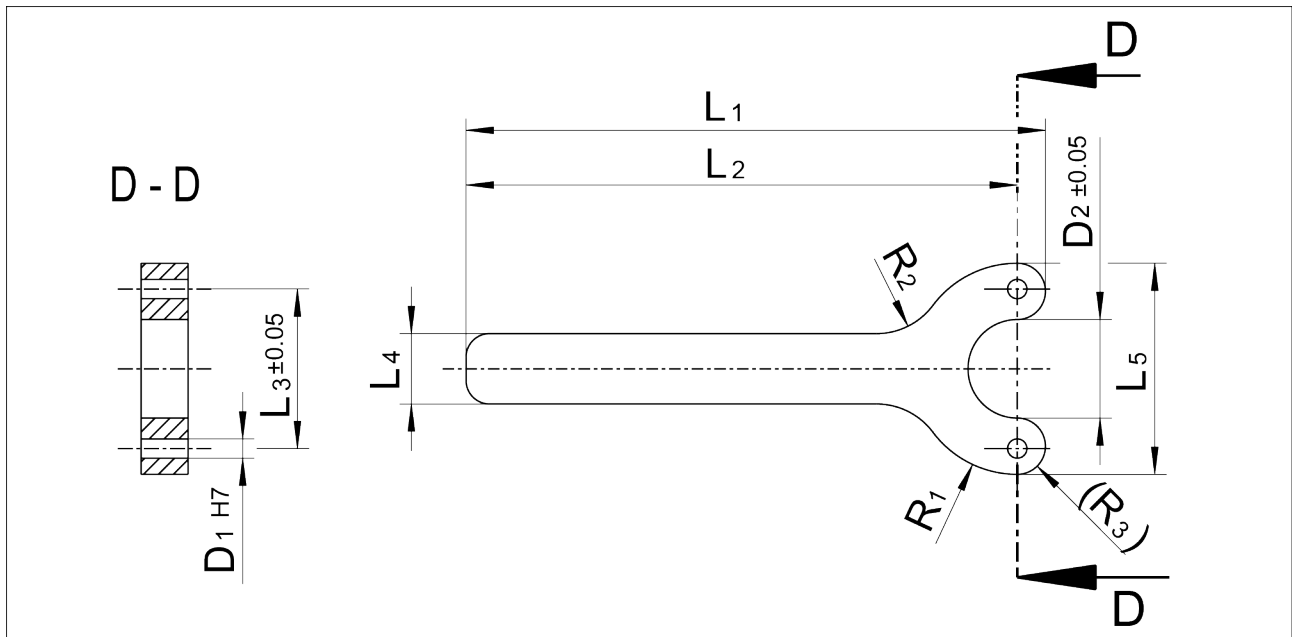


2. Remove the cover (15) and unclamp the eccentric (9). To do this, rotate the eccentric (9) by 90° to the left. Marking has to show in the direction of the outside wall.
3. Remove the nuts (61).
4. Remove the set-screw (45) and undo the screws (46) through the base plate (13).
5. Remove the base plate (13).
6. Remove the toothed belt (11).
7. Remove the toothed belt (20).
8. Remove the bearings (20 / 21), fitting disks (39) and the eccentric (9).
9. Base jaw clamping piece (10) and centering sleeves (62).
10. Remove the base jaw (4).



11. Remove the lock nut (16) with the assembly tool (Y).
12. Pull the base jaw (2) with the piston (3) out of the housing (1) and remove the piston (3) from the base jaw (2).
13. Remove the piston rod clamping nut (7) with the assembly tool (X) and take out the piston rod (5).
14. Remove the sleeve (12).
15. Remove the air diffuser piece (6) from the housing (1).

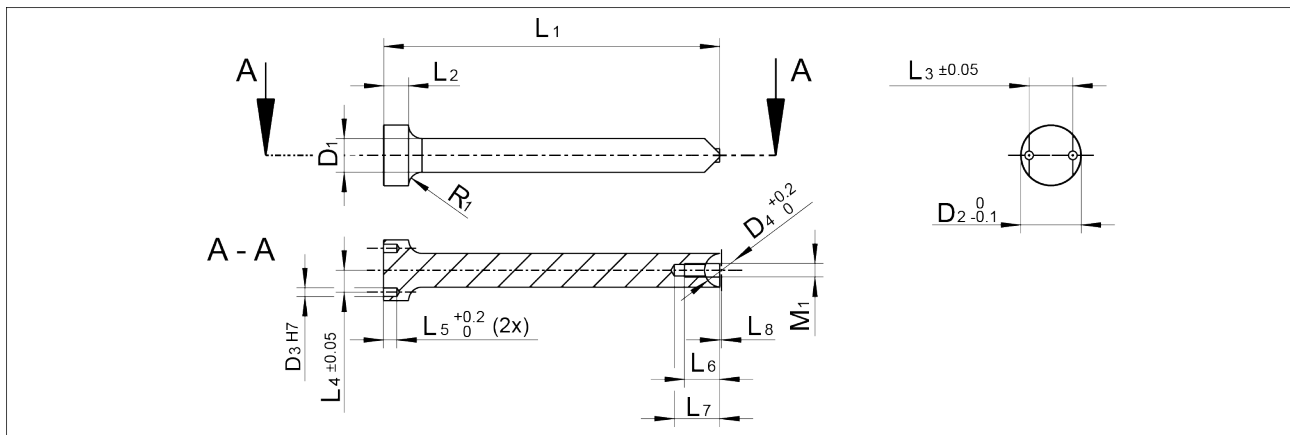
### 7.4.1 Assembly tool X



Tab.: (Dimensions in mm)

PZH-plus	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	L <sub>5</sub>	D <sub>1</sub>	D <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
20	113.95	112.0	10.5	10.0	16.0	1.6	8.2	8.0	5.0	1.95
30	111.5	109.0	17.0	10.0	22.0	2.6	12.0	11.0	5.0	2.5
50	107.75	104.0	25.5	13.0	32.0	3.1	17.0	16.0	8.0	3.75
75	123.5	117.5	34.0	15.0	45.0	4.1	21.0	22.5	15.0	6.0

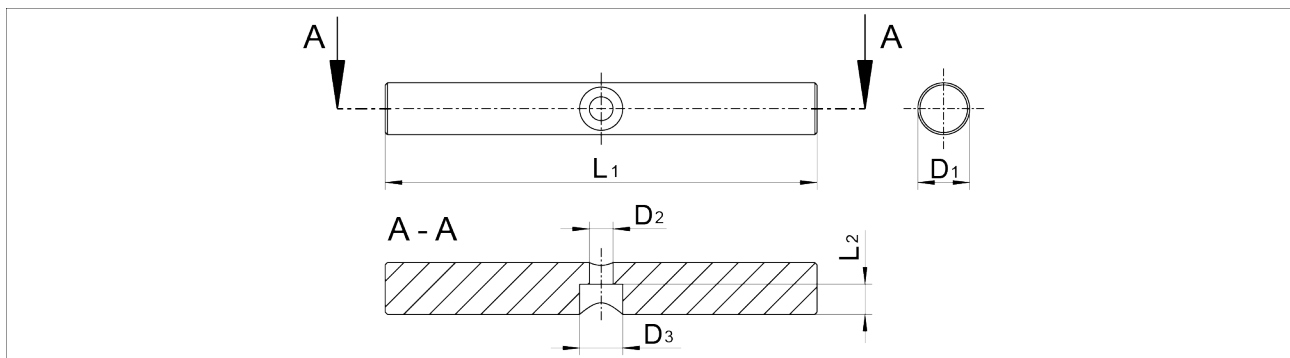
## 7.4.2 Assembly tool Y



Assembly tool Y, part 1

Tab.: (Dimensions in mm)

PZH-plus	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	L <sub>5</sub>	L <sub>6</sub>	L <sub>7</sub>	L <sub>8</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	M <sub>1</sub>	R <sub>1</sub>
20	100	-	9.0	4.5	3.0	13.0	17.0	1.0	12.0	12.0	1.6	12.0	M5	-
30	100	-	11.5	5.75	5.0	13.0	17.0	1.0	15.0	15.0	2.6	15.0	M5	-
50	130	15.0	17.0	8.5	8.0	13.0	17.0	1.0	15.0	25.0	2.6	15.0	M5	R8
75	200	15.0	26.0	13.0	8.0	21.0	27.0	1.0	20.0	36.0	5.1	20.0	M8	R8



Assembly tool Y, part 2

Tab.: (Dimensions in mm)

PZH-plus	L <sub>1</sub>	L <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>
20	100	7	12	5.5	10
30	100	7	15	5.5	10
50	100	7	15	5.5	10
75	150	11	20	9	15

## 7.5 Servicing and assembling the product

Position of the item numbers ▶ 7.6 [📄 39]

### Maintenance

- Clean all parts thoroughly and check for damage and wear.
- Treat all greased areas with lubricant.
  - ▶ 7.3 [📄 34]
- Oil or grease bare external steel parts.
- Replace all wear parts / seals.
  - Position of the wearing parts ▶ 7.6 [📄 39]
  - Seal kit ▶ 1.4.1 [📄 7]

### 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. ▶ 7.5.1 [📄 38]

### 7.5.1 Screw tightening torques

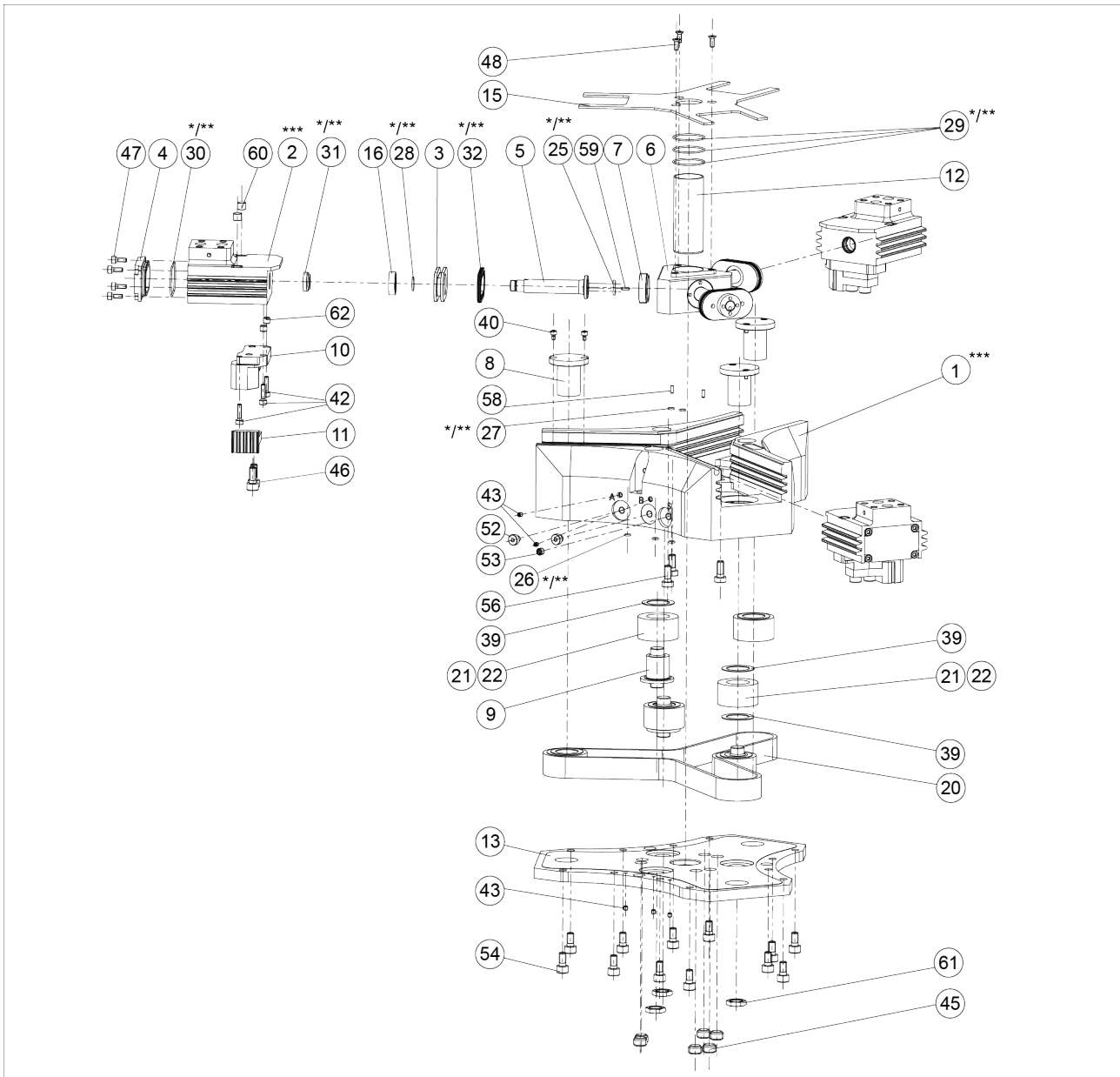
Position of the item numbers ▶ 7.6 [📄 39]

Tab.: Values in Nm

Item	42	46	47	48	54	56
20	0.8	1.3	0.8	0.8	1.3	1.3
30	1.3	6.0	1.3	1.3	6.0	6.0
50	10.0	6.0	6.0	1.3	10.0	6.0
75	25.0	48.0	25.0	1.3	48.0	10.0

## 7.6 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.



Assembly

- \* Wearing part, replace during maintenance.
- \*\* Included in the seal kit. Seal kit can only be ordered completely.
- \*\*\* Positions are adapted to each other and can not be replaced by the customer.

## 8 Translation of the original declaration of incorporation

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

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

We hereby declare that the partly completed machine described below

Product designation:        3-finger centric gripper / PZH-plus /pneumatic  
ID number                      0305360, 0305370, 0305380, 0305390

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, March 2024

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](https://www.schunk.com/SVHC).

*Signature: see original declaration*

Lauffen/Neckar, March 2024

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





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

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