

Assembly and Operating Manual

PZN

3-Finger-Centric Gripper



Superior Clamping and Gripping



Imprint

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Technical changes:

We reserve the right to make alterations for the purpose of technical improvement.

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Dear Customer,

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 [□ 5] 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](https://www.schunk.com).

1.1.3 Sizes

This operating manual applies to the following sizes:

- PZN 50
- PZN 64
- PZN 80
- PZN 100
- PZN 125
- PZN 160
- PZN 200

1.1.4 Variants

This operating manual applies to the following variations:

- PZNwithout gripping force maintenance
- PZNwith gripping force maintenance"O.D. gripping" (AS)
- PZNwith gripping force maintenance"I.D. gripping" (IS)
- PZNhigh-temperature (V/HT)

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 applicable documents, ▶ [1.1.2 \[5\]](#)
- Observe the ambient conditions and operating conditions, Link [Umgebungs- und Einsatzbedingungen](#)
- Observe the specified maintenance intervals, ▶ [6 \[40\]](#)

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 PZN in the version ordered
- Accessory pack

Content of the accessory pack:

PZN 50:

- 6 x countersunk screws
- 3 x washers
- 2 x O-rings for direct mounting without hoses
- 2 x eccentric insert
- 2 x cylinder pins for fixing
- 2 x sealing screws for hose connections

PZN 64 - 200:

- 2 x O-rings for direct mounting without hoses
- 1 x control cam
- 2 x cylinder pins for fixing
- 2 x sealing screws for hose connections

ID.-No. of the accessory pack

Size	ID number	
	PZN	PZNV/HT
PZN 50	5509651	395509651
PZN 64	5509412	395509412
PZN 80	5509414	395509414
PZN 100	5509415	395509415
PZN 125	5509417	395509417
PZN 160	5509419	395509419

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.

ID.-No. of the seal kit

Size	ID number	
	PZN	PZN V/HT
PZN 50	0370762	39370762
PZN 64	0370505	0370696
PZN 80	0370506	0370606
PZN 100	0370507	0370629
PZN 125	0370508	0370779
PZN 160	0370509	0370706
PZN 200	0370747	39370747

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

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- 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 Environmental 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. See also Link Daten Umgebungs- und Einsatzbedingungen.

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 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 from sharp edges and corners!

Sharp edges and corners can cause cuts.

- Use suitable protective equipment.

**⚠ 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 8573-1:7 4 4
Nominal working pressure [bar]	6
Min. pressure [bar] without gripping force maintenance with gripping force maintenance	2.0 4.0
Max. pressure [bar] without gripping force maintenance with gripping force maintenance	8.0 6.5
Noise emission [dB(A)]	≤ 70

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

4 Assembly

4.1 Mechanical connection

4.1.1 Fastening of the gripper

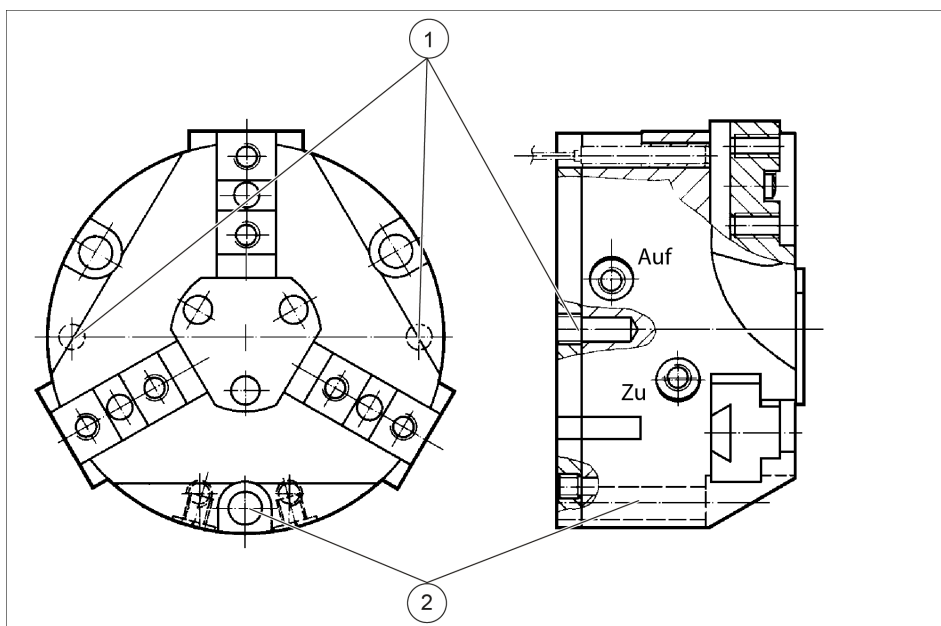
Evenness of the mounting surface

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

Requirements for evenness of the mounting surface (Dimensions in mm)

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

Mounting



Opportunities of assembly

Item	PZN				
	50	64	80/100	125/160	200
1	Ø3H7	Ø4H7	Ø5H7	Ø6H7	Ø8H7
2	3 x M3	3 x M5	3 x M6	3 x M8	3 x M10

NOTE

- For attachment from behind or lateral fix the modular unit with the locating holes intended for this purpose.
- Secure the product unit with the securing holes intended for this purpose.
- Secure the top jaws with the securing holes intended for this purpose.



⚠ 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.

4.1.2 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.

4.2 Air connection



⚠ 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.

NOTICE

Damage to the gripper is possible!

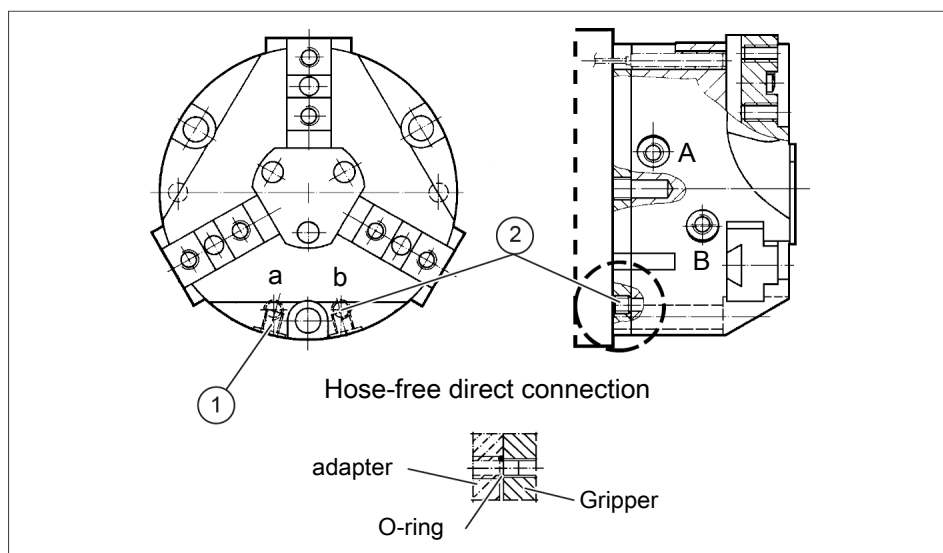
If the maximum permissible finger weight or the permissible mass moment of inertia of the fingers is exceeded, the gripper can be damaged.

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

NOTICE

Observe the requirements for the air supply

▶ 3 [16].



Thread diameter of the air connections

Item	Connection	50	64	80	100, 125, 160, 200
1	Hose connection (A = open, B = close)	2 x M5			2 x R1/8"
2	Hose-free direct connection (a = open, b = close)	2 x M3	2 x M4	2 x M5	

- 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.

4.3 Mounting the sensor

NOTE

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

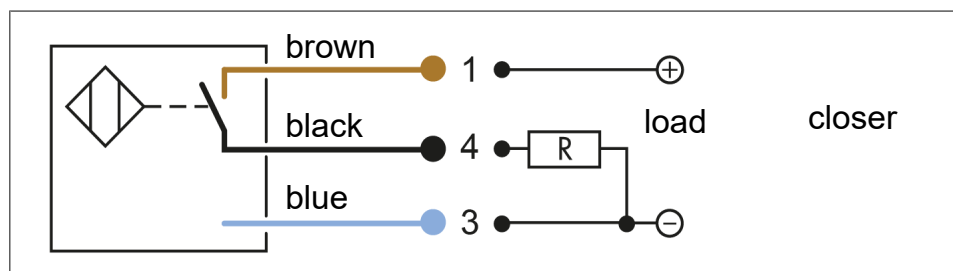
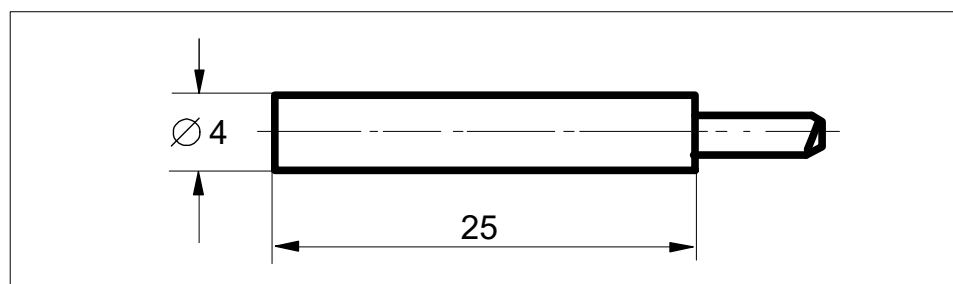
The product is prepared for the use of sensors.

- For the exact type designations of suitable sensors, please see catalog datasheet and Link Übersicht Sensoren.
- 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.

4.3.1 Overview of sensors

Designation	PZN						
	50	64	80	100	125	160	200
Inductive proximity switch IN 40	X	X	X	–	–	–	–
Inductive proximity switch IN 65	–	–	–	X	–	–	–
Inductive proximity switch IN 80	X	–	–	–	X	X	X
Flexible position sensor FPS	–	X	X	X	X	X	X

4.3.2 Inductive proximity switch IN 40



Types that can be ordered (☞ catalog):

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

Make sure that you handle the proximity switches properly:

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

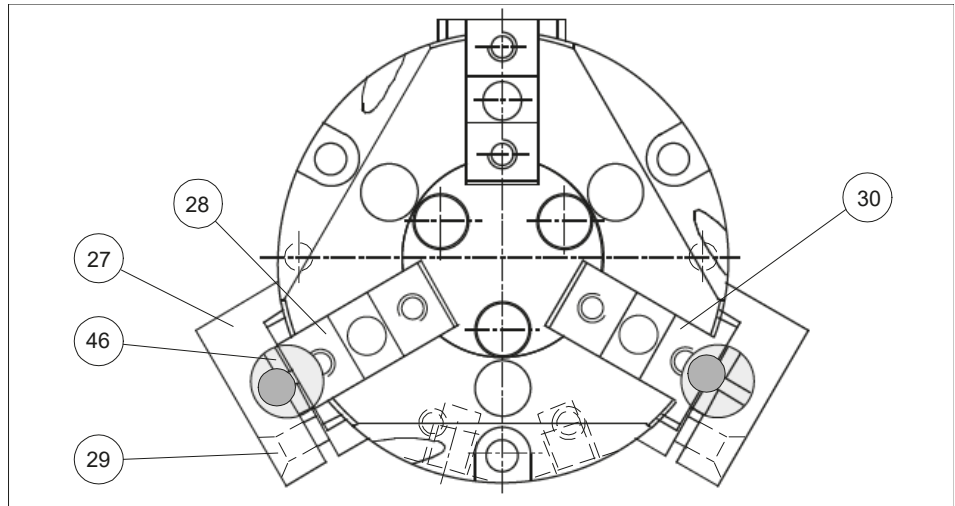
The inductive proximity switches are electronic components, which can react sensitively to high-frequency interference or electromagnetic fields.

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

Mounting and adjusting of the proximity switch PZN 50

NOTE

Proximity switches are accessories of a gripper and therefore have to be ordered separately. The inquiry with proximity switches $\varnothing 4 \times 30$ (2 closers) can be adjusted. Concerning the inquiry with proximity switches M 8 x 1 x 32 it is only possible to query either the open position or the closed position of the gripper.



Gripper open:

1. Move the gripper to the “open” position.
2. Push the proximity switch 1 carefully into the eccentric insert (46) until it touches the base jaw with the milled step (30).
3. Pull back the proximity switch for appr. 0.5 mm.
4. Turn the eccentric insert (46) by using a fork-wrench SW 8, until the proximity switch actuates.
5. Fix the eccentric insert (46) with the clamping screw (29).
6. Test the function of the gripper by opening and closing it.

Gripper closed:

1. Move the gripper to the “closed” position.
2. Push the proximity switch carefully into the eccentric insert (46) until it touches the base jaw with the milled pocket (28).
3. Pull back the proximity switch for appr. 0.5 mm.
4. Turn the eccentric insert (46) by using a fork-wrench SW 8, until the proximity switch actuates.
5. Fix the eccentric insert (46) with the clamping screw (29).
6. Test the function of the gripper by opening and closing it.

Part gripped:

1. Clamp the piece that you want to grip.
2. Push the proximity switch carefully into the eccentric insert (46) until it touches the base jaw (28/30).
3. Pull back the proximity switch for appr. 0.5 mm.
4. Turn the eccentric insert (46) by using a fork-wrench SW 8, until the proximity switch actuates.
5. Fix the eccentric insert (46) with the clamping screw (29).
6. Test the function of the gripper by opening and closing it.

To query the two final positions gripper “opened” and gripper “closed” with two proximity switches M 8 x 1 x 32, you have to take out the two eccentric inserts (46) out of the tool holder (27) and replace them with the proximity switches.

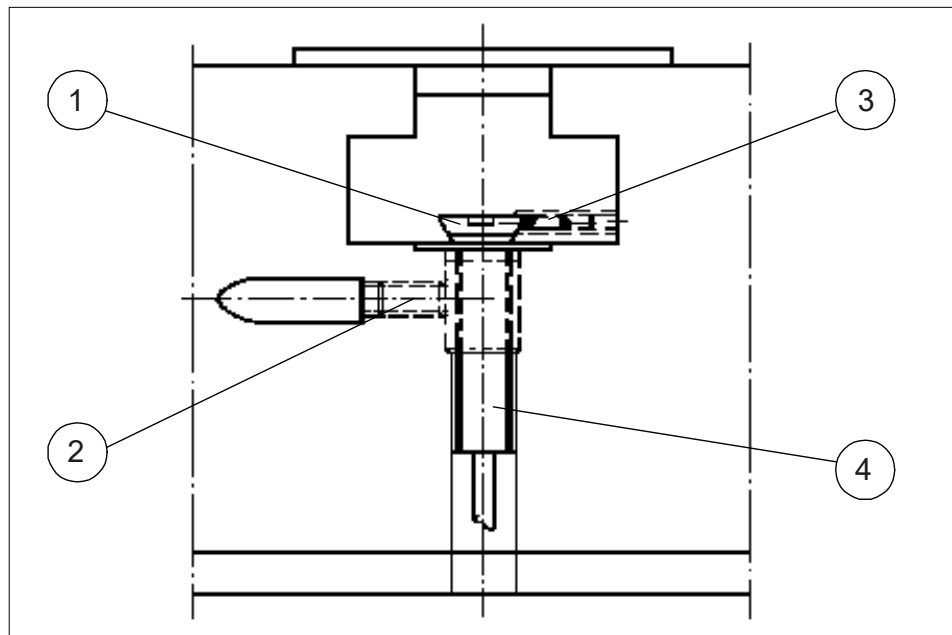
To replace them you need a closer for the gripper position “open”, and an opener for the gripper position “closed”. Furthermore, the toolholder for the position “gripper opened” has to be fixed by a distance plate (thickness $t = 2.5$ mm with a stroke 1 or $t = 1.5$ with a stroke = 2) and fastened by using some screws. The tool holder for the position “gripper closed” as well has to be fixed by a distance plate and fastened by using some screws.

The necessary distance plates and fixing screws will be delivered in the little plastic bag. By diversifying the switching distance you can regulate the shift point slightly.

Mounting and adjusting of the proximity switch PZN 64 und 80

NOTE

The switch cams for gripper "open" and "close" are already mounted and adjusted. Control cams for intermediate positions can be found in the little plastic bag. For gripper position "component gripped" a control cam is needed, which may be shortened for large interfering edges. This control cam is supplied free of charge in every consignment of this type of gripper.



1	Control cam (magnetic)
2	Clamping screw, Proximity switch
3	Clamping screw, Control cam
4	Proximity switch

Gripper open:

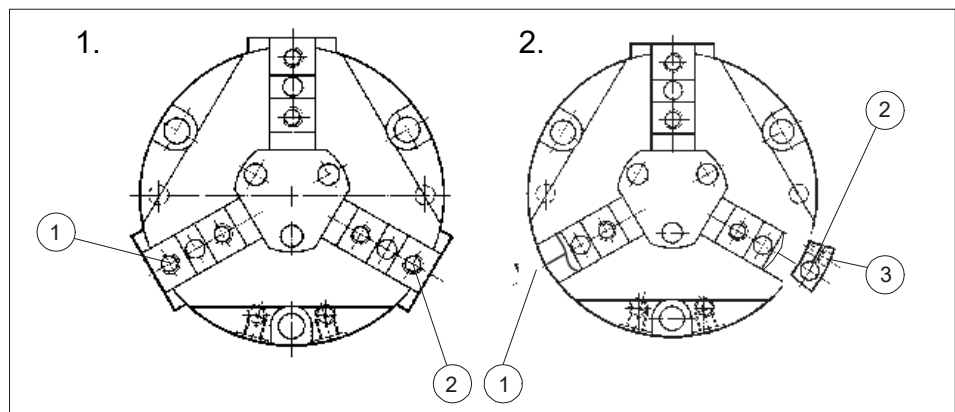
1. Move the gripper to the "open" position.
2. Actuate the closer carefully into the drill until the switch touches the control cam (1).
3. Pull back the proximity switch for appr. 0,5 mm.
4. Fix the proximity switch with the sets crew (2). For extra mounting, you have to tighten the clamping screw.
5. Connect the proximity switch.
6. Test the function of the gripper by opening and closing it.

Gripper closed:

1. Move the gripper to the "closed" position.
2. Actuate the closer carefully into the drill until the switch touches the control cam (1).
3. Pull back the proximity switch for appr. 0,5 mm.
4. Fix the proximity switch with the sets crew (2). For extra mounting, you have to tighten the clamping screw.
5. Connect the proximity switch.
6. Test the function of the gripper by opening and closing it.

Part gripped:

1. Mount the proximity switch as it is described above.
2. Move the gripper in "open" position.
3. Loosen the set screw, which clamps the control cam.
4. Clamp the workpiece that should be gripped.
5. Move the gripper carefully to the "open" position.
6. Fix the control cam and test function.

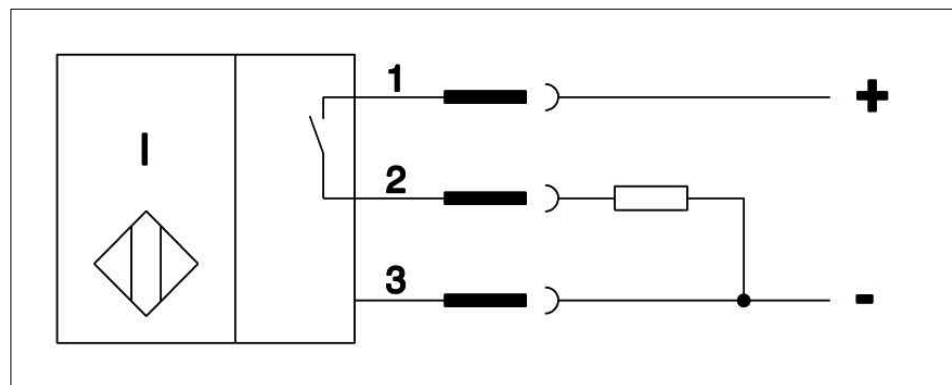
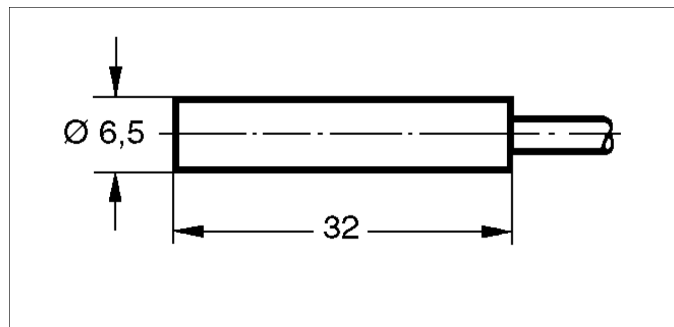


**1. PZN in standard version
(except PZN 50)**

**2. PZN 64, 80 with
Näherungsschalter
M 8 x 1 x 32 outside**

1	Closer (for gripper closed or workpiece gripped)
2	Closer (for gripper open or work piece gripped)
3	Clamping screw

4.3.3 Inductive proximity switch IN 65



Inductive proximity switch IN 65

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

orderable types (☞ catalogue).

The used inductive proximity switch is reverse battery protected and short circuit-proof.

Make sure that the proximity switches are used only for its intended purpose:

- Do not tear at the cable
- Don't let the sensor swing at the cable.
- Do not tighten the fixing screws or anchoring clip too much.
- Stick to the max. bending radius of the cable (☞ catalogue).
- Prevent the proximity switches from touching any hard objects. Also make sure that they do not get in contact with chemicals in particular nitric, chromic or sulphuric acid.

The Proximity switch is electronic parts which is sensitive to any electromagnetic fields or high-frequency disturbances.

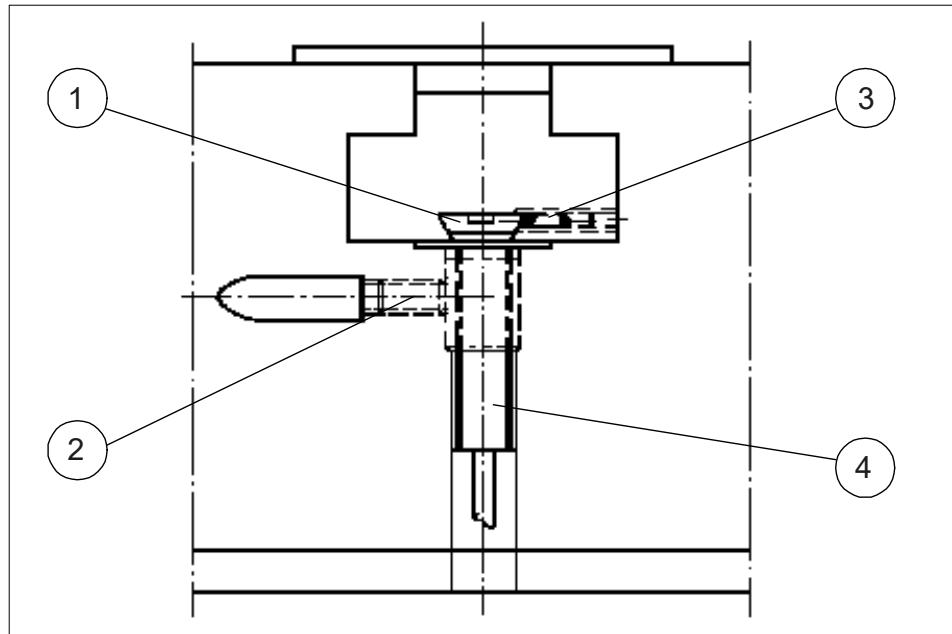
- Check the position and installation of the cable. Make sure that you keep a sufficiently large distance to any source of interference.
- It is allowed to mount several sensors of the same type parallel to each other. This construction does not increase the permitted load.

- You also have to take into account that the leakage load of each sensor (appr. 2 mA) adds up..

**Mounting and
adjusting of the
proximity switch
PZN 100**

NOTE

The switch cams for gripper "open" and "close" are already mounted and adjusted. Control cams for intermediate positions can be found in the little plastic bag. For gripper position "component gripped" a control cam is needed, which may be shortened for large interfering edges. This control cam is supplied free of charge in every consignment of this type of gripper.



1	Control cam (magnetic)
2	Clamping screw, Proximity switch
3	Clamping screw, Control cam
4	Proximity switch

NOTICE

The max. tightening moment of the screws of the proximity switch is 100 Ncm.

Gripper open:

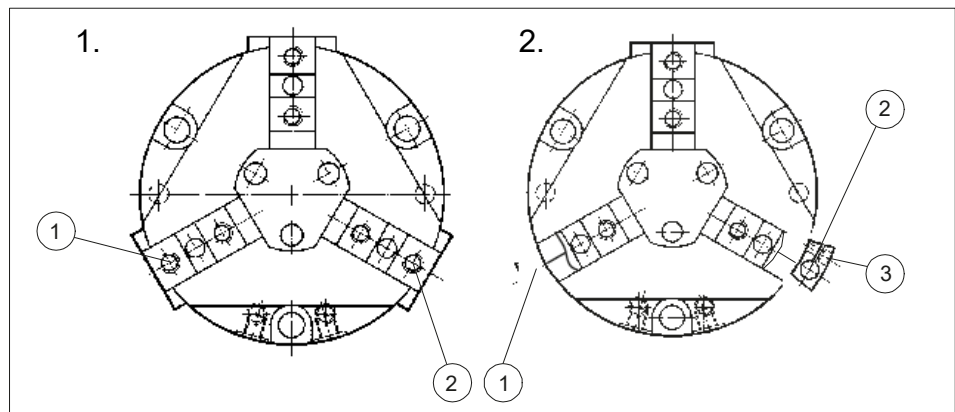
1. Move the gripper to the "open" position.
2. Actuate the closer carefully into the drill until the switch touches the control cam (1).
3. Pull back the proximity switch for appr. 0,5 mm.
4. Fix the proximity switch with the set screw (2). For extra mounting, you have to tighten the clamping screw.
5. Connect the proximity switch.
6. Test the function of the gripper by opening and closing it.

Gripper closed:

1. Move the gripper to the "closed" position.
2. Actuate the closer carefully into the drill until the switch touches the control cam (1).
3. Pull back the proximity switch for appr. 0,5 mm.
4. Fix the proximity switch with the set screw (2). For extra mounting, you have to tighten the clamping screw.
5. Connect the proximity switch.
6. Test the function of the gripper by opening and closing it.

Part gripped:

1. Mount the proximity switch as it is described above.
2. Move the gripper in "open" position.
3. Loosen the set screw, which clamps the control cam.
4. Clamp the workpiece that should be gripped.
5. Move the control cam until the proximity switch actuates.
6. Move the gripper carefully to the "open" position.
7. Fix the control cam and test function.

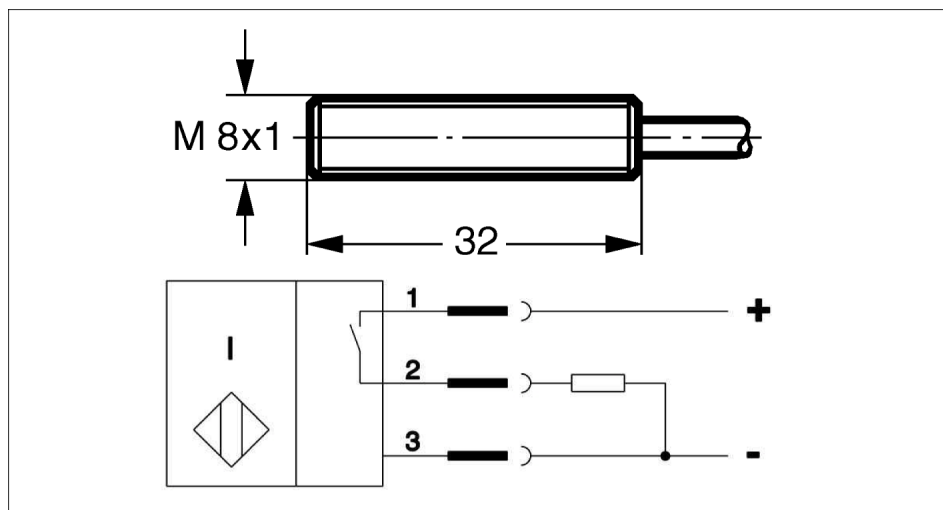


1. PZN in standard version

2. PZN 100 with proximity switch M 8 x 1 x 32 outside

1	Closer (for gripper closed or workpiece gripped)
2	Opener (for gripper open or workpiece gripped)
3	Clamping screw

4.3.4 Inductive proximity switch IN 80



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. (see catalog)
- Avoid contact of the proximity switches with hard objects and with chemicals, in particular nitric acid, chromic acid and sulphuric acid.

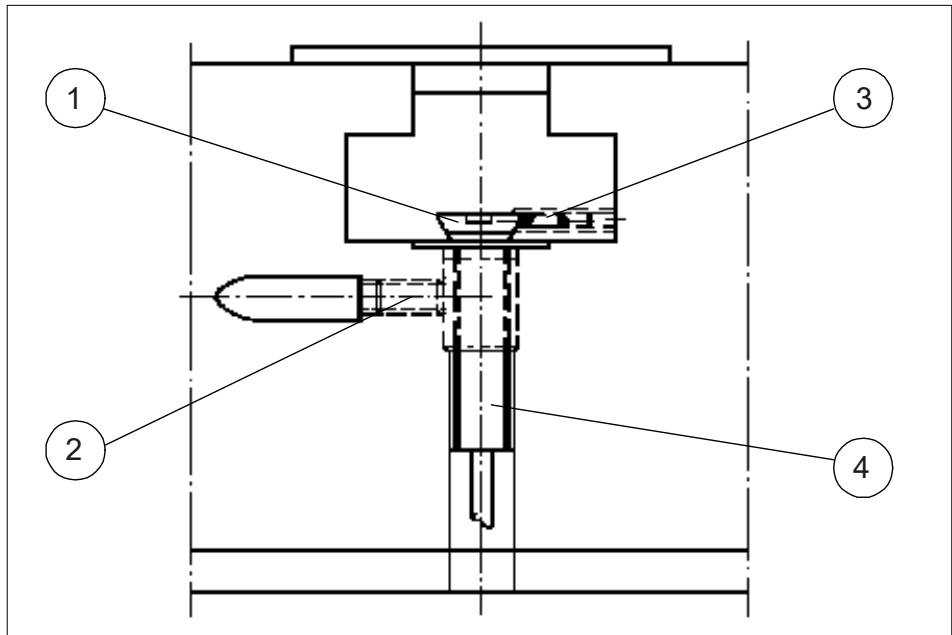
The inductive proximity switches are electronic components, which can react sensitively to high-frequency interference or electromagnetic fields.

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

Mounting and adjusting of the proximity switch 125 - 200

NOTE

The switch cams for gripper "open" and "close" are already mounted and adjusted. Control cams for intermediate positions can be found in the little plastic bag. For gripper position "component gripped" a control cam is needed, which may be shortened for large interfering edges. This control cam is supplied free of charge in every consignment of this type of gripper.



1	Control cam (magnetic)
2	Clamping screw, Proximity switch
3	Clamping screw, Control cam
4	Proximity switch

NOTICE**Damage to the sensor during assembly is possible.**

The max. tightening moment of the screws of the proximity switch is 100 Ncm.

Gripper open:

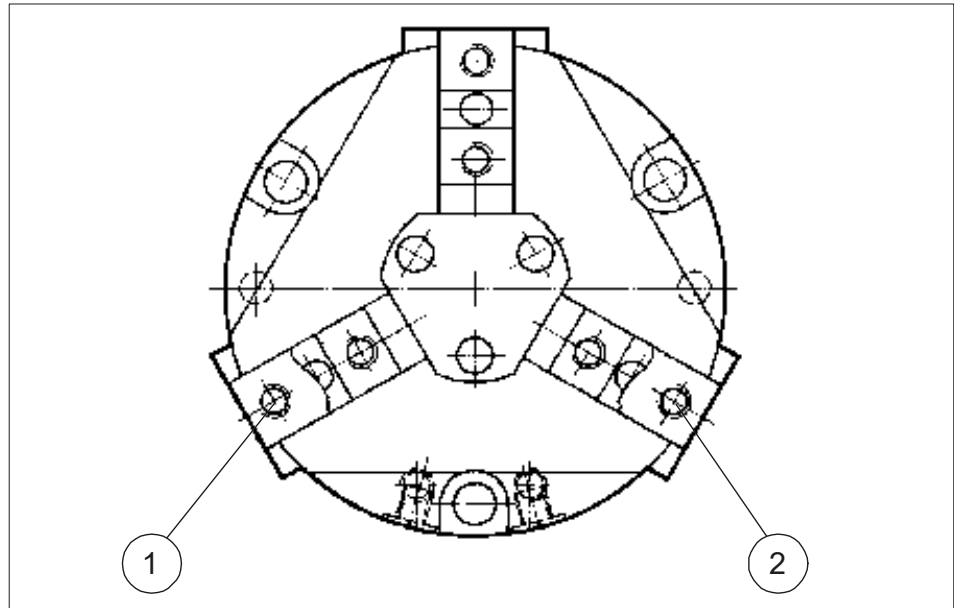
1. Move the gripper to the "open" position.
2. Actuate the closer carefully into the drill until the switch touches the control cam (1).
3. Pull back the proximity switch for appr. 0,5 mm.
4. Fix the proximity switch with the sets crew (22).
5. Connect the proximity switch.
6. Control function by closing and opening the gripper.

Gripper closed:

1. Move the gripper to the "closed" position.
2. Actuate the closer carefully into the drill until the switch touches the control cam (1).
3. Pull back the proximity switch for appr. 0,5 mm.
4. Fix the proximity switch with the set screw (2).
5. Connect the proximity switch.
6. Control function by closing and opening the gripper.

Part gripped:

1. Mount the proximity switch as it is described above.
2. Move the gripper in "open" position. (For PZN 200 in "closed" position).
3. Loosen the set screw, which clamps the control cam.
4. Clamp the workpiece that should be gripped.
5. Move the control cam until the proximity switch actuates.
6. Move the gripper carefully to the "open" position. (For PZN 200 to the "closed" position.)
7. Fix the control cam and test function.



PZN in standard version

1	Sensor (for gripper closed or workpiece gripped)
2	Sensor (for gripper open or work piece gripped)

4.3.5 Operation with a closing and opening proximity switch

In an old standard version of the PGN, the "open" position was monitored with an opener and the "closed" position with a closer. If a gripper of this version is replaced by a new version, however the existing sensors (1x closer, 1x opener) should still be used, please proceed as follows:

Closed-open monitoring

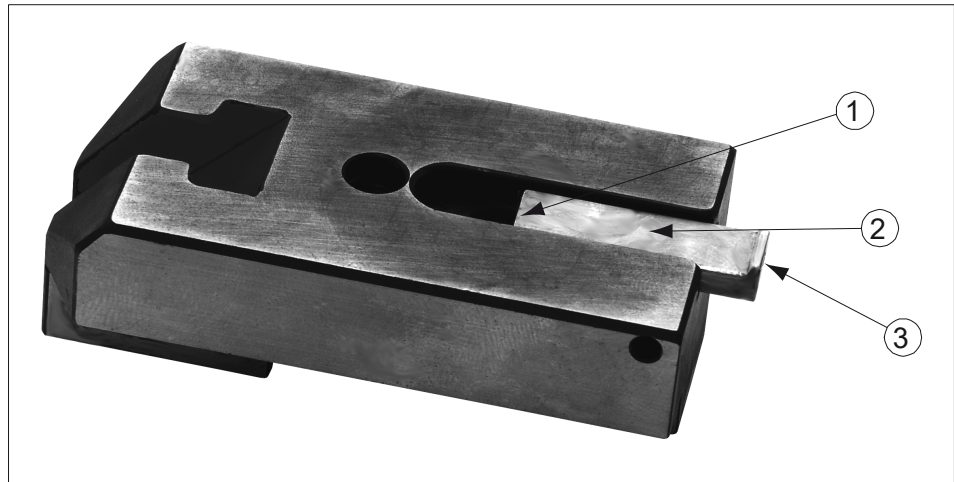
The position "open" is monitored by an opener, the position "closed" by a closer. The long control cam at the side of the opener has just to be turned by 180°. The nose is no longer turned towards the wedge hook, but is located outside the base jaw (see illustration).

The position of the opening sensor is adjusted now in a way, that it has the largest possible distance to the control cam, is still actuated and therefore doesn't furnish a signal while it traverses area **B** of the control cam.

An output signal is not furnished until the gripper completely opens and edge **K** of the control cam has been passed. Edge **K** therefore determines the switching point of the opening sensor.

Monitoring the status "Gripped" is the same as monitoring "closed" status of a closer.

After the initial adjustment of the control cam, the exact switching points have to be re-adjusted.



1	Edge K of the control cam
2	Even range B of the control cam
3	Nose

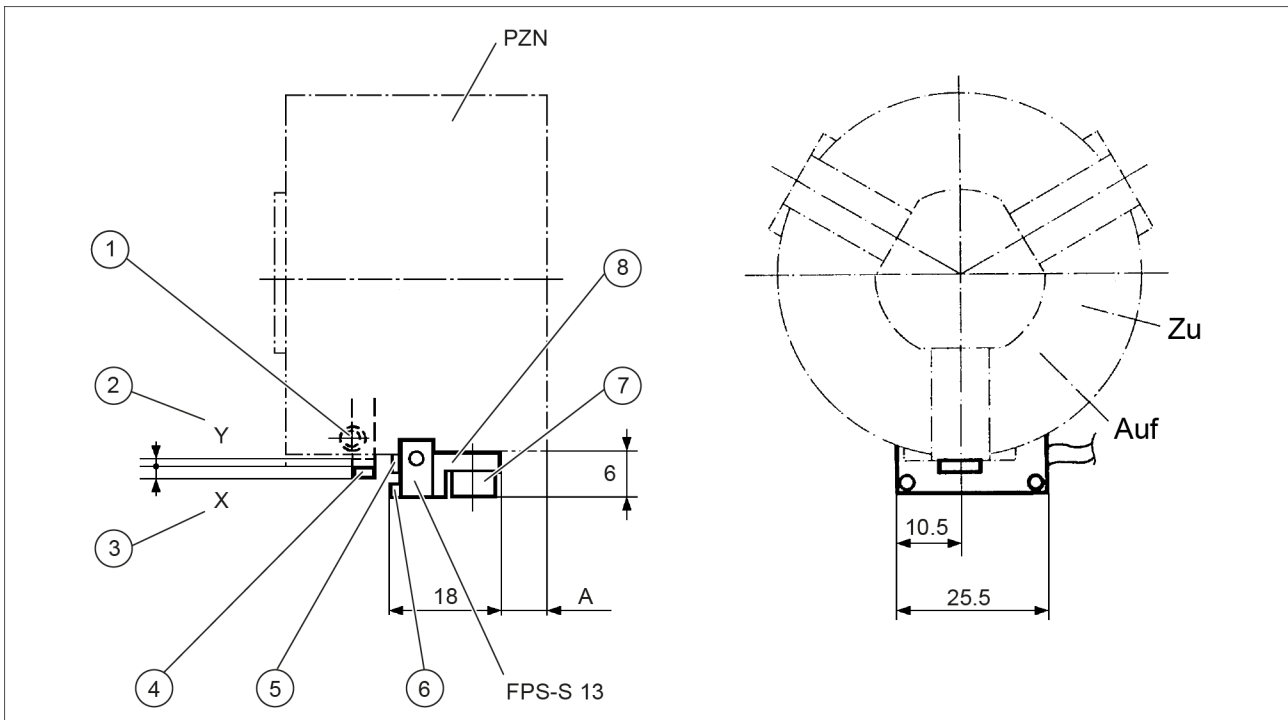
In case of grippers used for I.D. gripping, the status "gripped" is monitored with the long control cam and the status "closed" with the short one. All the other functions are working in the same way. Depending to the gripper and the monitored position, the long control cam may overhang from the housing and be an interfering contour. In this case the control cam should be shortened.

4.3.6 Flexibler Positionssensor FPS

To use the flexible position sensor FPS-M8, the grippers have to be retrofitted with a special mounting kit. This mounting kit is available from SCHUNK for the models below (see catalog):

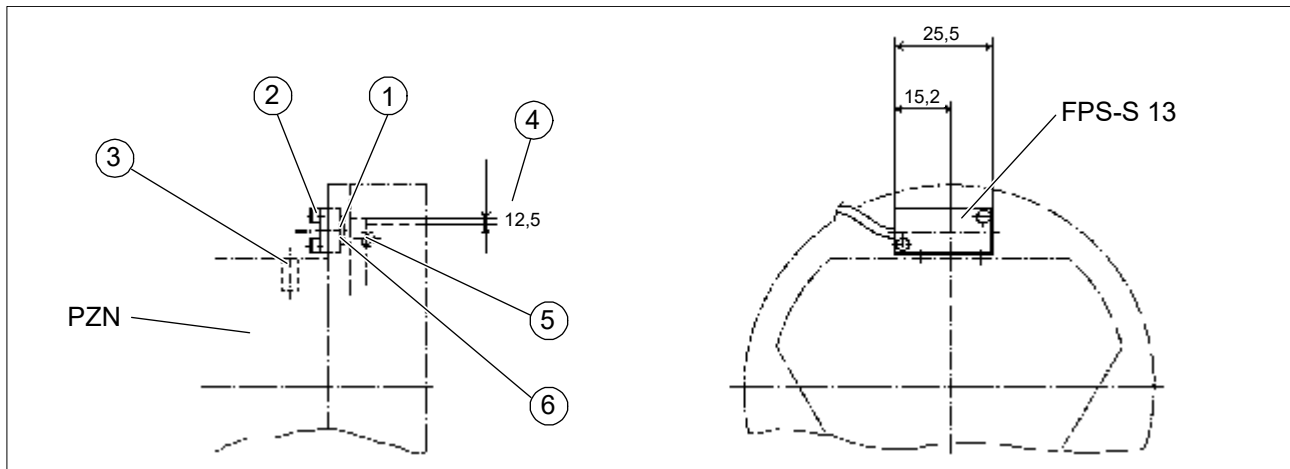
64, 80, 100, 125, 160, 200

PZN 64-160



1	Clamping screw in the base jaw. For clamping the switch cam, you have to move the gripper to the opened position.
2	Switch cam inside the forehead of the base jaw.
3	Switch cam outside the fore head of the base jaw.
4	Insert the coloured surface of the control cam into the base jaw. (1 Switch cam with a mounted magnet)
5	active sensor surface
6	2 Cylinder pins M 2 x 8
7	1 Cylinder pin M 4 x 6
8	1 Holder

PZN 200



1	Insert the coloured surface of the switch cam into the base jaw! (1 Switch cam with a mounted magnet)
2	2 Cylinder pins M 2 x 8
3	For clamping the clamping sleeve, remove the mounted clamping sleeve and the set screw.
4	The control cam towers the base jaw for appr. 12.5 mm
5	Clamping pin in the base jaw. For clamping the switch cam, move the gripper in the closed position.
6	active sensor surface

5 Troubleshooting

5.1 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. ▶ 4.1 [□ 17]
	Loosen the mounting screws of the product and actuate the product again.
Pressure drops below minimum.	Check air supply. ▶ 4.2 [□ 18]
Compressed air lines switched.	Check compressed air lines. ▶ 4.2 [□ 18]
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.

5.2 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. Link Pneumatischer Anschluss
Mounting surface is not sufficiently flat.	Check the evenness of the mounting surface. ▶ 4.1 [□ 17]
Component part defective.	Replace component or send it to SCHUNK for repair.

5.3 Product opens or closes abruptly

Possible cause	Corrective action
Too little grease in the mechanical guiding areas.	Clean and lubricate product. ▶ 6 [□ 40]
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.

5.4 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.

5.5 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.
	IMPORTANT! The throttle check valve must not be removed, even if the product has not reached the opening and closing times.
	If, despite optimum air connections, the opening and closing times specified in the catalogue are not achieved, SCHUNK recommends the use of quick-air-vent-valves directly at the product.
Loading too large.	Check permissible weight and length of the gripper fingers.

5.6 The gripper remains in an intermediate position without any external influence?

the gripper has to be checked at SCHUNK.

6 Maintenance

6.1 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.

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.

6.2 Maintenance interval

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.

Interval [Mio. cycles]	1.5
------------------------	-----

6.3 Lubricants/Lubrication points

SCHUNK recommends the lubricants listed.

Greasing area	Lubricant
Metallic sliding surfaces	Rivolta F.L.G. GT-2
All seals	Rivolta F.L.G. GT-2
Bore hole at the piston	Rivolta F.L.G. GT-2

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

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

NOTE

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

The guides in the housing can be re-lubricated as needed. Remove the set-screw of the air purge connection and replace it with a lubrication nipple.

6.4 Servicing and assembling the module

Position of the item numbers ▶ 7 [□ 48]

Maintenance

- Clean all parts thoroughly and check for damage and wear.
- Replace all wear parts / seals.
- The seals are in the enclosed sealing kit. ▶ 1.4 [□ 7]
- Treat all greased areas with lubricant. ▶ 6.3 [□ 40]
- Oil or grease bare external steel parts.

Assembly

Assembly takes place in the opposite order to disassembly. Observe the following:

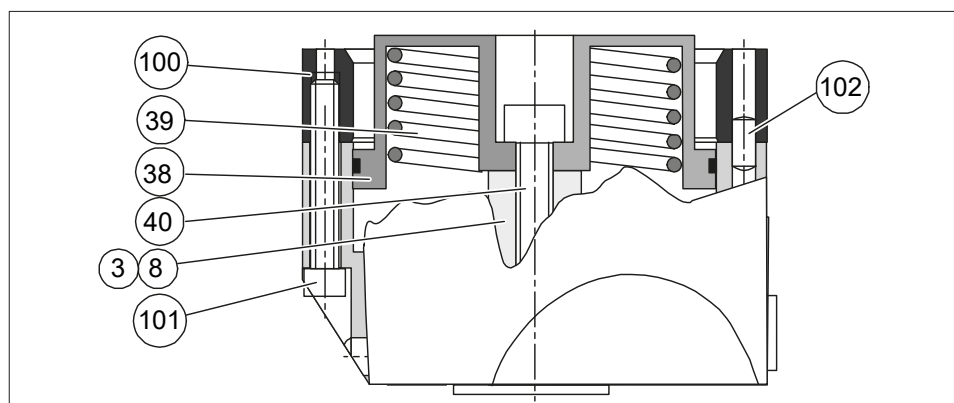
- Unless otherwise specified, secure all screws and nuts with Loctite no. 243 and tighten with the appropriate tightening torque. ▶ 6.4.3 [□ 45]
- Under variant with maintenance of gripping force "O.D. gripping", sizes 50-100 mount the cylinder piston by using a mounting device. Sizes 40-100, on sizes 125 und 160 mount the cylinder piston by using two mounting devices. Sizes 125 - 380.

6.4.1 Assembly by using a special assembly device

Position of the item numbers ▶ 7 [□ 48]

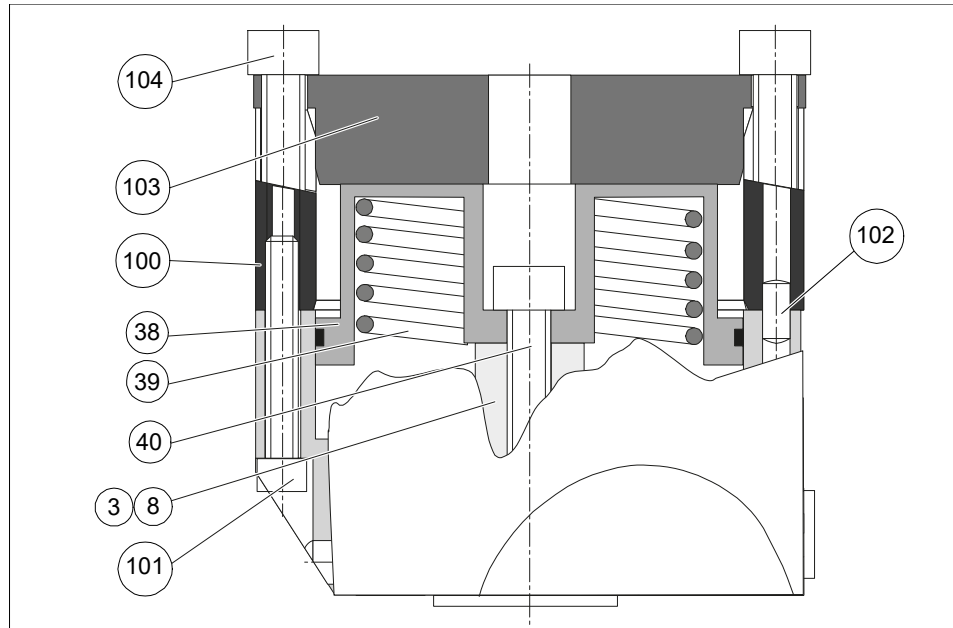
Dimensions of the assembly device ▶ 6.4.2 [□ 44]

mount the sizes
50-100 by using an
assembly device



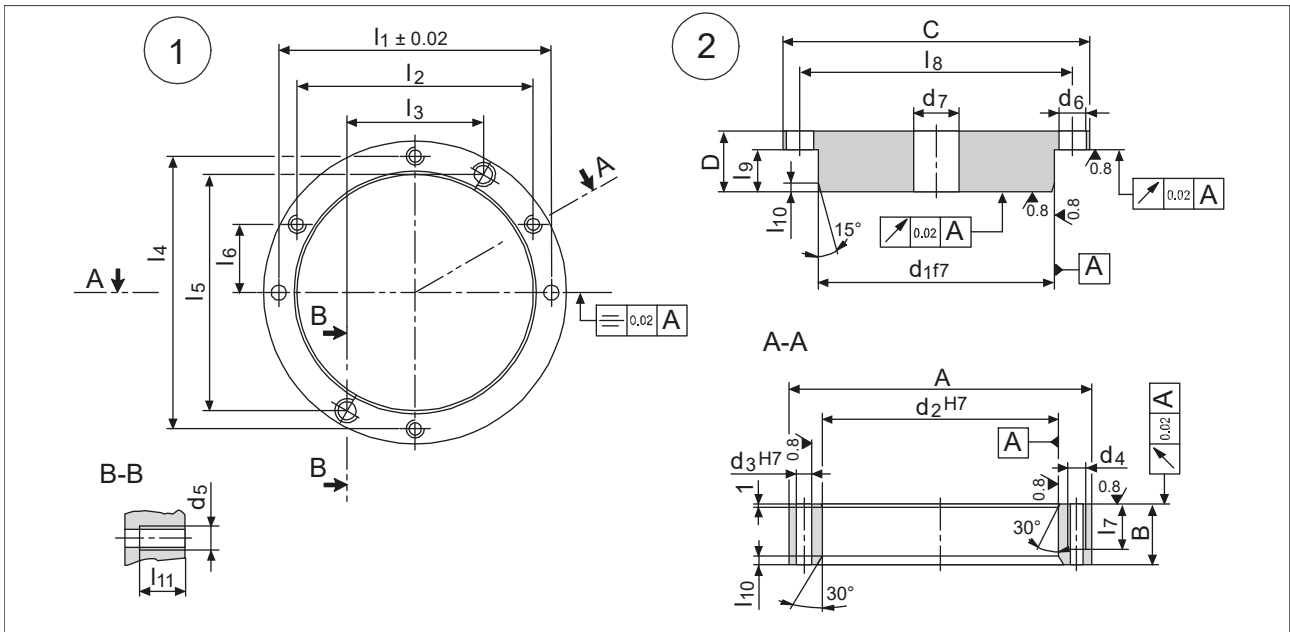
1. Fit fixture 1 (100) with the screws (101) and grease the centering hole with Renolit HLT 2.
2. Push springs (39) through the centering hole into the housing.
3. Fit the cylinder piston (38) to the centering hole and press it evenly into the hole by hand, (**WARNING:** make sure that it doesn't jam), until the cylinder piston contacts the spring.
4. Insert the screw (40) and screw it into the piston (3 / 8) with slight pressure.
5. Remove the fixture, insert the seal (17) and fit the cover (37).

mount the sizes 125 and 160 by using two assembly devices.



1. Fit fixture 1 (100) with the screws (101) and grease the centering hole with Renolit HLT 2.
2. Push springs (39) through the centering hole into the housing.
3. Fit the cylinder piston (38) to the centering hole and press it evenly into the hole by hand, (**WARNING:** make sure that it doesn't jam), until the cylinder piston contacts the spring.
4. Insert the screw (40) and screw it into the piston.
5. Fit the assembly device 2 (103) and screw it evenly into the assembly device 1 (100) by using the screws (104).
6. Insert the screw (40) and screw it into the piston (3 / 8).
7. Remove the fixture, insert the seal (17) and fit the cover (37).

6.4.2 Assembly devices gripping force maintenance



Assembly devices gripping force maintenance

Assembly devices cylinder piston - dimensions in mm

Type	∅ A	B	∅ C	D	∅d1f7	∅d2H7	∅d3H7	d4	d5	∅d6	∅d7
50	50	20	-	-	-	34	3	M3	-	-	-
64	64	20	-	-	-	45	4	M5	-	-	-
80	80	20	-	-	-	58	5	M6	-	-	-
100	100	20	-	-	-	78	5	M6	-	-	-
125	125	72	125	54	94.5	94.5	6	M8	M8	9	18
160	160	80	160	57	127.5	127.5	6	M8	M8	9	20

Assembly devices cylinder piston - dimensions in mm

Type	l1	l2 ± 0.02	l3	l4	l5	l6	l7	l8	l9	l10
50	45	38	-	44	-	11	12	-	-	2.5
64	56	48.5	-	56	-	14	20	-	-	3
80	70	60.6	-	70	-	17.5	20	-	-	3
100	90	78	-	90	-	22.5	20	-	-	3
125	112	97	56	112	97	28	20	112	44.5	3
160	146	126.4	73	146	126.4	36.5	20	146	47.5	3

Assembly devices cylinder piston - dimensions in mm/ Screws for assembly devices cylinder piston

Type	l11	Screw 1 DIN EN ISO 4762	Screw 2 DIN EN ISO 4762
50	-	M3 x 25	-
64	-	M5 x 25	-
80	-	M6 x 30	-
100	-	M6 x 35	-
125	43	M8 x 45	M8 x 50
160	43	M8 x 45	M8 x 50

6.4.3 Screw tightening torques

Position of the item numbers ▶ 7 [48]

Item	50	64	80	100	125	160	200
10	4 Nm	10 Nm	10 Nm	24 Nm	48 Nm	84 Nm	125 Nm
11	0.8 Nm	0.8 Nm	3.6 Nm	3.6 Nm	7.1 Nm	10 Nm	24 Nm
40	6 Nm	21 Nm	21 Nm	35 Nm	60 Nm	100 Nm	-

6.5 Disassemble the product

6.5.1 Version without gripping force maintenance

Position of the item numbers ▶ 7 [48]



⚠ 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. Remove the pressure tubes.



⚠ WARNING

For the version which is equipped with a pressurepiece be aware that the pressure-piece is springpackaged!

2. Loosen the screws (33) carefully and take out the pressure-piece. Remove the springs (35).
3. Remove the cover plate (5).
4. Mark the mounting position of the piston (3 / 8) and the position of the base jaws.
5. Remove the screws (11) and take off the cover (4). Loosen the screws (10).
6. Take the cylinder piston (6) out of the housing and press the piston (3 / 8) up out of the housing.
7. Remove the base jaws out of the housing.

6.5.2 Version with gripping force maintenance O.D.

Position of the item numbers ▶ 7 [48]



⚠ WARNING

Risk of injury due to spring forces!

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

- Dismantle the product carefully.



⚠ WARNING

Risk of injury due to spring forces!

The cylinder piston is under spring tension.

- Carefully disassemble the product.

**⚠ WARNING**

For the version which is equipped with a pressure-piece be aware that the pressure-piece is spring packaged!

1. Remove the pressure tubes.
2. Loosen the screws (33) carefully and take out the pressure-piece. Remove the springs (35).
3. Remove the cover plate (5).
4. Mark the mounting position of the piston (3 / 8) and the position of the base jaws.

**⚠ WARNING**

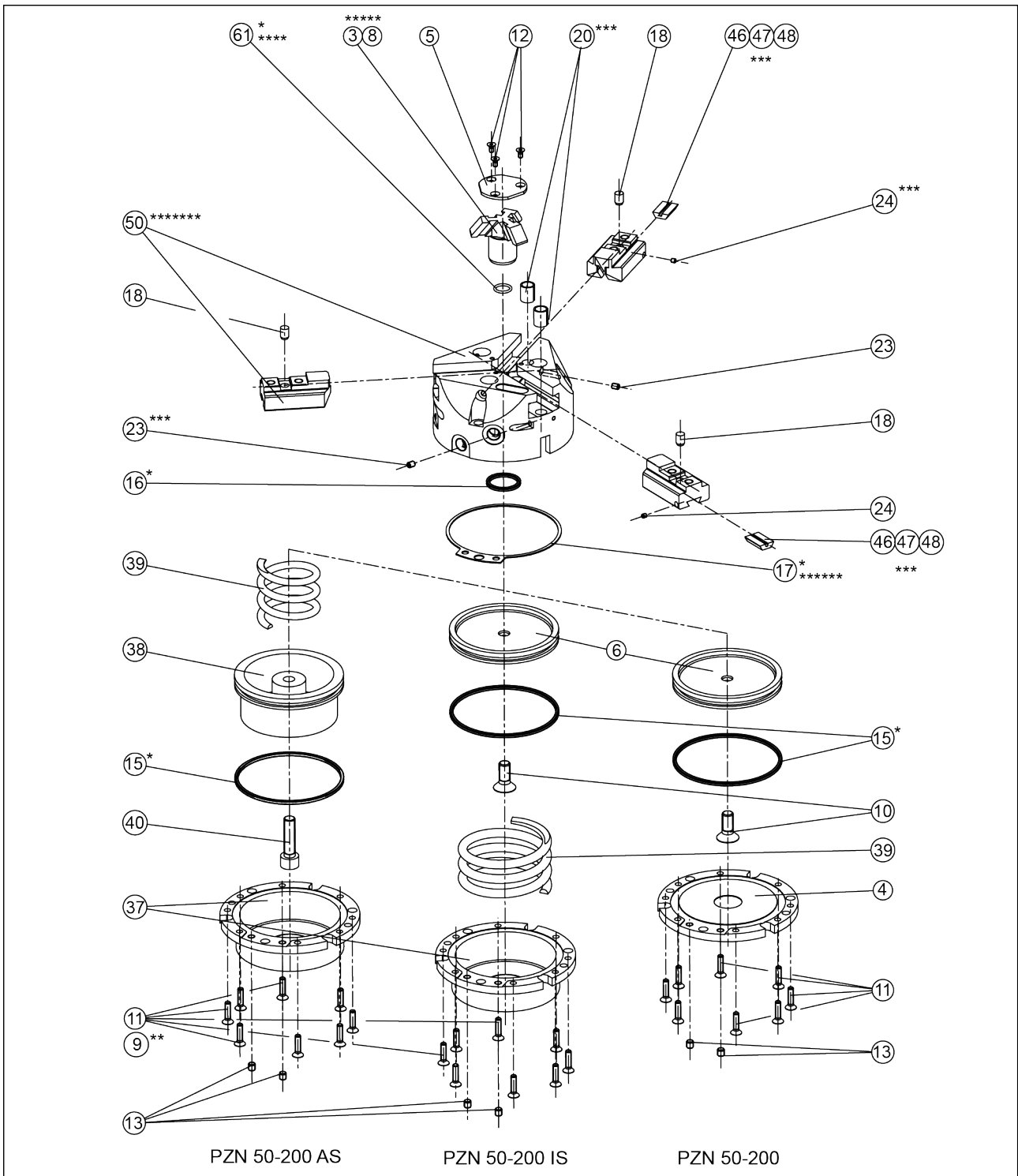
For the version “Gripping force maintenance by spring” it may be possible that as a result of a defect, the cover (37) is spring-pressured.

5. Clamp the gripper carefully between the housing (50) and the cover (37).
6. Remove the screws (11) and unclamp it carefully.
7. Remove the cover (37).
8. Clamp the gripper again carefully between the housing (50) and the cylinder piston (38).
9. Remove the screws (40) and slowly unclamp until the spring is released.
10. Take the cylinder piston (6) out of the housing and press the piston (3 / 8) up out of the housing.
11. Remove the base jaws out of the housing.

7 Assembly drawing

The following figure is an example image.
It serves for illustration and assignment of the spare parts.
Variations are possible depending on size and variant.

- * Wearing part, replace during maintenance.
Included in the seal kit. Seal kit can only be ordered completely.
- ** used for PZN 50
- *** not be used for PZN 50
- **** not be used for PZN 50 - 80
- ***** **PZN 200:** Pos. 8 / 26
- ***** **PZN 125:** Pos. 17* / 42*
- ***** **PZN 160 - 200:** Pos. 17* / 60*
- ***** Positions are adapted to each other and can not be replaced by the customer.



Assembly for the Variants "O.D. gripping" / "I.D. gripping" / without gripping force maintenance

9 UKCA declaration of incorporation

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

Manufacturer/
Distributor SCHUNK Intec Limited
 Clamping and gripping technology
 3 Drakes Mews, Crownhill
 MK8 OER 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: 3-Finger-Centric Gripper / PZN / pneumatic
ID number 0300309 ... 0300644, 39300309 ... 39300609

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 manufacturer agrees to forward on demand the relevant technical documentation for the partly completed machinery in electronic form to national authorities.

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

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



Lauffen/Neckar, February 2023

Dr.-Ing. Manuel Baumeister,
Technology & Innovation

10 Annex to declaration of Incorporation

in accordance with 2006/42/EC, Appendix II, no. 1 B

as well as

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

1. Description of the basic safety and health protection requirements, as per 2006/42/EC, Annex I and per the Supply of Machinery (Safety) Regulations 2008, that apply to and are fulfilled for the scope of the incomplete machine:

Product designation	3-Finger-Centric Gripper
Type designation	PZN
ID number	0300309 ... 0300644, 39300309 ... 39300609

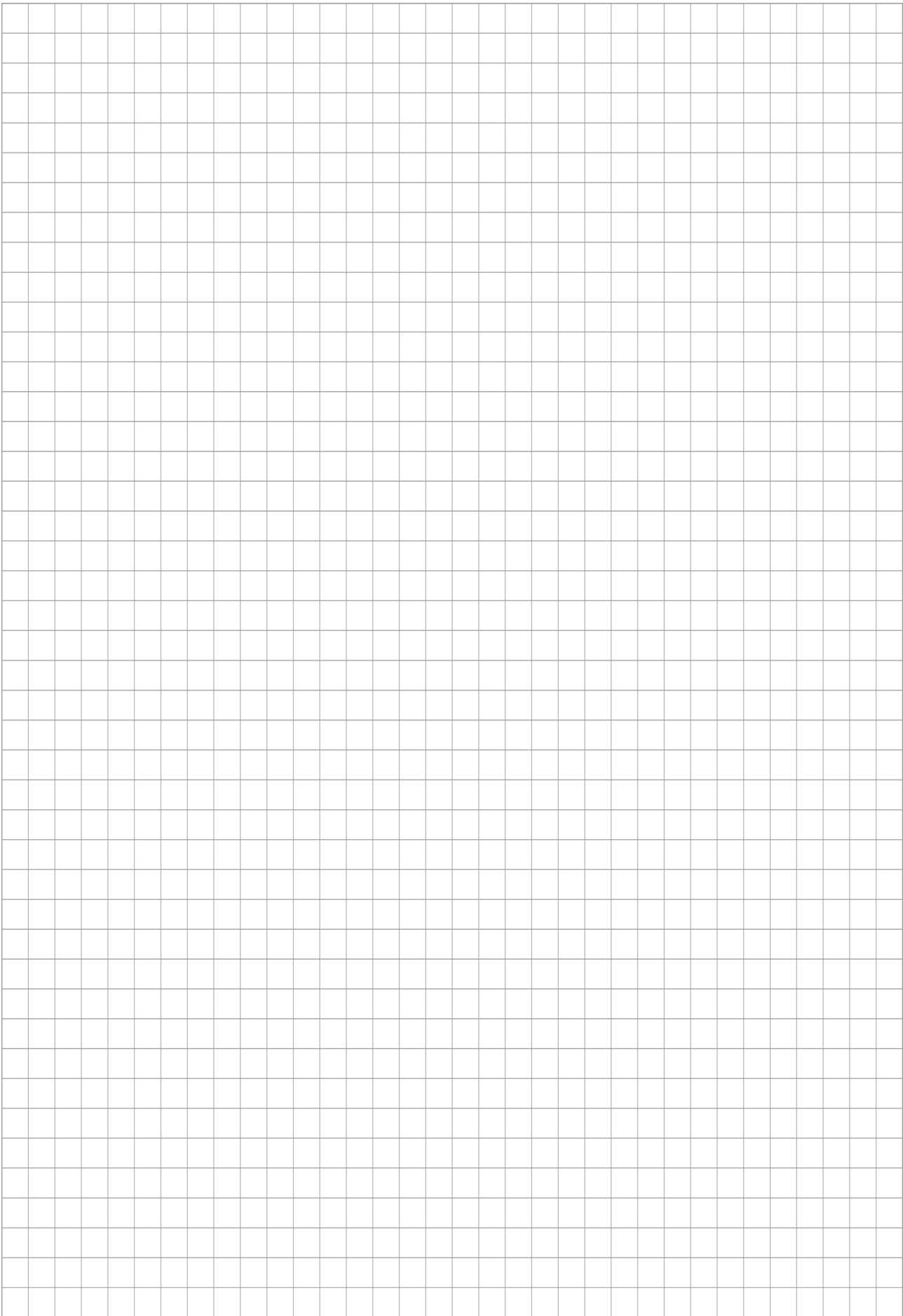
To be provided by the System Integrator for the overall machine	↓
Fulfilled for the scope of the partly completed machine	↓
Not relevant	↓

1.1	Essential Requirements		
1.1.1	Definitions	X	
1.1.2	Principles of safety integration	X	
1.1.3	Materials and products	X	
1.1.4	Lighting	X	
1.1.5	Design of machinery to facilitate its handling	X	
1.1.6	Ergonomics	X	
1.1.7	Operating positions		X
1.1.8	Seating		X

1.2	Control Systems		
1.2.1	Safety and reliability of control systems	X	
1.2.2	Control devices	X	
1.2.3	Starting	X	
1.2.4	Stopping	X	
1.2.4.1	Normal stop	X	
1.2.4.2	Operational stop	X	
1.2.4.3	Emergency stop	X	
1.2.4.4	Assembly of machinery	X	
1.2.5	Selection of control or operating modes	X	
1.2.6	Failure of the power supply		X

1.3	Protection against mechanical hazards			
1.3.1	Risk of loss of stability			X
1.3.2	Risk of break-up during operation			X
1.3.3	Risks due to falling or ejected objects			X
1.3.4	Risks due to surfaces, edges or angles		X	
1.3.5	Risks related to combined machinery			X
1.3.6	Risks related to variations in operating conditions			X
1.3.7	Risks related to moving parts		X	
1.3.8	Choice of protection against risks arising from moving parts			X
1.3.8.1	Moving transmission parts		X	
1.3.8.2	Moving parts involved in the process			X
1.3.9	Risks of uncontrolled movements			X
1.4	Required characteristics of guards and protective devices			
1.4.1	General requirements			X
1.4.2	Special requirements for guards			X
1.4.2.1	Fixed guards			X
1.4.2.2	Interlocking movable guards			X
1.4.2.3	Adjustable guards restricting access			X
1.4.3	Special requirements for protective devices			X
1.5	Risks due to other hazards			
1.5.1	Electricity supply		X	
1.5.2	Static electricity		X	
1.5.3	Energy supply other than electricity		X	
1.5.4	Errors of fitting		X	
1.5.5	Extreme temperatures			X
1.5.6	Fire			X
1.5.7	Explosion			X
1.5.8	Noise			X
1.5.9	Vibrations			X
1.5.10	Radiation	X		
1.5.11	External radiation	X		
1.5.12	Laser radiation	X		
1.5.13	Emissions of hazardous materials and substances			X
1.5.14	Risk of being trapped in a machine	X		
1.5.15	Risk of slipping, tripping or falling	X		
1.5.16	Lightning			X

1.6	Maintenance			
1.6.1	Machinery maintenance		X	
1.6.2	Access to operating positions and servicing points		X	
1.6.3	Isolation of energy sources		X	
1.6.4	Operator intervention		X	
1.6.5	Cleaning of internal parts		X	
1.7	Information			
1.7.1	Information and warnings on the machinery		X	
1.7.1.1	Information and information devices		X	
1.7.1.2	Warning devices		X	
1.7.2	Warning of residual risks		X	
1.7.3	Marking of machinery	X		
1.7.4	Instructions	X		
1.7.4.1	General principles for the drafting of instructions	X		
1.7.4.2	Contents of the instructions	X		
1.7.4.3	Sales literature	X		
	The classification from Annex 1 is to be supplemented from here forward.			
2	Supplementary essential health and safety requirements for certain categories of machinery			X
2.1	Foodstuffs machinery and machinery for cosmetics or pharmaceutical products			X
2.2	Portable hand-held and/or guided machinery			X
2.2.1	Portable fixing and other impact machinery			X
2.3	Machinery for working wood and material with similar physical characteristics			X
3	Supplementary essential health and safety requirements to offset hazards due to the mobility of machinery		X	
4	Supplementary essential health and safety requirements to offset hazards due to lifting operations		X	
5	Supplementary essential health and safety requirements for machinery intended for underground work			X
6	Supplementary essential health and safety requirements for machinery presenting particular hazards due to the lifting of persons		X	



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