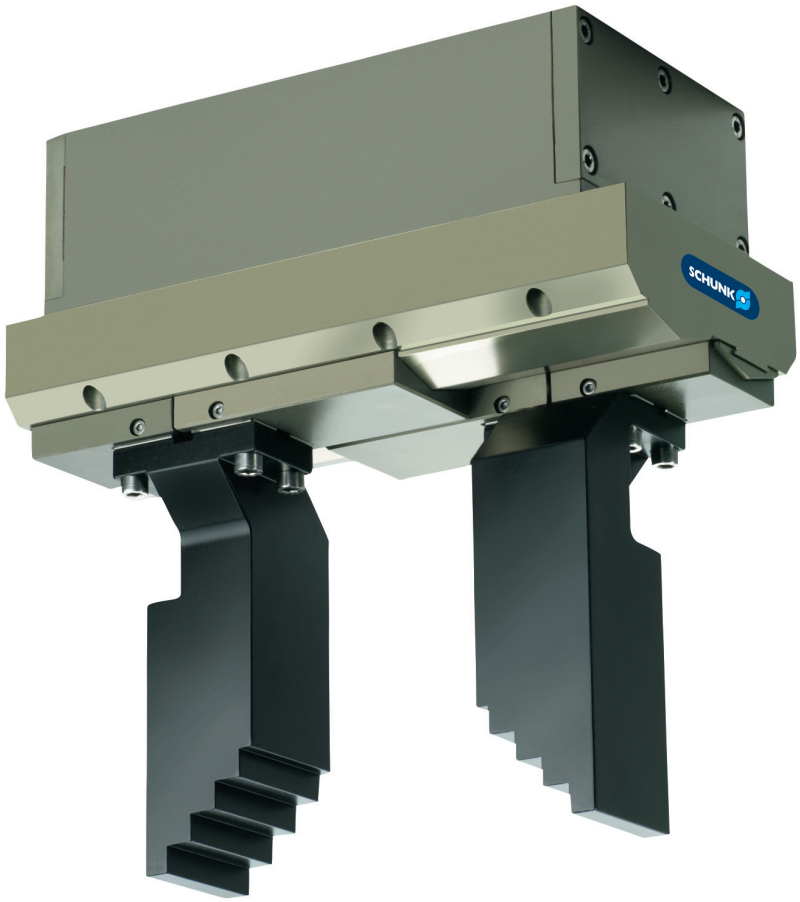
Assembly and Operating Manual

PGH

2-Finger parallel gripper



Superior Clamping and Gripping

SCHUNK®

Imprint

Technical changes:

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

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Dear Customer,

thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

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Table of Contents

1 General

1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

In addition to these instructions, the documents listed under Applicable documents [▶ 6] are applicable.

1.1.1 Presentation of Warning Labels

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

⚠ DANGER

Danger for persons!

Non-observance will inevitably cause irreversible injury or death.

⚠ WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.

⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

CAUTION

Material damage!

Information about avoiding material damage.

1.1.2 Applicable documents

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

The documents listed up here, can be download on our homepage schunk.com

1.1.3 Variants

This operating manual applies to the following variations:

- PGH without gripping force maintenance
- PGH with gripping force maintenance O.D. gripping
- PGH with gripping force maintenance I.D. gripping
- PGH High-temperature (HT)

1.2 Warranty

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

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

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

1.3 Scope of delivery

The scope of delivery includes

- 2-finger parallel gripper PGH in the version ordered
- Assembly and Operating Manual
- Accessory pack

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 Sensors

Overview of the compatible sensors

Designation	Type
Inductive proximity switches	IN
Position monitoring	FPS *

* Für PGH 30

- Exact type designation of the compatible sensors see catalog.
- Information on handling sensors is available at schunk.com or from SCHUNK contact persons.
- For mounting the sensors, mounting kits are partly necessary.

1.4.2 Seal kit

ID.-No. of the seal kit

Seal kit for	ID number
PGH 30	0370698
PGH 40	0370699
PGH 50	0370626
PGH 70	0370728

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, Technical data [▶ 17].
- When implementing and operating components in safety-related parts of the control systems, the basic safety principles in accordance with DIN EN ISO 13849-2 apply. The proven safety principles in accordance with DIN EN ISO 13849-2 also apply to categories 1, 2, 3 and 4.
- The product is intended for installation in a machine/system. The applicable guidelines must be observed and complied with.
- The product is intended for industrial and industry-oriented use.
- Appropriate use of the product includes compliance with all instructions in this manual.

2.2 Not intended use

It is not intended use if the product is used, for example, as a pressing tool, stamping tool, lifting gear, guide for tools, cutting tool, clamping device or a drilling tool.

- Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

2.3 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.

2.4 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.

2.5 Gripper fingers

Requirements for the gripper fingers

Stored energy within the product creates the risk of serious injuries and significant property damage.

- Arrange the gripper fingers in a way that the product reaches either the position "open" or "closed" in a de-energized state.
- Only exchange the gripper fingers when no residual energy remains in the product.
- Make sure that the product and the top jaws are a sufficient size for the application.

2.6 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, Technical data [▶ 17].
- 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.

2.7 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.

2.8 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.

2.9 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.

2.10 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.

2.11 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.

2.12 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.

2.13 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.

2.13.1 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.

2.13.2 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.

2.13.3 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.

2.13.4 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.

2.14 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 the base jaw procedure and when breaking or loosening the gripper fingers.

- 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

Size	PGH 30	PGH 40	PGH 50	PGH 70
Stroke per jaw [mm]	30	40	50	70
Opening time [s]	0,3	0,5	0,6	1,0
Closing time [s]	0,3	0,5	0,6	1,0
Weight [kg]	1,7	3,9	9	18
Mass moment of inertia I_y [kg cm^2]	110	420	1875	2000
Repeatability [mm]	0,05			
Max. permissible finger length [mm]	300	400	500	700
Noise emission [dB(A)]	≤ 70			
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:7 4 4			

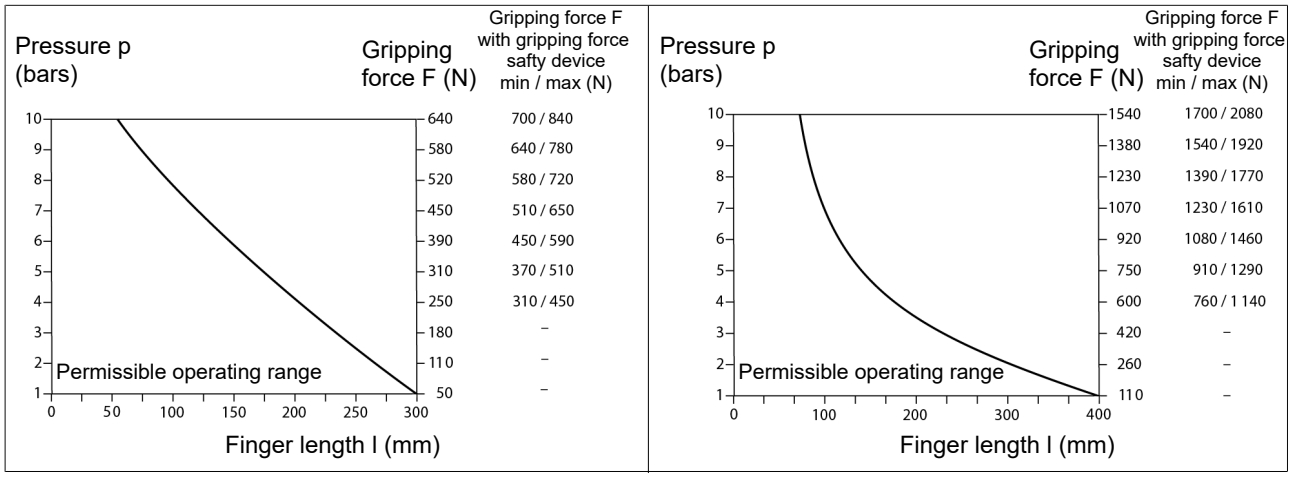
More technical data is included in the catalog data sheet. Whichever is the latest version.

3.1 Gripping force diagrams

NOTE

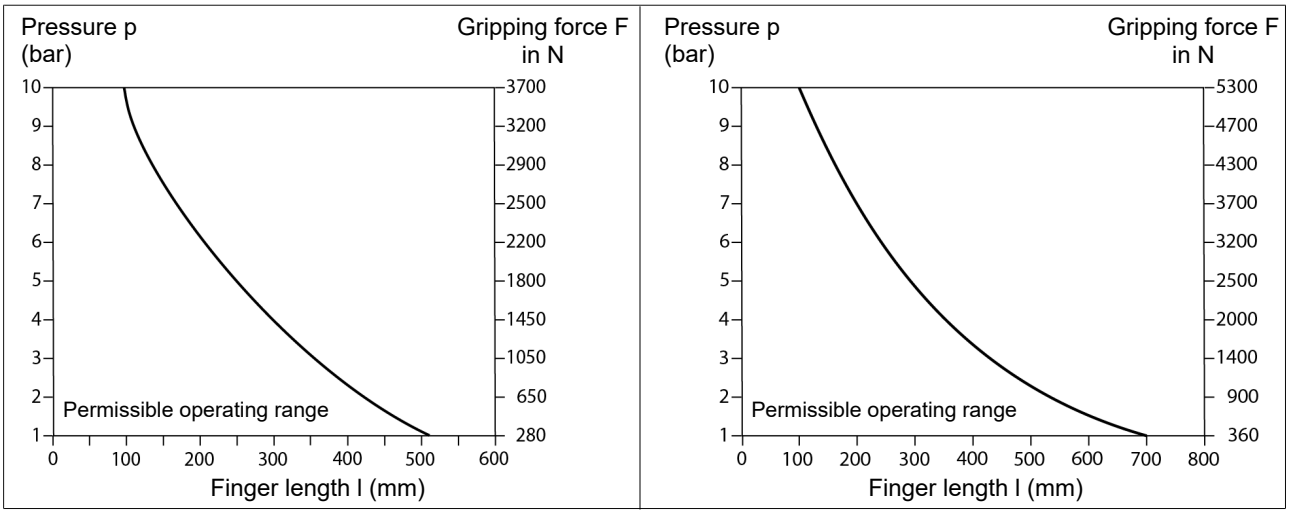
The values actually experienced by the gripper must fall within the permissible range!

PGH 30 / 40



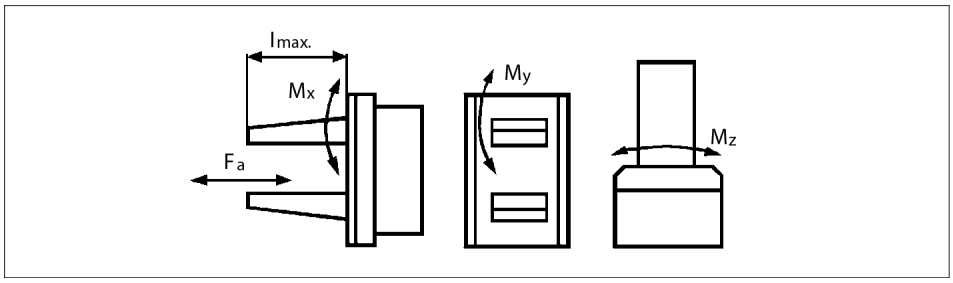
Gripping force diagrams PGH 30 / 40

PGH 50 / 70



Gripping force diagrams PGH 50 / 70

3.2 Maximum permissible forces and moments on the claw jaws



	PGH 30	PGH 40	PGH 50	PGH 70
$l_{max.}$	300 mm	400 mm	500 mm	700 mm
F_a	1000 N	1500 N	3500 N	6000 N
M_x	20 Nm	30 Nm	170 Nm	280 Nm
M_Y	30 Nm	50 Nm	250 Nm	300 Nm
M_Z	10 Nm	20 Nm	60 Nm	250 Nm

4 Assembly

4.1 Connections

4.1.1 Mechanical connection

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)

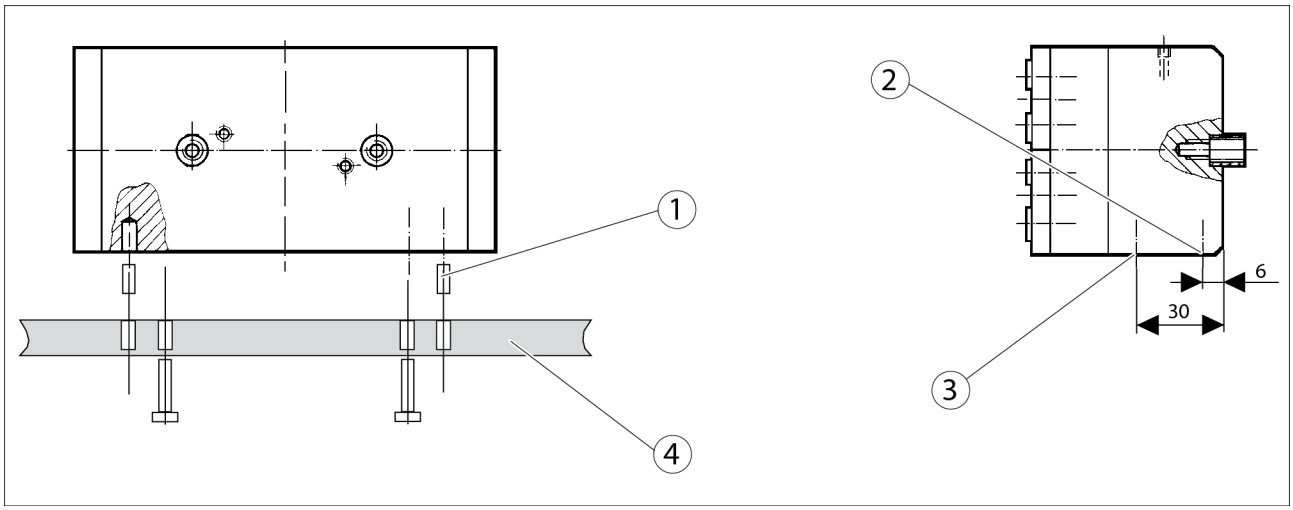
Edge length	Permissible unevenness
< 100	< 0.02
> 100	< 0.05

Lateral mounting

NOTE

The fastening thread between the air connections is sealed against dirt by a set screw. Before lateral fastening, the set screw must be removed.

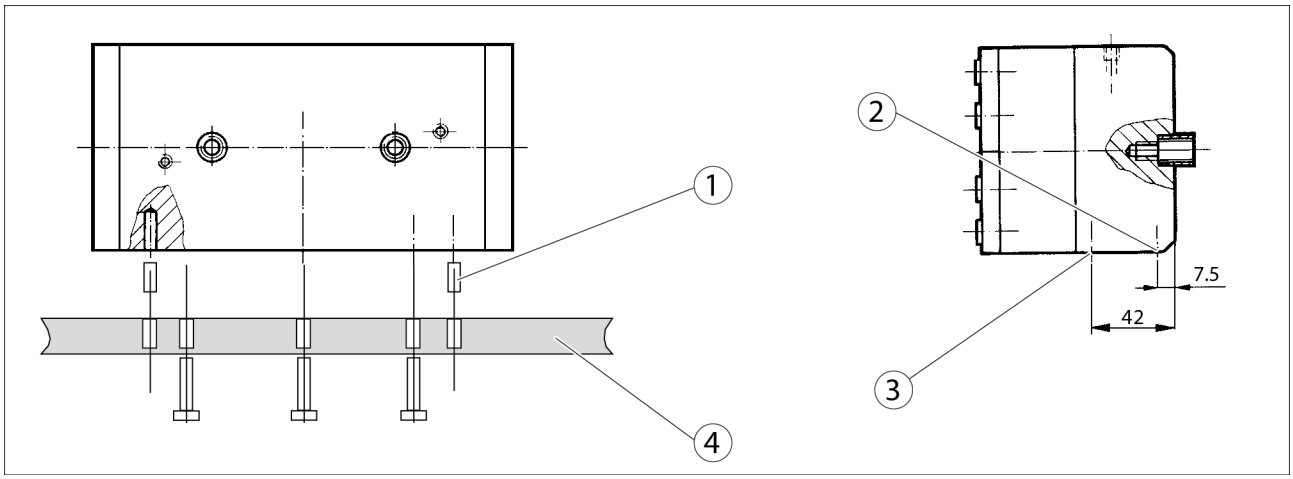
PGH 30



PGH 30

1	Cylindrical pin (Ø4m6 x 12) (2 parts from enclosed pack)	3	Screws M4 ISO 4762, 12.9 screw-in depth 4.5 mm
2	Screws M4 ISO 4762, 12.9 screw-in depth 7.5 mm	4	Adapter plate

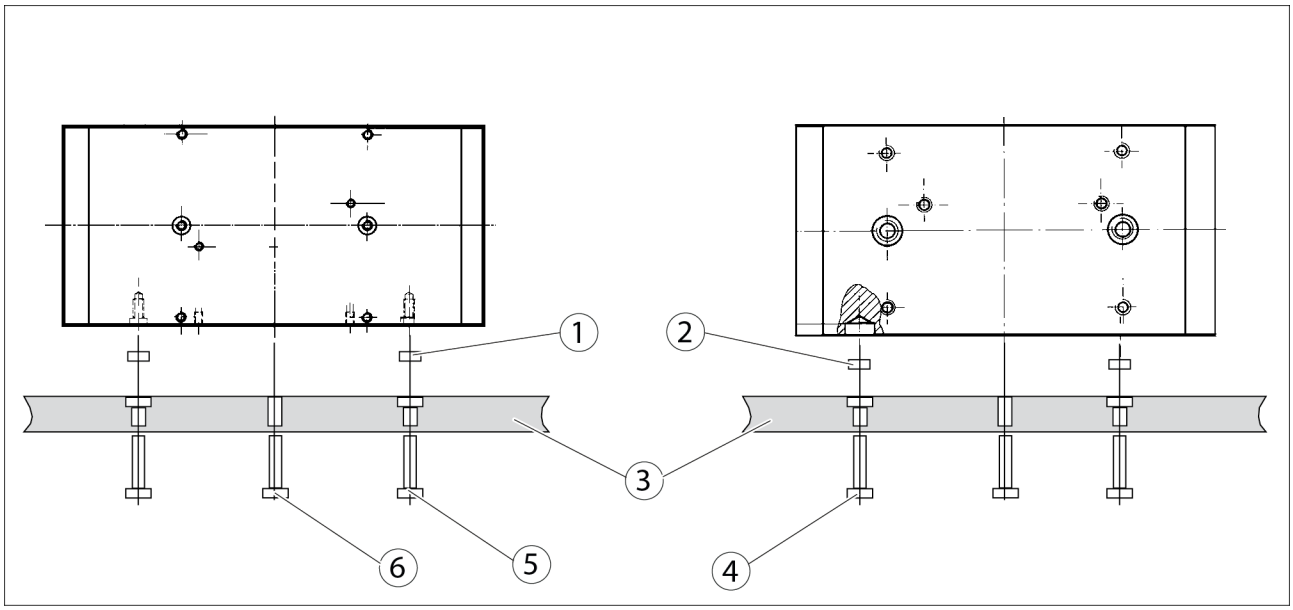
PGH 40



PGH 40

1	Cylindrical pin (Ø4m6 x 12) (2 parts from enclosed pack)	3	Srew M4 ISO 4762, 12.9 screw-in depth 6 mm
2	Screw M4 ISO 4762, 12.9 screw-in depth 9 mm	4	Adapter plate

PGH 50 / 70

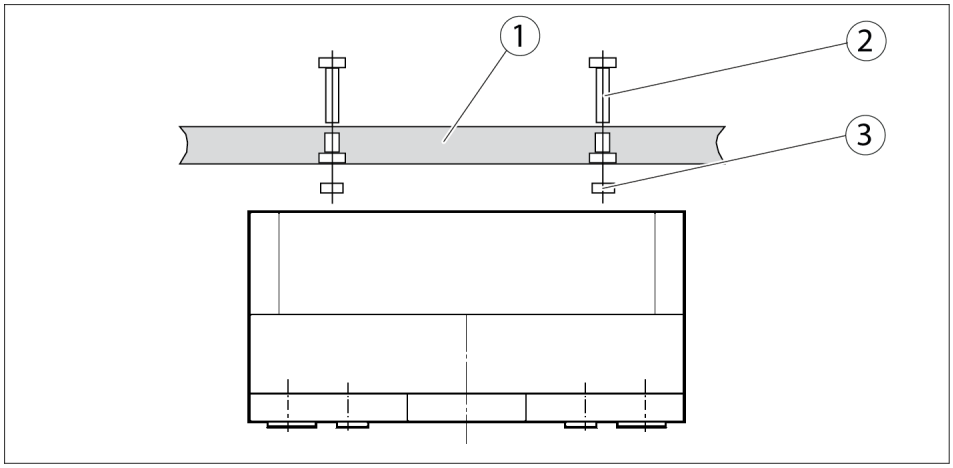


PGH 50 / 70

1	Centering sleeve (Ø10f7 x 10) (2 parts from enclosed pack)	4	6 Screws M8, screw-in depth 14 mm
2	Centering sleeve (Ø14f7 x 10) (2 parts from enclosed pack)	5	2 Screws M6, screw-in depth 12-15 mm
3	Adapter plate	6	4 Screws M6, screw-in depth 7-10 mm

Mounting from below

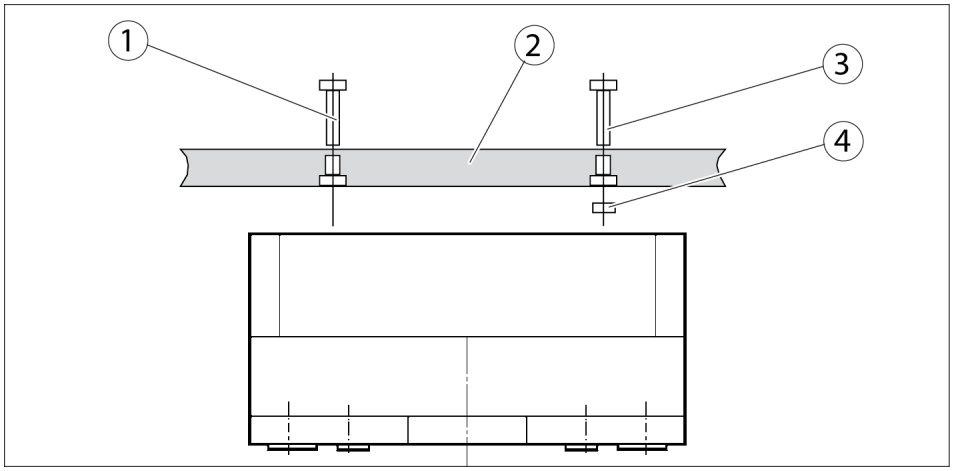
PGH 30 / 40



PGH 30 / 40

1	Adapter plate	3	Centering sleeve (Ø12f7 x 10) (2 parts from enclosed pack)
2	2 screws Screw-in depth: • PGH 30: 16 mm • PGH 40: 20 mm		

PGH 50 / 70



PGH 50 / 70

1	• PGH 50: 4 screws M6 Screw-in depth 7-10 mm • PGH 70: 4 screws M8 screw-in depth 14 mm	3	• PGH 50: 2 screws M6 Screw-in depth 12-15 mm • PGH 70: 2 screws M8 Screw-in depth21 mm
2	Adapter plate	4	• PGH 50: Centering sleeve (Ø10f7 x 10) (2 parts from enclosed pack) • PGH 70: Centering sleeve (Ø14f7 x 10) (2 parts from enclosed pack)

4.1.2 Pneumatic connection

NOTE

- Observe the requirements for the compressed air supply, Technical data [▶ 17].
- 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.

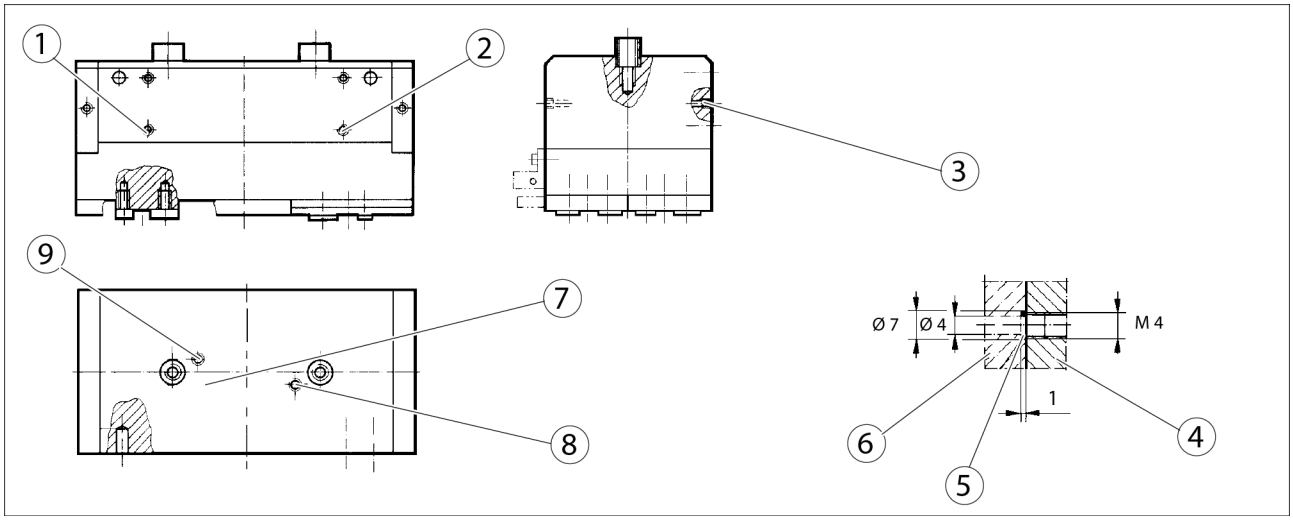
NOTE

The air connections are identical on PGH 30 / PGH 40 and PGH 50 / PGH 70 with gripping force maintenance device.

PGH 30	PGH 40	PGH 50	PGH 70
M4 / M5	M5	M5	M6 / R 1/8“

For hose-free assembly, use the two O-rings from the accessory kit. Close the unused air supplies with suitable dummy plugs.

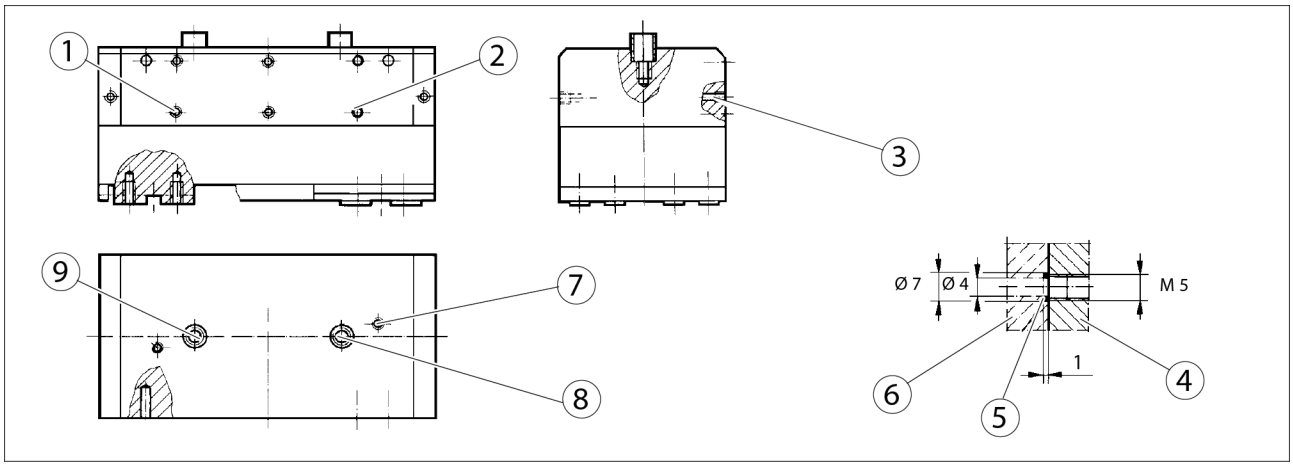
PGH 30



PGH 30

1 / 7	close	2 / 9	open	3	Hose connection M5 (can be connected on both sides)
4	Gripper	5	O-ring Ø4 x 1.5	6	Adapter
8	Hose-free direct connection M4				

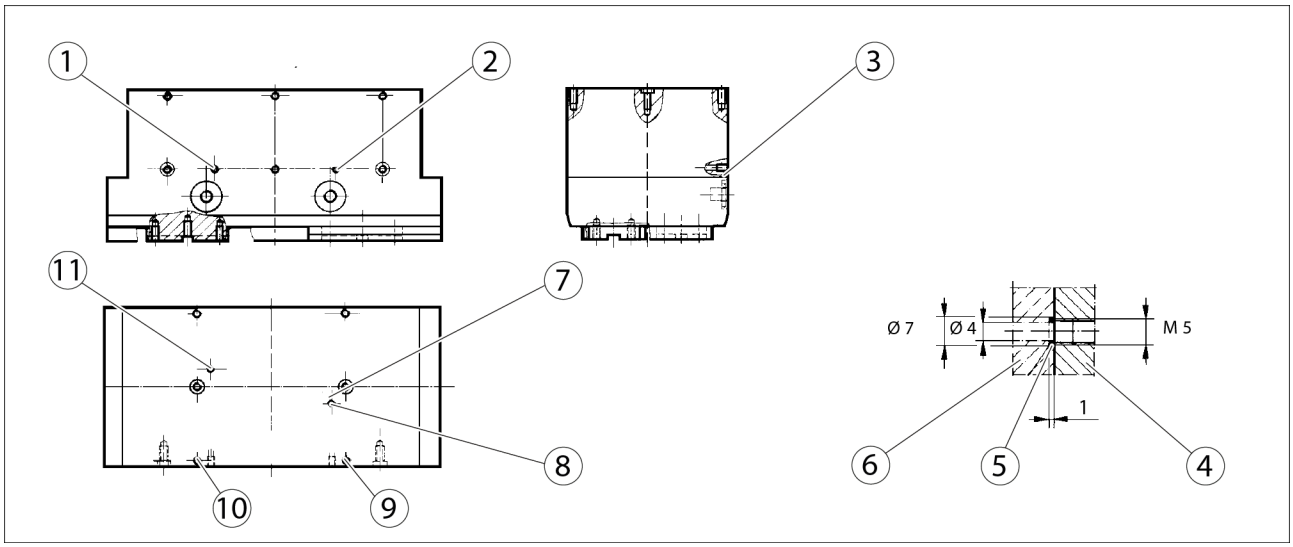
PGH 40



PGH 40

1 / 8	close	2 / 9	open	3	Hose connection M5 (can be connected on both sides)
4	Gripper	5	O-ring Ø4 x 1.5	6	Adapter
7	Hose-free direct connectionM5				

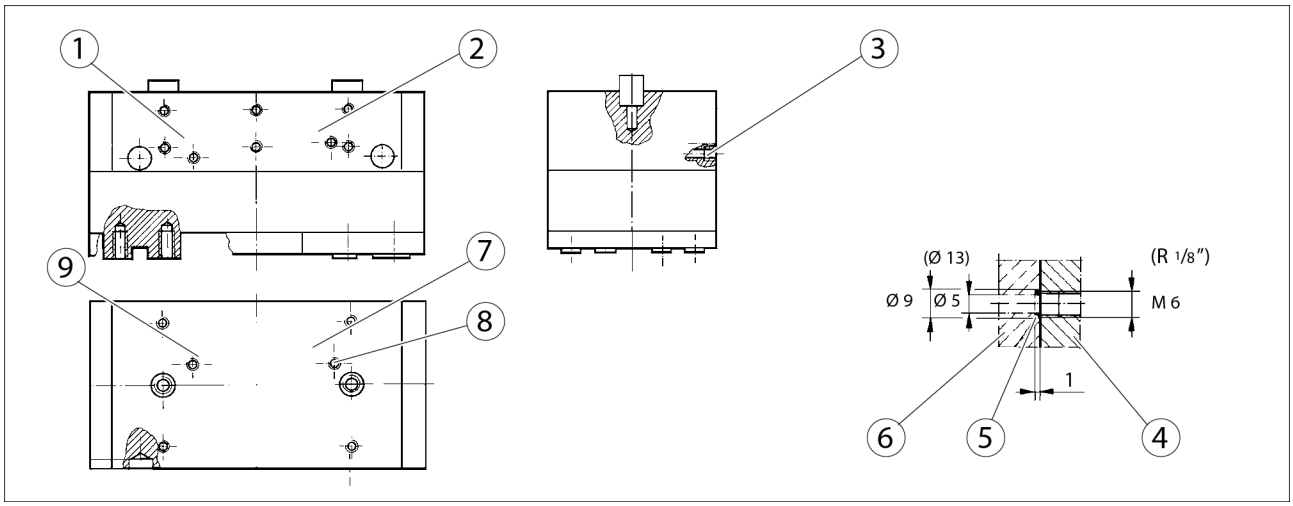
PGH 50



PGH 50

1 / 7 / 10	OPEN	2 / 9 / 11	open	3	Hose or hose-free connection M5
4	Gripper	5	O-ring Ø 4 x 1.5	6	Adapter
8	Hose-free direct connectionM5				

PGH 70



PGH 70

1 / 7	close	2 / 9	open	3	Hose or hose-free connection R1/8”
4	Gripper	5	O-ring Ø4x 1.5 O-ring Ø10 x 1.5	6	Adapter
8	Hose-free direct connection M6				

4.2 Mounting the sensor

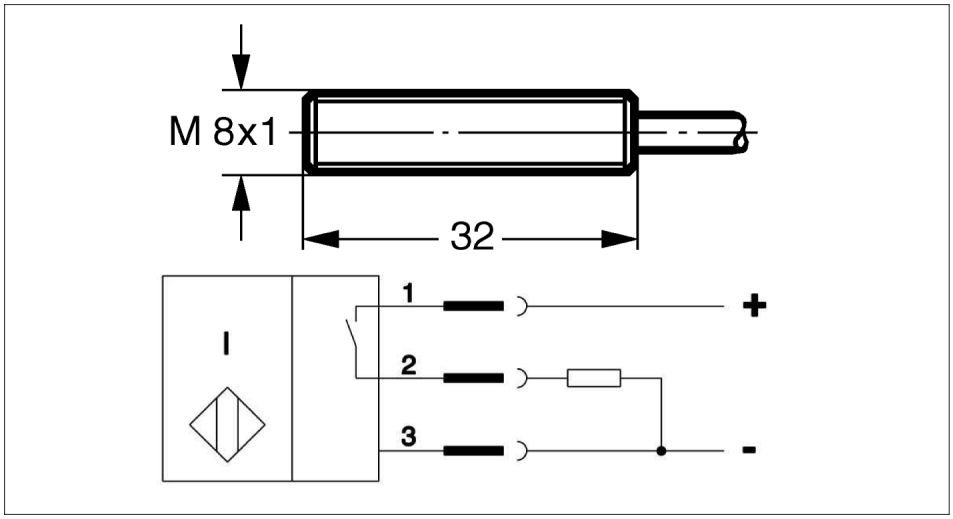
NOTE

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.
- Information on handling sensors is available at schunk.com or from SCHUNK contact persons.

4.2.1 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. (☞ 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.

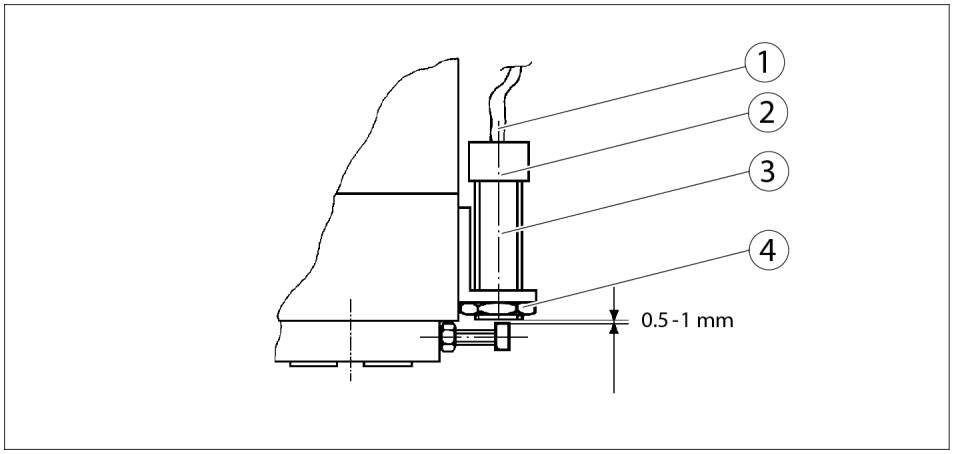
Mounting and adjusting proximity switches for PGH 30 and 40

- ➢ Remove spigot nut from the housings.
- ➢ Insert proximity switches (M 8 x 1 x 32, closer) into the housings.
- ➢ Screw spigot nuts on the housings.
- ➢ Connect proximity switches.
- ➢ Test their function by closing and opening the gripper.

Mounting and adjusting proximity switches for PGH 50 and 70

- ➢ Housings for proximity switches with spigot nut and hexagon nut are in the little plastic bag.

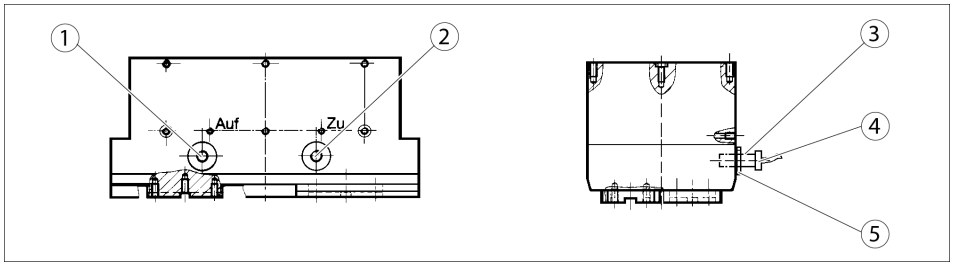
Gripper open:



Gripper open

1	Proximity switch	2	Spigot nut
3	Housing for proximity switch	4	Hexagon nut (loosen nut for adjusting the housing if necessary)

- Put the gripper onto "open" position.
- Remove the screwed set-screw (1 x M 10 x 1) which is used as dirt protection and fully screw in the proximity switches' housing (accessories kit) into the matching thread.
- Screw back the housing (3) by appr. 0,5 – 1,0 mm.
- Fix the housing (3) by driving in the hexagon nut.
- Plug the proximity switch (1) (M 8 x 1 x 32, closer) into the housing.
- Screw the spigot nut (2) onto the housing (3).
- Connect the proximity switch (1).
- Check it on its proper function by opening and closing the gripper.



Gripper closed

1	Proximity switch "opened"	4	Spigot nut
2	Proximity switch "closed"	5	Hexagon nut
3	Housing for proximity switch		

Gripper closed:

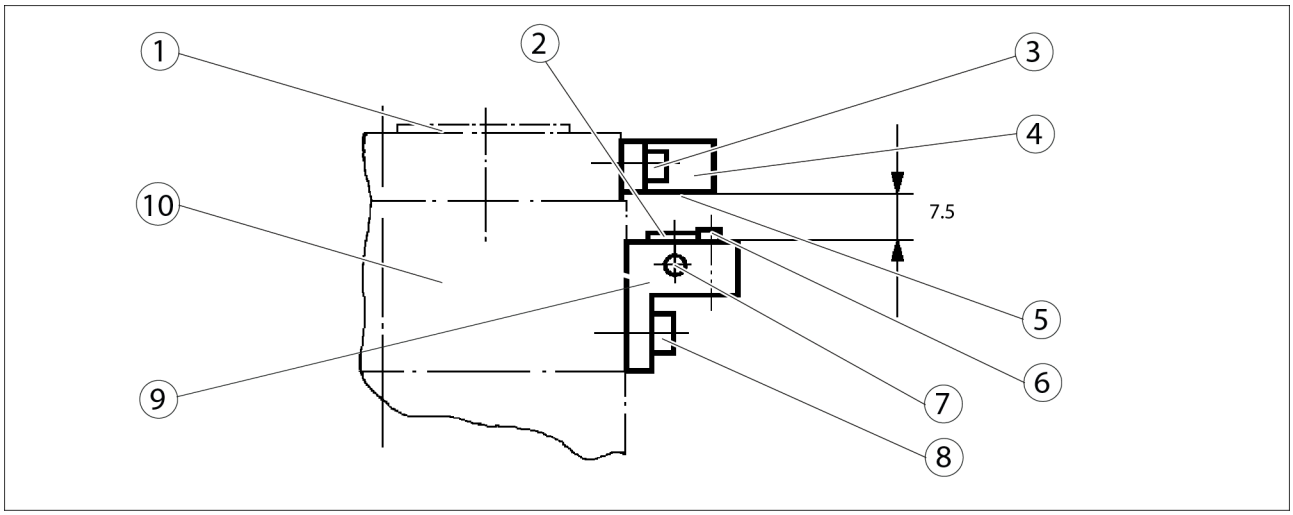
- Put the gripper onto "closed" position.
- Proceed with the proximity switch as previously described in "Gripper open".
- If the proximity switch should be dammaged, they may be exchanged easily (only the spigot nut has to be removed). Adjustment of the proximity switches is not necessary.

4.2.2 Mounting set for the flexible position sensor FPS for PGH 30

NOTE

Technical data and adjusting of sensor Type FPS see separate operating manual.

Type	ID number
AS-PGH 30	0301726



1	Base jaw	5	Magnet side	9	Bracket
2	Active area of sensor	6	2 Cheese head screws M2 x 8	10	PGH 30
3	Remove mounted set screws	7	FPS-S 13		
4	Control cam with mounted magnet	8	Remove mounted set screws		

5 Troubleshooting

5.1 Product does not move

Possible cause	Corrective action
Base jaws jam in housing, e.g. mounting surface is not sufficiently even.	Check the evenness of the mounting surface. Mechanical connection [▶ 19]
Pressure drops below minimum.	Check air supply. Technical data [▶ 17]
Compressed air lines switched.	Check compressed air lines. Pneumatic connection [▶ 23]
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 opens or closes abruptly

Possible cause	Corrective action
Too little grease in the mechanical guiding areas.	Clean and lubricate product. Maintenance [▶ 31]
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 Maintenance

6.1 Notes

Original spare parts

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

Exchange of housing and base jaws

The base jaws and the guidance in the housing are matched. To exchange these parts, send the product with a repair order to SCHUNK or order the housing with the base jaws as a set.

6.2 Maintenance and lubrication intervals

CAUTION

Material damage due to hardening lubricants!

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

- Reduce the lubricant intervals accordingly.

Lubricate the piston contact surfaces, the pinion and the rack on the piston and changing the seals.

Size	30 - 70
Interval [Mio. cycles]	2

Lubricating the linear bearing directly on the raceway (PGH PGH 30 and 40) or the grease nipples of the linear carriages (PGH 50 and PGH 70).

PGH 30 - 50	PGH 70
Every six months or every 1.5 mio. cycles	Every six months or every 500.000 cycles

6.3 Lubricants/Lubrication points (basic lubrication)

SCHUNK recommends the lubricants listed.

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

Lubricant point	Lubricant
Linear bearings	Renolit HP
All seals, sliding surfaces of the seals	Renolit HLT 2
Piston contact surfaces, pinion, rack on the piston	Molykote BR 2 plus

6.4 Disassembly of the module

For exchange of seals disassemble the gripper from **A to Q**.

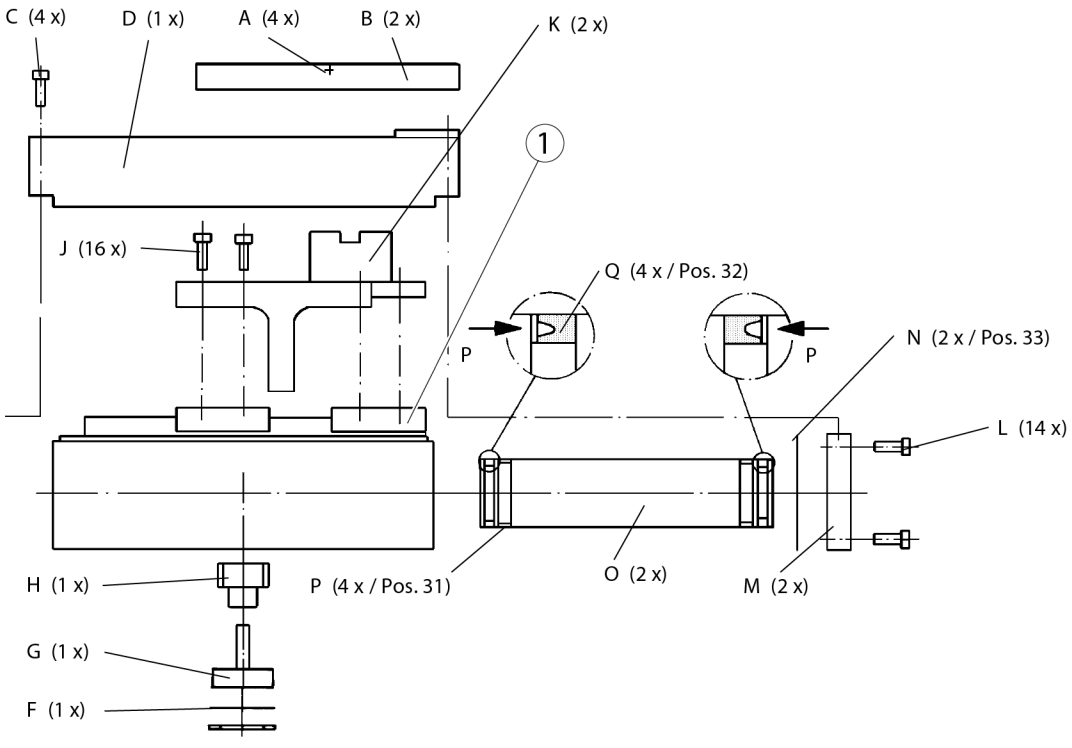
Thoroughly clean all components and check them on damage and wear-out.

Replace all seals according to the seal kit list. Seal kit [▶ 7].

The O-rings (seal kit (38)) are needed for the hoseless direct connection of the gripper.

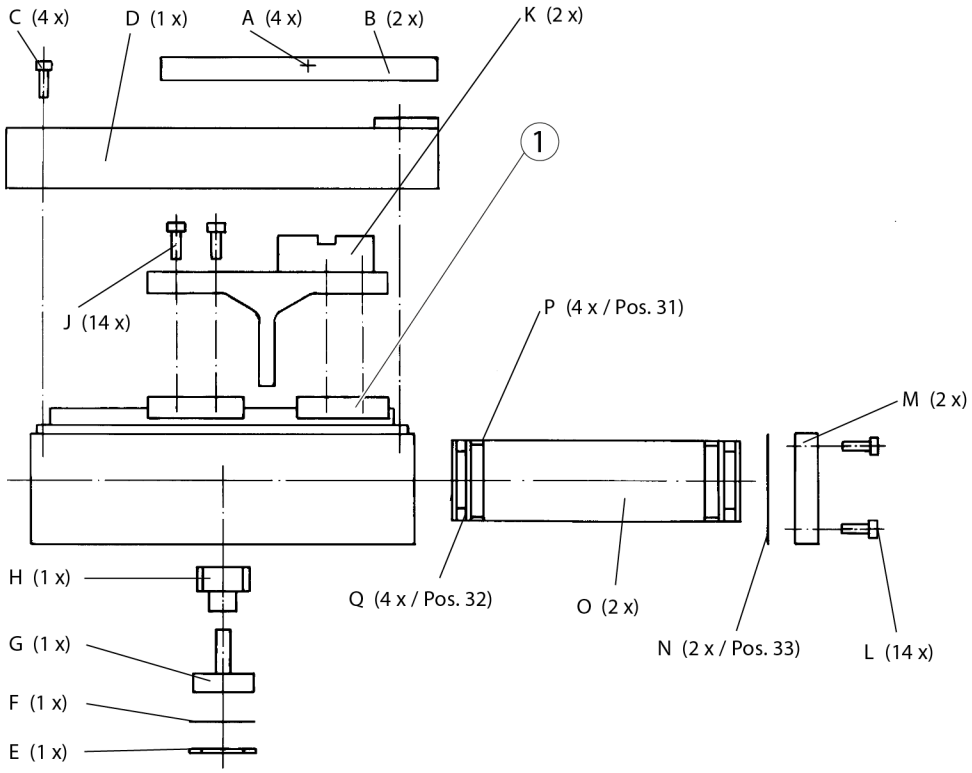
Assembly is done in reverse order.

6.4.1 PGH 30



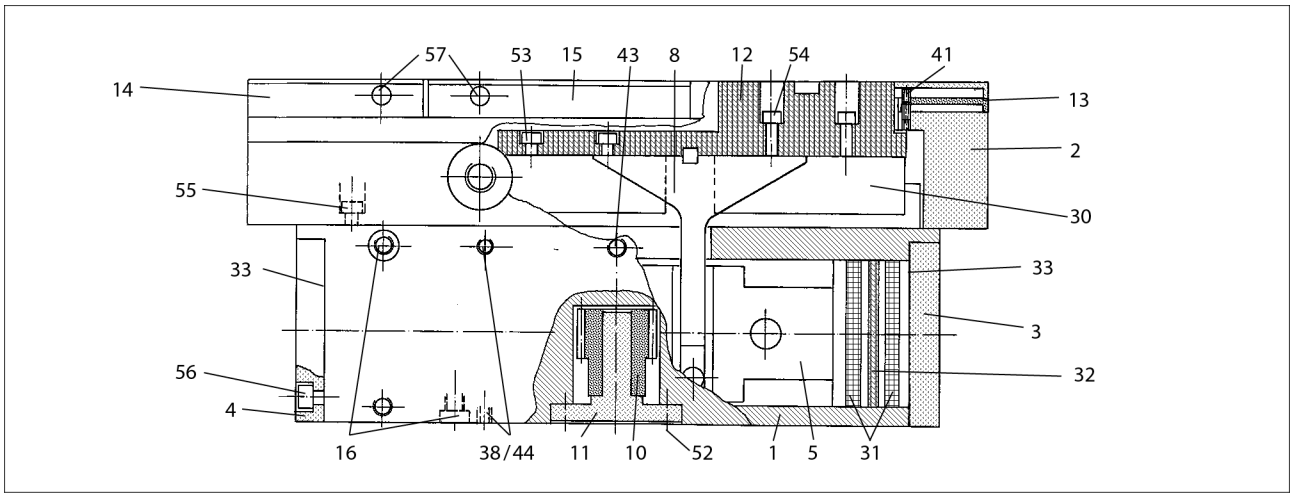
K	Install the base jaws in such a way that the steps at the bottom laterally adjoin the carriages of the linear guide mechanism.	1	**Do not pull the carriage off the guide rail. Push max. to the end of the guidance!**
M	**The covers of version with gripping force safety device are under spring tension!**	P	Mount the guiding bands to the pistons in such a way that their grooves lie opposite to the slot in the housing.

6.4.2 PGH 40



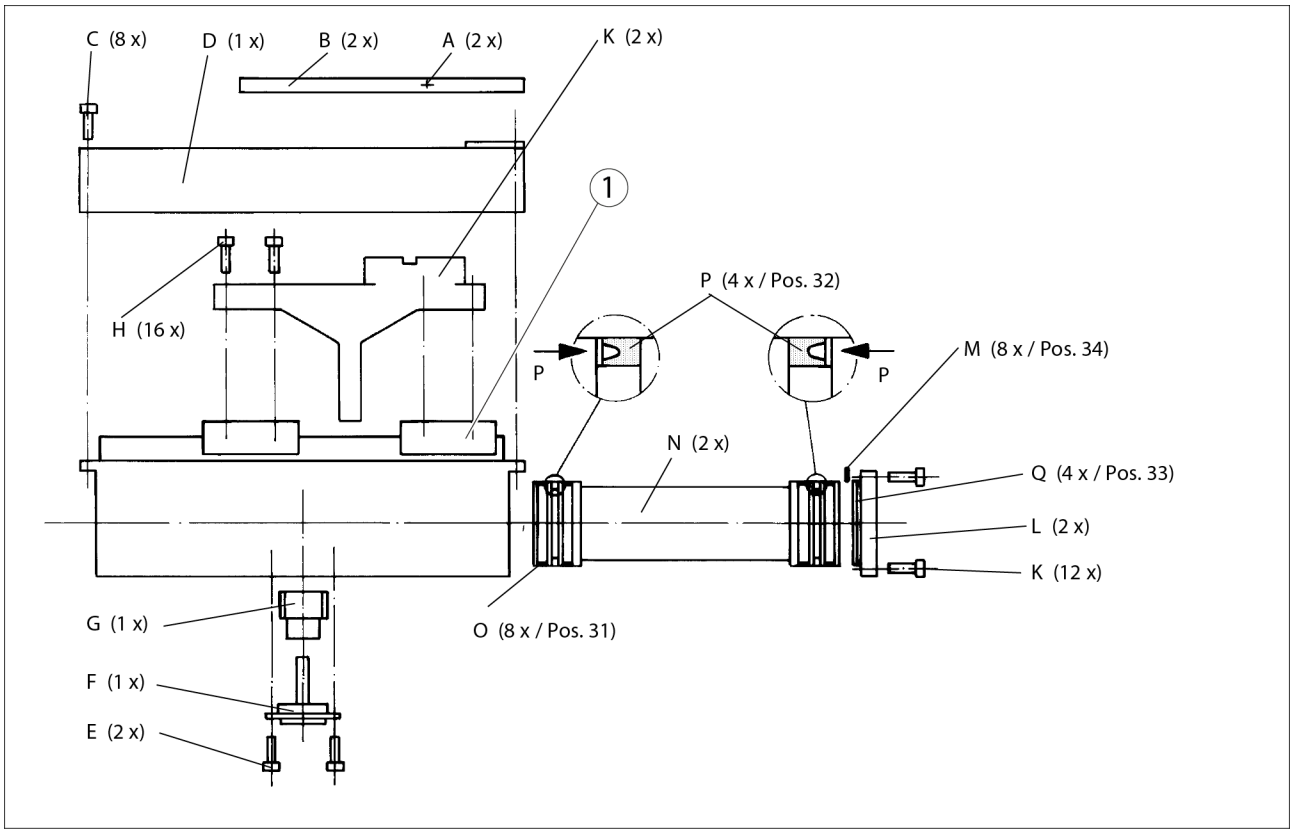
K	Install the base jaws in such a way that the steps at the bottom laterally adjoin the carriages of the linear guide mechanism.	1	**Do not pull the carriage off the guide rail. Push max. to the end of the guidance!**
P	Mount the guiding bands to the pistons in such a way that their grooves lie opposite to the slot in the housing.	M	**The covers of version with gripping force safety device are under spring tension!**

6.4.3 PGH 50



- Remove the screws (57, 8 pcs.) and take off the covers (14 and 15).
- Remove the proximity switches (if available). Remove the screws (55, 8 pcs.) and take off the housing's cover (2).
- Draw back the set-screws (41) and take off the cover (13).
- Remove the screws (53 and 54, 8 each pcs.). Unscrew the base jaws (12) completely with the active drive (8).
- Unscrew the screws (52, 4 pcs.) and take the pinion bearing (11) and the pinion (10) out of the housing.
- Remove the screws (56, 6 pcs. each) and take off the cover right (3) and left (4).

6.4.4 PGH 70



K	Install the base jaws in such a way that the steps at the bottom laterally adjoin the carriages of the linear guide mechanism.	1	**Do not pull the carriage off the guide rail. Push max. to the end of the guidance!**
O	Mount the guiding bands to the pistons in such a way that their grooves lie opposite to the slot in the housing.		

6.5 Servicing and assembling the module

Maintenance

- Clean all parts thoroughly and check for damage and wear.
- Treat all greased areas with lubricant.
  Lubricants/Lubrication points (basic lubrication) [▸ 31]
- Oil or grease bare external steel parts.
- Replace all wear parts / seals.

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.

➢ Before assembly, all seals and sealing faces have to be lubrified, the lubrication nipples at the linear guidances have to be refilled, the cyl. piston and the cylinder as well as the pinion and the toothed rack at the piston have to be lubrified.

➢ The base jaws (12) are to be monted in a way, that the steps at the bottom of the carriage touch the linear guidance (30).

➢ The set-screw (41) is to be mounted in a way, that the cover (13) is easily moveable – but can’t fall out.

➢ The guidance bands (31) are to be mounted on the pistons (5) in a way, that their grooves lie opposite to the slot of the body (1).

7 Translation of original declaration of incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1.B of the European Parliament and of the Council on machinery.

Manufacturer/ Distributor	SCHUNK GmbH & Co. KG Spann- und Greiftechnik Bahnhofstr. 106 – 134 D-74348 Lauffen/Neckar

We hereby declare that on the date of the declaration the following partly completed machine complied with all basic safety and health regulations found in the directive 2006/42/EC of the European Parliament and of the Council on machinery. The declaration is rendered invalid if modifications are made to the product.

Product designation:	2-finger parallel gripper / PGH / pneumatic
ID number	0302931… 0302970

The partly completed machine may not be put into operation until conformity of the machine into which the partly completed machine is to be installed with the provisions of the Machinery Directive (2006/42/EC) is confirmed.

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:
Robert Leuthner, Address: see manufacturer's address

Signature: see original declaration

Lauffen/Neckar, July 2019

p.p. Ralf Winkler,
Manager for development
of gripping system components

7.1 Annex to Declaration of Incorporation

according 2006/42/EG, Annex II, No. 1 B

1.Description of the essential health and safety requirements pursuant to 2006/42/EC, Annex I that are applicable and that have been fulfilled with:

Product designation	2-finger parallel gripper
Type designation	PGH
ID number	0302931… 0302970

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	Protection against mechanical hazards			
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	