

Assembly and Operating Manual

MTB KS-PGS3

Application kit

Translation of Original Operating
Manual

Hand in hand for tomorrow

Imprint

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Technical changes:

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

Document number: 1495022

Version: 04.00 | 16/05/2024 | en

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 ▶ 1.1.4 [6] are applicable.

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

1.1.1 Presentation of Warning Labels

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



⚠ DANGER

Dangers for persons!

Non-observance will inevitably cause irreversible injury or death.



⚠ WARNING

Dangers for persons!

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



⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

CAUTION

Material damage!

Information about avoiding material damage.

1.1.2 Definition of Terms

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

1.1.3 Symbol definition

The following symbols are used in this manual:

■ Prerequisite for an action

1. Action 1

2. Action 2

⇒ Intermediate results

⇒ Final results

▶ 1.1.3 [📄 6]: chapter number and [page number] in hyperlinks

1.1.4 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *
- Assembly and Operating Manual "TANDEM Power Clamping Block PGS3" *
- "SCHUNK Application Kit MTB" software manual for
 - Universal Robots *
 - FANUC *
 - ABB *

The documents labeled with an asterisk (*) can be downloaded from [schunk.com/downloads](https://www.schunk.com/downloads).

1.1.5 Sizes

This operating manual applies to the following sizes:

- MTB KS-PGS3 100

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 maximum service life
- Observe the ambient conditions and operating conditions, ▶ 2.4 [9]
- Observe the specified maintenance intervals, ▶ 8 [27]

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

Performance	MTB KS-PGS3
Cycles, maximum number *	200 000

Tab.: Performance

* A cycle consists of a complete clamping process ("Open" and "Close").

1.3 Scope of delivery

The scope of delivery includes

- Application kit MTB KS-PGS3
- Safety information (product-specific instructions available online)

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.

Robot connection package

Robot connection packages enable quick assembly and commissioning of the product on the robot.

Content:

- Velcro strips
- Connection cables
- Compressed air hose
- Protective hose
- USB stick

ID: 1490839

2 Basic safety notes

2.1 Intended use

The product is designed for loading and unloading machines and is intended for use with the following robots in association with gripper applications:

- UR: e-Series
 - TM: TM-Series
 - OMRON: TM-Series
 - FANUC: CRX-Series
 - Doosan: M-, A-, H-Series
 - ABB: CRB15000
- The product may only be used within the scope of its technical data, ▶ 3 [17].
 - 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 use.
 - The product is not suitable for operation without separating protective equipment, e.g. human-robot collaboration (HRC). The product may only be operated with suitable protective measures, e.g. protective fence, etc.
 - In a risk assessment, the owner must identify additional hazards arising from the specific working conditions at the place of use of the product. Process sequences between the robot and the processing machine must be analyzed and any necessary protective measures implemented.
 - When integrating the product into a control system, ensure that communication – if necessary safety-related – is established between the processing machine and the robot.
 - Appropriate use of the product includes compliance with all instructions in this manual.
 - Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

2.2 Constructional changes

Implementation of structural changes

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

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

2.3 Spare parts

Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Use only original spare parts or spares authorized by SCHUNK.

2.4 Ambient conditions and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, ▶ 3 [17].

2.5 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.

2.6 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff in the event of a danger that 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 and 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 place a hairnet over long hair when dealing with moving components.
- Wear hearing protection in case of increased noise level.

2.7 Notes on safe operation

An incorrect manner of working can make the product unsafe and risks 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. Products for special ambient conditions are excluded.
- Rectify malfunctions as soon as they occur.
- Observe the care and maintenance instructions.
- Observe the information on the safety data sheets of the additives and lubricants.
- Observe the current safety, accident prevention, and environmental protection regulations for the application field of the product.

2.8 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.

2.9 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.

2.10 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.

2.11 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.

2.11.1 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.

2.11.2 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.

2.11.3 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 Notes on particular risks



⚠ WARNING

Risk of injury to operating personnel if the clamping block fails because the technical data have been exceeded and a workpiece is released or parts fly off!

- The technical data specified by the manufacturer for using the clamping block must never be exceeded.
- The clamping block may only be used on machines and facilities that fulfill the minimum requirements of the EC Machinery Directive 2006/42/EC; specifically, they must have effective technical measures to protect against possible mechanical hazards.



⚠ WARNING

Risk of injury due to workpiece loss if compressed air fails or is reduced, or as a result of improper controlling (operator error)!

- Safeguards in user program.



⚠ WARNING

Risk of injury from clamping force block or chuck jaws falling during transport, installation or removal!

- Make sure the clamping force block and chuck jaws do not fall during transport, installation or removal.
- Only install the clamping force block on machines with the appropriate connection dimensions.



⚠ 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 sharp edges and corners!

Sharp edges and corners can cause cuts.

- Use suitable protective equipment.



⚠ WARNING

Risk of crushing due to chuck jaws opening and closing!

- Do not reach between the chuck jaws.
- Wear personal protective equipment.
- Prevent the clamping force block from being actuated unintentionally.
- When integrating the clamping force block into a control system, ensure that communication – if necessary safety-related – is established between the processing machine and the robot.



⚠ CAUTION

Risk of crushing from chuck jaws opening and closing when manually loading and unloading!

- Do not reach between the chuck jaws.
- Wear personal protective equipment.
- Prevent the clamping block from being actuated unintentionally.
- Use automated loading.

3 Technical data

Designation	MTB KS-PGS3
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:2010 [3:4:3]
Nominal operating pressure [bar]	6
Minimum pressure [bar]	2
Max. pressure [bar]	6
Supply voltage [VDC]	24
Min. [VDC]	21.6
Max. [VDC]	26.4
Maximum current input [mA]	500
Nominal current [mA]	170

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

Ambient conditions and operating conditions

Designation	MTB KS-PGS3
Ambient temperature [°C]	
min.	+5
max.	+50
Protection class IP Clamping force block	40
Protection class IP Valve box	67
Noise emission [dB(A)]	≤70

Auxiliary materials and lubricants used

Component	Manufacturer	Designation
Lubricant on the valves	TECNOLUBESEAL SRL, Via G. Galilei, 7 I-37029 San Pietro in Cariano VR	UNIFLOR 8512S-FG
Seals, valve box	Bremer & Leguil GmbH Am Burgacker 30 - 42 47051 Duisburg info@bremer-leguil.de www.bremer-leguil.de	SCHUNK grease 1

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

The product contains food-compliant lubricants as standard.

The requirements of standard EN 1672-2:2020 are not fully met.

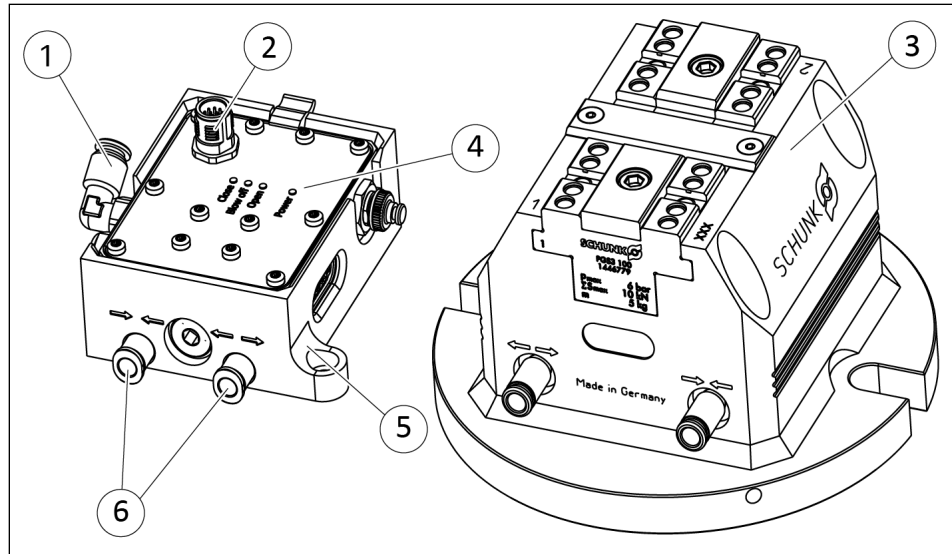
NOTE

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

Observe the manufacturer's safety data sheets!

4 Design and description

4.1 Design



Design Application kit MTB KS-PGS3

1	Plug connector compressed air connection, hose \varnothing 6 mm
2	M12 plug, A-coded, 12-pin, voltage supply and control
3	Clamping block PGS3
4	Valve box
5	Mounting frame
6	Connections for the clamping force block

4.2 Description

Application kits enable automated machine loading.

The clamping force block is supplied with a separate valve box. The valve box enables the control of the clamping force block via the robot controller.

By using a gripper application on the robot, automated loading of the clamping force block is possible with optimized cycle times. A blow-off nozzle is integrated in the gripper application. The outgoing air from the blow-off nozzle can be used to remove chips or coolant from the clamping force block.

4.3 Display

The following LEDs are located on the valve box:

Designation	Color	Description
LED "Close"	Orange	<ul style="list-style-type: none"> Lights up when chuck jaws are closing.
LED "Blow off"	not assigned	not assigned
LED "Open"	Orange	<ul style="list-style-type: none"> Lights up when chuck jaws are opening.
LED "Power"	Green	<ul style="list-style-type: none"> Lights up if ready for operation. Does not light up if supply voltage polarity is reversed or voltage is not in the valid range.

5 Assembly

5.1 Installing and connecting



⚠ 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.

NOTE

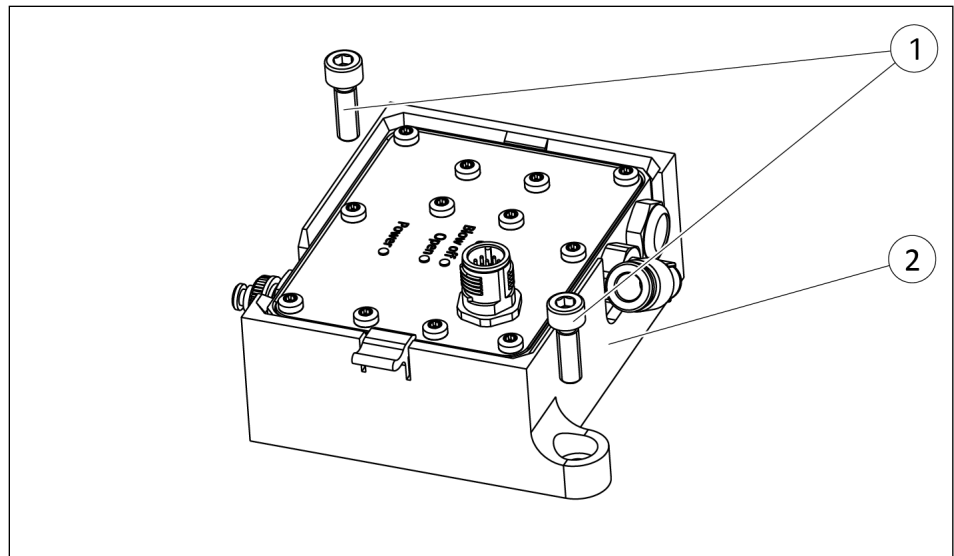
- Observe the requirements for the compressed air supply, ▶ 3 [17].
- In case of compressed air loss (cutting off the energy line), the product loses its dynamic effects and does not remain in a secure position.

Overview

1. Screw the clamping force block onto the machine, see the Assembly and Operating Manual for the clamping force block.
2. Fix the valve box close to the machine, ▶ 5.2 [22].
 - ⇒ Observe the tightening torque, depth of engagement and strength class, if required.
3. Connect the first compressed air hose (Ø 6 mm) to the connector (1) and connect it to the compressed air supply, ▶ 4 [19].
4. Cut two pieces of the second compressed air hose to connect the valve box to the clamping force block.
5. Cut protective hoses to the same length.
6. Slide the protective hoses over the cut compressed air hoses.

Note: Protective hoses protect against a heavily contaminated environment and against damage by chips.
7. Connect the valve box and clamping force block with the cut compressed air hoses (see markings on the push-in fittings for opening and closing).
8. Plug the power supply and control cable into the plug (2) and screw it hand-tight.
9. Connect the cable to the robot controller.

5.2 Mechanical connection



Mounting the valve box

Item	Mounting	MTB KS-PGS3 100
1	Mounting screw Mounting screw according to standard	M5 DIN EN ISO 4762 Max. strength class 8.8
2	Mounting frame	

NOTE

For information on mounting the clamping force block, see the mounting and operating instructions.

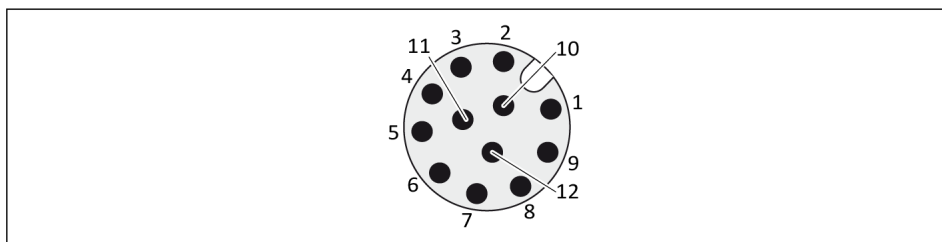
5.3 Electrical connection

On the valve box there is an M12 plug for voltage supply of the valve box and for control of the product.

The corresponding connection cable is included in the robot connection package.

NOTE

For further information about connecting to the robot controller, see the corresponding software manual, ▶ 1.1.4 [6].



Pin allocation M12 connector, A-coded

No.	Signal
1	+24 VDC
2	GND
3	-
4	-
5	-
6	-
7	-
8	-
9	Switching clamping force block
10	-
11	Release signal
12	-

5.3.1 Control of the digital signals

Truth table

The truth table shows the actuation of the digital inputs during possible commands by the superordinated control unit.

Power consumption per digital inputs amounts to max. I=10 mA.

Function	Pin 9 switching, clamping force block	Pin 11 release signal *
Clamping force block not pressurized with air	0 or 1	0
Clamping force block opens	0	1
Power clamping block closes	1	1

Tab.: Truth table control – clamping force block

* **Activating pin 11 leads to immediate execution of the function!**

0: max. 12 V (low)

1: min. 18 V (high)

6 Start-up

SCHUNK provides software modules for commissioning the product on robot controllers.

NOTE

For further information, see the corresponding software manual, ▶ [1.1.4 \[6 \]](#).

7 Troubleshooting

7.1 Electrical signals are not transmitted

Possible cause	Corrective action
Cable connected incorrectly.	Check round connector for correct fit.
Strands swapped.	Check pin allocation.

7.2 Product does not move

Possible cause	Corrective action
Power supply connected incorrectly.	Check the power supply. ▶ 5.3 [📄 23]
Compressed air can escape.	Check compressed air lines.
Supply voltage too low.	Check the compressed air supply.

NOTE

For further information, see the Assembly and Operating Manual for the clamping force block.

8 Maintenance



⚠ 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.

Original spare parts

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

Maintenance intervals

Interval cycles with MTB KS-PGS3

Maintenance work

5,000

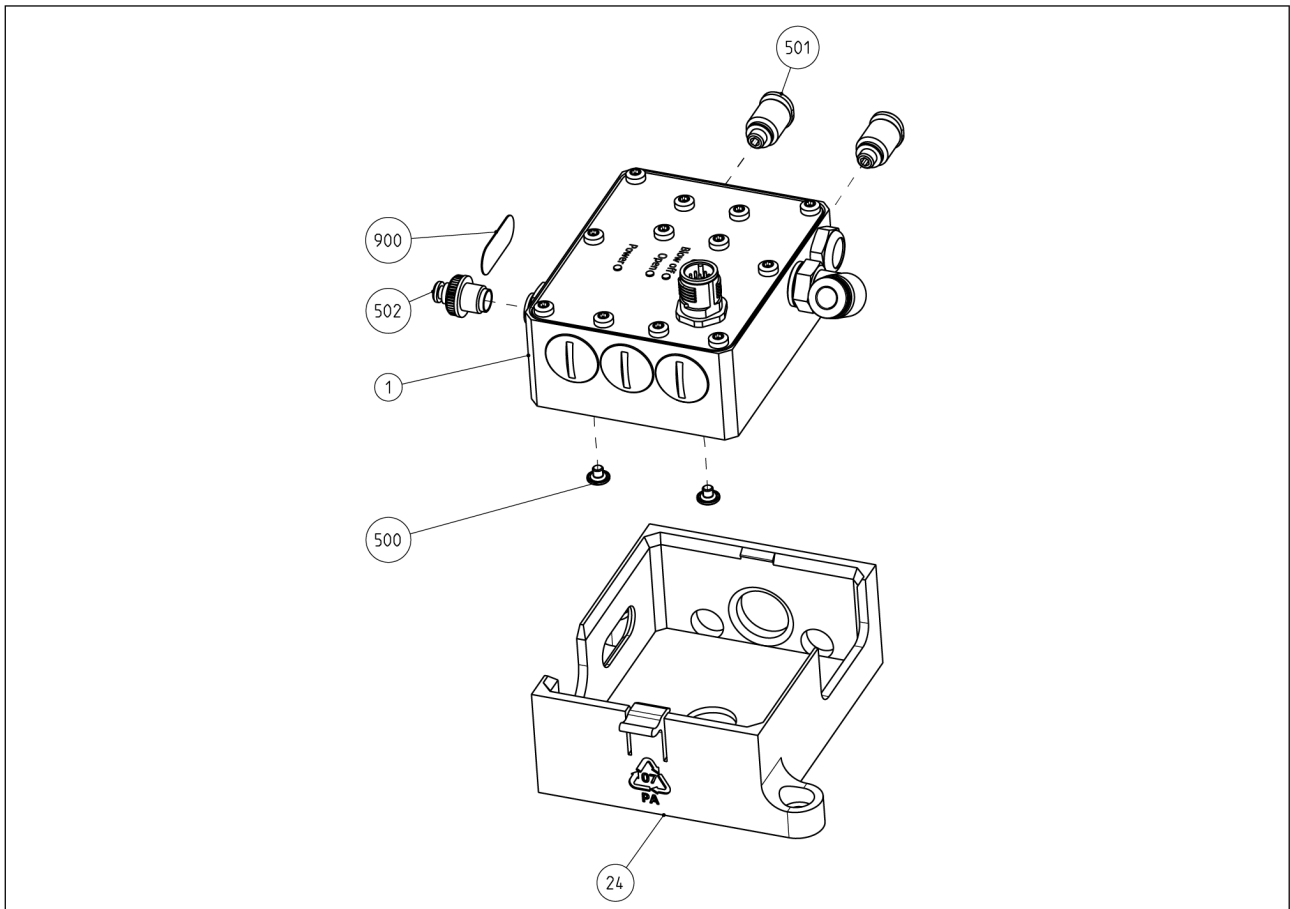
Please check the clamping device for tightness regularly by applying a clamping force tester for a relatively long period of time (>10 min). The clamping force should not drop during this period.

Adapt the test interval to the operating conditions. SCHUNK recommends checking every 5,000 clamping cycles at the latest.

NOTE

For further information, see the Assembly and Operating Manual for the clamping force block.

8.1 Assembly drawing



Assembly drawing for valve box

9 Translation of the original declaration of incorporation

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

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

We hereby declare that the partly completed machine described below

Product designation: Application kit / MTB KS-PGS3 /pneumatic
ID number 1490833

meets the following basic occupational health and safety of the Machinery Directive 2006/42/EC:
No. 1.1.1, No. 1.1.2, No. 1.1.3, No. 1.1.5, No. 1.3.2, No. 1.5.3, No. 1.5.4, No. 1.5.6, No. 1.5.8,
No. 1.5.10, No. 1.5.11, No. 1.5.13

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

Applied harmonized standards, especially:

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

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

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

Signature: see original declaration

Lauffen/Neckar, May 2024

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

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

RoHS Directive

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

REACH Regulation

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

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

Signature: see original declaration

Lauffen/Neckar, May 2024

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



SCHUNK SE & Co. KG
Spanntechnik | Greiftechnik | Automatisierungstechnik

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