



Assembly and Operating Manual

TENDO SVL – Extension

Hydraulic Expansion Toolholder

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: 1561508

Version: 01.00 | 08/01/2024 | 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 *

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

1.2 Warranty

The warranty is valid for 24 months from the date of delivery from the production facility if the product is used as intended and in compliance with the prescribed operating data.

Wear parts and parts that come in contact with the tool or machine are not covered by the warranty.

1.3 Scope of delivery

- Product
- Tool clamping technology safety information (ID 1561465)

1.4 Accessories

The following accessories for the product are available separately:

- Test shafts for checking the clamping force
- Allen key for actuating the clamping screw
- Hexagon socket wrench for length adjustment
- GZB-S intermediate sleeves for clamping several different shank diameters
- GZB-S sleeve remover for removing intermediate sleeves
- Cleaning brush for cleaning clamping diameters

2 Basic safety notes

2.1 Appropriate use

- The product is used to clamp rotationally symmetric tools.
- The product is intended for industrial use.
- 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 may only be used and operated within the scope of the technical data and the specifications in this manual, ▶ 3 [13].

2.2 Inappropriate use

The product is not being used as intended if:

- The information in the technical data is not observed when using and operating the product ▶ 3 [13].
- The maintenance and storage instructions are not observed ▶ 7 [26].
- The product is used with heat shrinking technology.
- The product is used in explosive environments.

2.3 Notes on safe operation

- The product must not be clamped without a tool above 25°C.
- Never combine multiple product extensions.
- Only use SCHUNK intermediate sleeves and always insert up to the fixed backstop point. The use of intermediate sleeves can reduce the transmittable torque.
- Long, projecting or heavy tools may only be clamped if the speed of rotation is reduced according to the ambient and operating conditions on site. The level of reduction is the responsibility of the operator and must ensure safe operation of the product.
- Maintain and service the product on a regular basis.
- Do not remove the air bleed screw (secured with pin or resin).
- All repair work must be performed by SCHUNK.
- The operational safety and function of the product must not be impaired by external influences.
- Follow the country-specific applicable safety, accident prevention, and environmental protection regulations for the application field of the product.
- Use mechanical screwdrivers only after approval by SCHUNK.

2.4 Personnel qualification

Work conducted on and with the product by inadequately qualified personnel can lead to serious injuries and considerable material damage.

- Personnel must have read and understood the complete manual before beginning any work on the product.
- All work may only be performed by appropriately qualified personnel:
 - **Specialist personnel**
Specialist personnel have the specialized training, knowledge, and experience to perform the tasks entrusted to them, to recognize and avoid potential dangers, and know the relevant standards and regulations.
 - **Instructed person**
An instructed person has been instructed by the operator regarding the tasks entrusted to them and the potential dangers of inappropriate handling of the product.

Work on the product	Necessary qualification
Transport	Qualified personnel/ instructed person
Assembly/disassembly	Specialist personnel
Settings/functional testing	Specialist personnel
Operation	Qualified personnel/ instructed person
Maintenance/troubleshooting	Specialist personnel/ SCHUNK service personnel
Disposal	Specialist personnel/ SCHUNK service personnel

2.5 Personal protective equipment

Personal protective equipment is necessary to protect staff in the event of a danger that may interfere with their health or safety at work.

- Observe the valid safety and accident prevention regulations and health & safety at work rules.
- When working on and with the product, wear the required personal protective equipment.
 - Always wear safety boots.
 - Wear close-fitting protective clothing and place a hairnet over long hair when dealing with moving components.
 - 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.

2.6 Handling during transport

Incorrect handling during transport can make the product unsafe and risks the danger of serious injuries and considerable material damage.

- During transport and handling, secure the product to prevent it from falling.
- Do not walk under suspended loads.
- Do not leave suspended loads unattended.
- Observe the assembly and operating manual specifications for transport.
- Use suitable assembly and transport devices*.
- Take precautions against pinching and crushing.

* Assembly and transportation devices must be able to carry at least twice the attached weight.

2.7 Constructional changes

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

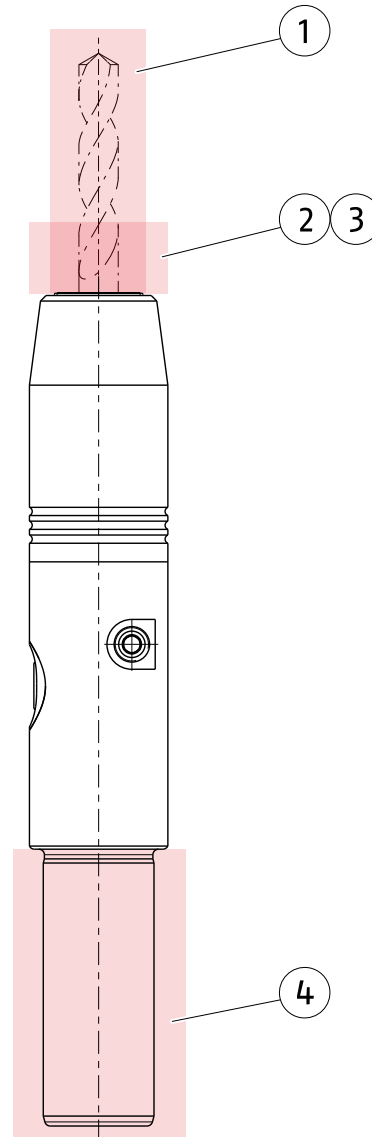
- Structural changes should only be made with the written approval of SCHUNK.
- Use only original spare parts and spares authorized by SCHUNK.

2.8 Behavior in case of malfunctions

Incorrect handling during a malfunction can make the product unsafe and risks the danger of serious injuries and considerable material damage.

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Get appropriately qualified personnel ▶ 2.4 [9] to rectify the malfunction.
- Observe the information on troubleshooting in the assembly and operating manual.
- Faults not described in the assembly and operating manual may only be rectified after consultation with SCHUNK.
- After a malfunction, ensure that the product is able to function properly and no increased risks have arisen.
- Do not recommission the product until the malfunction has been rectified.

2.9 Hazardous points on the product



NOTE: Illustration may differ from the actual design.

Position	Danger when	Danger due to
1	Assembling/disassembling the product/Clamping the tool	Cutting
2	Clamping the tool	Crushing risk
3	Clamping the tool	The expansion sleeve bursting
4	Assembling/disassembling the product	Crushing risk

3 Technical data

CAUTION! The following values may deviate for special products. The corresponding details on the enclosed approval drawing must be observed!

3.1 General data

Max. coolant pressure [bar]	80
Tool shank tolerance	h6
Max. tightening torque of the clamping screw [Nm]	10 to 12
Adjustment travel of the length adjustment screw [mm]	10
Run-out accuracy [μm] (with a tool projection length of 2.5 x clamping diameter or max. 50 mm)	≤ 6

NOTE: The min. transmittable torque applies to tool shank smallest dimension h6, tool shank oiled.

Measured at room temperature. At higher operating temperatures, actual shank diameter and, depending on the lubrication condition, the transmittable torque may be higher.

The load limits of the spindle holder must be observed.

Clamping \emptyset [mm]	Min. transmittable torque [Nm]	Permissible radial force F [N] *
6	16	113
8	23	185
10	45	270
12	90	325
16	165	705
20	300	920

Clamping \emptyset [inch]	Min. transmittable torque [Nm]	Permissible radial force F [N] *
1/4	95	325
3/4	300	920

* = with 2.5x clamping \emptyset , however max. 50 mm tool projecting length

3.2 Ambient conditions and operating conditions

Relative air humidity 20–80%

Range	Temperature [°C]
Operating temperature	+20 to +50
Transport temperature	-10 to +50
Storage temperature	+10 to +30
Cleaning temperature	0 to +60
Test temperature clamping force control	+20 to +25
Maximum temperature, clamping without tool	+25

NOTE: The temperatures refer to the product.

3.3 Maximum RPM

Max. speed of rotation [RPM]	10,000
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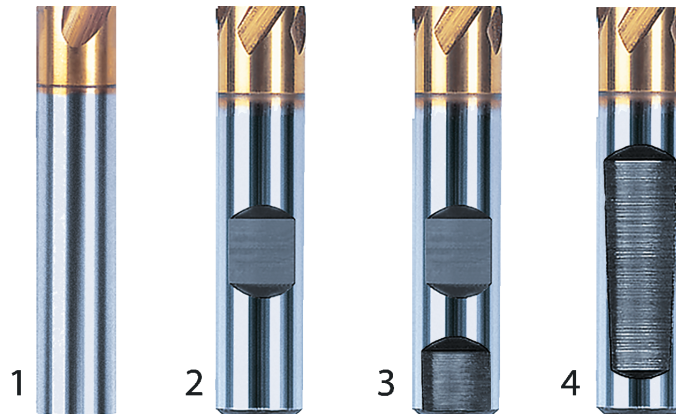
The maximum RPM depends on the interface of the spindle and tool to be clamped.

3.4 Minimum clamping depth

Clamping Ø [mm]	Minimum clamping depth [mm]
6	27
8	27
10	31
12	36
16	39
20	41

Clamping Ø [inch]	Minimum clamping depth [mm]
1/2	36
3/4	41

3.5 Usable tool shank types



1. Shank type according to DIN 1835-1 form A and DIN 6535 form HA
2. Shank type according to DIN 1835-1 form B and DIN 6535 form HB (up to \varnothing 20 mm)
3. Shank type according to DIN 1835-1 form B and DIN 6535 form HB (from \varnothing 25 mm)
4. Shank type according to DIN 1835-1 form E and DIN 6535 form HE

NOTE: Tool shanks with recesses (forms 2, 3 and 4) can impair the balancing grade and run-out accuracy of the overall system.

- Tool shanks with diameters not within tolerance range h6 cannot be fitted or else no transmittable torque is guaranteed.
- Tool shanks with projections/markings are difficult or impossible to fit and can impair the run-out accuracy of the overall system.

3.6 Further information on the product

For more information about the product, proceed as follows:

- using an internet-enabled smartphone or tablet, scan the data matrix code located on the product.

NOTE: A separate app may be required to scan the Data Matrix code.



**Data matrix
code**

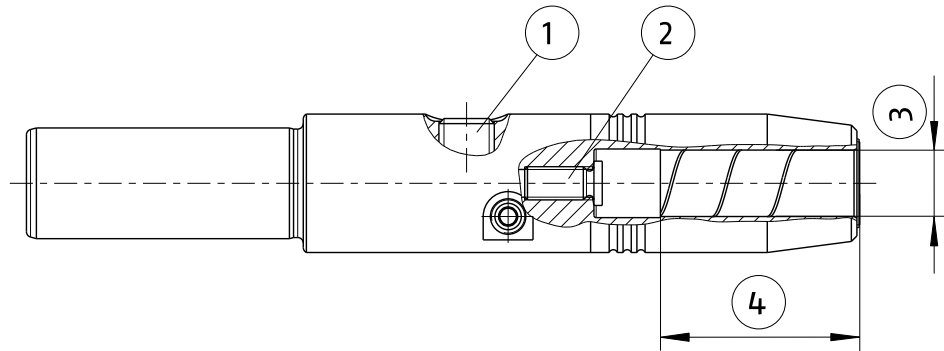
or:

- Open the website **schunk.com** and enter the 8-digit serial number ("SN:") located on the product in the search field.

For further information, visit schunk.com/serialisierung

4 Design and description

4.1 Design



NOTE: Illustration may differ from the actual design.

Position	Description
1	Clamping screw
2	Length-setting screw
3	Clamping diameter
4	Minimum clamping depth

4.2 Functional description

This product clamps hydraulically by means of manual actuation. The piston with stroke limitation is actuated via a clamping screw. To achieve the full clamping force, the clamping screw must be screwed in until it reaches the stop. The stroke limitation protects the product against over-expansion.

The volume of oil that is squeezed out of the piston chamber is pressed in measured amounts against the thin-walled expansion sleeve. The resulting internal pressure presses radially against the thin-walled expansion sleeve, causing the clamping range to expand evenly along the entire active clamping length, uniformly central to the middle axis. The tool is clamped.

Screwing back the clamping screw causes a reduction of the pressure in the piston chamber and the expansion chamber. The thin-walled expansion sleeve then returns radially to its exact home position. The tool can be removed.

5 Operation

5.1 Basic information



⚠ WARNING

Risk of injury and material damage due to the expansion sleeve cracking.

If the expansion sleeve cracks, oil may be emitted at high pressure and chips or broken pieces may fly off, causing severe injuries.

- **Never heat the product in heat shrink devices; only perform a tool change using the integrated clamping screw!**
- Avoid knocking or banging the expansion sleeve.
- When the product is tensioned, do not exceed the maximum permissible operating temperature.
- Only operate the product within the optimum operating temperature range.
- Take suitable protective measures to secure the danger zone.
- Wear suitable protective equipment.



⚠ WARNING

Risk of injury due to leakage of highly pressurized oil!

If the air bleed screw is unscrewed when the product is clamped, highly pressurized oil can escape, causing serious injury.

- Never unscrew the air bleed screw.
- Do not remove the air bleed screw locking device (pin or resin).



⚠ WARNING

Risk of injury when the product is rotating, due to the possibility of parts flying off!

- Comply with the technical data.
- Make sure the attachments and operating components present are installed and fitted correctly.
- Check the clamping force regularly.
- Take appropriate protective measures to secure danger zones.
- Wear suitable protective equipment.



⚠ WARNING

Risk of injury due to the tool being flung out if the speed of rotation is too high or not suitable!

- Comply with the technical data.
- Do not exceed the maximum speed.
- Reduce the speed of rotation appropriately for strongly protruding or balance-asymmetrical tools.
- Take appropriate protective measures to secure danger zones.
- Wear suitable protective equipment.



⚠ WARNING

Risk of injury due to ejected parts!

The max. speed of rotation of the machine/automated system must be reduced when using long, projecting or heavy tools and with extensions.



⚠ CAUTION

Risk of injury from tools with sharp edges!

Sharp edges on tools can cause cuts.

- Wear protective gloves when assembling the tool.



⚠ CAUTION

Risk of crushing and knocks during tool changes!

- Do not reach between the product and the tool when changing tools.
- Wear suitable protective equipment.

CAUTION

Risk of possible damage to the product!

If the product is not used as intended, the product may get damaged.

- Only operate the clamping screw by hand.
- Observe the minimum clamping depth of the tool.
- The tool must be free of burrs and dirt on the shank.
- Do not adjust the tool length when the tool is clamped.

CAUTION

Material damage due to excessive cutting values!

Due to its length, the product increases the lever of the cutting forces. If the cutting values are unsuitable, the exact limits of the machine spindle can be exceeded and the spindle holder can get damaged.

- Observe the loading limits of the spindle holder.
- Reduce the cutting values accordingly.
- Do not combine the product with other extensions.

5.2 Clamping the tool

To join the tool, the product must be unclamped. Initial tension inhibits loading and could damage the expansion sleeve.

Caution! The tools to be clamped must be deburred at the surfaces that come into contact with the product, may not have sharp contours and must be free of oil, grease and dirt.

When clamping the tool, observe the following points:

- The clamping screw may only be actuated by hand.
- Do not combine multiple extensions (e.g. TENDO SVL).
- The product may not be clamped without a tool above 25°C.
- Only clamp permissible tool shank types ▶ 3.5 [16].

For clamping, proceed as follows:

1. Observe the technical data ▶ 3 [13] and the marking on the product.
2. Make sure that the product is in an unclamped state.
3. Clean clamping surfaces.
4. The tool length can be adjusted by screwing the length-setting screw in or out. Observe the adjustment travel of the length-setting screw ▶ 3 [13].
5. Insert the tool into the product in the correct position without exerting too much force.
CAUTION! The minimum clamping depth ▶ 3.4 [15] must not be undershot!
6. Screw the clamping screw in by hand until it reaches the stop. Observe the maximum specified tightening torque ▶ 3 [13].
7. Check that the tool is firmly in place.
8. Mount the product ▶ 6 [24].

CAUTION! Safe clamping of the tool is only achieved when the clamping screw is screwed in until it reaches the stop!

5.3 Unclamping the tool

1. Disassemble the product ▶ 9 [📄 31].
2. Unscrew the clamping screw far enough to allow the tool to be easily removed.
NOTE: The clamping screw is not secured against falling out.
3. Remove tool.

IMPORTANT! The air bleed screw is secured with a pin or resin and must not be unscrewed!

5.4 Changing the tool

1. Unclamp and remove the tool ▶ 5.3 [📄 23].
2. Join and clamp the new tool ▶ 5.2 [📄 22].

6 Assembly

6.1 Basic information



⚠ WARNING

Risk of injury due to incorrect assembly!

If assembled incorrectly, the product may be flung out during rotation, causing severe injuries.

- Regularly check the fastening of the product.
- Take suitable protective measures to secure the danger zone.
- Wear suitable protective equipment.



⚠ WARNING

Risk of injury if the product falls during transport, assembly or disassembly.

Due to the oily surface required to preserve it, the product can slip through your hands, resulting in injury.

- Take appropriate safety measures to prevent the product from falling.
- Only install the product on machines with the appropriate connection dimensions.
- Wear suitable protective equipment, especially safety gloves.



⚠ CAUTION

Risk of crushing, impact and cutting when assembling and disassembling the product!

- Do not reach between the product and machine.
- Wear suitable protective equipment, especially protective gloves and safety boots.

CAUTION

Risk of possible damage to the product!

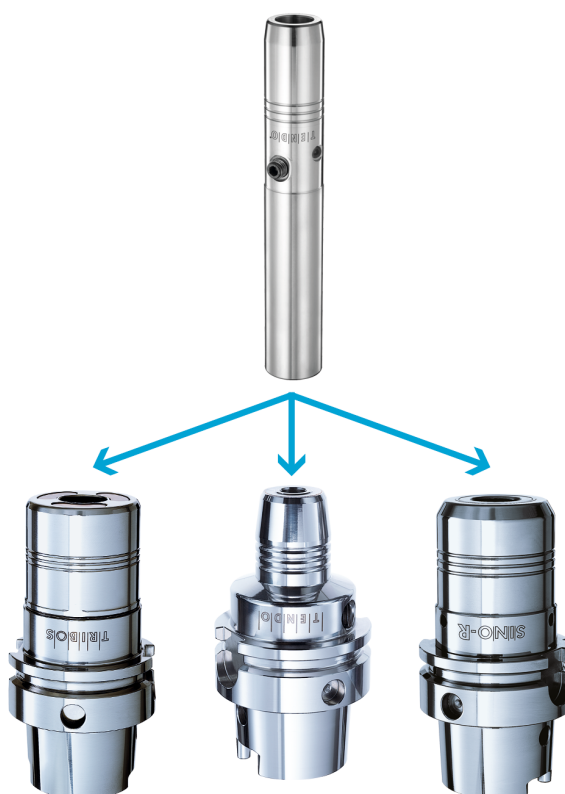
- When transporting and handling the product, ensure that it is not damaged by knocks, impact, etc.

6.2 Assembly of the product

CAUTION! Before the product is assembled, the tool must be fitted and clamped!

1. Clamping the tool ▶ 5.2 [📄 22].
2. Insert the product with tool in the correct position in a suitable toolholder and clamp.
NOTE: Observe the toolholder manufacturer's specifications!
3. Check that the product is in the correct position and securely clamped in the toolholder.

CAUTION! Secure clamping of the product in the toolholder must be ensured!



7 Maintenance

7.1 Basic information



⚠ WARNING

Risk of injury and material damage due to the expansion sleeve cracking.

If the expansion sleeve cracks, oil may be emitted at high pressure and chips or broken pieces may fly off, causing severe injuries.

- Avoid knocking or banging the expansion sleeve.
- Observe the test temperature specified in the technical data to check the clamping force.
- Take suitable protective measures to secure the danger zone.
- Wear suitable protective equipment.



⚠ WARNING

Risk of injury and material damage due to the expansion sleeve cracking at high product temperatures!

If the product is operated at too high temperatures without a tool, the expansion sleeve may burst. As a result, hot oil may be emitted at high pressure and chips or broken pieces may be ejected, causing severe injuries and burns.

- Do not exceed the maximum temperature specified in the technical data when clamping without a tool.
- Take suitable protective measures to secure the danger zone.
- Wear suitable protective equipment, especially heat-resistant gloves.



⚠ WARNING

Risk of injury due to sharp edges and rough or slippery surfaces!

- Wear suitable protective equipment, especially protective gloves.



⚠ CAUTION

Injury of the eyes by dirt particles

When cleaning with compressed air, the eyes may be injured by flying dirt particles.

- Wear suitable protective equipment, particularly protective goggles.

For trouble-free, long-lasting use, clean, maintain and check the functionality of the product regularly.

Repair work may only be carried out by SCHUNK!

If you have any questions regarding maintenance and servicing, our technical

customer service is available during our business hours:

Service telephone: +49-7133-103-2956

service.toolholder@de.schunk.com

7.2 Intervals and tasks

Operation	Interval period
Cleaning the clamping surface	after every clamping procedure
Cleaning the product	daily
Checking the clamping force	every 3 months or after 100 clamping operations
Checking and lubricating the clamping screw	as required

The specified maintenance intervals are based on empirical data gathered by SCHUNK and are a recommendation. Depending on the ambient and operating conditions, as well as the clamping frequency of the product, the maintenance intervals need to be adapted and noted accordingly. For maintenance intervals with two or more specifications, the specification that applies first is valid.

7.2.1 Cleaning the clamping surface

1. Disassemble the product ▶ 9 [📄 31].
2. Remove tool ▶ 5.3 [📄 23].
3. Clean the clamping bore and the groove, if present, with a cleaning agent containing solvents.
4. Carefully remove any stubborn dirt with a suitable tool ▶ 1.4 [📄 6].
5. Wipe the surfaces dry with a clean cloth.

7.2.2 Cleaning the product

1. Disassemble the product ▶ 9 [📄 31].
2. Remove tool ▶ 5.3 [📄 23].
3. Clean the entire product with compressed air.
4. Carefully remove any stubborn dirt with a suitable tool.
5. Wipe all surfaces dry with a clean cloth.
6. Check the product for deformation, damage or wear, in particular the surfaces that come in contact with the tool.
7. Lightly oil the entire surface of the product.

NOTE: Damage or wear can compromise the functioning of the product. If non-replaceable parts of the product are worn or damaged, return the product to SCHUNK for inspection.

7.2.3 Checking the clamping force

To check the clamping force, a corresponding test shaft ▶ 1.4 [📄 6] is required.

IMPORTANT! Observe the specified temperature range for the clamping force check!

1. Disassemble the product ▶ 9 [📄 31].
2. Remove tool ▶ 5.3 [📄 23].
3. Insert the corresponding test shaft to the minimum clamping depth.
4. Screw the clamping screw in by hand until it reaches the stop. Observe the maximum specified tightening torque ▶ 3 [📄 13].
5. The clamping force is no longer sufficient if the test shaft can be pulled out of the product with little effort using two fingers.

In this case, send the product to SCHUNK for inspection.

7.2.4 Check and lubricate the clamping screw



⚠ CAUTION

Allergic reactions if lubricating grease comes into contact with the skin.

- Wear protective gloves.

In order to prevent wear to the clamping screw, we recommend that it be lubricated using a method suited to the ambient conditions and the conditions of use. This is especially relevant in case of:

- high clamping frequency
- high operating temperature
- Intensive cleaning

For optimum clamping screw lubrication, we recommend copper paste type MOLYKOTE CU 7439 (100 g tube, ID 9247204).

IMPORTANT! The air bleed screw is secured with a pin or resin and must not be unscrewed!

1. Disassemble the product ▶ 9 [📄 31].
2. Remove tool ▶ 5.3 [📄 23].
3. **CAUTION! The clamping piston behind the clamping screw is not secured against falling out and must not be removed.** Unscrew the clamping screw from the product.
4. Clean the clamping screw and actuating thread and check for damage to the thread flanks. Replace if necessary.
5. Lubricate the clamping screw and actuating thread.
6. Screw the clamping screw into the product.
7. Check the clamping force ▶ 7.2.3 [📄 28].

8 Troubleshooting

Malfunction/ error	Possible cause	Solution(s)
Tool is not clamped	Clamping screw is not screwed in as far as the stop	Screw the clamping screw in until it reaches the stop
	Clamping piston was removed during lubrication of the clamping screw	Insert clamping piston into product
	Wear on the clamping diameter	Send the product to SCHUNK for inspection
	Oil loss on the product	Send the product to SCHUNK for inspection
Workpiece cannot be joined	Product is not completely unclamped	Unclamping the product ► 5.3 [23]
Workpiece cannot be removed		
Insufficient run-out accuracy	Product is not correctly positioned on the machine interface	Clean the contact surfaces of the product and machine
	The tool shank has recesses	Use the tool shank without recesses

If you have any questions regarding troubleshooting, our technical after-sales service is available during our business hours:

Service telephone: +49-7133-103-2956
service.toolholder@de.schunk.com

9 Disassembly

9.1 Basic information



⚠ WARNING

Risk of injury if the product falls during transport, assembly or disassembly.

Due to the oily surface required to preserve it, the product can slip through your hands, resulting in injury.

- Take appropriate safety measures to prevent the product from falling.
- Only install the product on machines with the appropriate connection dimensions.
- Wear suitable protective equipment, especially safety gloves.



⚠ CAUTION

Risk of crushing, impact and cutting when assembling and disassembling the product!

- Do not reach between the product and machine.
- Wear suitable protective equipment, especially protective gloves and safety boots.

CAUTION

Risk of possible damage to the product!

- When transporting and handling the product, ensure that it is not damaged by knocks, impact, etc.

9.2 Disassembly of the product

1. Secure the product against falling.
2. Loosen connection to the machine interface. Observe the specifications of the machine manufacturer.
3. Remove the product.
4. If necessary, remove tool ▶ 5.3 [23].

NOTE: To avoid damage, only place the product on a clean and soft surface.

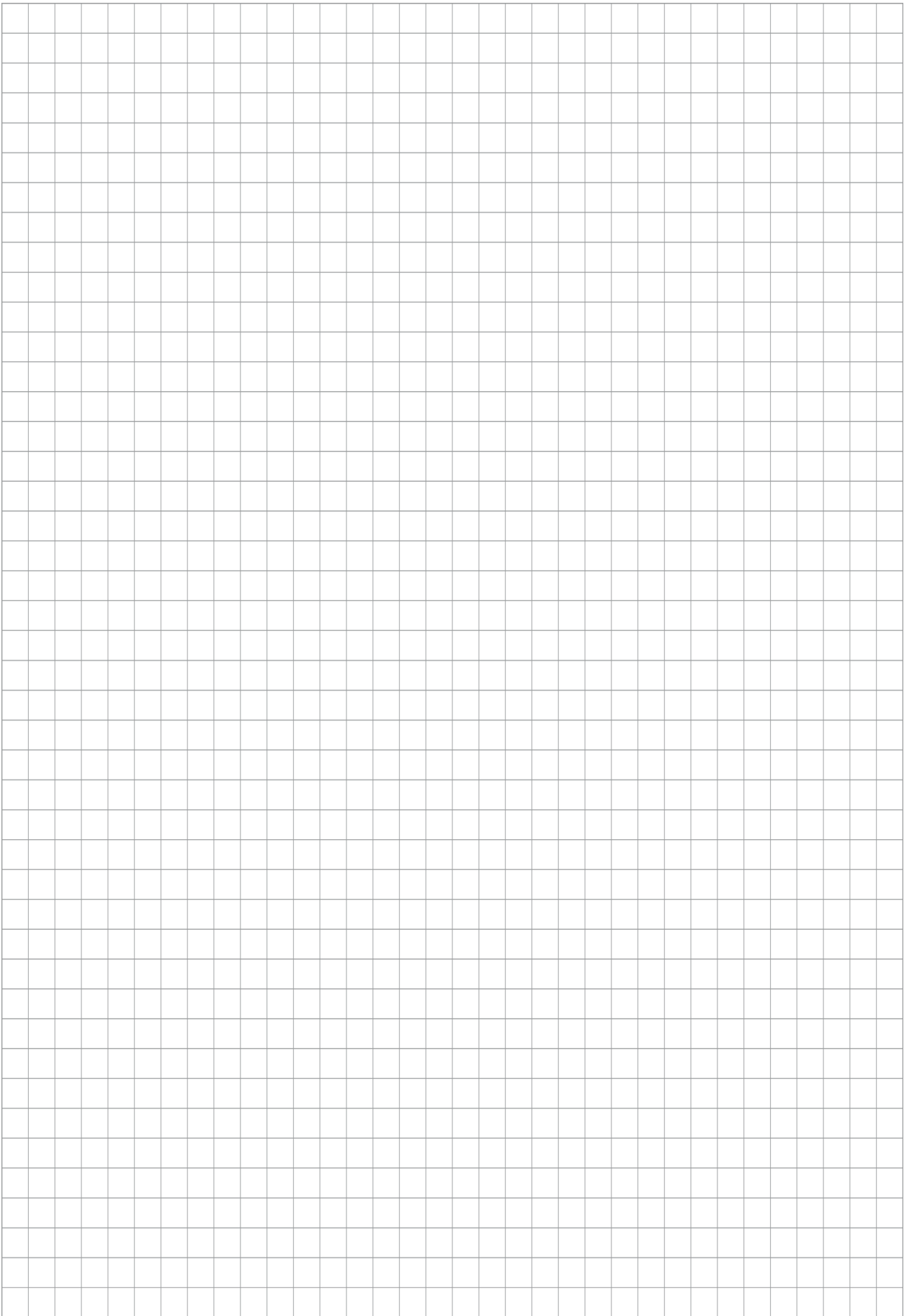
10 Storage

When storing the product for a longer period of time, observe the following points:

- Ensure that the product is in an unclamped state.
- Clean the product and lubricate it lightly.
- Only store the product in dry rooms.
- Protect the product from major temperature fluctuations.
- Comply with the storage temperature specified in the technical data.
- Store the product in a suitable transport container.

11 Disposal

- Follow local regulations on dispatching product components for recycling or proper disposal.
- Alternatively, you can return the product to SCHUNK for correct disposal.







SCHUNK SE & Co. KG
Toolholding and Workholding | Gripping Technology |
Automation Technology

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