

Polygonal Clamping System Clamping device SVP-2

Assembly and Operating manual



Design with manual pump for quick actuation and frequent tool changes

Rev. 12-1101 Page 2 of 32
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Technical changes:

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congratulations on choosing a SCHUNK product. By choosing SCHUNK, you have opted for the highest precision, top quality and best service.

You are going to increase the process reliability of your production and achieve best machining results – to the customer's complete satisfaction.

SCHUNK products are inspiring.

Our detailed assembly and operation manual will support you.

Do you have further questions? You may contact us at any time – even after purchase.

Kindest Regards

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This instruction is an integral part of the SCHUNK TRIBOS Clamping Device SVP-2 and contains important information for a safe and proper assembly, commissioning, operation, maintenance and helps for an easier trouble shooting.

Before using the Clamping Device SVP-2, read and note the instruction, especially the chapter "Basic safety notes".

1.1 Warnings

The following key words and symbols are used to highlight dangers.

1.1.1 Key words

DANGER	Dangers for persons. Non-compliance will inevitably cause irreversible injury or death.
WARNING	Dangers for persons. Non-compliance may cause irreversible injury or death.
CAUTION	Dangers for persons. Non-observance may cause minor injuries.
NOTICE	Information about avoiding material damage

1.1.2 Symbols



Warning about a danger point



Warning about dangerous electrical voltage



Warning about hand injuries



General mandatory sign to prevent material damage

1.2 Applicable documents

- General terms of business
- SCHUNK catalog Clamping Systems

The documents listed here, can be downloaded on our homepage www.schunk.com

2.1 Intended use

The clamping device has been designed to equip and replace tools in TRIBOS tool holders.

TRIBOS tool holders are suitable to clamp rotationally symmetric tools or work pieces. With shank tools, all shanks can be clamped according to DIN 1835 Form A, B, E or DIN 6535 Form HA, HB, HE (shank tolerance h6).

The polygon clamping system (clamping device, reduction inserts and TRIBOS tool holders) may only be used within the framework of its defined application parameters ([☞ 6, Page 11](#)).

The product is designed for industrial use.

To use this unit as intended, it is also essential to observe the technical data and installation and operation notes in this manual and to comply with the maintenance intervals.

2.2 Not intended use

It is an not intended use of the clamping device if tool holders were used that are not SCHUNK TRIBOS tool holders.

2.3 Environmental and operating conditions

The TRIBOS clamping device may be stored and operated only in clean, dust-free and dry rooms at a temperature of + 5°C till + 40°C. The relative humidity can be between 20 - 80%.

2.4 Position of the type plate

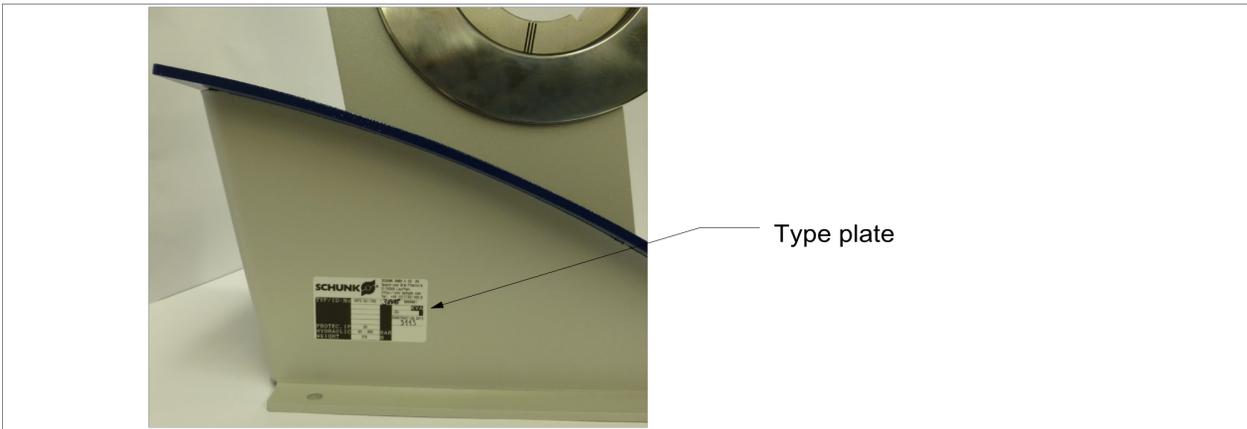


Fig. 1

2.4.1 Type plate

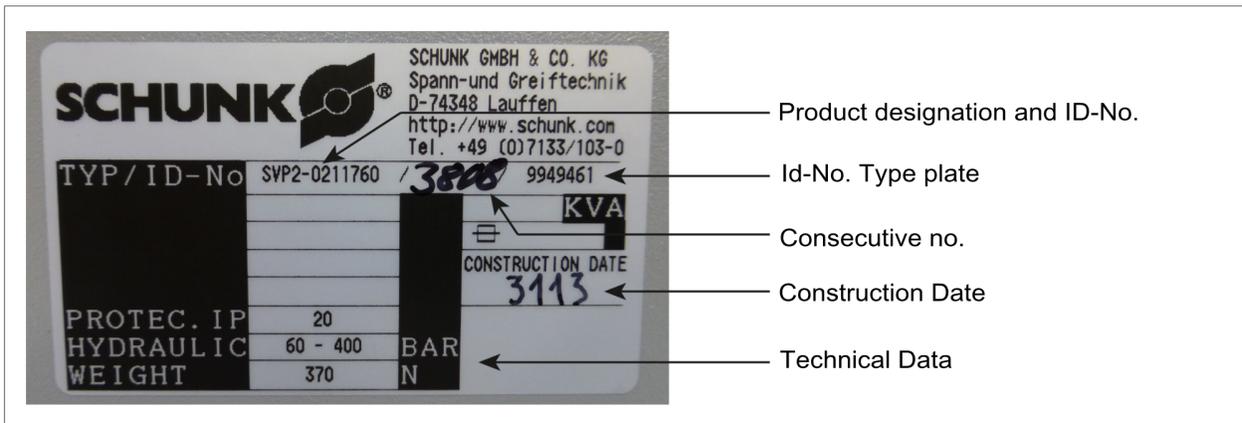


Fig. 2

2.5 Product safety

2.5.1 Constructional changes, attachments, or modifications

Additional drill holes, threads, or attachments that are not offered as accessories by SCHUNK may be attached only with permission of SCHUNK.

2.6 Personnel qualification

The initial commissioning, maintenance, and repair of the clamping device may only be performed by trained specialist personnel. Every person called upon by the operator to work on the module must have read and understood the complete assembly and operating manual, especially the chapter "Basic safety notes". This applies particularly to personnel only used occasionally at the TRIBOS clamping device.

2.7 Notes on particular risks

	 WARNING
	<p>Sideways under high pressure escaping oil through the seals of the pressure hull. Wear Gloves, Glasses and individual protection.</p>

	 WARNING
	<p>Sideways under high pressure escaping oil after opening the venting screw of the pressure hull. Wear Gloves, Glasses and individual protection.</p>



NOTICE

The gripping force of the TRIBOS clamping device SVP-2 goes up to 800 000 N!

The tool holder needs to be inserted up to the locating surface into the reduction application. The reduction application needs to be inserted into clamping device up until impact. Nonobservance may end in plastically deformation and lack of functions at the clamping device, the reduction application and tool holder.



NOTICE

Only charge the TRIBOS tool holder with pressure, if positioned exactly in the reduction application (tool holder in indexing position on flat surface)

Nonobservance may end in plastically deformation.



NOTICE

The abrasion of the reduction application may be maximum of 0.04 mm.

Loss of function.



NOTICE

Never exceed the pressure which is indicated on the tool holder!
The TRIBOS tool holder will be deformed and useless!



NOTICE

Nonobservance of the minimum clamping depth.
Threatening loss of accuracy and torque.

If the product is used as intended, the warranty is valid for 24 months from the date of delivery from the production facility under the following conditions:

- Intended use in 1-shift operation
- Recommended operating and maintenance regulations

Basically tool and machine contacting components, and wear parts (actuation screw and seal) are not part of the warranty.

4 Scope of delivery

The scope of delivery includes:

- TRIBOS clamping device SVP-2 Id No.: 0211760
- Documentation SVP-2 Id No.: 0289021

5 Accessories

- Cylindrical brush
(see catalog Tool holder systems "Accessories")
- Insert SRE (see catalog Tool holder systems "Accessories")
- Protective cover for TRIBOS clamping device SVP-2/2D
(ID number: 9935548)
- Length adjustment LMG-M (ID number: 0201961)
- Stacker (ID number: 0211768)
- Protective cover for Stacker (ID number: 9937963)

Reference value	Value
Operating pressure	0 - 400 bar
Pressing time	depending on the clamping pressure (approx. 8 sec at 400 bar)
Hydraulic fluid	Mobile Vactra 2 (Viscosity 68)
Operating temp.	+5°C to +40°C
Dimensions	300mm x 370mm x 347mm (LxBxH)
Weight	37 kg
IP class	40

7 Overview

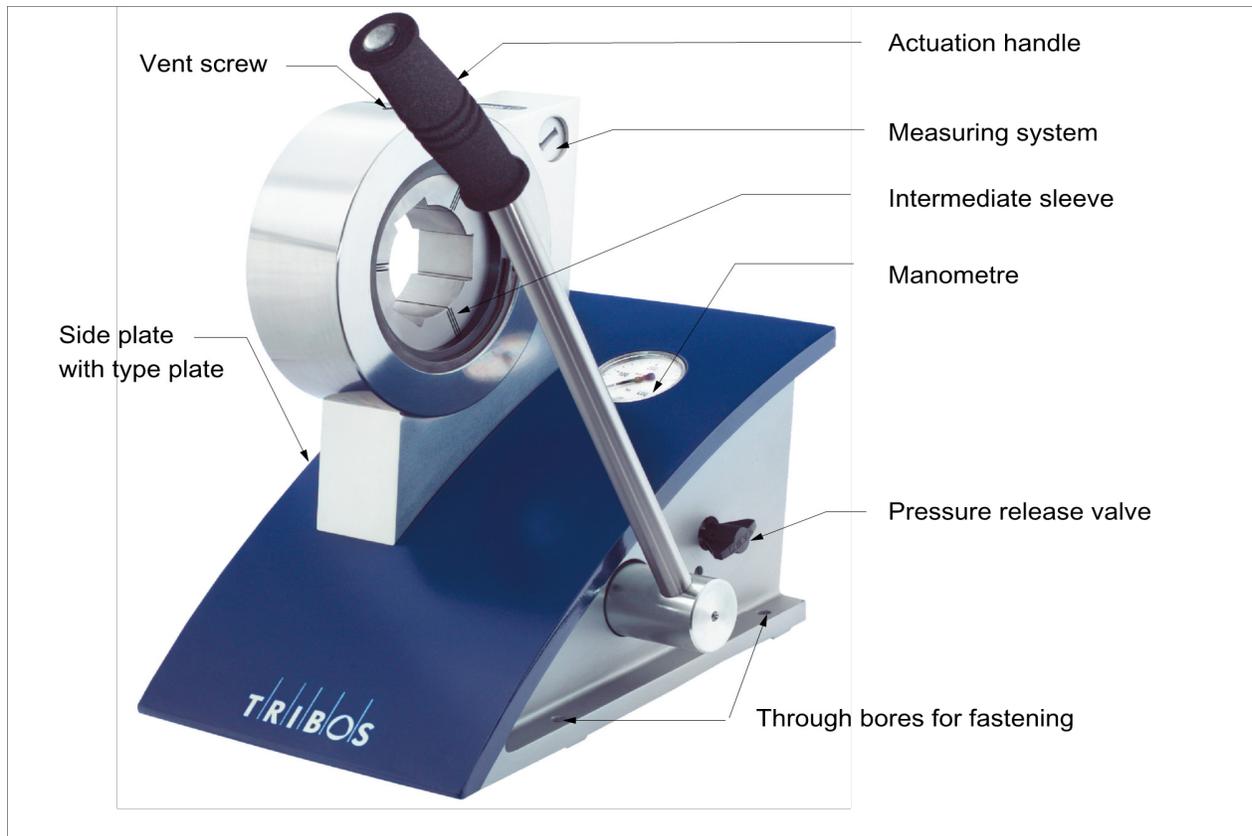


Fig. 3

8.1 Fastening the clamping device onto a work bench

In the base plate of the TRIBOS clamping device SVP-2 there are four bore holes.

The SVP-2 has to be fastened to a work bench with four screws M8 and shims (preferably made of plastic to avoid optical damages to the housing) through the mounting holes!

	 WARNING
	<p>Clamping device may tilt or fall when not attached. Hands and feet may be squeezed and jammed.</p>

8.2 Assembly of the length adjustment

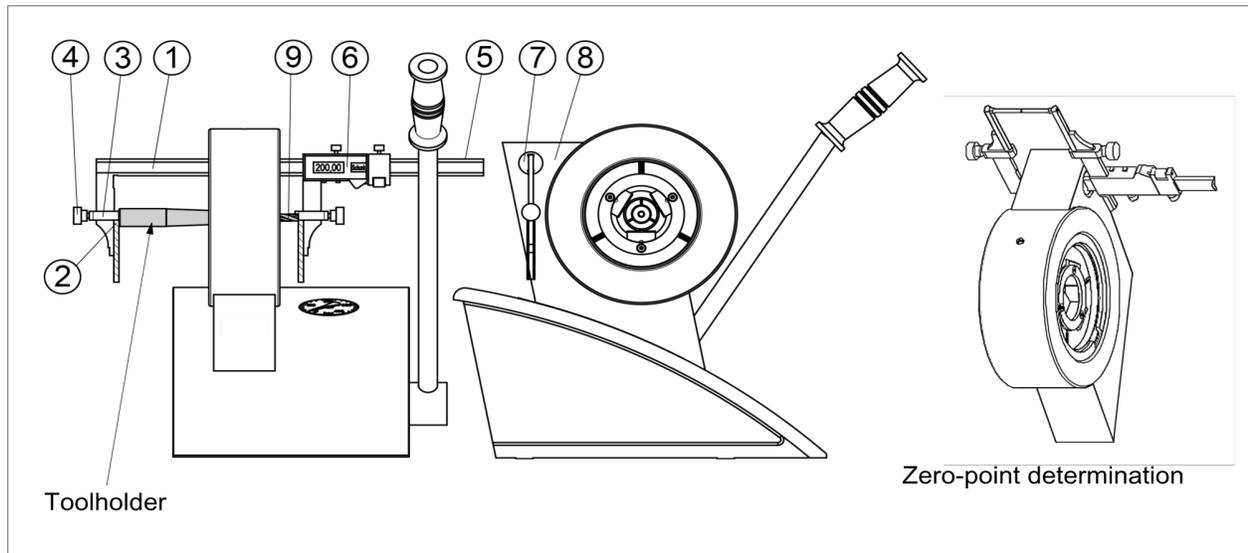


Fig. 4

Check that all the parts have been provided:

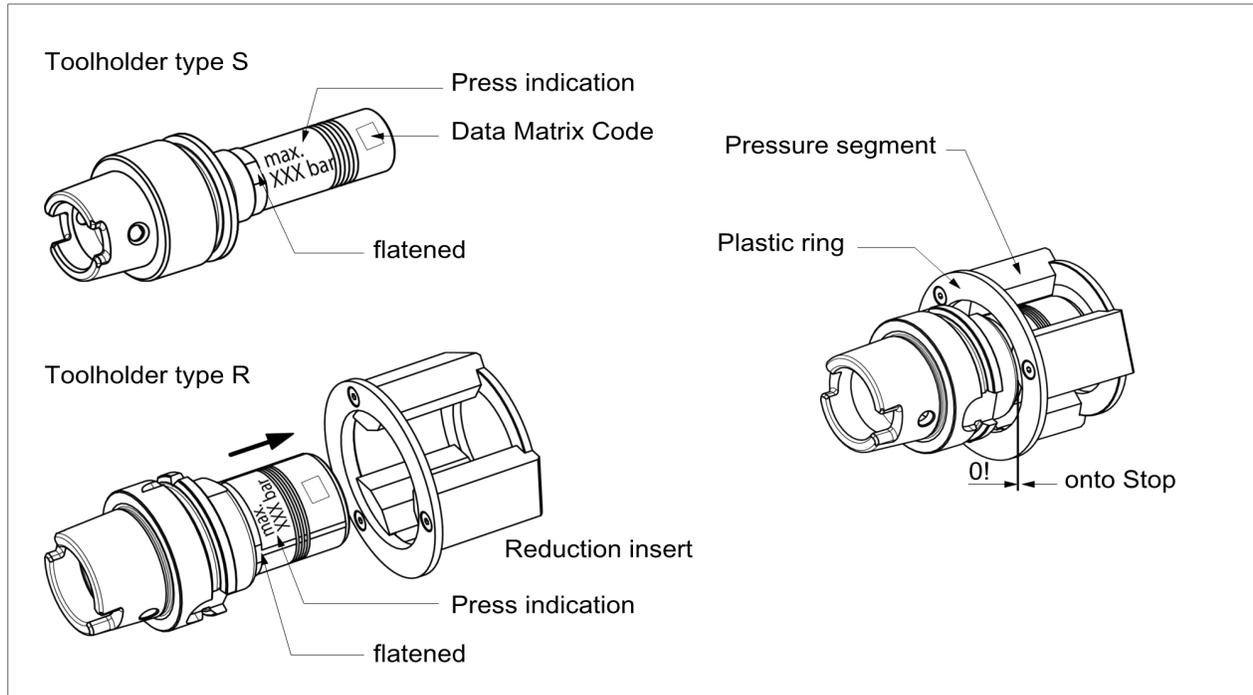
- 1 Caliper gauge (1)
- 2 Measuring legs (2)
- 2 Brackets for the measuring pins (3)
- 2 Knurled screws (4)
- 1 Safety pin (5)

away. Then guide the caliper gauge from left to right through the two slotted bearings (7) of the bracket of the base body (8) of the clamping device. Push the movable side (6) again onto the caliper gauge and secure it with the safety pin (5) in the bore on the rear of the caliper gauge. Then guide the caliper gauge from left to right through the two slotted bearings (7) of the bracket of the base body (8) of the clamping device. Push the movable side (6) again onto the caliper gauge and secure it with the safety pin (5) in the bore on the rear of the caliper gauge.

- 2 In order to reach the cutter of your tool (9), you will need an extension of the caliper gauge side. Turn the knurled screw (4) into the bracket (3). Push one bracket over each side of the caliper gauge (1) and insert the measuring legs (2) into the bracket with the slotted side facing the caliper gauge side (see illustration)
- 3 After having inserted the measuring legs (2) into the required position, fix the bracket (3) with the knurled screw (4).
- 4 To determine the zero point of the caliper gauge, swivel up the two measuring arms and slide towards one another. Set the caliper gauge's display to zero (see illustration). Set the caliper gauge's display to zero (see illustration)

9.1 Reduction insert and tool holder

Valid for TRIBOS Toolholder: Typ S / Typ R / Typ Mini / Typ RM / Typ SVL



✓ Note the pressure indication on the toolholder.

NOTE

Former versions of the toolholder type S are not equipped with a locking surface yet. Before clamping the toolholders in the clamping device SVP-2, please contact SCHUNK (+49-7133-103-2333) SVP-2 We gladly support you in order to avoid damages at the toolholder caused by wrong clamping operations.

- 1 Push the reduction insert onto the toolholder until it snaps in via the flattened areas. In order to eliminate possible play between the flattened area and the reduction insert, turn the toolholder, which is clamped into the reduction insert, to the right (clockwise).
- 2 Slide the reduction insert and the toolholder into the clamping device until the stop. The position is automatically determined by the three segments of the reduction insert in the large intermediate sleeve of the clamping device at an angle of 120°.



Once you have inserted the reduction insert with the toolholder until it contacts the stop of the clamping device, it is essential that you check whether the toolholder and reduction insert are still correctly inserted to the stop and that any possible toolholder play is eliminated by turning to the right!



NOTICE

Do not exceed the pressure indicated on the toolholder!
Otherwise the toolholder will be damaged!



NOTICE

Danger of deformation of the reduction insert

- The intermediate sleeve **may never** be clamped empty (without clamping insert and TRIBOS Toolholder).

- 3 Close the pressure release valve and actuate the manual pump until the required pressure is achieved
⇒ The tool/workpiece can be inserted or removed now.
- 4 To unclamp the device, open the pressure release valve.
⇒ The reduction insert with the toolholder can be removed from the clamping device. The toolholder is now ready for us.

9.2 Notes on clamping and unclamping

- Due to the manufacturing and material tolerances, it is possible to insert or loosen tools or work pieces even at a pressure below that indicated on the TRIBOS tool holder.
- **This lower pressure value may be significantly less than that stipulated on the tool holder .**

However, this has no influence on the transmissible torque of the tool holder (see operating manual TRIBOS polygonal tool holder).

- Please make sure that the tool/work piece is still clamped in the tool holder at this time, if the actual unclamping pressure of the clamping device was exceeded! It is also possible that the tool can no longer be inserted into the tool holder at the indicated pressure, but instead at a value that is a few bars below it!
- Continually check the pressure in the clamping device at which the tool/workpiece can be inserted or removed from the tool holder.
- If it proves impossible to loosen or insert the tool or work piece from or into the tool holder until the indicated pressure is achieved, stop the clamping procedure. Release the pressure of the clamping device first and then check that any play between the flattened area of the tool holder and the reduction insert is eliminated by turning the tool holder to the right (clockwise). Repeat the clamping procedure.
- If it proves impossible to loosen or insert the tool/work piece, even though the tool holder is inserted correctly in the reduction insert, unclamp the device and remove the reduction insert and the tool holder. Turn the reduction insert on the tool holder by 120°, push it into the clamping device again and repeat the clamping procedure. It should now be possible to loosen the tool/work piece.
- The tool can become stuck in the tool holder as a result of fine particles in the cooling lubricant. If this is the case, insert a piercer through the rear opening of the TRIBOS tool holder and loosen the tool by pushing or gently hitting it with this piercer.
- Sometimes, the tool shanks are marked. These markings are often "wrapped". This impairs the insertion of the TRIBOS tool holder or even makes an insertion impossible. In this case, remove the wrapping.

6335 shape HE are often twisted and can therefore frequently not be inserted into the TRIBOS tool holder or quickly lead to poor run-out accuracy. The same is also true of tool shanks that fall below h6 quality (no torque) or exceed it (not joinable).

For clamping shanks of shape E or HE, please consider the position of the flattening to the pressure segments:

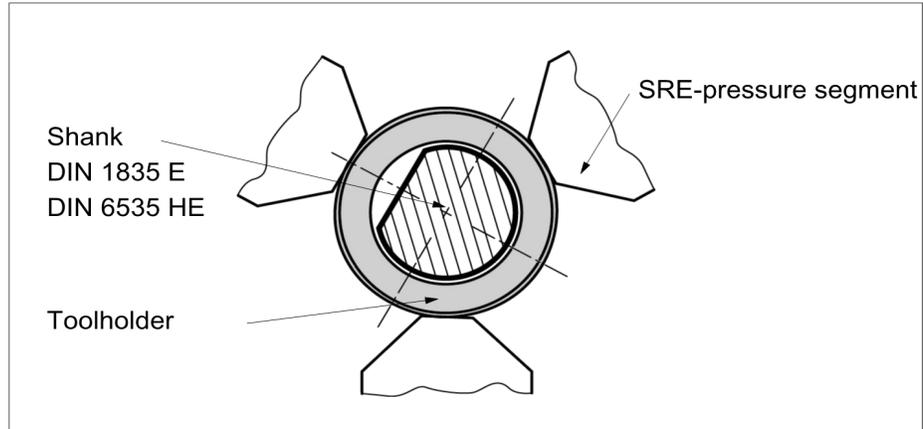


Fig. 5

At this shank position in the TRIBOS tool holder the clamping faces are positioned at the round shank and thus achieve the effect of a "round shank clamp". The hardness at the tool shank should be min. HRC 50 (shank stiffness min. 1000 N/mm²) in order to avoid a deformation of the tool shank. If the degree of hardness or stiffness should be lower, the compression joint is not properly covered and therefore results a reduced force transmission of the clamping system.

9.3 TRIBOS pressure table

In general: Observe TRIBOS pressure table

- 1 Auf Anschlag einschieben | Insert until stop
- 2 Auf Indexierfläche einrasten | Engage on indexing surface
- 3 Spanndruckbereich beachten! | Consider range of clamping pressure!

Spann-Ø [mm] Clamping-Ø [mm]	TRIBOS-Mini TRIBOS-Mini-SVL	
	Druck Pressure [bar]	! max. [bar]
1-6	60 - 85	85

Spann-Ø [mm] Clamping-Ø [mm]	TRIBOS-S TRIBOS-SVL		TRIBOS-R	
	Druck Pressure [bar]	! max. [bar]	Druck Pressure [bar]	! max. [bar]
6	120 - 180	210	110 - 160	170
7	140 - 210	220	120 - 180	180
8	150 - 220	250	120 - 170	180
9	160 - 240	250	180 - 250	260
10	180 - 250	280	180 - 240	260
11	180 - 270	280	230 - 300	320
12	210 - 280	310	250 - 300	320
13	240 - 320	340	240 - 320	330
14	240 - 310	330	280 - 320	340
15	260 - 340	360	270 - 320	340
16	270 - 330	350	280 - 320	340
17	280 - 360	370	240 - 290	310
18	290 - 350	370	300 - 340	360
20	300 - 350	370	320 - 360	380
25	320 - 370	380	300 - 340	350
32	270 - 310	320	270 - 300	310
1/8"	60 - 85	85	-	-
3/16"	60 - 85	85	-	-
1/4"	130 - 200	210	100 - 160	160
5/16"	170 - 240	260	-	-
3/8"	190 - 250	270	180 - 250	280
7/16"	200 - 270	290	-	-
1/2"	220 - 310	320	220 - 290	320
5/8"	280 - 350	380	280 - 320	350
3/4"	290 - 360	380	280 - 330	350
1"	300 - 360	380	270 - 300	320
1 1/4"	-	-	200 - 250	260

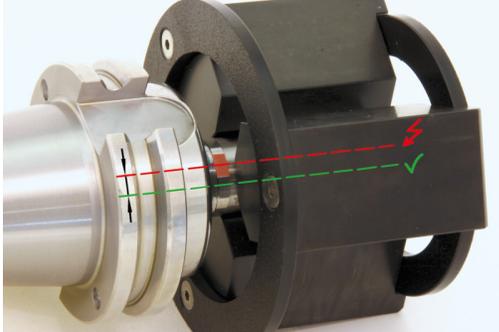
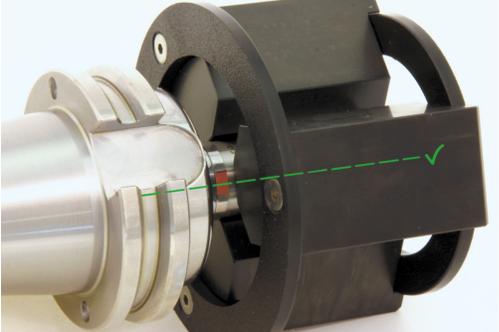
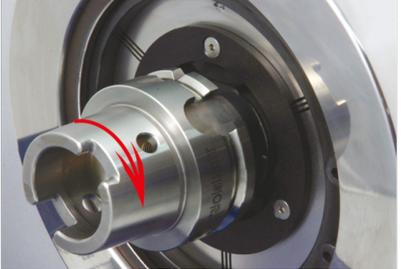
Außen-Ø [mm] Outside-Ø [mm]	TRIBOS-RM	
	Druck Pressure [bar]	! max. [bar]
18	80 - 120	120
20	110 - 180	180
25	190 - 260	260
32	280 - 380	380

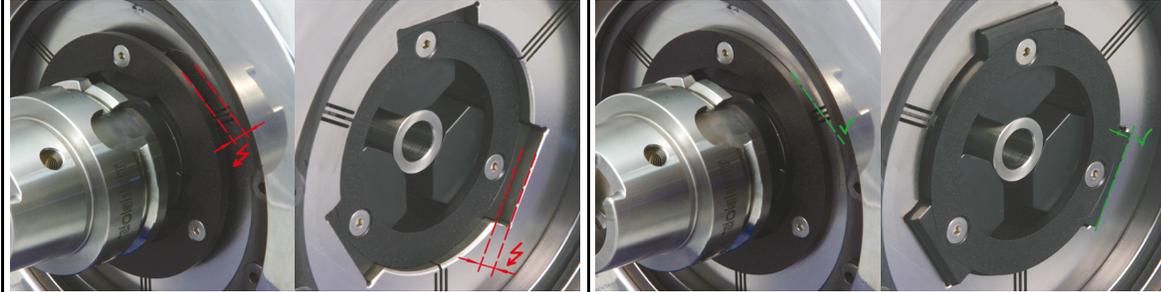
Außen-Ø [mm] Outside-Ø [mm]	TRIBOS-S HSK-F 63	
	Druck Pressure [bar]	! max. [bar]
25	280 - 300	310

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Fig. 6

10.1 Tool shank does not seat properly when pressure has built up

Possible cause	Corrective action
 <p>Tool holder not properly engaged with the engaging surfaces of the reduction insert (1) Tool holder not seated on end stop (2).</p>	 <p>Engage tool holder properly and seat on end stop.</p>
 <p>Wrong tool holder angle . Too much pressure could have been applied to tool holder reduction insert causing constant deformation.</p>	 <p>Ensure correct angle on tool holder / reduction insert (engaging surface must be aligned with the segment).</p>
<p>TRIBOS tool holder not turned to right-hand stop.</p>	 <p>Turn TRIBOS tool holder to right-hand stop</p>



Reduction insert not inserted into intermediate sleeve of the clamping device up to the stop.

Insert reduction insert into the intermediate sleeve of the clamping device up to the stop.

Shank is too large.
Shank does not have the required tolerance h6.

Use tool shank with tolerance h6.

Clamping pressure is too low or too high (wrong pressure value was entered)
Tool holder has already been over-pressurized once before.

Observe TRIBOS pressure table (do not exceed max. pressure).

Clamping area dirty

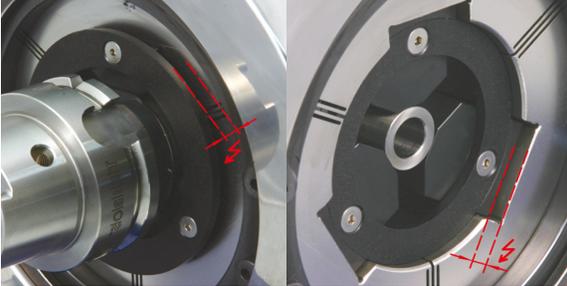
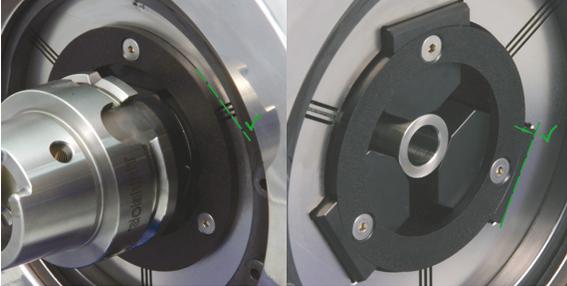
Keep clamping area clean.



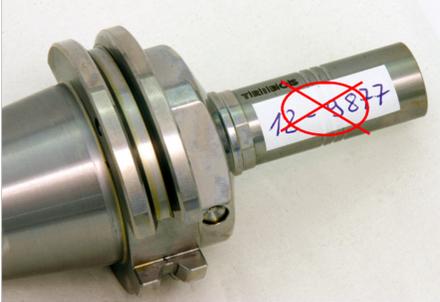
Stickers or the like on the clamping area

Keep clamping area clean at the outer diameter. It must be possible to seat the reduction insert properly.

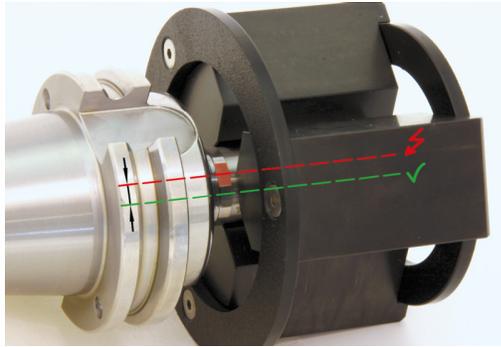
10.2 Tool shank can only be partially inserted into the tool holder

Possible cause	Corrective action
 <p>Tool holder has not fully engaged with the engaging areas of the reduction insert.</p>	 <p>Engage tool holder properly.</p>
 <p>Reduction insert not inserted into intermediate sleeve of the clamping device up to the stop.</p>	 <p>Insert reduction insert into the intermediate sleeve of the clamping device up to the stop.</p>
<p>Quality of tool shank is not OK, e.g. it may have a slightly conical shape.</p>	<p>Check tool shank. Use tool shank with tolerance h6.</p>

10.3 Tool can not be removed from the tool holder

Possible cause	Corrective action
Frictional corrosion / contact corrosion	Actuate clamping device on release pressure for the tool holder. Drive out the tool shank using a hammer and a suitable drift punch. Clean clamping bore and tool and carry out new clamping procedure.
 <p>Stickers or the like on the clamping area</p>	Keep clamping area clean at the outer diameter. It must be possible to seat the reduction insert properly.
 <p>Laser inscription located on tool shank.</p>	 <p>Remove or smoothen inscription on the shank with a fine emery paper or a grinding stone.</p>
Tool broke off.	Actuate clamping device on release pressure for the tool holder. Drive out the tool shank using a hammer and a suitable drift punch. Clean clamping bore and clamp new tool.

10.4 Tool shank can be seated outside the pressure range if slight pressure is applied

Possible cause	Corrective action
 <p>Tool holder pressed at wrong angle (clamping area is deformed). Tool holder has been over-pressurized (clamping area distorted).</p>	<p>Send back the tool holder to SCHUNK for inspection/repair. Observe TRIBOS pressure table (do not exceed max. pressure).</p>
<p>Shank does not have the required tolerance h6. Tool shank is under-dimensioned (< h6).</p>	<p>Use tool shank with tolerance h6.</p>

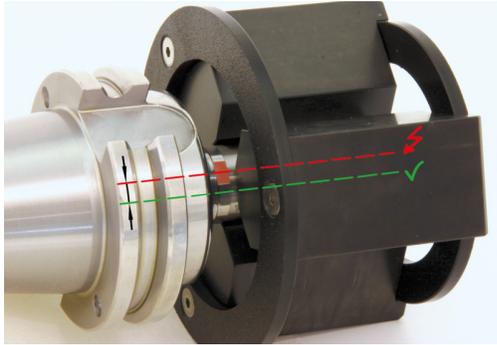
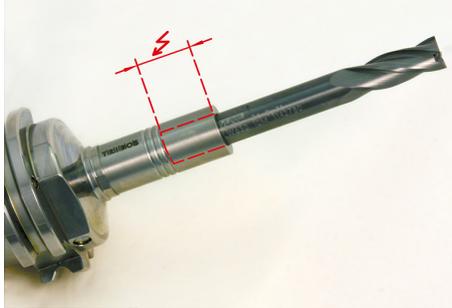
10.5 Tool shank can not yet be seated at maximum pressure

Possible cause	Corrective action
<p>Shank does not have the required tolerance h6.</p>	<p>Use tool shank with tolerance h6.</p>

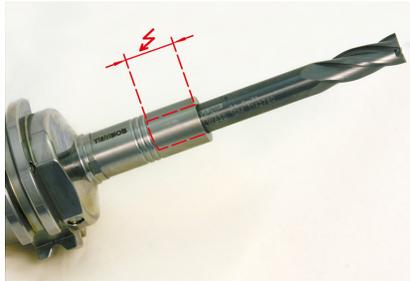
10.6 Clamping device does not build up pressure

Possible cause	Corrective action
 <p>Hydraulic valve on pump housing is open.</p>	 <p>Close hydraulic valve.</p>

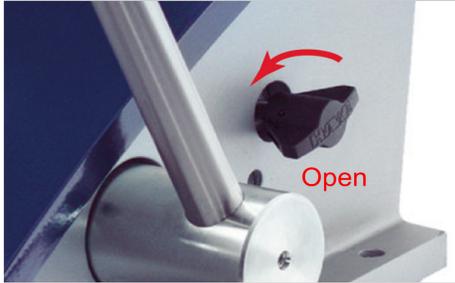
10.7 Torque / clamping force / holding force too low

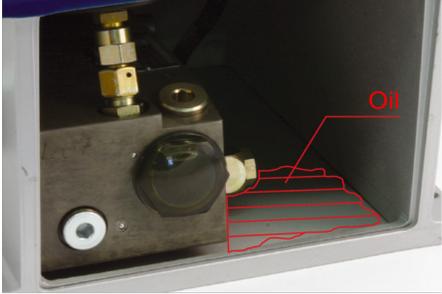
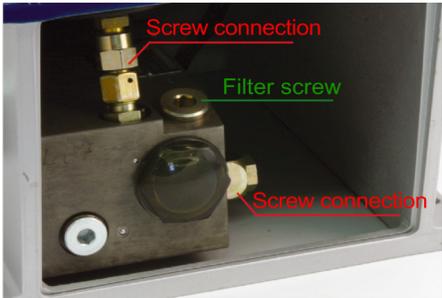
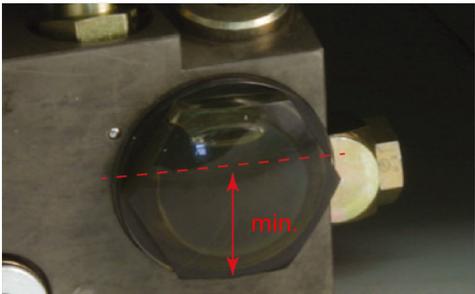
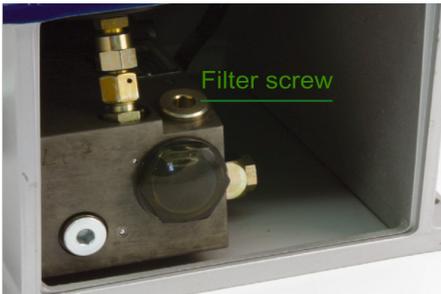
Possible cause	Corrective action
 <p>Tool holder pressed at wrong angle (clamping area is deformed). Tool holder has been over-pressurized, that mean charged with too much pressure (clamping area distorted)</p>	<p>Send back the tool holder to SCHUNK for inspection/repair. Observe TRIBOS pressure table (do not exceed max. pressure).</p>
<p>Shank does not have the required tolerance h6. Tool shank is under-dimensioned (< h6).</p>	<p>Use tool shank with tolerance h6.</p>
 <p>Minimum shank clamping depth was not observed.</p>	 <p>Observe minimum shank clamping depth (see operating manuals TRIBOS polygonal tool holder).</p>
<p>Lubricant film on tool shank and/or on the clamping area.</p>	<p>De-grease and clean clamping area and tool shank.</p>
<p>Tool holder and tool were inserted with wrong (too high) cutting data.</p>	<p>Adjust cutting data/cutting values.</p>

10.8 Concentricity errors on the clamped tool

Possible cause	Corrective action
Tool holder damaged, improper handling.	Check tool holder for collision or damage and send back to SCHUNK for inspection/repair if necessary.
Machine spindle damaged, concentricity error/axial eccentricity error on the machine spindle.	Check machine spindle for damage and check true running.
Tool has not been ground properly.	Check tool and replace if necessary.
Tool shank not fully cylindrical.	Use fully cylindrical tool shank.
 <p>Minimum shank clamping depth was not observed.</p>	 <p>Observe minimum shank clamping depth (see operating manuals TRIBOS polygonal tool holder).</p>

10.9 Clamping device does not reach required pressure

Possible cause	Corrective action
 <p>Hydraulic valve on pump housing is open</p>	 <p>Close hydraulic valve.</p>
 <p>Oil leakage on pressure body (seal)</p>	<p>Replace seal send the clamping device to SCHUNK for inspection/repair</p>

 <p>Oil leakage on pressure body (screw connection)</p>	<p>Check screw connection send the clamping device to SCHUNK for inspection/repair</p>
 <p>Oil leakage on pressure body (screw connection, terminal block)</p>	<p>Retighten screw connections, top up with oil if necessary and bleed clamping device (11.1, Page 27).</p>
 <p>Not enough oil in the clamping device</p>	 <p>Fill compensation unit and bleed clamping dev</p>

10.10 Oil leaking out of the clamping device

Possible cause	Corrective action
 <p>Oil leakage on pressure body (seal)</p>	<p>Replace seal. send the clamping device to SCHUNK for inspection/repair</p>

11.1 Care and storage

- Store the TRIBOS clamping device in unpressurized condition.
- Only store and use the TRIBOS clamping device in horizontal position, because it is just intended for horizontal applications. Otherwise, the pump may draw with air.
- Before storing, lightly lubricate the TRIBOS clamping device, the reduction insert and the TRIBOS tool holder.
- If the TRIBOS clamping device is not used for a longer period of time, cover it with the optionally available protective cover.
- Each time the tool/work piece is changed, clean the clamping diameter in the clamping area. (Suitable cylindrical brushes are available separately).
- If the desired pressure can not longer be achieved, check the oil level in the receptacle inside the housing. To open the housing, loosen the 4 screws at the back and remove the back wall. The oil level can now be checked and the receptacle topped up, if necessary. The oil receptacle should always be full.
- If there should be air in the pressure system (caused by improper storage or insufficient oil in the oil receptacle), you may release this air using the vent screw a little and pump the actuation handle until the air is expelled (oil will displace). Close the vent screw (starting torque max. 3 Nm) and check the oil level of the oil receptacle. If necessary, please refill oil.

11.2 Maintenance and service

The TRIBOS clamping device is maintenance-free.

Service and repair work should only be carried out in accordance with the service instructions by qualified personnel. This includes SCHUNK service technicians or qualified technicians trained by SCHUNK.

12.1 Transport

Use the original SCHUNK packaging for transport. Transport the clamping device only horizontally.

	 CAUTION
	<p>The clamping device may be lifted and moved only with a suitable lifting Non-observance could cause risk of injury to the transport personnel</p>

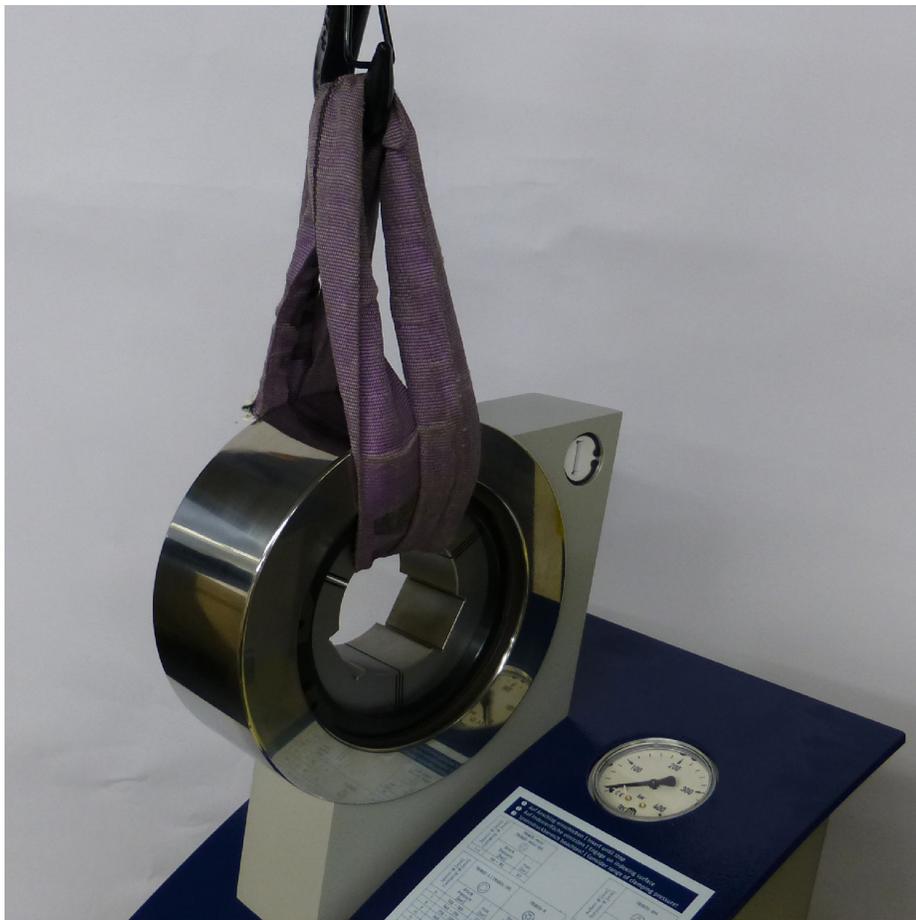


Fig. 7

12.2 Disposal

For proper disposal, return the clamping device to SCHUNK.

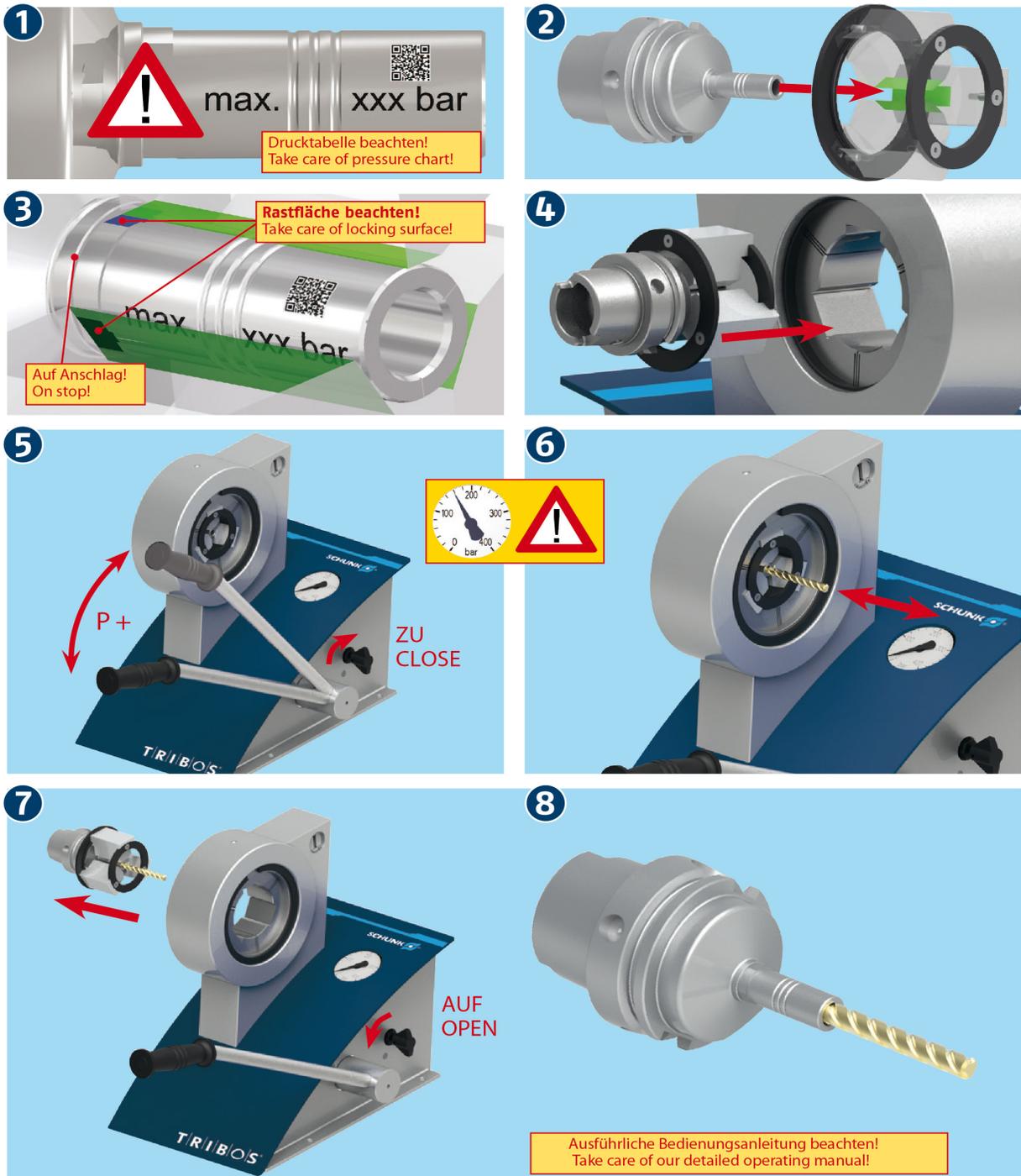


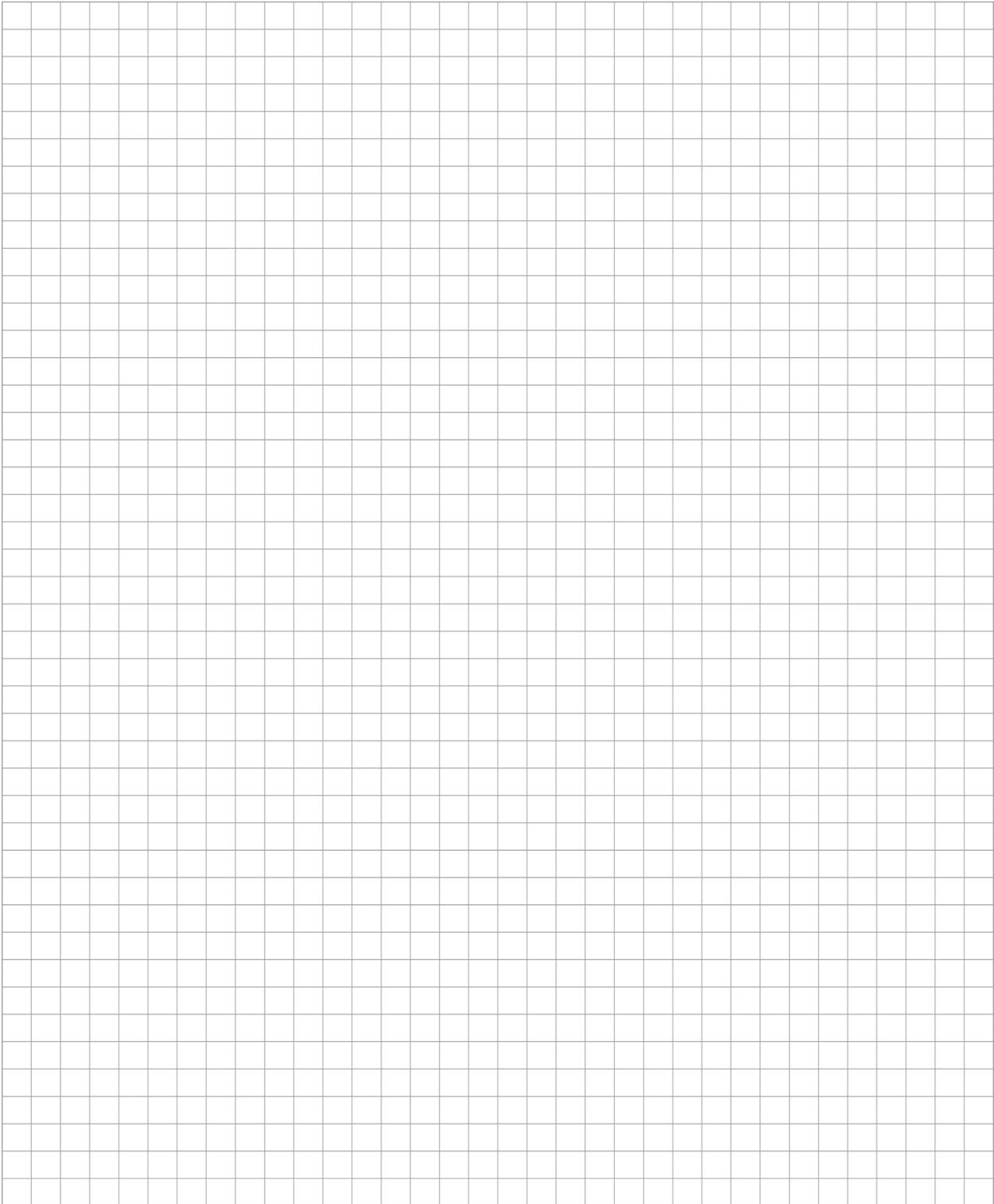
Fig. 8

Design with manual pump for quick actuation and frequent tool changes

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