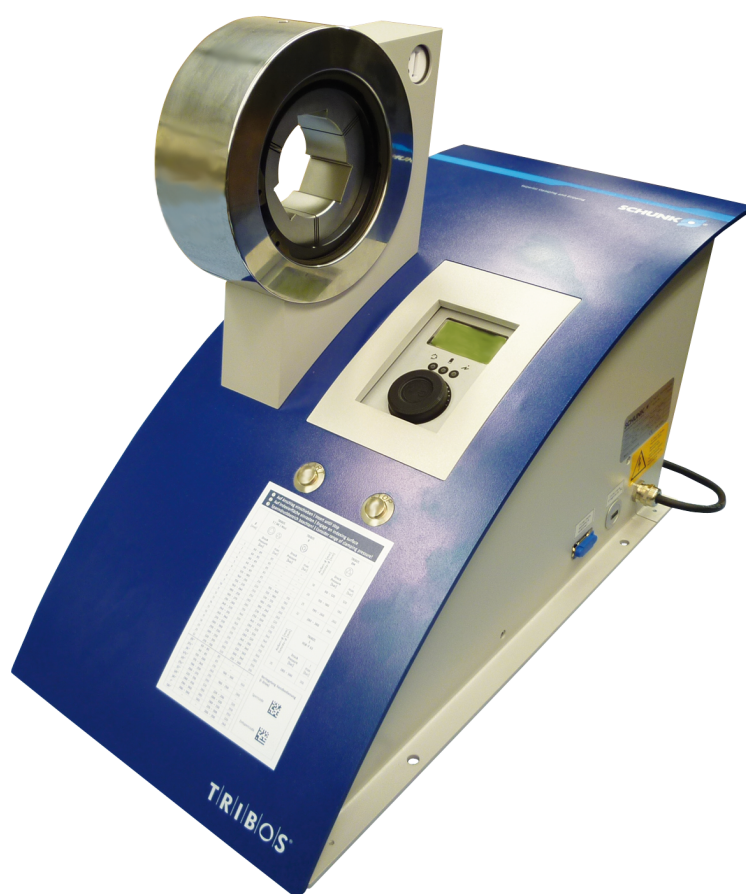


Assembly and Operating manual

Clamping device SVP-4

Polygonal Clamping System



Imprint

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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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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 manual "TRIBOS Polygonal Clamping device" (Toolholder) *

The documents marked with an asterisk (*) can be downloaded on our homepage **schunk.com**

1.2 Warranty

The warranty is valid for 24 months from the delivery date to the production facility or 50 000 clamping operations under 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.

1.3 Scope of delivery

The scope of delivery includes:

- TRIBOS clamping device SVP-4 in the ordered model (230V or 110V).
- Operating manual SVP-4
- USB-A cable

1.4 Accessories

- Cylindrical brush (see catalog Tool holder systems "Accessories")
- Insert SRE (see catalog Tool holder systems "Accessories")
- Protective cover for TRIBOS clamping device SVP-4 (Id. Nr.: 9957700)
- Length adjustment LMG-M (Id No: 0201961)
- Stacker (Id No.0211768)
- Protective cover for stacker (Id No.: 0211768)
- Handheld scanner,
- Power adapter, [Power adapter](#) [► 7]

1.4.1 Power adapter

- China / Australia - ID No.: 9958139
- Italy - ID no.: 9958140
- England - ID no.: 9958141
- USA / Canada - ID no.: 9958142
- Switzerland - ID no.: 9958143
- South Africa - ID no.: 9961009
- France - ID no.: 9900076

Note: Product pictures see catalog Tool holder systems
"Accessories"

2 Basic safety notes

2.1 Intended use

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

TRIBOS toolholders 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 toolholders) may only be used within the framework of its defined application parameters [Technical data](#) [► 14].

- 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 an not intended use of the clamping device if toolholders were used that are not SCHUNK TRIBOS toolholders.

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 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 +15°C till + 40°C. The relative humidity can be between 20 - 80%.

NOTE

- Please observe the operating time of the pump in continuous mode.
 - If the on-time is not observed, the power supply unit may be overloaded. The clamping device switches off until the power supply unit has cooled off again.
-

The on-time and the associated rest periods must be adhered to as follows:

At ambient temperature 20°C: 100% on-time S3 / 60 Min.

At ambient temperature 40°C: 40% on-time S3 / 60 Min.

(Operating period 24 minutes, rest period 36 minutes)

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 clamping device must have read and understood the complete assembly and operating manual, especially the chapter "Basic safety notes" [Basic safety notes](#) [► 8]. This applies particularly to personnel only used occasionally at the TRIBOS clamping device.

2.7 Transport

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



⚠ CAUTION

Risk of injury due to unsuitable means of transport!

The use of unsuitable means of transport can cause injuries.

- Use suitable means of transport.



2.8 Disposal

For proper disposal, return the clamping device to SCHUNK.

2.9 Fundamental dangers

2.9.1 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.

2.10 Notes on particular risks



⚠ DANGER

Risk of fatal injury due to electric current!

Touching live parts poses an immediate risk of fatal injury by electrocution.

- Only allow a qualified electrician to perform work on electrical components.
- Prior to commencing work on electric components, restore to a de-energized state.
- In case of damage to the insulation, switch off the power supply immediately and arrange for a repair.
- Keep humidity away from live parts.



⚠ WARNING

Risk of injury because of electrical energy!

Remove the energy supplies.



⚠ WARNING

Risk of injury due to lateral under high pressure escaping oil!

Lateral under high pressure escaping oil on seals or by opening the vent screw can cause serious injuries.

- Wear protective gloves and safety goggles.

CAUTION

Material damage due to incorrect insertion of the toolholder / reduction insert!

The gripping force of the TRIBOS clamping device SVP-4 goes up to 800 000 N!

Incorrect insertion and positioning of the toolholder causes plastically deformation and loss of function of the toolholder.

- Insert the toolholder till the stop into the reduction insert and position correctly (via the flattened areas).
- Insert the reduction insert till the stop into the clamping device.

CAUTION**Material damage due to incorrect positioning!**

Incorrect Positioning of the TRIBOS toolholder in the reduction insert causes plastical deformation when force is applied.

- Position toolholder over flattening in the reduction insert.

CAUTION**Material damage due to wear of the reduction insert.**

Too high wear of the reduction insert causes loss of function of the toolholder.

The wear of the reduction insert may be maximum of 0.04 mm.

- When exceeding the maximum wear replace reduction insert.

CAUTION**Material damage due to exceeding the permissible pressure!**

Too high pressure causes deformation of the toolholder and loss of function.

- Observe the pressure specifications of the toolholder.

CAUTION**Material damage due to false minimum clamping depth!**

A too low minimum clamping depth causes loss of accuracy and torque at the toolholder.

- Observe minimum clamping depth of the tool,
✓ See Assembly and Operating manual Toolholder.

CAUTION**Property damage due to incorrect connection!**

Connecting a remote control during service and maintenance work on the built-in pump type CPT-60/400 will damage the control board.

- Do not connect a remote control during servicing and maintenance work!

3 Technical data

Reference value	Value
Operating pressure [bar]	60 - 400
Voltage/frequency	230V AC, 50 - 60 HZ (Id-No.: 0219230) 110 V AC, 50 - 60 Hz (Id-No.: 0219231)
Power [W]	200
Drive motor	DC-Permanent Magnet Motor
Pressing time (depending on clamping pressure and oil temperature)	depending on clamping pressure and oil temperature (approx. 15 s at 400 bar)
Sound pressure	78 db(A) at a distance of 1m
Accelerations	< 2.5 m/s ² (weighted root mean square acceleration value)
Hydraulic oil	AGIP EXIDIA HG - 68
Ambient temperature [°C]	+15 to +40
Dimensions (L x W x H) [mm]	610 x 320 x 460
Weight [kg]	40
Protection class IP	2X
RS-232 interface	Pin1: +5VDC Pin2: TXD Pin3: RXD PIN5: GND

NOTE

A voltage can be measured between the positive pole and negative pole of the power supply unit due to the electrical AC/DC conversions in the power supply unit. This voltage is generated by the electronic components during the conversion from 230/110 V to 18 V. However, it cannot be compensated. This can be seen, for example, whenever the voltage is measured with a digital multimeter between the TRIBOS pressure body or the intermediate sleeve. This AC voltage is indicated on an electronic measurement instrument (multimeter) when measuring against ground. Digital measurement instruments are designed with high impedance due to their measuring function. This also applies to the power supply unit, which allows the existing AC voltage to be indicated by the measurement instrument. In effect, this is a measurement error of a digital measurement instrument. The insulation resistance of the primary side on the secondary side of the power supply unit is 999 MΩ. Touch current measurements result in current values within the µA range. The power supply unit is designed for double insulated devices (double rectangle) and does not allow the usage of a grounding conductor.

3.1 Technical characteristics and functions

- The pump body and all the functional components are made of tested, high-strength materials.
- The light and compact pump housing is made of insulating, shock-resistant, glass-fiber-reinforced polyamide.
- The system's check valve is adjusted to 630 bar.
- Standardized hydraulic connection couplings on the pump.
- The pump's displacement volume is approx. 0.15l/min.
- The device has a high return displacement volume for fast work cycles.
- The pump motor is actuated via PWM (soft start in order to preserve the gears, motor and the power supply).
- The pressure curve can optionally be shown on the display (pressure and time).
- Input and output element can be operated via (I-Drive) rotary knob.
- The device is controlled by a microcontroller.
- The pressure is monitored by an electronical pressure sensor.
- Electronically managed service management.
- The traceability of the pressure cycles is ensured by automatic recording and saving on an internal memory.

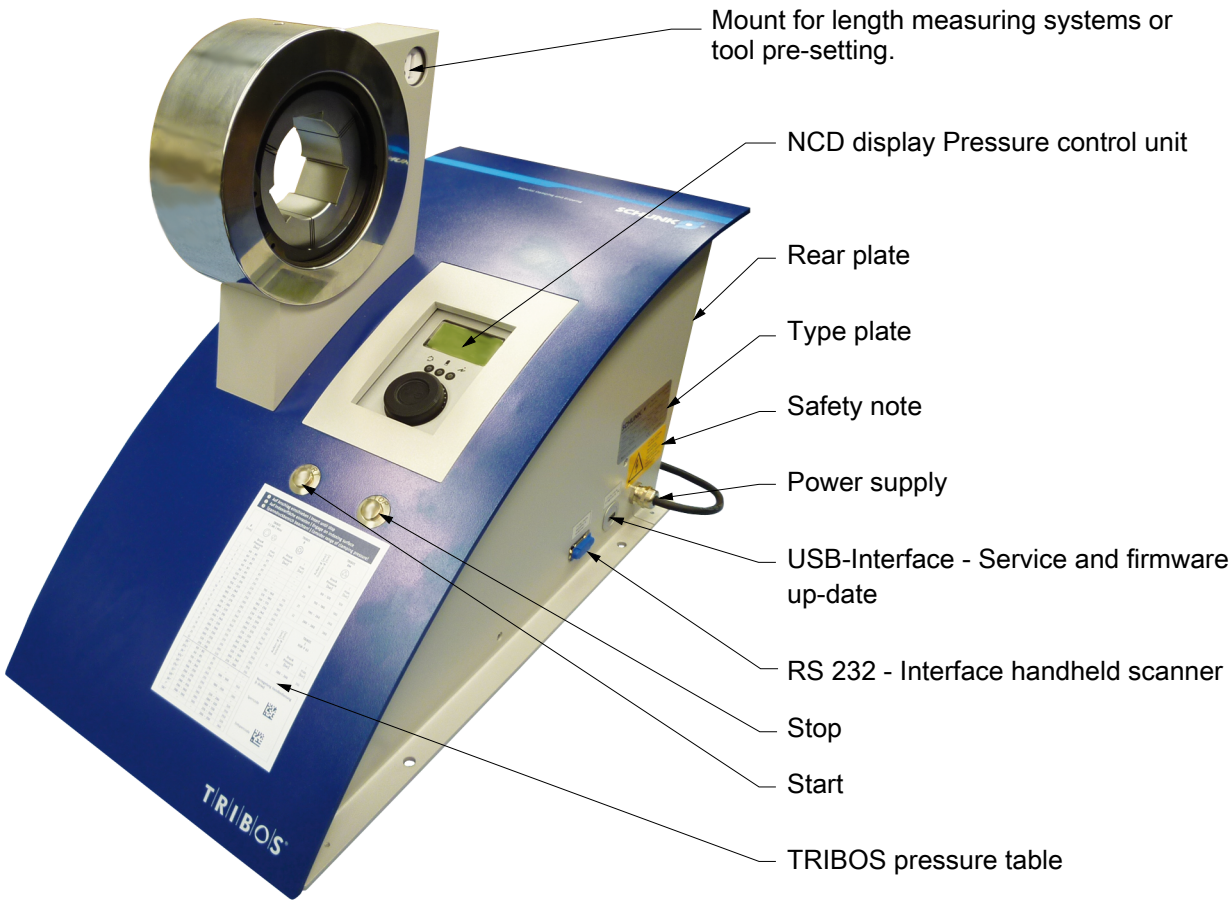
- The RS-232 interface allows reading in the clamping pressures via a Data Matrix Code (DMC) into the control unit by using a handheld scanner.
- The USB interface can be used to export the stored data and update the software.
- Remote diagnostics of the electrical elements is possible.
- Integrated, intelligent electronic module and large LCD display.

3.2 Technical Data of the optional handheld scanner

Handheld scanner CR6000

Dimensions (L x W x H) [mm]	151 x 93 x 35
Housing IP protection class	IP64
Lighting	Diffuse bright field, dark field
Interface	serial RS-232
Supply voltage [VDC]	+5
Power consumption [W]	2,2
Weight [g]	130
Operating and storage humidity	5% to 95% non-condensing
Ambient temperature [°C]	+15 to +40
Material	Polycarbonat housing

3.3 Position of the safety notes and type plates



3.3.1 Type plates and safety notes

SCHUNK www.schunk.com					Typ/ID SVP-4/0219230 Serial-No. 120001				
Input	1P+N/230 V	<0,5KVA	Hydraulic	60-400bar					
Tolerance	-10/+6%		Weight	400N					
Output	DC18V	DC10-33A	Protect IP	2X					
Frequency	50/60Hz		Pumpe SN						
Made in Germany					CE EN 60204				

SCHUNK www.schunk.com					Typ/ID SVP-4/0219231 Serial-No. 120002				
Input	1P+N/110 V	<0,5KVA	Hydraulic	60-400bar					
Tolerance	-10/+6%		Weight	400N					
Output	DC18V	DC10-33A	Protect IP	2X					
Frequency	50/60Hz		Pumpe SN						
Made in Germany					CE EN 60204				

230 V-Version

110 V-Version



Safety note voltage

4 Assembly and installation

4.1 Fastening the clamping device onto a work bench



⚠ WARNING

Risk of injury due to tilting, falling of the clamping device!

Due to tilting, falling of the clamping device hands and feet may be squeezed and jammed.

- Fix clamping device.

In the base plate of the TRIBOS clamping device SVP-4 are four bore holes.

The SVP-4 has to be fastened to a work bench through the mounting holes using four screws M8 and shims (preferably made of plastic to avoid optical damages to the housing)!

4.2 Software installation instructions

4.2.1 System requirements

System requirements for installing the analysis software

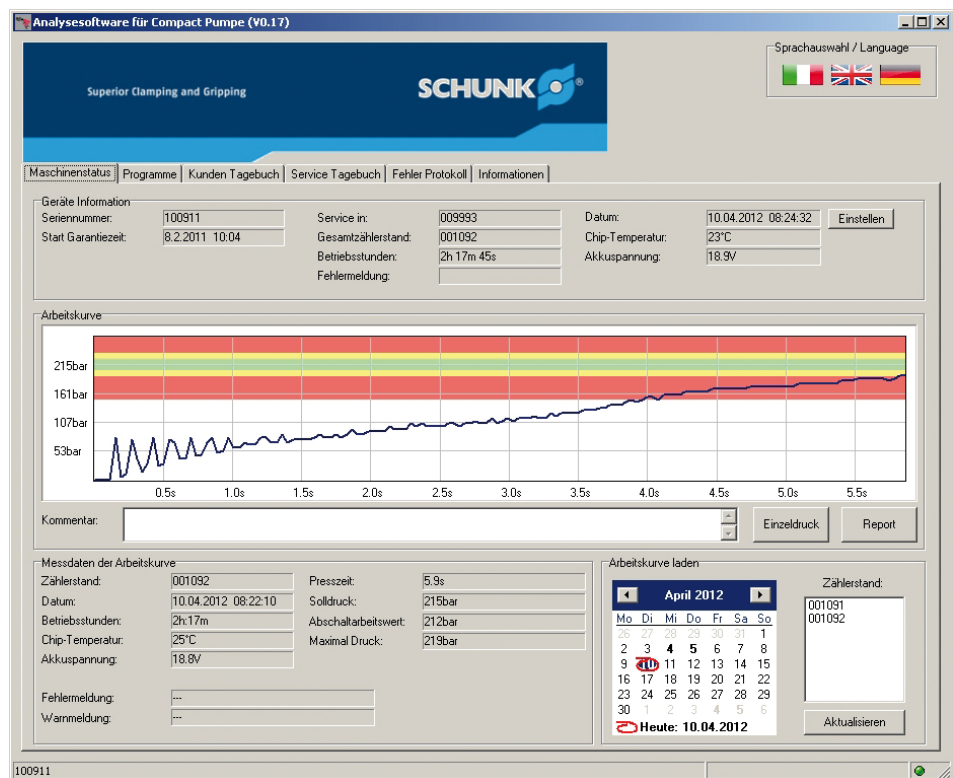
Operating system:	Windows 2000, Windows XP, Windows Vista, Windows 7
CPU:	Pentium 4, minimum 1.7 GHz
Working memory:	512 MB or more (1 GB or more recommended)
Hard drive:	200 MB (1 GB recommended)
Screen resolution:	1024 x 768 or higher, 65.535 or more colors
Miscellaneous	CD-ROM drive, USB 2.0 interface

4.2.2 Program installation

Analysis software can be downloaded as a ZIP file in the download area of the SCHUNK homepage (Service → down loads → 3. Toolholding and Workholding → Tribos SVP-4) for installation on a PC. Connect the TRIBOS clamping device to the PC via the USB interface.

Once the software has been installed, the computer automatically detects the compact pump and the SVP-4 programs or data can be updated. The software displays the machine status, programs and fault logs, among other things.

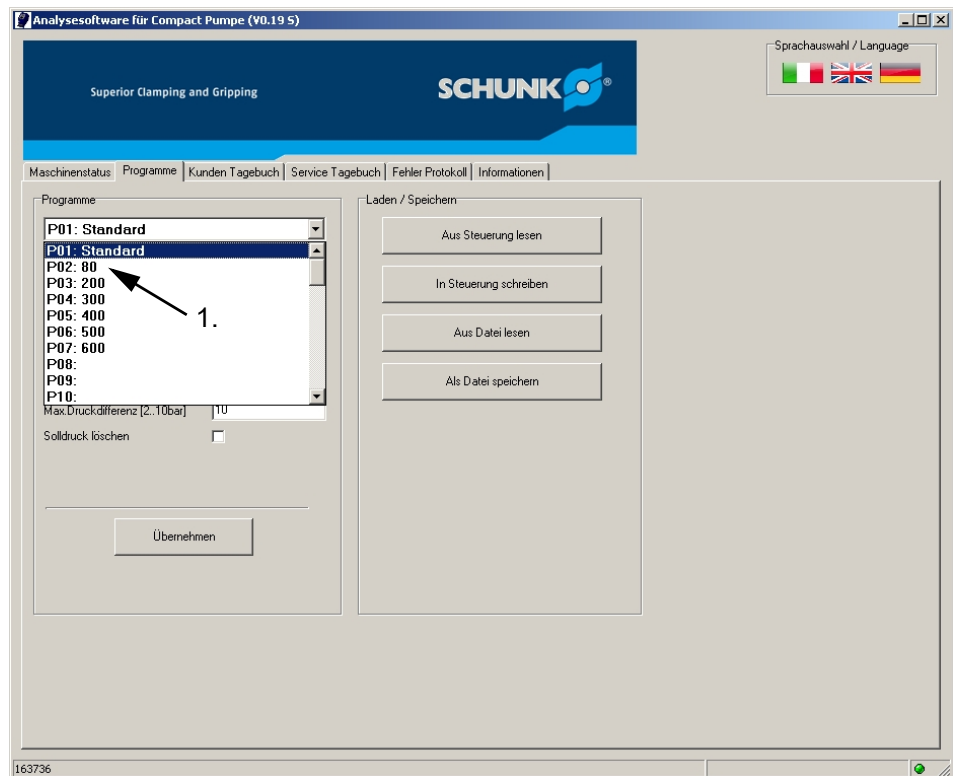
4.2.2.1 "Machine status" menu item



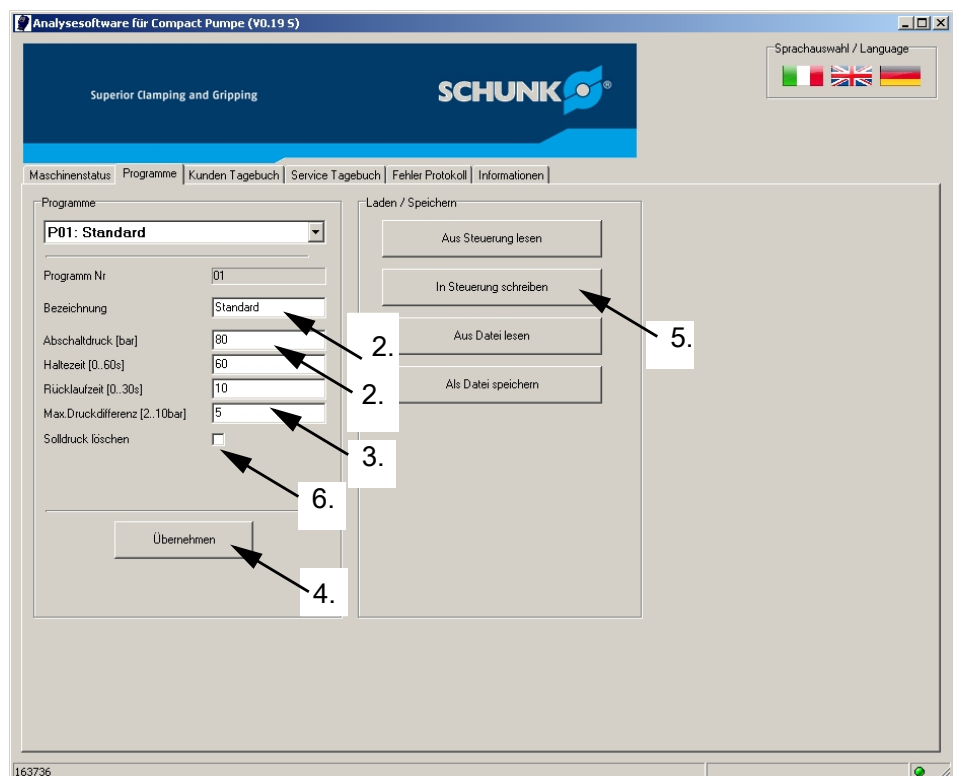
The pump's serial number and warranty period are stored here (among other information), as well as the meter reading for the clamping procedures carried out. The service meter, pressing time, target pressure and maximum pressure are also stored here.

4.2.2.2 "Programs" menu item

- Individual pressure values can be stored here.



- Select program number (1).



- Enter designation and cut-out pressure (2).
 - ✓ The designation appears in the main menu.
- Insert the values for the holding time, runback time and difference in pressure from the standard program P01 (3).
- Delete set pressure (6):
 - Activate if the target pressure is always to be set to zero when the pressure decreases.
 - Leave it inactive if the previously entered target pressure is to be maintained during pressure reduction.
- Click on the "Apply" button (4) to transfer the values to the controller.
- Press the "Write PLC" button (5) to save the values in the controller.
 - ✓ The respective program can now be called up in the main menu.

You can store the content of the program P01 to P47 as follows:

- Click on the "Save data" button.
- Enter file name *. prg.

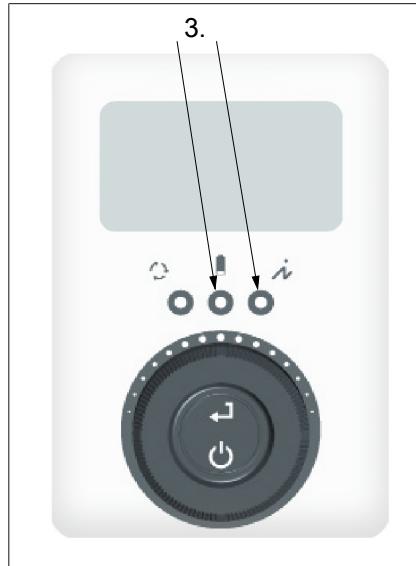
The data can be read into the controller as follows:

- Click on "Scan data" button.
- Then click on "Write PLC" (5).

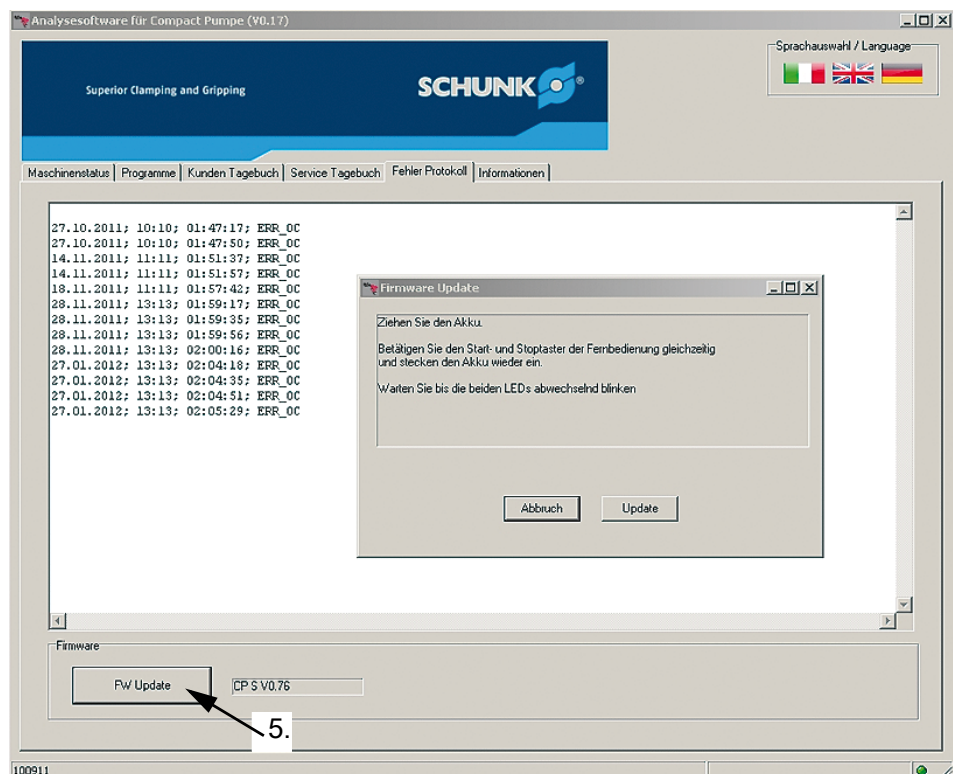
This procedure should always be used as soon as the clamping device is shipped for service.

4.2.2.3 "Fault log" menu item

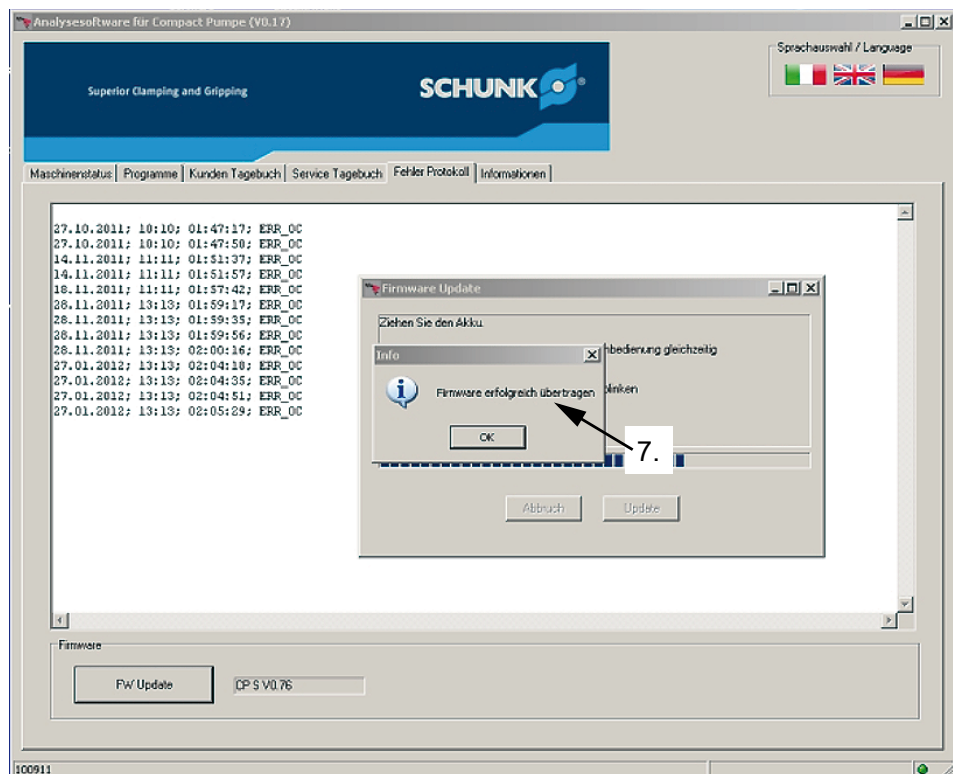
- A firmware update can be performed via FW.
- Disconnect the power supply or power plug.
- Press and hold the start and stop buttons at the same time and reconnect the power supply or power plug.



- The two LEDs in the control unit display light up red alternately (3).
- Release the start and stop buttons.

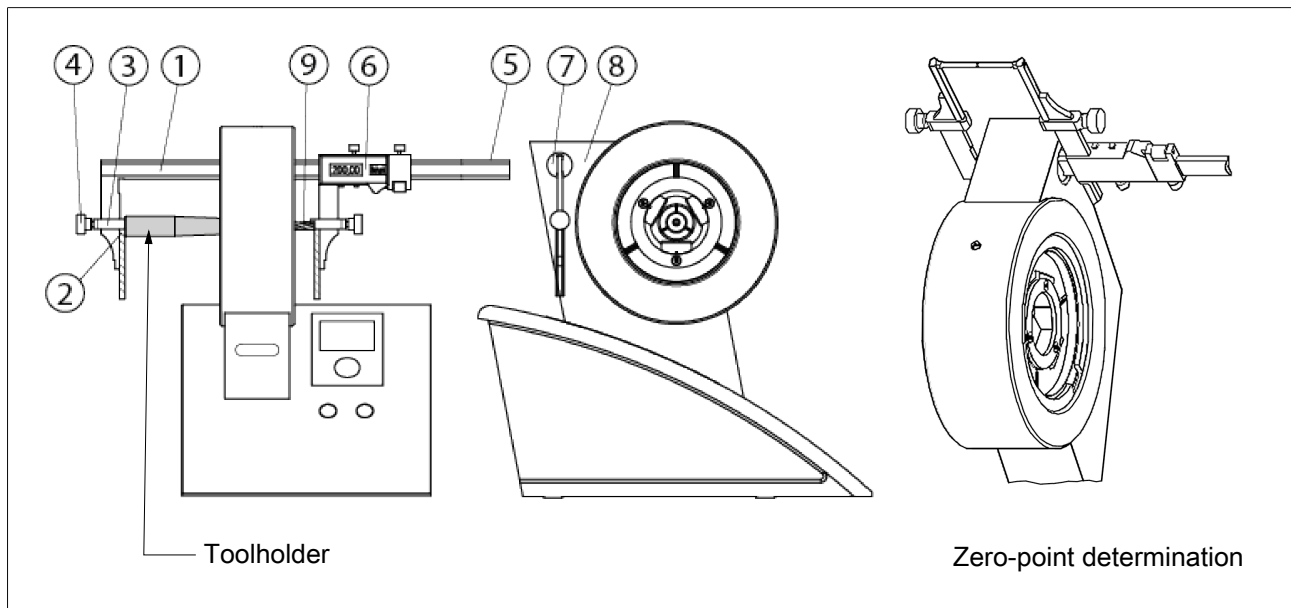


- Click button "FW Update" and select update from firmware file (.hex) (5).
- Update starts automatically.



- Update is complete once the message:"firmware transferred successfully" appears (7).

4.3 Assembly of the length adjustment for TRIBOS SVP-4



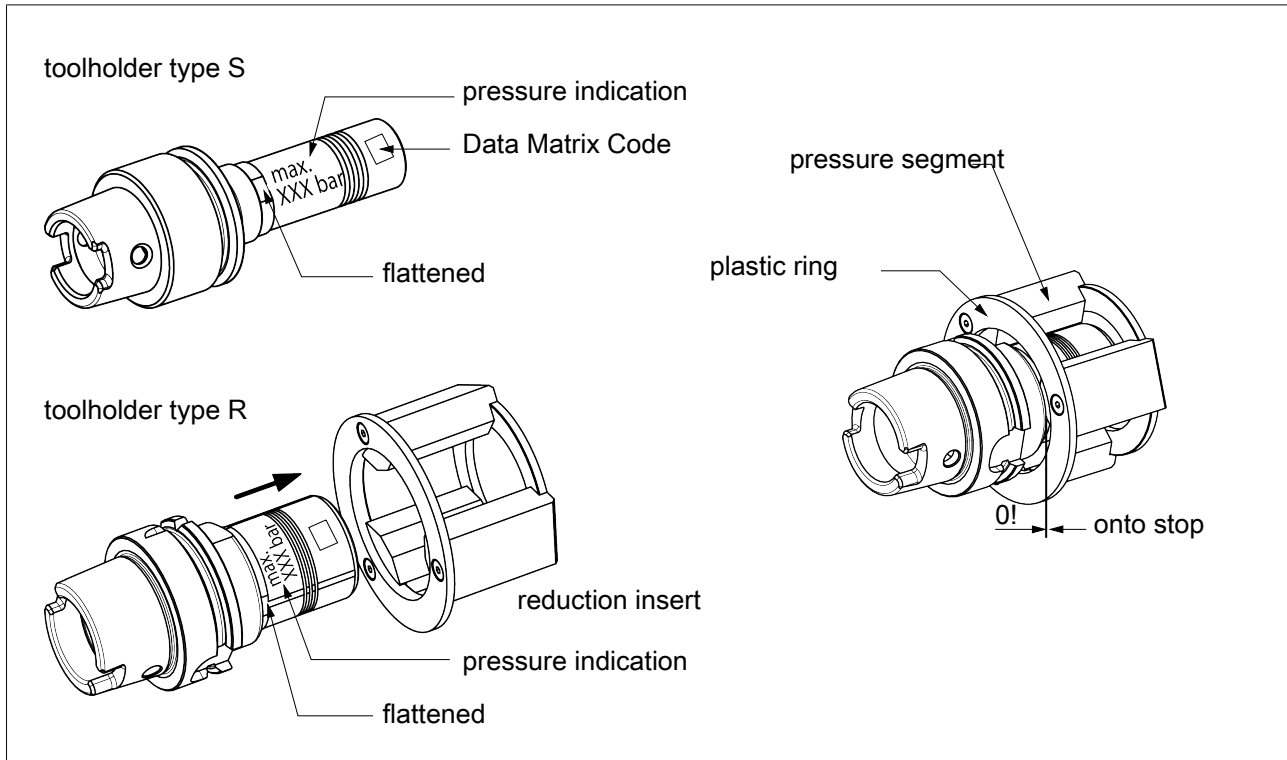
Check that all the parts have been provided:

- 1 Caliper gauge (1)
 - 2 Measuring legs (2)
 - 2 Brackets for the measuring pins (3)
 - 2 Knurled screws (4)
 - 1 Safety pin (5)
- Carefully draw the movable side (6) of the caliper gauge (1) 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.
 - 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)
 - After having inserted the measuring legs (2) into the required position, fix the bracket (3) with the knurled screw (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).

5 Operation

5.1 Reduction insert and Toolholder

Valid for the following TRIBOS toolholder: Type S / Type R /
Type Mini / Type RM / Type SVL



NOTE

Earlier versions of the Type S toolholders may still be a version without latching surfaces. To prevent damage to the toolholders caused by incorrect clamping operations, please contact SCHUNK (+49-7133-103-2333) before clamping these toolholders in the SVP-4 clamping device.

CAUTION

Material damage due to exceeding the permissible pressure!

Too high pressure causes deformation of the toolholder and loss of function.

- Observe the pressure specifications of the toolholder.

CAUTION

Material damage due to incorrect handling!

Deformation of the intermediate sleeve by clamping without reduction insert and TRIBOS toolholder.

- Intermediate sleeve clamp with reduction insert and TRIBOS toolholder only.

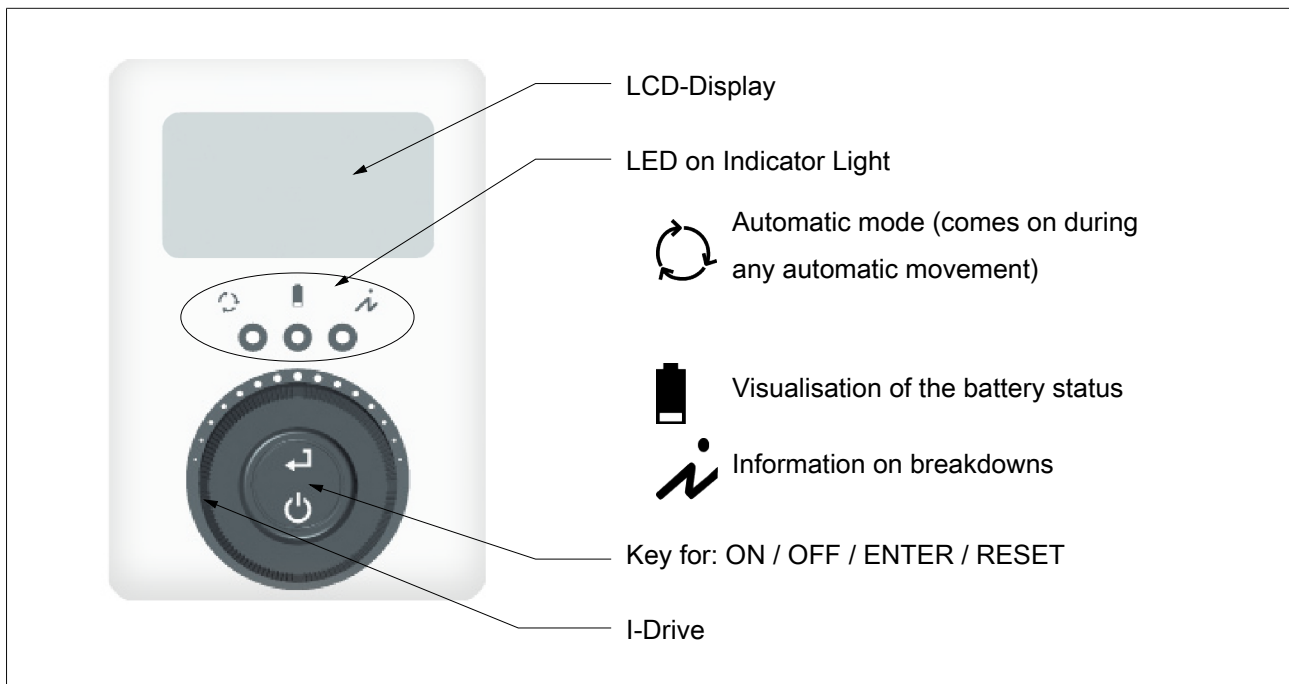


⚠ CAUTION

Risk of injury due to sharp-edged tools.

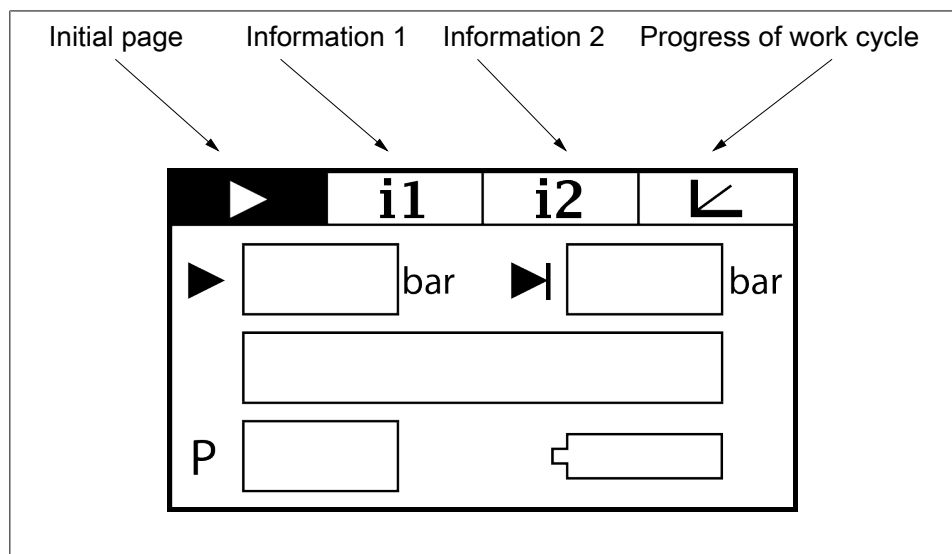
- Wear protective gloves at tool change.
-
- Observe the pressure specifications of the toolholder.
 - Push the reduction insert onto the toolholder until it snaps in via the flattened areas. In order to eliminate possible play between the flattened area and the reduction insert, turn the toolholder, which is clamped into the reduction insert, to the right (clockwise).
 - 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°.
 - **IMPORTANT! Check that the toolholder and the reduction insert are correctly inserted to the stop and that any possible toolholder play is eliminated.**
 - Set the clamping device SVP-4 into operation with the "Start button".
 - ✓ The tool/workpiece can now be inserted or removed.

5.2 Operating the module for stationary use and the pressure regulator



- To switch on the pressure regulator, briefly press the **ON/OFF** button.
- To switch off the device, hold down the **ON/OFF** button for 3 seconds.
- If left inactive, the device automatically switches off after 3 minutes.

An initial page will appear on the display with four tabs.

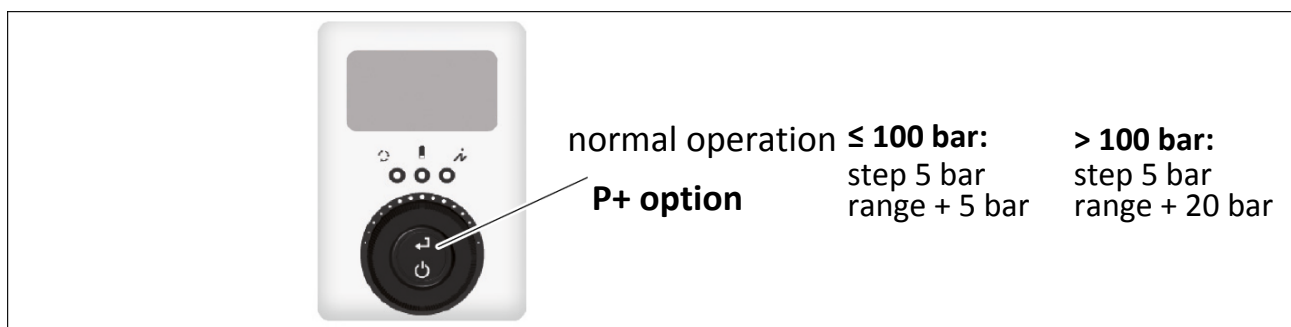
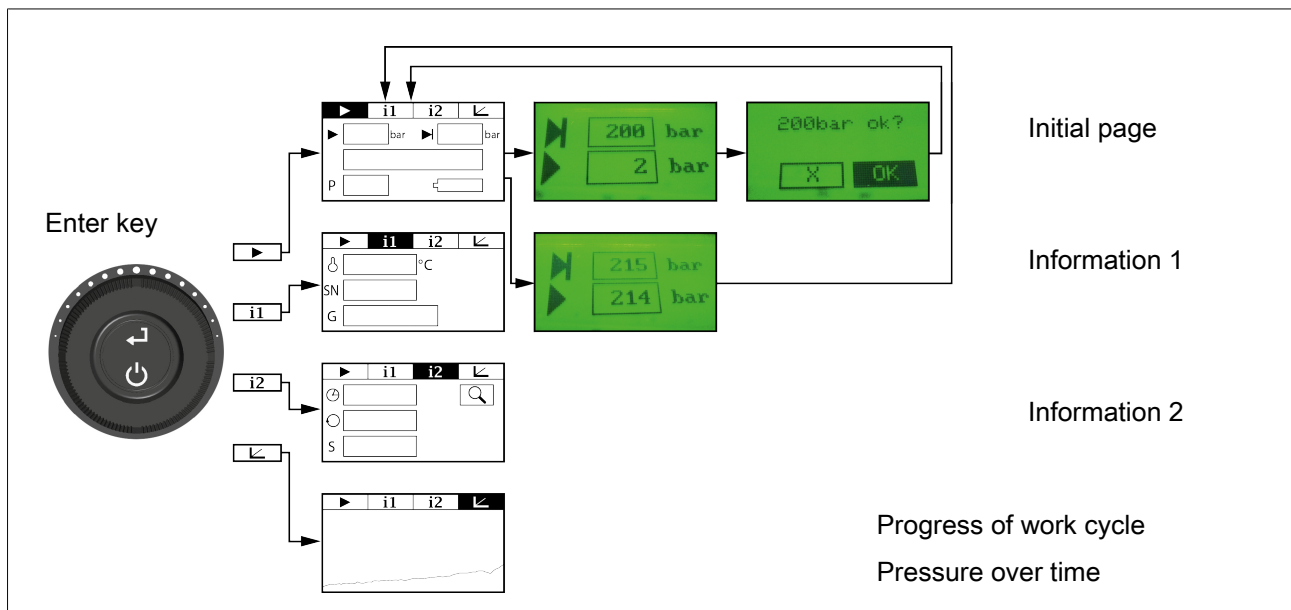


In order to go from one tab to another, press the Enter key, so that the initial page is no longer on the black background (►). At this point, you can rotate the I-Drive clockwise or counter clockwise to choose a different tab.

The sequence in the clockwise direction is:

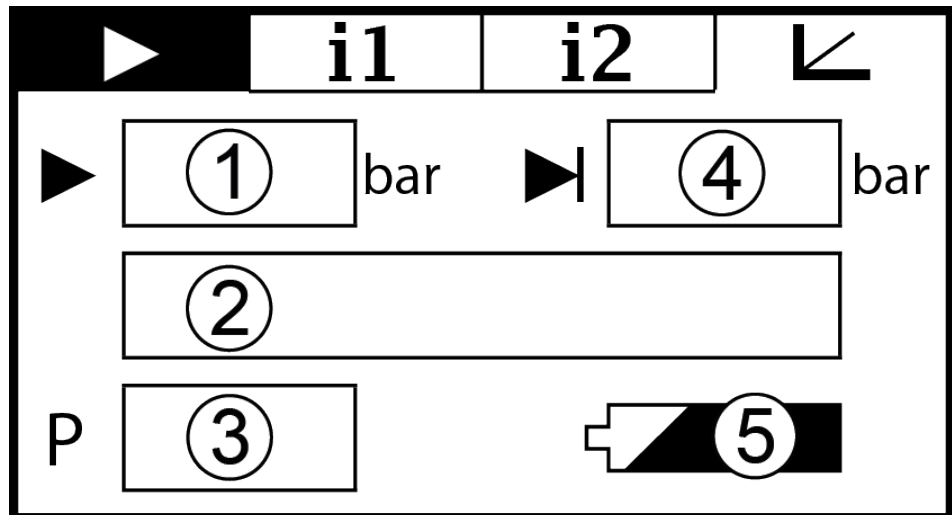
Initial page, Information 1, Information 2 and Progress of work cycle.

To activate the initial page again, just select it with the I-Drive and press the Enter key, the corresponding symbol will again be positioned on a black background. (►).

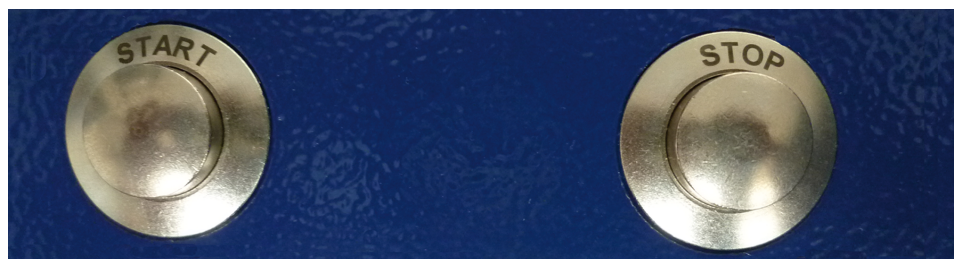


5.2.1 Tab "Initial Page"

If the "Initial Page" tab is active, you can select the various fields by pressing the I-Drive. Press the ENTER key to enter the setting and confirm it by pressing the ENTER key again. Just rotate the I-Drive to exit from the field again.



1	Current pressure (measurement)	4	Pressure TARGET value Pressure setting is possible only on special version
2	Program designation	5	Visualisation of state of charge
3	Program-No. 1 - 47		



You can raise and lower the system pressure using the "Start" and "Stop" button

5.2.2 Tab "Information 1"

On the "Information 1" tab, you can see the internal device temperature, the serial number and the warranty date. You cannot make any settings on this tab.

	▶	i1	i2	⏏
🔧		①	°C	
SN		②		
G		③		

1	Internal temperature of Compact Pump	3	Date of guarantee
2	Serial number		

5.2.3 Tab "Information 2"

On the "Information 2" tab, you can read the motor operating hours, the completed work cycles, the number of cycles until the next service and the installed software version. The service program is designed for remote diagnostics by a service technician.

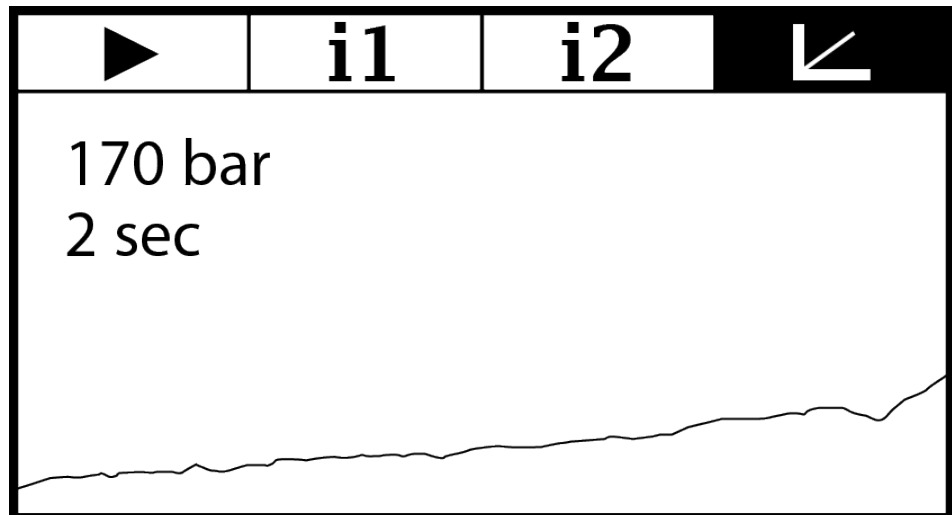
Cycles to service = work cycles until maintenance.

	▶	i1	i2	⏏
🕒		①	④	🔍
🔄		②		
S		③	⑤	CP V x.xx

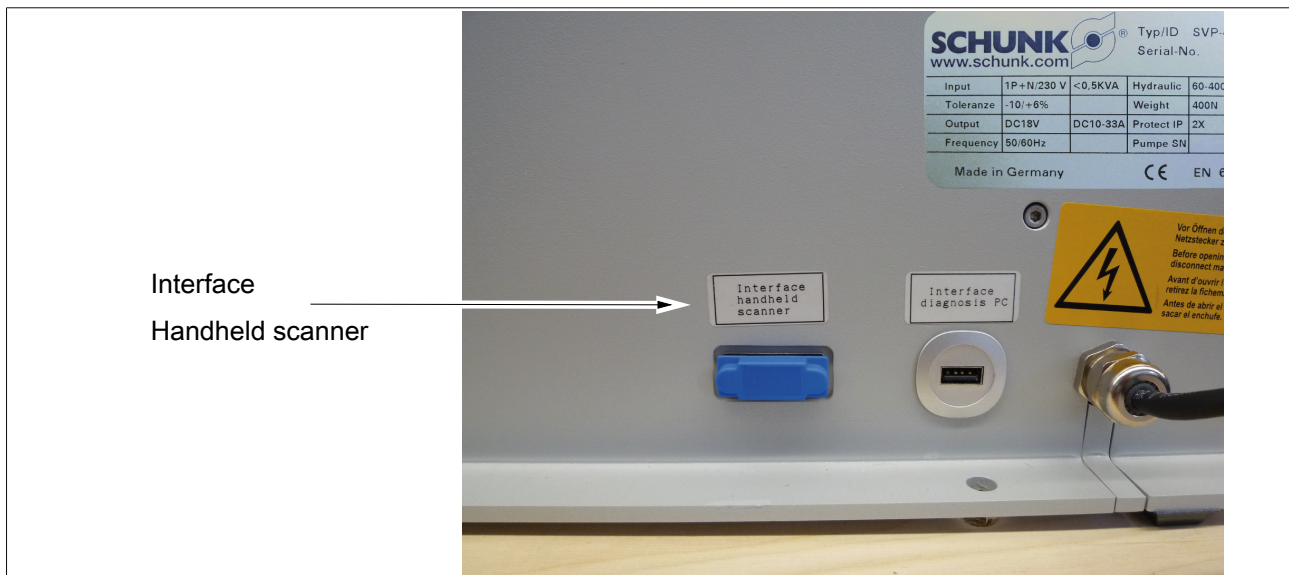
1	Motor operating hours since commissioning	4	Service program for service technicians only
2	Completed clamping cycles	5	Software version
3	Cycles to service		

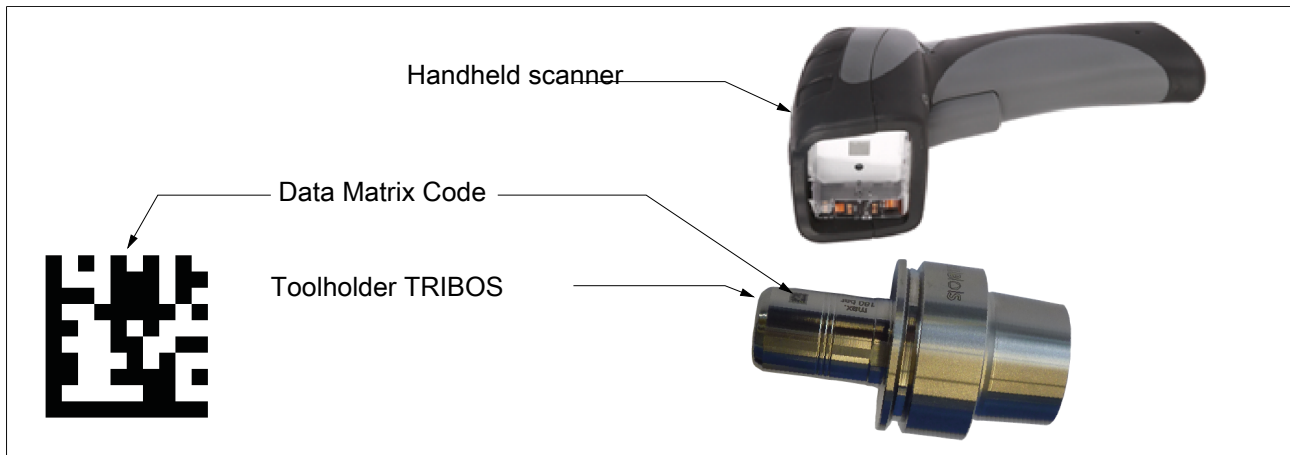
5.2.4 Tab "Progress of work cycle"

The "Progress of work cycle" tab displays the last completed work cycle in graphic form, including the pressure reached and the time taken to reach it.



5.2.5 Handhold scanner for DataMatrix-Code





- Fully automatic detection of the toolholder type and the clamping- $\emptyset$ via DataMatrix-Code.
- The *Handhold scanner CR6000 with power cord (Id.-No. 0201758)* is connected at the RS 232 interface.

When using the handheld-scanner the manual user interface (I-Drive) has to be lock with a lock code. The lock code can be found on the TRIBOS pressure table [TRIBOS pressure table](#) [► 37]. To lock, scan the lock code with the handheld scanner.

All the handhold scanner is able to read now is the bracket specific Data Matrix Codes It is no longer possible to insert pressure information via the manual control. The P+ option for pressure fine adjustment (+ 5 bar steps) can still be used.

If no scanner is used, the manual user interface must be unlocked (delivery state). The unlock code can be found on the TRIBOS pressure table [TRIBOS pressure table](#) [► 37]. After scanning the unlock code, only manual operation is active. Scanning the code with the handheld scanner is no longer possible.

5.3 Behavior in the event of malfunctions

In the event of a malfunction, the CPT-60/400 compact pump switches off and remains blocked until the fault is acknowledged by pressing the ENTER button (for 1 second). A symbol on the display and a corresponding error code indicate the cause of the malfunction.

This error code can be deleted by holding down the ENTER button (for more than 1 second) and the control unit resets the system.

The error codes listed in the table [Error codes](#) [► 33] provide information about remedying the fault.

If the malfunction is still present after the CPT-60/400 compact pump is reset, contact our after-sales service.

Service-Hotline: +49-7133-103-2333

Service-Fax: +49-7133-103-942173

5.4 Error codes

The error codes listed in the table provide information about remedying the fault.

Error can be deleted by pressing and holding *ENTER* for at least 1s.

The control programme resets the system. If the fault is still present after resetting the system, contact the customer service.

Service-Hotline: +49-7133-103-2333

Service-Fax: +49-7133-103-942173

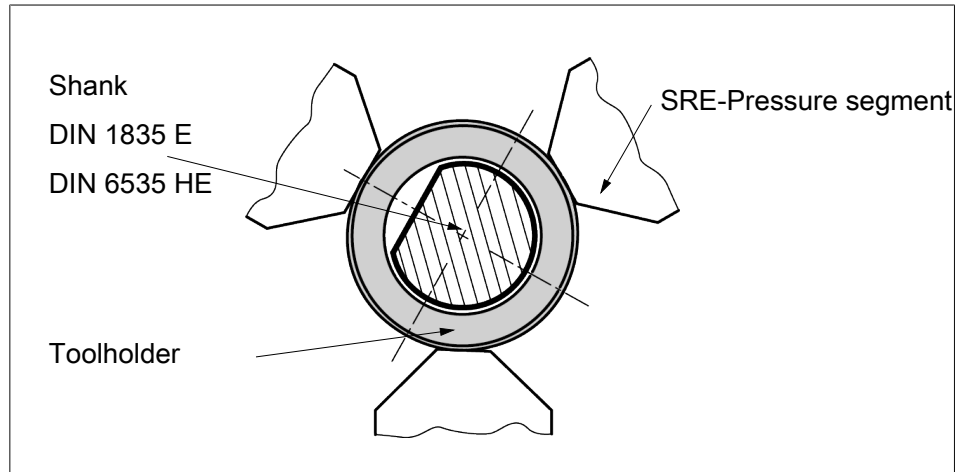
Indication after inserting the power pack	Error-Symbol	Error-Code	Battery LED 	Assistance LED 
Boot loader activated			Flashing red	Flashing red
Error during initialisation of the SD card				Flashing orange
Regular initialisations				Flashing green
Battery tension low		3	Flashing red	
Field of work not reached at timeout		1		Flashing red
Operating value in red area		2		Flashing red
Operating value in yellow area				Flashing red
Operating value in green area				Flashing green
Battery tension low		3	Flashing red	
Assistance Service Interval Expired				Flashing red/ green
SD card error				Flashing orange
Overload		5		Flashing red
Machine too cold (continuous control)		6		Flashing orange
Machine too hot (continuous control)		7		Flashing orange
Error during initialisation of sensor temperature		4		Flashing red
Drop in pressure during compression		8		Flashing red
Fan is not working		9		Flashing red
Control of battery discharge (check battery)		10		Flashing red
Low tension of 3.3 V		11	Flashing red	
Pressure sensor error; pressure below calibration value of 0 bar		12		Flashing red
I-Fuse error. Shunt/fuse is blown or motor is running without activation		13		Flashing red

5.5 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 toolholder.
- **This lower pressure value may be significantly less than that stipulated on the toolholder.**
However, this has no influence on the transmissible torque of the toolholder (see operating manual TRIBOS polygonal tool holder).
- Please make sure that the tool/work piece is still clamped in the toolholder 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 toolholder 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 toolholder.
- If it proves impossible to loosen or insert the tool or work piece from or into the toolholder 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 toolholder and the reduction insert is eliminated by turning the toolholder to the right (clockwise). Repeat the clamping procedure.
- If it proves impossible to loosen or insert the tool/work piece, even though the toolholder is inserted correctly in the reduction insert, unclamp the device and remove the reduction insert and the toolholder. Turn the reduction insert on the toolholder 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 toolholder 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 toolholder 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 toolholder or even makes an insertion impossible. In this case, re-move the wrapping.

- Tool shanks with clearances, especially DIN 1835 shape E or DIN 6535 shape HE are often twisted and can therefore frequently not be inserted into the TRIBOS toolholder 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:



At this shank position in the TRIBOS toolholder 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.

5.6 TRIBOS pressure table

Generally the following applies: Observe TRIBOS pressure table

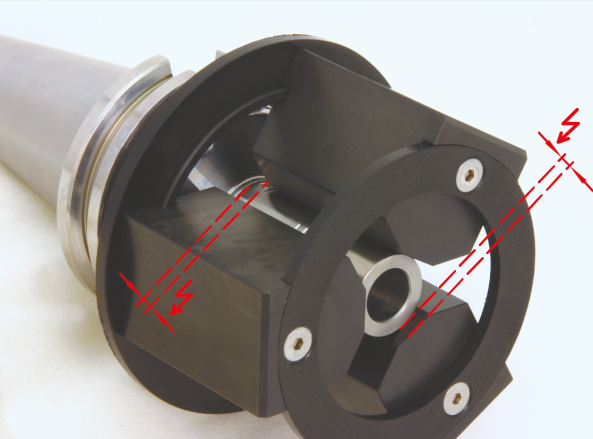
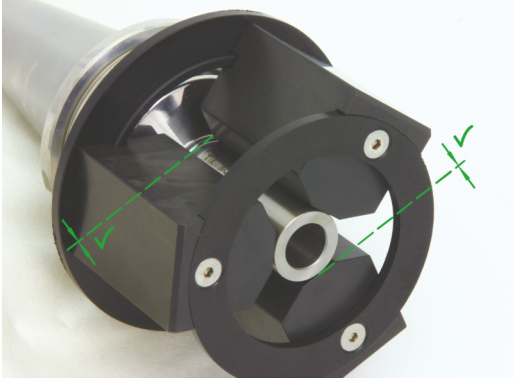
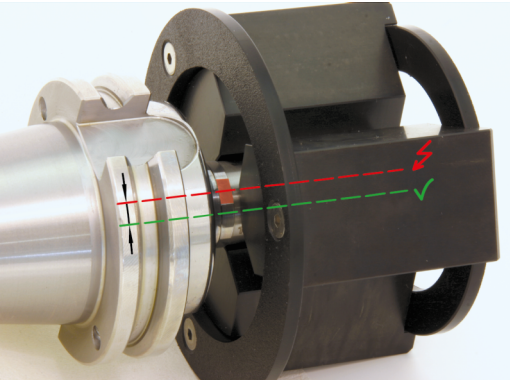
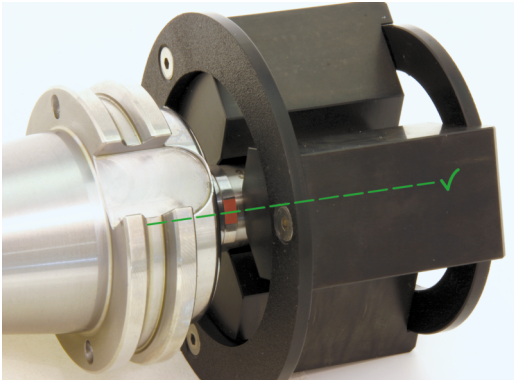
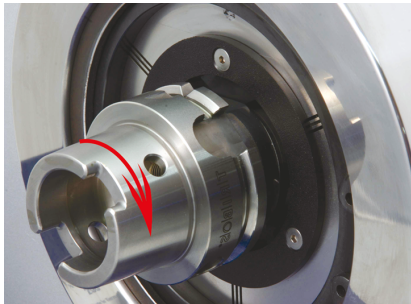
Auf Anschlag einschieben | Insert until stop
 Auf Indexierfläche einrasten | Engage on indexing surface
 Spanndruckbereich beachten! | Consider range of clamping pressure!

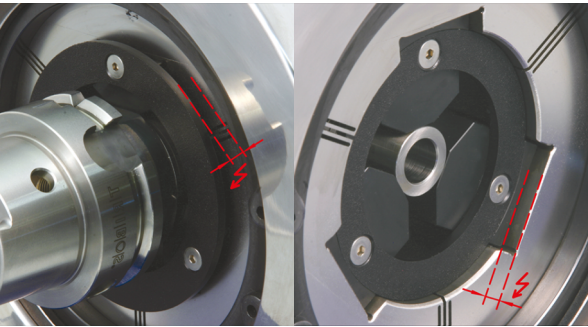
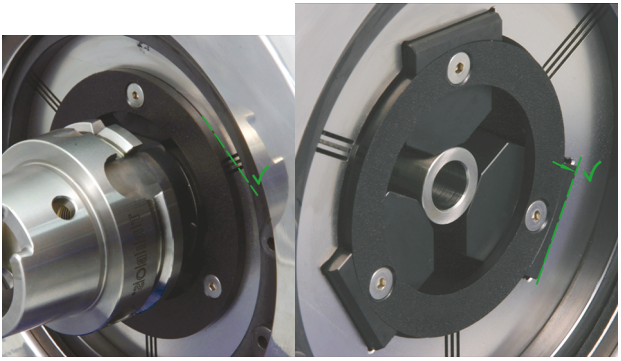
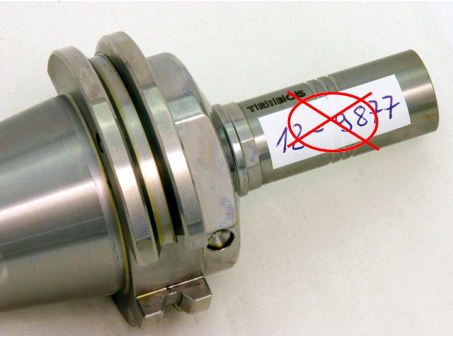
Spann-Ø [mm] Clamping-Ø [mm]	Druck Pressure [bar]	max. [bar]	Spann-Ø [mm] Clamping-Ø [mm]	Druck Pressure [bar]	max. [bar]	Spann-Ø [mm] Clamping-Ø [mm]	Außen-Ø [mm] Outer-Ø [mm]	Druck Pressure [bar]	max. [bar]	Schnittstelle Interface
TRIBOS-S TRIBOS-SVL 			TRIBOS-R 			TRIBOS-Mini TRIBOS-Mini-SVL 				
6	120–180	210	6	110–160	170	1–4	6.65	42–55	55	ER 11
7	140–210	220	7	120–180	180	1–6	9	60–85	85	ER 16/20/25/32, HJND 50
8	150–220	250	8	120–170	180	1/8"	6.65	42–55	55	ER 11
9	160–240	250	9	180–250	260	3/16"	6.65	42–55	55	ER 11
10	180–250	280	10	180–240	260	1/8"	9	60–85	85	ER 16/20/25/32
11	180–270	280	11	230–300	320	3/16"	9	60–85	85	ER 16/20/25/32
12	210–280	310	12	250–300	320	1/4"	9	60–85	85	ER 16/20/25/32
13	240–320	340	13	240–320	330	TRIBOS-RM 				
14	240–310	330	14	280–320	340	3–8	14	70–115	115	ER 20, HJND 50/28
15	260–330	350	15	270–320	340	3–6	18	80–120	120	WK 16
16	270–330	350	16	280–320	340	3–12	18	100–140	140	ER 25/32
17	280–360	370	17	240–290	310	3–12	20	150–160	160	WK 19
18	290–350	370	18	300–340	360	3–12	20	110–180	180	HJND 28
20	300–350	370	20	320–360	380	3–12	25	190–260	260	HJND 21
25	320–370	380	25	300–340	350	3–16	32	280–380	380	
32	270–310	320	32	270–300	310	3/8"	18	100–140	140	ER 25/32
1/4"	130–200	210	1/4"	100–160	160	TRIBOS-S HSK-F 63				
5/16"	170–240	260	3/8"	180–250	280	25	35	280–300	310	
3/8"	190–250	270	1/2"	220–290	320	Verriegelung Handbedienung Locking manual operation Sperrcode lock code  Entsperrcode unlock code 				
7/16"	200–270	290	5/8"	280–320	350					
1/2"	220–310	320	3/4"	280–330	350					
5/8"	280–350	380	1"	270–300	320					
3/4"	290–360	380	1 1/4"	200–250	260					
1"	300–360	380								
1 1/4"	270–320	340								

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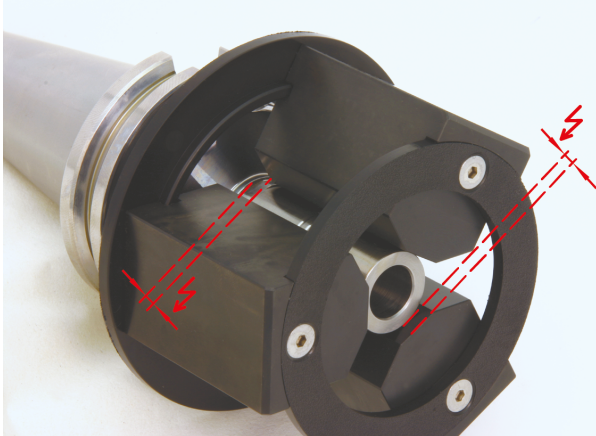
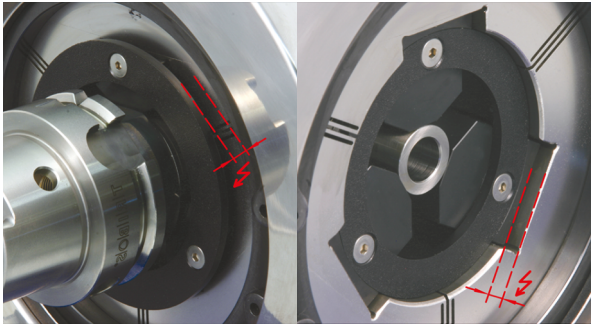
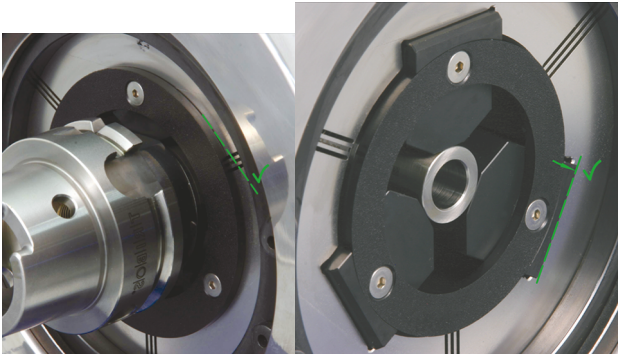
6 Troubleshooting

6.1 Tool shank cannot be inserted if pressure is built up

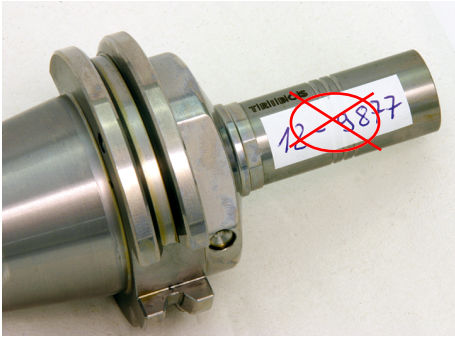
Possible cause	Corrective action
 Toolholder has not fully engaged with the engaging areas of the reduction insert. Toolholder not placed on end stop.	 Engage toolholder properly and place on end stop.
 Wrong toolholder/reduction insert angle. Too much pressure could have been applied to toolholder/reduction insert causing constant deformation.	 Ensure correct angle position of toolholder/reduction insert (engaging surface must be aligned with the segment).
TRIBOS toolholder not turned to right-hand stop.	 Turn TRIBOS toolholder to right-hand stop

Possible cause	Corrective action
 Reduction insert not inserted up to the stop into intermediate sleeve of the clamping device.	 Insert reduction insert up to the stop into the intermediate sleeve of the clamping device.
Shank is too large. Shank does not have the required tolerance h6.	Use tool shank with tolerance h6.
Clamping pressure too low or too high (wrong pressure value was entered). Toolholder has already been over-pressurized 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 insert the reduction insert properly.

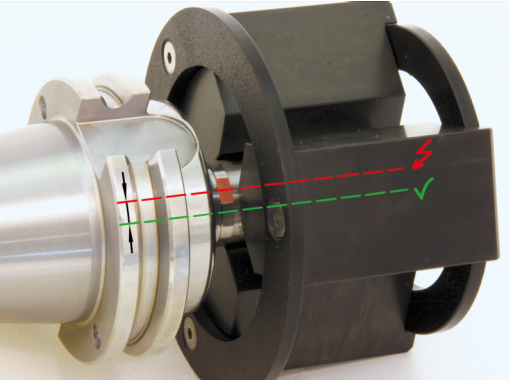
6.2 Tool shank can only be partially inserted into the toolholder

Possible cause	Corrective action
 Toolholder has not fully engaged with the engaging areas of the reduction insert.	 Engage toolholder properly.
 Reduction insert not inserted up to the stop into intermediate sleeve of the clamping device.	 Insert reduction insert up to the stop into the intermediate sleeve of the clamping device.
Bad quality of tool shank e.g. it may have a slightly conical shape.	Check tool shank. Use tool shank with tolerance h6.

6.3 Tool cannot be removed from the toolholder

Possible cause	Corrective action
Frictional corrosion / contact corrosion	Actuate clamping device on release pressure for the toolholder. Drive out the tool shank using a hammer and a suitable drift punch. Clean clamping bore and tool and carry out new clamping procedure.
 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.
 Laser inscription located on tool shank.	 Remove or smoothen inscription on the shank with a fine emery paper or a grinding stone.
Tool broke off.	Actuate clamping device on release pressure for the toolholder. Drive out the tool shank using a hammer and a suitable drift punch. Clean clamping bore and clamp new tool.

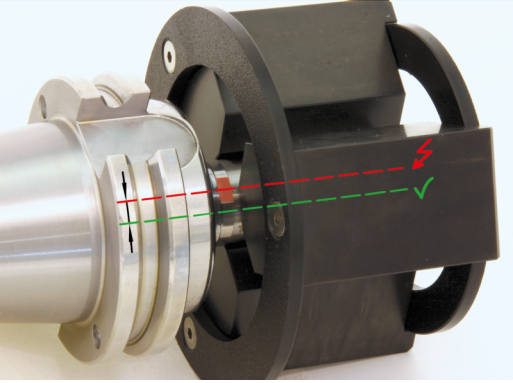
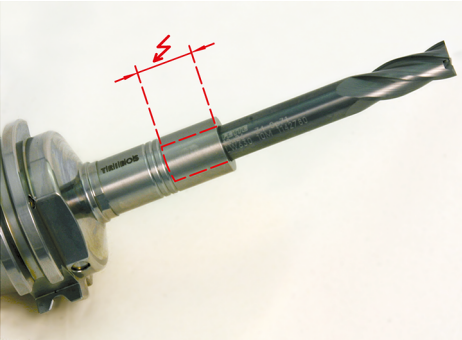
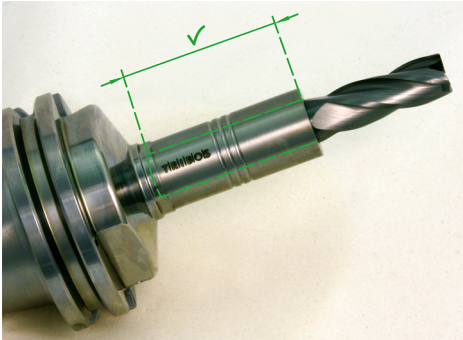
6.4 Tool shank can be inserted outside the pressure range if slight pressure is applied

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

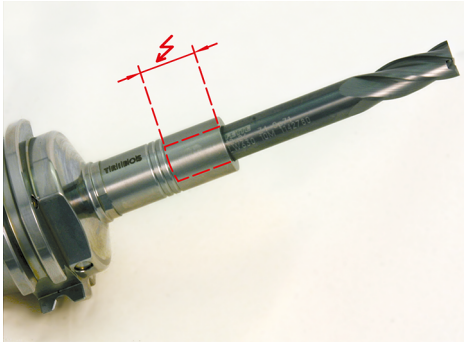
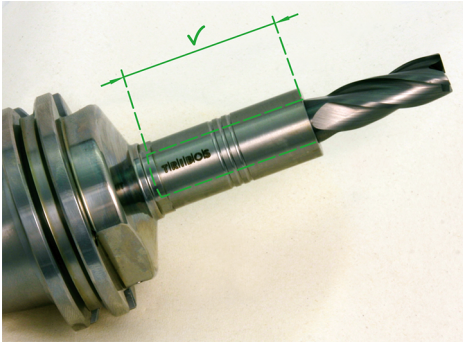
6.5 Tool shank can yet not be inserted at maximum pressure

Possible cause	Corrective action
Shank does not have the required tolerance h6, tool shank is too big (> h6).	Use tool shank with tolerance h6.

6.6 Torque / clamping force / holding force too low

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

6.7 Concentricity errors on the clamped tool

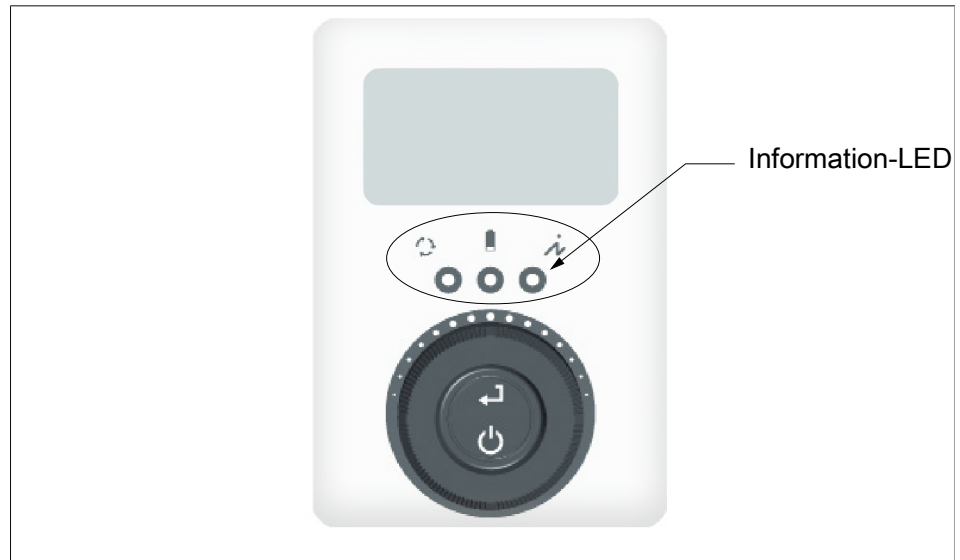
Possible cause	Corrective action
Toolholder damaged, improper handling.	Check toolholder for collision or damage and send back to SCHUNK for inspection/repair if necessary.
Machine spindle damaged, concentricity error/axial eccentricity error on the machine spindle.	Check machine spindle for damage and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

7 Maintenance

Service and repair work in accordance with the service instructions may only be carried out by qualified personnel. These include SCHUNK service technicians or specialist personnel trained by SCHUNK.

As soon as the number of service cycles has been reached, the INFO LED lights up alternately green/red after each cycle.

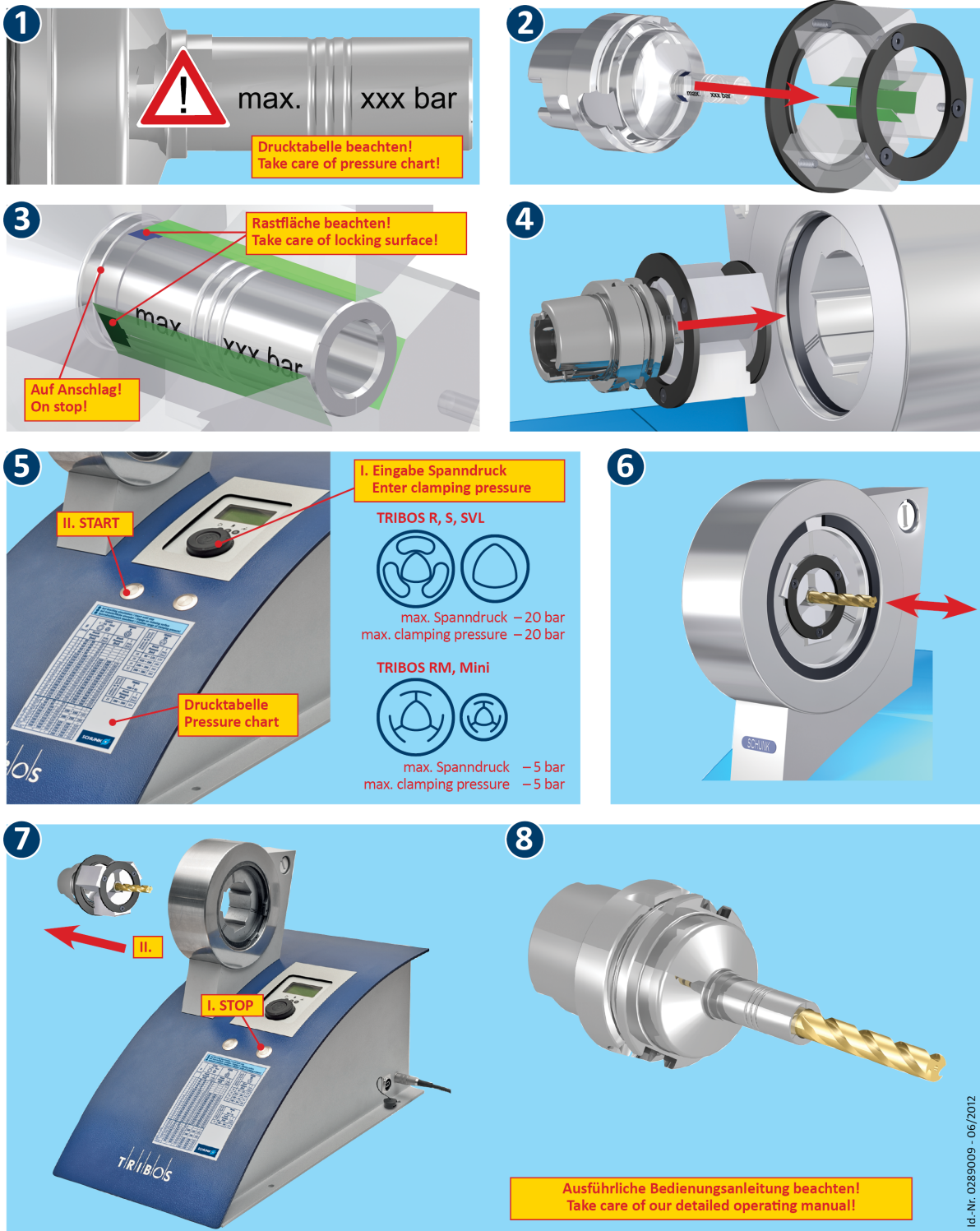
The first service must be performed after 50 000 clampings.



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 toolholder.
- 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).

8 Short manual



9 Declaration of conformity

in terms of the Directive 2006/42/EC, Annex II, Part 1.A 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
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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:	Polygonal Clamping System Clamping device SVP-4
ID number	0219230 / 0219231

Applied harmonized standards, especially:

EN 1005-2:2003+A1:2008	Safety of machinery- Human physical performance - Part 2: Manual handling of machinery and component parts of machinery
EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 60204-1: 2006-09 + A1: 2009-02	Safety of machinery - Elektrical equipment of machines
EN ISO 80079-36:2016	Fluid power - General rules and safety requirements for hydraulic systems and their components

The following further EU guidelines in particular:

EMV-Directive 2004/108/EG with the standards:

EN 61000-6-2 (2005)	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards -Immunity for industrial environments IEC 61000-6-2: 2005
EN 61000-6-4:2007 + A1:2011	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:2006 + A1:2010);

Person authorized to compile the technical documentation:
Robert Leuthner, Address: see manufacturer's address

Signature: see original declaration

Lauffen/Neckar, January 2020

p.p. Thomas Retzbach
Head of Development Clamping Technology

