Kaindl®
SCHLEIFTECHNIK

OPERATION MANUAL FOR DRILL GRINDING MACHINE

BSG 60

Original manual

Please keep for futher use!

Kaindl-Schleiftechnik REILING GmbH, Remchinger Str. 4, D-75203 Königsbach-Stein, Germany
Tel.: +49 7232/4001-0, Fax.: +49 7232/4001-30, Internet: www.kaindl.de, E-Mail: info@kaindl.de

CONTENT

EC-DECLARATION OF CONFORMITY

The manufacturer:	Kaindl-Schleiftechnik Reiling GmbH Remchinger Straße 4 75203 Königsbach-Stein Germany
declares that the machine described herein:	**Drill grinding machine** Type: **BSG 60**
refers to the security and health requirement of the following EC instructions:	EC-Machine instruction (2006/42/EC) EC-Instruction EMV (2004/108/EC)

Applied harmonised norms:

**EN ISO 12100; EN ISO 13857; EN ISO 13732-1;
EN 60204 Part 1; EN 61000-6-1; EN 61000-6-2;
EN 61000-6-3; EN 61000-6-4**

Changes in design, which affect the technical data, listed in this instruction manual and the directe use, therefore change the mache substancially, make this declaration of conformity invalid!

The documents were collected by:	Reinhard Reiling Kaindl-Schleiftechnik Reiling GmbH Remchinger Straße 4 75203 Königsbach-Stein

1. SET UP

The machine is packed in a box placed on a pallet. Unpack the machine at the final working place. Before starting, please check the machine for transport damage.

1.1 ENVIRONMENTAL CONDITIONS FOR SET UP

Use the drill grinding machine only in dry rooms.
Environmental temperature from +5 to +50°C, Humidity: up to 90%, not condensing
The BSG 60 is a table machine, may attention to a safe stand on your work table.
The place has to grant a vibration-free running of the machine.

1.2 SAFETY ADVICE

Check if the grinding wheel is turning free (eventually move back the prism support) in case you don´t pay attention to this, the grinding wheel pay be damaged. For continuous operation, please attach a suitable dust exhaust.

During all grinding work, wear safety glasses. Please read this manual. For damage caused by lack of knowledge or not following the operation manual, we do not assume any responsibility.

1.3 DIRECTED USE

The drill grinding machine BSG 60 is exclusively determined for occasional grinding of spiral, step-, wood-, Forstner-, sheet metal-, and stone (carbide) drills and countersinks.

The directed use includes also reading this operation manual, as well as keeping all containing directions of use - especially the safety information. For all material- and personal damages, arising by not intended use, note the manufacturer, but the operator is responsible.

1.4 PREDICTABLE WRONG APPLICATION

The use as a table machine for manually guided grinding of workpieces, such as chisel, sheet metal, screws driver, etc. is not allowed!

1.5 START UP

Remove preservation (grease film).
Independing with which type of motor the machine is equipped with, please check:

a) is your electric current identical to the data on the nameplate of the motor.
b) when you have a 400 V phase motor, pay attention to a correct connection of the rotating field.
c) **Sound check, Mounting and dressing of the grinding wheel** (see page 25)

On the back of the machine you find the electric switch with positions:
I - ON, 0 - OFF (400 V phase motor).

2. EXPLANATION OF SAFETY ICONS

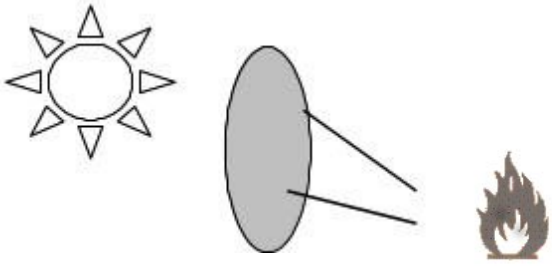
In this manual, the following safety symbols are used. These symbols shall attract the attention of the reader to the text beneath. These symbols indicate to existing danger for life and health of persons!

Eye protection during grinding against kicked around particles

Gerneral danger

When moving the machine, disconnect from electric current.

Laser beam warning



CAUTION!!!

Lens cover always must be kept close when not in use! (danger of fire from sunbeam)

3. TECHNICAL DATA

DIMENSIONS

Length	570 mm
Depth	320 mm
Height	400 mm
Weight	52 Kg
Range/Basic version	3-40 mm Ø
Special accessory	40-60 mm Ø
Grinding wheel	200 x 40 x 51 mm Ø
Noise emission	< 70 dB (A); Emission- acoustic pressure at workplaces (ear level) as per DIN EN ISO 11204
Operating conditions	Sharpening of a HSS drill Ø 40 mm

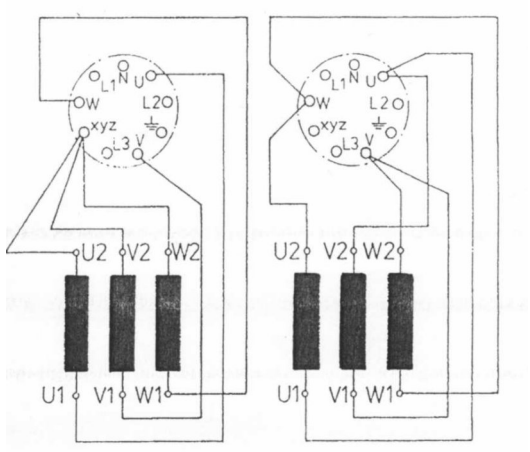
ELECTRONICAL DATA

Standard version		Special version	
Motor	230 V	400 V	110 V
Design	IMB 14	IMB 14	IMB 14
Voltage	230 V	400V	110V
Frequency	50 Hz	50 Hz	60 Hz
Power	0,37 KW	0,37 KW	0,25 KW
Revolutions	2840 RPM	2800 RPM	2800 RPM
Protection	IP 54	IP 54	IP 54

Run out time of mounted grinding wheel 30 seconds.

Connection designation after DIN 57530 VDE 0530 Part 8

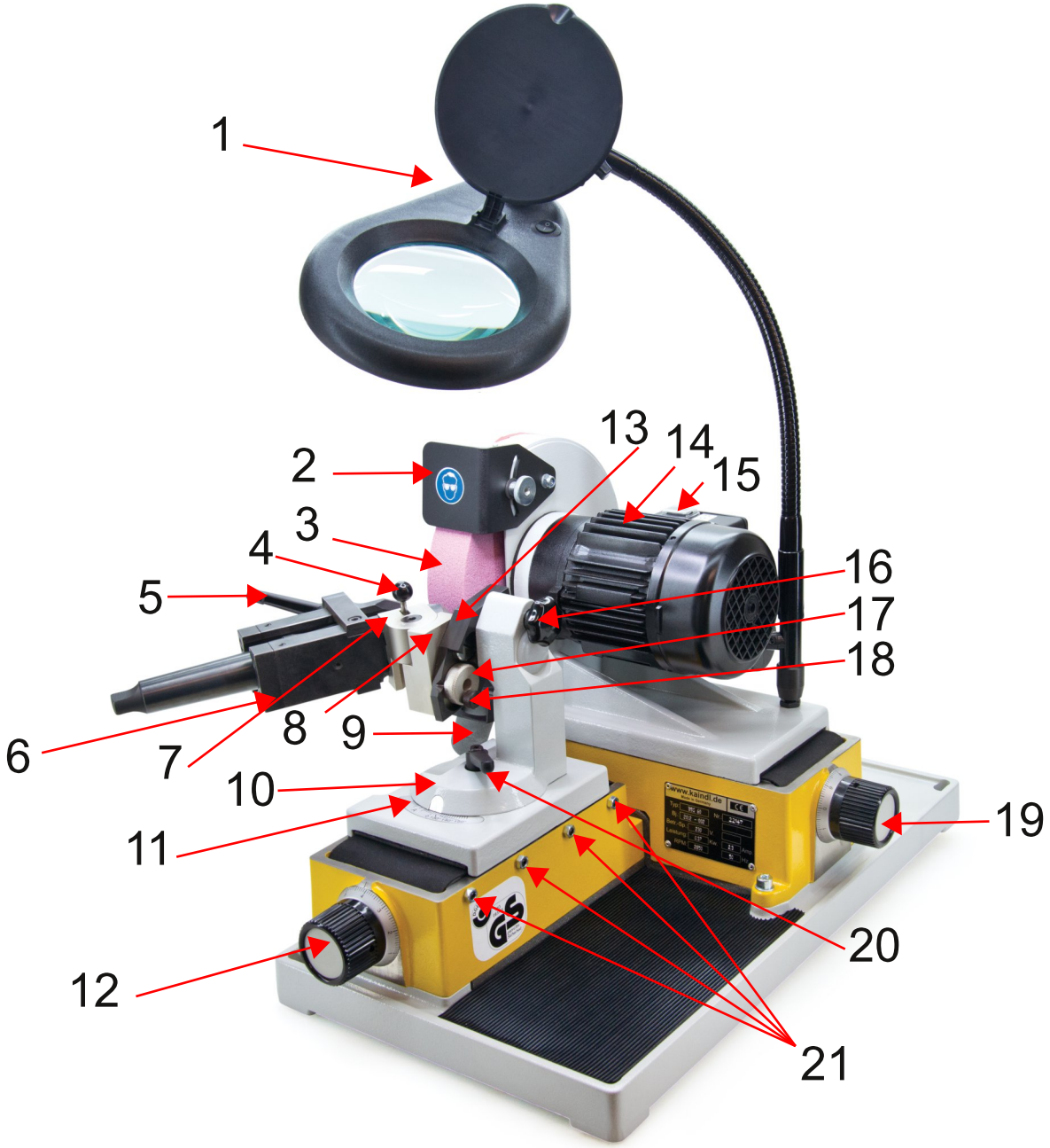
Y- connection Triangle switch



Power connector
L1, L2, L3

S 100
SN 652 724
BS 7094

4. DESCRIPTION OF COMPONENTS



1. Optical lens LED lighted
2. Grinding wheel protection
3. Grinding wheel
4. Clamping lever for eccentric clamping
5. Clamping lever for prism
6. Clamping prism
7. Prism support with scale
8. Bracket for prism support
9. Nozzle for dust exhaust
10. Support block (with clamping lever)
11. Tip angle adjustment
12. Prism feed
13. Support plate with fixation threats
14. Motor, 230 V, 50 Hz
15. Main switch
16. Star knob locking screw
17. Stepless clearance angle adjustment
18. Fixation screw for clearance angle adjustment
19. Motor feed
20. Clamping lever for support block
21. Adjustment screws for roller bearing slide

5. ACCESSORIES

Extra prism
Clamping range Ø 40-60 mm **Item No. 10602**

Countersink sharpening device SVR 31
incl. collet 10 mm **Item No. 10583**

Stop dog for long drills
Item No. 10623

Cutting rost for cutters
Item No. 10622

Morse trapper sleeves
for short MK-Drills, MK 1 **Item No. 14483**
for short MK-Drills, MK 2 **Item No. 14484**
for short MK-Drills, MK 3 **Item No. 14485**

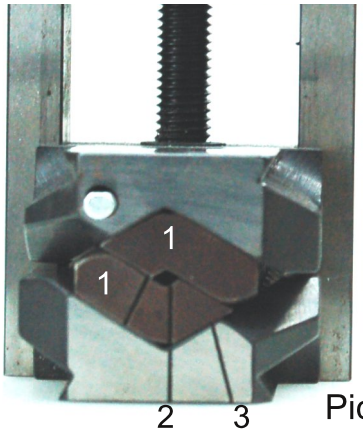
Magnetic depth stop for cutters
Item No. 10621

Nozzle for dust exhaust
Item No. 10646

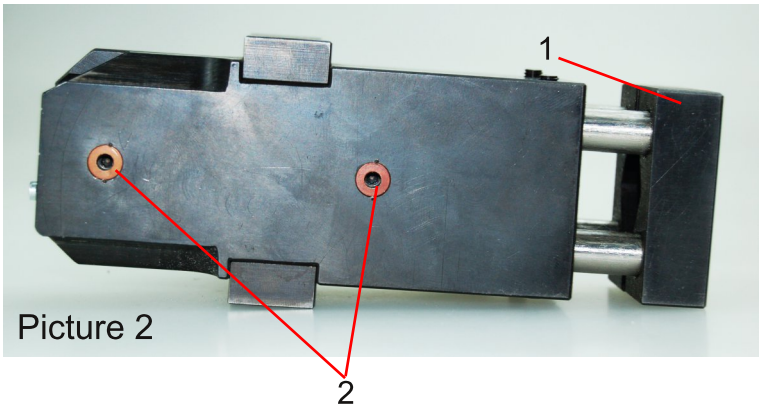
Cutter and countersink attachment SZVR
incl.10 mm collet, MK3-Support,
Cam for 3-flute countersink,
Index plate for 2-,3-, and 4-flute cutters
Laser adjustment **Item No. 12280**

6. OPERTATION

For drills from **3-20 mm** use the prism including the inner jaws. For drills from **20-40 mm** remove the inner jaws.
Removing of the inner jaws: Loosen the 4 pcs socket head cap screws with a suitable key SW 2,5 (see picture 2).
Mounting of the inner jaws: Place the inner jaws inside the prism in the way that the graduation marks are in line with the outer marks (1, picture 1). The numbers on the jaws shall not be visible. Softly tighten the fixation screws (picture 2) do not tighten too strong.

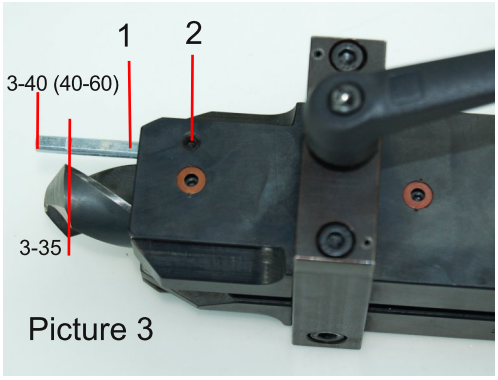


Picture 1

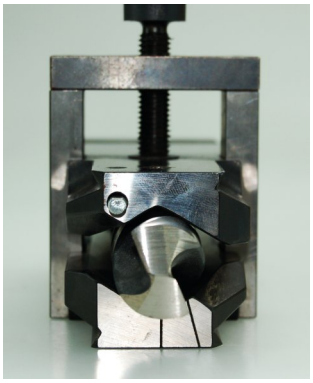


Picture 2

6.1. CLAMPING AND ALIGNMENT OF RIGHT HAND SPIRAL DRILL BITS



Picture 3


Picture 4

Loosen clamping screw (2) and pull out the pin (1) to the stop dog and fix again. Depending on the diameter, let the drill project outside the prism (picture 3). Drills from **Ø 3-35 mm**, cutting edge to graduation notch. Drills from **Ø 35-40 mm**, cutting edge to total length of the pin. Then align the cutting edge parallel to the slantwise graduation line (picture 4).

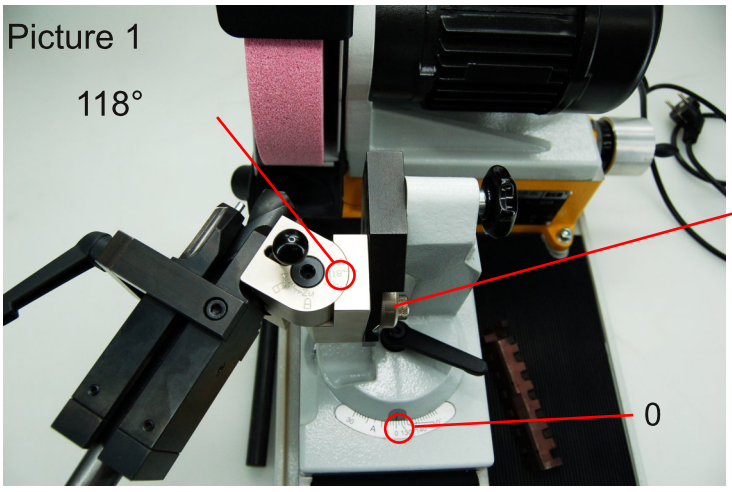
For getting a parallel clamping of small drills, we propose to clamp a second drill of same diameter on the back of the prism. For drills with bigger diameter also use the prism elongation for the cylindrical part (picture 2, Pos. 1). Move back pin (1) and fix the screw. Broken drills, first pre-sharpen till they are flat.

7. GRINDING OF RIGHT HAND SPIRAL DRILLS

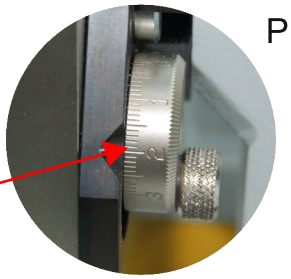
Adjust prism rest to **118°** and support to scale value **0** (picture 1).
For the clearance angle adjustment, open fixation screw and adjust with the eccentric locking screw to the value listed below (picture 2). The smaller the scale number, the smaller the clearance. Take off the star knob screw.

Now start the motor and swivel the prism with drill by carefully moving forward the slide in direction to the grinding wheel. Note the number on the scale and move back. Open the small lever and turn the prism for **180°**. Finally check if the basic alignment, saying that the cutting edge, is still parallel to the graduation line. If not - adjust the drill and repeat the process again.

Picture 1



Picture 2

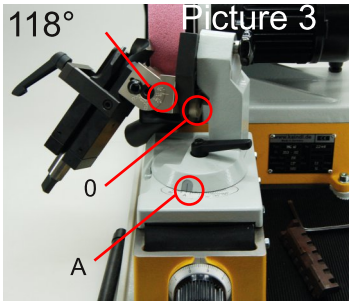


Clearance angle	
Drill, Ø	Scale grade
3 - 40	1,5 - 2,5
40 - 60	2,0 - 3,0

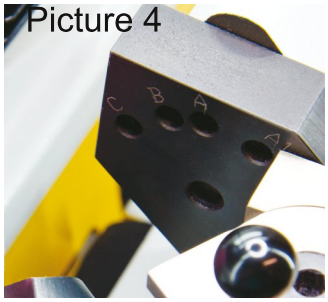
8. WEB THINNING OF SPIRAL DRILLS

For additional web-thinning, do not remove the drill out of prism, adjust the clearance (picture) to **0** and lock the prism support with the star knob screw in **hole C**. Move the grinding wheel with motor to the right. Open the clamping lever on the prism rest and turn to the line **A** (picture 3). Now go forward and sharpen approx. 1/10 of drill diameter using the left side of the grinding wheel behind the cutting edges inside the drill. For correct positioning, you must turn prism- and motor feed. The width of the cross cutting edge should be approx.1 mm for a drill of dia 10 mm. Note the both numbers of prism and motor feed, turn the prism for **180°** and repeat the procedure.

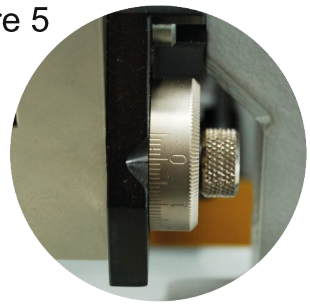
Picture 3



Picture 4



Picture 5



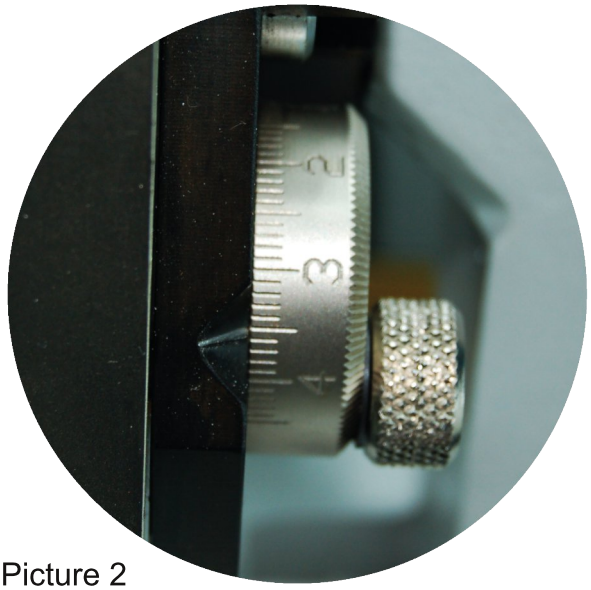
9. GRINDING OF LEFT HAND DRILLS

Picture 1

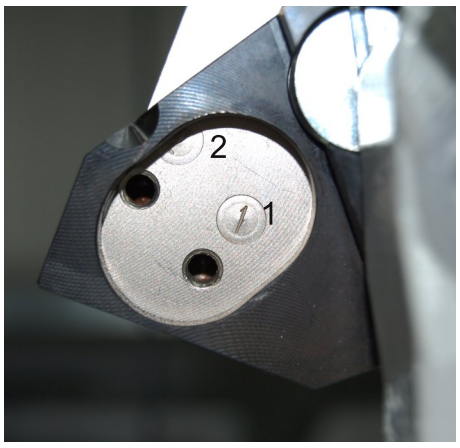
Let project the drill outside the prism depending on diameter (same as for right hand drills). **Align one cutting edge to the line** (as shown on the picture, Pos. 1).

For adjusting the correct clearance angle, remove the stepless clearance angle adjustment from boring (1, picture 2) and screw it in boring (2). Boring 1 is for right hand- and boring 2 for left hand spiral drills.

Provide for left hand drills: the higher the number, the smaller the clearance angle.


Picture 2

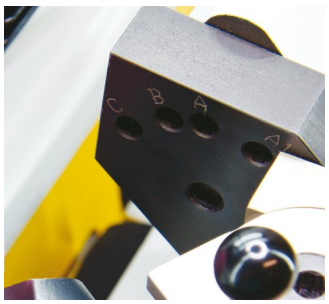
Clearance angle	
Drill, Ø	Scale grade
3 - 14	3,3 - 3,9
15 - 40	2,7 - 3,3
40 - 60	2,2 - 2,8



Picture 3

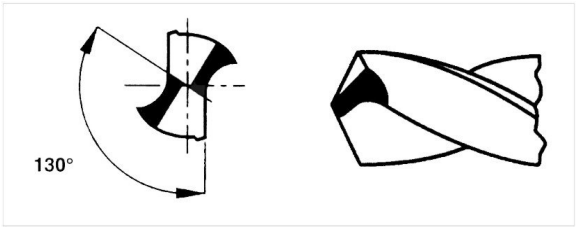
For web thinning of left hand drills use boring No. 1. Turn the prism rest to Pos. **A** and fix with the star know screw in hole **A1** (picture 4). With the clearance angle adjustment you determine how steep the web thinning should be.

Thinning the left hand drills	
Drill, Ø	Scale grade
3 - 20	2,0 - 2,6
21 - 40	2,7 - 3,3
41 - 60	3,2 - 3,8

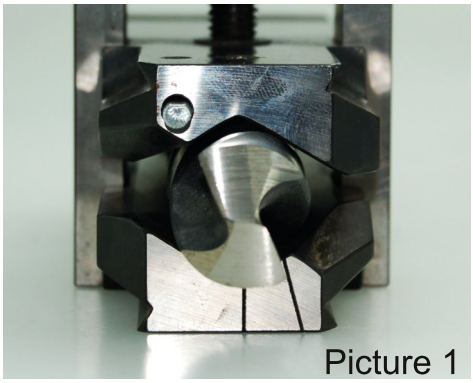

Picture 4

10. CROSS- OR FACET SHAPE

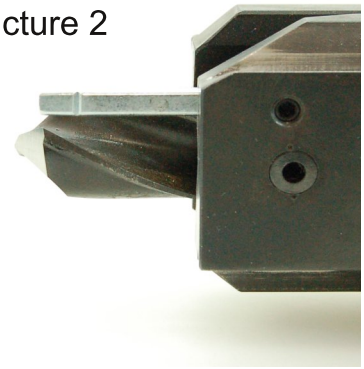
Main cutting edge:

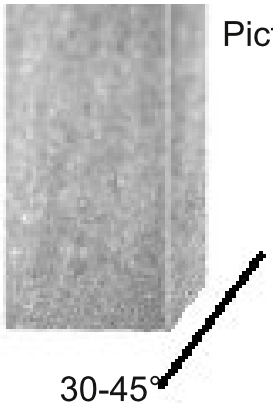


The drill is aligned as a right hand cutting spiral drill to the right graduation mark (picture 1). For the cross facet shape align the drill always to the total length of the pin (picture 2). Now sharpen the main cutting edge same way on both sides as described on page 10.


Picture 1

Picture 2

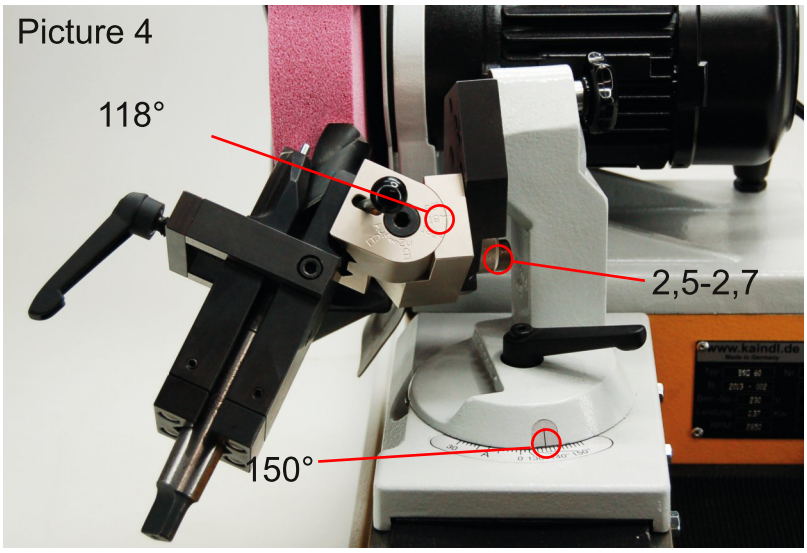


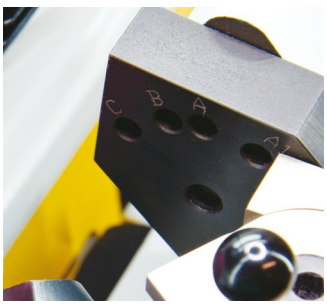


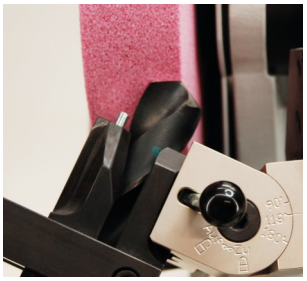
Picture 3

Web thinning (cross facet shape):

For web thinning, dress the right edge of the grinding wheel with approx. **30° - 45°** by hand (picture 3).
After finishing the grinding procedure, let the drill fixed in the prism. Put clearance angle to **2,5 - 2,7** (picture 4) fix the prism with the star knob screw in hole **C** (picture 5). Turn the top angle to approx. **150°**. Now move with the grinding wheel, starting at the outer edge of the drill till the center of the drill's chisel edge (picture 6). Note the feeding mark and move back from the grinding wheel. Reverse the prism for **180°**. Now repeat the last steps and move to the noted feeding mark.



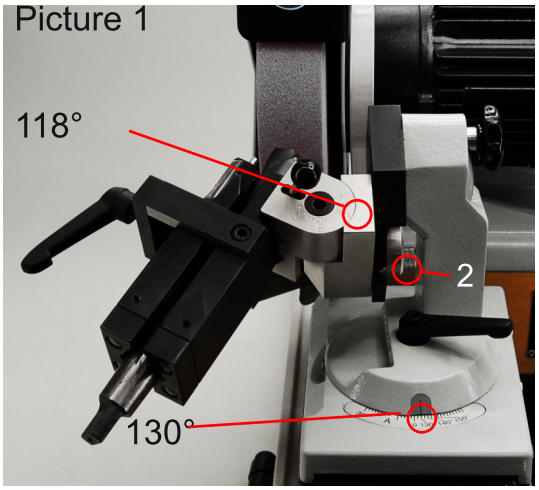

Picture 5


Picture 6

11. CARBIDE DRILLS FOR STONE

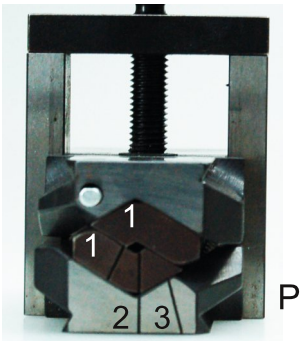
Only sharpen with diamond- or silicone grinding wheel. Let project the drill **approx. 30 mm** outside the prism. Align one cutting edge parallel to the straight graduation line (picture 2, Pos. 2). Prism support to **118°** and base adjustment to **130°**. Clearance angle to graduation **2** (depending on your type of your drill, more or less). Fix star knob screw in boring hole **B**. By using the motor feed, grind from the outside to the inside over the tip. Turn prism **for 180°** and repeat grinding procedure.
For correcting the main cutting edge, keep drill fixed inside the prism, only fix the unit in boring hole **A1**. Repeat grinding procedure as before.

Picture 1

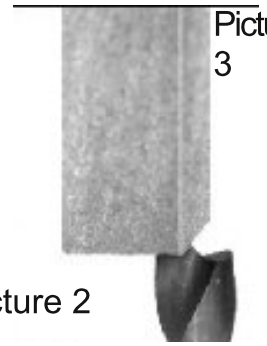


12. GRINDING OF SHEET METAL DRILLS

Let project the drill **min. 40 mm outside** the prism and align one cutting edge to graduation line **2** (picture 2). Fix the diamond dresser in the prism and dress the inside of the wheel to **60°** (picture 3). Adjust prism support to **180°**. Clearance angle as per your request. Adjust the star knob screw in hole **B**. With the motor feed pass from left to right by swiveling the prism.



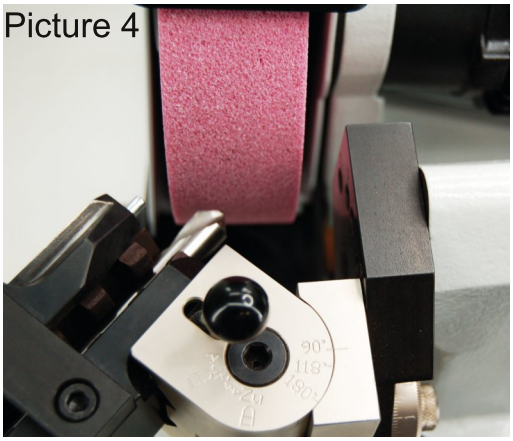
Picture 2



Picture 3

<u>Grinding the center tip:</u>
Let the drill fixed in prism. Prism support to **118°**, adjust prism base between **-30 and -A** (picture 4, page 10). Clearance angle adjustment between **2 and 3,5** and lock star knob screw in boring **C**. By moving motor- and prism feed, move to the cross-cutting edge and sharpen the form like a pyramid. Notice marks on both scales (motor- and prism feed) turn the prism and repeat the grinding operation.

Picture 4



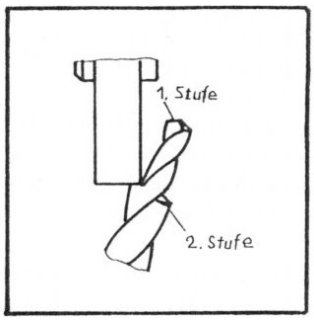
GRINDING OF NC DRILLS 90°

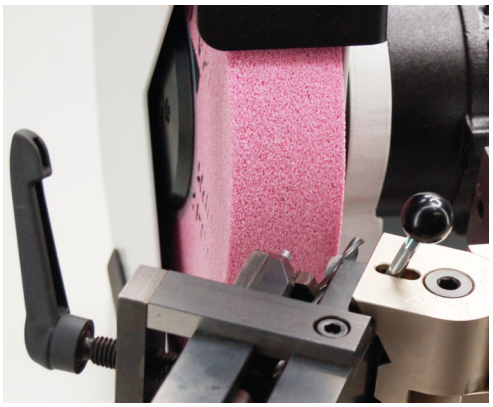
Let project your NC drill **15 mm outside** the prism and place cutting edge parallel to drill grinding adjustment (picture 2, Pos 3). Adjust the prism support to **90°** and clearance angle adjustment to **3,2** (more or less). Move prism feed by swiveling and sharpen one side. Turn prism and sharpen the second side.

13. GRINDING OF STEPPED DRILLS WITH 2 CUTTING EDGES 118°

First step: Adjust prism support to scale mark **118°**. The fixation and alignment is same as described in page 10 (right hand drills).

Second step: Adjustment as first step and sharpen over the right edge at the straight angle of the grinding wheel. Clearance angle as per your request.





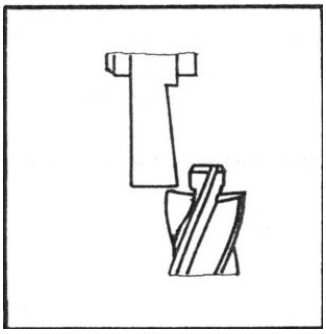
14. GRINDING OF STEPPED DRILLS 90°

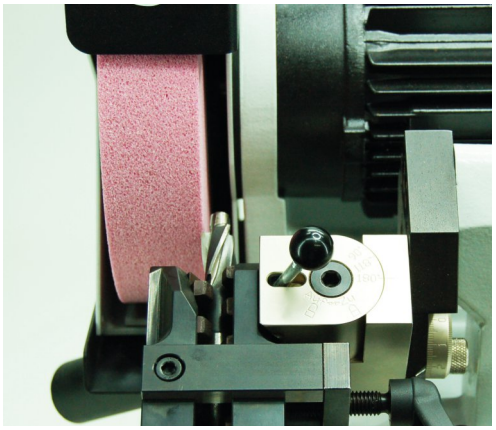
First step: The grinding is same as for right hand drills.
Second step: For this you have to "hollow out" the right side of the grinding wheel from the outside to the middle, in order the angle of edge of wheel is less than **90°**. Then adjust the second step. Adjust prism support to **180°**, clearance angle to **0**. Fix star knop screw in boring **A**. By means of motor feed form the outside to the inside and move back when finished. Reverse the prism and repeat the grinding procedure.

15. GRINDING OF SPOT FACERS

Hollow out the grinding wheel as described for **90° stepped drills**. Let the spot facer project around **35 mm** outside the prism and align one cutting edge parallel to the straight marking line. Use magnetic depth stop and cutting rost (page 8). Adjust clearance angle to **0** and lock knob screw in boring **A**. Grind from the inside to the outside by use of the motor feed. Move back and align the next cutting edge.

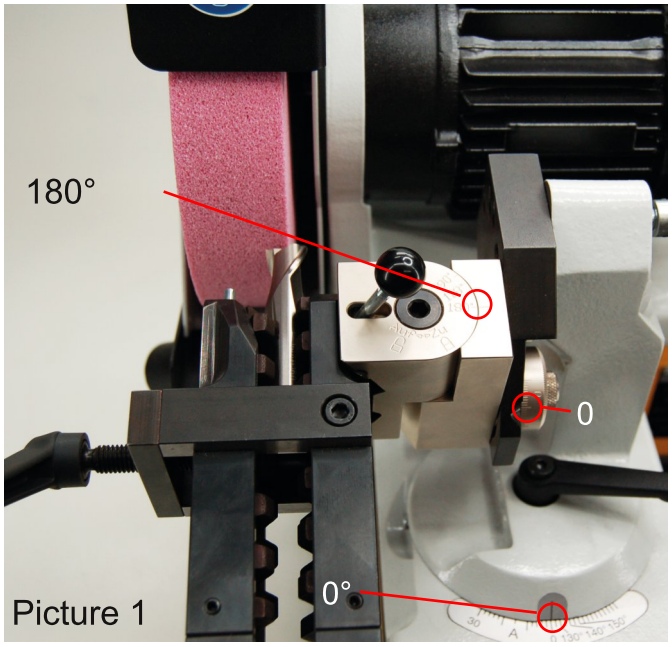
Do not change prism feed position. **For back grinding** fix the star knob screw in hole **B** and repeat the grinding procedure as before.





16. GRINDING OF CUTTERS WITH 2 CUTTING EDGES

Fix the cutter and align one cutting edge parallel to the straight marking line (see page 13, picture 2). For short cutters, fix another of same diameter in the backside of the prism.



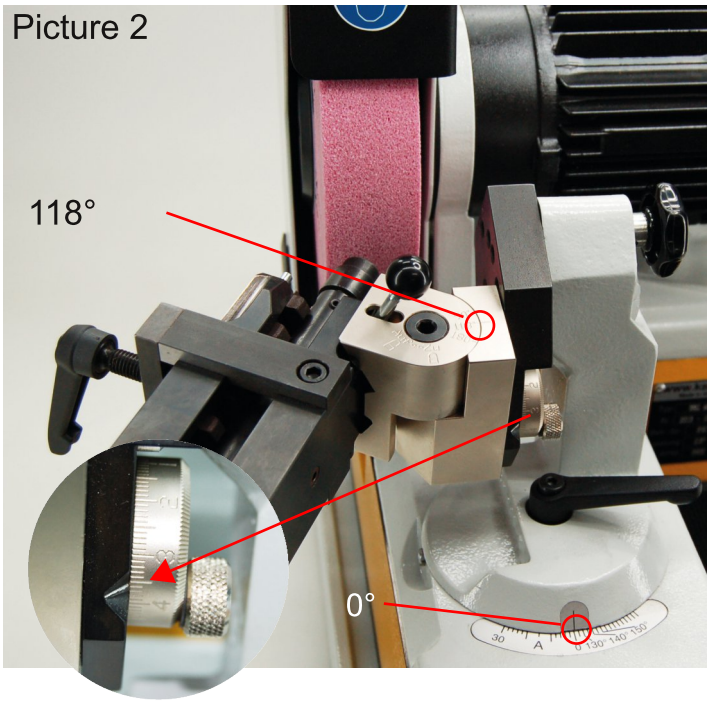
Picture 1

Grinding of the main cutting edge
Adjust prism support to **180°**. The base adjustment to **0** or **1-2 scale lines** on the right beneath. Place clearance angle adjustment to **0**. Fix star knob screw in boring **A**.

Grinding of the clearance surface
Now fix the star knob screw in hole **B** and repeat grinding procedure as for the main cutting edges.

For cutters with more than 2 edges (max. 4 cutting edges) you will need the magnetic depth stop and the cutting rost for cutters (Accessories, page 8).

17. DRESSING THE GRINDING WHEEL



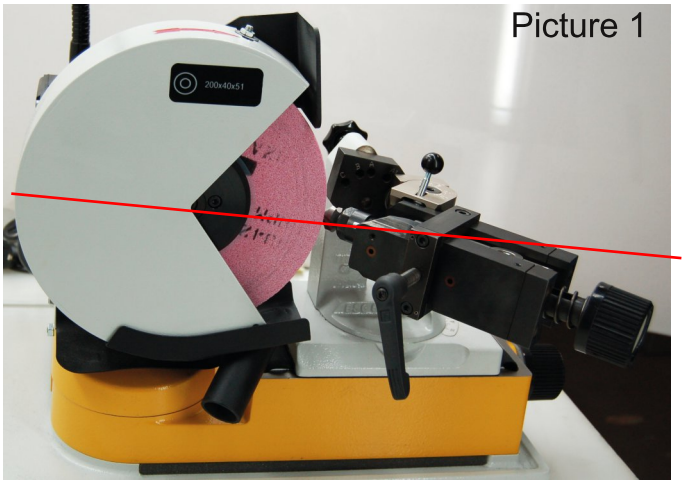
Picture 2

Fix the rotating dresser in the prism and place prism support to **118°**. Lock with star knob screw in boring hole **A**. Place clearance angle adjustment to pos. **3,5**. Place prism rest to **0** (Picture 2). Move the prism feed in direction to the grinding wheel till the diamond softly touches the grinding wheel and starts turning. Now move with the motor feed to the left or the right, till the grinding wheel is cleaned and sharp again.

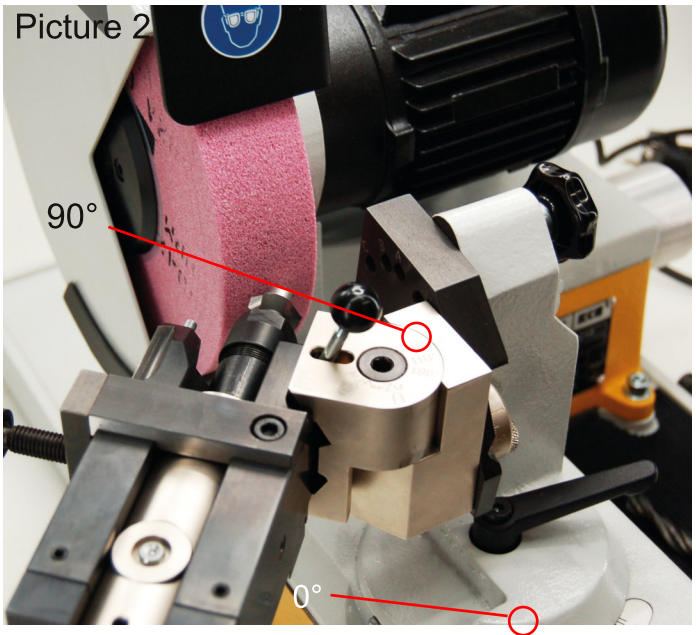
Attention:
Please only move carefully with the prism feed (**max. 2-3** scale lines).

18. SPECIAL ACCESSORY
COUNTERSINK SHARPENING DEVICE SVR 31

For sharpening countersinks, you need a special accessory to the BSG 60 the countersink sharpening device SVR 31. First fix the support plate in boring **A**. Then adjust the stepless clearance angle adjustment to No. **2**.


Picture 1

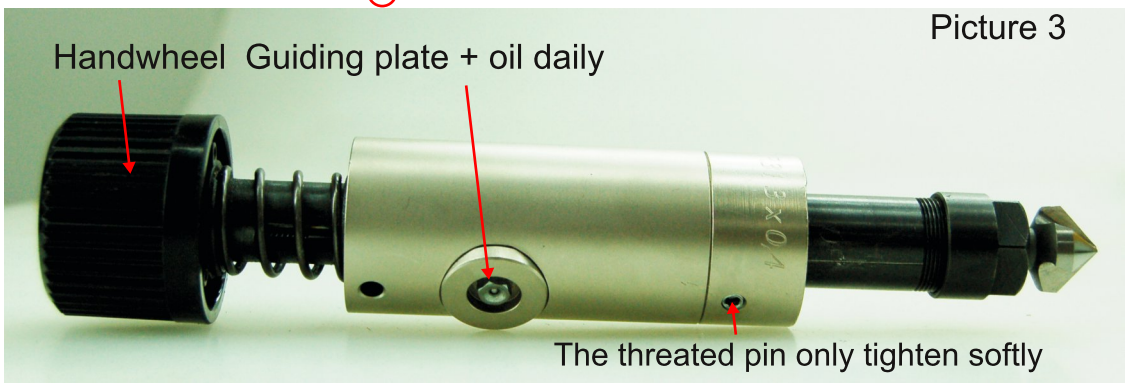
This grants that the imagined line goes through the center of the clamping prism and meets the center of the grinding wheel. (For older models you may have to change the clearance angle). The prism support place to **90°**. Now put your countersink in the collet of the SVR 31 and align one cutting edge as shown in picture 2, page 17 to the graduation line.



Picture 2

Move the prism to the stop on the prism support and fix the locking pin. Then fix the SVR 31 with the guiding plate (picture 3) on top in the prism. Prism range **20 - 40 mm**. By turning the handwheel of your SVR 31 clock-wise and carefully moving the prism feed, sharpen the cutting edges of your countersink.

A clean and parallel dressed grinding wheel is recommended.



Picture 3

19. ALIGNMENT OF THE COUNTERSINK

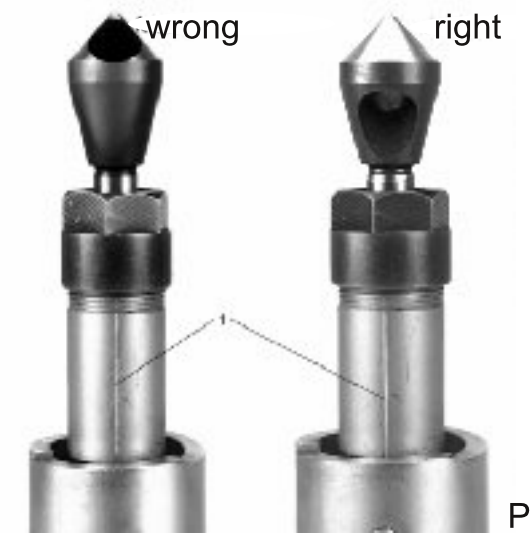
SVR 31 Basic adjustment: Cam for countersinks with 3 cutters and 10 mm collet + nut.

For cross countersinks you need a one step cam (special accessory).
The adjustment is made as shown on picture 1.

ATTENTION: Adjustment of the countersink hole on center of back flush with the alignment mark.

Alignment of cross-countersinks

wrong right



Picture 1

Alignment countersinks

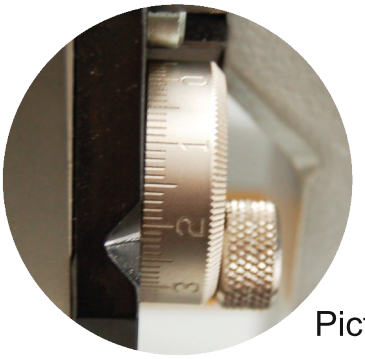
Picture 2

OPTIONALLY AVAILABLE

Cam for
cross-countersinks

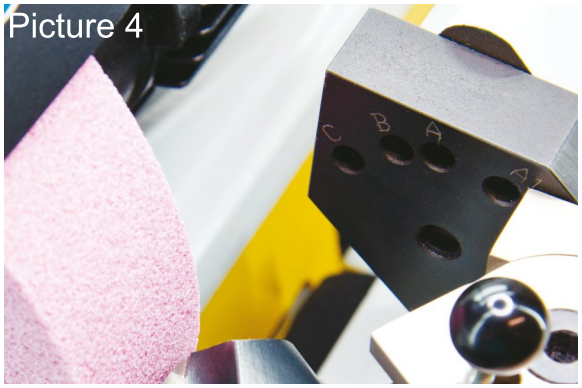
Collet
6/8/12 mm

Adjust clearance angle to mark No. **2**



Picture 3

Screw star knob screw in hole No. **A**



20. CHANGE OF THE CAM OF THE SVR 31

In case you have to change the cam of your SVR 31 loosen the threaded pin with an allen key SW 3,0 (see picture).
Place the SVR 31 with the handwheel on a flat surface.
By hand, press down the body (against spring tension). With your other hand, draw the cam **beside the roller bearing**, upside out of the body.

The inset of the cam is done reversely.

Please pay attention that threaded pin is mounted on the provided notch.

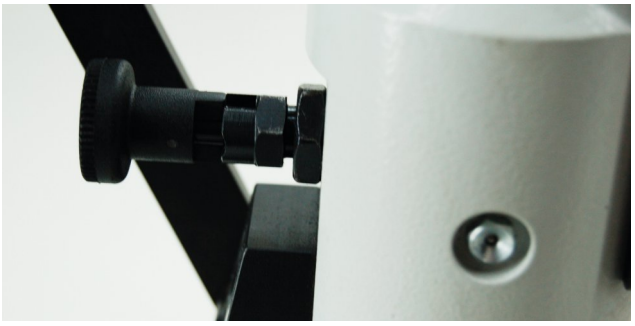
21. SPECIAL ACCESSORY BSG 60

SINKER AND MILLING CUTTER GRINDING DEVICE SZVR

22. FIXATION AND ALIGNMENT OF COUNTERSINK

SZVR Basic version: Curve for countersinks with 3 cutting edges + curve for cutters.

Place your countersink in the suitable collet and let project **approx. 10 mm** outside.
Then softly tighten the collet nut.
Now press the body of the SZVR downwards until it snaps in
(Pay attention, that the grid pins can snap in, eventually turn a little).

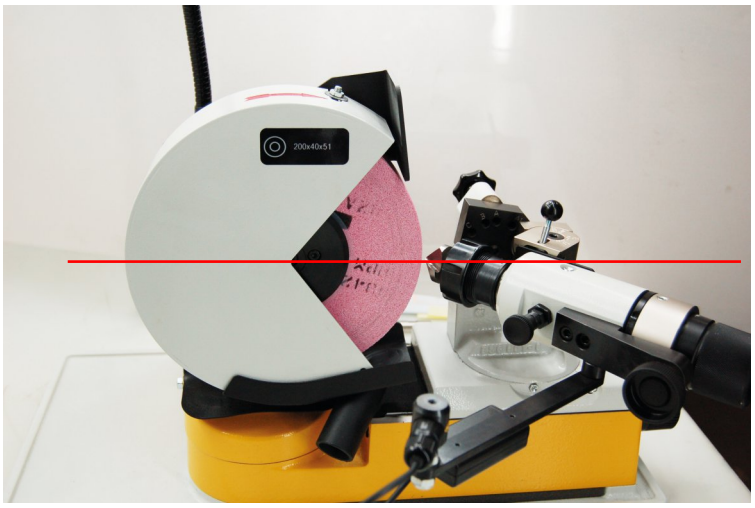


Press body of SZVR downwards
till it snaps in.

After the SZVR is snapped in, softly press against the grid pin by turning the handwheel. So long as the grid pin snaps in align. This grants that the alignment position of the countersink is attained.

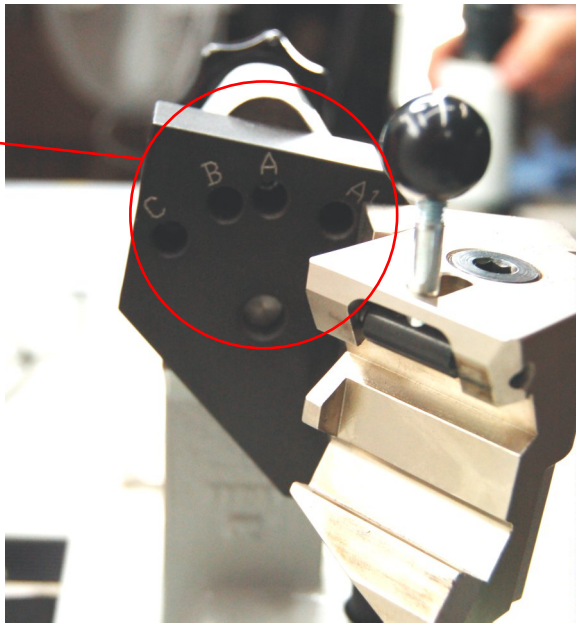
Press the ON button of the laser and turn the countersink in its collet until one cutting edge is in line to the laser beam. Then fix the collet nut. Loosen the grit pin and the SZVR snaps back to it's start position.

23. GRINDING OF THE COUNTERSINK



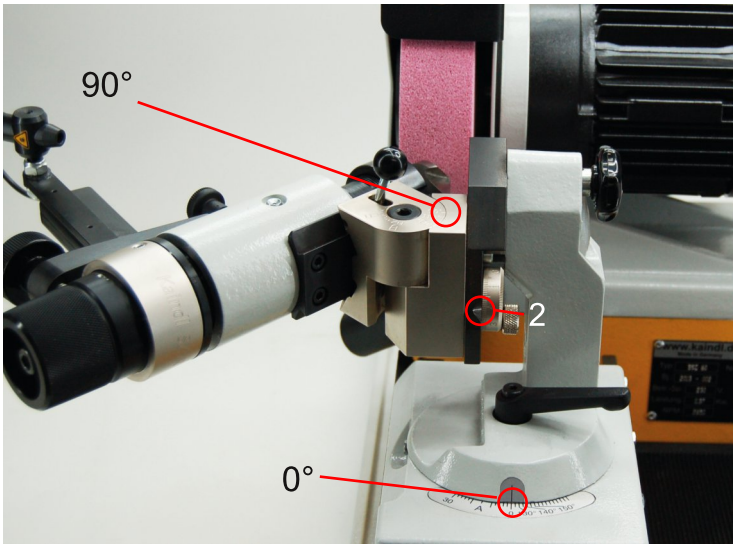
Fix the support plate of the SZVR with the star knob screw in boring hole **A**. The stepless clearance angle adjustment has to be turned to scale value **2**.
This grants that the virtual line, going through the center of the SZVR, meets the middle of grinding wheel (for older machines change the clearance angle accordingly).
The prism support fix to **90°**.

Locking points



Slide the **SZVR** on the prism support to the stop. By turning the handwheel of the SZVR to the right and carefully feeding with the prism feed, you can now sharpen the cutting edge of the countersink.

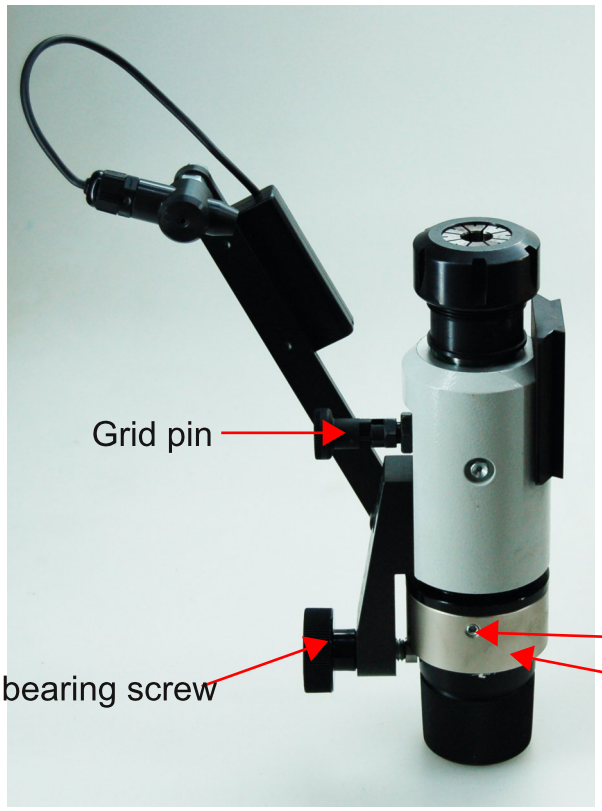
A freshly dressed and parallel aligned grinding wheel is requested.

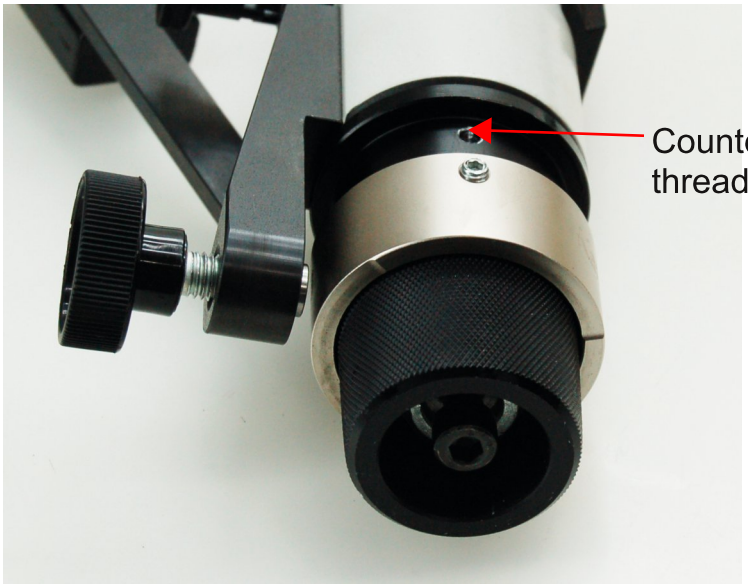


24. CHANGE OF GUIDING CURVE FOR CUTTERS

For changing the guiding curve, press the body downwards in other the SZVR snaps in the grid pin.
Now loosen the roller bearing screw and therefore turn back the bearing as far as possible. Loosen the threaded pin of the guiding pin and remove the guiding curve.

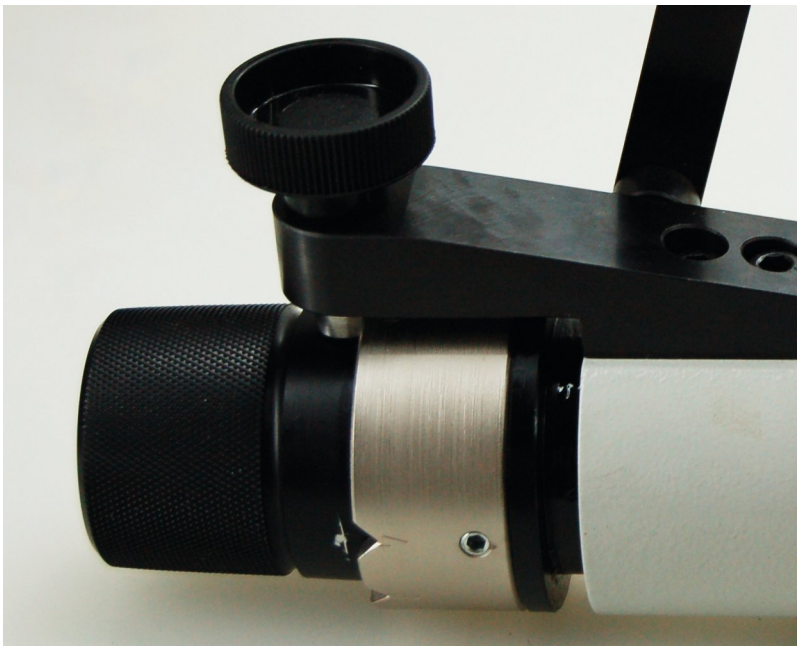
By turning the guiding curve, you can sharpen the head of **2, 3 or 4 flute cutters**. Now mount the cutter grinding curve in reverse sequence. Pay attention that the threaded pin is fixed in the corresponding groove.





25. GRINDING OF 2, 3 OR 4 FLUTE CUTTERS

After changing to the suitable grinding curve, fix the cutter in the corresponding collet and softly fix with the cullet nut. Turn the handwheel so that it snaps in the correct groove number. For 3 flute cutters No. 3, for 2 or 4 flute number 4.



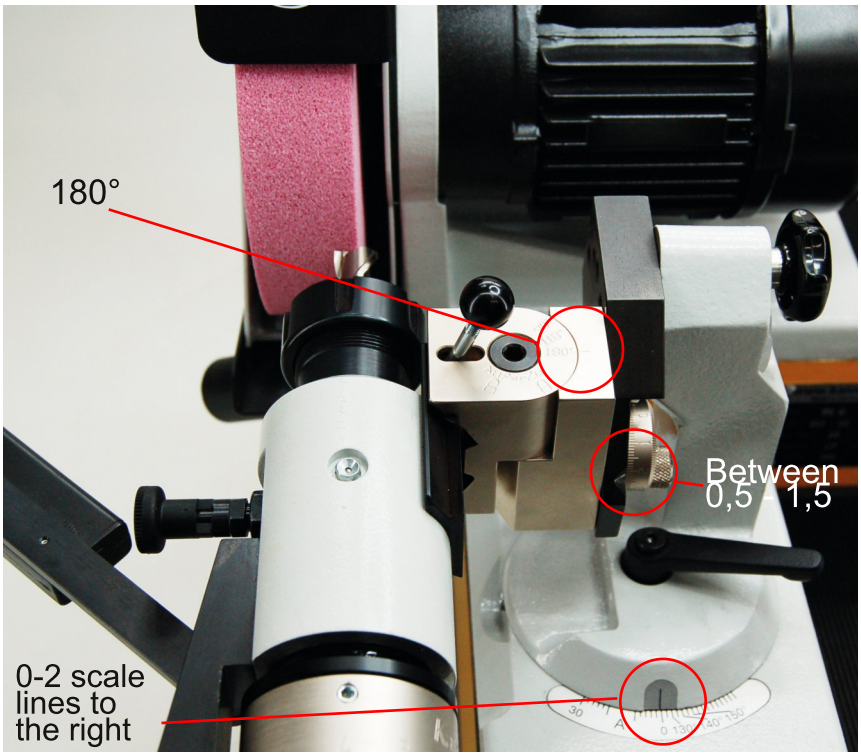
When the **SZVR** in snapped in, align one cutting edge of the cutter so that comes in line with the laser beam (see picture).
Now fix the collet nut.

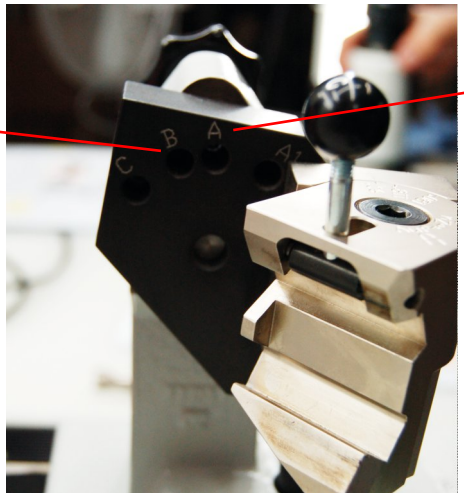
Grinding of the main cutting edge:

Slide the **SZVR** onto the prism support to the stop and lock with the star knob screw in hole **A**. Adjust the clearance angle on the machine, depending on your cutter between **0,5 and 1,5**. Fix the prism support at **180°** (see picture). By carefully feeding with the prism feed now sharpen the first side of the cutter. Note the measure on the scale and go back for two turns.
Turn the handwheel to the next suitable lock. Now sharpen the second side, by feeding to the noted measure. For 3 or 4 flute cutters, sharpen the other sides correspondingly.

Grinding the clearance angle of the cutter:

For grinding the clearance angle, lock the star knob screw in hole **B**. The grinding procedure is identical to the description before.





26. MOUNTING AND DRESSING OF GRINDING WHEEL BEFORE STARTING UP THE MACHINE

After you have moved the machine to it's final place, take out the grinding wheel and make a "sound check" with it. Also make an optical check, regarding perhaps damages. After this, mount the grinding wheel on the support.

The picture shows the mounting of the grinding wheel on the support (Picture 2, item 2-5). Please pay attention, that the screw (Item 4) has a right-hand thread.
Place the included plastic spacers between support and grinding wheel. After the mounting of the grinding wheel, loosen both hat cao screws with a 10 mm open-end spanner or combination wrench and pull off the grinding wheel cover to the left side.
Place the new grinding wheel on the motor shaft and tighten up the allen screw M8. Now re-mount the grinding wheel over in reverse order and check, if the grinding wheel cover is mounted is mounted correctly.

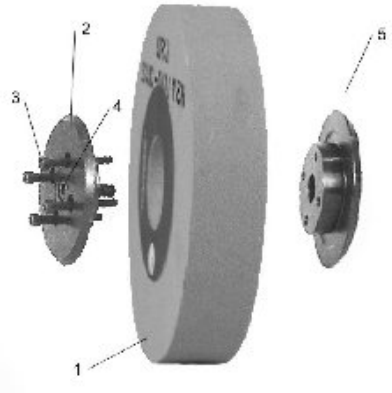
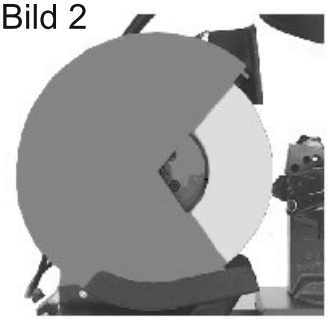


Bild 1

Bild 2



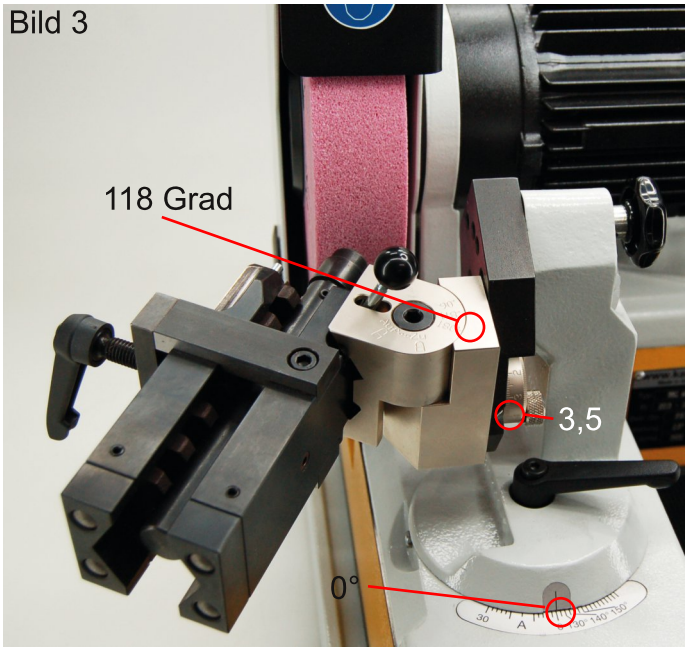
Never operate the BSG 60 with a not correctly mounted grinding wheel cover.

After you have mounted the grinding wheel correctly, you have to dress the grinding wheel.

Fix the dresser gyro in the prism, adjust the prism support to **118°**, lock with the fixation screw in hole **A**.
Turn the clearance angle adjustment to pos. **3,5**. Prism rest to **0** (Picture 3). Move the prism feed towards the grinding wheel, so that the diamond touches the grinding wheel and starts to rotate. Move the motor feed with the grinding wheel to the left and the right, unit the grinding wheel it clean and dressed.

<u>ATTENTION:</u> feed carefully (only feed 2-3 graduation lines) with the prism feed.

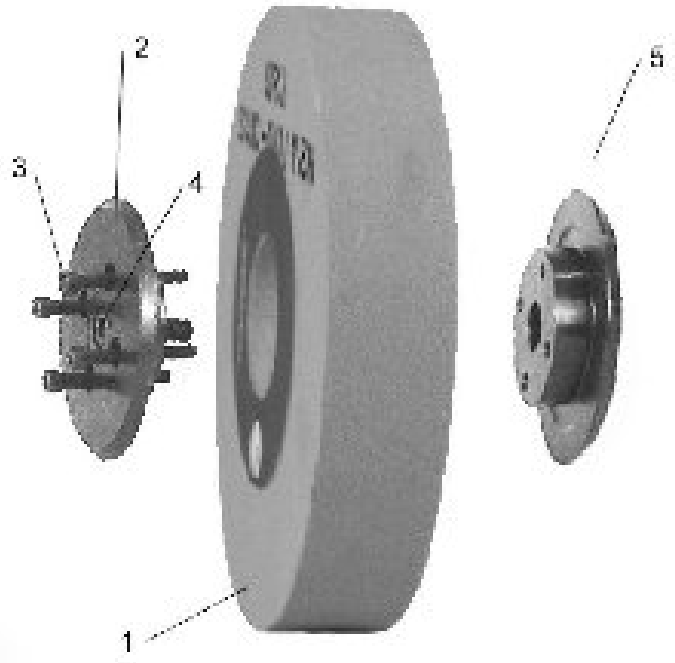
Bild 3



26.1 MOUNTING OF GRINDING WHEEL

STANDARD GRINDING WHEEL

Picture 1



The picture shows the assembly of the grinding wheel with the grinding wheel support (Picture 1, Pos. 2-5).

Pay attention that screw (Pos. 4) has a right hand thread.

Use the supplied plastic material (between recording and grinding wheel). Same also for special grinding wheel support as shown on picture 2 + 3.

Picture 2

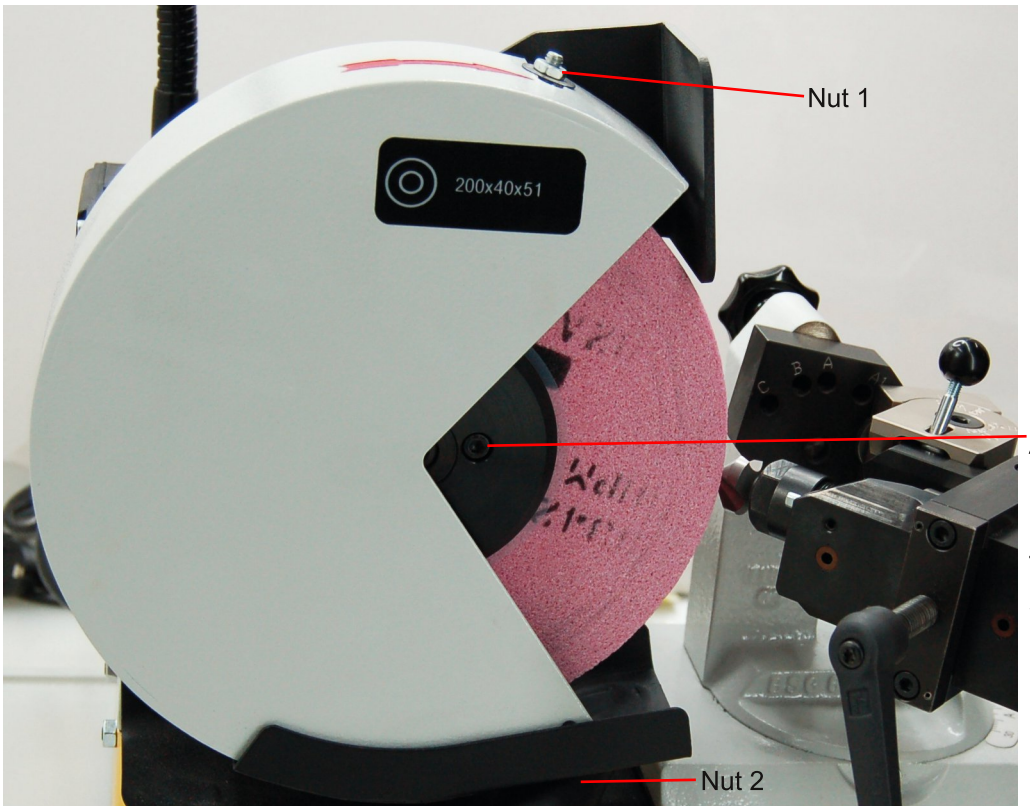
Picture 3

GRINDING WHEEL AS SPECIAL ACCESSORY

For grinding wheels of 20 mm thickness (picture 2, Pos. 2) please use the 20 mm spacer ring.

For grinding wheels of 8 mm thickness (picture 3, Pos. 4) please use the 32 mm spacer ring.

27. CHANGE OF THE GRINDING WHEEL



Loosen with a 10 mm open-end or ring spanner the two Nut (1 +2) and pull the grinding wheel protective cover to the left.

Now loosen the hexagon socket screw with the supplied wrench SW 5. Turn the screw until you can pull o the grinding wheel support together with the wheel.

Mount the grinding wheel support to your new grinding wheel (page 21).

Slide the new grinding wheel on the motor spindle and fix the screw again. Finally mount the grinding wheel protection cover. Please re-check that the cover is mounted correctly.

The grinding wheels have to comply with **EN 12413** or **EN 13236** (Vmin=30m/s). After changing the grinding wheel a 1-minute test run is carried out. In unusual behavior the machine must be switched off immediately and remove the fault.

Never operate the BSG 60 without a correctly mounted grinding wheel cover!

SPARE PART LIST ***BSG 60***

Item. No.	Description
10594	Prism 3-20 mm, Inner jaws
10598	Prism 20-40 mm
10602	Prism 40-60 mm
10624	Diamond dresser complete
10625	Spare gyroscopic dresser
18070	Optical lens LED-lighted
11042	Spare LED lamp
10613	Corundum grinding wheel 200x40x51 mm grit 60 (standard)
10614	Corundum grinding wheel 200x40x51 mm grit 100
10615	Corundum grinding wheel 200x40x51 mm grit 180
10688	Corundum grinding wheel 200x20x51 mm grit 100
10694	Spacer ring for 8 mm wheels
10616	Grinding wheel support with cone
10656	Prism support
10655	Holder for prism support
10658	Eccentric pin for prism support
10670	Ball bearing for swivelling mechanic
10680	Stretch cover for dust protection
10639	Clamping lever M 10 for prism 20-40 mm
10643	Clamping lever M 12 for prism 40-60 mm
10664	Length adjustment pin for prism
10634	Motor 230 Volt, 50 Hz
10633	Motor 400 Volt, 50 Hz
10638	Grinding wheel protection
10665	Control knob with scale
10671	Trapeziod spindle TR 12x3 for feeding sleigh

REPAIRS

Repairs to the BSG 60 and their mechanical components must be carried out in our company Kaindl or people, authorized by us. The replacement of wearing parts remain unaffected. The exchange of electric parts may only be performed by a qualified electrician.

DISPOSAL OF THE MACHINE INSIDE EU

When sending back the machine to us (transport charges prepaid), the company Kaindl- Schleiftechnik Reiling GmbH grants for the competent disposal as per the currently in force guidelines of the European waste equipment regulations.

CLEANING AND GREASING

Regular cleaning and lubrication of the equipment is essential for the lifetime.

Daily: clean prism support slide and clamping prism from grinding dust. Do not blow off the machine with air pressure!

Weekly: clean the complete machine and spray the blank parts with oil. Keep grease pots closed. Lubricants from open pots are unsuitable for greasing.
The motor roller bearings have a lifetime lubrication. In case of aggravated working conditions, as increased bearing load, high humidity, excessive dirt, etc, we suggest to change the motor bearings after around 5 years.

WARRANTY

The warranty is **12 months** from date of shipment and refers to a **one shift work** under condition of a appropriate use of the machine. The guarantee includes the costs of replacing of defect parts and assembly groups, including the required working time.

Excluded from any guarantee are:

- Wear parts
- Transport damage
- An improper use
- Damage by use of force
- Damages and consequential damages caused by breach of the duty taking care of the user

In case of a warranty claim, we ask you to inform us about the serial No. of the machine.

Returns have to be authorized by us, before shipment. We reserve the right to charge you with the transportation cost, if the return was not authorized.

Spare parts or replacement parts are transferred absolutely in our ownership.