1. Description of product

Directed use

The drill grinding machine BSM 20/SZ is exclusively determined:
- for occasional grinding of spiral-, step-, wood-, Forstner drills
- sheet metal-, stone-, (carbide) drills, turning tools, countersinks

For other use than listed here, the machine is not destined for and is regarded as a matter of adverse use!

The directed use includes also reading this operation manual, as well as keeping all containing directions of use - especially the safety information. In case the drill grinding machine BSM 20/SZ is not used as per the intended purpose, a save operation cannot be granted. For all personal- and material damages, arising by not intended use, not the manufacturer, but the user of the RUKO BSM 20/SZ is responsible.

2. Description of function

This mobile drill grinding machine made by RUKO is unique as to its design and offers a genuine alternative to bigger and considerably more costly equipments. Owing to ist solid construction, its high precision, its small space requirement and its favourable price, the RUKO drill grinding machine is an indispensable auxiliary equipment and a real measure of economy even for single operation sections and for smaller workshops. The machine facilitates the adjustment and the resharpening of twist drills to that extend, that everybody will be able to resharpen drills with every lip angle that is imaginable. From the prism reversing process results automatically the highest precision and cutting edge symmetry. The well planned conception and the possibility of an easy change of all parts subject to wear, preserve the RUKO drill grinding machine as an indispensable aid in your work-shop. Even after many years of employment.

2.1 Basic equipment BSM 20 /SZ

BSM 20 range 1,0 – 21,0 mm (prism) complete with corundum grinding wheel, diamond dresser and optical lens neon lighted.
SZ with corundum cup wheel and grinding table with electro magnet, diamond cup wheel, diamond dresser and optical lens neon lighted
3. Accessory and spare parts BSM 20 / SZ

10895 Corundum grinding wheel 125x20x20 mm grit 60 (coarse)
10890 Corundum grinding wheel 125x20x20 mm grit 80 (standard)
10891 Corundum grinding wheel 125x20x20 mm grit 180 (very fine)
10893 Corundum grinding wheel 125x05x20 mm (HSS wood bits)
10896 Corundum cup wheel ø 125 mm grit 60 (standard) for SZ
10897 Corundum cup wheel ø 125 mm grit 80 (medium) for SZ
10898 Corundum cup wheel ø 125 mm grit 100 (fine) for SZ
10899 Grinding wheel support
10885 Diamond grinding wheel D 76 covered on 3 sides for carbide wood drills
10886 Diamond grinding wheel D 76 covered on 3 sides for carbide drills
10906 Universal clamping device for single-lip cutters, cut off tools, etc
10889 Magnetic depth stop for cutters
10875 Countersink sharpening device SVR 31 with collet 10 mm
10877 collet 6,0 mm
10878 collet 8,0 mm
10879 collet 12,0 mm
10901 Morse taper sleeve MK I
10902 Morse taper sleeve MK 2

4. Technical data: BSM 20 and sharpening center SZ with magnetic table

**Dimension drill grinding machine BSM 20:**
- Lx Dx H: 370,0 x 350,0 x 270,0 mm
- Weight: ca. 22,0 kg

**Dimension SZ 215:**
- Lx Dx H: 500,0 x 420,0 x 310,0 mm
- Weight: ca. 40,0 kg

**Movement: Drill grinding machine**
- Prism clamping rage: 1,0 until 20,0 mm
- Motor feed: max. 65,0 mm
- Prism feed: max. 45,0 mm
- Clearance angle: stepless adjustable
- Top angle: stepless adjustable from 60° to 200°
- Gradient of spindles: 3,0 mm (1 scale line = 0,03 mm)
- Grinding wheel: Corundum grinding wheel 125,0 x 20,0 x 20,0 / grit 80 / hardness M
- Vmax = 35 m/s ; n = 5400 RPM
- Noise emission: < 70 dB(A) ; Emissions-acoustic pressure at workplace
  (ear level) as pair DIN EN ISO 11204
- Operating condition: Sharpening of a HSS 15 mm dia drill
- Run out time of Grinding wheel: approx. 10 seconds

**Grinding table**
- Movement: 305,0 mm
- Table size: 170,0 x 100,0 mm
- Swing range table: stepless from +20° to –60°
- Grinding wheel: Corundum cup wheel 125,0 / 105,0 x 40,0 x 20,0 mm / Kom 60 / hardness J
- Vmax = 30 m/s ; n = 4600 RPM
- Noise emission: see above BSM 20
- Electrical connection:
  - Total value: 230 Volt / 50 Hz / 130 Watt

Technical changes may be done without notification!
5. General Safety advise

Duty of taking care by the user

The Drill grinding machine BSM 20/SZ has been designed and constructed under consideration of an endangering analysis and careful selection of observed harmonized norms, as well as further specifications. The BSM 20/SZ meets the state of the art and grants a maximum of safety. This safety can only be achieved in daily work, when all necessary steps are taken. It is the duty of taking care by the user to plan and control these steps.

The user especially has to take care that:
- the BSM 20 SZ is used as directed (see chapter description)
- the machine is used in flawless workable condition, especially that the safety installations are checked.
- the provided adjustment devices are to be operated according to the grinding tool wear.
- requested personal security equipment for the operator is available and used.
- The operation manual is always in a readable condition, complete and available near the machine.
- the drill grinding machine BSM 20/SZ should only be operated by staff who are familiar with the operating manual and particularly the safety instructions contained therein.
- All safety and warning instructions are not removed from the machine and kept readable.

6. Explanation of the used safety symbols

In this Instruction manual, the following safety symbols are used:
These symbols shall attract the readers attention to the text next to the symbols

These symbols indicate that there is an existing danger to live and health of persons.

Protects eyes while grinding, against kicked around particles

Before changing the grinding wheel or moving, disconnect from electric current!

The lens of the magnifying lamp has to be closed after use:

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

7. Basic Safety advise

Keep information on-hand:
This instruction manual has to be kept beneath the machine. It has to be granted, that all persons working on the machine, have access to the instruction manual. Additionally there should be provided special advises in sense of a safe workplace. All safety and operation labels on the machine should be keep in good condition and readable. Damaged or non readable labels have to be replace immediately.

These symbols indicate that there is an existing danger to live and health of persons.

For all grinding works with BSM 20/SZ always wear safety glasses.
Grinding dust may hurt your eyes.

Only remove the grinding wheel protection for changing the wheel.
NEVER OPERATE THE MACHINE WITH COMPLETE GRINDING WHEEL PROTECTION

Before changing the grinding wheel or moving, disconnect from electric current!
8. Demands for the operating personnel

Only persons who are familiar with this manual are allowed to work with this machine.

9. Special types of danger

Before starting the machine, the following jobs have to be done:

- Check the machine for visible damage and eliminate ascertain defects.
- The operation of the machine is only permitted in flawless condition.
- Electrical connections have to be checked regularly.
- Fix loose connections.
- Damages electric cables have to be immediately replaced by an electrician.
- Never clean electric parts with water or similar liquids.

Changes on the machine:
Due to safety reasons changes on the machine without permission are not allowed. Only use original – spare parts, - original wear parts original accessories these parts are especially designed for this machine.

10. Set up

Environmental conditions for set up

- Use the drill grinding machine / Tool sharpening center only in dry rooms.
- Environmental temperature from +5 to +50°C
- Humidity up to 90 %, not condensing
- the BSM 20 / SZ is a table version.
- Pay attention that the machine has a safe stand on the work table
- The place has to grant a vibration free running of the machine.

11. Transport

The machines is delivered in a box, packed on a pallet (approx. 50.0 Kg).
The machine has to be lifted outside diagonal, BSM 20 approx. 25.0 Kg; SZ approx. 40.0 Kg
Remove transport locks (Only for SZ)

After you have unpacked and placed the machine on a work table, please remove the transport locks (see picture).

12. Start up

- In order to prevent damage to the machine or injuries, please pay attention to the following,
  items before starting:
  - Check that all tools or part not belonging to the machine have been removed before starting.
  - Check the turning direction of the grinding wheel.
  - Grinding wheel always has to run downwards.
  - Also read the chapter General safety advice.
  - Wear protective glasses.

12.1 Control before the first start up

- Check electric components for damage (sight check)
- Check guidance for soft turning
- Check fixed parts.
### 13. Description of parts

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Bezeichnung</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grinding wheel adaptor</td>
</tr>
<tr>
<td>2</td>
<td>Prism</td>
</tr>
<tr>
<td>3</td>
<td>Prism holder</td>
</tr>
<tr>
<td>4</td>
<td>Clamping screw</td>
</tr>
<tr>
<td>5</td>
<td>Mounting block</td>
</tr>
<tr>
<td>6</td>
<td>Clamping lever</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Bezeichnung</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Clearance angle adjustment</td>
</tr>
<tr>
<td>8</td>
<td>Prism feed</td>
</tr>
<tr>
<td>9</td>
<td>Motor feed</td>
</tr>
<tr>
<td>10</td>
<td>Locking screw (e.g. for point thinning)</td>
</tr>
<tr>
<td>11</td>
<td>Scale (point angle)</td>
</tr>
</tbody>
</table>
14. Operation BSM 20

Grinding of right hand drills

The reversing prism has a clamping range from 1,0 - 20,0 mm.
Open the prism by turning the knurled screw.
Place the drill in the prism.

Main cutter

Let project the drill around 20,0 mm outside the prism clamp. Close the prism carefully with the knurled screw, pay attention that the drill still can still be turned. Align one cutting edge between both graduation lines (see pic. on the left).
Now tighten the prism with the knurled screw by hand (without use of force). The drill is now aligned and ready to sharpen.

Slide prism with the drill onto the prism support and fix with the wing screw. Adjust the requested top angle (Standard 118°) on the support and fix with the clamping lever.

- right part-scale: support to right stop dog (slot) and adjust clearance angle.
- left part-scale: support to left stop dog (slot) and adjust clearance angle. It does not matter which part-scale you use.

The clearance angle is adjusted by the clearance angle scale

- direction 3 = more clearance angle
- direction 1 = less clearance angle

By opening the clamp screw, the clearance angle can be set infinitely.

Grinding of the drill

Move the drill to the front side of the grinding wheel, by using the prism feed and the motor feed.
By carefully feeding with the prism feed and meantime turning the prism upside down, grind the first cutting edge completely.
Note the graduation No. On the scale, feed back, remove and turn the prism, place again in the prism support, fix it and grind the second cutting edge to the same graduation as noted.
15. Grinding of left hand drills

Grinding wheel: depending on sort of drill: use corundum and diamond wheel

Adjustment on the machine.:  
-Tip angle 118°

For grinding of left hand drills, the prism rest and clearance angle adjustment has to be changed

Remove the prism support from the clearance angle adjustment and screw together on the provided fixation threat (L) for left hand drills

Let project the drill approx. 15,0 mm out of the prism  
Align one cutting edge parallel to the graduation mark for left hand drills

Adjust the requested clearance angle on the scale.  
Applicative scale range for left hand grinding 2-3.  
2= slight clearance angle, 3= high clearance angle
16. Web thinning of drills

Keep the prism in the prism support, as described before. Turn the clearance angle adjustment to 1. (see pic. below) Fix the turning mechanism in hole No. C of the fixation plate (see pic. below) Shift the complete prism trestle to the left stop, adjust on mark A.

By using the motor- and prism feed, grind inside the drill behind the cross cutting edge. Note the graduation No. on the prism feed scale and go back for 3 complete turns. Do not change the position of the motor feed. Open the clamping lever, reverse the prism, fix again and thin the web of the other side.

Lock points
A: Lock point for cutter, carbide drill crossfacet shape, four surface shape
B: Lock point for back or free sharpening
C: Lock point for web thinning

Grinding of cross cutting or 4 facet drills

Depending of the drill is made of, use the corresponding grinding wheel.

Align one cutting edge parallel to both graduation lines. (see pic.) Project the drill approx. 20.0 mm outside the prism. Fix the turning mechanism in hole A. (See pic. below) Adjust the top- and clearance angle to your specifications.

Grind the first side over the right edge of the grinding wheel by feeding the prism and moving with the motor feed. The second side is ground with the same adjustments. For grinding the back, fix the turning mechanism in hole B. The grinding operation is the same as for the first two cutting edges.
17. Grinding of a cutter

Align the cutter to the straight line of the prism

Prism rest 180° - 185°

A : Locking for main cutting edge
B : Locking for free sharpening

Cutter grinding is slightly different to cross facet grinding. But the adjustment and alignment is identical to the 4 facet drill. The difference is only the top angle adjustment. Here use 180° - 185°, (see pic above). The sharpening procedure is identical. For cutters with more than two cutting edges use the magnetic depth stop, listed under special accessories. For cutters with odd. cutting edges (e.g. 3-cutters) each cutting edge has to be adjusted separately. Having cutters with even numbers of cutting edges, the opposite cutting edges can by ground by reversing.

18. Step drills

Grinding wheel: Depending on the drill, use corundum or diamond wheel.

Attention! Only step drills with two steps can be sharpened.

Grinding of the 1. step (tip) Alignment and sharpening as for right hand drills.

The second step is adjusted in length and side direction as twist drills. The tip angle is adjusted on the prism support. Clearance angle as per your request. Grind the second step over the right side of the grinding wheel.
19. Carbide drills

Use diamond wheel! (Option)
Change of grinding wheel

Grinding of carbide drills depending on shape of cutting edge use the 4 facet shape or twist drills.
The sharpening of stone drills with 4 facet shape is same as described.
The sharpening of stone drills with standard twist drill shape is same as described for right hand drills.

20. Sheet metal drills (with center tip)

Grinding wheel: corundum, dress the right side of the wheel with an angle of 45 °
Use the grinding wheel dresser to dress the requested shape.

Adjustment of the drill in the prism:
- Adjust the main cutting edge parallel to both graduation lines on the prism (see pic.)
- Project the drill around 35,0 - 40,0 mm outside the prism

Adjustment of the machine:
- Top angle 180 ° left
- Clearance angle to your requirement

Grinding operation:
By carefully feeding the prism towards the wheel and meantime swivelling the prism, grind the first side of the cutting edge, then move with the motor feed to the centre tip of the drill bit and grind over the tip using the 45 ° dressed side of the grinding wheel.
Note the No. on the scale of the prism feed and move back, remove the prism of the prism support, reverse, fix again in the support and grind the second cutting edge to the same graduation No. Now the second side of the tip is ground centrically.
The tip thinning is identical as for twist drills.

21. Centre bits for wood with center drill point and taper taps

Grinding wheel: depending of the material the drill is made of; thin corundum or thin diamond wheel.

Adjustment of the drill in the prism:
- main cutting edge parallel to both graduation lines
- project the drill approx. 35,0 - 40,0 mm outside the prism

Adjustment of the machine:
- tip angle 180 ° left
- clearance angle to your requirement

Grinding of the drill:
By carefully feeding the prism towards the wheel and meantime swivelling the prism, grind the first side of the cutting edge, then move with the motor feed to the centre tip of the drill bit and grind over the tip using the 45 ° dressed side of the grinding wheel. Note the No. on the scale of the prism feed and move back, remove the prism of the prism support, reverse, fix again in the support and grind the second cutting edge to the same graduation No. Now the second side of the tip is ground centrically. Move with the motor feed to the left and grind the Outer cutter with the dressed side of the grinding wheel.
The second outer cutter grind with the same setting.
The tip thinning is identical as for twist drills.
22. Forstner drills

Attention! Only the open types can be ground
Grinding wheel: depending on the material of the drill, use a thin corundum or thin diamond wheel.

Adjustment of the drill in the prism:
The outer and main cutting edges are placed directly on the grinding wheel.

Grinding of the main cutting edges:
- align the main cutting edge to the grinding wheel, so that the outer edge cannot be hurt by the grinding wheel
- grind the first main cutting edge from the inside to the outside.
- reverse the prism and grind the second main cutting edge from the outside to the inside.

Adjustment of the machine:
- tip angle 180° left
- clearance angle to your requirement
- turning mechanism fix in hole A

Grinding of the outer cutting edges:

Adjustment on the machine:
- tip angle 180 ° left
- clearance angle to your requirement

Align outer cutters to the grinding wheel and grind by reversing.

23. Countersink sharpening device SVR 31

Fix in hole A.
24. Countersink sharpening device SVR 31

For sharpening countersinks with the BSM 20/SZ, this special accessory type SVR 3 is required.

Arrest the turning mechanism of the BSM 20 drill sharpening machine in hole A.

Fix the stepless clearance angle adjustment on the third graduation mark from above. The prism rest fix at 90 ° see draw on the right.

Place your countersink inside the collets of the SVR 31 and align one cutting edge parallel to the line on the SVR 31, below the Collets nut. (see also drawing E)

With the screws i and j (see the drawing on the right) you can adjust the distance between the SVR 31 and the grinding wheel. For bigger Countersinks the SVR is positioned backwards and can only fixed with one screw on the adaptor plate.

Slide the SVR 31 on the turning mechanism to the stop dog and fix with the clamping screw. By turning the hand wheel of the SVR 31 clockwise and carefully moving forward with the prism feed on the BSM 20 you can now sharpen.

25. Change of grinding wheel

Before changing the grinding wheel, disconnect from electric net.

Loosen both hat cap screws (1 & 2) with a 10 mm engineers wrench and remove the grinding wheel cover.

Now loosen the socket screw (3) with the hexagon socket wrench SW 2,5 (comes with the machine) on the grinding wheel support and tear the grinding wheel with support from the motor spindle.

Place your new grinding wheel on the motor spindle and pay attention that the grinding wheel supports not touch the back side of the grinding wheel protection guard.

Now fix the socket screw, mount the front grinding wheel cover and make shure that the cover is mounted correctly.

Never use the corundum cup wheel for drill grinding.

26. Wheel dressing

Place the dresser Part No. 10908) in the prism, in order the rotating front part can still be turned. Fix the clearance angle to No. 2 and set the angle on the support rest to 118 °

Now fix the clamping screw in hole A. Now carefully move the prism feed toward the wheel so the rotating diamond part starts turning. Now feed max 1-2 part lines. By moving the motor feed, you can now dress the wheel.

The BSM 20 is not allowed to be operated without a correctly mounted grinding wheel cover.
It is absolutely recommended grinding with a clean and parallel dressed grinding wheel.

For one-flute countersinks you have to mount the special cam. - Art No. 10605

Attention! When you align the tip of countersink parallel to the graduation line on the SVR 31, take care that the bigger hole is on this side.

27. Repair – Maintenance

Cleaning and lubrication
At least once a week, abrasive dust on the BSM20/SZ should be cleaned with a soft brush and stubborn stains removed with a commercial machine cleaner. After cleaning, all moving parts should be lubricated with a few drops of machine oil. To prevent corrosion, apply a little oil on all exposed parts and scrub the parts with a soft cloth again.

Repairs
All parts given in the list of spare parts can also be replaced by the operator. Repair of components such as the covering prism or the base plate with guide and spindle can be carried out only here at RUKO, because they are directly related to the precision of your equipment.

28. Spare part list BSM 20 / SZ

<table>
<thead>
<tr>
<th>Description</th>
<th>Article-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prism 1,0 - 20,0 mm</td>
<td>104 060 - 1</td>
</tr>
<tr>
<td>Mounting block complete with clearance angle adjustment</td>
<td>104 060 - 2</td>
</tr>
<tr>
<td>Clamping lever with washer</td>
<td>104 060 - 3</td>
</tr>
<tr>
<td>Replacement diamond dressing top</td>
<td>104 060 - 4</td>
</tr>
<tr>
<td>Loose mounting for diamond dressing top</td>
<td>104 060 - 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Article-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob for (Elesa) with scale for prism-motor feed</td>
<td>104 060 - 6</td>
</tr>
<tr>
<td>Loose motor painted 230 Volt / 50 Hz</td>
<td>104 060 - 7</td>
</tr>
<tr>
<td>Grinding wheel guard painted</td>
<td>104 060 - 8</td>
</tr>
<tr>
<td>Grinding wheel grain 80 for BSM 20</td>
<td>104 060 - 9</td>
</tr>
<tr>
<td>Grinding wheel adaptor</td>
<td>104 060 - 10</td>
</tr>
</tbody>
</table>

29. Warranty

The warranty complies with legal requirements (Warranty Directive 1999/44/EC) and refers to single-shift operation conforming to the requirements for using the machine. The warranty covers the cost of the replacement of defective parts and components, including the necessary work. Excluded from any warranty are operation-related wear and tear parts, improper use of the machine, as well as damage caused by the use of force.

For warranty claims, please include the serial number of the machine in your communication.

Return of machine should follow our earlier agreement. We reserve the right to charge the transportation costs of unauthorized returns.
EG-Konformitätserklärung

Der Hersteller: RUKO GmbH
Präzisionswerkzeuge
Robert-Bosch-Str. 7-9
71088 Holzgerlingen

Erklärt hiermit, dass die nachstehend beschriebene Maschine:

<table>
<thead>
<tr>
<th>Maschinen Nr.</th>
<th>Baujahr</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

Schleifmaschine
Typ: BSM20+SZ

Die Sicherheits- und Gesundheitsanforderungen folgender EG-Richtlinien erfüllt:
- EG-Maschinenrichtlinie (2006/42/EG)
- EG-Richtlinie EMV (2004/108/EG)

Angewendete harmonisierte Normen:
- EN ISO 12100-1 und EN ISO 12100-2 ; EN ISO 13857 ; EN ISO 13732-1 ;
- EN 61029-1 ; EN 60204 Teil 1 ; EN 61000-6-1 ; EN 61000-6-2 ;
- EN 61000-6-3 ; EN 61000-6-4

Konstruktive Änderungen, die Auswirkungen auf die in der Betriebsanleitung angegebenen technischen Daten und den bestimmungsgemäßen Gebrauch haben, die Maschine also wesentlich Verändern, machen diese Konformitätserklärung ungültig!

Die Unterlagen wurden zusammengesellt von:


Holzgerlingen, den 18.03.2011

Jörg Rapport, Geschäftsführer