

OPERATION MANUAL FOR CIRCULAR KNIFE SHARPENING MACHINE RMS-NC



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EC-DECLARATION OF CONFORMITY

The manufacturer:

Kaindl-Schleiftechnik Reiling GmbH Remchinger Straße 4

75203 <u>Königsbach</u>-Stein Germany

declares that the machine described hereafter:

Circular knife sharpening machine Type: **RMS-NC**

are conform the following EC safety and health regulations:

EC-Machine instruction (2006/42/EC) EC-Instruction EMV (2004/108/EC)

Applied harmonised norms:

EN ISO 12100-1 and EN ISO 12100-2; EN 294; EN ISO 13732-1; EN 61029-1, 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 manual and the directed use, herefore change the machine substanially, make this declaration of conformity invalid!

The documents had been assembled by:

Reinhard Reiling

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Reinhard Reiling, General Manager

Königsbach-Stein, dated 29.12.2009



1. TRANSPORT

The **circular knife sharpening machine RMS-NC** is deliveres in a wooden box on pallet. The gross weight of the machine is 210 Kg. The transport is done with the pallet by a lifting cart or fork-lift truck.

1.1 ENVIROMENTAL CONDITIONS FOR SET UP

Place and use the circular knife sharpening RMS-NC only in dry rooms.Environmental temperature:from +5 to +50°CHumidity:up to 90%; not condensing

1.2 SET UP

Move the pallet as close as possible to the final position of the machine. Then remove the screw joints between the machine and pallet. Before placing the machine at its final position on the floor, screw in, the machine feet from below. Please pay attention that the machine is aligned horizontal on the floor. The alignment should be done by use of a bubble level (standard model is sufficient). Place the bubble level on top of the cabinet and align in both direction by adjusting the machine feet.

Please pay attention, that the place of the machine grants a vibration free operation.

1.3 GENERAL SAFETY ADVISE

Read the operating manual intensive!

For damages caused by ignorance or not following the operating manual, no liability is assumed!

When dealing with circular and shape knife greatest caution is needed, because this can have the sharpness of a **razor** and it can result in significant cuts if handled carelessly. To largely avoid these, the use of cut protection gloves is strongly recommended.

1.4 DIRECTED USE

The circular knife sharpening machine RMS-NC is exclusively intended for sharpening circular blade in the range of **Ø** 100 mm to **Ø** 350 mm. The directed includes also reading this operation manual, as well as keeping all containing directions of use - especially the safety information.

For all personal- and material damages, arising by not intended use, not the manufacturer, but the user of the RMS-NC is responsible!



2. STRUCTURE





3. TECHNICAL DATA

Dimensions

Lengh:	700 mm
Depth:	900 mm
Height:	1540 mm
Weight net:	Automatic 180 Kg
Clamping range / Basic:	Ø 100 mm to Ø 400 mm
Grinding wheel:	Ø 125x32x20x5x30 mm
Noise emission:	<70 dB(A)
Spacer rings:	20x22, 20x30, 20x32, 20x40, 20x30 with face

Electronical Data

Drive of grinding spindle:

Motor:	1~ 230V / 50 Hz
Motor speed:	2770 RPM
Power:	0,37 KW
IP code:	IP 55

Flow time of the mounted grinding wheel approx. 10 sec.

Coolant pump:

Motor:		1~ 230V / 50 Hz
Power	Step 1:	0,028 KW
	Step 2:	0,045 KW
	Step 3:	0,063 KW
IP code:	-	IP 65
Delivery ra	ate:	16-35 l/min

Technical changes may be done without notification



4. OPERATION 4.1 CLAMPING OF THE CIRCULAR KNIFE

Center the circular knife with the appropriate spacer ring on the fixation flange. Now fix the circular knife with the supplied pressure disk and the fixation nut on the fixation flange (see Picture).

When fixing or loosing the fixation nut, keep pressed down the shaft locking mechanism. Turn the shaft by using the supplied spannern wrench till the shaft locking snaps in.

!!! Pay attention when fixing or loosing, risk of injury **!!!**



Then place the lynette on the backside of the circular knife. Align the lynette in the way that it's turning softly on the cutting edge of the knife (e. g. align circular knife **10**°, lynette to **15**°). Depending on the type of your circular knife, you can change the angle of the lynette head correspondingly. The lynette acts as support for the circular knife and gives the knife a burr-free shape.

Place on the backside of the cutting edge



Adjustment of angle value



4.2 ALIGNMENT OF THE CIRCULAR KNIFE

After loosening the star knob screw (1) you can now adjust the grinding angle.



Hand lever for adjustment of the grinding motor

Star knob screw for fixation of the grinding angle

After you have adjusted the cutting angle, now open the star knob screw (2) and move the column to the position, where the cutting edge of the circular knife is inside the grinding range.





5. OPERATION OF THE CONTROL UNIT



Digital jogwheel

Press the green on switch to start up the machine. The display is activated automatically.



6. EXPLANATION OF THE DISPLAY



Important information - please read III7. basics regrading grinding

Please keep in mind, that grinding basicly is a form of soft treatment. For getting optimal results, please pay attention to some elementary rules.

Physically grinding is a interaction between material of the workpiece, the suitable abrasive, binding of the abrasive, grit size, cooling liquid and finally the well matched feeding size as well as halt- and grinding cycles without feeding.

For achieving perfect precision it is basicly considered using small feeding sizes (4 μ), halt cycles of minimum 15 to 30 seconds at a speed of 10 to 20 RPM, cooling liquied directed to the circular knife.

It is absolutely recommended to focus your attention to grinding cycles with no feeding. This timespan should last a long until you hear no more noise from the grinding wheel. This grants that the complete feeding size has been worked off.

Surely grinding also means scrub treatment, but this is which it's parameters quite sobering for a amatuer in grinding. Scrubbing means very coarse grit, open bonding of the grinding wheel, feeding of max. 12μ , halt periods of min. 10 - 30 seconds, at knife rotation of 15 - 25 RPM and a lot of cooling liquid.

As mentioned above, these parameters are only a rough guidline which grants that chooses parameters can be processed by the machine. Finally, factors as grinding medium and material has to be considered and specially selected for each application.

Material: HSS, high-grade steel hardened, hardened steel, etc. can successfully sharpened with a corundum or CBN grinding wheel. By use of resinoid bond abrasive material, the cooling liquid should have min. 10% oil content, as this abrasive bond produces a sonsiderable rubbing on the workpiece causing more heat.

Material: Carbide steel glas, ceramics can be sharpened successfully by a diamond wheel. As written before, a adequate oil content has to be considered.



8. STANDARD VALUES FOR THE SHARPENING PROGRAMM

Scrub treatment

Material:	Carbide
Abrasiv:	Diamond
Grit size:	D 252
Feeding:	8-12
Halt time:	16 sec
Spark time:	80 sec
Knife speed:	20
Spark time. Knife speed: Cooling liquid:	20 Emulsion 10-15 %

Finishing treatment

Material: Abrasiv: Grit size: Feeding: Halt time: Spark time: Knife speed: Cooling liquid:

Carbide Diamond D 76 4 25 sec 120 sec - 150 sec 12 Emulsion 10-15 %

Scrub treatment

Material:	High grade steel
Abrasiv:	CBN
Grit size:	B 252
Feeding:	8
Halt time:	20 sec
Spark time:	100 sec
Knife speed:	18
Cooling liquid:	Emulsion 10-15 %

Finishing treatment

Material: High grade steel Abrasive: CBN Grit size: B 76 Feeding: 4 Halt time: 25 sec Spark time: 120 sec - 150 sec Knife speed: 12 Emulsion 10-15 % Cooling liquid:

Scrub treatment

Material:	HSS; hardened steel
Abrasive:	CBN
Grit size:	B 252
Feeding:	8
Halt time:	20 sec
Spark time:	90 sec
Knife speed:	22
Cooling liquid:	Emulsion 10-15 %

Finishing treatment

Aaterial: Abrasive: Grit size: Feeding: Halt time: Spark time: Knife speed:	HSS; hardened steel CBN B 76 4 25 sec - 30 sec 120 sec - 180 sec 10 Emulsion 10-15 %
Cooling liquid:	Emulsion 10-15 %

The values listed are our recommended guidelines.



9. REFERING OF THE MACHINE



By pressing the reference point button, the machine is refering automatically.

9.1 INPUT OF SETTING VALUES







In menu 2, you can enter the halt steps and the sparking time.

Halt time (Feeding - halt - feeding) (min. 10 sec. / max. 300 sec.)

Sparking time (min. 30 sec. / max. 300 sec.)

During halt time, feeding is stopped to reduce pressure on the knife. After end of feeding operation the machine runs till end of sparking time and then stops.

In menu 3 you can enter the value for drive backwards and cooling on/off.



Drive backwards value

Cooling on/off

Drive backwards value means, you can determine how far the machine should move back at the end of the program.

In menu 4 you can enter the values of the engine speed and the sparking time during the grinding operation.

RPM during grinding

RPM during sparking time

By pressing the arrow key on the right you will return to main menu.





10. SAMPLING OF CIRCULAR KNIFE



By turning the digital jogwheel you can move in direction of the circular knife. Just before the grinding wheel touches the circular knife, you can switch on the motors of the grinding wheel and circular knife. Now move very carefully towards the knife. When they come in contact, then confirm the position by pressing the **OK** button. Now the sampling position by pressing will be taken over and saved. Move back a little distance and activate the automatic mode.

!!! Attention !!!

In the manual mode, motor of grinding wheel and circular knife can be started without shuting safety hood!



11. STARTING



By pressing the **start button**, the machine starts grinding the circular knife. By pressing the **stop button**, the grinding procedure will be interrupted.

At the end of the sharpening operation you have the possibility to sharpen the circular knife again without a new sampling. Therefore press the zero point offset button and the safed value from the first operation will be added.





12. CHANGE OF THE GRINDING WHEEL

First unplug from electric current!

Imperatively also remove the circular knife before!



Unscrew the allen screw M6 with the supplied allen wrench SW 5.

Screw in the lifting screw M8 for lifting the grinding wheel support with the grinding wheel.

Place the new grinding wheel on the motor shaft and pay attention that the driving pin of the grinding wheel support is placed in the groove of the motor shaft.

Now tighten the grinding wheel support with the allen wrench.



13. DESCRIPTION ON THE COOLING UNIT



Before the first start, please vent the cooling liquid pump! Please fill up the tank to the top level of the pump Electric plug for cooling unit (on the back of the cabinet)



Important information regarding cooling liquid:

Only use water-soluble emulsions on mineral oil base. By use of synthetic products, the painting and plastic parts can be damaged. We will not accept any responsibility for these damaged.

When proving the cooling liquids, pay attention to the directives of the manufacturer.

Please pay attention to the current waist disposal regulations.



14. CHANGE OF THE SUPPORT FOR THE CIRCULAR KNIFE



Allen screw

For changing the support, loosen with the supplied allen wrench SW 5 the allen screw M6. Srew in the provided allen screw M8 and lift the support from the cone.

15. CHANGE BATTERY ON THE PLC



Pleae check every 3 months the battery indicator "Batt" When the LED turns red, you have to change the battery.

Indicator "Batt"

For changing, pull off the plug connectors from the PLC completely.

Now you can open the battery compartment and change the battery.

After the change, remount the plug connectors.

16. WIRING DIAGRAM

The wiring diagram is placed in inside the control cabinet behind the door.



17. MOTOR CIRCUIT BREAKER

In case this sign appears, the built-in motor circuit breaker has triggerd. The motor turned too hot and due to this fact, has switched off. In the automatic mode, the machine moves back orderly and switches off after that.



Normal mode



Triggerd motor circuit breaker



Before you can re-activate the motor circuit breaker (by pushing the Start button), the bi-metal has to cool down. This can last some minutes.

18. Frequency converter (optional)

With the frequency converter you can steppless regulate the rotation speed of the grinding wheel from min.10m/s to max. 40m/s.

In case the frequency converter has been factory set, it is also the motor circuit breaker. When the circuit breaker has triggered, push the "reset" button on the frequency converter.

Please pay attention to the max. permitted rotation of your grinding wheel.

Frequency converter	
Desethutter	
Reset button	
Stepless regulation	



19. MAINTENANCE

The circular knife sharpening machine RMS-NC should be cleaned occasionally from grinding dust with a soft brush. Persisant dirt, please clean with a usual in trade machine cleaner. Occasionally check the electric cable and plug for damage.

20. CLEANING AND GREASING

For granting full functionality of the circular knife sharpening machine RMS-NC, the circular knife sharpening machine should be cleaned periodiacally from grinding dust with a soft brush. Persisant dirt, please clean with a usual in trade machine cleaner Occasionally check the electric cable and plug for damage. For preventing corrosion, provide blank and blue steel parts with a slight film of oil.

! Important ! The protective cover plates of the machine protect the guidances, spindles and switches below from dirt and cooling liquid. So when cleaning the machine with the cooling liquid gun, do not undermine these protective cover plates.

21. REPAIRS

Repairs on the machine can only be carried out in our company Kaindl or by persons authorized by us. The change of wear parts, as the diamond wheel, can be replaced by user.

The exchange of electronic parts may only be done by an electro engineer!

22. DISPOSAL OF THE MACHINE INSIDE EU

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



23. WARRANTY

The warranty is **12 months** from date of shipment and refers to a **one shift work**. For **Multi-shift work**, the warranty is **6 months** from date of shipment under condition of a appropriate use of the machine.

The guarantee includes the costs for replacing of defect parts and assembly groups, including the required working time. Replacement can also included repaired, used parts and assemblies.

Excluded from any guarantee are:

- Wear parts
- Transport damage
- Damage by improper use of the machine
- Damage by program parameter assignment
- Damage by use of force
- Damages and consequential damages caused by breach of the duty of taking care of the user
- damages caused by aggressive detergents as corrosive or caustic cleaning materials, solvents, etc. or aggressive cooling lubricants

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

Without information of year and number of machines, the processing of your warranty claim is not possible! Returns have to be authorized by us, before shipment. We reserve the right to charge you with the transportatopn cost if the return was not authorized.

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



24. SPARE PART LIST RMS-NC



- 1. Drive motor of grinding wheel
- 2. Coolant pipe with gate valve
- 3. Grinding wheel protection
- 4. Grinding wheel
- 5. Grinding wheel support
- 6. Support for circular knife
- 7. Lynette bearing
- 8. Lynette support

- 9. Drive motor for circular knife
- 10. Drive motor for feeding
- 11. Complete feeding unit
- 12. Collar adjustable
- 13. Star knob screw for fixation
- 14. Star knob screw with bolt
- 15. Cover plate feeding unit
- 16. Cover sheet