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01/21

Manual Spirator-3,5 (Spi-3,5)

For grinding, polishing, washing, deburring, derusting, matting, mixing, colouring and plating of objects/materials of various types and from small to around 9cm large, e.g. items of jewellery, byouterie pieces, stamped items, stones (precious or non-precious as well as those from collectors such as rolled river rocks, amber etc.). Furthermore, pieces of glass, ceramic, wood (colouring), rubber (coating with talcum), plastic (deburring) etc.

The correct operation of the machine is very important in order to achieve the best possible results in a reasonable period. Please take enough time to read these operating instructions carefully from start to finish. (Possibly note the points that are important to you with a red pen). The following document particularly goes over the preparation of stones = from precious stones to already naturally rolled "pebbles".

The container of the H+B 3.5 litre tumbler is made of a special rubber, and is suitable for many different grinding and polishing powders, soap etc. If you are working with sharp pure soaps etc. then please send us an enquiry in writing. This container has a work capacity of 3,5 Litre for max. 4,5 kg stones. When filled it has a volume of 73 db, if you stay near the machine. One metre in between it has 65 db ...

This machine functions through vibration. Quiet and fast. Each filled part to be processed is constantly moving.

This machine can be connected to 220/230Volt 50Hz alternating current (= usually the normal household grid). Only ever lift the machine using the bottom. Not the pot! And only when it is not connected to the power grid.

The working process is controlled or optimised with our grinding and polishing materials (powder, pressed abrasives, steel polishing scourer, polishing soap etc. see catalogue) or other additions that can be very different for the various branches.

PLACING THE MACHINE CORRECTLY:

Look for a dry, clean, well ventilated, stable and flat space for this machine. A somewhat rough, non-slip surface would be ideal to avoid any possible "wandering" of the machine. If it is to stand elevated (e.g. on a table) then, for reasons of safety, you should put four blocks on the planned surface around the feet of the machine, in order to avoid any possible wandering of the machine.

Very important to read:

PUT ON AND MOUNT THE CONTAINER CORRECTLY (important periodically):

First of all, note the information about the container at the end of this manual. Last paragraph.

If you need to remove the container first unscrew the plastic lock button (rubber nut) at the top of the container lid by turning it counter-clockwise. Now remove the lid. Use e.g. a screwdriver or a blunt knife for assistance. Unscrew the M8 nut which sits on the threaded rod. To get started you can use a wrench (size SW13mm) to help you, and then continue turning by hand (in a counter-clockwise direction). Now remove the U disk (washer). Then you can lift the container off.

Look carefully at the exterior of the container floor: You can see four depressions. Then lift the now visible black rubber mat up (important: This mat must always lie between the screw head and the container): Here you will discover 4 screw heads. Here one thing is very important: The depressions in the floor of the container are intended for these screw heads. When you put the container back on make sure that these depressions (notches) fit or are placed exactly on the screw heads when the container is fitted again. After the replacement of the container, again place the U disk over the threaded rod on the container and screw on the M8 nut. First tighten it by hand and afterwards with a wrench (size SW13mm) for 1.5 more rotations. (Don't tighten it so much that the nut won't be able to come off again, but also not so lose that the container wanders around. If the container does wander then tighten the nut a little more.) After filling you can put the lid on. For this please ensure that it sits in the correct depression (see last paragraph of the instructions).

OPERATION: WASHING, GRINDING AND POLISHING OF THE STONES.

We work the stones with silicon carbide (abbreviated to SiC) grinding powder with the grit sizes 80, 220, 400 or 800 and with our well-known polishing powder **X-3** (which is suitable for *almost* all stones). Talk to us. We are happy to let you know the right polishing powder for your stones.

We will mention the SiC abrasives later (= in the form of pressed powder) as well as a special granulate as an addition for soft objects.

1) The stones: It is recommended to fill with stones of differing sizes. The more small stones are included (even those which are only the size of a small fingernail), the more friction surfaces you have, and in addition to this they can easily reach into any concave surfaces on the other stones. It is also possible, instead of these small stones to fill with our so-called abrasives (pellets from around 1-2 cm size), which reach any uneven parts of the objects to be ground particularly well due to their shape!

If you ever want to fill with large stones then it is better to only add 3 pieces (of a maximum length of 7 or 8 cm) into a mixture of many small stones. During running always pay attention to the completely free and vigorous movement and circulation in the container! The larger stones should not (mutually) block themselves.

(If you insert already rolled/rounded stones then by all means a length of 8 to 9 cm and up to around 5cm thickness is possible). However you should observe the effect in the running machine over a longer period of time, and precisely at the start you should check a lot/more often, react/make changes if necessary, make notes and find out/establish what the best working method is for you.

2) Before you fill in your stone pieces they must be washed. The new container on the new machine can this time remain mounted on the machine because it is clean. (To be safe however, check with a wrench / spanner of size SW13 (= for M8) that the six edged nut on the inner container cone (= under the container lid) is really screwed on tightly. If you do this then you will at the same time get a feeling for "how tight" this nut should be.) The container must simply be made damp inside. (Easy to do with a flower sprayer or sponge. Only with water. Don't mix anything else in. No amount of water should collect in the bottom of the container! Just make the whole inner wall and cone wet, finished.

3) The filling of the container occurs as follows:

The container is wet inside (only with water). Fill the wet washed stones into the container. (If possible stones of around the same hardness - if this is not known then note this later "yourself" through regular observation. If certain stones decrease in size too quickly then remove these early and keep them for later subsequent working with the next finer grit size). Fill the container to at least half the height of the inner container cone (= heightened part, in the middle of the container), or even better higher (creates pressure) until just under the middle cone top surface. It always depends on which stone size you are filling with. The rule is always: As full as possible (not so little that the stones just wander around; there have to be enough stones that they are circulated: Fall inward from the outer wall) ... and ... however, later, when running, no stones should be disruptively pressed inside against the cover plate and knock (hinders the circulation). Important for good movement is also a good mixture of stone sizes (large, middle, small). Good movement ensures good grinding.

Positioning and fixing the lid:

Once the lid is properly seated in the container, place the rubber washer on top, followed by the metal washer, and finally secure everything with the star nut. Do not overtighten, but ensure it is not so loose that it comes undone and allows the lid to rotate! Please also note the information regarding the container at the very bottom of these instructions.

The following information is intended for a maximum filling of the 3.5 litre tumbler container with raw stones.

4 a) FIRST GRINDING = 1st day (first 12 hour course in 80 grit)

a) Sprinkle 30 ml of SiC grit 80 with the measuring cup, or a lightly heaped tablespoon, over the wet stones in the (internally) wet container. Put the container lid on.

Put the machine plug in the power point with dry hands and turn ON the machine at the switch. This course should be for the first 12 hours.

Before you move away, observe for a short time whether everything is running properly: Lively movement of all stones and a circulation from outside to inside. The container itself must sit snugly on the machine and must never independently turn on the machine.

(If this ever does happen then the nut on the inner container cone, under the lid, is loose and must immediately be properly tightened when the machine is not moving.

Check again **after 2 to 3 hours**. Now all stones should be covered with a thin layer of grinding sludge. If the grinding sludge is a little too thick then carefully, with a not moving machine, spray or drip on a little water. Close the lid again, turn the machine on and observe whether the sludge now slowly becomes thinner and whether the stones move better. If not then repeat this process again. If however you find (now or later) that the stones come up without grinding sludge, so "blank", then you have too much water in the container. This is at the bottom of the container and washes the (too thin) grinding sludge off the stones so that it lies useless at the bottom of the container. You have to get rid of this excess of water, of moisture! How? You can leave the container open for a while when the machine is turned off to evaporate or: Take the machine plug out of the power point, unscrew the container and try to pour a little water into a cup. Then properly mount the container on the machine again, turn it on and observe whether after a little time the correct amount of grinding sludge is on all the stones. If it is still too thin then sprinkle a little powder. Naturally continue to check periodically: Lively movement and circulation of all stones, well fixed container and that no strange noises can be heard. It can happen that stones tick/knock inside on the underside of the lid. If this only happens every now and again and it doesn't bother you then it is OK and you don't need to do anything. However if it constantly knocks then it means that too many stones have been filled. The circulation cannot freely occur and a couple of stones must be taken out.

4 b) After the total 12 hour first course check again. Most likely you will find that the stones are no longer circulating/vibrating as intensively/actively. This occurs due to evaporation of the water in the container and some stone wear. Thus more water must be added. Turn the machine off, open the lid and sprinkle a little water with the measuring cup. Try it with 15 to 20 ml. If required repeat again but this time add a little less water. Maybe only 10 ml. Put the lid on again and tighten the plastic nut.

After around 20 minutes check if the grinding sludge is already "thin" (i.e. the stones are moving actively) and all stones are coated with grinding sludge. Now the SECOND 12 HOUR PERIOD OF THE FIRST DAY is running. Still in the old powder grit size 80. After these 12 hours comes the ...

4 c) SECOND DAY with its first 12 HOUR PERIOD with the same, but fresh, grinding grit Cleaning etc.: Turn OFF the machine with dry hands and pull the schuko plug out of the power point. Take off the container. (= unscrew rubber nut, take off the lid, release the M8 nut on the container cone with a wrench (size SW 13) and unscrew it, remove the container. Carefully pour out the entire container contents into a sieve, which should be standing in a collecting tub. Wash out the inside of the container and pour it out over the stones in the sieve. This does not need to be “thorough” as we are going to use the same grit size 80 again.

Rinse the stones in the sieve, look closely at the surface of some of the stones to learn what the daily progress looks like (then you will notice that at some stage no further progress is made with the same grit powder and you should thus move on to a finer powder) and put wet stones in the (internally) wet container. Wash and dry your hands, mount the filled container on the machine etc. ... and then only right at the end, with dry hands, stick the plug into the power point and turn on the machine.

5) BETWEEN EVERY GRIT CHANGE (so from e.g. 80 to 220 etc.) it is recommended to, after the washing (as described in 4c - but this time thoroughly!) to carry out an additional washing cycle of around 20 minutes in the tumbler. This process operates like grinding: Container wet inside, stones wet and already sprinkle about 30 ml of the planned finer grit and let this run for one hour in the machine. Then pour out, carefully wash everything again and brush out the inside of the container again. (This intensive cleaning work can be avoided by purchasing an extra container per grinding and polishing grit.)

6) CONTINUE WITH FINER POWDER Fill the carefully washed container with the clean stones. Mount the container (or perhaps you have already mounted the empty container on the machine and then filled in the stones). Sprinkle on 30 ml of powder, put on the lid, screw on the rubber nut and tighten it well by hand. Connect the machine to the power network with the schuko plug; push the plug into the power point with dry hands. Turn the switch on the machine ON, monitor the operation for a short time. After 2-3 hours once again check that everything is functioning correctly. Lively movement/circulation of all stones, grinding sludge always visible on all stones and listen for any conspicuous (additional) noises. (E.g. stones that are constantly knocking on the lid or that the lid is not attached well enough). Now the **FIRST 12 HOUR PERIOD with a FINER GRIT IS RUNNING**. Check after this 12 hour period. If the grinding sludge is too thick sprinkle a couple ml of water etc. etc.

The **SECOND 12 HOUR PERIOD** can now run ... (see also 4b, 4c).

Continue in this way until one day you can no longer see any general improvement on the stone surface. Time to **CHANGE TO AN EVEN FINER GRIT** e.g. from 220 to 400. Later from 400 to 800.

Through **DAILY CHECKING** of the dry stone **SURFACE** you will soon gain a little experience with assessment of when it no longer gets better or will get better with “this” grit size (80, 220, 400 or 800).

7) THE LAST PROCESS is the POLISHING For this a separate container “only for polishing” is truly advisable! If not (yet) available, once again clean the container and stones **VERY CAREFULLY**. (See 4c and 5)

The best polishing powder in the tumbler is, as we always hear, our well-known **X-3**. Here also the same sequence:

Fill the clean, wet stones into the clean, internally wet container

Sprinkle 30 ml of our **X-3** ... etc. (X-3 is our well-known polishing powder which is suitable for almost all stones.

Other available polishing powders (for special stone types) are: Titanium and ceroxide

let run for 12 hours

check and if the sludge is too thick thin it with water

let it run for 12 more hours

Check stones. Polish already achieved? If not then continue as before and check every hour or every half hour, as normally the polish can be achieved in one day.

* * * * *

If you are WORKING WITH ALREADY ROUNDED, ROLLED STONES, such as those out of a river bed, from some stone beaches or a gravel pit, then the overall process will be much shorter: You will already have high gloss results in 7 to 8 days. In this case **ONLY** fill with these rounded stones (after thorough washing) - don't add any raw, angular stones.

Reports from experienced “grinders” (amongst them many women) and the results that they have shown us are impressive.

Therefore we can recommend you the following working method:

3 day with SiC 80

3 to 4 days with SiC 800

1 to 2 days with X-3 polishing powder

With these, as with precious stones, there are sometimes a couple of stone types that don't polish well in the machine. These are particularly soft. You can sort these out, store them until enough of this type are collected and then experiment “only with these stones”, i.e. you try this with an additional “special granulate” (available from us) that avoids the direct rubbing together of the stones.

See the subsequent description for **SOFT STONES**. You can also try to polish individual stones by hand with a felt (our “Politex”) with X-3 polishing powder.

If that doesn't succeed there is also the possibility of trying it with different polishing powders (such as e.g. ceroxide or tin oxide) in our powder range (on respectively new/fresh Politex polishing underlays). This also applies for jagged, raw stones.

Many STONES WITH A FACE

If (small) serrated sheets (e.g. for pendants) or other objects with a face are filled then there is a danger that these stone faces could “suck on/stick” to one another or small slices stick to the container wall. In order to avoid this enough small, already well ground or polished stones should be filled in with them (ratio of slices: Addition 1:1) so that a couple of these stones always “have to” sit between these stones. If you don't have any such small and flat stones then we recommend you

our abrasive FINE. Here it is advisable to check it already after 1 hour instead of 2-3 hours ... and ... instead of the 12 hour course only carrying out 6 hour courses. Here you can also advance faster because the cut surfaces are (should be) already finer compared to "raw" uncut stones.

WORKING WITH AMBER (not a stone but actually fossilised resin) is different again. It is difficult to polish. Because this material is so light we recommend that you, in addition to the (only) amber filling and grinding or polishing powder, only fill with small flat stones or, if these are not available, with our abrasives in a ratio of amber: Abrasives 1: 1 in order to achieve PRESSURE.

If you are working with RAW STONES (raw PRECIOUS STONES) then you can pre-form these faster, possibly WITH A "PERSONAL FORM GRINDER" or "ORIGINAL", most simply on a small grinding machine (e.g. the H+B machine of type SLB4-15/20) (or simple somewhat "bump and even out" the raw surfaces, edges and points) and then further work them in the tumbler. In this way you can finish a "pile" of beautiful ornamental stones and can then stick on a "cap with an eyelet" and ... the pendant is finished.

The WORKING OF JEWELLERY ITEMS. Whether chains or used items of jewellery... to freshen them up / polish them ... or ... Deburring cast/lasered/cut items is all possible in the tumbler. Deburring can be done, depending on the condition, with a rough or medium abrasive. Fine grinding, polishing, e.g. with fine abrasives or with steel polishing mix with addition of extra IRPS (intensive cleaning and polishing soap).

SOFT STONES are difficult and hardly or sometimes not able to be polished in the tumbler. The grinding is possible, but with monitoring at short intervals because the material quickly reduces in size. For the polishing attempt patience and imagination are needed.

As an addition we recommend our "special granulate" so that the stones/objects don't touch each other. Use a standard package of e.g. 1.5 kg, which you generously distribute (ratio granulate: Stones e.g. 1:1 or even 2:1). For this you naturally have to halve the already ground parts and work/add them further in two separate lots.

You can apply these in the fine grinding process and then also in the polishing process. (You can use the already used granulate again but naturally ONLY with the same grit size as it already ran with. Don't use the same granulate for different grit mixtures! Therefore after use store the granulate in its bag or in a container reserved for it, with clear marking of the associated grit, e.g. SiC800 or X-3, Titanium... Don't seal the bag or box/container air tightly due to risk of mould. You can try out the function "FINE grinding with granulate" and "polishing with X3 or titanium and granulate" in various ways such e.g. ... dry, damp or wet. After successes with "problem stones" you are welcome to let us know.

Note your experiences. Good ones and less good ones. These can be useful for you later on. Collect your experiences.

USE OF THE ABRASIVES and ADDITIVES

In the course of time you are welcome to vary the powder types / amounts and grinding duration etc. at your discretion, i.e. experimenting in order to achieve better or faster results can be very successful.

The water amounts added are always dependant on the amount and the size of the stones added and any additional abrasives. Many small parts create more surface to be dampened ... than ... less and larger stones. Therefore here also experience will guide you.

MAINTENANCE: Always keep your machine and its surroundings clean. Once a month check (with the machine turned OFF and the plug pulled out of the power point), with lifted container and removed rubber washer, that the M8 nut on the threaded rod (directly on top of the top of the machine) is firm. For this use a wrench of the size SW13. (Hold the upper part of the machine tightly and with the other hand turn the M8 nut clockwise tightly with the wrench, i.e. you are trying to tighten this as it is highly probable that it will never release itself.

(If at any stage later this nut has released a little and you can't tighten it, i.e. it can always be turned further clockwise then you should not use the machine anymore. This means that it is only able to be set if the lock nut under the steel plate, so in the housing, is "held". This should only be done by a specialist.) If your rubber washer is worn you can get a new rubber washer.

POWDER DISPOSAL: The small amounts of powder and stone dust that you sometimes have left over (every 24 hours) is hardly worth keeping for re-use. Therefore we recommend that you store this, e.g. in a (cut open) milk carton and at some stage when enough has been collected and the water has evaporated or been poured out you can dispose of it (in Germany: household waste). If the use differs from the above, the the appropriate code is selected by the user (Regulations of the respective countries).

Disposal: The machine is durable. If the engine is defective, it is detached from the machine and replaced. Otherwise, it belongs to the disposal of electrical appliances.

The rubber container for Spirator-3,5

If the container has blemishes /outside/inside or on the edge), it does not affect its function and durability. This is unavoidable when producing a rubber container. They are optical in nature and do not interfere with function.

It can happen that the container-3.5, during transport, by lateral pressure, is slightly deformed, so no longer looks really round. This is easy to fix as follows:

Place the container in a warm room for a few hours or a day (do not try to heat the container differently) so that it can be brought back to its original round shape a little softer and therefore easier. Then insert the lid and leave it in for a period of time.

It may be that new lids from us (on both sides) are protected against scratches by a film. Peel off this foil (possibly with the help of a tape piece, which you attach to the edge. Hold the protruding Tesa part and pull it off with a jerk upwards).

Place the Plexi lid in the container. This may seem "impossible" with slightly deformed containers, but please proceed as follows (do the same with a nicely round-looking container, but where you do not get the lid in so easily and think that it would be too big):

Place the container on a table and place the lid on top, with one side (obliquely) in the intended container edge.

With one hand, push the lid down where it was inserted. With the other hand, take the flat stem of an (old) teaspoon and place it exactly under the lid where it does not want to sag into its intended container edge.

Inexorably keep the pressure (on the lid) down with one hand. Meanwhile, guide/slide the dipperstick through the edge of the container. The lid will, due to its vigorously applied pressure, follow the spoon handle piece by piece downwards (into the edge of the container). Once you have driven around completely, the lid is in the edge.

If the lid is seated, i.e. completely locked into the edge of the container, leave it (in a warm environment) so that the container regains its round shape and the lid then fits in appropriately.

Warning: Do not use sharp objects (e.g. knives, screwdrivers, etc.) that could injure you.

Once the lid is properly seated in the container, place the rubber washer on top, followed by the metal washer, and finally secure everything with the star nut. Do not overtighten, but ensure it is not so loose that it comes undone and allows the lid to rotate.

Warnings:

- Read the operating instructions carefully and observe all safety instructions! Check that the information on the label matches your power supply. The machine / equipment must not be exposed to the weather or stand in a damp room and must not stand/run with flammable liquids or gases.
- Do not place the machine and cable on heat sources (e.g. stove, heater).
- Unplug the power outlet when the machine is not in use
- if the machine "moves", please check, with the machine switched off and the plug pulled out, whether the threaded rod is firmly seated on the upper part of the machine (see note under "Care!") and whether the container with its lower 4 recesses has been correctly placed over the 4 screw heads.
- Very important: The container must be firmly screwed for the operation and must never rotate on the machine!
- If it smells burnt, immediately turn OFF the machine and unplug it from the socket. Determine if the smell comes from this machine or if it is due to the socket. Have it checked by a specialist (electrician).
- Do not use multiple sockets.
- Do not use extension cables.
- Plug into grounded socket only.
- Only pull the plug out of the socket with dry hands or plug the plug into the socket!
- Do not pull the machine on the cable.
- Do not use the machine if the power cord or plug is damaged, the machine is not working properly, has fallen or is otherwise damaged.
- We recommend a DI personal protection adapter plug, which switches off the current in fractions of milliseconds in the event of a short circuit, for example.
- Keep the machine clean. Do not clean the machine in a water bath.
- When cleaning the container, remove the container.
- Never try to open/remove the lid while the machine is running.
- In the presence of children, always keep children under supervision.
- Use the machine out of the reach of pets.
- Do not run the machine in a closed cabinet/box. Don't put anything over it.
- Do not place the machine in a tub/box.
- The engine needs cooling and the upper part of the machine must be able to vibrate freely.
- Do not move or carry back and forth while running.
- Place the machine only on a straight, solid floor or table.
- In case of unknown / disturbing noises that you cannot assign: Switch off the machine and use it again only after clarification.
- Use only suitable tools and do not make do with unsuitable or sharp aids. These could cause accidents or injuries.

We wish you a lot of pleasure. H+B Team

Certificate of Conformity



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Germany

Grinding-/Polishingmaschine Spirator-3,5 Spi - 3,5

AC 230V, 50Hz, 55 Watts, Shaded-pole motor, 2600 rpm,

65 db when filled with 4,5kg (semi-) precious stones.

Max. payload 4,5kg

**The machine is herewith declared to conform with the following guidelines
Machine guidelines 2006/42/EU**

Measured value of the protective resistance - 0,1 Ohm (limit value 0,3 Ohm)

Kirschweiler, 2018

Kitty Homberg, Owner

A handwritten signature in blue ink, appearing to read 'Kitty Homberg'.