

# *Guide to adapting* **Klemsan®** *KLM-PS Engraver*



**Plotter KLM-PS (A4)**  
half size



**Plotter KLM-PS (A3)**  
full size



**Engraver Controller**



**Vacuum Cleaner**

## Guide to adapting the KLM-PS Engraver at the KLM - Plotter System

### Content

1. Adaptation KLM-PS Engraver.....	3
2. Scope of supply.....	4
3. Connection and assembly of the Engraver to the KLM-PS.....	6
3.1 Assembly of the support arm for cable and hose .....	6
3.2 Disassembly of the Pen-holder from the KLM-PS.....	6
3.3 Installing the Engraving head .....	7
3.4 Arrange Vacuum Cleaner and Controller.....	7
3.5 Connecting the cables.....	8
3.6 Installing the Engraving spindle into the Engraving head .....	8
3.7 Alignment of the Engraving unit .....	8
3.8 Connections at the Engraving head .....	9
3.9 Placing the cover on the Engraving head .....	9
3.10 Test run.....	9
3.11 Placement of the Engraving material.....	9
3.12 Buttons and indications of the Controller .....	9
4. Adjustment of the Engraving depth.....	10
5. Changing the Engraving needle .....	11
6. Vacuum cleaner Bag and Filter change.....	12
6.1 Changing the Vacuum cleaner bag .....	12
6.2 Changing or cleaning of Motor dust-filter .....	12
7. Instructions for cleaning the Engraving spindle .....	12
8. Troubleshooting.....	13
9. Accessories.....	14
10. Technical data.....	15
11. General Safety Rules.....	16
11.1 Tool Safety Instructions .....	17

## ■ 1. Adaptation KLM-PS Engraver

The engraving unit was specifically designed for getting adapted to the KLM-PS, other plotters will not be able to carry the unit.

The main purpose of the engraving unit is the engraving of plastic signs.

Respective double sided material is available through local suppliers. As an alternative, pre-cut plastic material in different sizes is available through us, please refer to accessories.

With the use of other materials like aluminum, brass, stainless steel and glass we will not accept any warranty claim.

The use of lubrication and cooling fluid is not suggested at all, as the vacuum cleaner cannot handle any fluid.

*Note:* Please use the engraving needles supplied with the system only. Any other brand will possibly lower the engraving result, as we will not accept any quality claim.



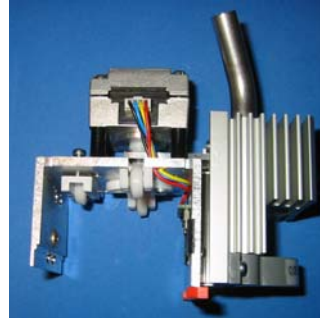
**Important Notice:** Please read the **General Safety Rules** carefully and follow them, as the manufacturer shall under no circumstances be liable for damage or any personal injury caused by not following the **Safety Rules and Instructions**.

## ■ 2. Scope of supply

1. Engraving spindle



2. Engraving head



3. Support bearing for engraving head



4. Connecting cable for Engraving spindle



5. Hose for Vacuum cleaner



6. Engraving head cover



7. Vario Engraving Controller



8. Connecting cable for Controller - KLM-PS



9. Power cord for Controller



## ■ Scope of supply

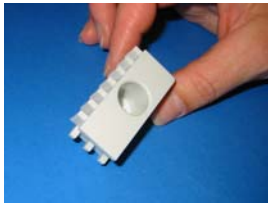
10. Vacuum cleaner



11. Connecting cable for Vacuum cleaner



12. Support bracket for holding pipe



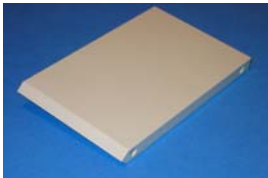
13. Holding Pipe



14. Support arm for holding hose and cable



15. Calibration plate for alignment



16. Tool for adjusting engraving needle



17. Engraving needle .5 mm 15°



18. Tool for adjusting engraving head



## 3. Connection and assembly of the Engraver to the KLM-PS

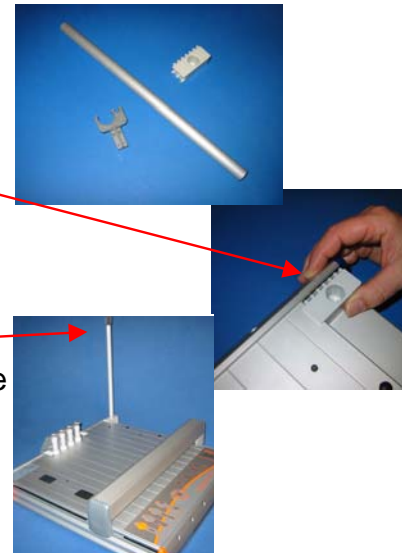
The connection and assembly of the engraving unit is easy to work through. The components need careful treatment in order to prevent any damage. The following describes the assembly process in detail.

### 3.1 Assembly of the support arm for cable and hose

Place the support bracket on top of the base plate as shown in the picture and push into the side of the plotter profile.

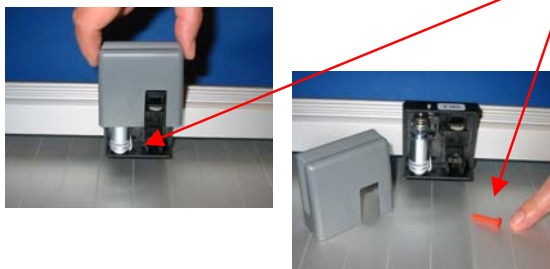
Insert the aluminum pipe into the support bracket

Place the support arm into the opposite side, holding the cable and hose.



### 3.2 Disassembly of the Pen-holder from the KLM-PS

Remove the plastic cover and the safety lock.



Slightly tilt the pen-holder and release from the holding bar by pulling up.



The unit can be very tight and fixed in the bar. Remove the pen-holder very carefully to prevent damaging the holding bar.

## 3.3 Installing the Engraving head

Please pay attention to inserting the engraving head on both sides. The holding bar must be parallel.

Press the engraving head down to its limit, support the holding bar manually from the bottom side in order to prevent damaging the holding bar.



Secure the engraving head.

In order to prevent any movement of the engraving head during the process, the safety lock needs to be closed by pushing the middle on both sides as shown.

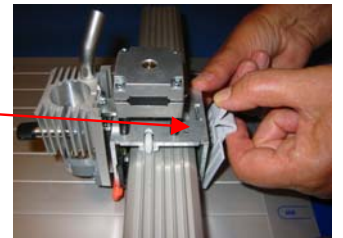


Double check the proper mounting.



Install the support bearing.

Place the support bearing as shown, snap in place.



Later the horizontal alignment of the engraving head will be done by using the tool.

## 3.4 Arrange Vacuum Cleaner and Controller

Arrange the units behind the KLM-PS, as shown.



## 3.5 Connecting the cables

■ Connect the Vacuum cleaner cable between the Vacuum cleaner and the Controller, tighten the plugs on each end.



■ Connect the Controller cable between the KLM-PS and the Controller, tighten the plugs on each end.



■ Connect the power cord to the Controller and the electrical outlet.



■ The main fuse (4 amp) is placed within the socket next to the On / Off switch.



## 3.6 Installing the Engraving spindle into the Engraving head

Insert the engraving spindle into the engraving head as shown and tighten the spindle with the clamp screw. The engraving spindle has a 0.5 mm engraving needle pre-installed from the factory. The red mark of the depth controller needs to be in line with the arrow of the engraving head.



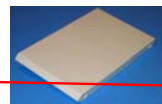
**Important:** Do not turn the depth controller in any direction as the precise alignment will not be possible.

 **Attention: Please read and follow the safety instructions for using.**



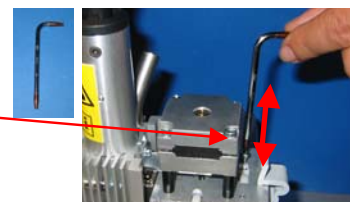
## 3.7 Alignment of the Engraving unit, only necessary for the first start up!

■ Place the calibration plate on the KLM-PS as shown.



■ Move the arm with the engraving head manually against the calibration plate, the KLM-PS must be turned off.

■ Align the engraving head vertically, turn the screw with the tool CW or CCW as shown.





## 3.8 Connections at the Engraving head

Manually move the arm with the engraving head to the lower right corner, the KLM-PS must be turned off. Connect the vacuum hose to the engraving head as shown and clip the hose into the support arm placed in the pipe with a slight bend. Connect the opposite end to the Vacuum cleaner.

The connection of the cable between the engraving spindle and the Controller is the same process.

Tighten all screws at the connection plugs.



## 3.9 Placing the cover on the Engraving head

Place the cover over the engraving head and push the cover down to the limit.



## 3.10 Test run

First turn on the power with the switch located at the back of the Controller.

Then turn on the KLM-PS and the engraving unit moves to its zero position alignment, noticeable with a short noise. Once aligned the KLM-PS arm will be in zero position alignments in z, x and y direction, turn off the KLM-PS thereafter.

## 3.11 Placement of the Engraving material

Place the support plate together with the engraving material on the KLM-PS Engraver as shown on the label. (place the label per instructions of support plate). Move the arm manually with the engraving head over the engraving material. The KLM-PS must be turned off.

**Important:** The distance between the lower end of the spindle and the engraving material must be 2 mm. If the distance is lower or higher re-check the alignment of the engraving unit with the calibration plate.

Now turn on the Controller and the KLM-PS in order to start the engraving unit.



## 3.12 Buttons and indications of the Controller

The power switch of the Controller is placed at the back, once switched on the green LED is lit. The Controller controls the Vacuum cleaner automatically. In case the Vacuum cleaner should be operated manually e.g. to clean the engraved material after the job is completed, use the ON and OFF button. The proper operation of the spindle is indicated with the yellow LED, any failure of the spindle will be indicated with the red LED and the engraving will be stopped.

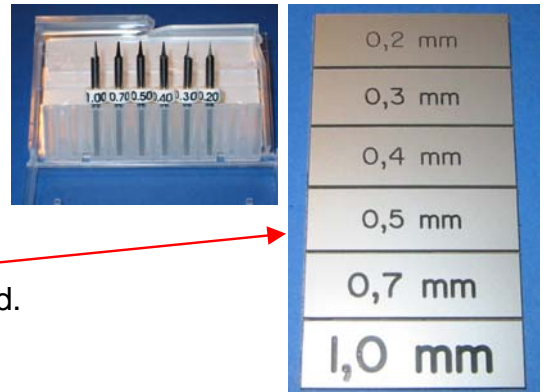


## 4. Adjustment of the Engraving depth

The engraving depth will be adjusted through the depth controller at the bottom of the engraving spindle. Depending on the size and the angle of the engraving needle as well as the engraving depth, certain engraving widths could be achieved. We suggest to engrave with the needle angle of 15 degrees for normal use.

The engraving needles are available in sizes of .2; .3; .4; .5; .7; 1.0 mm.

Special sizes are available on request.

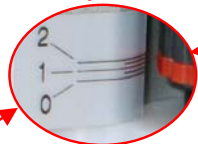


According to the samples shown, different results of the engraving can be achieved.

The adjustment of the engraving depth will be done by manually turning the depth controller.

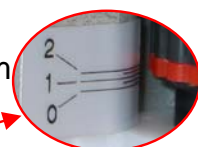
Each clock wise turn will increase the depth, each counter clock wise turn will reduce the depth. With the turn of the controller a notch is noticeable.

zero position



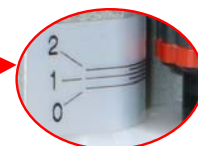
With each notch the engraving needle will change position of .025 mm in either direction. One complete turn counts 40 notches and equals to 1 mm in the change of depth of the engraving needle.

1 mm



The depth of the engraving can be checked at the scale on the left side of the spindle.

2 mm



**Attention: The point of the engraving needle is very sensitive and needs to be treated carefully. Prevent damaging the point, if damaged the engraving quality will be extremely limited.**

## 5. Changing the Engraving needle

In order to change the engraving needle, please follow the steps below:

Loosen the clamp screw at the engraving head and take out the spindle. The connecting cable can be left on.



Unscrew the depth controller of the engraving spindle completely.

**Attention: Engraving needle and spindle could be hot!**

Thereafter, the clamp holding the needle needs to be opened

by pressing the knob at the end of the spindle

towards the needle. Find the position with the lowest point and turn the knob

CCW, that opens the clamp and the engraving needle can be

pulled out carefully.



**Attention: Open the clamp only a few turns to pull out the engraving needle, open the clamp completely for cleaning purpose only.**

In order to insert the engraving needles with the correct length, use always the tool. Please use the engraving needles supplied by us only, with the use of other brands we will not be responsible for the lack of quality or any damage to the unit.



**Attention: The point of the engraving needle is very sensitive and needs to be treated carefully. Prevent damaging the point, if damaged the engraving quality will be extremely limited. Use always the tool for inserting the new needle.**

Insert and fix a new engraving needle within the tool and push the needle with the tool into the spindle.



Close the clamp by turning the knob CW, unscrew and remove the tool.



Screw the depth controller onto the spindle.

The controller has reached its zero position with a distance of approx. 3mm to the spindle. Use the tool as a distance check by holding the one side open washer between the depth controller and the spindle, as shown.



Insert the spindle into the engraving head by checking the position of the red mark of the depth controller, needs to be in line with the arrow at the engraving head. Tighten the spindle with the clamp screw.



## 6. Vacuum cleaner Bag and Filter change

The Vacuum cleaner was specifically designed for use with the KLM-PS Engraver in order to pickup the engraving dust directly at the spindle, stored in a bag.

### 6.1 Changing the Vacuum cleaner bag

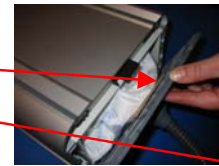
The Vacuum cleaner bags are standardized. Replacement bags are available through us or any retailer.

For changing the bag gently press up on the knob at the Vacuum cleaner and the front closure with the bag will open.

Before taking out the bag please remove the hose by slightly turning and pulling.

Remove the bag, insert and secure a new bag.

To close up the unit please reverse the above steps.



### 6.2 Changing or cleaning the Motor dust-filter

Once the front closure is open as described above, the internal motor dust-filter can be removed. You need to follow the housing of the bag and take out the filter with your hand. Depending on the number of engravings the filter needs to be cleaned from time to time, replacement filters are available through us only.



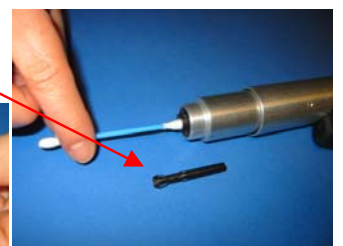
## 7. Instructions for cleaning the Engraving spindle

The engraving spindle is a very sensitive item and needs to be treated carefully. Use the spindle in low dust environments only. A high dust concentration at the work bench will cause clogging of the ball bearings and consequently the spindle can be off-centered.

Never use pressurized air for cleaning the spindle because of loosing the inside lubrication of the bearings. Never use any lubrication during the engraving process. Do not clean the spindle with water.

If any dust is collected within the clamp, possible reason for missing quality, take out the needle and unscrew the clamp completely by using the knob.

Clean the front part of the clamp saddle carefully using a Q-Tip as shown.



## 8. Troubleshooting

### Problem

The Engraving controller cannot be switched on. The **green** "Power"-LED is not on.

The **red** LED "spindle failure" at the Engraving controller is on.

**Attention: The engraving will be stopped immediately.**

Unable to engrave

The engraved result is poor, letterings are un-consistent, lines are not sharp

The engraving depth is not sufficient.

### Solution

Check the power cord, connected correctly and the mains supply is available at the outlet.

Next, check the AC input fuse at the backside of the Controller. Disconnect the cable at both ends and pull out the fuse holder, located beneath the power on/off switch, see page 8 chapter 3.5 of the manual.

The high RPM-spindle is either faulty or overloaded. To verify, hold down the **ON** and **OFF** button simultaneously at the Controller. The Vacuum cleaner starts to run, shortly after the engraving spindle. The RPM of the spindle can be altered using the **ON** or **OFF** button.

The spindle needs to be replaced if the **red** LED (error indication) is still on.

Check the connection cable between the Controller and the Plotter KLM-PS. Pay attention to the messages of the labeling software on the screen. Switch on the Controller first and then the KLM-PS. Verify also the correct seating of the engraving head and the cable connection between the Controller and the spindle.




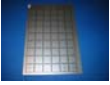
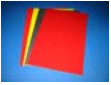
First check if the engraving needle is broken somehow damaged, in case the needle needs to be replaced. Check if engraving dust remains in the head or clamp of the spindle. Unscrew the depth controller and the clamp carefully. Clean the depth controller and the clamp of the spindle according to the manual "Instructions for cleaning the Engraving spindle", see page 12 chapter 7 of the manual.

**Attention: Do not use pressurized air for cleaning!**

The 2 mm distance between the depth controller and the surface of the engraving material might be not correct. Move the arm manually with the engraving head over the engraving material, the KLM-PS must be turned off and check the distance, see page 9 chapter 3.11 of the manual.

Make sure the engraving needle and depth controller are adjusted correctly with the included tool, see page 11 chapter 5 of the manual.

## 9. Accessories

Description	Part no.	Picture
Engraving needle 15 ° set .2; .3; .4; .5; .7; 1 mm	3414 0011	
Engraving needle 15 ° .2 mm	3414 0067	
Engraving needle 15 ° .3 mm	3414 0068	
Engraving needle 15 ° .4 mm	3414 0069	
Engraving needle 15 ° .5 mm	3414 0070	
Engraving needle 15 ° .7 mm	3414 0071	
Engraving needle 15 ° 1 mm	3414 0072	
Engraving needle 90 ° .5 mm	3414 0074	
Engraving needle 90 ° .7 mm	3414 0075	
Engraving needle 90 ° 1 mm	3414 0076	
Engraving needle Metall 35 ° .4 mm	3414 0077	
Vaccum cleaner bag, set of 5 pcs.	3502 0000	
Universal support plate for Engraving and Plotting half size (DIN A4)	3490 2106	
Universal support plate for Engraving and Plotting full size (DIN A3)	3490 2107	
Engraving material full size DIN A3 / half size DIN A4 blank sheet or pre-sized tags	please call for details	 

**10. Technical data**

Environmental conditions  
for all units

Operation: 10°C (50°F) up to 35°C (95°F)  
rel. Humidity: 35% to 75% no condensation  
Storage: -10°C (14°F) up to 50°C (122°F)  
rel. Humidity: 10% to 90% no condensation

Safety certificate:

EN 60950-1

Interference safety compliance:

EN 55022 B

EN 61000-4-2 to 6

EN 61000-4-11

EN 61000-3-2 and 3

**10.1 Engraving Spindle**

Revolution speed:

min. 5000 RPM, max. 50.000 RPM

Torque:

6 Ncm

Frequency:

83-830 Hz

Power consumption:

max. 60 W

Clamp:

Shaft diameter 3 mm (.118 inch)

Clamp mechanism:

Head clamp

Revolution accuracy with clamp:

.03 mm (.00118 inch)

Motor details:

Three-phase asynchronous, brushless

Housing:

Aluminum

Holding diameter:

25 mm (.984 inch)

Ball bearing:

Double, steel, permanent lubricated

Cooling:

Air through integrated fan

Weight:

approx. 280 g (.62 pounds)

Overall length:

approx. 175 mm (6.89 inch)

Usage:

Engraving only

Guaranteed bearing lifetime :

min. 1000 hours at appropriate  
usage

**10.2 Controller**

Voltage supply:

110-240 V ~ 50-60 Hz

Mains fuse:

4A, slow-blow

Measurements:

180 mm x 250 mm (7.08 inch x 9.84 inch)

Weight:

approx. 2.7 kg (5.95 pounds)

**10.3 Vacuum Cleaner**

Input voltage:

24 VDC

Power consumption:

max. 55 W

Vacuum cleaner bag:

Swirl Type Y98

Measurements:

350 mm x 250 mm (13.78 inch x 9.84 inch)

Weight:

approx. 4.6 kg (10.15 pounds)

## 11. General Safety Rules

**WARNING: “READ ALL INSTRUCTIONS” Failure to follow the SAFETY RULES listed BELOW, and other safety precautions, may result in serious personal injury. “SAVE THESE INSTRUCTIONS”**

### Work Area

- **KEEP WORK AREAS CLEAN.** Cluttered areas and benches invite accidents.
- **AVOID DANGEROUS ENVIRONMENTS.** Don't use power tools in damp or wet locations. Do not expose power tools to rain. Keep work area well lit.
- **AVOID GASEOUS AREAS.** Do not operate portable electric tools in explosive atmospheres in presence of flammable liquids or gases. Motors in these tools normally spark, and the sparks might ignite fumes.
- **KEEP CHILDREN AWAY.** Do not let visitors contact tool or extension cord. All visitors should be kept away from work area.

### Personal Safety

- **GUARD AGAINST ELECTRIC SHOCK.** Prevent body contact with grounded surfaces. For example; pipes, radiators, ranges and refrigerator enclosures. Rubber gloves and non-skid footwear are recommended when working outdoors, where damp or wet ground may be encountered. A Ground Fault Circuit Interrupter protected power line must be used for these conditions.
- **DRESS PROPERLY.** Do not wear loose clothing or jewelry. They can be caught in moving parts. Wear protective hair covering to contain long hair.
- **USE SAFETY EQUIPMENT. WEAR SAFETY GOGGLES** or glasses with side shields. Wear hearing protection during extended use of power tools and dust mask for dusty operations.
- **STAY ALERT. USE COMMON SENSE.** Watch what you are doing. Do not operate tool when you are tired or under influence of drugs.
- **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
- **AVOID ACCIDENTAL STARTING.** Don't carry plugged in tool with finger on switch. Be sure switch is OFF when plugged in.
- **DON'T OVERREACH.** Keep proper footing and balance at all times.
- **BEFORE CONNECTING THE TOOL** to a power source (receptacle, outlet, etc.), be sure voltage supplied is the same as that specified within the technical data or on the nameplate of the tool. A power source with voltage greater than that specified for the tool can result in serious injury to the user — as well as damage to the tool. If in doubt, DO NOT plug in the tool. Using a power source with voltage less than the nameplate rating is harmful to the motor. “VOLTS AC” designated tools are for Alternating Current 50-60 Hz only. “VOLTS DC” designated tools are for Direct Current. Do not use AC designated tools with DC power source. Do not use electronic speed controlled tools with DC power source.

### Tool Use and Care

- **DON'T FORCE TOOL.** It will do the job better and safer at the rate for which it was designed.
- **USE THE RIGHT TOOL.** Don't use tool for purpose not intended, only as described in the manual..
- **USE THE SPINDLE ONLY WHEN INSERTED IN THE ENGRAVING HEAD.**
- **SECURE WORK.** Make sure the support plate is always adhesive enough holding the material, if not clean the plate with clear water. Never use your hand holding the material in place. Use only original support plates holding the material.
- **DON'T ABUSE CORD.** Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil and sharp edges. Always keep cord from spinning blade, bits or any other moving part while the tool is in use.
- **INDOOR USE ONLY!**
- **THE USE OF ANY OTHER ACCESSORIES** not specified in this manual may create a hazard and is strictly forbidden.
- **DISCONNECT TOOLS.** When not in use; before servicing; when changing blades, bits, cutters, etc.
- **STORE IDLE TOOLS.** When not in use, tools should be stored in dry, high or locked up place — out of the reach of children.
- **DO NOT ALTER OR MISUSE TOOL.** These tools are precision built. Any alteration or modification not specified is misuse and may result in a dangerous condition.
- **MAINTAIN TOOLS WITH CARE.** Keep tool clean for better and safer performance. Follow instructions for changing accessories. Inspect tool cords periodically and if damaged, have repaired by an authorized service facility. Inspect extension cords periodically and replace if damaged. Keep engraving unit dry, clean and free from oil and grease.
- **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced. Have defective switches replaced. Do not use tool if switch does not turn it on or off.
- **ALL REPAIRS,** electrical or mechanical, should be attempted only by trained repairmen. Contact the nearest authorized repair service facility. Use only original replacement parts, any other may create a hazard.



## 11.1 Tool Safety Instructions

- **Do not reach in the area of the spinning bit.** The proximity of the spinning bit to your hand may not always be obvious.
- **Never start the tool while engaged, by any reason, in the material.** The bit cutting edge may grab the material causing loss of control of the tool.
- **Always disconnect the power cord from the power source before making any adjustments or attaching any accessories.** You may unexpectedly cause the tool to start leading to serious personal injury.
- **Do not leave a running tool unattended, turn power off.** Only when tool comes to a complete stop it is safe to change bits.
- **Do not touch the bit or spindle after use.** After use the bit and spindle are too hot to be touched by bare hands.
- **Do not use the tool for any other purpose than described in the manual!**
- If the workpiece or bit becomes jammed or bogged down, turn the tool "OFF" by the switch. Wait for all moving parts to stop and unplug the tool, then work to free the jammed material. If the switch to the tool is left "ON" the tool could restart unexpectedly causing serious personal injury.
- **Do not allow familiarity gained from frequent use of your rotary tool to become common place.** Always remember that a careless fraction of a second is sufficient to inflict severe injury.
- **Do not alter or misuse tool.** Any alteration or modification is a misuse and may result in serious personal injury,  
**Klemsan and the tool manufacturer shall under no circumstances be liable for damage or any personal injury caused by misuse or not following the instructions.**

**WARNING: Some dust created by power sanding, sawing, grinding, drilling, engraving and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm.**

**Some examples of these chemicals are:**

- Lead from lead-based paints,
- Crystalline silica from bricks and cement and other masonry products, and
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

### Extension Cords

- Replace damaged cords immediately. Use of damaged cords can shock, burn or electrocute.
- If an extension cord is necessary, a cord with adequate size conductors should be used to prevent excessive voltage drop, loss of power or overheating. The table shows the correct size to use, depending on cord length and nameplate amperage rating of tool. If in doubt, use the next heavier gauge. Always use U.L. and CSA listed extension cords.

#### RECOMMENDED SIZES OF EXTENSION CORDS

**NOTE:** The smaller the gauge number, the heavier the cord.

Tool's Ampere Rating	120 Volt A.C. Tools Cord Length in Feet Cord Size in A.W.G.			
	25	50	100	150
3-6	18	16	16	14
6-8	18	16	14	12
8-10	18	16	14	12
10-12	16	16	14	12
12-16	14	12	-	-