USER MANUAL

VENUS

Content

UNPACKING

Caution:

- The weight of LaserPro VENUS is about 32 kg (70 ponds).
- Please save the original shipping carton in case any returning service is needed.
- Please inspect what you have received from the shipped carton by comparing with the following listed items.

Unpacking inspection

Your package should contain the following items:

ITEM	QUANTITY
Cleaning Set cotton swab lens cleaner lens tissue (lint free)	 1 pack 1 1
1.5" Manual Focus Gauge (blue color)	1
AC Power Cord	1
Print Port Cable	1
LaserPro VENUS Driver	1
Mirror (for Mirror#2, #3)	1
Engraving Samples	1 pack

QUICK MENU

1. Connect air exhaust system.
2. Setup computer and connect with engraving system properly.
3. Turn **ON** host computer system.
4. Install the Venus Driver. (for the first time use only)
5. Use Windows-based program (such as CorelDRAW, PhotoShop, PhotoPaint, Illustrator, CASmate, Signlab, EasySign, AutoCAD, etc.) to operate with the engraver.
6. Turn **ON** engraver. The working table moves down 50mm approximately and the lens carriage moves to the home position (upper left corner) after system initialization.
7. **Auto-focusing:** under **STOP** status, put work-piece on the table, move X-axis (Please refer to Fig. 3) and carriage by arrow keys to locate the lens carriage above the engraving material (holding carriage by hands for prompt moving is acceptable under STOP condition but not recommended). Press **AUTO FOCUS** the table will move up then down to the focal position automatically.
8. The following is an example by using **CorelDRAW V.8.0**.or after
   Layout → **Page Setup** → **Set from Printer,** choose **Portrait** → **OK** → Edit desired file (picture etc.) → **File** → **Print** → **Properties** → **Options,** choose **desired Mode** (refer to Fig. 8) then set up proper resolution, power and speed **OK** → **Print** →
   File name is shown on LCD then press **START/STOP** button.
   (Please refer to page 14, **Start to Operate,** for detail operation in different mode selection)

NOTICE:

1.When operating with **CorelDRAW V.8.0 or after**, please choose **Landscape** ***for Page Setup*** when X > Y **;** choose **Portrait** when X < Y → **O.K.**.

2. When using the available artworks from the Clipart of CorelDRAW, ***to prevent the hidden vector lines shown on your engravings***. Please do as follows:
   CorelDRAW, choose file from Clipart → **Bitmaps** → **Convert to Bitmap** → Click **Color** then choose **Grayscale** → **Ok**

3.In order to match Venus driver's color. Make sure your **CorelDRAW V.8.0** or **after** the **' Calibrate colors for display '** is disable. Please follow the steps:
Tools → **Options** → **Global** → **Color Management** → Disable **' Calibrate colors for display '** → **OK.**

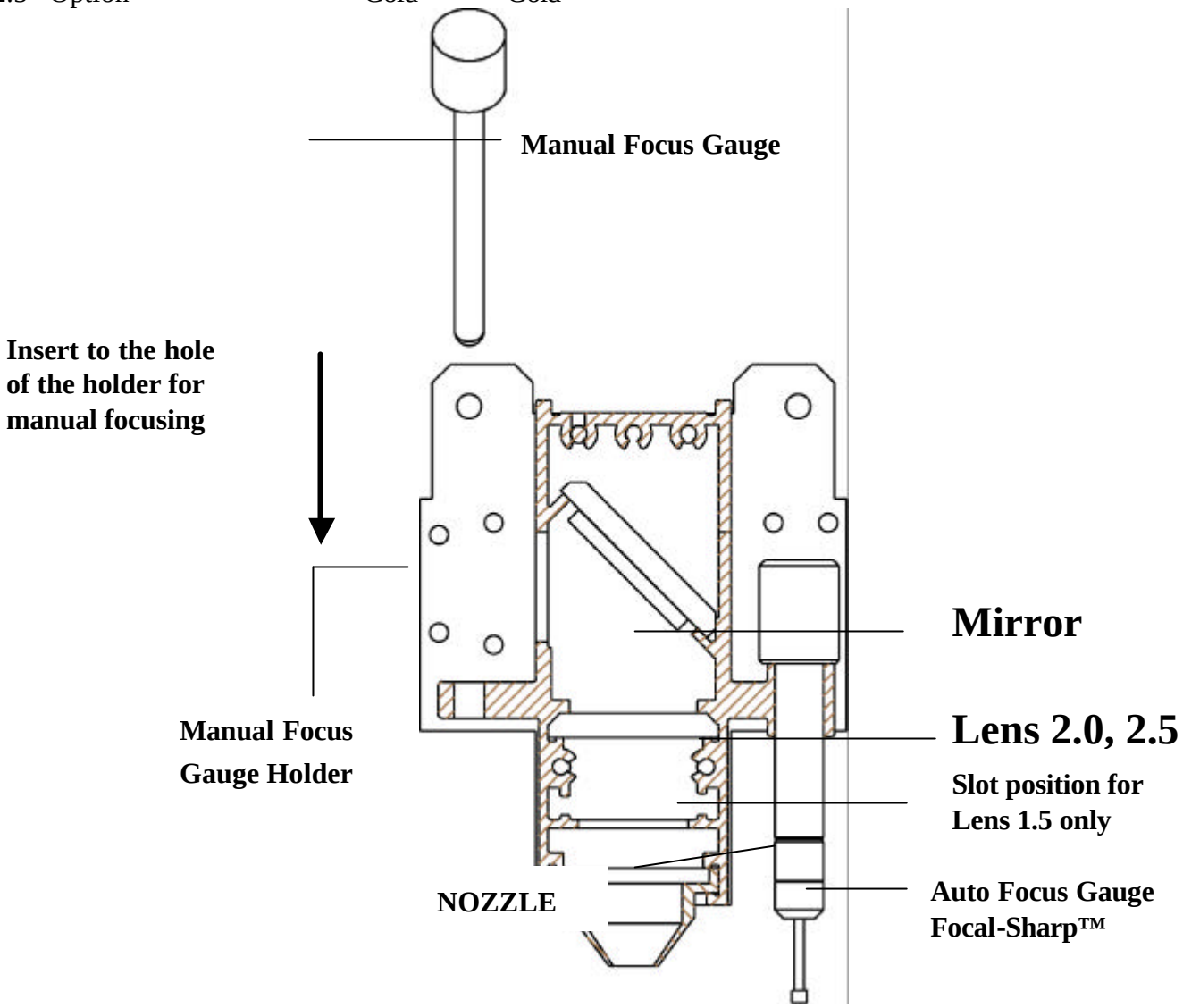
NOTE:

- If the memory buffer is set up in **Single file** mode, under **START** condition, the engraver will start to engrave/cut upon receiving a file. While if the memory buffer is set up in **Multiple File** mode, receiving at least one complete file then press **START/STOP** to start a job (refer to page 14, **Start to Operate**).

- Choices of ***DPI must be the same*** for both editing and printing out a file.
- Turn on the air exhausting system before engraving.
- The ***maximum loading weight*** of working table is ***5 kg***.
- When engraving at 3D mode or cutting materials that easily caught on fire, such as acrylic, wood or paper, it is advised to have air compressor turned on to prevent flame.

LENS and MANUAL FOCUS GAUGE

Focal Length	Matched Color	
	LENS	MANUAL FOCUS GAUGE
1.5” Standard	Purple	Blue (same as 2.0”)
2.0” Option	Blue	Blue
2.5” Option	Gold	Gold



Focus Carriage Assembly

I. INTRODUCTION

Principles of CO_2 Laser

LASER is a **L**ight **A**mplification by **S**timulated **E**mission of **R**adiation. A CO_2 laser works by exciting the molecules of a carbon dioxide gas mixture. To engrave, the beam is focused through a lens. The intensive beam can vaporize the surface of the material leaving an engraved image or, in some cases, cutting through the material.

Safety

The safety rating of Class 1 by CDRH means that the laser beam is enclosed in a cabinet and has safety interlock mechanisms to protect the operator from injury. While when a class 1 laser system equipped with a red dot pointer which allows you to position laser beam, the safety rating turns into Class 3a due to the red beam is laser light. A few extra safety precautions; namely, **avoid placing your eyes in the red beam path,** is required.

Precaution

1. Do not attempt to modify or disassemble the laser system at any time.
2. Always wear appropriate safety goggles during operation, especially when engraving with mirrors or coated metals such as enameled brass and anodized aluminum..

   NOTE: Each LaserPro laser machine is equipped with a safety goggle, if you need another one, please contact LaserPro for it or try to get one that meets the following specification.

   190-398 nm OD5+
   10,600 nm OD5+

   Visible light transmission: 92.9%
3. Good ventilation is required to remove odors and vaporized materials to the outside of the building or structure. An exhausted system is recommended.
4. Invisible intensive laser radiation may cause physical burns or sever eye damage. Always read the manual and caution labels carefully before operation.
5. Do not work with reflective metals, heat sensitive surfaces or other materials that may produce toxic substances, such as PVC and Teflon.
6. A fire extinguisher should be available on hand at any time.
7. Never leave the machine unattended during operation.
8. Follow the recommendations for maintaining and cleaning your system. Not only will this enable you to engrave efficiently, it will ensure that your machine runs safely as well.

Fire Precaution

1.When engraving at 3D mode or cutting materials that easily caught on fire, such as acrylic, wood or paper, it is advised to have air compressor turned on to prevent flame.

2.If cutting table, or honey comb table, is used for cutting purpose, do not leave any material underneath, as when material at top is cut through, the material at below will be burned easily due to trapped heat.

3.It is not encouraged leaving the cutting job unattended, especially with materials mentioned above.

Warning Label

DANGER

INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK FAILED OR DEFEATED AVOID EYE OR SKIN EXPOSURE DIRECT OR SCATTERED RADIATION

On the back right side of the top area.

WARNING!!

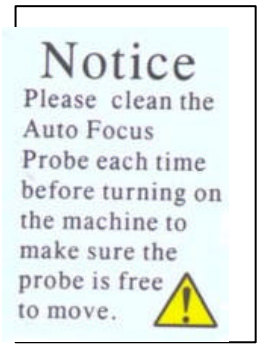
Do not use reflective metals, heat sensitive surfaces or other materials that may produce toxic substances, such as PVC and Teflon. Any corrosion caused by working on an unsuitable substances will not be covered in the warranty.

On the upper center of the top area.

CAUTION

AVOID PLACING YOUR EYES IN THE RED BEAM PATH

On the front center of the top door.



On the surface of Focus Carriage

Frequently Asked Questions

1. What materials can be processed by CO_2 laser?

Virtually any materials such as acrylic, wood, fabrics, glass, leather, marble, stone, rubber stamps, paper products, coated metals, plastics (especially micro plastic developed by IPI, Spectrum and Rowmark etc.) other hard-surface materials blended with polyester and fibers (Corian™, Fountainhead™, and Avonite™ etc.) or laserable simulated products of stone, wood and metal etc.

Bare metals can not get a good engraving result by using CO_2 laser. However, ***special kind of spray*** has been developed that allows CO_2 laser to mark on the bare metals such as stainless steel, aluminum etc. Do not engrave or cut materials which are heat sensitive or toxic substances can be produced ***(e.g. PVC and Teflon coating)***.

2. What is the life cycle of the laser source?

The life cycle of laser source is around 20,000 hours, however it can be re-filled and should be done by your dealer.

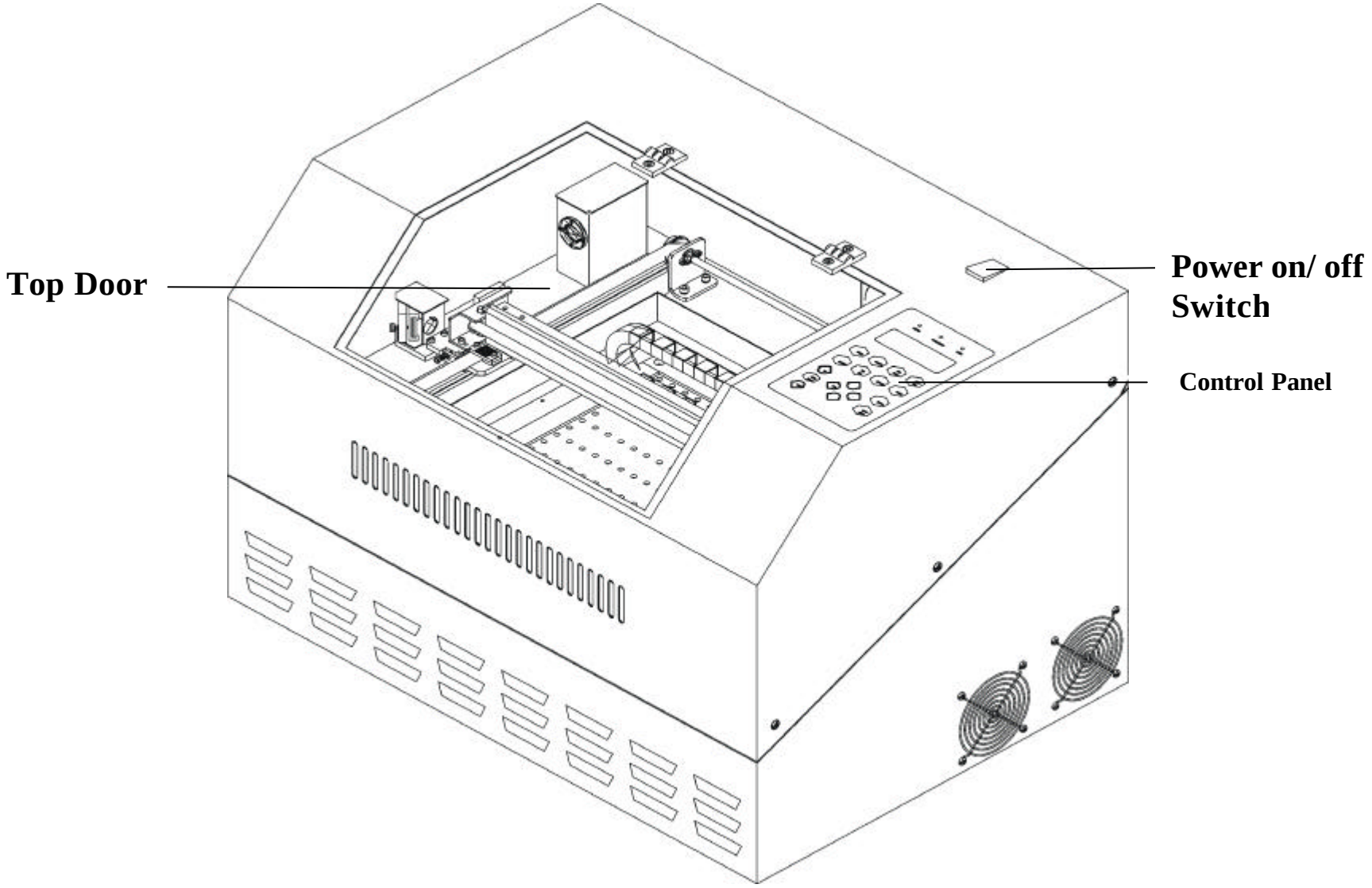
3. What is the main purpose of air assist system?

The air assist system can provide a much better engraving & cutting effect, as it will blow away vaporized particles and prevent fire due to overheating.

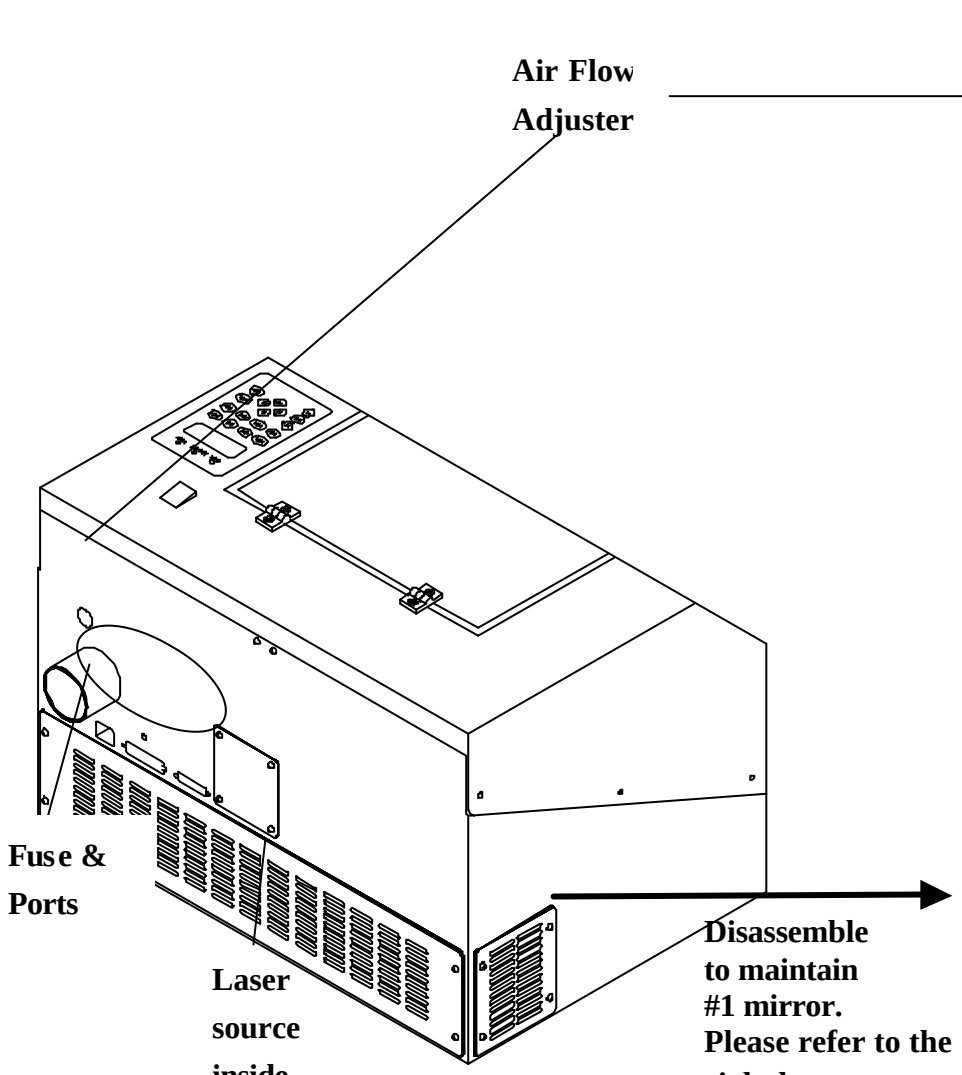
4. What does cutting table do?

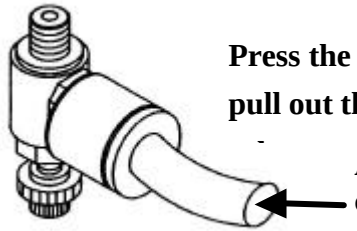
The cutting table, also known as honeycomb table, is especially useful for vector cutting application. The space between materials and working table, gapped by cutting table, allows heat and smoke to be disbursed and vented out which may otherwise cause bad cutting effect.

5. **What is the maximum engraving speed of LaserPro Venus?**
The maximum engraving speed of LasePro Venus is 508 mm/sec (20 inch/sec).



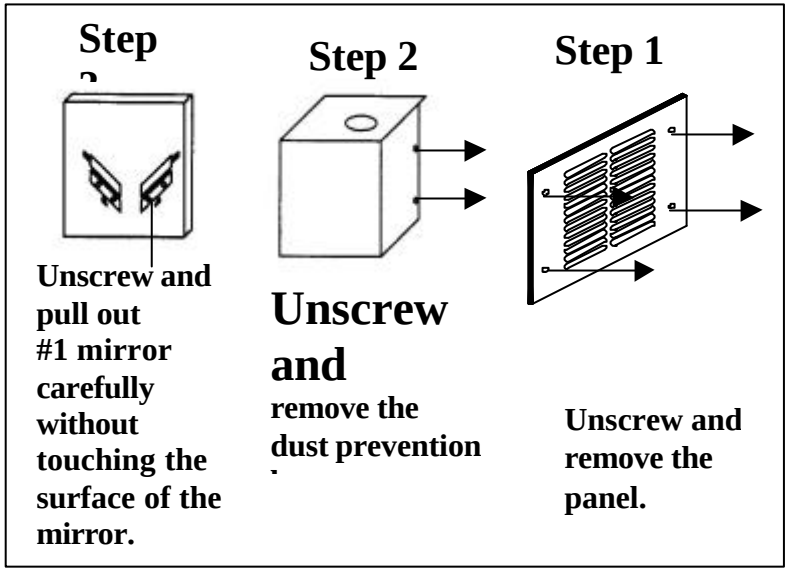
Back View



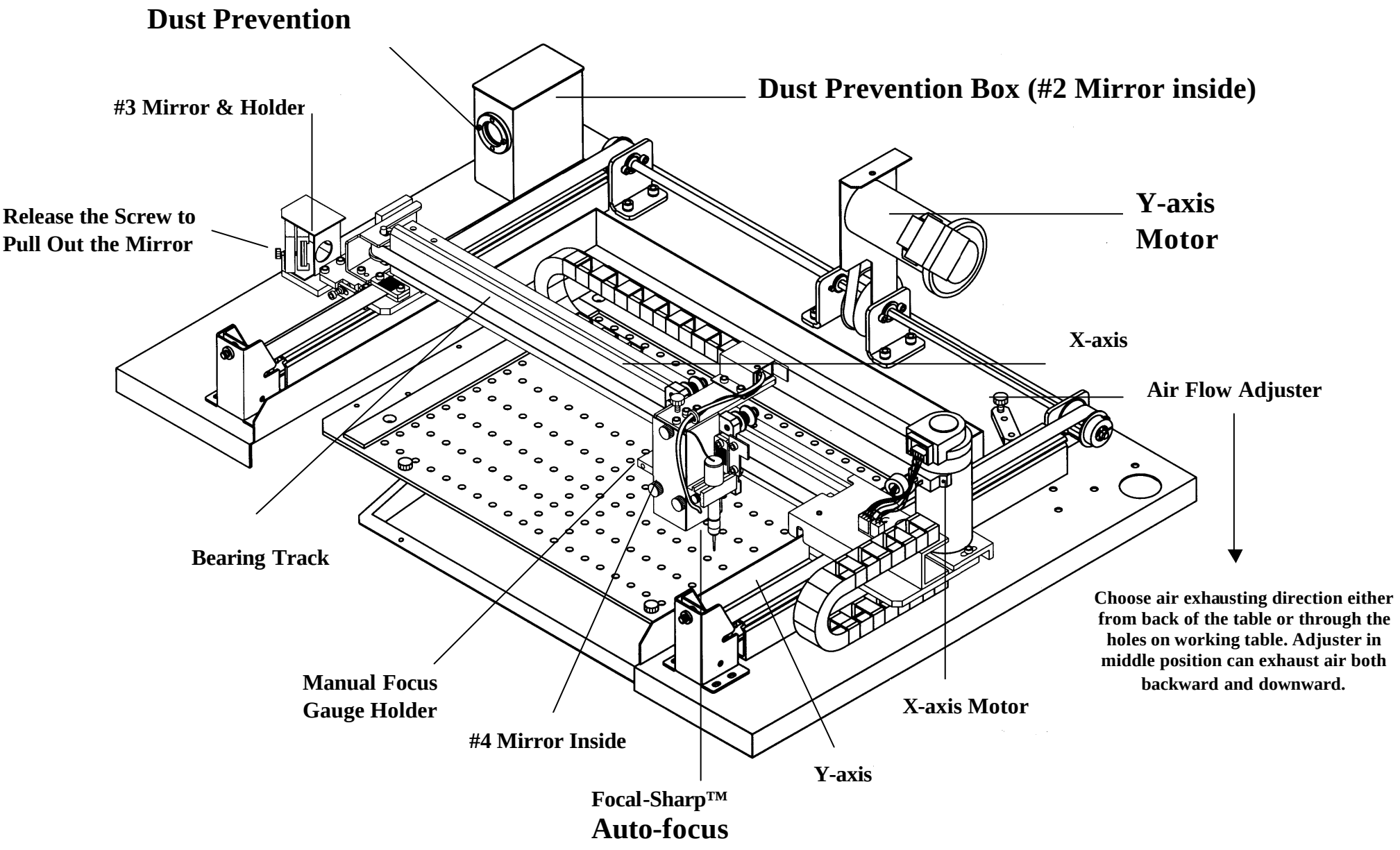


Turn clockwise to decrease the air flow and counterclockwise to

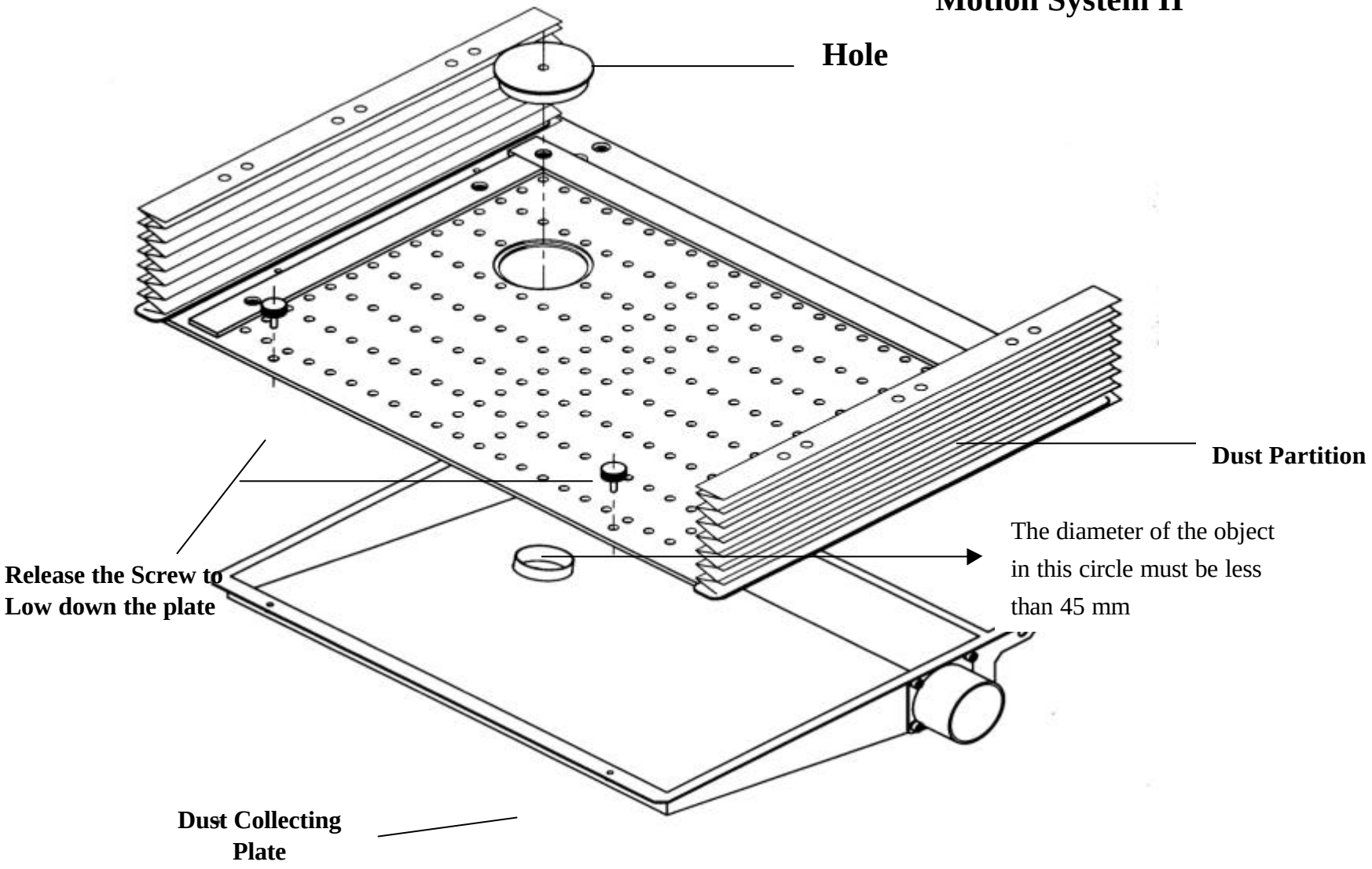
NOTE: ***Please refer to Chapter VI and follow the instruction for the basic maintenance of mirror.***



Motion System I



Motion System II



II. RECOMMENDED CONFIGURATION

Computer

Your PC must be sufficient to equip with Window 95 at least.

We recommend the specification of PC for better work as below:

CPU	Pentium at least
DRAM	32 MB RAM or up
FDD	One 3.5" 1.44 MB floppy
HDD	1.2 GB Hard Drive or up
SVGA	15" Super VGA Monitor

★ ★On Board Parallel Mode(Setup from PC BIOS):

SPP—Preferred Mode

ECP—Cable length less than 1.8meters

Scanner

Flat Bed

Minimum resolution: 200 DPI

Software

GCC driver (designed under Window 95 or higher level)

Windows	Window 95 or higher
CorelDRAW	7.0 Version or up

Any program that can output HPGL commands

III. HARDWARE INSTALLATION

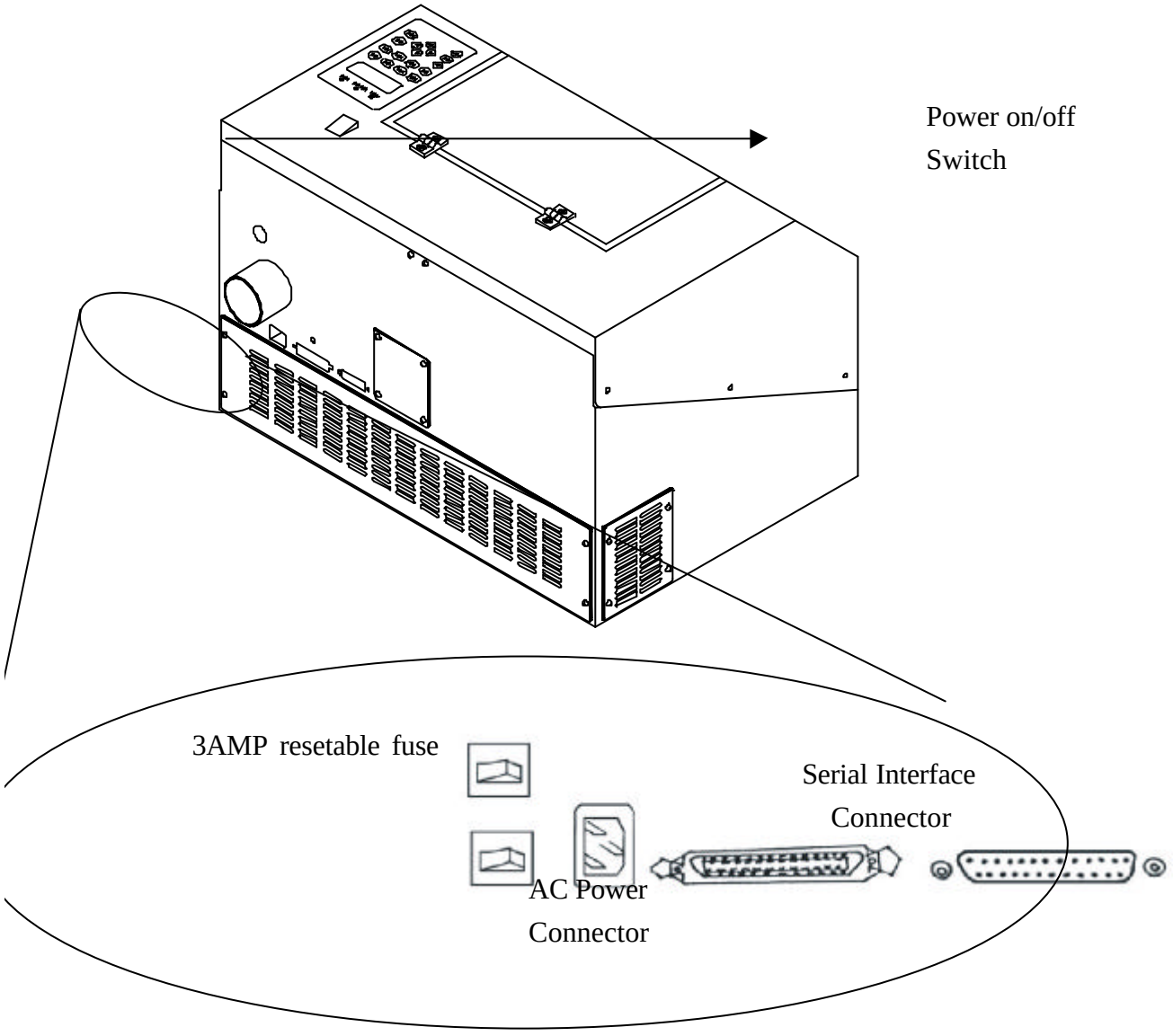
Caution:

15AMP resetable fuse

- Turn all equipment off before making any connection.
- Check the plug of the power cord to see if it matches the wall outlet. If not, please contact your dealer.

Cabling Connection:

1. Insert the power cord (male) into a well grounded power outlet.
2. Plug the other end (female) into the engraver. The engraver has been designed to switch from 100~240 VAC automatically.
3. The engraver can communicate with a computer through either a serial (RS-232C) or a parallel port (Centronics).



Parallel Transmission

Connect a parallel cable to the engraver (parallel port) then to the parallel port of the host computer.

Caution:

Never use a mechanical switch box when a second printer port is required.
The electrical surges can cause damage to the computer and the engraver.

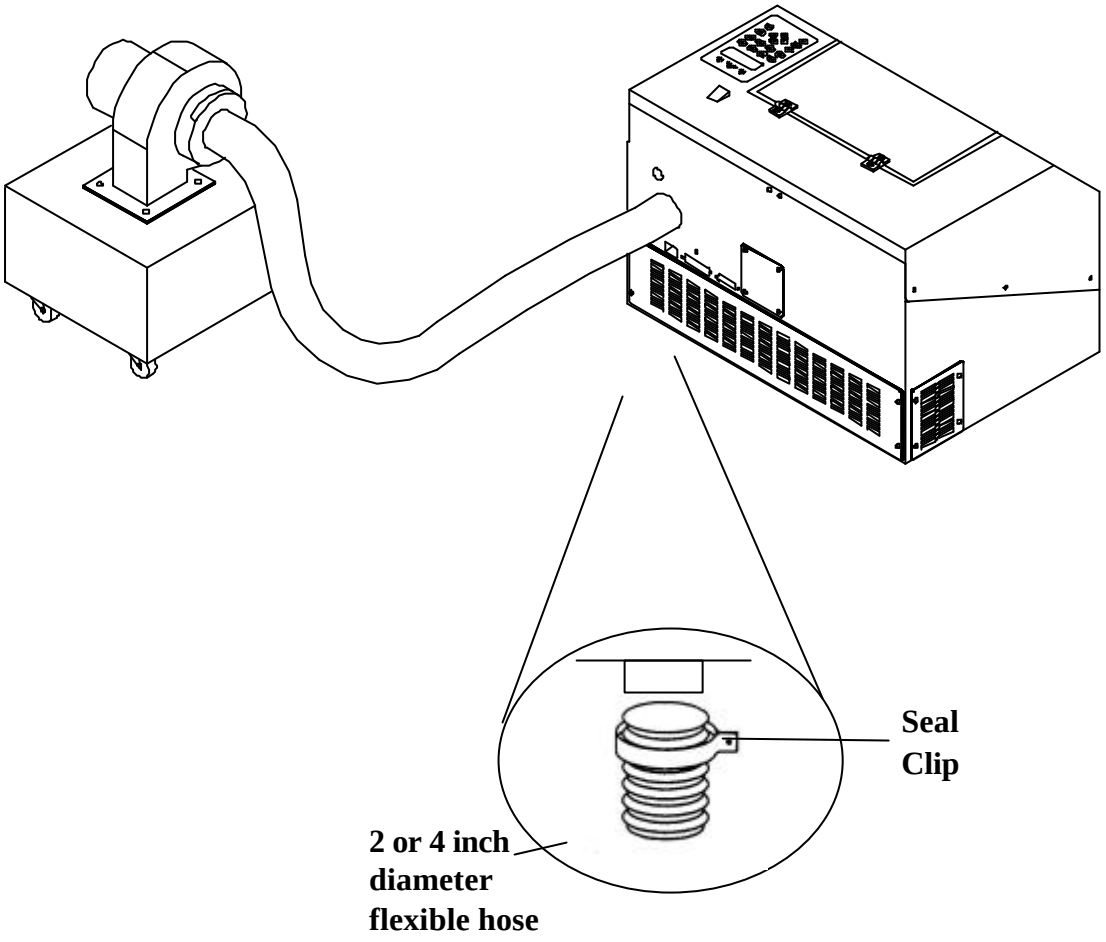
Serial Transmission

If you are using IBM PC, PS/2 or their compatibles, connect the supplied RS-232C cable to the engraver (serial port) then to the serial port of the host computer.

Interface for Macintosh

To operate the engraver with a Macintosh computer (e.g. Power Mac), you need a MAC modem cable (DIN8 to DB25) as an adaptor to connect to the RS-232C cable.

Exhaust Ventilation



IV. SOFTWARE INSTALLATION

Install LaserPro VENUS printer driver for windows 9x /XP

Power On, click **START**
→ choose **Settings** and click **Printers**
→ Double click **Add printer** and start **Add printer wizard**
→ **Next step**
→ Choose **Local** and click **Next step**
→ choose **Have disk** and click **Next step**
→ Insert the VENUS Driver disk properly into the floppy drive then click **OK**
→ choose the port where your laser system is connected and click **Next step** → name your system or bypass
→ choose the driver to be default printer
→ **Next step**
→ select **No** when asked to print a test page and click **Finish**

Now the LaserPro VENUS printer driver is installed completely. Don't forget to take the GCC driver disk from the floppy drive and store in a safe place.

V. OPERATION

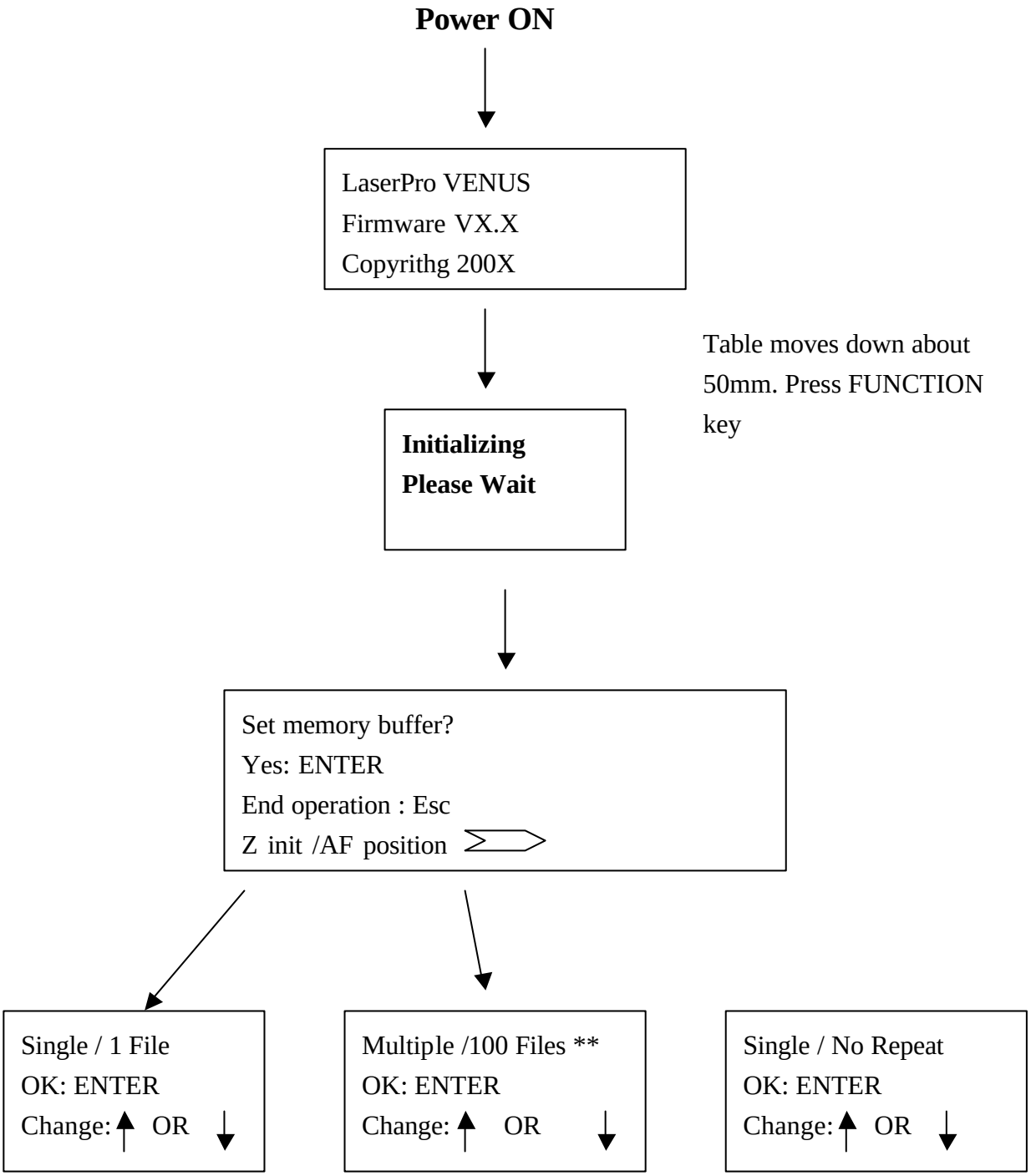
Environment

- A clean, well-ventilated room with a temperature of 15℃~ 25℃ (60℉~78℉) (Strongly suggested the temperature of 25℃) and a relative humidity between 30% and 40%, as an office type environment.
- Stable floor isolated from vibration.
- Avoid from unstable voltage supply.
- Short path for an effective air exhaust.
- Have a fire extinguisher available at any time.

Flexible Utility of Your Memory Buffer.

The standard memory buffer size of Venus is 16M and can be expanded to 64 M (32M SIMM x 2). You can choose **Multiple file** mode with limited memory to save files and re-call them for constant applications. Or, you can choose **Single file** mode to get an unlimited data output while still keep files that you saved before under multiple file conditions. However, the file sent under **Single file** mode will not be saved. In other words, every time you want to engrave this file, you have to re-send again from the host computer

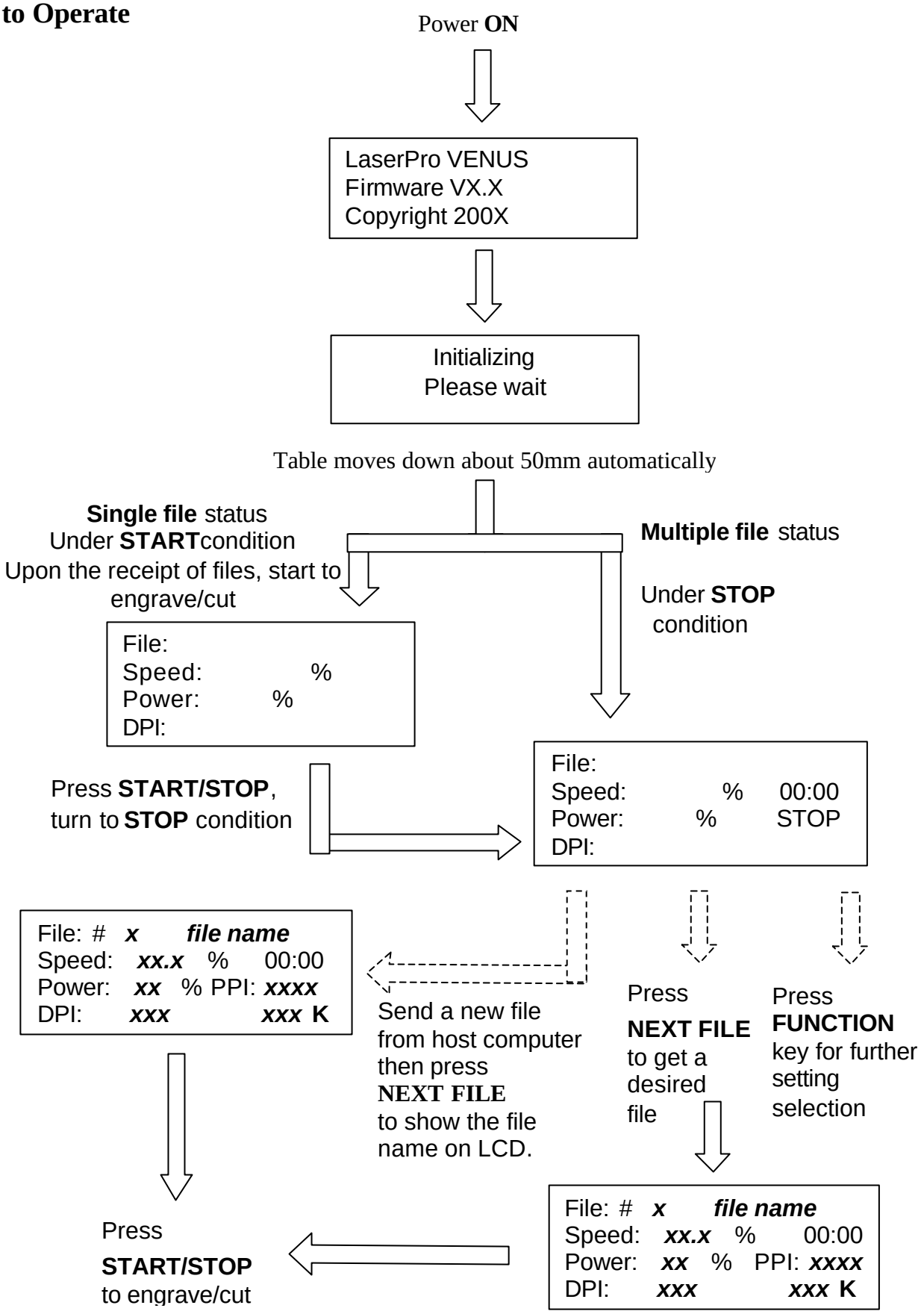
Am I in Multiple File mode or **Single File mode now?**



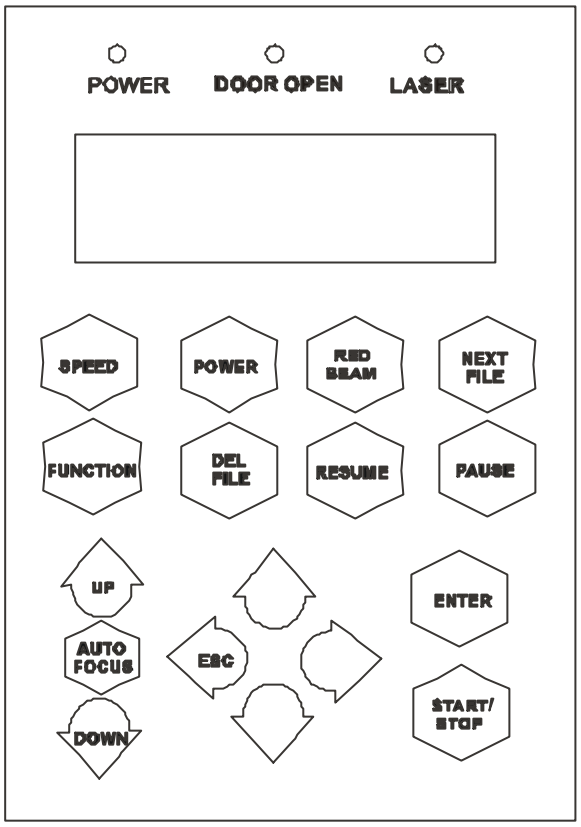
NOTE:

1. ** means default or current setting.
2. AUTO FOCUS and all other function keys should be operated under **STOP** condition.
3. NEXT FILE and DELETE keys are invalid under Single file mode.

Start to Operate



Control Panel Operation



START/STOP

- Single File Mode:

Turn on power, VENUS is under START condition and ready to receive a file. LCD shows as follows:

File:
Speed: %
Power: %
DPI:

Upon the receipt of a file, VENUS starts to engrave/cut immediately. When a job is done, LCD will show the working time such as 100s means 100 seconds.

File:	***file name***	
Speed: ***xx***	%	01:10
Power: ***xx***	%	STOP
DPI: ***xxx***		

condition AUTO FOCUS and all other function keys can be operated while NEXT FILE and DELETE

keys are invalid under Single file mode.

```
File:        file name
Speed:          %   00:00
Power:       %       STOP
DPI:
```

- Multiple File Mode:

Turn on power, LaserPro is under **STOP** condition and all function keys can be operated. Laser engraver is ready to receive a file. LCD shows as follows.

```
File:
Speed:          %   00:00
Power:       %       STOP
DPI:
```

Upon the receipt of a complete file, LCD will show the following message for instance. Then press **START/STOP** key, the engraver start engraving or cutting.

```
File: # 1    file name
Speed:   70 %      00:00
Power:   40 %      STOP
DPI:      500
```

If there is no file having been sent, the message will display as follows.

Wait until at least one complete file is Received, then press START

NOTE: Please refer to the flow chart of **"Start to Operate"**, page 14 .

ENTER

Accept and store the selection for setting up.

AUTO FOCUS

This key can only be operated under **STOP** condition. Press this key will move up the working table until the engraving object touches the tip of the focus tool, then the table will move down and stop in focus automatically.

Whenever you change a lens with different focal length, press Function key and go through the process of "**Select lens**" (refer to page 23). After changing the lens, press **AUTO FOCUS** key to save the new focal

length in memory. LCD will show as follows:

Focusing Then do setup or send a file to start a job 0.0 mm

NOTE: **1.** "0.0 mm" means the focus position is the Z-axis home position of the Working table. Above this position the value is negative while below this position the value is positive.

2.Whenever the motion system or working table has ever been adjusted by a technical person, please press **AUTO FOCUS** key to get an initial position before going through the function of "Tune (Auto focusing)" to change the focal length.

NOTICE:

To stop the motion of auto focus, please press either **UP** or **DOWN** arrow key. If you press the key ***continuously***, working table will move up or down correspondingly.

Arrow Keys

Move cursor on the display for selection or adjust the working table on Z position by pressing the arrow keys of **UP** and **DOWN**.

NOTE:

UP key – After initializing, press this key will move up the table. LCD displays:

Focusing Then do setup or send a file to start a job −***X.X*** mm

During working time (i.e. Start condition), this message won't be shown.

When* Auto Focus *is under process, press* UP *key will stop the motion of Auto Focus and change to up movement.

DOWN key – Same as above function but the motion direction is opposite.

ESC (Escape)

Exit and back to the main menu.

NEXT FILE

This key is valid under **Multiple file** mode only. Press this key the LCD shows

File: # ***x*** ***file name*** Speed: ***xx*** % 00:00 Power: ***xx*** % PPI: ***xxxx*** DPI: ***xxx*** ***xxxxx*** k

The "**k**" message shows on the lower right corner expresses the k bytes memory that has been left over in the buffer.

File: # shows the current working file number. Press **NEXT FILE** each time will increase 1 (i.e. 1, 2, 3…100) and recycle the counting. Once the buffer has received up to 100 files, the LCD shows:

More than 100 files are not allowed Please delete some and send again

If a file received is out of memory, the LCD shows

Not a complete file **due to out of memory** **Please delete some**

RED BEAM

On/Off red beam

SPEED

Set up laser speed for desired effect. When working without using VENUS' s driver. Press **FUNCTION** key then select one of the sixteen setups then set up desired cutting speed. No matter you are using VENUS' s driver or not, you can press **PAUSE** key prior to change speed during cutting or engraving. Set up desired speed, press **ENTER** then press **RESUME** to start the job again.

POWER

Set up laser power for desired depth and effect. Other conditions are same as stated in SPEED.

PAUSE

Temporarily stop the job during cutting or engraving.

RESUME

Restart the job after pausing.

DEL FILE

This key (delete file) is valid under Multiple file mode only.

Delete current file? Sure: Press again No: **Esc**

Press DEL FILE again to delete the file and LCD shows

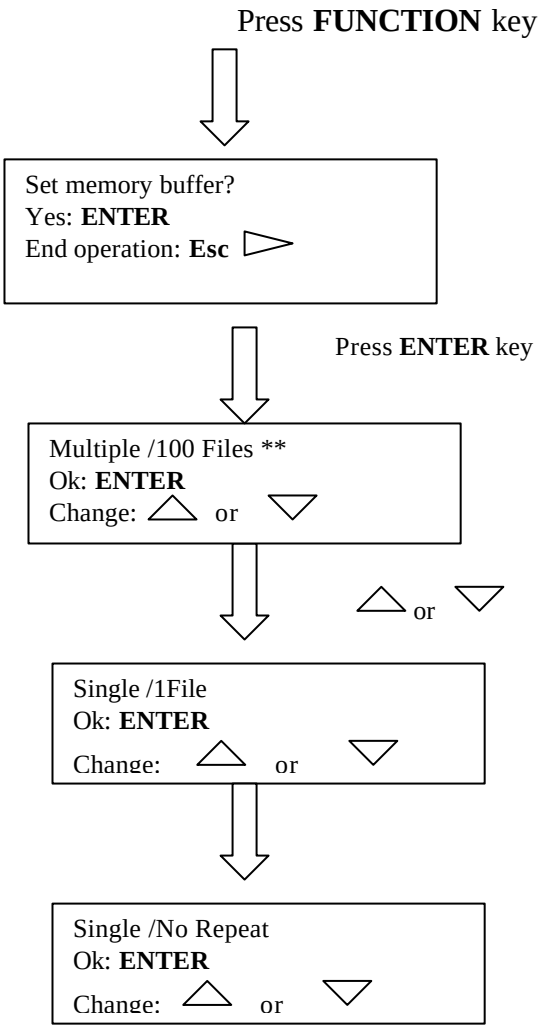
Now deleting current file Please wait

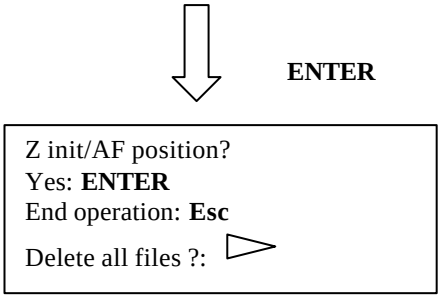
FUNCTION

- Set memory buffer?
  Setting memory buffer in Single file mode when working with a large data file, or Multiple file mode (up to 100 files) that can be saved for constant engraving.

Under Single file mode, you can only output one job a time. Unlimited data can be transferred without saving in the buffer therefore once you want to repeat the job you have to re-send the file from the host computer.

Under Multiple file mode, you can engrave one job while transfer and design the next simultaneously until 100 files' memories are all used up.

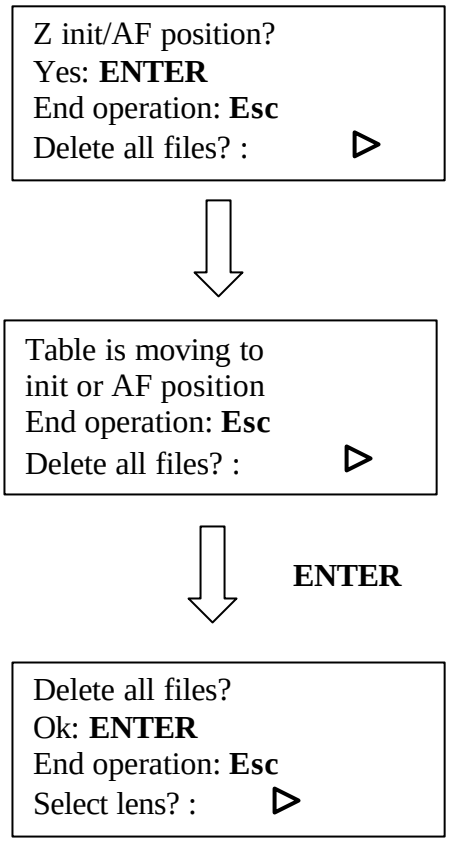




- Z init/AF position?

To avoid focus carriage hitting the engraving object accidentally during initializing, working table will move down about 50mm automatically after power on the equipment. Whereas, if a rotary attachment has been installed, the working table will move down to the bottom of the engraver.

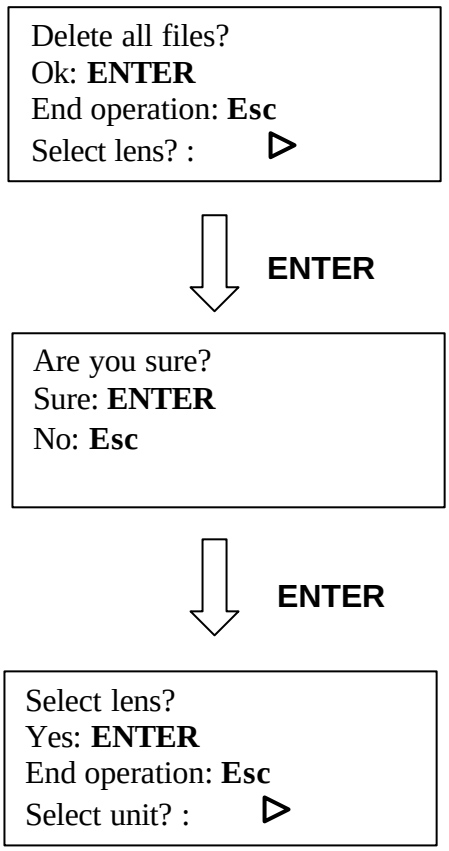
As long as you have not press **AUTO FOCUS** key, you can go into this function and move the working table back to the original position before initializing. Once the **AUTO FOCUS** key has been used, the last auto focus position has been saved in the memory. Therefore, you can move the table to the last auto focus position instead of the original Z position by using this function.



- Delete all files?

All files in the buffer will be deleted by using this function when setting under Multiple file mode.

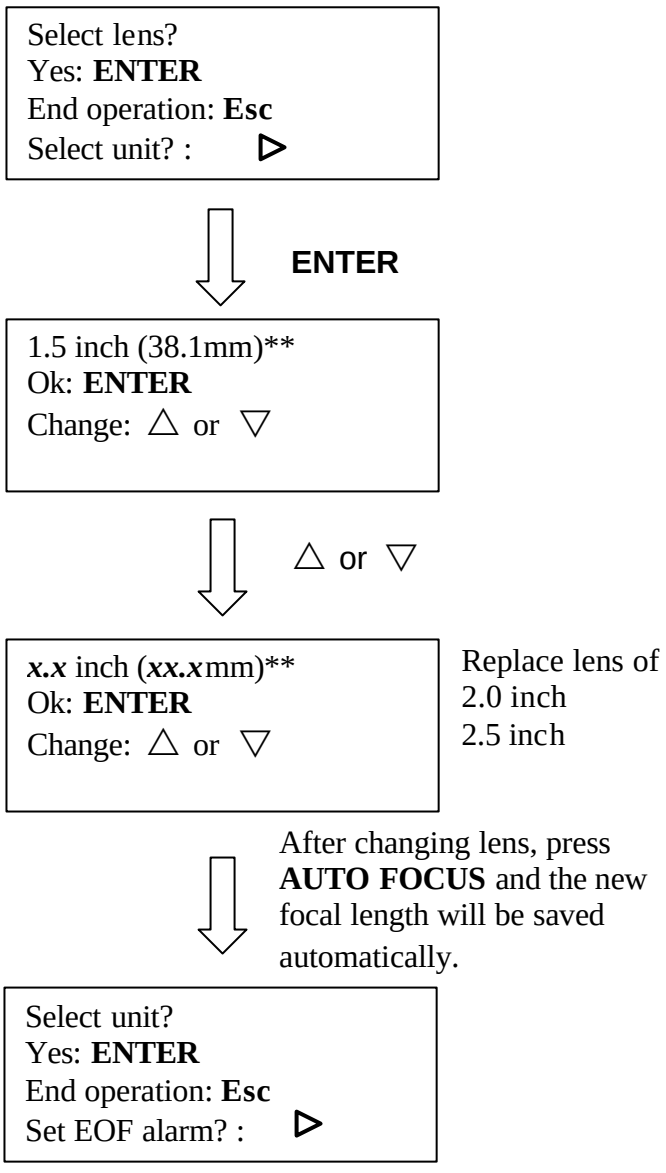
This function is invalid under Single file mode. Once you stop or complete a job under Single File mode the file won’ t be saved in the buffer.



- Select lens?
  There are four different lenses for use on the LaserPro VENUS as follows:

Focal Length		Resolution ▲	Cutting capability ▼
1.5”	**standard**	**High**	**Thin**
2.0”	**optional**		
2.5”	**optional**	**Low**	**Thick**

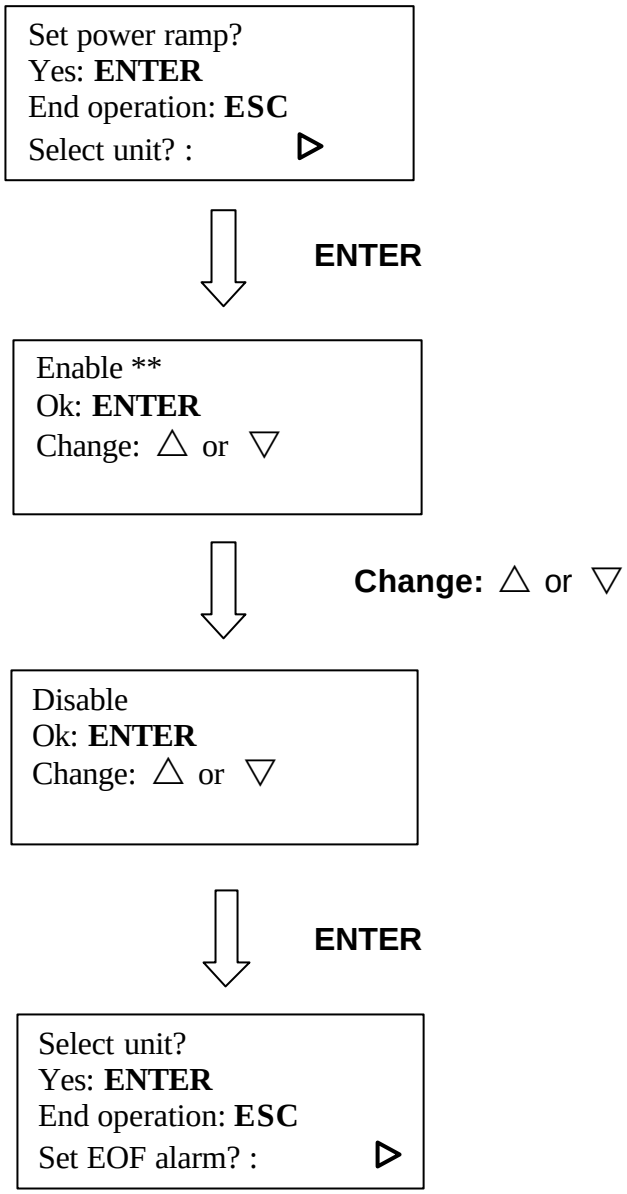
The longer the focal length, and the bigger the spot size. The higher resolution lens is designed for precision engraving, while the lower resolution lens is mostly applied for cutting due to its lower beam divergence which results in a straighter cut in thick materials. However, using higher resolution takes longer time for engraving. The large spot size of lower resolution lens can spreads the laser’s heat over a larger area, which helps minimize melting thus can be applied to engrave certain kinds of plastics.



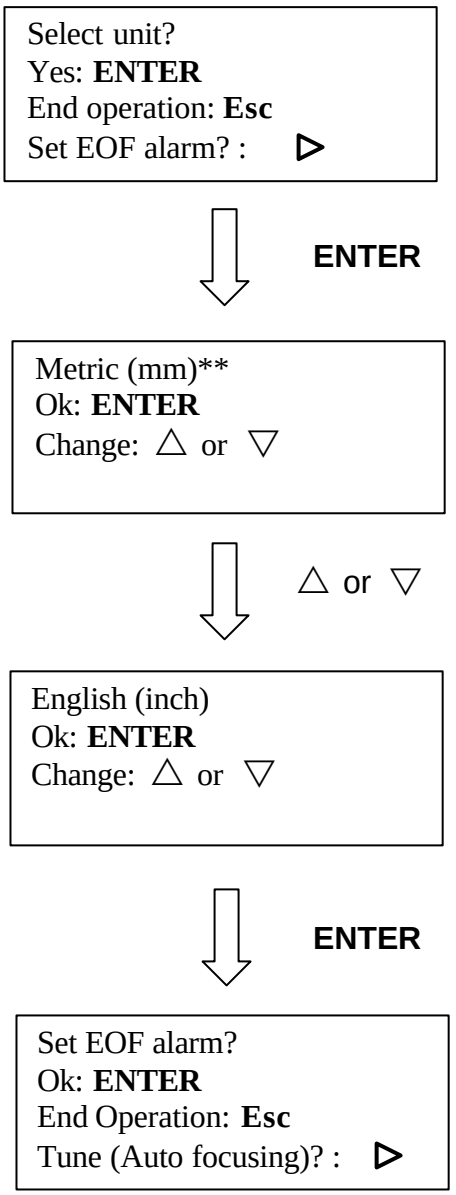
- Set power ramp?

If set in Enable condition and cutting speed is 3% or above, under vector mode, the power control is enabled. If set in Disable, the power control is disabled.

Default : Enable

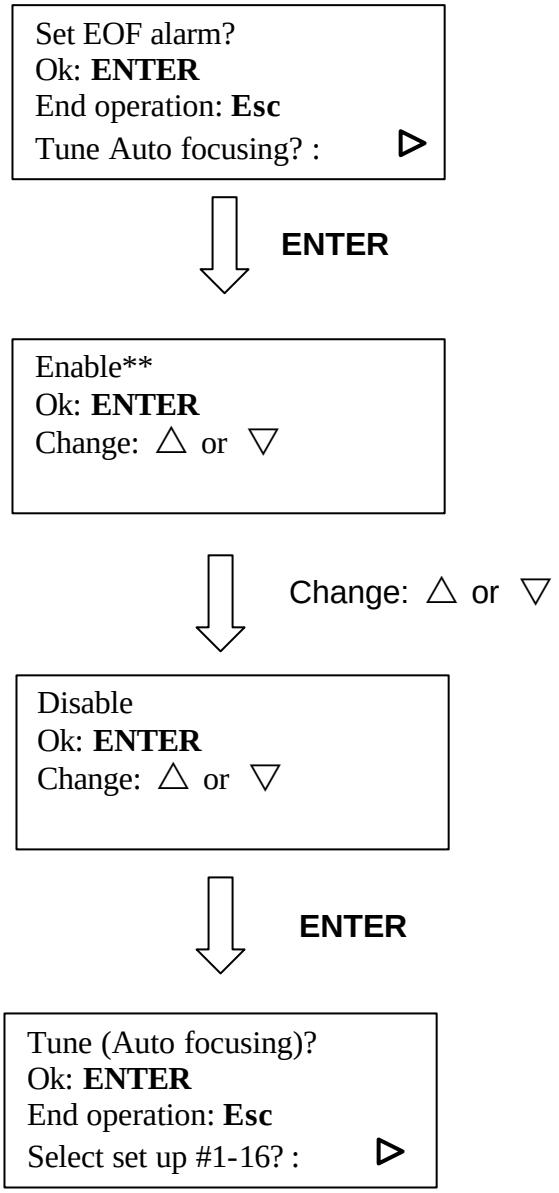


- Select unit?
  Set unit in Metric or English.

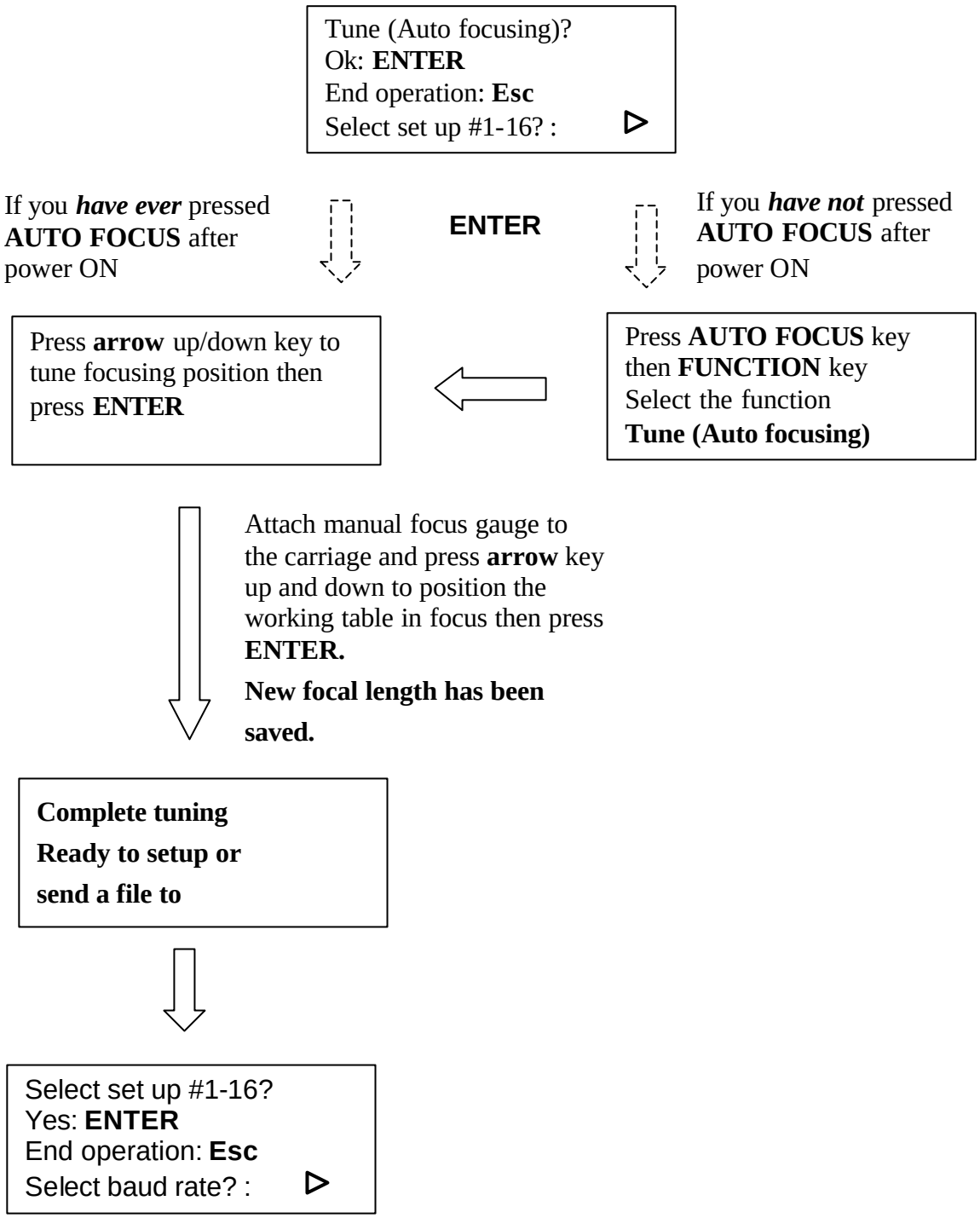


NOTE: ** means default or current setting.

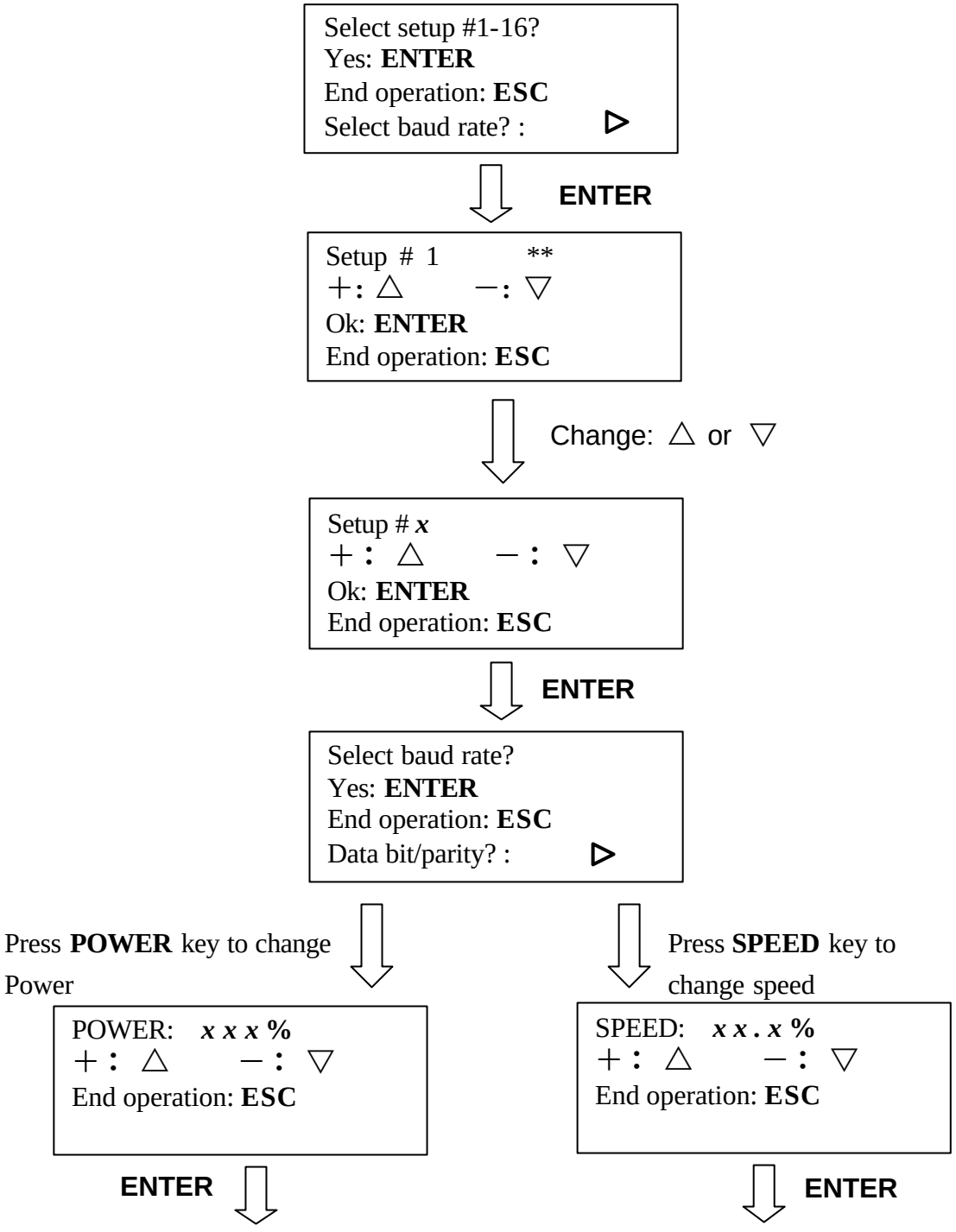
- Set EOF alarm?
  If set in Enable condition, a beep tone sounds when **E**nd **O**F **F**ile.



- Tune (Auto focusing)?
  In case the focal length of Auto Focus needs to be corrected, please insert the corresponding manual focal tool to the hole of the holder shown as in the Figure of **LENS and MANUAL FOCUS GAUGE**. Then, operate as follows.



- Select Set Up #1-16?
  You can assign 16 different colors individually for speed and power to achieve a variety of cutting effects.
  This function works when your software package can output HPGL plot without using VENUS' s driver.



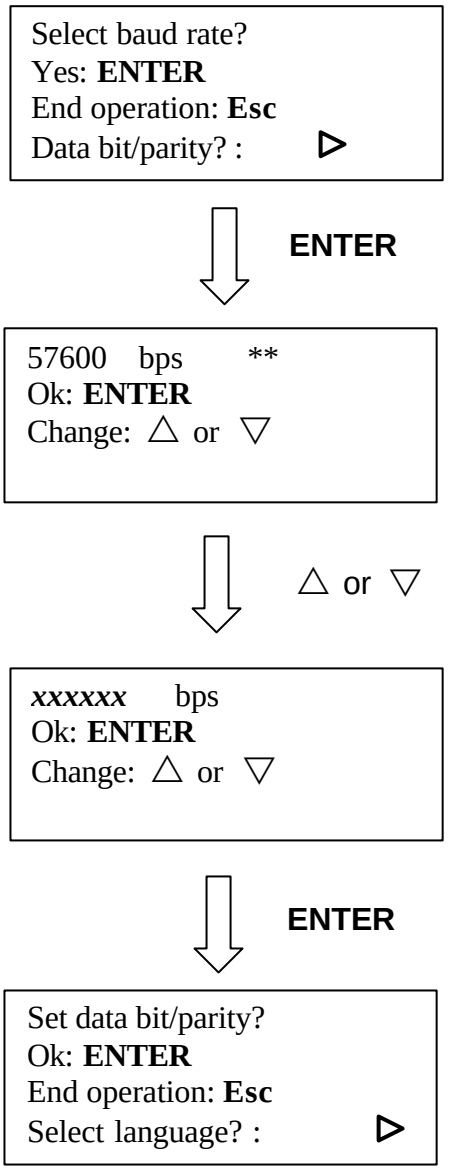
NOTE: ** means default or current setting.

- Select baud rate?

  Baud rate is to determine the speed of data transmission to communicate with the host computer.

  Setting range: 9600, 19200, 38400, 57600, 115200

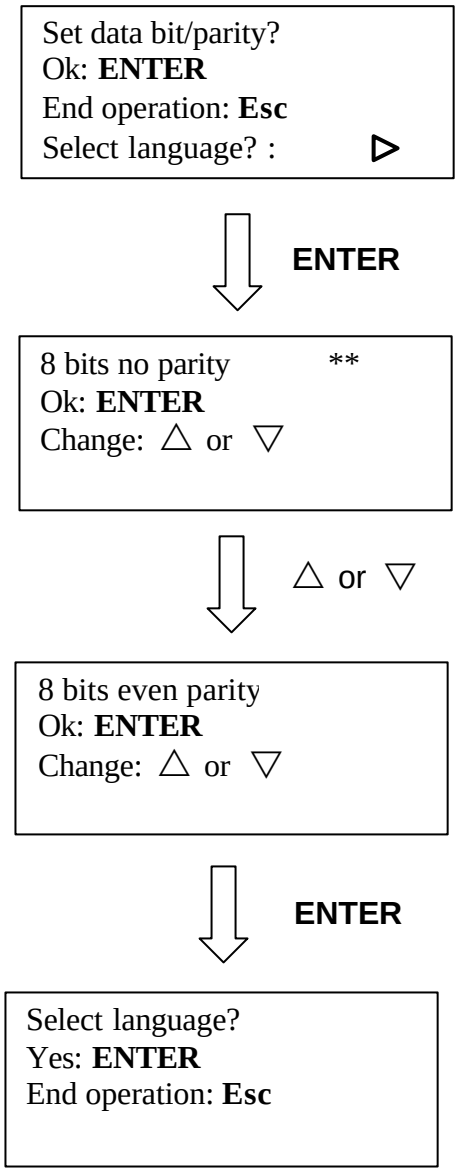
  Defaults: 57600



NOTE: ** means default or current setting.

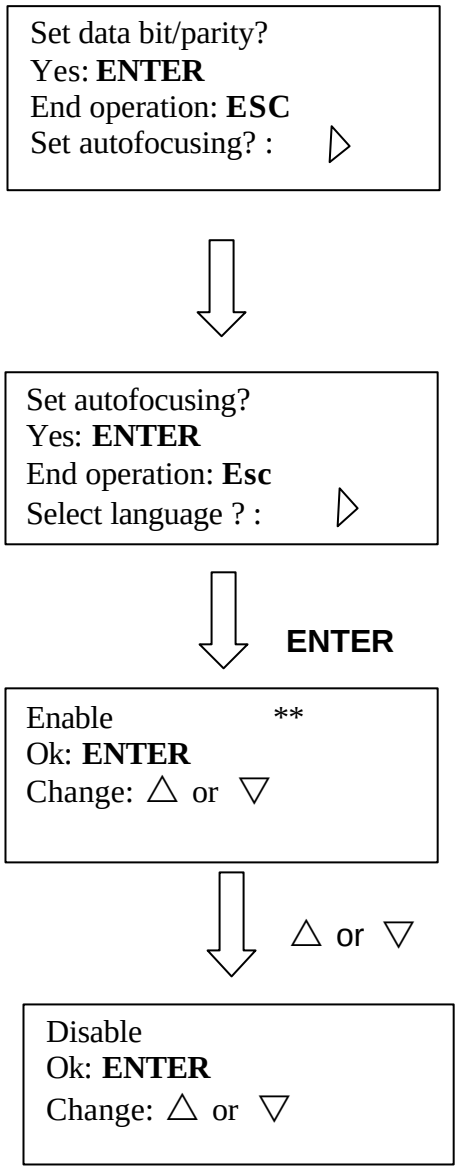
- Set data bit/parity?

  Data bits refer to the size of one block of data and **parity** is used to check if data was received correctly or not. The **data/parity** feature is to adjust the byte format and parity type in order to communicate with the host computer.

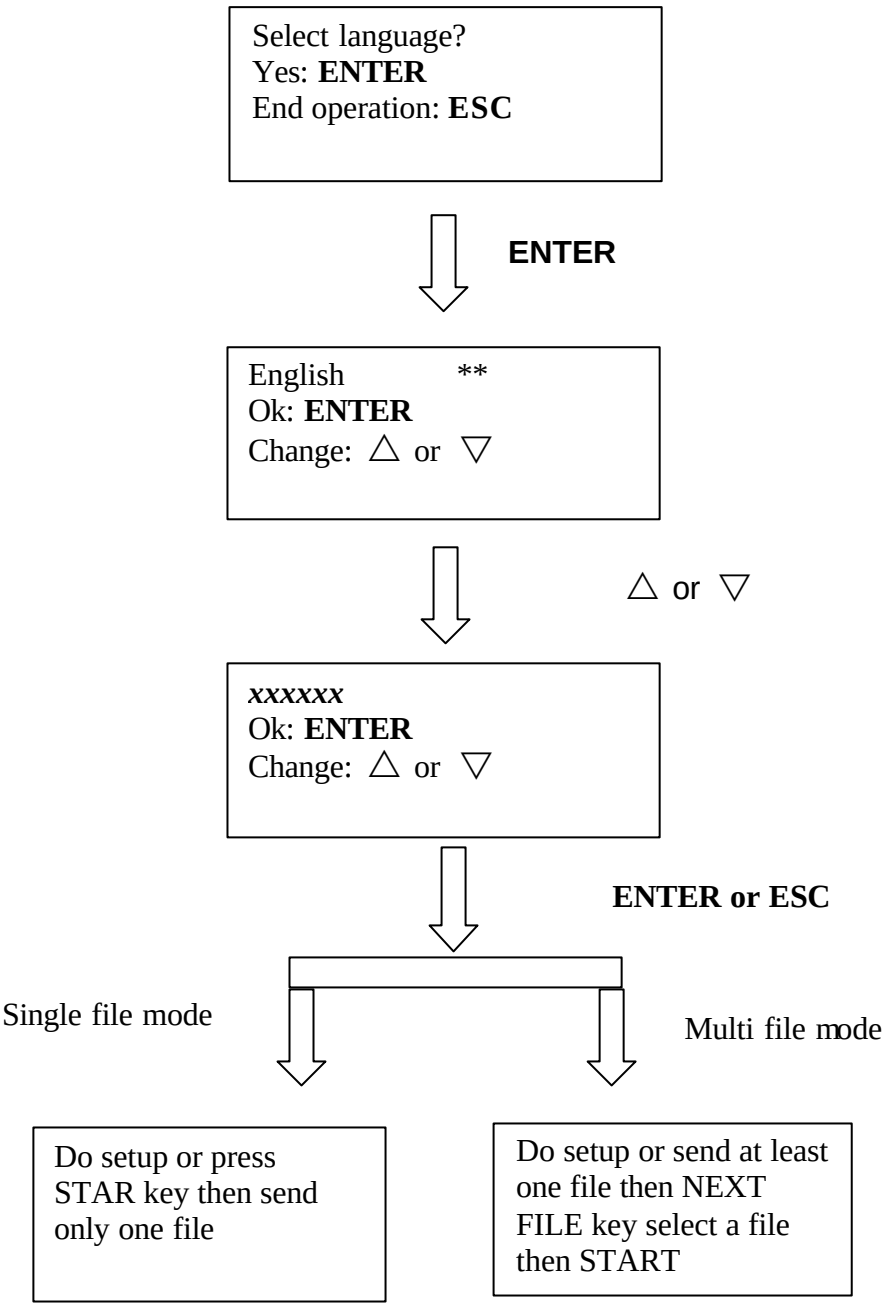


- Enable/Disable auto focus

The manufactures' default is **Auto-focus** enable. If **auto-focus** set as disable, the working table will not lower down automatically as soon as power turned on.



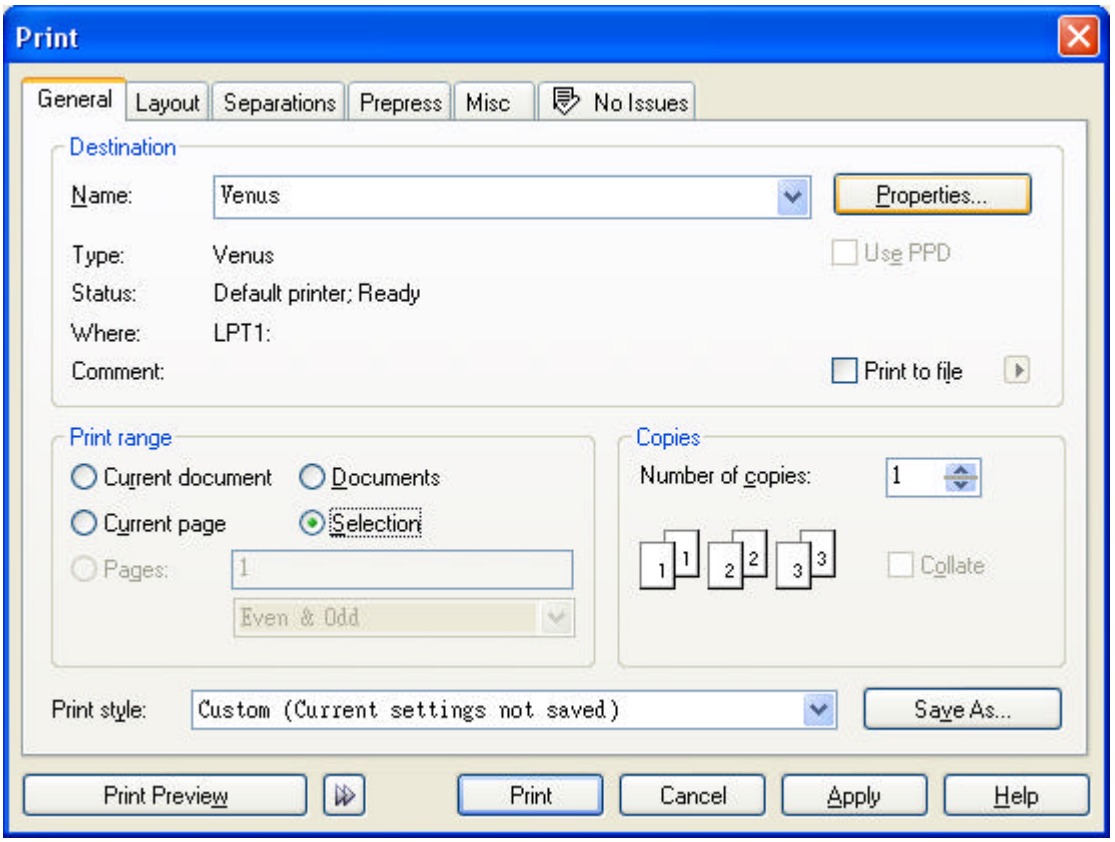
- Select language?



NOTE: ** means default or current setting.

Software Operation

After completing your editing job choose **File** ⟶ **Print,** click **"Properties"**



Mode:

A. Black & White mode

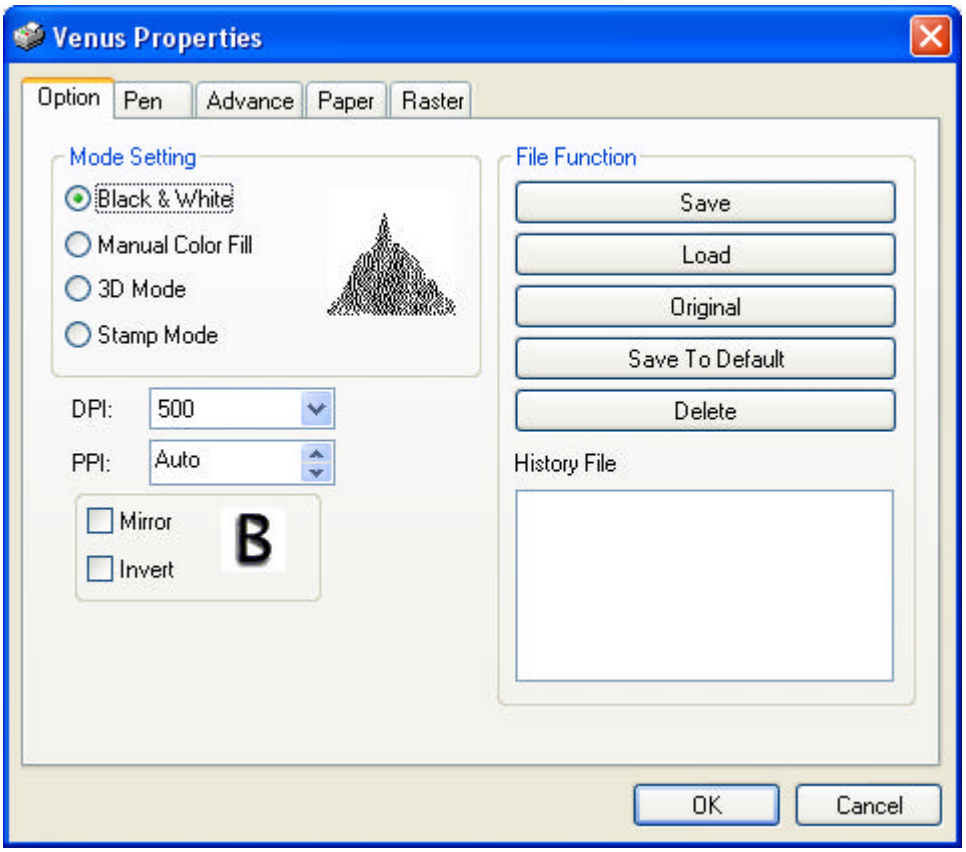
Let you obtain half-tone effect quickly without going through complex steps of application software (operating procedures shown as a) Editing file, and b) Engraving, on the following paragraph) to obtain the similar effect. You can choose the look of the laser engraved photo by applying one of the driver software' s halftone options.

- **Dithering**

  The gray areas of image will be filled with from a 5-grade halftone with 2x2 dots to a 65-grade halftone with 8x8 dots. 8x8 dithering type would presents the image into different shading effect than the 2x2 dithering, while the 2x2 dithering type would have smaller dots than 8x8, that produces higher resolution. The dithering type choice would depend on the image and application

- **Enhance Dithering**

  The enhance dithering as what it reads would help to compensate the shortage of smaller grade halftone type, such as choosing 2x2 dithering type and enhance dithering at the same time, the image would be printed with 256-grade halftone and 2x2 dots. Therefore, better shading effect with small 2x2 dots/ grids.



- **Error Diffusion**
  The error diffusion presents the shade of image as a shade of image as a spread halftone instead of dots, therefore more detailed.

- **Pattern Type**
  The halftone pattern has three kinds of layout options, which determine the shape of each grid/ dot to compose the shading effect of raster image.

  a. **Dot:** A halftone pattern consists of circle dots.
  b. **Corner**: The dark dot spread from the left upper corner of the pattern result in a little triangle shape to imitate a shading effect.
  c. **Bayer** : A random halftone pattern.

NOTE: Black & White mode is the easiest way to get the half-tone effect. However if a higher image quality is required, please refer to the following steps operated by **CorelDRAW V. 8.0 and after.**

a) Editing file:

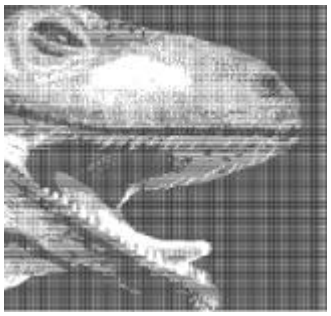
Layout → **Page Setup** → **Set from Printer, Landscape** → **OK** →
Edit desired file (picture etc.) → **Bitmap** → **Transfer to Bitmap**,
256 shades of gray → chose proper DPI → **OK** →

Bitmap → **Convert to** → **Black and White,** choose **error diffusion** → **OK**

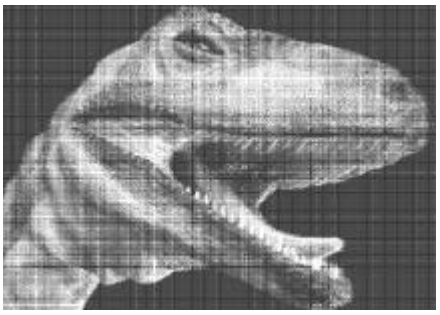
b) Engraving (Printout):

File → **Print** → **Properties,** choose **Options** and the default mode is set up at **Manual color fill** then set up proper resolution, power and speed → **OK**

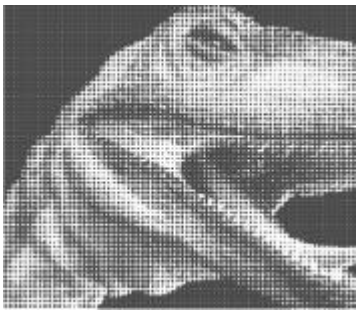
NOTE: Please refer to "**NOTICE**" of **Quick Menu** in the front page.



2*2 dithering

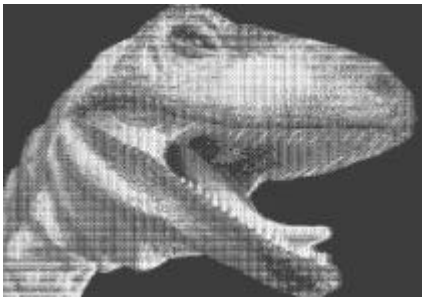


4*4 dithering

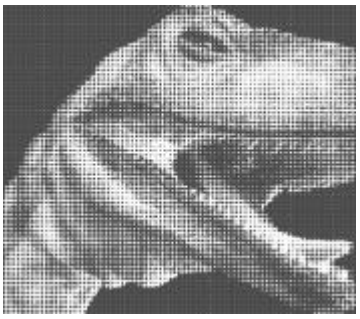


8*8 dither

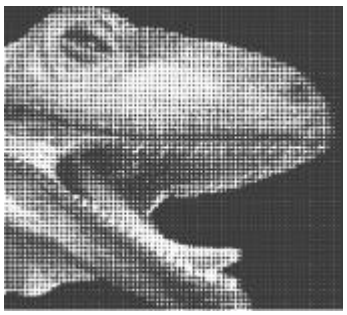
Error Diffusion



2x2 Enhance Dithering

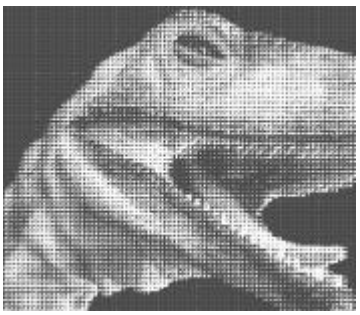


8x8 Enhance D



Dot

Bayer



Corner

B. Manual color fill

Each power and speed setting can be linked to certain color on the layout. Totally 16 color settings arE available. The desired color can be adjusted by changing the ratio of Red, Green and Blue. If the speed or power is set to 0, the corresponding color area or vector line will be invalid.

C. 3D effect

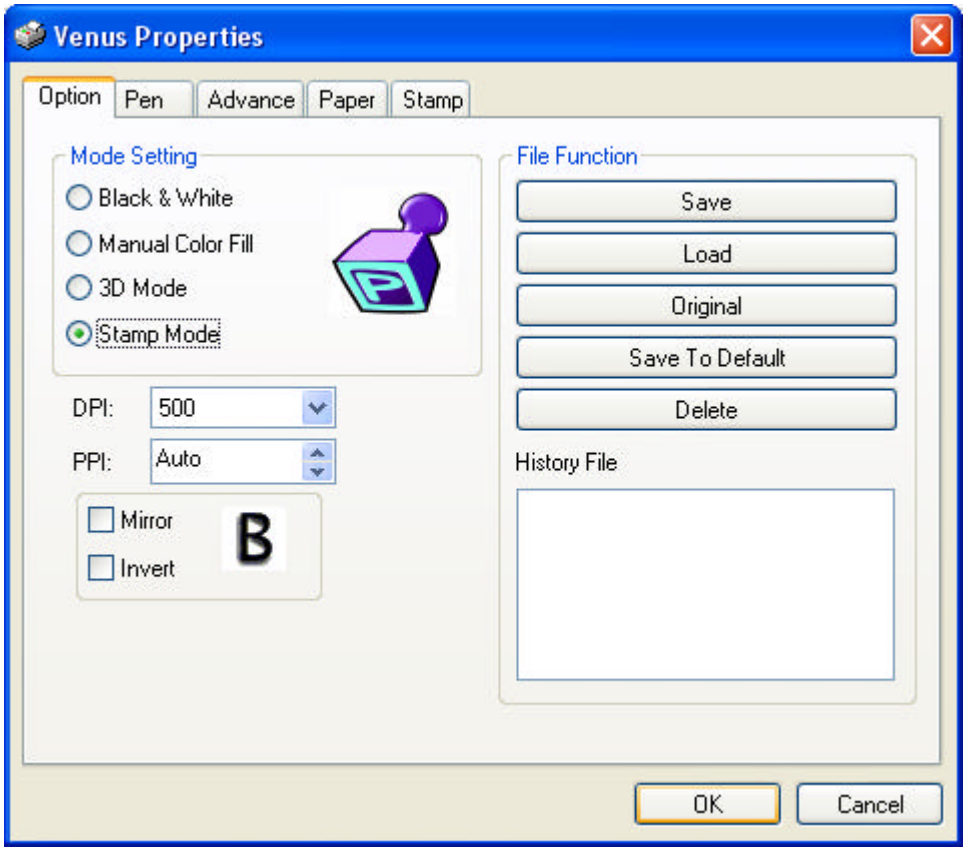
With this function, we can get the sculpture effect. The engrave image must have gray levels as following photo shows. The engrave image is effected by PPI, DPI, power and speed setting. Please refer to Appendix for parameter settings suggestion.

3D Image File

Sample/ Material: Density Board

D. Stamp Mode

Mainly used in rubber stamp production. Create a slope base of stamp characters by setting up the **stamp parameter**. Normally the pitch number for engraving a 2~3mm thick rubber pad can be set at 0.2 or 0.3. The smaller the pitch number, the sharper the slope. If setting the pitch number at a very big value, it may take for a very long time for the math calculation.



- **Pitch Value & Shoulder Power Setting**

The finished stamp will be a reversed image with engraved depressions and ridges. Many of these ridges may be too thin and would break off or be unstable. Creating pitch is a way to add support to the thin lines and ridges. The pitch value setting allows you to adjust the width of the ridges. Broad pitch gives the maximum amount of support for each ridge. Experiment with different pitch value

settings in order to produce the stamp that is best suited for your application. You can specify the size into the pitch box under stamp mode and adjust the bar to specify different laser power level for shoulder.

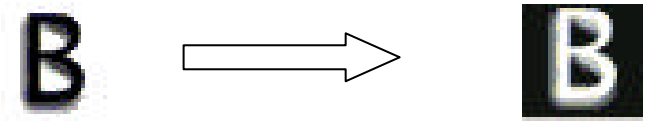
- **Add Border**

You may wish to include a thin or wide border around the outline of your stamp. This can be done by creating outline greater than .001" thickness around the image. When the Mirror setting is selected, this outline will automatically be reserved as a ridge that does get engraved.

- **Image Invert**

The Invert mode will reverse the black and white outlines and fills in the selected image. Black will become white and vice-versa, thus creating a high area that will be covered with ink when the stamp is put to use. This function is disabled when the Manual Color Fill mode.

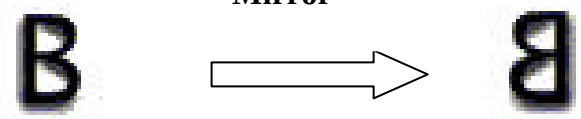
Invert



- **Image Mirror**

When using a stamp, the image needs to be reversed or mirrored in order to show up properly when the stamp is in use. This setting will transfer right to left and vice-versa.

Mirror

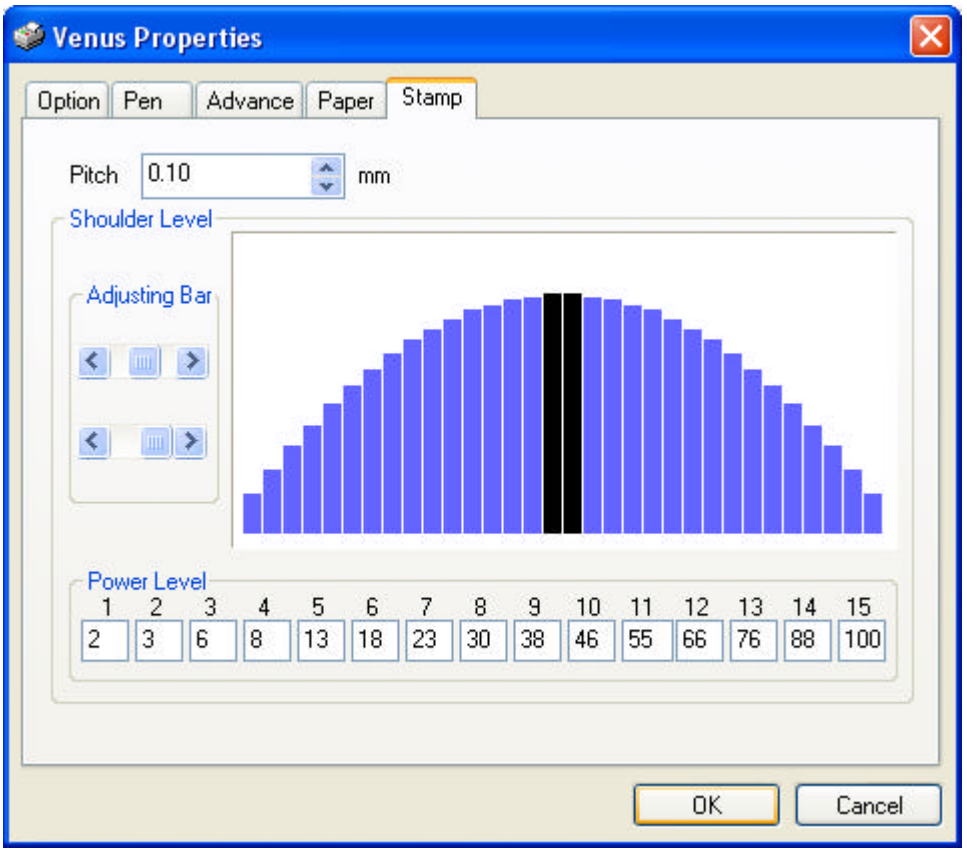


- **Cutting out the stamp**

To cut the finished stamp, create a thin(0.001") red line on the outline edge of the border or where ever you wish the stamp to be cut. The vector setting will always be performed after the engraving is complete.

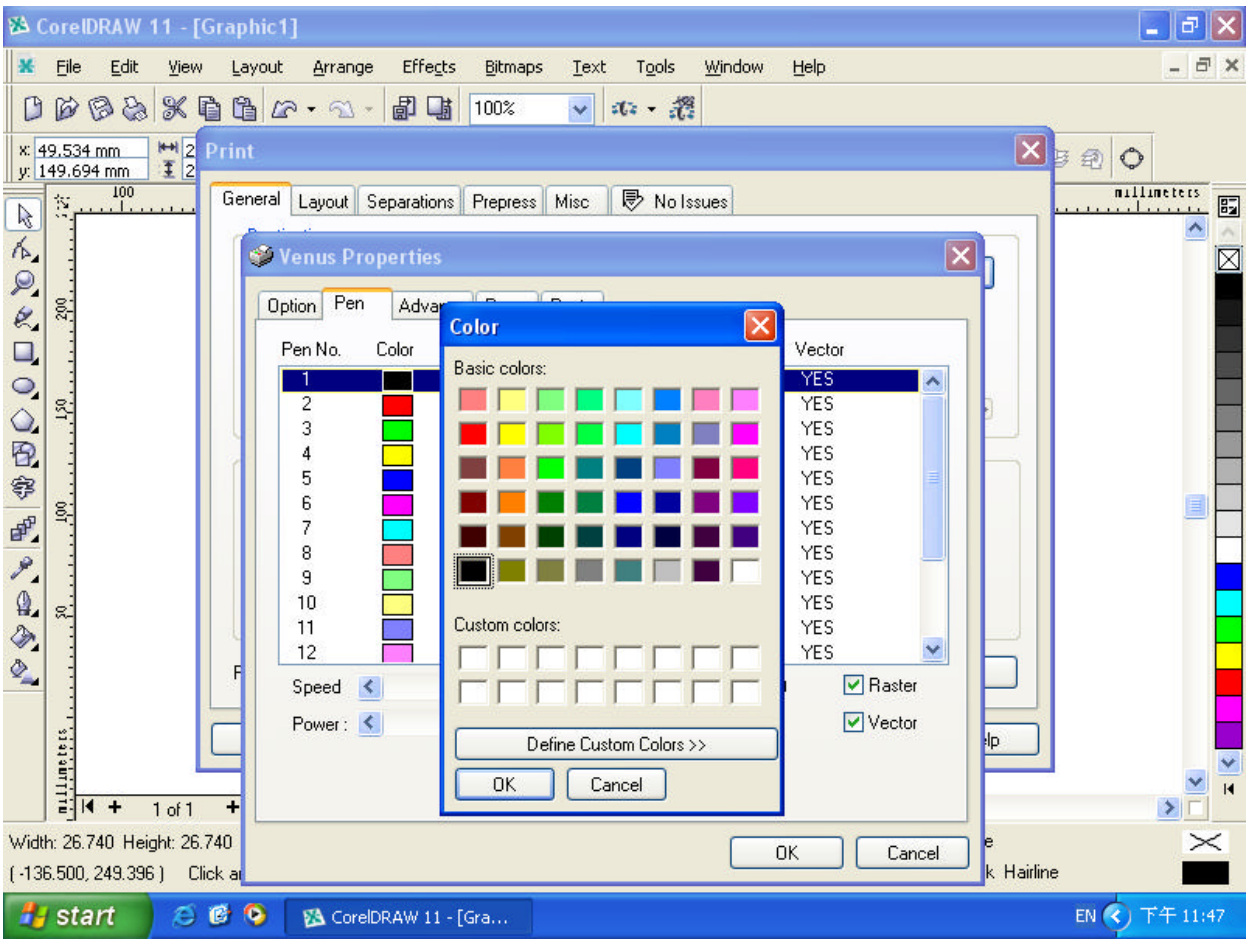
- **Stamp Production**

You may wish to create a full sheet of duplicated rubber stamps in order to have them all engraved at once, saving on material cost and operational time. To do this, copy and paste the image enough times to fill the page size that is smaller or equivalent to the working table and the rubber sheet. Next make sure that the image is mirrored, inverted and that the appropriate should, border, power and speed settings are in place.


Venus Properties
Option
Pen
Advance
Paper
Stamp
Pitch
0.10
mm
Shoulder Level
Adjusting Bar
Power Level
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
2 3 6 8 13 18 23 30 38 46 55 66 76 88 100
OK
Cancel

Parameter Settings

The LaserPro Venus allows users of 16 different colors to represent 16 different power and speed settings when cutting and engraving. These colors are referred to as PENS. Try to think of each pen as a designated laser setting, rather than as a color. An image that is only black and white will use only one power and speed laser setting (Black). An image that includes black, red and blue colors will use three different assigned power and speed settings. In order to utilize up to 16 different pens, make sure your graphics program uses the 16 colors recognized by the driver.

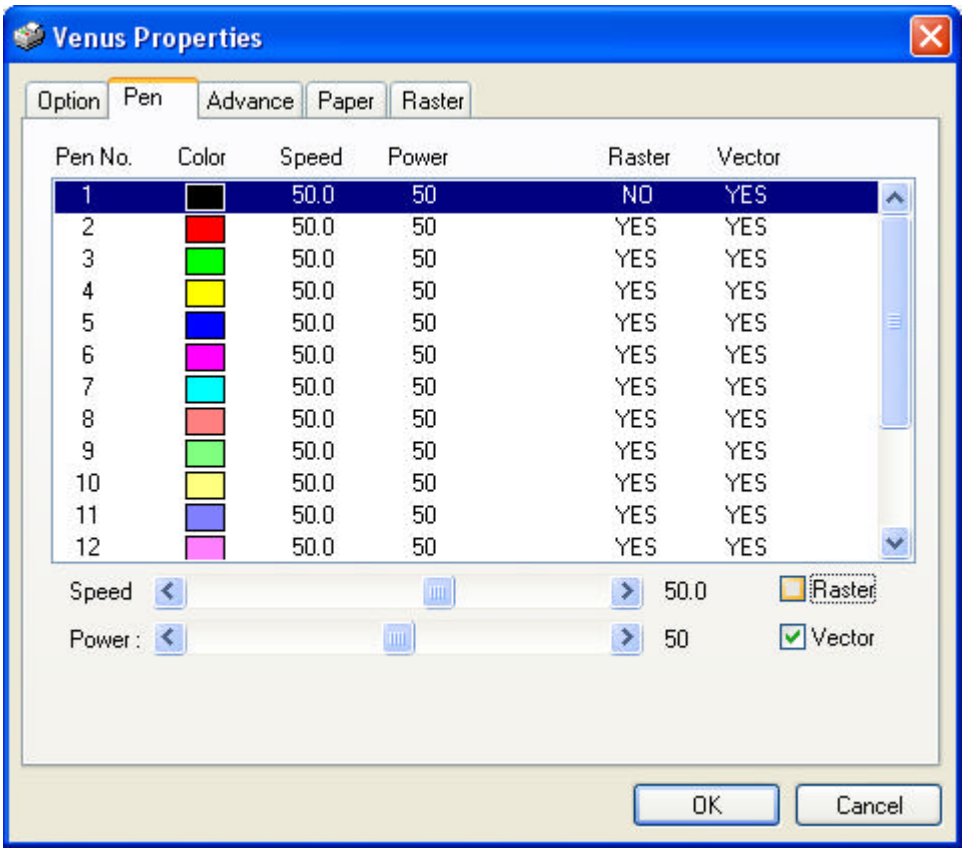


A. Pen setting

There are 16 available pen settings to match a specific laser setting with the different colors used in the graphic image. If your image uses black outlines, and red and blue color fills, then the driver will instruct the laser to use three different power and speed settings on the three distinct areas. The speed and power settings designated to each pen color, will represent a proportion of the master control speed and power settings. If you would like to use a color not included in the driver's original 16 colors, please double click on the specified pen and the color manager window would jump out then you can select the color you would like to apply.

B. Speed

Speed setting here determines the speed of laser's motion system during operation. The range is from 0.1% ~ 100%. 100% speed is equivalent to the fastest speed and will be the speed that the motion system travels when cutting or engraving straight lines. The machine will automatically slow down when it is cutting or engraving curves.



C. Power

Power setting here would decide the laser' s power during operation. The range is from 0.1% ~100%. The percentage represents the power of each laser pulse fired. Power and speed work together to determine the depth of a cutting and/or engraving. Higher power and slower speeds will produce the deepest engraving.

D. Raster Vector On / Off

Each color in the graphic image may include a variety of color fills and very thin lines. It is then possible for one pen color to require both raster and vector modes. Turning either Raster or Vector off will force the driver to ignore the pen color's fills or thin lines. You can check the Raster or Vector box to turn on / off the function.

E. DPI – Dots Per Inch

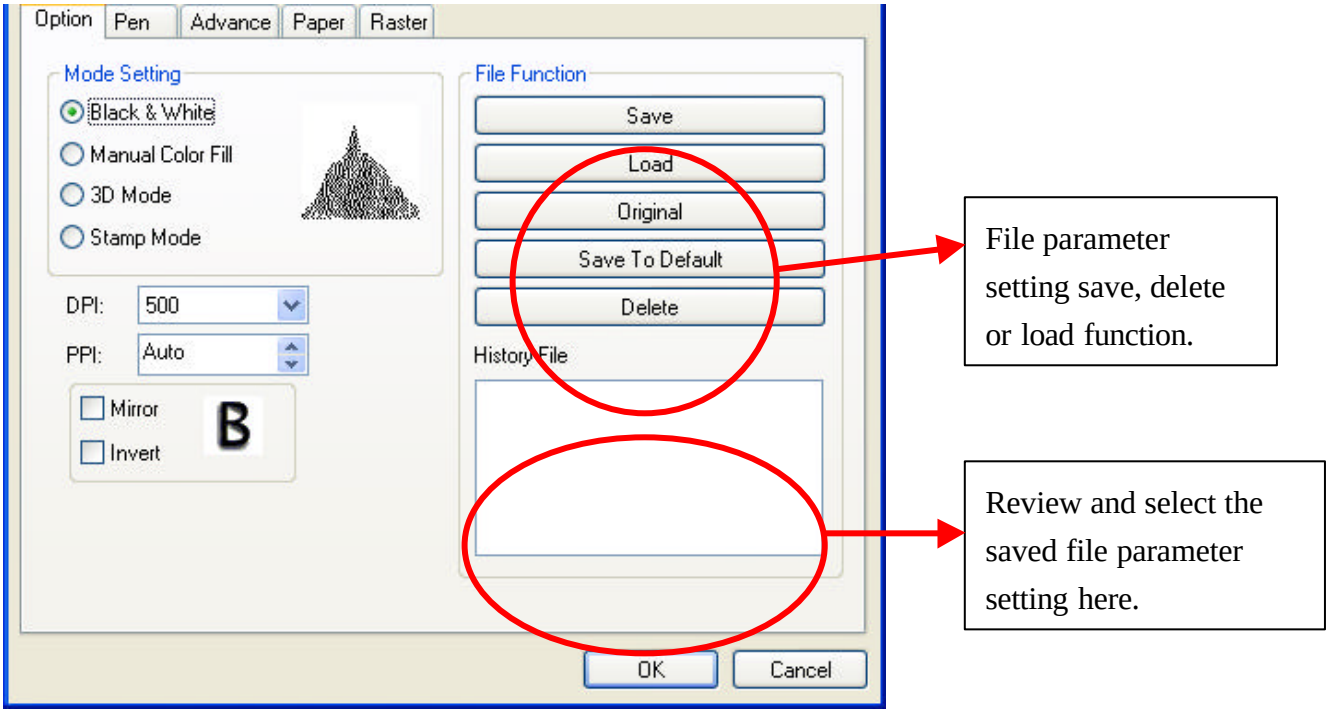
This setting determines the quality of image resolution was using the raster engraving. DPI can also referred to as horizontal lines per inch or fill spacing. The amount of raster strokes per vertical inch of travel will affect the image resolution of the engraving. Higher DPI settings will have cleaner and deeper engravings, but will take longer to complete. Lower DPI settings will have coarser and more shallow engravings, but will take less time to complete. Experiment with different settings to get your desired effect. You can find the DPI function at Venus driver- Properties- Options.

F. P.P.I.-- Pulse Per Inch.

- Purpose: By changing the laser firing pulses per inch, the distribution of energy would be changed.
- The adjusted range is 30 to 1500 PPI or you can choose auto mode. When choosing auto mode, the system will come up with the proper PPI value automatically. In order to maintain the quality of raster graph, the PPI value will at least equal to DPI value automatically even you set the lower PPI value than DPI value.

G. Save Parameters Setting

Each job may require unique Mercury driver parameter settings. After you have adjusted all of the settings, remember to save it in a desired location for future use. Press the SAVE icon and save the parameter settings to the proper directory as wished or default for all applications, then you can see the saved files shown in the History Files column. You can access your saved settings by clicking on Load or by using the History scroll, which keeps track of the settings most recently used.



Note:

a. These editing options can be saved in image files such as CoreI Draw graphics with printer driver parameters setting inside or can be saved a s the default settings in Mercury driver for future files.

b. Please make sure your ID to log in the computer is set to “Administrator ” level, therefore OS of 2000/XP can allow you to save parameter settings.

Paper

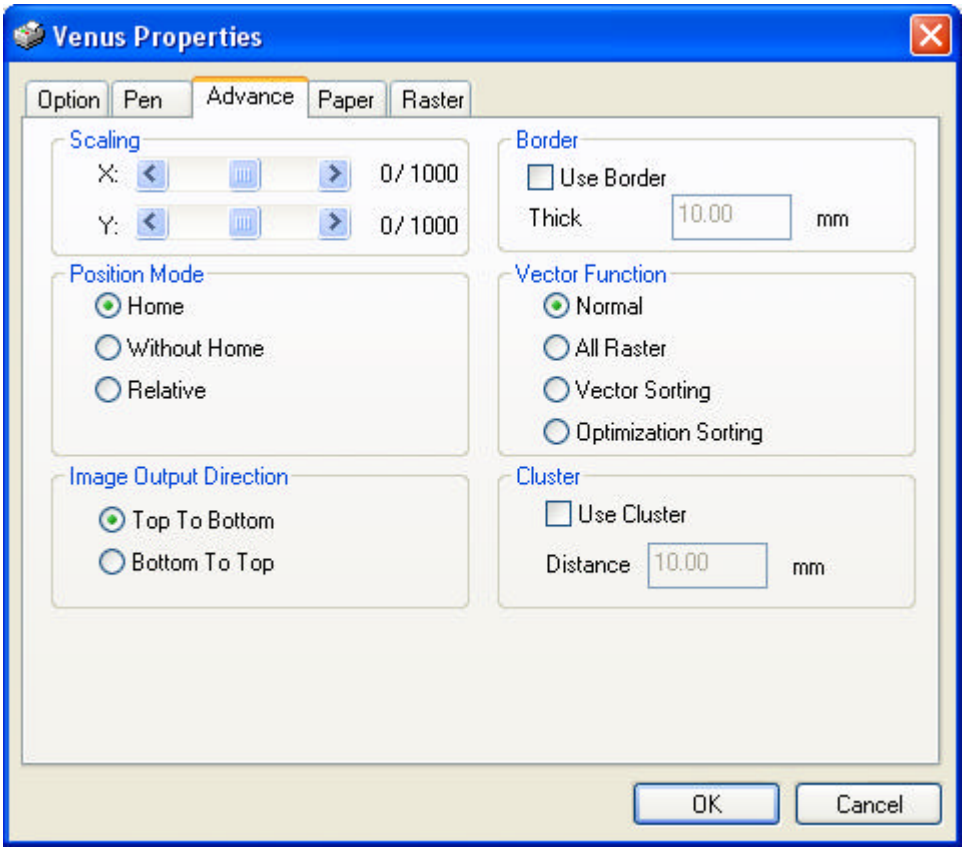
- Paper Size: Set up the working size for engraving.

- D-2 Unit: You can choose the unit measurement either with metric or imperial inch.

- Scaling Function
  Apply this function to adjust the difference in size between the object in the page of software and the real object engraved. Scale can be adjusted up to ± 50/1000. Positive value is to enlarge the size, negative to reduce. For examples, adjust the scale by +10 to enlarge the object' s size by 10/1000.

Advanced Function

- Position Mode
  - **Home** - Focus carriage goes back to the upper right position after finishing a job.
  - **Without Home** - Focus carriage stops at the last position of a data file. You can engrave inside a bowel or a concave object to prevent hitting the object.
  - **Relative Move** - You can place the focus carriage at any place you want to start a job. When finishing a job, the focus carriage will move back to the starting point. You can engrave inside a bowel or a concave object to prevent hitting the object.



- Image Output Direction

- **Top to Bottom**- The laser would engrave from top to bottom of the image.
- **Bottom to Top**- Normally, the LaserPro engravers from top to bottom, left to right. Selecting Bottom Up will force the machine to start from the bottom and work its way to the rear of the working table. Some laminates will produce dust that may get lodged in the engraved area if the machine engraves from top to bottom. Since the exhaust system is located at the rear of the machines, the dust will be sucked away from the engraved area.

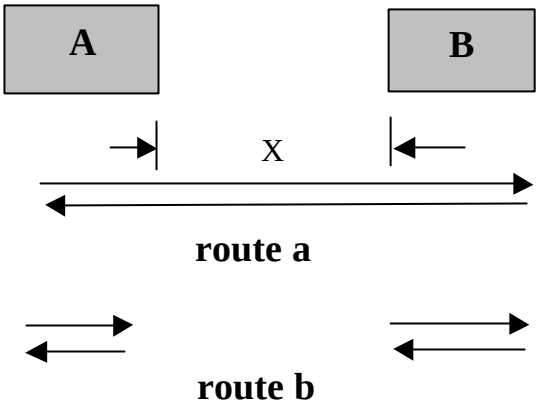
- Vector Setting
  - **All Raster** – when choose "All Raster Output" to print graphic including vector line and raster image, the laser would take the vector line as raster data and print the whole graphics as raster engraving image.

  - **Vector sorting**- When your image has one vector cut area enclosing another vector cut area, this setting will automatically direct the laser to cut out he inside enclosure before moving to the outside image.

  - **Optimization**- This is another setting that will automatically cut down on operation time. When selected, the Venus driver will analyze your image and find the most efficient passing route to complete the job.

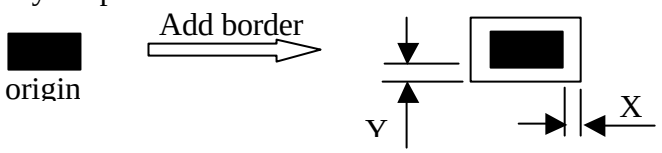
- Cluster

In order to reduce the working time, the output movement can be clustered under stamp mode. Suppose the "Distance" you specified is D and the distance between graph A & B is X. If you chose the function "Cluster" and X > D, the output movement will be route b. If you don't chose "Cluster" or even you chose "Cluster" and X = D, the output movement will be route a.



- Border

You can add border at image edge for a better output of the stamp image (refer to Fig. 19). You must select "Image Invert" (refer to Fig. 16) under stamp mode when using border. As for Fig.17, you can specify the border X and Y. If you chose the "Cluster" and want to have border, the border X and Y must be less than the "Distance" D you specified.



VI. BASIC MAINTENANCE

Caution:

- Keeping the optics and motion system clean is essential to an excellent quality engraving and the reliability of your engraver. **Please clean Bearing track and X-axis (DU) bearing daily to maintain good condition of machine.**
- Never pour or spray any liquid directly onto the laser system.
- Turn off the power and unplug the system before cleaning.

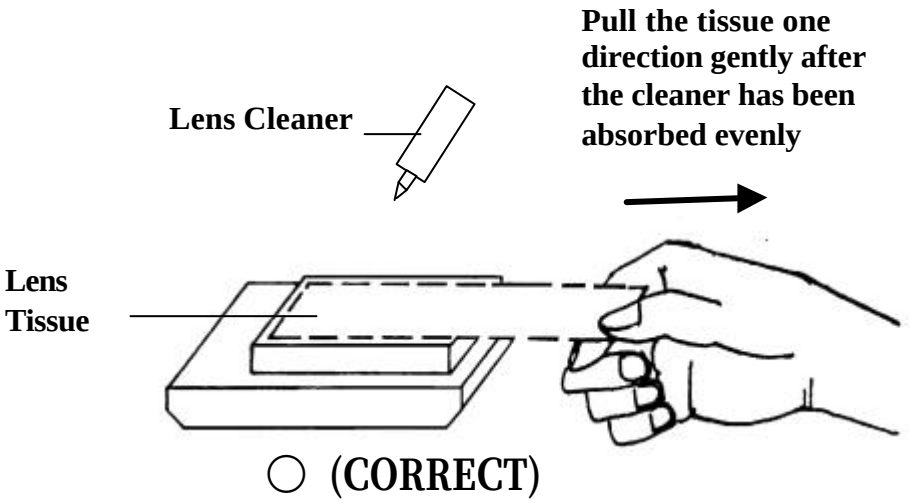
1. **Inside the System:** Open the top door, the front door and the back door (if necessary). Vacuum to clean inside of the engraver and vent area thoroughly.
2. **Engraving Table:** Dampen the paper towel or cloth with alcohol or cleaner to clean the Engraving Table.
3. **Motion System:** Dampen the cotton swab to clean the rails of the Motion System. Get rid off any debris built up in the bearing tracks.
4. **Bearings:** Hold a dampened cotton swab against the bearing and moving the motion system by hand to clean each bearing.
5. **Mirrors and Lenses:** The focus lens and the mirror located on the carriage are the two components most likely to require cleaning once a week.

Caution:

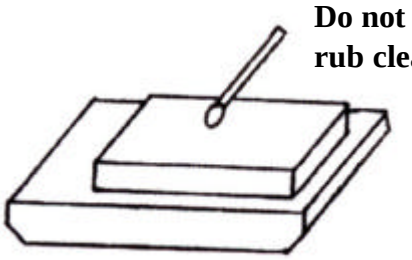
Don't scratch out the soft coating of the mirror's surface. Excessive cleaning the mirrors and lenses may cause damage and reduce the life of the mirror (refer to Fig. 21).

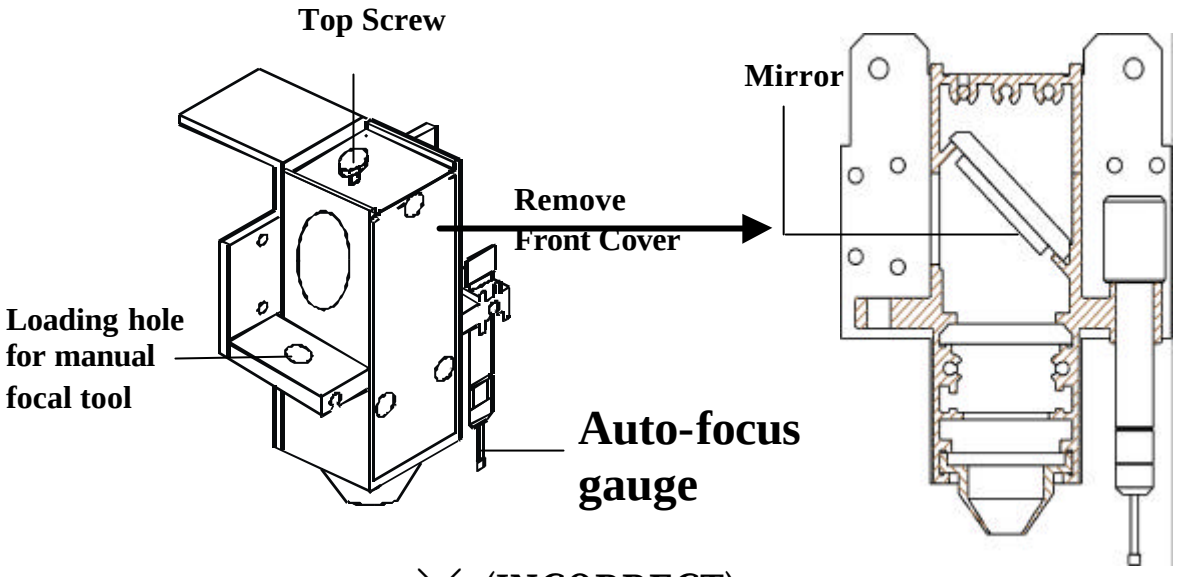
Clean the mirror -

1. Unscrew and remove front cover of the focus carriage. Release the top screw and pull out mirror carefully
2. Put lens tissue on the mirror and drop a little lens cleaner on the middle area of the tissue, after the fluid has been absorbed evenly, pull the tissue **one direction** gently to clean the mirror.
3. Let it air dry and re-install it.
4. Unscrew and remove the dust prevention box then clean the #2 Mirror, #4 Mirror and #1 Mirror same as above process separately.



○ (CORRECT)





× (INCORRECT)

Clean the focus lens –

1. Unscrew and remove the front cover of the focus carriage. Pull out focus lens carefully
2. Flood the focus lens with lens cleanser on both sides then using a cotton swab or lens tissue to dry off the remaining solution gently.
3. Do not touch the lens surface with your bare hands or press down hard with any cleaning material.

VII. TROUBLE SHOOTING

Quality Problems

- Check focus length set under the function key to see if it matches the type of the lens installed.
- Focus Lenses are not installed correctly. Focus Lens loose in the holder.
- Debris or dust builds up in the bearing tracks or X-Axis rails.
- The focus lens and the mirror in the carriage are damaged or need to be clean.

Non-operational Problems

Laser beam does not generate

1. If the red alignment beam is not revealed, the laser beam is misalignment.
   Adjust reflection mirrors for exact focus.
2. If the red alignment beam is revealed, please check the driver power. The laser power may be too low to be detected. Please increase the percentage setting of
   the Laser Power from the software driver or the control panel.
3. Please check if the laser power connector is loose.
4. For safety purpose, the laser beam will not be generated when the top or front door is opened unless you short the connector of the magnetic switches.

APPENDIX I. Specification

VENUS	V-12	V-35
Laser Source	**12W**	**35W**
	Sealed CO_2 laser	
Work Area	**11.8"x8.3" (300mm × 210mm)**	
Max. Working Piece (W×D×Thick)	**14.2"x11.8"x2.8" (360x300x70mm)**	
Table Size	**14.2"x11.8" (360x300mm)**	
Overall Dimensions W×D×H	**24.4”x17.1”x18.1” (620x435x500 mm)**	
Weight	**32 Kg / 70 lb**	**37 Kg / 81 lb**
Drive	**DC servo control**	
Speed Control	**Adjustable from 0.02 to 20 inch/sec with up to 16 colors linked speed setting per job**	
Power Control	**Adjustable from 0 100% and 16 colors linked power setting per job**	
Z Axis Moving	**Automatic**	
Resolution (DPI)	**1000, 600, 500, 300, 250, 200**	
Computer Interface	**Print port and serial port for PC**	
Memory Buffer	**16MB standard upgradable to 64 MB with SIMM modules. Multiple file mode saves up to 100 files.**	
Display Panel	**4-line LCD display showing current file name, total working time. Laser power, engraving speed, file loaded into memory buffer, setup and diagnostic menus.**	
Power	**100 240V, AC Auto Switch**	
	10Amp	
Cooling	**Air-cooled**	

** Above specification is subject to change without prior notice.

Optional Items: Odor Reduction System
Air Assist System
Compressor for Air Assist System
Dust Prevention Window
Goggle

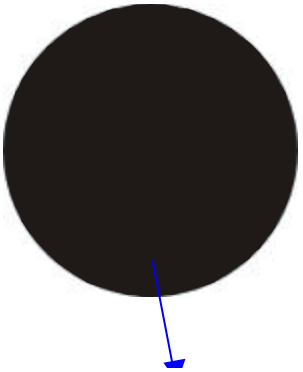
APPENDIX II. 3D Function

Tip for 3D Application

When doing 3D sample on LaserPro, acrylic or MDF wood are ideal materials for the purpose. For acrylic the suggested PWR is 100%, SPD around 30%(depends on how deep you want to cut).

The perfect image for 3D is like those shown below. When image is ready, choose 3D Effect as the output mode in the driver. Sometimes, some material shows better effect if you run the job with 2nd pass with laser out-of-focus. Especially with acrylic, the 2nd pass will smooth out the surface.

For engraving wood, as it burns easily and leaves blackened surface after the 1st pass, it is necessary to run the 2nd pass to remove the burned surface. To do that, simply fill the image with black colour as the mask (see below) and Run the black mask image with PWR 100% and SPD100%.



Create a black image for polishing

3D engraving / Material: 1cm Acrylic by Venus 12W Lens: 1.5 inch

Step	Speed	Power	DPI	PPI	Focus	Remarks
1	13%	100%	600	auto	Auto Focus	3D Mode Engraving
2	13%	100%	600	auto	Lower down table 2.5mm	3D Mode Engraving

3	100%	100%	600	800	Lower table again 2 mm	Black and White Mode Polishing
4	0.1%	100%	500	auto	Move table up 1.3mm	Cutting off