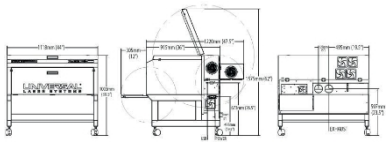
Mind- And Makerspace

Instruction sheet for laser
Universal PLS6.75

Laser cutter specifications

The PLS6.75 is a freestanding platform with a material handling envelope of **813 x 457 x 229 mm** or 84,950 cm³. The single laser platform supports a 10.6 µm **75-watt CO2 laser**.



STEP 1: Preparing vectorial drawing

VECTOR

EPS PDF
AI SVG
CDR DXF
CGM

RASTER

PCX BMP
GIF JPG
TIFF PNG

To cut and line draw, the drawing must be are structured as **vector drawings**. To import the files into the laser cutter driver, you need to save your document at **scale 1/1** (actual size) in **PDF**.

>> This means that text should be converted into letter outlines or vector lines.

>> Images should be overlaid in vector drawings.

>> TIP: check your file for colour (RGB) and line thickness.

STEP 1: The laser cutter works by colours and line thickness.

COLOURS:

>> **BLACK** (and greyscale): screening (full-flat screening)

>> **RED** (RGB, R=255, G=0, B=0): cut

>> **BLUE** (RGB, R=0, G=0, B=255): engraving (cutting with light laser power and high speed creating lines: is faster than rasterising)

LICENSE:

The line width should be set to the **thinnest line width**.

>> AutoCAD: **0.00 mm**,

>> Inkscape and Illustrator: **0.025mm**

>> Archicad: save As... pdf and under document properties select ☑**Hairline**

STEP 2: PRINTABLE file

It is best to save your vector drawing for the laser cutter in **PDF** (full size) or, if you are working in Illustrator, in AI. There are also other options: EPS, SVG, CDR, DXF, CGM to import into Illustrator or Inkscape.

A photo can be lasered using our photo software '***1-Touch Laser Photo***'.
To do this, save your image in .JPG, .PNG ... Make sure the contrast values are high enough and the quality is high enough.

STEP 3: Forward drawing (PDF) to the laser cutter.

1. **Open your PDF** with Adobe reader and **check** if everything looks good.
2. **FILE >> PRINT >>** choose **PLS6.75 >> OK** (your drawing has now been sent to the laser software).
3. **Open UCP in the desktop toolbar or by clicking on the red icon at the bottom right: your drawing will be ready.**
4. **Check if all lines are visible in the laser software** (do you see red, blue and heavy lines?)

   >> Adjust the position of your shape. Always take at least 7mm margin from the side

   Enter as X and Y values 7mm and press the large enter key to move your shape

   >> You can start duplicating your object according to X-axis and Y-axis (Array).

STEP 4: Laser cutter settings (Power and Speed)

1. **Open the settings via the 'SETTINGS' button** and click on **Material Database**

2. **Choose the material of your piece.**

   >> MDF = Natural > Wood > Medium Density Fibrewood

   >> Poplar plywood = Softwood general

   >> Plexi = Plastic >> Acrylic >> Cast acrylic

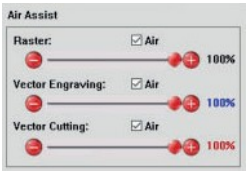
3. Enter the **thickness** of the **sheet** in mm. The laser cutter will automatically focus its focal point at the correct distance. >> **Thickness**

>> TIP: In the second tab of settings (manual control) you can manually adjust power and speed to achieve a different result

>>> You can also choose to engrave only (blue, black) without cutting: then tick '**skip**' at the red lines.

>>> You can also save your print settings with 'save'

4. **Air assist**:tick, and move all the bullets up so they are at 100%



5. Click on '**Apply**'
6. Click on **OK**

Exception: Rubber

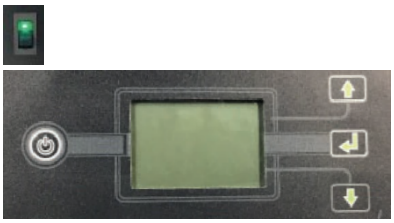
1. **Adjust settings at print settings in Adobe Reader**

   >> At printer setting select: Document & Stamps

Exception: Photos

1. **Via photo software '*1-Touch Laser Photo*'**

STEP 5: Switch on and adjust air filter



1. Connect the air filter with the **switch** at the back
2. Then press the front **power button**

STEP 6: Turning on the laser cutter

1. Turn on the laser using the **switch** on the right side.
2. Open the flap and check the **position** of the **cutting bed**:check that it lies nicely in the upper-left corner.
3. Put your **plate** on the bed in the top left corner, well **in the 0-point** slid.
4. Close the flap.

>> **TIP:** For complex shapes or precise alignments on existing objects, it is best to first make a **mould** in a sheet material on which you then lay your object or complex shape.

STEP 7: Forward drawing to the laser cutter.

1. Check again if everything is correct.
2. **On the computer,** press the **big green 'play' button**.
3. The laser now starts cutting.

Always stay nearby! (!!! Fire hazard!!!)
>> **TIP** If it doesn't do what you want, you can stop the laser by pressing the red 'pause' button on the laser itself.

>> **TIP:** You can always test your laser job first on a residual piece & only then on your final plate. Make sure you keep/set the right thickness.

STEP 8: Check workpiece and touch up if necessary.

1. Open the cover of the laser. **Without touching the workpiece, check** if the engravings are sufficiently strong and if all layers/ colours were executed.
   >> Is something **wrong**? Then leave your workpiece and you can have a layer re-cut/ engraved/ r asted while it is in the same place.
   >> Is it **correct**? Then you may take out your piece of work.

STEP 9: Aftercare machines and computer

1. You turn off the air filter using the power button. Then you turn off the switch at the back of the air filter as well.
2. You switch off the laser if it is not to be used after.
3. **You remove all scraps from the laser bed**.Wood waste is allowed in the blue barrel.
4. You write down the consumed material (even if not usable) and the welding time along with your name and date. You hand this over to the educator or administrator.

STEP 10: Sorting residual material

FILTER

Plates that are no longer usable may go in the bin.

>> Blue barrel is for wood

>> Small bin is for plexi and other waste.

SMALL RESTS

Do you have a small piece of plate left over and can't use it yourself? Then you may put it in the rack of leftovers in the laser lab. These pieces are ideal for doing tests on or lasering out small objects.

LARGE REST

Do you have a large piece of plate left over and can no longer use it yourself? Give them to our administrator, which will then be used by schools or organisations.

Points of attention laser

If there is excessive smoke in the laser cutter cabin, you should **pause** the job **immediately.**
Check the following items:

>> Is the air filter working properly?

>> Is the laser table filled with too much debris so that the air cannot be adequately exhausted?

>> **Is** the laser not cutting through the material sufficiently? Notify the administrator, perhaps the laser is contaminated.

Does **a (small) flame** appear while lasering? Then you must immediately pause the job using the red button.

>> Have you set the distance to your material properly? After all, fire distance is extremely important.

>> Is there dust on your equipment?

>> Is your material flammable?

Materials:

Some materials should not be used because they severely damage the laser lamp and machine components. **PVC and Vinyl should not be used because toxic fumes are released during laser cutting.**

MDF, Plexi and Plywood should be purchased through our Mind and Makerspace. After all, here we can be sure of solid quality and it is wood that does not contain excessive amounts of glue. After all, this contaminates the laser head and parts of the machine.