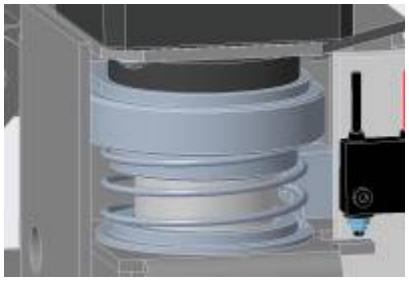
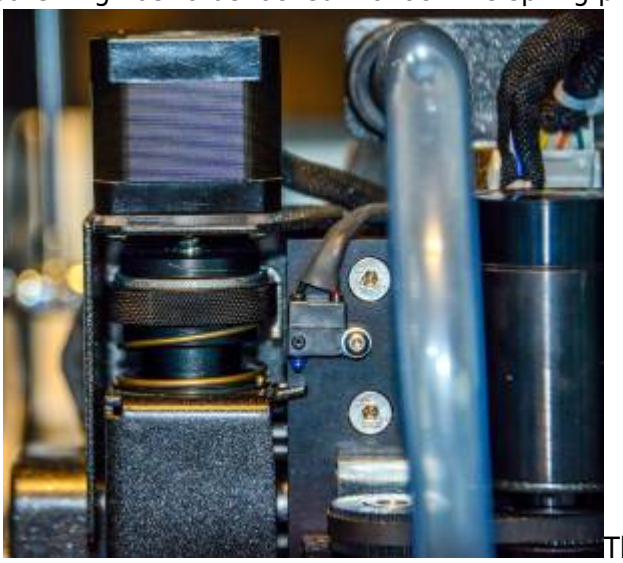
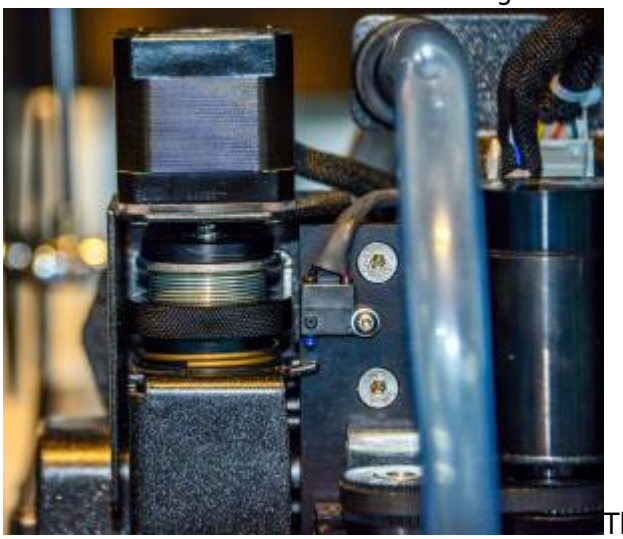
Using the spindle pressure spring



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\\    \\  ==== Locking the pressure spring for engraving without depth
regulator nose ====
```

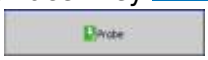
If you want to engrave without nosecone, e.g. after having performed a surface map, or when cutting a 3d relief, the spring pressure ring has to be locked. To lock the spring pressure ring, it has to be screwed down completely. This image shows the spindle pressure ring in the up position (unlocked). This image shows the spindle pressure ring in the down position (locked).

Note: Be extremely careful never to use the nosecone on your spindle when the spring pressure lockring is down. You may harm your Z-axis motor, the Z-axis leadscrew and even the controller. In other words, always respect the following principle: Never launch an engraving cycle with both the nosecone on the spindle and the spring pressure lock ring screwed down.

Plate surfacing with unlocked spring and engraving with locked spring

In the section here-above you can read how to lock the spring pressure lock ring, and how to take off the nosecone retainer ring with the nosecone and the vacuum boot.

In order to surface and then to engrave without nosecone, you proceed as follows:

1. Screw the spring pressure lock ring all the way up, hence unlock the floating movement.
2. Pull off the transparent vacuum hose from the vacuum boot.
3. Take off the nosecone retainer ring with nosecone and vacuum boot.
4. Insert the cutter which you want to use into the spindle and tighthen it.
5. Place your material to be engraved on the engraving table and make sure it is well secured.
6. Move your spindle somewhere over the plate to be engraved.
7. Make sure the “plate surface” indicates . If not then activate this mode by clicking on the  key.
8. Click the “set material surface” key  on your keypad.
9. Click the “probe” button  to begin the surfacing routine. Keep on pressing this “probe” key and the Z-axis will move down slowly until the spindle touches the material. It will then move up above the material surface.
10. The above mentioned procedure implies that your cutter will touch your engraving material. If you prefer that this does not happen, because of the potential danger to damage your plate, you can use a thin plate in between, of which you know the exact thickness. Bear in mind that the thickness of this dummy plate has to be added to your engraving depth to get the correct depth.
11. Screw the Spring pressure lock ring down, so that the floating mechanism is completely locked.
12. Run your engraving job.

Notes:



1. When working without nosecone and with a locked floating mechanism, the machine will execute the depths which are in the engraving job. If your engraving job contains depths depends entirely on the software used. Some softwares use Z-depths and Z-up instructions, other softwares just use a “Cutter down” and a “Cutter up” instruction, without specifying a real value. In the latter cases, the engraving table will use a preprogrammed depth, which can be entered or modified through the “Job dialog window” on the virtual keypad.
2. Whenever the controller contains values, which show up in the “job dialog window”, these values will only be used if the engraving or routing job in question does not contain values for these specific variables. This is valid on a variable per variable basis. E.g. if the engraving job does not contain depths, but does contain XY speeds, then the system will use the depth which is specified in the “job dialog window”, but the XY speed setting from the job will automatically overrule the XY speed setting which is visible in the “job dialog window”.

Surface mapping with unlocked spring and engraving uneven surfaces with locked spring

If the object you want to engrave has an irregular surface, or if the plate you want to engrave is cast acrylic (PMMA), which can have rather important differences in thickness, and you do not want to use the nosecone because of the risk of scratches or shadows along the engraved characters, then using the surface mapper is a possible solution. Surface mapping a plate surface works as follows:

1. Remove the engraving cutter from the spindle.
2. Remove the vacuum hose from the spindle and then remove the nosecone retainer ring with the nosecone and the vacuum boot from the engraving spindle.
3. Insert the special surface map rod (option) into the spindle and fix it in the cutter knob when the rod sticks about 10 mm out at the bottom of the spindle.
4. Make sure the spring pressure lock ring is in the max up position.
5. Position your object to be mapped on the engraving table and secure it.
6. Position your spindle in the upper left corner of an imaginary rectangle in which the engraving job has to be executed. This imaginary rectangle is not necessarily the same as the object’s surface, it can be smaller (but not bigger), and set home there.
7. Make sure the “plate surface” is set to 

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8. Then click the “set surface” key , which will make a small window pop up. In this window several variables have to be entered:
9. }}
10. * **“X scan distance”**: the width of the imaginary rectangle you want to map. Entering values has to be done by typing the correct numbers on your computer’s keyboard.
    - **“Y scan distance”**: the height of the same imaginary rectangle you want to map.
    - **“Step size”**: the distance between each of the points to be digitized, both in X and in Y. If your plate is almost flat and has relatively unimportant height differences, you can use a relatively high value, e.g. 20 or even 30 mm. If your object has a more irregular relief, keep the step size small, e.g. 5 mm. Which value you have to choose with which kind of surface is a matter of trying and building some experience.
    - **“seek feed”**: the speed at which the spindle with the mapping rod will move down to map each of the points in the mapping matrix. Normally a speed between 5 and 15 mm/sec is adequate.
    - **“Z Safe Lift”**: Z-up move after mapping each point. You just have to make sure that the lift value is high enough to move over to the next point. Suppose that the relief has a rather steep surface, and that the Z-position of the next point to be measured is 3 mm higher than the last measuring point. It is clear that your Z safe lift has to be bigger than 3 mm, otherwise your mapping rod will crash sideways with your relief.
    - **“save surface map”**: In normal circumstances you do not want to save the surface map unless you have to engrave a series of objects with identical surfaces. If you want to save a mapped surface, highlight the “Save Surface Map” option and click the “Enter” key. There is a separate chapter in this manual, where you can read in detail about the surface mapping option.
11. Take out the mapping rod from the spindle, put in the engraving cutter of your choice, surface the cutter somewhere inside the imaginary rectangle which has been mapped and run your engraving job.
12. Your 2D engraving job, with all of its speeds and depths, will be projected on the mapped surface. The mapped surface is a fluid interpolated cloud of points. Although the machine in reality performs a 3d job, for the user it is just a 2D application.

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