

# WATERJET BASIC OPERATIONS

## To start machine

1. Turn on water (big valve on wall to the left of filter).
2. Turn on both electrical isolator switches.
3. Check On/Off switch on back corner of machine.
4. Press green [CTRL ON] button on controller (top right corner).
5. Go to the chiller (rectangular cabinet next to the cylindrical garnet hopper against the wall) and press the bottom left hand button [RUN]. Then press the button to the right of it [COMP1] (the fan on top of the chiller should start to run).
6. Return to the controller and wait for the machine to start up.
7. When the message appears on the screen (Press Error Reset) press the [ERROR RESET] which is located (top right corner below the ON button).
8. When the message appears (Home the machine) choose [YES].
9. Once all the red lights stop flashing you can start programming.

## USING A DXF FILE SAVED TO A USB STICK

1. Insert stick into sockets located on top of controller.
2. Select the 14<sup>th</sup> icon from left on the top bar (Red arrow pointing to a computer screen).
3. Make sure Scale is 1.0 then press [OK].
4. Find your file and then press [OPEN].
5. If no preview shows when selecting the file [CANCEL] the import and go to one of the computers near the 3D printers and open the file in Autodesk and resave the file. Then return to the waterjet and try again. If no preview shows again see a staff member.
6. Next press the [OFFSETS] button 3<sup>rd</sup> button down on the right-hand side (red arrows & green corner).
7. Make sure [Automatic compensation] and [Automatic lead ins] are ticked. If you want tabs to be applied to stop small parts falling into the tank select [Automatic tabs (outside only)] then select [OK].
8. Repeat steps 2-7 for the remaining parts you would like to cut.

## USING A STANDARD OBJECT

1. Select the 11<sup>th</sup> icon from left on the top bar to open a page. (you can give it a name if you wish but not necessary).
2. Then select the next icon (12<sup>th</sup>) (flange with 4 holes in it).
3. Select the template that best suits the finished shape you want.
4. Enter the data. If you don't want some features leave blank or insert 0.
5. Take note where the \* is on the picture (+ in every corner and in center. These are places where you can make the datum point). The point \* specifies the Datum point for the template on your drawing.
6. Select [OK].
7. Press the [Ctrl] key and touch the screen. This will bring up a Position box where you can specify where you want the datum point to be. Normally you would insert 0 in the X and Y boxes then press [OK].
8. Press [Esc] twice to clear template unless you want more than 1 inserted, just keep holding [Ctrl] and touching the screen until you have the required number.
9. You can select as many templates you want to produce the part you require. You must use steps 3-8 to locate each template in the correct position.
10. Select the last icon (paintbrush) to refresh the image and check your drawing is correct.
11. Next press the [OFFSETS] button 3<sup>rd</sup> button down on the right-hand side (red arrows & green corner).
12. Make sure [Automatic compensation] and [Automatic lead ins] are ticked. If you want tabs to be applied to stop small parts falling into the tank select [Automatic tabs (outside only)] then select [OK].
13. Repeat the process if you want another shape to be cut.

## SETTING MACHINE PROPERTIES AND NESTING

1. Select the [Project Properties] folder (Yellow file 6<sup>th</sup> icon from left on the top bar).
2. Select [Sheet tab] and input sheet size, thickness, material, select [Medium Fine] for the Edge Cut Quality and pierce option (dyna Pierce for most applications, brittle material glass and acrylic use low pressure pierce and Pierce first).
3. Select [Auto functions] tab and check tab length if using tabs and straight lead ins (should be 3mm for most cases, longer if cutting brittle material glass, acrylic). NOTE: - A general rule the softer the material the loners the tab will need to be. Make it longer if you are unsure. Metals 2-4mm, Plastics 4-6mm is a starting point.
4. Select [Nest] tab and check [Minimum distance between cuts] (should be around 3mm). If using a whole sheet set [Minimum distance between cut and edge] (2-3mm is fine, leave at 0 if not cutting a full sheet).

5. Make sure [Rotate parts] is ticked unless you don't want the all parts to be rotated. Option in next tab to stop 1 part from being rotated).
6. Select [Nest origin] (bottom left is the preferred setting).
7. Select [Object] tab and insert quantity you require of each part (default is 1). Set the [Step Angle] (default is 90) Only change if you have parts with angles (note the smaller the angle the longer it will take to nest). Tick the box [Don't Rotate] if you don't want this part rotated.
8. Select [PAC] tab and select [Straight Cutting only] and [Maximise straight cutting area] ONLY if you are cutting a full sheet otherwise leave blank. LEAVE the Skip Height at 20mm.
9. Then select [OK].
10. Select the [Nesting] icon (3<sup>rd</sup> last icon on top bar beside the calculator icon) and wait for it to nest all your parts.
11. Select [OK] when dialog box appears after nesting is complete.
12. Select the [Simulate] icon (red people running in a movie 19<sup>th</sup> from the left on top bar). Press the [play] button and slide the slider bar to a speed you can check you are cutting your parts in the order you want. This will also give you an estimated cutting time.
13. If the cutting order is wrong select the icon with 2 double headed arrows going in opposite directions (18<sup>th</sup> from left on top bar). Select the double headed arrow pointing to the right, then select every object in your nest in the order you want them cut starting with the first to last. Select any yellow line on the part and make sure the parts flash after each selection. You should notice the black line are changing with each selection. HINT select an edge (internal or external) that is clear from other edges and other objects. DO NOT select a black line.
14. Repeat step 12 to check all your parts are being cut in the order you have selected. If not repeat step 13 and make sure you select an edge and the nest flashes.
15. SAVE your file now to your flash drive. Save it as a (.wjp) this way it will open all nested and ready to cut. DO NOT save it on the desktop because it will be DELETED.

## SET UP MACHINE AND CUT

1. Place material on bed and fasten either with clamps or weights.
2. Select [Manual Control] icon (4 arrow heads pointing outward 7<sup>th</sup> icon from left).
3. Select [origin 1] and move cutting head to middle of cutting area. Lower the head until there is a 3mm gap between nozzle and plate. (Use the height packers that should be on the machine).
4. Move cutting head to bottom left corner of plate to be cut.
5. Select [Set Plate Origin].
6. If you have used the laser to set the orientation, select [Origin Positions] button and type the angle from Origin 2 into Origin 1 then

- select [OK]. Next select [Recall Origin] to activate this angle. (See section Setting Up Plate Orientation with the Laser) if you want to set the plate orientation.
7. Move the head around the plate watching the RED dot on the screen to check that the parts will fit on the plate. If you need an exact check click on the outside of the object you want to check and using the right mouse button on keyboard select [Restart dry run from here] and click start. The head should move to the start of the line you selected and follow the cut path it will take. Press [Pause] and once the machine has paused press [Stop] when you are satisfied all is right. Repeat this step on any other parts that you would like to check.
  8. Once you are satisfied everything is ready select the [Manual Control] icon again and select [Recall Origin]. While the head is moving up put the skirt on nozzle. DO NOT try putting the skirt on while the head is lowering. If there is not enough time to put the skirt on while it is moving up manually raise the head and put the skirt on then select [Recall Origin] again. Once the head is at the origin close the Manual Control window.
  9. Press the [ARS] button on the controller and wait until the pump outside starts working.
  10. Then press the [ESP] button, [Garnet] button and the [Cutting Head 1] buttons and wait until the pressure builds up. Check the gauge from the front of the machine.
  11. You can now raise the water if you want to cut below water. It is advisable not to cut below water if you are cutting thin plate or materials that float. If you see the material start to float while the water is being raised lower the water and cut above water.
  12. Select the [CUT] icon (red nozzle 8<sup>th</sup> from the right) and then select cut.
  13. If you want to pause the cut to move weights or remove some scrap that has floated onto the plate tick either or boxes [Pause before cut] or [pause after cut]. These boxes can be ticked / unticked while the machine is cutting and the machine will stop after it has finished cutting that cut or before it starts the next cut.

## SETTING UP PLATE ORIENTATION WITH THE LASER

1. Select the [Manual Control] icon (4 arrow heads pointing outward 7<sup>th</sup> icon from left).
2. Select [Origin 2].
3. Open the Laser cover plate at the back of the head.
4. Select [Currently Tool] button (under the 4 origin positions). This button will turn red and change to [Currently Laser] when selected.

5. A red dot should be seen below the laser. Move this dot to the left-hand end on the edge of the plate you want to cut. Make sure the plate is clamped or weighted down first.
6. Select the [Set Plate Origin] button on the screen.
7. Now move the head to the other end of the plate in the 'X' axis and move the 'Y' axis until the laser is on the edge of the plate again.
8. Select [Set Plate Orientation] button this time (the button below the set plate origin).
9. Select the [Origin Positions] button to check that there is an angle in Origin 2 position. Then click [OK] to exit this screen.
10. Select [Currently Laser] button again and it will go back to the green button [Currently Tool]. Select [Origin 1] and CLOSE the Laser cover plate.
11. Return to Step 3 in the 'Set Up Machine and Cut' section.

## SHUT DOWN PROCEDURE

1. Select [File] in the top left-hand corner. DO NOT use the windows shut down in the bottom left-hand corner of screen.
2. Select [Shutdown] from drop down menu.
3. Select [YES] when asked to shut down the system.
4. Select [No] if asked to save your work unless you want it saved. Save it to your USB stick NOT the desktop.
5. Select [YES] when asked to Home the Machine.
6. Wait for the machine to shut down. The beacon lights should flash as it shuts down.
7. Turn off the water valve (the big valve to the left of the filter) and turn off the 2 isolator switches that are on the wall near the chiller. Turning off the isolator switch will turn off the chiller.

CREATE CHANGE

