

## SECTION 11: OPTIONAL FEATURES

### 3-Jaw Chuck Rotary Attachment

### Firmware Preparation

Make sure your Fusion firmware is version 1.0.0.9 or higher to operate the Rotary Attachment. The firmware version is one of the menu items under the Config menu items on the Fusion Control Panel. To upgrade your firmware follow the instructions at “**Section : Upgrading the Operational Firmware**” on page 151.

### 3-Jaw Chuck Rotary Attachment Installation

1. Install the 3” lens.
2. Lower the engraving table to its lowest point.
3. Turn off power to the Fusion.

These are explained in detail in the following section.

**Important!** It is important that you power down the machine before inserting the rotary connector at the table. The Fusion laser system will not recognize the Rotary Attachment until the system is rebooted and you could damage the electronics if the rotary is installed while the laser system is powered on.

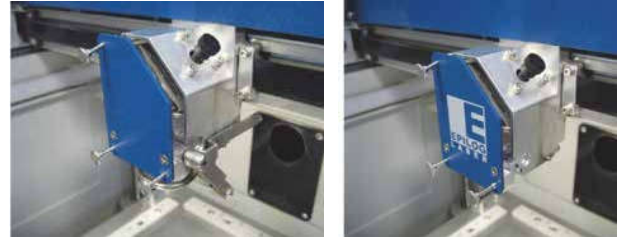
### 3” Lens Installation

When installing the 3-Jaw Chuck, install the 3” lens included with the additional components. The CO2 Fusion 3-Jaw Rotary Attachment requires the use a 3” lens. The crash bar on the standard 2” lens on the CO2 Fusion interferes with the Rotary Attachment and cannot be used.



If you have the dual-source CO2 and Fiber laser, the system comes with a 3” lens already installed. There is no need to change lenses.

1. Remove the standard 2” lens. Notice that the 2” lens incorporates the crash bar and the Air Assist tube.



2. Install the 3” lens. Notice that the 3” lens does not include the Crash Bar or Air Assist tube.

#### Lower Table and Turn Off Power

1. Lower the engraving table to its lowest point.
2. Turn off power to the Fusion.

**Important!** It is important that you power down the machine before inserting the rotary connector at the table. The Fusion laser system will not recognize the



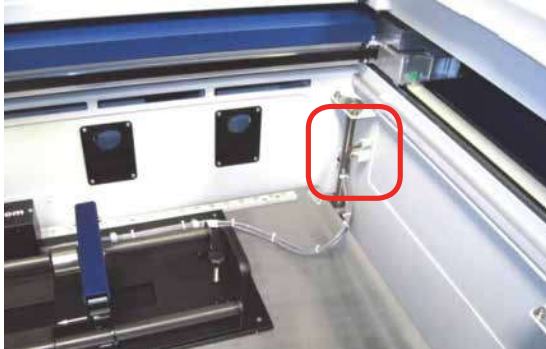
Rotary Attachment until the system is rebooted and you could damage the electronics if the rotary is installed while the laser system is powered on.

3. With the Fusion powered off, place the Rotary Attachment so that the baseplate butts up tight against the left-side and upper rulers.

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4. Insert both connectors into the receptacles on the right side of the machine.



5. Once the Rotary Attachment is plugged in you can power on the Fusion.
6. When the Fusion powers on with the Rotary Attachment installed, the carriage moves to the Rotary Home Position, which is directly above the 3-Jaw Chuck.

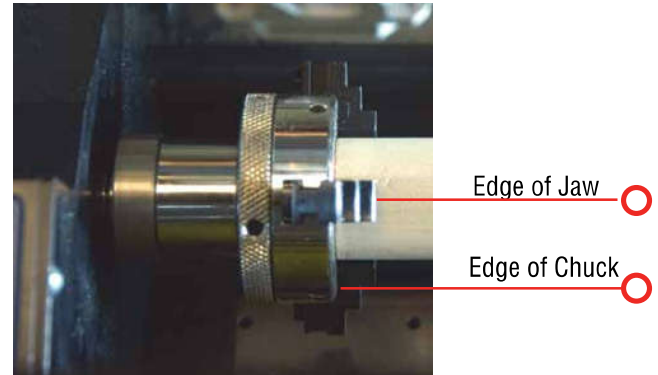
### Initial Setup (Setting Home - First Time Use Only)

New installations may need to establish the Rotary Home Position. The following instructions show how to set a Home Position for the 3-Jaw Rotary Attachment. For most users this is not necessary because they set a new Home Position for every rotary job they run using the Center-Center engraving feature in the driver. Center-Center engraving is explained later in these instructions. The concept of why Center-Center is used is hard to explain, but rest assured that it will become obvious on your very first 3-Jaw Chuck Rotary job.

Install the rotary and power on the system. The system will go through its standard power up sequence. The carriage will come to rest directly over the rotary instead of in the upper left corner and the table will move to its lowest position.

Turn on the **Red Dot Pointer** (you will need to raise the table to focus the Red Dot Pointer). The red dot will show you the location of your Home Position. For proper

operation most users set the Home Position at the edge of either the clamp or the jaws. However, depending on your specific application it can be set anywhere you want. Our experience shows that most users prefer the edge of the jaws.



Your X-Home Position defines the left edge of your page in your graphics software.

To establish the Rotary Home setting at the edge of the jaws we will use the Red Dot Pointer to show us where our Home Position is and then how much we need to adjust our settings.

1. Turn on the **Red Dot Pointer** from the Fusion Control Panel.
2. Go to **Jog** on the Control Panel.
3. Use the **Joystick** to move the carriage so that the Red Dot Pointer is at the front edge of the jaws or the clamp. Make sure the red dot is also centered front to back. This exercise is easier to perform if you have a cylinder in place.
4. The LCD on the Control Panel shows a digital readout of the location of the Red Dot Pointer. The number displayed on the left is the X-axis, the number on the right is the Y-axis. **Write down these two numbers** including the plus or minus sign associated with each.
5. Go to **Config** on the Fusion Control Panel.
6. Tilt the Joystick down to scroll to the **X R Home** menu. New installations will show a value of 0.000.

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7. **Center click** the Joystick. A flashing cursor will appear below the number displayed. Tilt the Joystick up or down to increment or decrement the number so that it matches the number you recorded above for the Red Dot Pointer X-axis value.
8. Press the **Go** key to Save the setting.
9. Now, tilt the Joystick down to scroll to the **Y R Home** menu. New installations will show a value of 0.000.
10. **Center click** the Joystick. A flashing cursor will appear below the number displayed. Tilt the Joystick to increment or decrement the number so that it matches the number you recorded above for the Red Dot Pointer Y-axis value.
11. Press the **Go** key to Save the setting.
12. Tilt the Joystick up to scroll back to the Restore XY Home menu item.
13. **Center click** to save the new X and Y values. The carriage will now move back and to the left to establish a new Home Position. Your Red Dot Pointer should now be located at its new location.

Once you have set and saved the X and Y Rotary Home Position you should not have to set it again, but you can always use the procedure above to adjust your Home Position.

**Note:** Many users do not worry about a fixed Home Position on the clamping style rotary. Instead users find that each new rotary job requires an entirely different clamping method than the last and setting a fixed Home Position just isn't important. Instead, they use the Center-Center feature in the driver and establish a new Home Position for each job. This is easy to do.

1. Clamp your cylinder into the Rotary Attachment.
2. Focus on your cylinder.
3. Turn on the **Red Dot Pointer**.
4. Use the **Jog** feature to move the red dot to a point

along your cylinder that defines the center point of your mark.

5. Center click to set that point as your Home Position.
6. Use the Center-Center feature in the driver when you are ready to print.

For more information on the Center-Center feature please refer to “**Center Engraving**” on page 101 in this owner's manual.

### 3-Jaw Chuck Rotary Attachment Setup

1. **Measure your Cylinder:** the cylinder diameter will be used in the print driver.



2. **Adjust the Rotary for Cylinder Length:** depress the blue anodized idle-side handle to move the support mechanism left or right to accommodate different length cylinders. There are photos later in this section that show the different configurations available for the Y-Axis idle side support.



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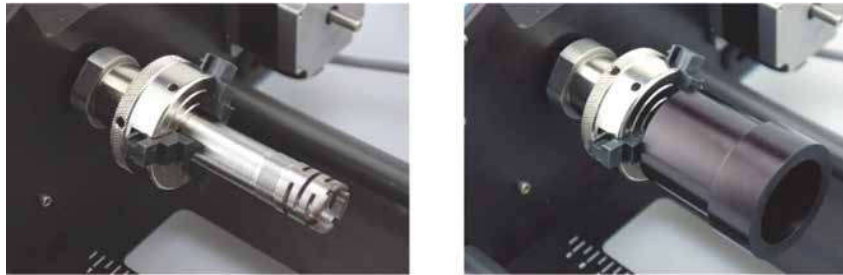
### 3-Jaw Chuck Rotary Attachment

3. **Clamp your Cylinder:** insert your cylinder into the 3-Jaw Chuck and tighten the chuck so the cylinder is held firmly in place.

You will need to use the two tightening pins that are provided with the chuck in order to clamp the cylinder tightly into place.



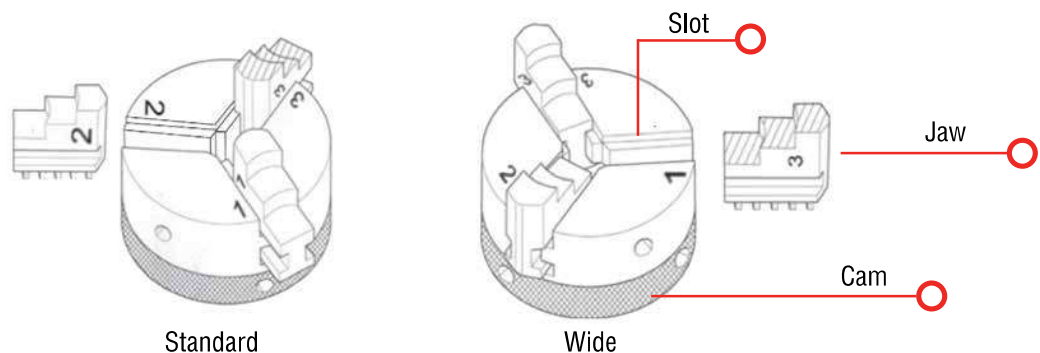
Cylinders can be held from the outside diameter or the inside diameter.



The chuck jaws can be flipped from Standard mode to Wide mode (180 degrees) to accommodate larger radius cylinders.

Notice that there is a stamped number on each side of each jaw and next to each slot. For wide-radius turning, simply remove jaws 1 and 3, flip them, and then insert jaw 1 into slot 3 and jaw 3 into slot 1. Remove jaw 2, flip it and return it to slot 2. The jaws do not need to be inserted all the way just yet. You will need to rotate the cam to capture the jaws in ascending order (1,2,3). Rotate the cam so that it catches jaw 1 first, then jaw 2, then jaw 3.

Pay particular attention to aligning the numbers as shown on the diagram when flipping the jaws! Failure to align the correct jaw in the correct slot will result in uneven spacing of the jaws when they are tightened.



## 3-Jaw Chuck Diameter Capacities

The 3-Jaw Chuck allows four different ways to hold your object based on cylinder diameter and whether you are holding it from the inside or outside diameter.

	Jaws in Standard Mode	Jaws in Wide Mode
Piece Held From Inside Diameter	0.875" to 3" (22.2 to 76.2 mm)	2.125 to 3.125" (54 to 79.4 mm)
Piece Held From Outside Diameter	0.040" to 1.25" (2.54 to 31.7 mm)	1" to 3" (25.4 to 76.2 mm)

## Vector Speed Limitations based on Cylinder Diameter

**Important!** There are speed limitations in Vector mode based on cylinder diameter. The driver will display the maximum speed setting that can be used for a given diameter. Your power setting will need to be adjusted according to the speed.

The 3-Jaw Chuck Rotary was designed to rotate cylinders that range in size from 0.040" (12.7 mm) to approximately 3" (76.2 mm) in diameter. However, from a practical point-of-view, it is difficult to produce a legible mark on cylinders that are smaller than .080" (2 mm).

## Set the Cylinder Diameter in the Driver

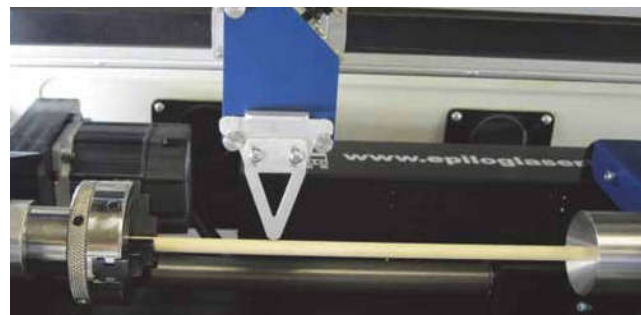
With the rotary installed, the diameter measured, and the cylinder held tightly in place, you are ready to print.

1. Select the 3-Jaw Chuck option in the Laser Dashboard's General Tab.
2. Notice that for small diameter cylinders the driver limits the Vector speed in Vector mode only. Larger diameter cylinders do not have speed limitations.

## 3-Jaw Chuck Focus

With your cylinder in place on the Rotary Attachment, place the focus gage on the lens carriage and then scroll to **Focus** mode on the Fusion Control Panel. The carriage will move back after one second so that the focus gage is centered over your cylinder.

When you are finished focusing press the **Reset** key on the Control Panel. The lens carriage will go back to its standard Rotary Home Position. You are now ready to start the job.



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## Additional notes about focusing with the rotary.

- The 3-Jaw Chuck Rotary was designed to use manual focusing only. While Auto Focus can be used, it is impractical for everyday use.
- When you are in Focus mode, the entire X-beam and carriage can be moved by hand. Normally, users will move only the carriage to a point along the long axis to focus. It is uncommon, but occasionally users will move the entire X-beam back and forth by hand. Use caution when moving the X-beam!
- After you have finished focusing, pressing any key on the Control Panel will reset the carriage back to its standard Rotary Home Position.
- The standard sub-menu items are available in Rotary Focus mode:

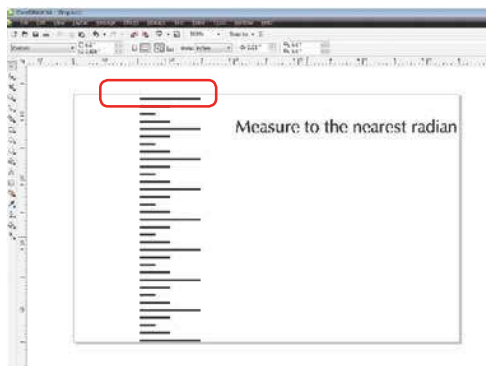
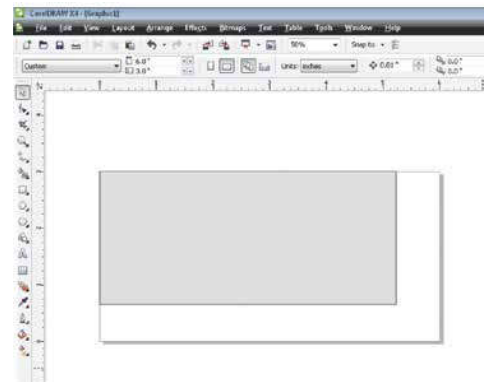


## Artwork Layout

Set up a custom page size in your engraving software that will accommodate the length and circumference of your cylinder. To set up your page in Corel, measure the length of the cylinder you are engraving. Use this as the minimum size of the horizontal dimension of your page. Measure the diameter of the cylinder and multiply this number by Pi (3.1416) to determine the circumference of the cylinder. Use the circumference as the minimum size of the vertical dimension of your page.

The actual size of the page is not overly important. If you have a cylinder that's 5.23" (133.8 mm) long with a circumference of 2.3" (56.7 mm), use a page that's slightly larger, say, 6" x 3" (152 x 76 mm).

This image shows a page size of 6" x 3" (152 x 76 mm). The gray inner rectangle represents the cylinder that is 5.23" x 2.3" (133.8 x 56.7 mm). Insure your artwork fits within the cylinder size.



It's important that you set up your artwork so the top of the artwork is as close to the top of the page as you can comfortably place it.

Any white space between the top of the page and your artwork is considered part of the print job and your cylinder will rotate that amount until it reaches the first point of engraving.

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### 3-Jaw Chuck Rotary Attachment

#### Rotary Removal

1. Turn off power to the laser.
2. Open the door.
3. Depress the release tabs on the connectors and unplug the connectors.
4. Remove the Rotary Attachment.

#### Using the Fixture plates and additional rotary components

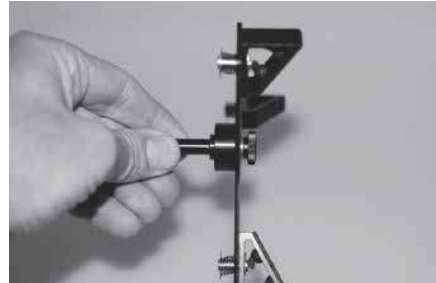
The 3-Jaw Chuck Rotary comes with additional attachments that make it easy to hold different sized and shaped cylinders. The photos below show different configurations that can be used to hold a wide variety of cylinders. The components can be mixed and matched. There is no single, correct method of holding a cylinder.

#### Attaching the Fixture Plate to the Chuck

Secure a large or small fixture plate to the spindle using one of the plate thumb screws.

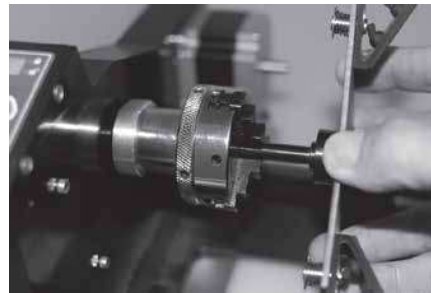


The fixture plate will look like the photo when the spindle is assembled.



Slide the spindle into the chuck. Make sure the spindle is fully inserted into the chuck, then secure it using the chuck tightening pins.

Be sure to check that your Home Position is where you need it once the fixture plate has been installed.



#### Attaching the Idle-Side Centering Fixture

The idle-side centering fixture is used to hold small diameter cylinders in place. It can be removed if the fixture plates are required for larger diameter cylinders. Remove or install it using the supplied hex wrench.



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### Attaching the Idle-Side Fixture Plates

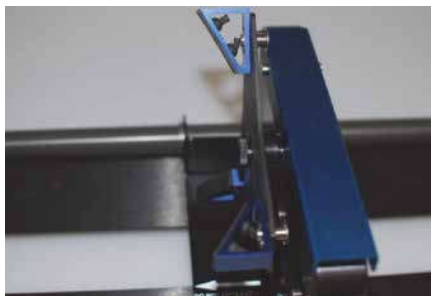
The fixture plates can be used on both the chuck side of the rotary as well as the idle-side. Attach the plate by placing it on the idle-side spindle and securing with a thumb screw.



The splines on all the fixture plates can be reversed to accommodate parts using the inside diameter (ID) or outside diameter (OD). To reverse the spline orientation, pull the spring-loaded splines away from the plate and rotate them 180 degrees.

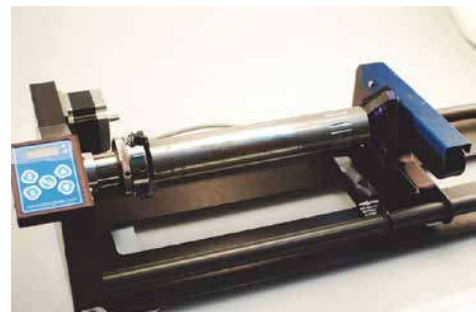


This photo shows the small idle-side plate fixture. The small plate fixture can accommodate sizes up to 1" in diameter.



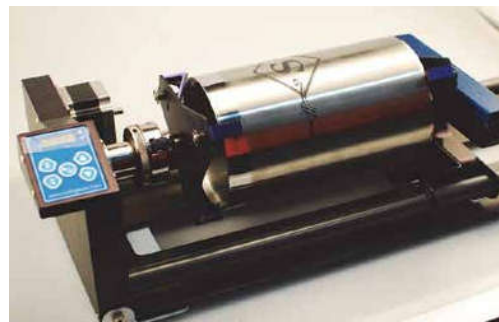
### Different Configurations for Fixturing Cylinders

This photo shows a typical example of a part that might be used with the 3-Jaw Chuck on the left side and the small idle-side plate fixture on the right.



This configuration is used when the cylinder diameter on the right side is too large for the centering fixture.

This photo shows a typical example of a larger part that requires a fixture plate on both the left and the right sides. Notice that the left side fixture plate is held in place with the 3-Jaw Chuck.



This photo shows the standard 3-Jaw Chuck on the left side and the idle-side centering fixture on the right. The idle-side centering fixture can accommodate sizes up to 1" in diameter.





The centering fixture is used to support small diameter parts that sag when held in place using only the 3-Jaw Chuck.



Some parts do not need the idle-side centering fixture for support and can be held using only the 3-Jaw Chuck.

### 3-Jaw Chuck Quick Start Guide

1. Lower the table far enough to accommodate the Rotary Attachment.
2. Turn off the machine.
3. Install the 3" lens.
4. Plug in the Rotary Attachment and position it in the upper left corner of the table.
5. Power up your laser.
6. Set up your artwork.
7. Print, and go to the Preferences window to set your laser parameters
  - Select Center-Center engraving mode.
  - Deselect Auto Focus.
  - Select the 3-Jaw Chuck option.
  - Input your cylinder diameter.
  - Set your Speed, Power, and other laser parameters.
  - Send the job to the laser.
8. Focus - Most users prefer to manually focus when using the 3-Jaw style rotary.
  - Press the Focus key on the Control Panel.
  - One second after pressing the Focus key the carriage will move back and to the right which places the manual focus gage directly over your cylinder.
  - Use the Joystick to move the table up and down to focus on your cylinder.
  - You can move the carriage by hand to focus anywhere along the length of your cylinder. You can also move the entire X-beam front and back by hand when the rotary is installed. Use caution when moving the beam by hand.
  - Press any menu key to exit Focus. The carriage and beam will move back to their Home Position.
9. Set Home
  - Press the **Jog** function on the Control Panel.
  - Turn on the Red Dot Pointer.
  - Use the Joystick to move the pointer to the point on your cylinder where you want your Home Position to be located.
  - Center click the Joystick to set a Home Position.
  - If desired, **double center click** to bring up the standard Jog sub-menu.
10. Close the top access door.
11. Press the **Go** key to start your job.