



This document includes:

- Hardware connection description
- Software configuration

Rotary Function

Rotary cutting&engraving with U axis

Application note Spra8012904

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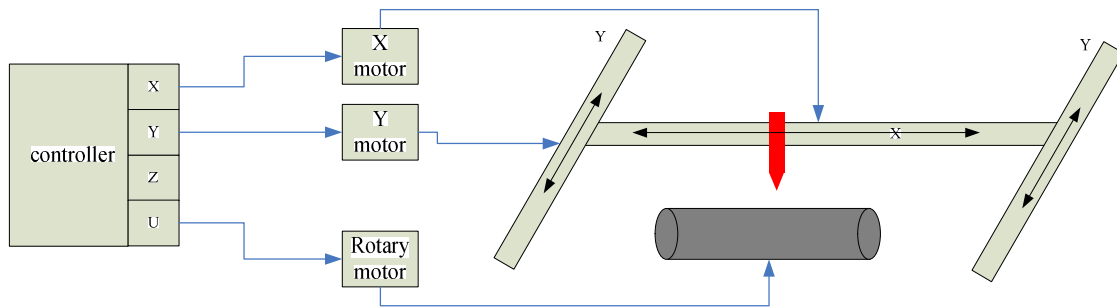
Introduction

This section provides information about...

- Rotary function description
- The rotary function difference between the RDC6445G and RDC6442G

Section 1 Rotary function on RDC6445G

Rotary engraving and cutting function is independent with the XY operation. In the rotary mode, the U axis is referenced to be the rotary axis. The rotary engraving and cutting is done by the X axis and U axis. Shown as picture 1-1.



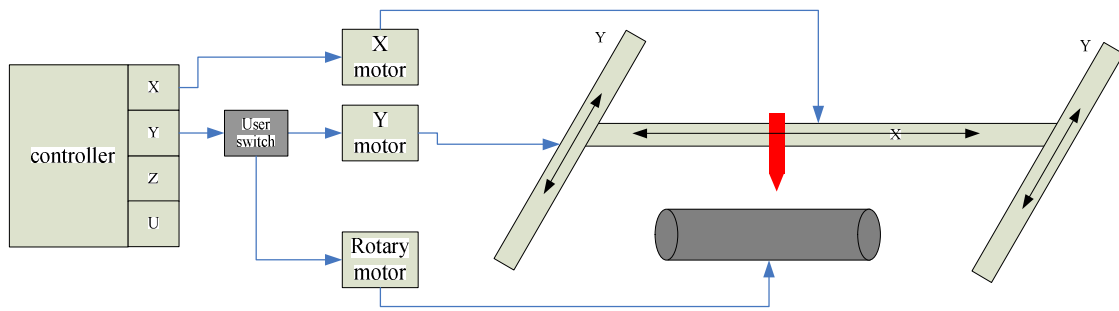
Picture 1-1 Diagram of the rotary function on RDC6445G

The picture has shown the function of the rotary engraving and cutting with RDC6445G. The U axis is referenced to be the rotary axis. User can move XY axis manually before starting a rotary function. And also user can move the rotary axis manually. All the motion can be done without switching the signals. So when making a machine, the rotary motor can be fixed to the U axis and never be changed.

To the controller there are 2 work modes for this. Normal mode is the XY axes motion control. The rotary mode is for the rotary motion control. the U axis and X axis can do the interpolation together for rotary engraving and cutting.

Section 2 Difference of rotary function between RDC6445G and RDC6442G

The difference of rotary function between the RDC6442G and RDC6445G is the hardware connection and software configuration. To the RDC6445G, it is very easy to operate the rotary function. The hardware connection is fixed. X,Y,U axis is independent. But for the RDC6442G, the rotary function should be multiplexed with the Y axis. this means when user is doing a XY table cutting or engraving, the Y axis is a normal axis control in the XY coordinate. But when user want to do a rotary job, he should switch the Y signals on the motion controller to the rotary motor. Usually a switch will be used. shown as picture 1-2.





Picture 1-2 Diagram of the rotary function onRDC6442G

So it is much more complex to do a rotary function. In the RDC6445G, it is much easier to do this.

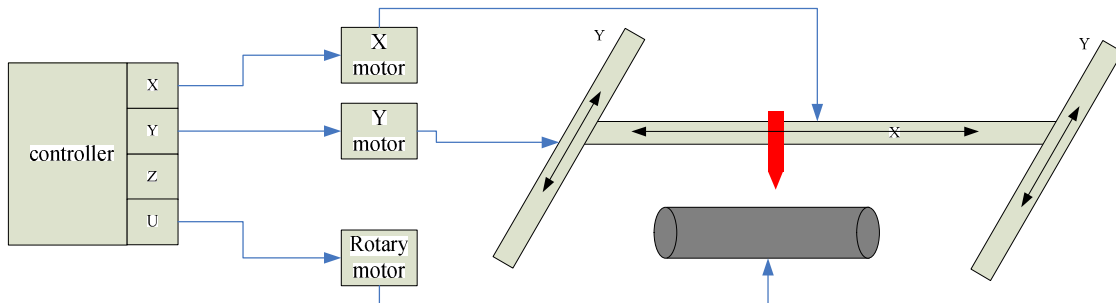
Hardware connection

This section provides information about...

-  **Hardware connection**
-  **Motion control**

2.1 Hardware connection

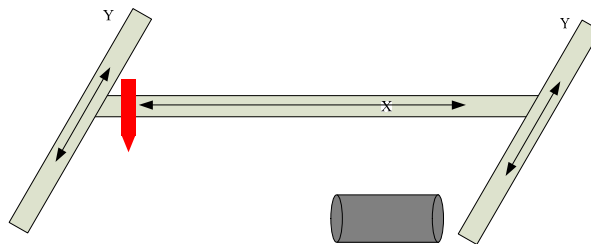
Picture 2-1 shown the connection between the motion controller and the motors. X and Y axis from the controller connect to the motor XY on the table. And the U axis from the controller connect to the rotary axis.



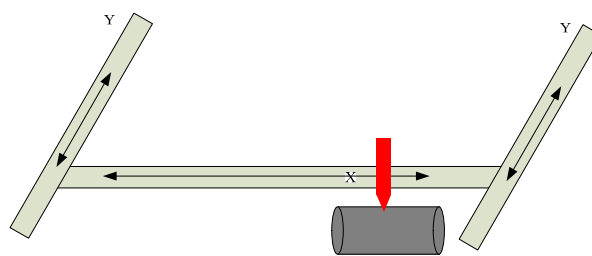
Picture 2-1 rotary function wire connections

2.2 Motion control

U axis is specialized for rotary engraving and cutting control. So the XY axis can move independently. So user can install the rotary device on the table of the machine. The rotary axis has been connected to the U axis. User can move the XY and Z axis to the start point of the work piece manually. Then start a rotary engraving or cutting. Shown as picture 2-2.2-3.



Picture 2-2 Rotary motion control



Picture 2-2 manually control of XYZ

User can move the XY and rotary axis to a referenced position and set the current position to be the <origin point >. when start a new rotary job, the laser head will move to the origin position and start the rotary engraving or cutting without any other operations.

Software configuration

This section provides information about...

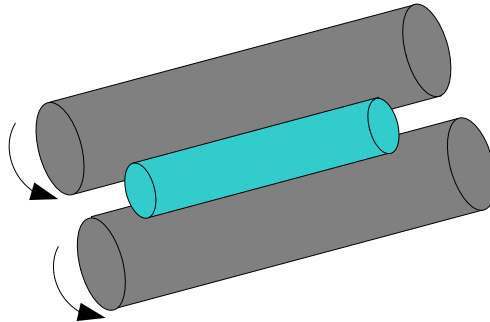
- Rotary device types
- Parameters for rotary engraving or cutting

3.1 Rotary devices

There are 2 typical devices for rotary engraving or cutting. We call the picture 3-1 as active type and we call the picture 3-2 as the negative type.



Picture 3-1 Active rotary device



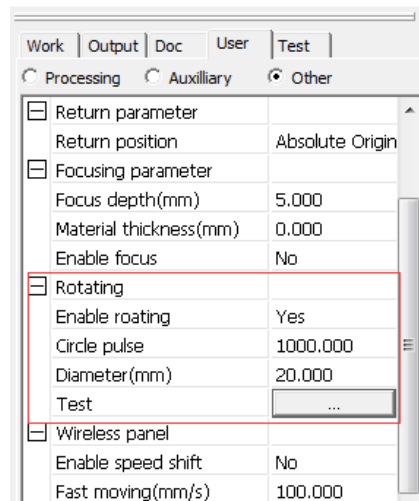
Picture 3-2 Negative rotary device

Active rotary device is driven by the motor directly. The negative rotary device means the work piece is driven by the 2 rollers. The two rollers are driven by motors directly. The work piece located on the rollers and moved by the friction.

According to different rotary devices, the parameters for rotary have different sense. Please see the next section for detail.

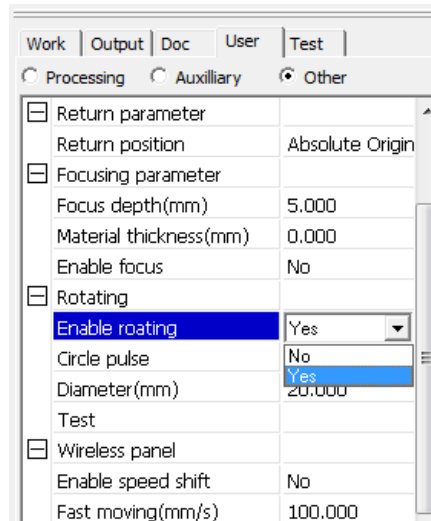
3.2 Parameters for rotary engraving or cutting

Before doing a rotary job, the parameters should be defined. Shown as picture 3-3.



Picture 3-3 Parameters for rotary engraving or cutting

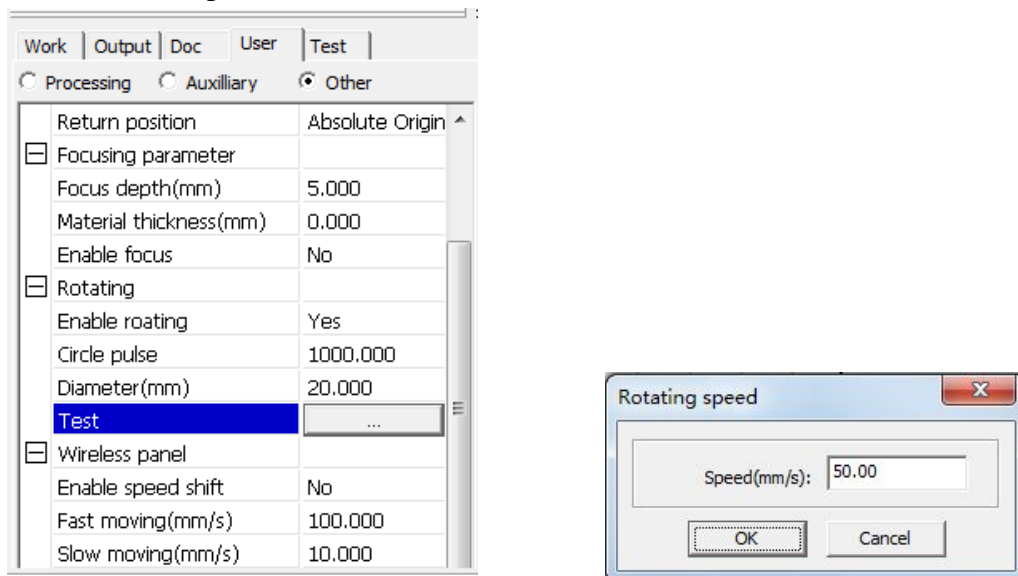
【Enable rotating】 : Enable the rotary mode. When disabled, all the jobs are considered as a platform job that can be done by XY table. Shown as picture 3-4



Picture 3-4 rotary engraving and cutting setting

【Circle pulse】 : Pulse/round, pulses should output to drive the work piece to rotate for one round. The parameters should test precisely. There are 2 methods to do that. one is to calculate the value according to the motor’s configuration and the gear ratio. Another method is to test the pulse per round. There are button named <test>. If you have input the value of the circle pulse, such as 1000. click the <test>, then the rotary will go for 1000 pulse. If it is not one round, please increase or decrease the circle pulse to try again and again until the pulse can drive the rotary device for one round.

The test speed can be set as picture



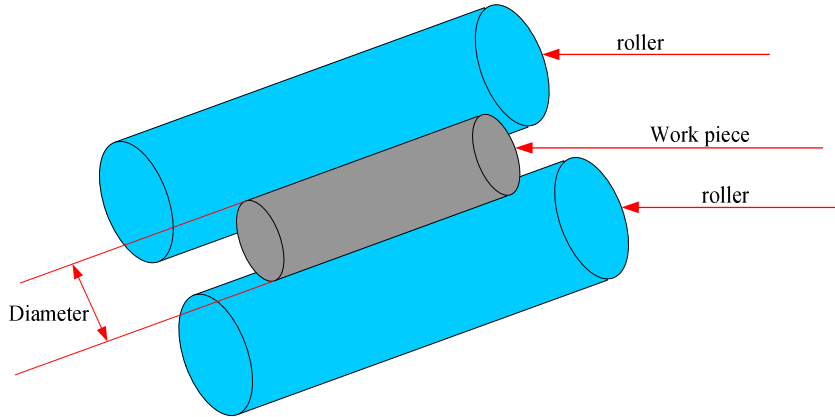
Picture 3-4 Pulse/ round testing

【Diameter】 : The parameters are the work piece’s diameter if user is using a active rotary device. If user is operating a negative rotary device, the parameters refer to the roller’s diameter.

Whatever the rotary device is, all the parameters is referring to the work piece. The diameters and the circle pulse are determined by the work piece. Shown as picture 3-5.



Picture 3-5 active rotary parameters of the work piece



Picture 3-6 Negative rotary parameters of the work piece