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I Preface

Foreword

Thank you for purchasing our CNC router!

We professionally manufacture of CNC Router in China. The routers are used for woodworking, advertising (manufacturing signs, marks and decoration), furniture, mould and crafts.

In the Introduction describe the Installation and maintenance, analyze of the normal malfunctions, simple engraving techniques in detail.

CNC Router is of high precision machine. Inaccurate installation and operation would affect the precision, stability and working lifetime. Please peruse the Introduction in order to correctly operation and maintenance. Keep the safety.

Please keep the user's manual for further use.

1. To ensure correct and safe usage with a full understanding of this product's performance, please be sure to read through this manual completely and store it in a safe location.
2. The contents of this operation manual and the specifications of this product are subject to change without notice.
3. The operation manual and the product have been prepared and tested as much as possible. If you find any misprint or error, please inform us.

II Parts and functions

Accessories of CNC router

Standard parts

Please check the number of the following parts. Please contact with us if any item is omitted.

Item	Name	Specification	Quantity	Remarks
1	Tool Box		1box	
5	Collet		2pcs	
6	DSP Controller		1pc	
7	IDE cable of DSP Controller		1pc	
8	USB IDE cable		1pc	
9	Hexagon ring spanner	M6	1pc	
10	Open-ended spanner	M19, 30M	2pcs	
12	DSP Installing CD		1pc	
13	System Introduction		1book	
14	User's Manual		1book	
15	Certificate of Compliance		1pc	
16	Warranty Card		1pc	
17	Bucket		1pc	
18	Power Cord	1.5m	1pc	
19	Clamp		6pc	
20	Water Pump		1pc	
21	IDE cable		1pc	

Foreground Drawing

Dust proof

Left board

Working Plate

DSP Controller

Control box

Main spindle (water cooling)

Right board

Lathe bed

Bracket

Control box

On

Off


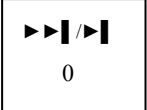

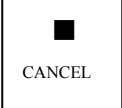
Frequency conversion
Spare port
DSP Connection Port

X: X-axis Motor Connection Port
L: Spindle Connection Port
Y2: Limited Switch Connection Port
Y-axis Motor Connection Port
Z: Z-axis connection Port
Y1: Y-axis connection Port

Frequency Conversion

Model Indicator Light
Showing part
State Candidate Key
Display
Date / Enter key
Function key /Exit key/Restoration key
Change number
Stop
Jog
Forward /Reversal
Run

DSP System

Z+ ▲1	X+ 2∧	Y+ 3	XY→0 4
X ▼5	Y 6∨	Z 7	Z→0 8
		ON/OFF .	MENU -
OK	--/—	 DELETE	 CANCEL

Name	Function
I①	Positive movement of Z axis, Menu upward , figure 1 inputting
I②	Positive movement of Y axis, accelerate cut speed, figure 2 inputting
I③	Positive movement of Z axis, figure 3 inputting
I④	Origin of X axis and Y axis setting, figure 4 inputting
II①	Negative movement of X axis; Menu downward, figure 5 inputting
II②	Negative movement of Y axis; slowdown cut speed; figure 6 inputting
II③	Negative movement of Z axis, figure 7 inputting
II④	Z axis origin setting ; figure 8 inputting
III①	Axes home to machine tool origin, figure 9 inputting
III②	Manual moving mode, high speed or low speed selection, figure 0 inputting
III③	Head axis startup/stop, decimal point inputting
III④	Menu setting entering, negative symbol inputting
IV①	All axes home: motions confirm/inputting/operating
IV②	Manual move, continue, step and distance modes selection
IV③	Cut process running/pause/inputted words delete
IV④	Cut process stop/selections, inputting and operating cancel

III Installation

- i Open the wooden case carefully. And lift up the machine and put it in flat ground. Don't knock the machine.
- ii Open the tool box. Connect the cable with the electricity to check whether the machine can work.
- iii Install the driving program and software on into the computer. (Details in DSP user's manual, Type3 user's manual and Wentai User's manual)
- iv Check the travel direction and traveling size.

Travel direction:

Stand in front of the machine. Press X+ on DSP system, blade will move to the right. Press X-, blade move to the left. Press Y+, blade move to the back. Press Y-, blade move to the front. Press Z+, blade move up. Press Z-, blade move down.

Traveling Size:

Design 10X10(mm) square (or other size) and then curve it use CNC router. Compare the size with you set in the software.
- v Start main spindle to check the rotating direction (deasil rotating) and the water cooling system.

IV Maintenance

- i The new machines have the wear-in period. We should adjust the machine during this period. One week later, we should check the conjunction of the parts. The main parts are as follows: The conjunction of the side board and the beam, the conjunction of the soleplate and the side board, the coupler between the stepper motor and the Y axis ball screw, the fixed screw in the front of the ball screw.

Fixed Screw

Side Board

Linear

Soleplate

Fixed Screw

- ii Maintenance after use.

- (1) Clear the machine after use.

- (2) Filling oil after cleaning.

Motor

Coupler

Side Board

Linear

Y-axis Orbit (oil point)

Soleplate

X-axis Ball Screw (fixed ball screw)

X-axis Orbit (oil point)

- iii Remarks:

Different material and condition, the period of maintenance are different. Such as: HD board, we should clear it in 3 days. Wood, we should clean it in 7 days.

The main points as follows:

Y-axis Motor

Y-axis Ball Screw (oil point)

Side Board

Water Cooling Motor

⊠ CAUTION ⊠

V. Caution

1. Don't use un-rating voltage for Xinhuiyou C and Z series CNC routers.

2. Please operate the machine strictly according to the manufacturing size of CNC router.
3. Forbid high strength, overload work.
4. After the using and the cleaning of the 1218 ball screw machines or larger, the gantry should be stopped in the center of the machine, in order to avoid the spontaneous droop of the ball screw which will influence the concentric degree and the accuracy.
5. When encounter smoking, awful smell, noise and other abnormal situation of the machine, please turn off the machine and check it.
6. Make sure the machine connect with the ground wire.
7. Don't touch the tip of the blade.
8. Don't use causticity liquid to clean parts and the keyboard of the machine.
9. Different materials and cuttings, choose different cutters and speed.
10. Turn on the spindle motor before positioning the Z axis and cutting mode.
11. Before using of the machine, please check the water circulation to ensure the spindle work well.
12. Don't damage or change the original wire, don't pull it, bind it or press it.
13. Don't touch the cutter and spindle by hand while working.
14. Don't drop the liquid and metallic parts to the machine. After using, lubricate the ball screw, feed shaft, orbit and rack.
15. Working temperature: 0°C–45°C
16. Cover the bullet while working to prevent the dust drop into the water and block the spindle.

Z/C Series High-speed CNC router

VI. Z/C Series High-speed CNC router

The high-speed CNC router is driven by the gear wheel of the X and Y axis, which integrate the validity, speed, capacity.

The gear belongs to the manufactured parts, it needs to run in period which to fill the gap between the gear wheel. After the running, we should adjust the machine. The methods are as follows:

1. Turn off the cover of the side plate and main spindle.
2. Use hexagon ring spanner to loose the fixed screw of the driven box.
3. Pull the driven box in the direction of the picture till there is no gap. Don't use heavy thing to knock the driven box.
4. After adjusting, screw down the fixed ball of the driven box, then turn on the power, after running the machine and make sure there is no mistake, assemble the machine head cover and the side board cover.

Maintenance:

1. Clean the orbit, gear wheel, ball screw periodically.
2. Use butter and normal machine oil for the gear wheel and gear axis in proportion of 3:2.
3. The gear wheel needs to be cleaned and lubricate it periodically to avoid rusty.
4. Check the tightness of synchronous belt and adjust it in time.

X-axis Beam Fixed Screw

Driving Box Fixed Screw

Ball Screw

Driving Box

High Speed Direction

VII. Electronic Parts.

The map of electronic parts of Z, C series CNC router. Pic.6

Maintenance of electronic parts:

1. Clean the motor and the dust in the control box to heat emission.
2. Check the wire, such as: knot, twist and abrasion.

Emergency Stop Main Switch

Filter

Frequency Converter

Transformer

Driver

Water Cooling Spindle

Stepper Motor

Stepper Motor

Stepper Motor

Analysis of normal malfunction and maintenance

Fault	Fault Reason	Remove The Fault
Arise the phenomenon of disturb, lost step, in the cutting process	Spider coupler loose	Screw down the spider couplers
	The driver lost step	Change the controller
	The numerical card loose	Insert the numerical card firmly
Arise the phenomenon of rack wave etc when the cutting process	Loosen of fixed screw of the ball screw or the guide block lead to the decrease of the accuracy; adjust the concentricity then screw down the screw.	Adjust the concentricity then screw down the screw.

When turn on the machine, the spindle motor moves to one direction or noisy, turn off the machine.	The wire breaks inside when running or the loose of the jointing point.	Use the gauge to check where the disconnection point is, then change the wire.
When the machine is running the driven system arise noise and have the phenomenon to be block.	There is dust in the ball screw or the lacking of the oil.	Discharge the bearing and clean it or change, then add oil and assemble.
The limit switch lost the function or the screen show the limit alarm in a long time.	The limit switch broken or the switch wire breaks inside or the inside of the switch stick, the emergency stop is on.	Change the switch, check the circuitry, and turn off the emergency stop.

IX Skills of cutting

Wood cutting

Wood is the main important material of modern decorations. There are many new designs of wood cuttings. Different materials, the cutting method is also different.

The following is the introduction of different materials.

1. If the wood is soft and more flexible adopt to cut the wood-wool in landscape orientation, the speed of the cutting should be faster gradually.
2. If the wood material is hard and the texture is too tight, pay attention to the speed of the cutter going into the material. First it should be slowly, after it cuts a gap in the material, and then add the speed.

Steel cutting

Hardness of steel is several times than wood. The following is the introduction of steel cutting.

1. Choose the special cutter for steel.
2. In the process of cutting adjust of the cutting speed and add cooling oil to the cutter.
3. If the depth of the material is too thick, we should cut it layer by layer.

Stone cutting:

The inner structure of the stone is high intensity not uniform.

Stone belongs to the material which the intensity of the inside structure is not uniform. Due to hard intensity of the stone, the requirement of the cutter is high; besides, the stone cutting also has the requirement to the rotation speed of the spindle motor. When cutting the stone, please choose the wearable alloy cutter with high intensity, and pay attention to the cooling of the cutter and the

spindle.

The above introduction only for reference, please operate according to the actual situation.

Appendix

The parameter of cutter

Different materials should be different cutter and parameters.

Materials:

Dual-color board, ABS board, organic glass, PVC board, metal (iron, alloy, brass, aluminum), glass, stone, wood, high density board, anti-firing plate, chipboard, composite material (brass board, aluminum plastic board, colophony board, soften material (hard latex products, soft latex product), small name seal material, organic glass seal, ox horn seal, brass seal, steel seal, latex seal, colophony board, stock ink cushion, atom seal etc.

Applied: chest card, construction mould, steel mould, letter mould, seal, furniture, cutting graphics, gift, souvenir making, adverting letter cutting, engraving...

During the processing, different materials should be different cutter and parameters.

1. Dual-color board

If cutting depth is less than 0.8mm, speed of the spindle should be 10000~20000 r/min; the traveling speed is 2.4m/min. If the angle and width are smaller should decrease the cutting speed. The blade 30 °/0.3 (or less than 30 °/0.3) should not be used in the frame cutting. The speed should be 0.6m/min.

2. PVC, ABS board

PVC board (less than 0.5mm), ABS board (less than 1mm), when making the mould, the rotating speed of spindle should be 20000-40000 r/min, the cutting speed should be 1.2m~2.4m/min.

3. Nonmetal inorganic material

Material	Blade	Rotation Speed (rev/min)	Cutting Speed (m/min)	Blade Down Speed	Remarks
Marble	20 °~30 ° /0.1~0.3	20000~40000	0.3 average low speed	0.2~0.4	
	20 °~30 °/0.3 above	20000~40000	0.3 average low speed	0.3~0.4	
	40 ° above	20000~40000	0.6	0.3~0.5	
Glass	20 °~30 ° /0.1~0.3	20000~40000	0.3	0.1-0.2	
	20 °~30 °/0.3 above	20000~40000 40000	0.3 0.6~2.4	0.1~0.4 0.1	

	40 ° above/0.3 above	20000~40000 40000	0.3 0.6~2.4	0.1~0.4 0.1	
For stone cutting please take the above parameters for reference, the harder stones should deduce the speed.					

4. Wood

Material	Cutter	Rotate Speed (r/min)	Cut Speed (m/min)	Travel Speed (m/min)	Remarks
Engrave	20 ⁰ -30 ⁰ /0.1-0.3	20000-40000	0.8-2.4	0.5-2	
	30 ⁰ /0.3	20000-40000	1.2-2.4	1-3	
Cut	φ 8- φ 13	10000-20000	0.3	1-3	
	φ 8	10000-20000	0.3	3-8	
Different material, density sheet or fireproofing sheet, adjust the parameter of cutter and blade.					

5. Organic Material

Material	Cutter	Rotate speed (r/min)	Cut speed (m/min)	Travel Speed (m/min)	Remarks	
Organic glass	Engrave	20 ⁰ -30 ⁰ /0.1-0.3	10000-40000	0.6-0.8	0.2-0.8	
		30 ⁰ /0.3	10000-40000	0.8-2.4	1-3	
Ox horn stamp	Cut	φ 0.8- φ 1.3	10000-40000	0.3	1-3	
		φ 2.5- φ 3	20000-40000	0.3	5-10	Big power motor
Hard plastic	Engrave	20 ⁰ -30 ⁰ /0.3-0.5	10000-20000	0.6-1.6	0.3-0.1	Please use the water cooling system
		30 ⁰ /0.5	10000-20000	2.4	0.5-1	
	Cut	φ 0.8- φ 1.3	10000-20000	0.6-1.6	0.5-1	
		φ 1.5	10000-20000	0.8-1.6	0.5-2	
Soft material		20 ⁰ -30 ⁰ /0.3	40000	0.3-0.6	1-20	
		40 ⁰ /0.3	40000	0.6-1.2	1-20	

The above parameter is only for preference. Please adjust the parameter accord to different material, cutter and precision.

(1) Hard material

If the cutter is small and the material is hard, deduce the depth of cutter on the clamp and deduce the cutting speed. If it needs the big depth for the cutter, deduce the speed of spindle. If you need the high light degree for your products, deduce of cutter on the clamp, improve the speed of spindle, improve the cutting speed and add the superposition.

(2) Soft material

If it needs the high light degree for your products, please improve the speed of spindle and deduce the cutting speed and add the superposition under the material not insert the cutter.

The parameter isn't absolute, please adjust the parameter accord to the your condition. You will find your favorable parameter. So it can reach to the best efficiency under the good precision and quality. Please take care the abrasion of cutter when engraving the material. The abrasion of cutter will affect the effect.

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