

CNC ROUTER MACHINE WATTSAN 0404/0609 MINI MANUAL



Wattsan

Jinan Wattsan CNC Technology Co. Ltd

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Dear customer!

Thank you for purchasing our equipment. We hope that its work will delight you for a long time.

The machines are manufactured in accordance with global standards. Each equipment undergoes pre-sale preparation.

First of all, we strongly recommend that this manual be read carefully and completely before using the equipment. Failure to comply with certain points of the Operating Manual may result in injury to personnel and/or damage to equipment!

Follow the instructions in this instruction. This will not only make the work easier, but also make the use of the equipment safe and long-term. Please follow these instructions carefully.

This document is intended to introduce the basic technical data and usage requirements of the Wattsan CNC router.

This document contains the main parameters and characteristics of the equipment.

In the event that the equipment is transferred to another customer, this document shall be transferred with it.

The manufacturer reserves the right to make changes and improvements to the design that do not impair the declared characteristics of the equipment.

SPECIFICATIONS

Model		0404 MINI	0609 MINI
Working field, mm	X	400	600
	Y	400	900
	Z	100	100
Maximum feed rate X/Y, mm/min		6000	
Maximum feed speed Z, mm/min		3000	
Spindle power, W		1500/2200	
Cooling system		Water/Air	
Bed		One-piece	
Engines		Stepper	
Guides		Hiwin	
Operating Ambient Temperature, °C		15-30	
Power supply		220±10% V 、 50Hz/380±10% V 、 50/Hz	
Power consumption excluding spindle and peripherals, W		~1500	
Protective cabin		Optional	
Length, mm		716	1218
Width, mm		709	909
Height, mm		708	710
Weight, kg		110	135
Weight with package, kg		145	175
Cabin weight, kg		62	90

EQUIPMENT

Name	Quantity
Machine	1 pc
RichAuto/NC Studio control system	1 pc
USB Cable	1 pc
Fuse Kit	1 pc
Milling bits set	1 pc
Wrench Set	1 pc
Collet set	1 pc
Clamp Set	1 pc
Key Set	1 pc
Water pump*	1 pc

* - Comes with a water-cooled spindle

Information about signs and symbols

In this instruction manual, the following designations, signs and symbols are used to convey particularly important information:

	This indicates a hazardous situation that could result in serious injury or death if the specified instructions are not strictly followed.
	Indicates a potential hazard that could result in minor injury or damage to the product.
	It contains important information about the safe and correct handling of the product.
	This component is energized by an electric current. In these places, strictly follow the safety rules when working with electricity.

Read the instructions carefully before starting.

Note!

The equipment you directly purchased may differ from the equipment shown in the figures.

	Untrained personnel should not be allowed to work with this equipment and install it.
 MUST-DO	The location of the equipment must be equipped with fire extinguishing equipment. It is forbidden to store flammable and explosive substances near the device.
 MUST-DO	The user must ensure that the material to be processed is suitable for processing on the machine in order to avoid risks to the life and operation of the equipment.
 FORBIDDER	The operator must not leave the equipment unattended while it is in operation. The equipment must be turned off at the end of operation.
 FORBIDDER	During the operation of the machine, it is forbidden to be in the area of movement of moving parts of the machine.
	The equipment must be located in a dry, uncontaminated place. The temperature inside the room should be 15-30°C. Humidity should be in the range of 5-70% (provided there is no condensation).
	The equipment operates from an AC voltage of 380 V with a frequency of 50 / 60 Hz. It is forbidden to use the equipment without a voltage stabilizer.

Attention!

The seller is not responsible for the improper use of the equipment and if the user fails to take precautions.

CHAPTER 1. INTRODUCTION

1.1 EQUIPMENT DESCRIPTION

WATTSAN MINI CNC router is designed for high-precision machining of various materials: plastic, wood, MDF, composite materials and soft metals (aluminum and copper). Due to its compact size, it is ideal for small workshops, advertising production and prototyping.

1.2 KEY FEATURES AND BENEFITS

- **Compact size:** The machine can be easily placed in tight spaces.
- **Spindle from 1.5 kW:** Suitable for most milling and engraving tasks.
- **Control system:** Possibility to choose between **RichAuto** (DSP handheld) and **NC Studio** (PC control).
- **High Accuracy:** Positioning accuracy up to **0.05mm**.
- **Ease of Use:** User-friendly control interface.
- **Stable operation:** Robust cast iron and ball screw frame design on the axles for smooth movement.
- **Safety Cabin (Optional):** Provides additional safety by preventing access to the work area while the tool is moving.

1.3 PURPOSE OF THE EQUIPMENT

WATTSAN MINI is designed to perform the following types of processing:

- **Milling:** Suitable for both simple and complex products, and can handle materials of different densities.
- **Engraving:** Provides high detail and accuracy when engraving on acrylic, wood, and other materials.
- **Profiling and contour cutting:** Ideal for creating complex contours and shapes.

1.4 APPLICATIONS

WATTSAN MINI CNC router is used in various industries:

- **Furniture and décor production:** Creation of interior elements, furniture facades, decoration of furniture items.
- **Advertising Industry:** Production of advertising signs, letters, logos and other advertising structures.
- **Souvenir & Art:** Suitable for the production of decorative products, souvenirs and art products made of wood and plastic.
- **Modeling and prototyping:** Creating accurate models and prototypes of plastic and composite products.
- **Education:** Teaching students the skills of working with CNC machines.

1.5 BASIC OPERATING REQUIREMENTS

Before you begin, make sure that all the requirements are met:

- Connected ground: Ground resistance $<4 \Omega$.
- It is necessary to install a mains voltage stabilizer to stabilize the voltage of the machine.
- Good ventilation is required to prevent the accumulation of dust and combustion products.
- To cool the spindle, it is necessary to properly configure and control the operation of the chiller. It is a specialized equipment that cools and circulates water and requires the use of distilled water only.
- To prevent fire, the workplace must be equipped with a suitable fire extinguisher.
- There should be a free area around the machine of about 1 m on each side.

CHAPTER 2. SAFETY INSTRUCTIONS AND PRECAUTIONS

2.1. OVERVIEW

Proper safety precautions when operating the milling machine are essential to prevent accidents, protect the operator and ensure the safe operation of the equipment. Failure to follow these guidelines may result in personal injury, damage to the machine, or disruption of the production process.

Before operating the machine and performing daily maintenance, the operator should read this chapter carefully, learn the safety precautions and requirements of the machine, and follow the appropriate precautions.

2.2 GENERAL SAFETY REQUIREMENTS

- Personnel working with this equipment must know and remember all the safety requirements for working with milling equipment and obey the safety requirements adopted at the enterprise, and the requirements for the management of the corresponding equipment.
- The operator is not allowed to leave the workplace while the equipment is in operation.
- The user must ensure that the material to be machined is suitable for milling in order to avoid risks to the life and operation of the equipment
- Keep the work area clean and provide adequate lighting.
- Do not wear loose-fitting clothing, gloves, bracelets, necklaces, or jewelry.

	It is forbidden to work on faulty equipment. If a fault is detected, turn off the equipment and unplug it. Inform the specialists. Do not repair the equipment yourself.
---	---

2.3 PRECAUTIONS FOR MACHINE OPERATION

- Familiarize yourself with the location of the emergency "STOP" button and make sure it is available for immediate use in the event of an emergency.
- Make sure that the selected tool is securely locked in the spindle. Unreliable fixation can lead to tool ejection and damage to the workpiece.
- When working, keep a safe distance from the cutting area and do not touch the spindle. To replace the tool, wait for it to stop completely.
- Use only the tools and accessories that are provided for installation with this equipment. Never use unsuitable or damaged tools.

2.4. ELECTRICAL SAFETY

- Make sure the machine is securely grounded to prevent static electricity and reduce the risk of electric shock.
- Make sure the correct AC supply voltage is used before applying power to the unit. Using the wrong voltage may damage the installation.
- Never use the device in a humid or wet environment. Do not touch electrical contacts and switches with wet hands to avoid electric shock.
- Do not open the electrical cabinet or change the machine parameters without consulting the manual. If you need to change something, then these changes must be approved with the equipment supplier. Before

modifying, record the original values so that the machine can be restored to its original parameters if necessary.

- Always turn off the device when not in use. Never leave the machine running unattended.
- Before performing any maintenance or repair work on the machine, make sure that the equipment is completely disconnected from the power supply.

 	After turning off the power to the machine, you must wait at least 5 minutes, and only then you can touch the electrical circuit of the machine. For a period of time after the power is turned off, there may be a high voltage in the machine's electrical system, which can cause harm to people and equipment.
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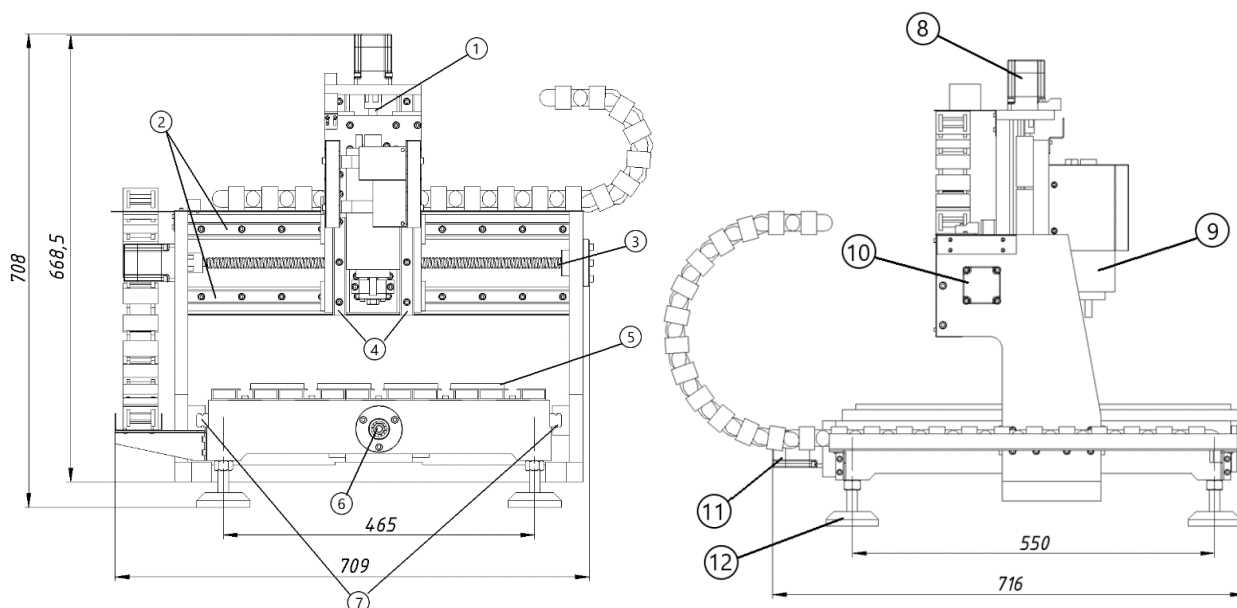
2.5. OPERATOR'S RESPONSIBILITIES

- The operator must undergo special training in order to start working on the machine.
- Follow the instructions for regular maintenance of the appliance to keep it operational and prevent accidents.
- After completing each work shift, remove chips and dust from the surface of the table and moving parts of the machine to avoid the accumulation of waste.

CHAPTER 3. APPEARANCE OF THE MACHINES

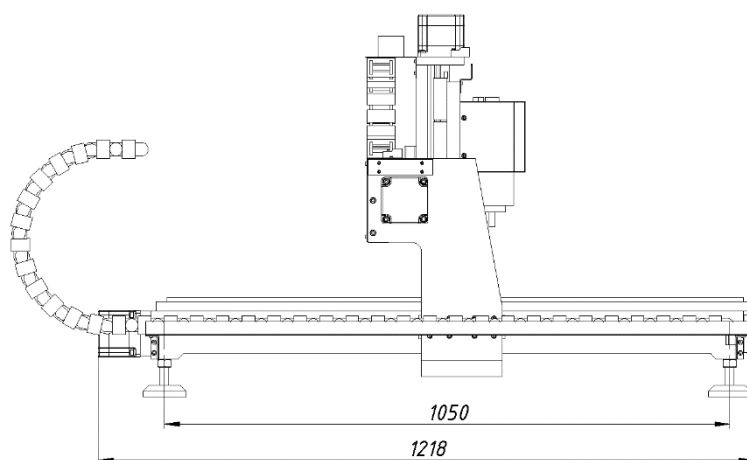
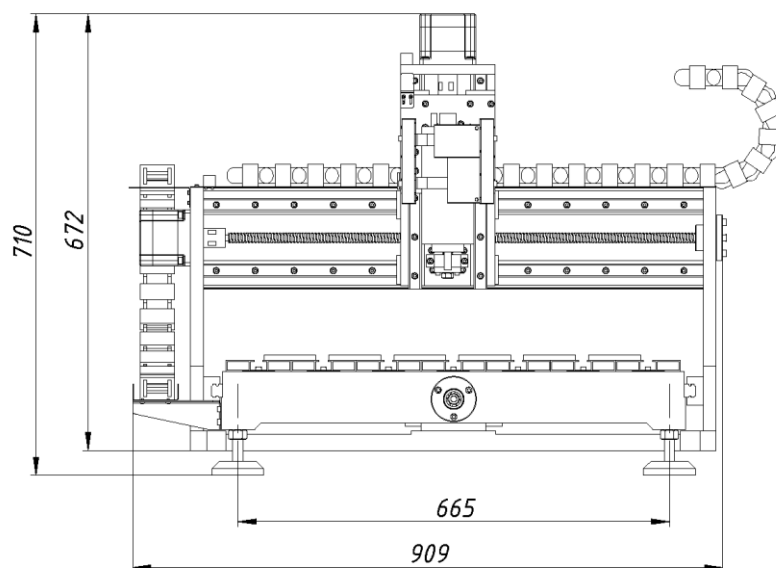
3.1 MACHINE DIMENSIONS

WATTSAN 0404 MINI



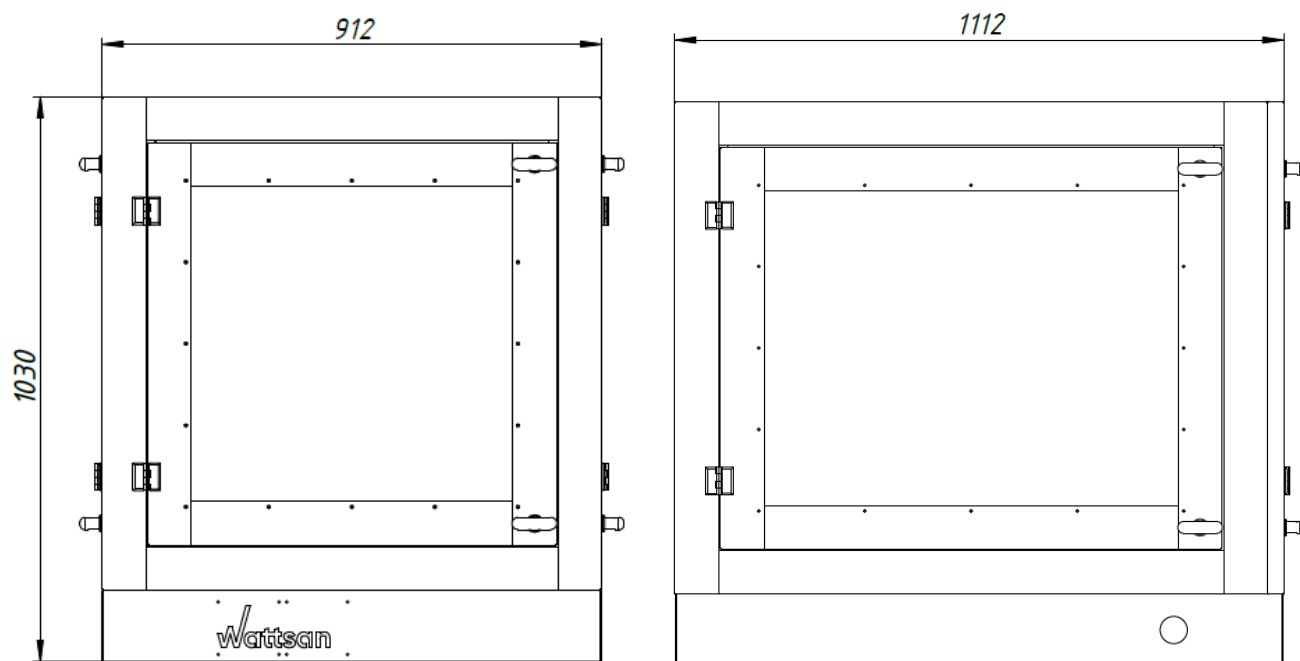
No	Name
1	Z-axis (ball screw)
2	X-axis guides
3	X-axis (ball screw)
4	Z Axis Guides
5	Work surface
6	Y-axis (ball screw)
7	Y-axis guides
8	Z-Axis Motor
9	Spindle
10	X-Axis Motor
11	Y-Axis Motor
12	Legs

WATTSAN 0609 MINI

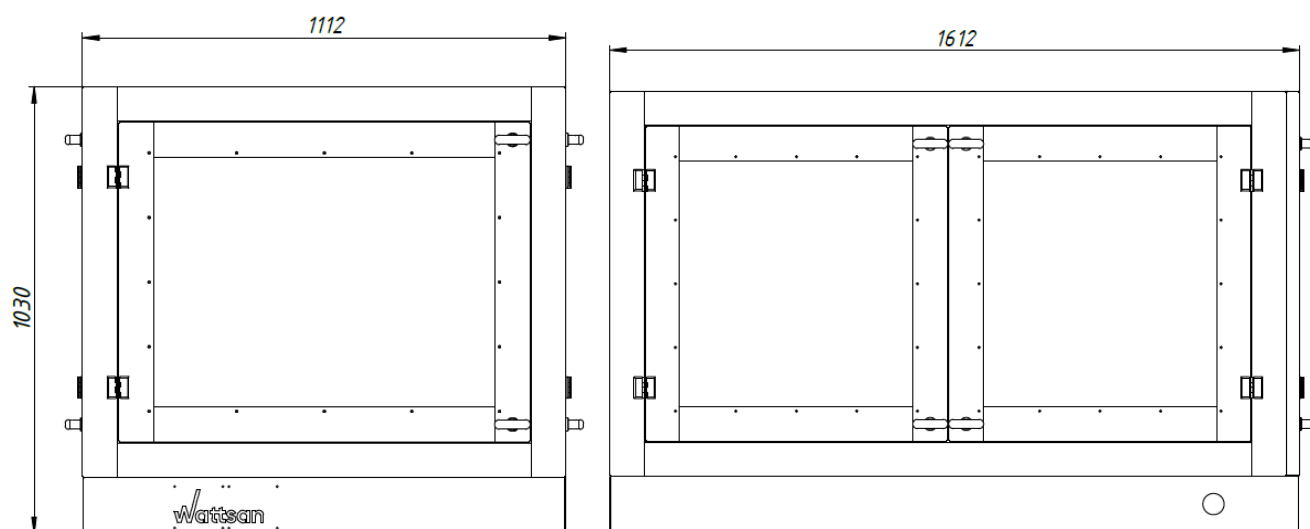


3.2 DIMENSIONS OF THE PROTECTIVE CABIN

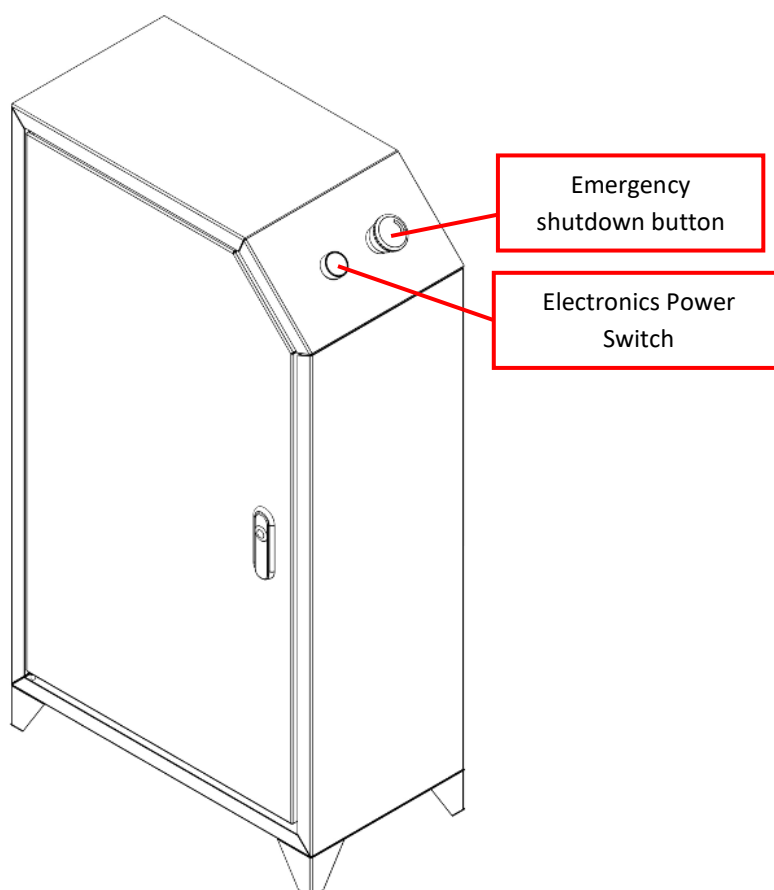
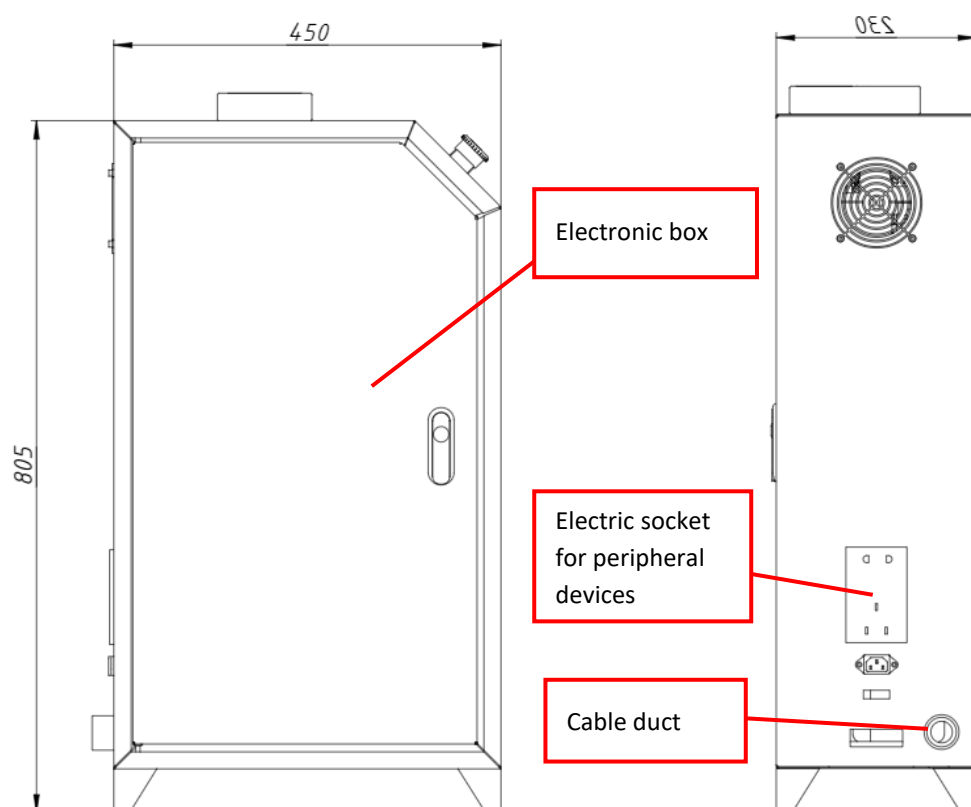
WATTSAN 0404 MINI Cabine

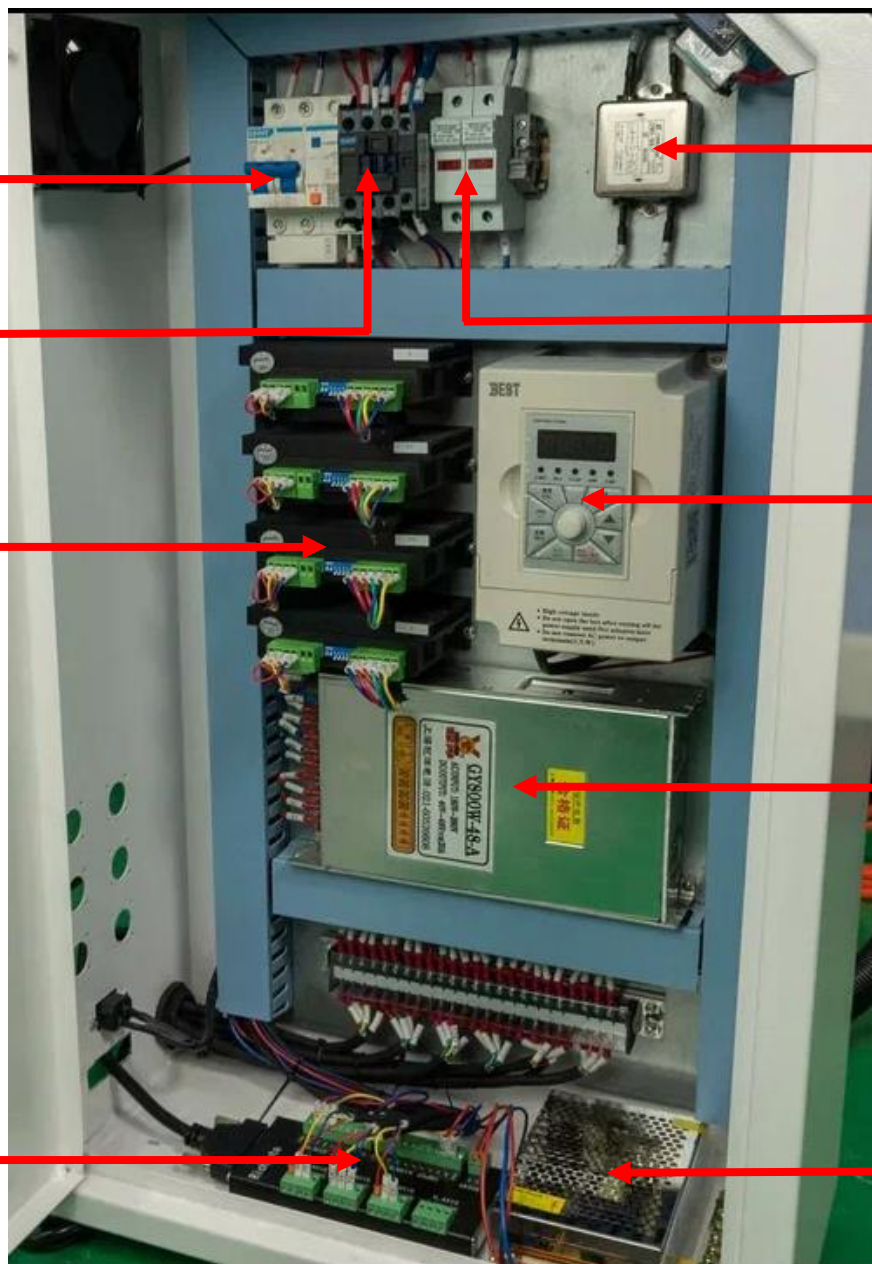


WATTSAN 0609 MINI Cabine



3.3 CONTROL CABINET WITH CONTROL UNIT





Main switch

Surge
protector

Contactor

Fuses

Drivers

Frequency
Converter

48V power
supply

RichAuto Module

24V power
supply

CHAPTER 4. ACCEPTANCE AND UNPACKING

4.1 GENERAL INFORMATION

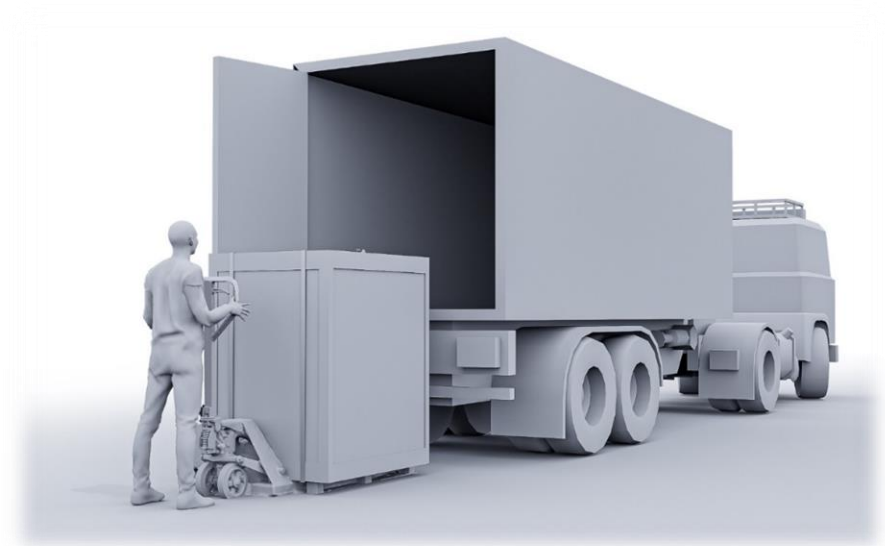
We strongly recommend that only specially trained personnel unload the machine.

Before unloading the equipment, carefully inspect the cargo and packaging for damage, check the number of pieces declared in the bill of lading. In the presence of damage and/or the absence of cargo packages, we recommend that you draw up a commercial act, since without this document, the insurance company has the right to refuse to pay compensation.

4.2 UNLOADING EQUIPMENT BY FORKLIFT OR STACKER

When unloading equipment using this type of equipment, pay attention to the lifting capacity and length of the forks. Make sure the forks are the right length by referring to the dimensions of the equipment. If you unload from the side, focus on the width of the base of the box/bed. If unloading is carried out through the rear gate - by the length of the box/bed.



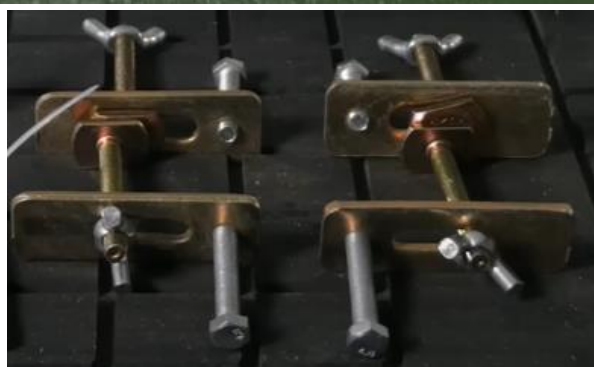


ATTENTION!

1. Do not stand under a lifted and moving load. Be sure to use a hard hat.
2. Avoid sudden movements and jolts when raising and lowering equipment.
3. Do not tilt the equipment until the original packaging is removed.

4.3 UNBOXING

Check the machine and all accessories for external damage when accepting the equipment from the carrier. If possible, unpack the equipment together with a representative of the carrier.



CHAPTER 5. INSTALLATION

5.1 PREPARING THE INSTALLATION SITE

Before installing the machine, make sure that the working area meets all technical requirements:

- **Size and Location:** Make sure that the mounting area is sufficient to accommodate the machine and allows access from all sides for maintenance. At least 1000 mm of free space around the machine on each side is required.
- **Flat surface:** The floor or table should be level and stable to avoid vibrations and distortions during the operation of the machine.
- **Lighting:** The work area should be well lit so that the operator can easily control the processing process.
- **Temperature and humidity:** The recommended temperature for the operation of the equipment is between +10°C and +35°C, with a humidity of no more than 70%. Avoid installation in places with high humidity or near heat sources.

5.2 CONNECTING THE MACHINE TO THE CONTROL UNIT

5.2.1 WIRING CONNECTION

1. Take the cable channel and slide the wires through the hole in the control unit.



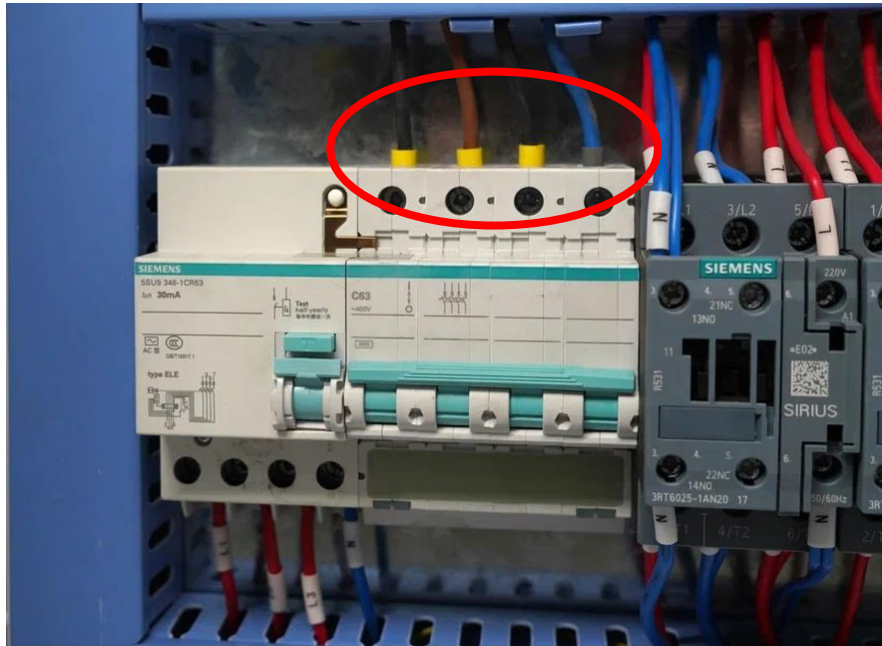


2. Connect the wires to the terminal according to the wire markings

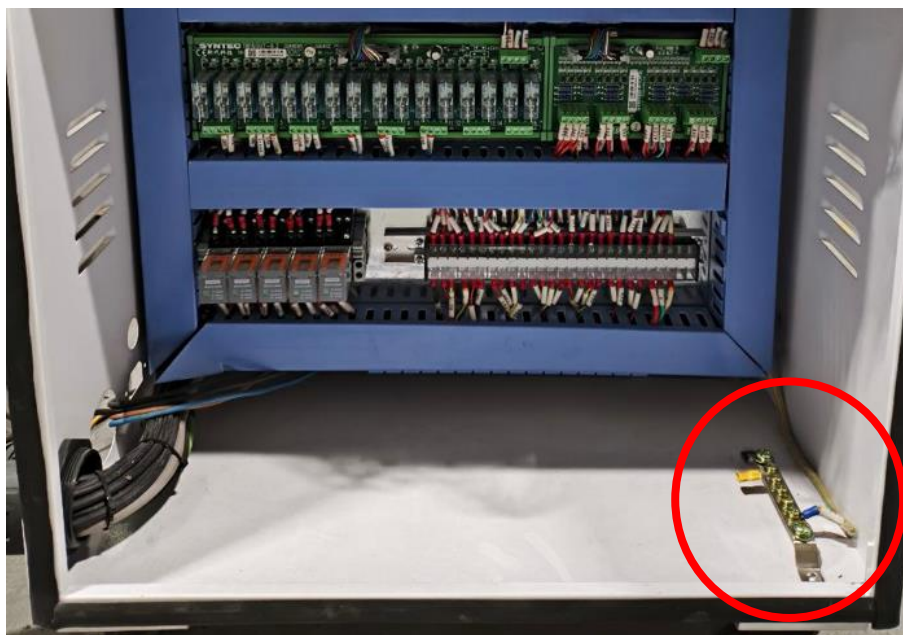


5.2.2 POWER SUPPLY CONNECTION

1. Locate the main switch in the control cabinet and connect the power supply to the switch:



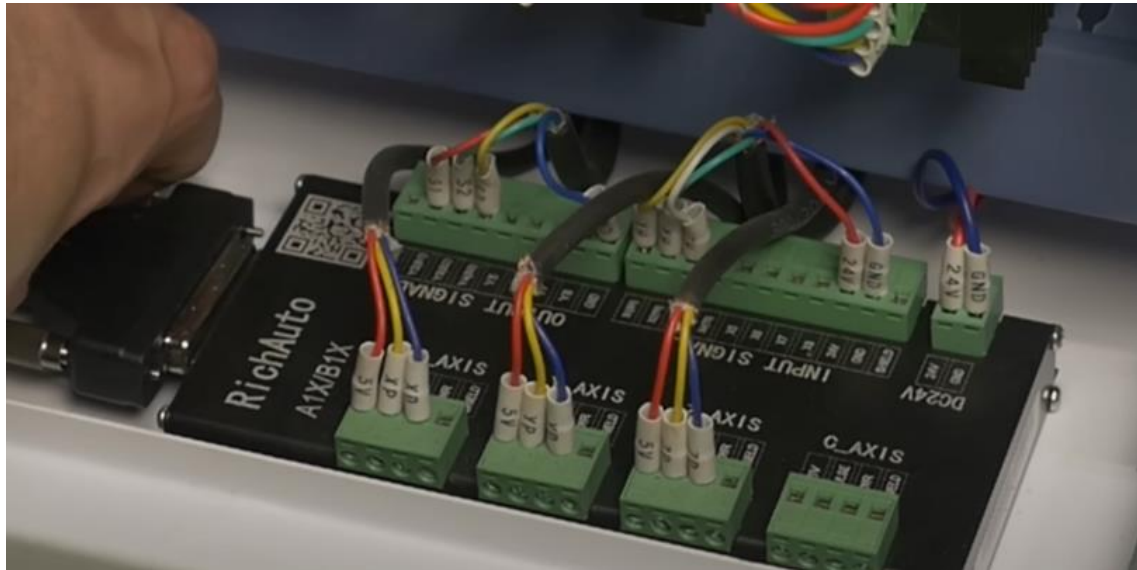
2. Connect the ground cable to the machine's ground bus.



It is important to connect equipment through a voltage stabilizer! If the voltage fluctuates, the equipment will not work properly. If the voltage is too high, the electronic components of the machine may be damaged!

5.2.3 CONNECTING THE RICHAUTO CONTROLLER

Connect the cable to the connector of the controller board:



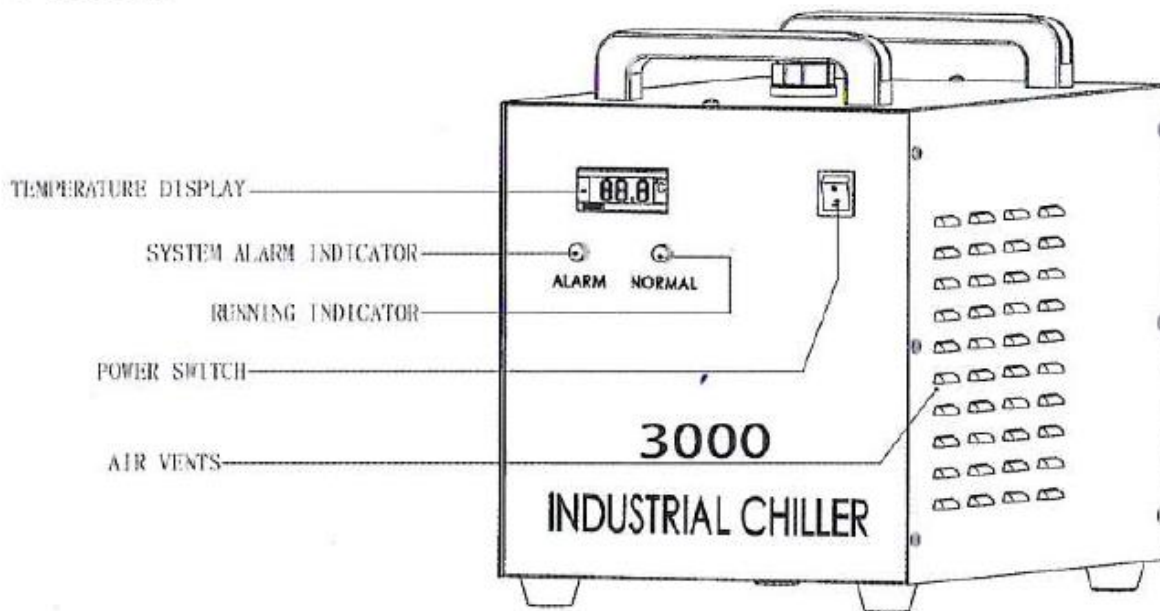
Connect the other end of the cable to the controller:



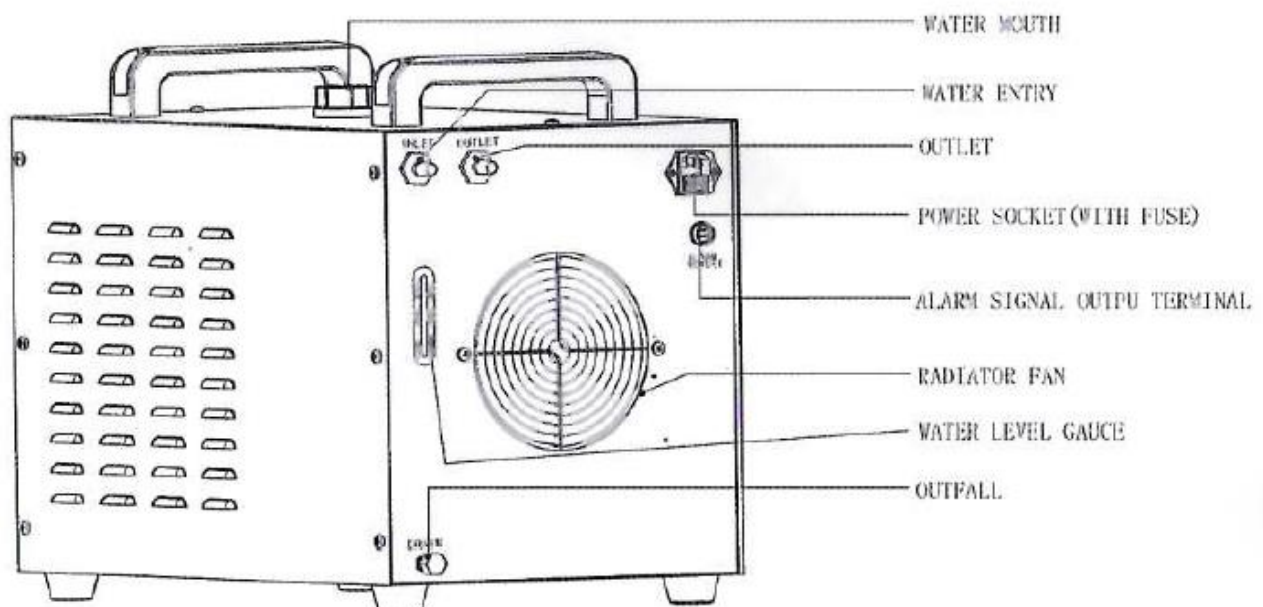
5.3 CONNECTING THE CHILLER

5.3.1 CONNECTION PROCEDURE

FRONT



BACK



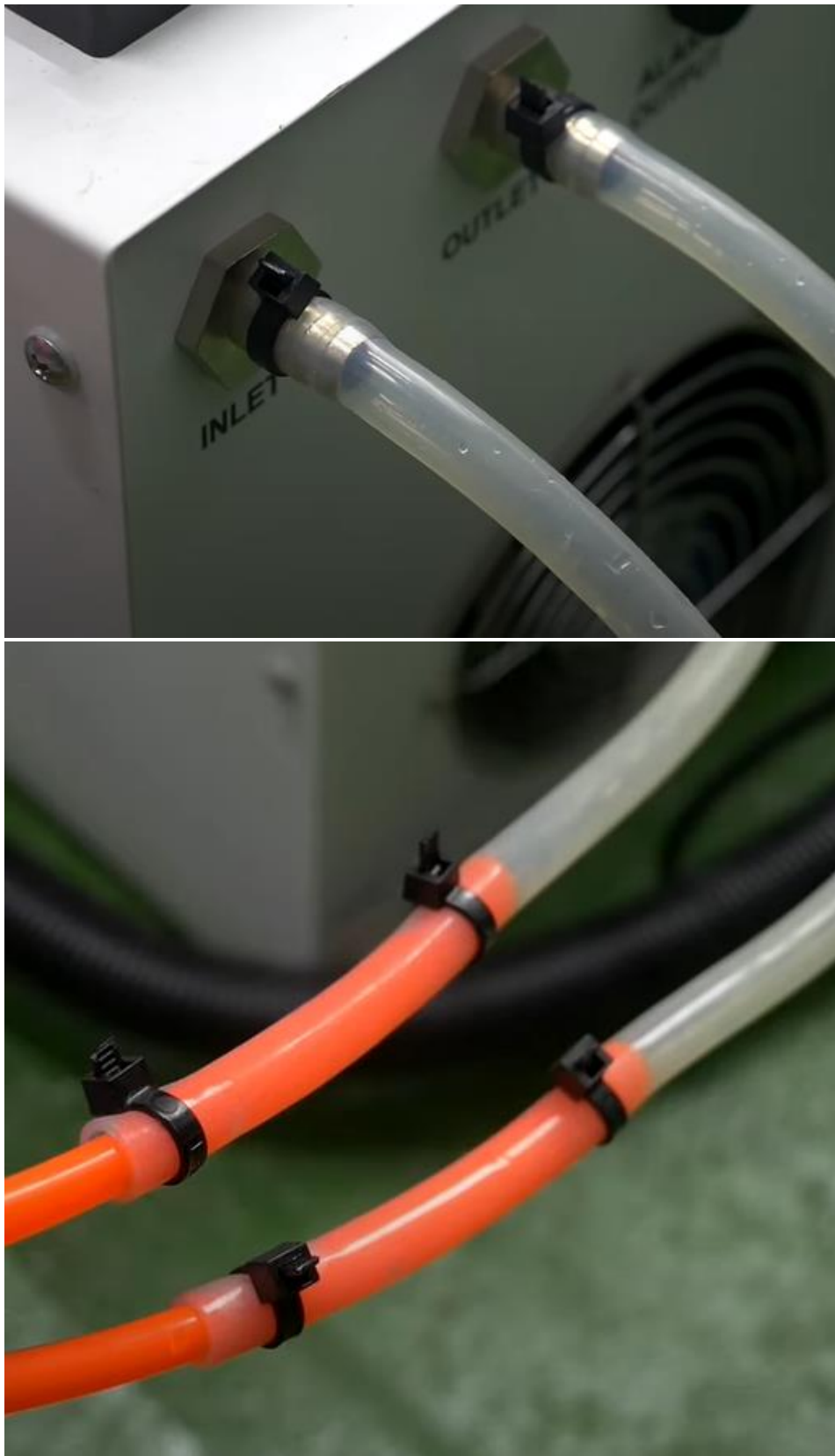
1. Take the two silicone hoses that come with the kit and connect them to the Inlet and Outlet fittings of your chiller:



2. Insert the machine cooling system hoses into the chiller silicone hoses:



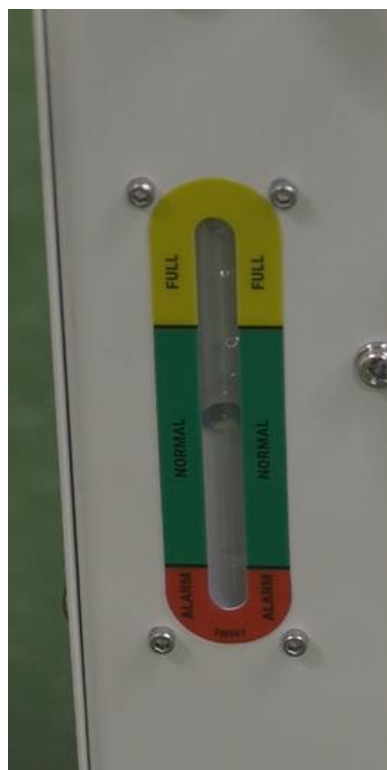
3. Tighten the hose connections with clamps:



4. Tighten the chiller drain plug until it stops.



5. Unscrew the filler plug of the chiller and pour distilled water into the chiller in the amount according to the chiller manual. Check at the back of the chiller that the water level is within the green zone. If the water level is below the green zone, add water, if it is higher, drain the excess water by unscrewing the chiller drain plug. And screw on the chiller fill plug.



6. Plug the chiller power cable into the chiller and a separate outlet at the other end. Be sure to connect the power supply to the chiller through a voltage stabilizer.



Hoses should not be twisted or pinched for normal water inflow and should be tightly connected to avoid water leakage!

5.4 MATERIAL INSTALLATION

5.4.1 FASTENING WITH PRESSURE PLATES

This method of fastening can only be used if the outer edges are not processed. To protect the machine bed, place a film under the material to be processed.



1. Insert the screw into the plate and tighten the nut:



2. Screw in the bolt:



3. Level the plate with a bolt and tighten the nut:

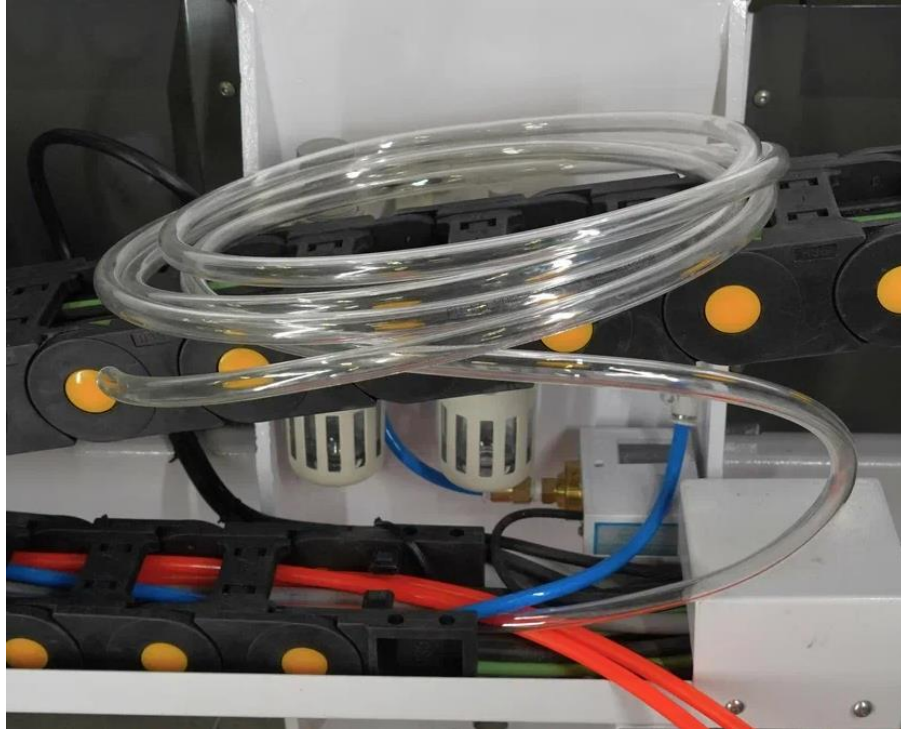
5.5 CONNECTING THE COOLANT SYSTEM (OPTIONAL)

The coolant system is used to cool and lubricate the tool and the material being processed.

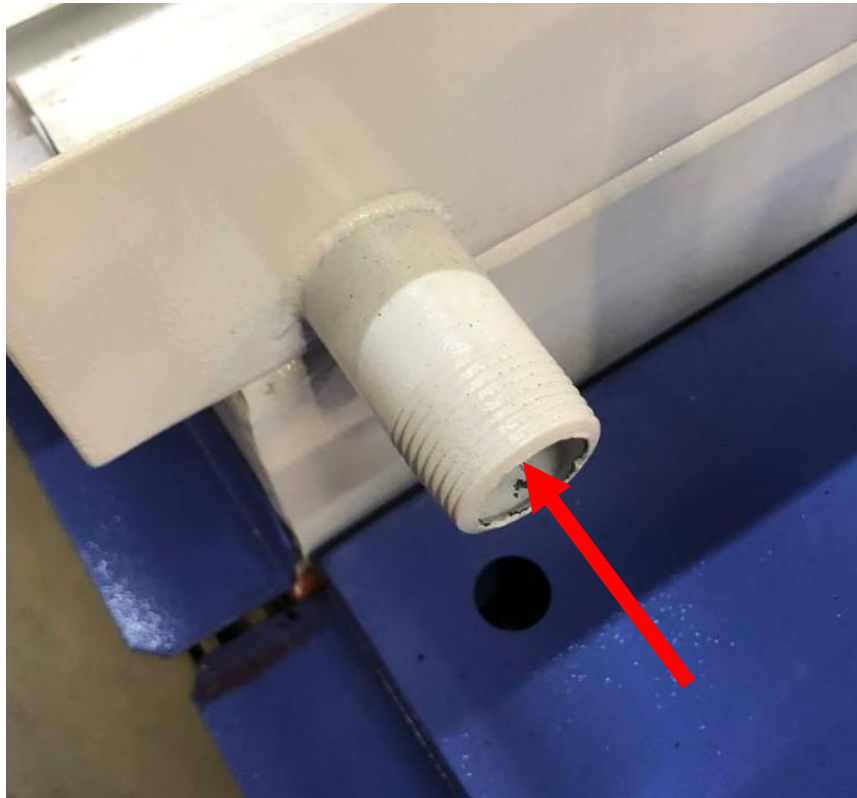
Coolant is an option on these machines.

Connection:

1. Locate the clear hose on the side of the machine. Connect it to the pump.



2. Slide one end of the hose into the machine drain and the other end into the pump reservoir



3. Plug the pump into the connector at the back of the machine



5.6 INSTALLING THE TOOL

1. Take the cutter and the collet that fits it.
2. Install the collet into the nut until it clicks into place.



It is recommended to insert the collet into the nut first, and only then the cutter into the collet.

3. Insert the tool into the collet.



It is recommended to insert the collet into the nut first, and only then the cutter into the collet.

4. Screw the nut with the collet inserted into it on the spindle with your hands for a couple of turns. Then take wrenches of suitable sizes, fix the spindle rotor with one wrench, tighten the nut with the other.



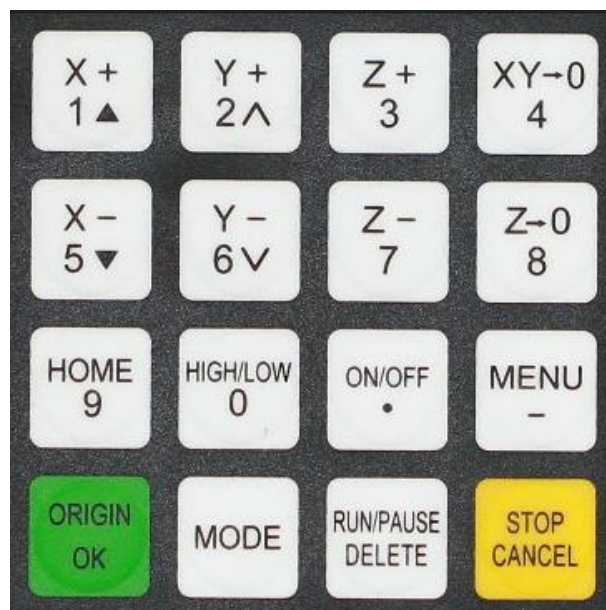
To remove the collet, you first need to move it sideways until it clicks, then it will jump out of the nut groove.

CHAPTER 6. CONTROL SYSTEM

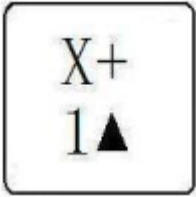
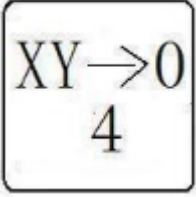
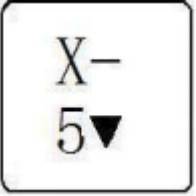
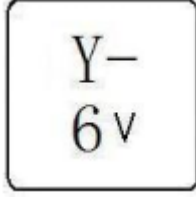
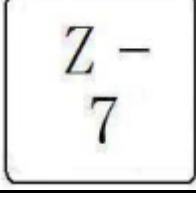
6.1. RICHAUTO CONTROLLER

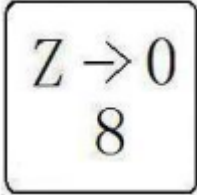
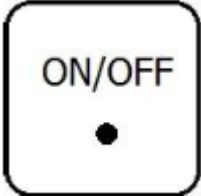
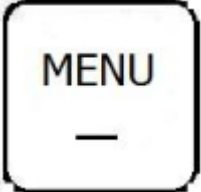


The keyboard contains 16 function buttons:



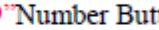
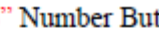
List of basic single-click commands:

Button	Team
	Positive movement along the X-axis; in the menu – "Up", enter the number 1
	Positive movement on the Y axis, entering the number 2, changes the value in the selected menu item
	Positive movement in the Z axis, entry of number 3, increase in spindle speed in operation
	Zeroing the spindle in the X, Y axes, entering the number 4
	Negative movement along the X axis, in the menu – "Down", entering the number 5
	Negative Y-axis movement, slowing down cutting speed, number 6, changes the value in the selected menu item
	Negative Z-axis movement, number 7 input, spindle speed reduction in operation

	Zeroing the spindle in the Z axis, entering the number 8
	Leaving for the house in all axes, entering the number 9
	Manual motion mode, switch between high and low speed, enter the digit 0, switch between the working and mechanical coordinate systems when operating in automatic mode
	Start/stop spindle, decimal point input
	Starting the menu, entering the "-" symbol, checking the status of the operation
	Moving the tool to the working position in all axes, confirming the movement, input, operation
	Manual control, modes: continuous, step, and full cycle.
	Start/pause, delete incorrectly entered characters

	Stop an operation, stop movement, cancel an operation entry
---	--

List of combined teams:

	Combination button	Function
1	 + 	Switch the coordinate system (0 for the mechanical coordinate system , 1 - 9 for the work coordinate system)
2	 + 	Start Z-axis automatic tool setting
3	 + 	Start the breakpoints processing (support number 1 - 8)
4	 + 	Start advanced processing
5	 +  + 	To switch gear shaft under manual mode
6	 + 	Repeat last time processing
7	 + 	Set stop position
8	 + 	System upgrade
9	 + 	Quit buttons check

Important: Do not use flash drives with more than 4 GB of memory.

6.2 RUNNING THE PROGRAM VIA FLASH DRIVE

There is a USB socket at the top of the controller.

1. Download your program to a USB drive.
2. Insert the USB drive into the USB connector of the controller.



3. Press the **RUN PAUSE/DELETE** button. The UDisk File inscription will appear on the display.



- Click OK. As a result, the screen will display what is on the USB drive.



- Use the arrow buttons to select the file you want to load into the controller.
- Select, and then click OK.
- Check that the parameters are correct, and click OK



- After downloading the code/program, the machine will start working.

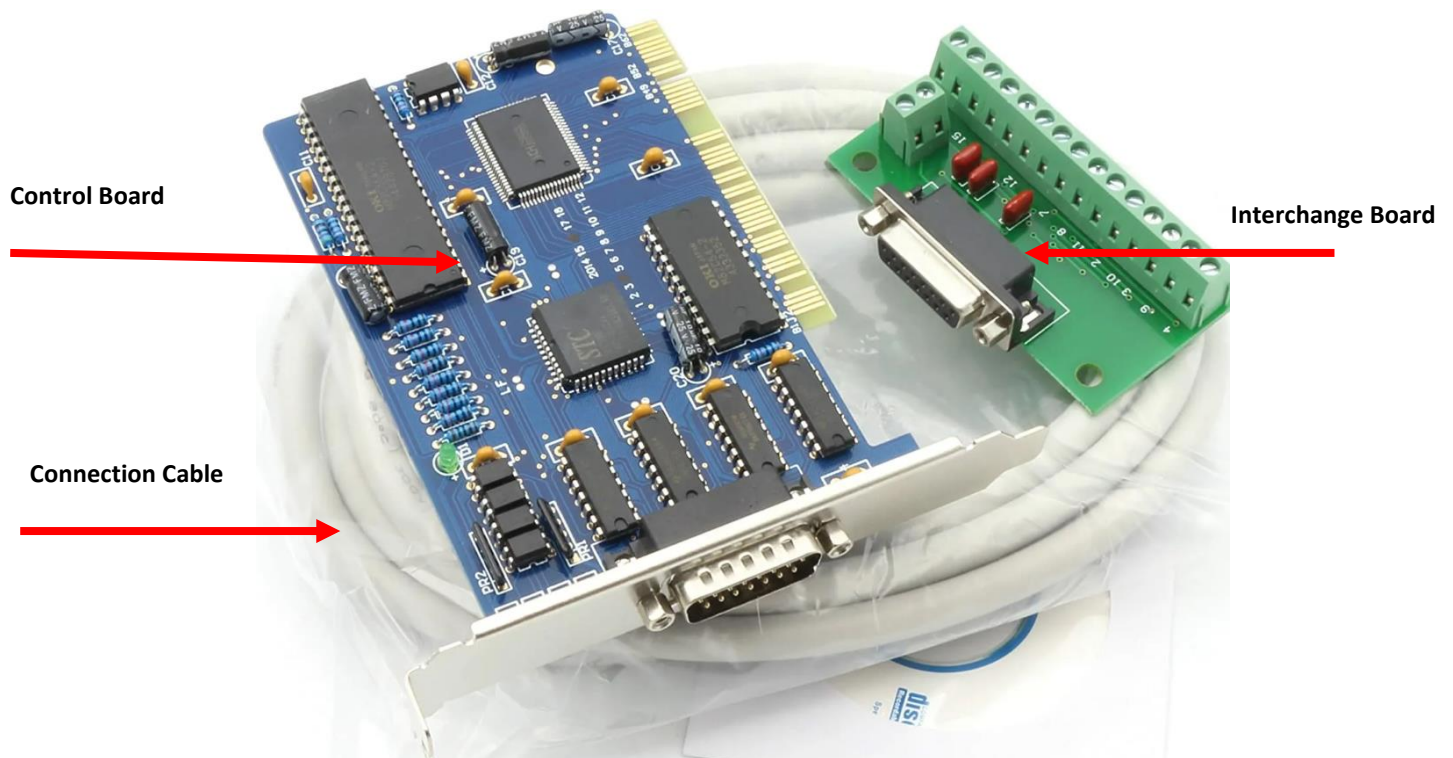
Setting the parameters for this option is done in advance, but it is recommended to check the key points. To do this, start the machine and go to the Machine setup section.

Settings:

Options		4040mini	6090mini
Pulse Equival	X	320	
	Y	320	
	Z	320	
Table size	X	400	600
	Y	400	900
	Z	100	100
Spindle Setup	Delay on	10.000	
	Delay off	0.0	
Home Setup:	Home speed X	1000	
	Home speed Y	1000	
	Home speed Z	800	
Home Order		Z, X and Y	
Acceleration	Accel Type	SCurve	
	Ln Accel	400	
	Cv Accel	400	
	J Accel	6000	
Start Speed	Skip	100	
	Cmpl	200	
Max Speed Limit	X-	6000	
	X+	6000	
	Y-	6000	
	Y+	6000	
	Z-	3000	
	Z+	3000	

Detailed instructions for working with the Rich Auto system will be attached in a separate user manual.

6.3 NC STUDIO



The NC Studio system requires a personal computer, because the control board is mounted in the PCI slot of the personal computer:



Important: The control board is mounted **ONLY** in the PCI slot. PCI Express and others won't work!

The isolation board is located inside the power cabinet.

Minimum system requirements:

- Operating system: Windows XP (SP2) x86;
- Processor: Intel 2 GHz or equivalent Athlon X2;
- RAM: 1 GB;
- Hard Drive: 10 GB of free space;
- Video card: with 128 MB video memory;
- PCI slot

Important: NC Studio is only supported on 32-bit operating systems.

6.4 INSTALLING THE NC STUDIO DRIVER

After installing NC Studio, you need to install the driver.

1. Go to Device Manager.
Start → Control Panel → System → Device Manager
2. In the Other devices tab, find an undefined device
3. Double-click on this device. In the window that appears, go to the **Driver tab** and click **Update**
4. In the window that appears, click "Search for drivers on this computer"
5. Specify the path to the driver. By default, the program is installed in the folder **C://Program files/NCStudio 5.5.60**
6. **After clicking the "Next" button, a window will pop up, click "Install this driver anyway"**
7. Run the software and enter the machine data in the Params → Manufactory tab (password ncstudio).

Trace
Log
Manager
Params
Editor
IOState

Machining
Manufactory

Workbench

"Set the workbench dimensions, which decide when the system raises an out-of-limit alarm after the mechanical coordinate has become effective."

Start (Mechanical) Coord.

X: 0 mm
Y: 0 mm
Z: -100 mm

End (Mechanical) Coord.

X: 600 mm
Y: 900 mm
Z: mm

Note: Please restart after changing above

Mobile Calibrator:

Thickness of the 19.1 mm

Motor Parameter rate of z axis:

X: 0,003125 mm/pulse
Y: 0,003125 mm/pulse
Z: 0,003125 mm/pulse

Start-up Feedrate:

100 mm/min

the maxium feedrate of z axis:

3000 mm/min

Acceleration

Set the angle-per-pulse while Y axis is a revolving axis:

Linear Acceleration:

400 mm/sec²

Connection Acceleration:

1000 mm/sec²

Spindle

Maximum rpm of the spindle:

24000 rpm

Startup/stop delay of the spindle:

10000 millisecond

Menu items:

	0404mini	0609mini
End (mechanical) Coord. X	400	600
End (mechanical) Coord. Y	400	900
Start (mechanical) Coord. Z	100/150 – depending on configuration	
Mobile Calibrator	19.1	
Motor Parameter X	0.003125	
Motor Parameter Y	0.003125	
Motor Parameter Z	0.003125	
Maximum rpm of the spindle	18000/24000 – depending on configuration	

Params Machining Speed Settings→

Trace
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Jog Feedrate

Normal Jog Feedrate: 15000 mm/min
Rapid Jog Feedrate: 15000 mm/min

Auto Mode Parameters

G00 Feedrate: 15000 mm/min
Machining Feedrate: 15000 mm/min

Detailed instructions for working with NC Studio software will be attached in a separate user manual.

CHAPTER 7. GET STARTED

7.1 STARTING THE MACHINE

Before starting the machine, it is necessary:

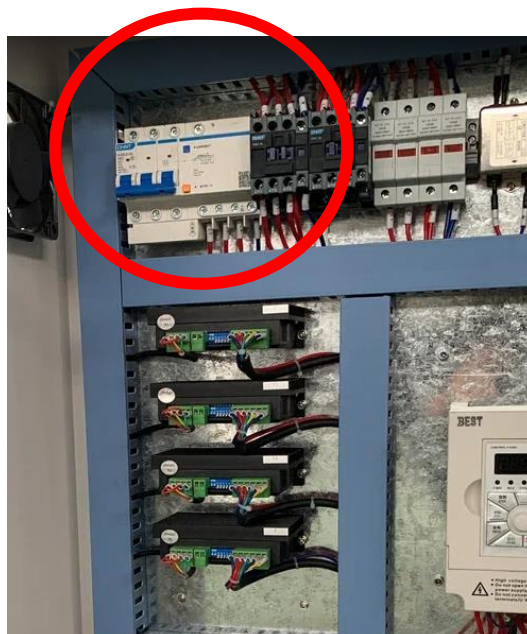
- ✓ Check that there are no forgotten tools or other foreign objects in the mechanisms of the machine.
- ✓ Check the tightening of the joints on the machine and its parts that need to be tightened.
- ✓ Check all electrical connections, make sure all cables are connected correctly and connectors are secured.
- ✓ Check the power supply parameters and their compliance with the characteristics of the machine and the connected load.
- ✓ Check the proper functioning of protective devices
- ✓ Ground the machine, the console and the control unit by connecting to the general workshop grounding system.
- ✓ After each turn on the machine, it is mandatory to perform the "Leaving for the house" procedure.



Every day, before starting work, it is recommended to warm up the spindle (Start the spindle for 5 minutes at a rotation speed of 10-12 thousand revolutions)

7.1.1 MACHINE START-UP PROCEDURE:

In the control unit, turn on the main switch:



Open the emergency shutdown button by scrolling it clockwise:



Press the top green button:



Turn on the chiller:



7.1.2. PROCEDURE 'HOMING'

After turning on the machine, it is mandatory to perform the procedure "Going home" ("Return to zero point", "Return to the point of origin", "Return to machine zero"). This is necessary for it to correctly determine its position relative to the desktop.

Take the controller and select **All axis home** from the menu:



Click on the OK button:



Make sure that the machine performs the procedure correctly.

CHAPTER 8. MACHINE MAINTENANCE

Interval	Maintenance
Daily	At the end of each shift, clean the work surface of chips, dust and material residue using an industrial vacuum cleaner or brush.
	Inspect the cutting edges and the condition of the tool. If it shows signs of wear or damage, replace it with a new one.
	Check the coolant level in the system and add it to the correct level if necessary.
Monthly	Inspect guides, ball screws, and gear racks for wear. If necessary, clean and apply a fresh coat of lubricant.
	Check the oil level. Add if necessary.
3 months	Replace the water in the chiller.
6 months	Check the condition of the screw connections.
Perforce	Carry out external cleaning of the machine with a soft and clean cloth.

All moving parts of the milling and engraving machine require external condition monitoring and replacement in case of significant wear.

CHAPTER 9. TROUBLESHOOTING



Codes and error messages are displayed in the control system. Study them and check the documentation to determine possible causes.

Issue	Reason	What to do
The machine does not turn on.	• An emergency shutdown has been activated. • Lack of power supply. • Faulty main switch. • Problems with cables or the power grid.	• Open the emergency shutdown button pins by turning the button clockwise. • Check your network connection and cables. • Make sure the main switch is working. • Check the circuit breakers and fuses.
Reduced machining accuracy.	• Wear of guides or ball screws. • Backlash in joints and fasteners.	• Check the condition of the rails and replace the worn parts. • Tighten the fasteners and check the backlash in the ball screws. All work with the mechanics of the machine should be carried out with the power supply turned off!
Jerks when moving.	• Lack of lubrication on the guides. • Engine breakdown or bearing problems.	• Apply lubricant to the guides. • Check the motor and bearings. Replace faulty components if necessary.
Spindle overheating	• Low coolant level. • Breakdown of the cooling system pump. • Blockage in the hoses of the water circuit.	• Check the coolant level. • Check the operation of the pump and replace it if it malfunctions. • Clean the cooling hoses.

CHAPTER 10. WARRANTY

In case of equipment breakdown during its warranty period due to a defect caused by the manufacturer, repair is carried out by the supplier's company free of charge.

However, consumable parts such as optical parts (tools, hoses, fittings, etc.) are not eligible for warranty service.

For free repair or replacement of accessories, the buyer bears the cost of delivering new components from the place of their storage to the buyer's address, and, if necessary, the buyer bears the cost of the specialist's visit to the place of work.

If the equipment failure is caused by a defective part or assembly of the equipment, this part or assembly is repaired or replaced free of charge.

Defective components and parts must be returned to the supplier.

If the malfunction is not caused by the quality of parts or components of the equipment, the buyer will have to pay the cost of repair as well.

Warranty service is also not subject to malfunctions due to improper use of equipment, non-compliance with maintenance rules, operating conditions, as well as warnings specified in manuals and on warning plates that have arisen during the warranty period.

Also, a prerequisite is that your equipment and peripherals are grounded and operated through a voltage stabilizer.