YRC-9PRO Product Manual

Catalogue

Preface

Dear user:

Welcome to YRC-9PRO equipment. To ensure your safe, efficient, and stable operation throughout the entire process, this manual serves as your essential operational guide, systematically outlining key operational procedures and safety protocols. To help you fully grasp the core content, we strongly recommend reading this manual thoroughly before first use and strictly adhering to the specified operational workflows, parameter settings, and maintenance requirements. For easy reference, please store this manual in a fixed, easily accessible location near the equipment (e.g., in a dedicated storage box) with dry conditions. This ensures all personnel involved in equipment operation and maintenance—including new staff members—can readily consult it to familiarize themselves with operational standards and safety guidelines.

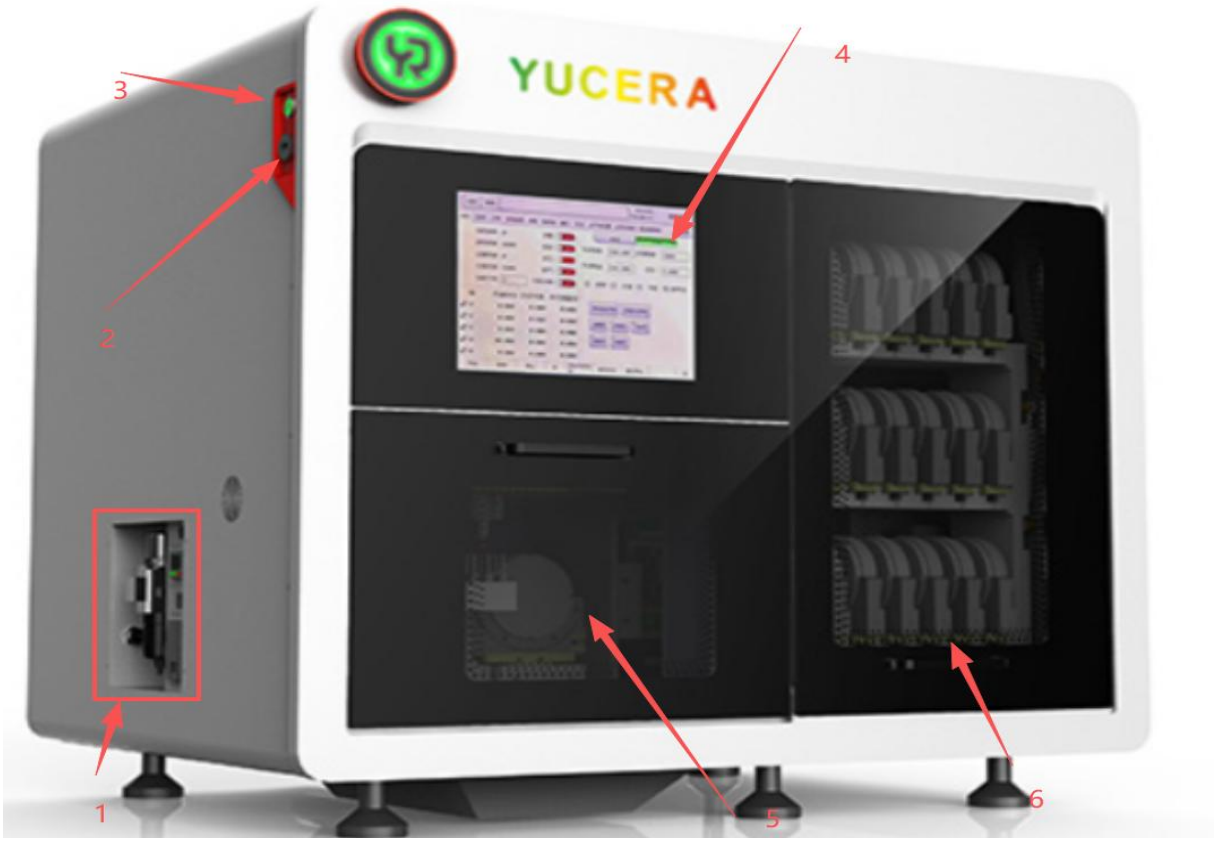
We remain committed to continuously enhancing product performance and service quality. While using the YRC-9PRO device or reviewing this manual, if you identify any areas for improvement (e.g., optimized operating procedures or expanded manual content) or have questions (such as inquiries about device functions or operational challenges), please feel free to contact your designated dealer. We value your feedback and will promptly address your needs to continually refine our products and documentation, ensuring you receive a superior user experience and support.

Thank you for trusting and supporting our products. We hope you enjoy using them!

Charpter 1 Basic understanding of equipment

1.1 Device overview

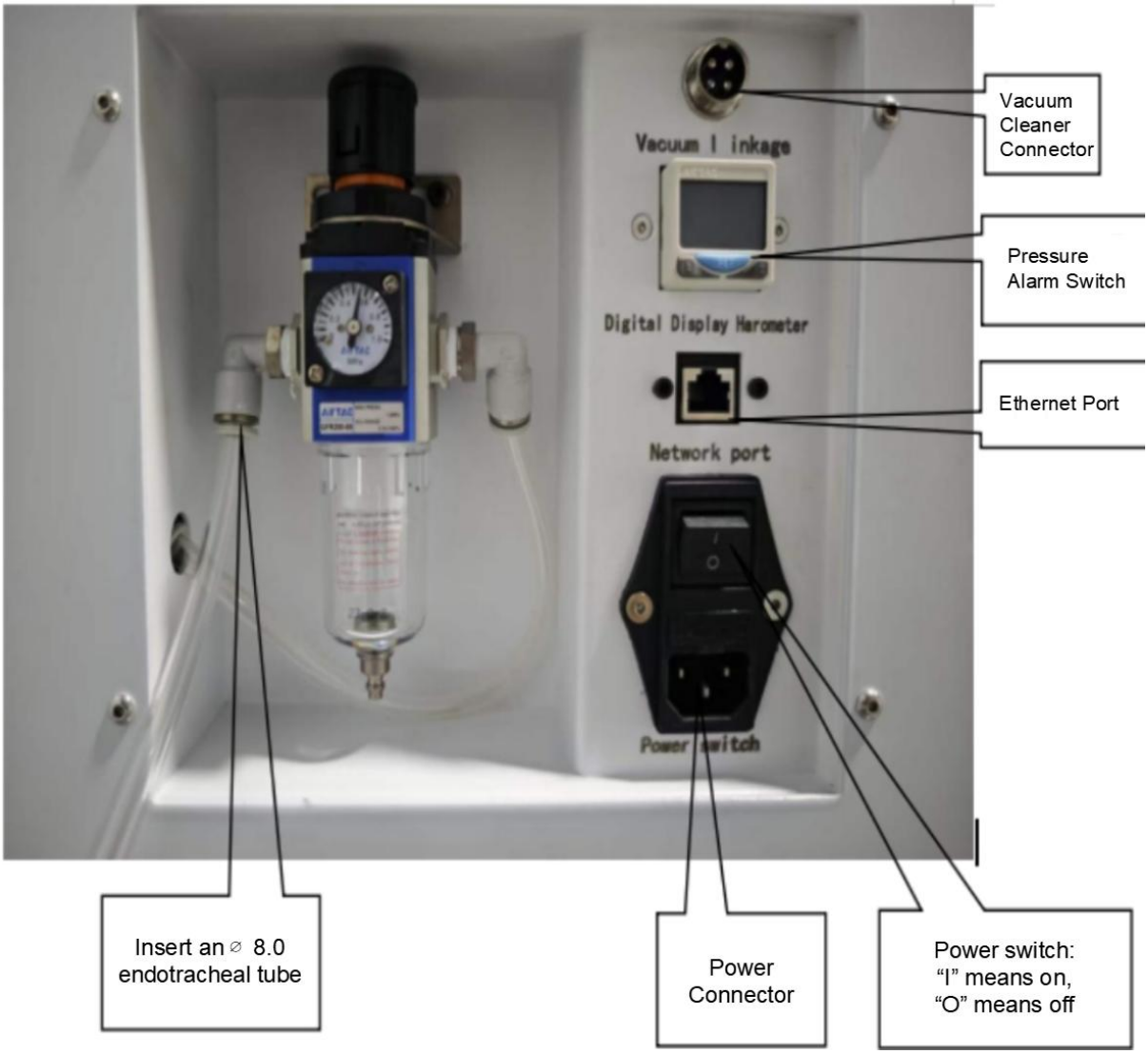
The YRC-9PRO five-axis milling machine is designed for the dental technology field to facilitate digital processing and can handle various types of materials.



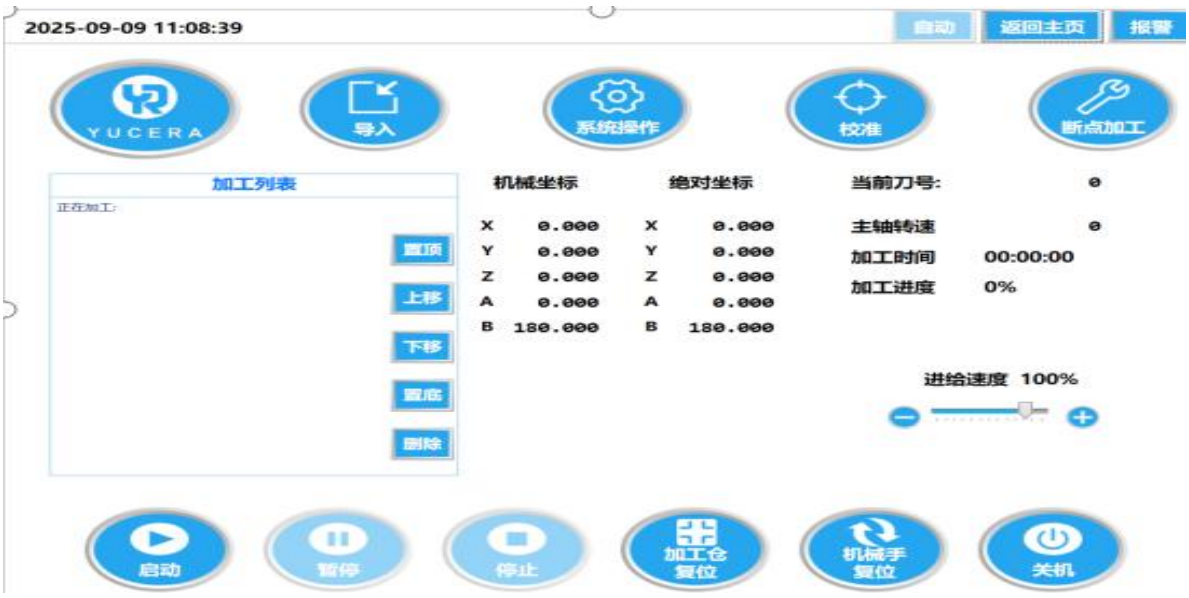
Schematic diagram of YRC-9PRO

1. Electrical unit and power-on/off button 2. USB interface 3. Emergency stop switch 4. Display screen operation interface 5. Opening and closing of processing warehouse doors 6. Opening and closing of material warehouse doors

1.2 Side panel of device



1.3 Host operation page



1.4 Work hatch

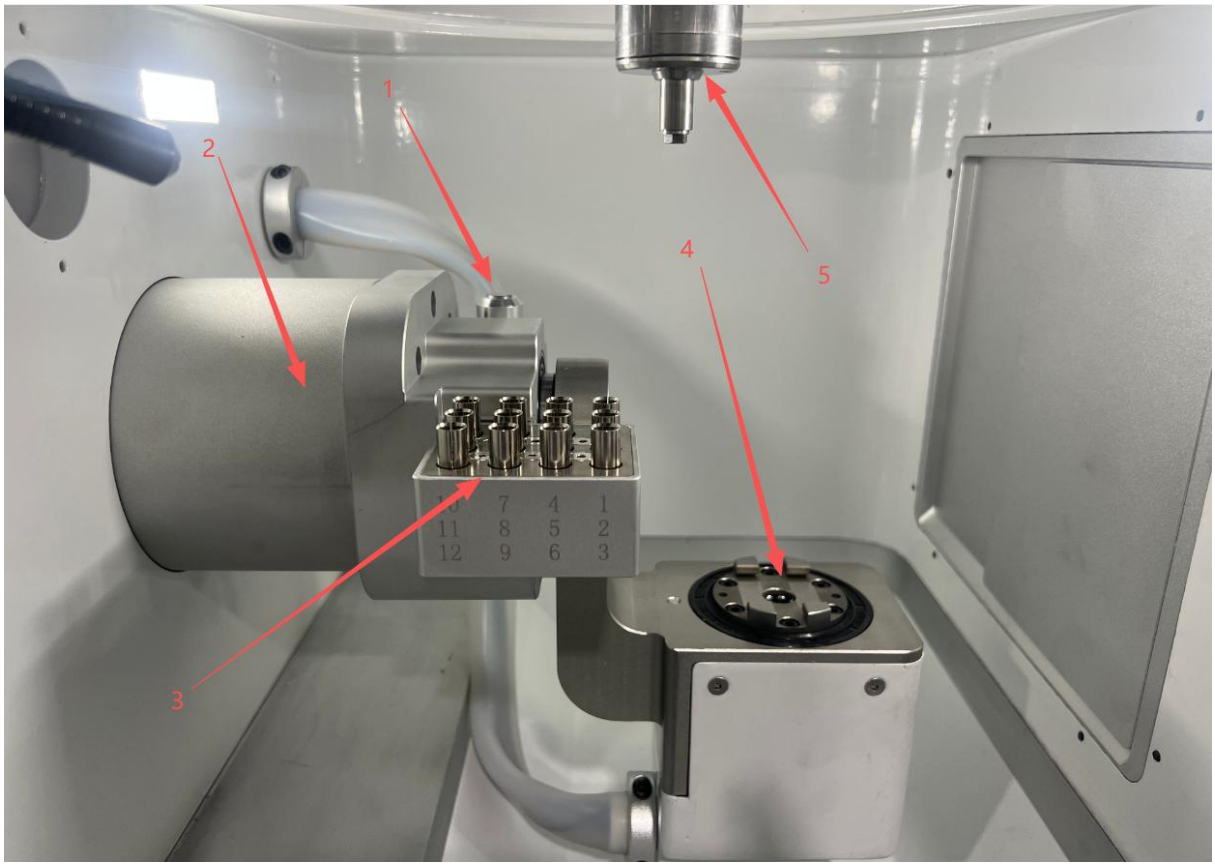
The work compartment door must be kept closed while the machine is in operation to prevent injury to personnel.

[Note] : Exercise caution to avoid entrapment injuries when opening or closing the cabin door.

- When opening the hatch, hold the handle and pull it outward.
- When closing the hatch, place your hand on the lower edge of the hatch and push upward.

1.5 Workstation

A chamber used for processing blank materials.

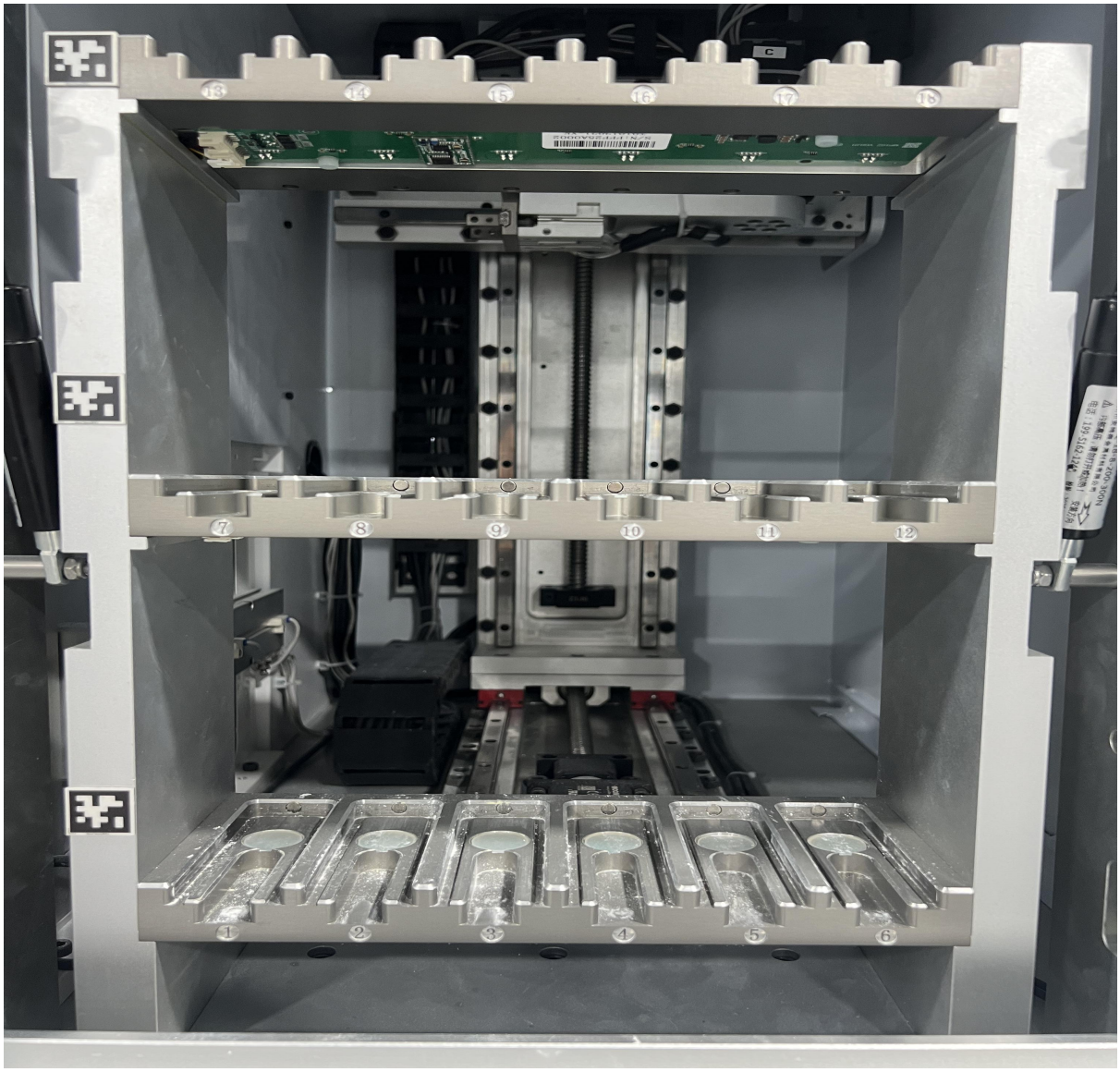


YRC-9PRO Work Cabin Diagram

1. Tool setter 2. A-axis 3. Tool holder 4. B-axis 5. Spindle

1.6 Material warehouse

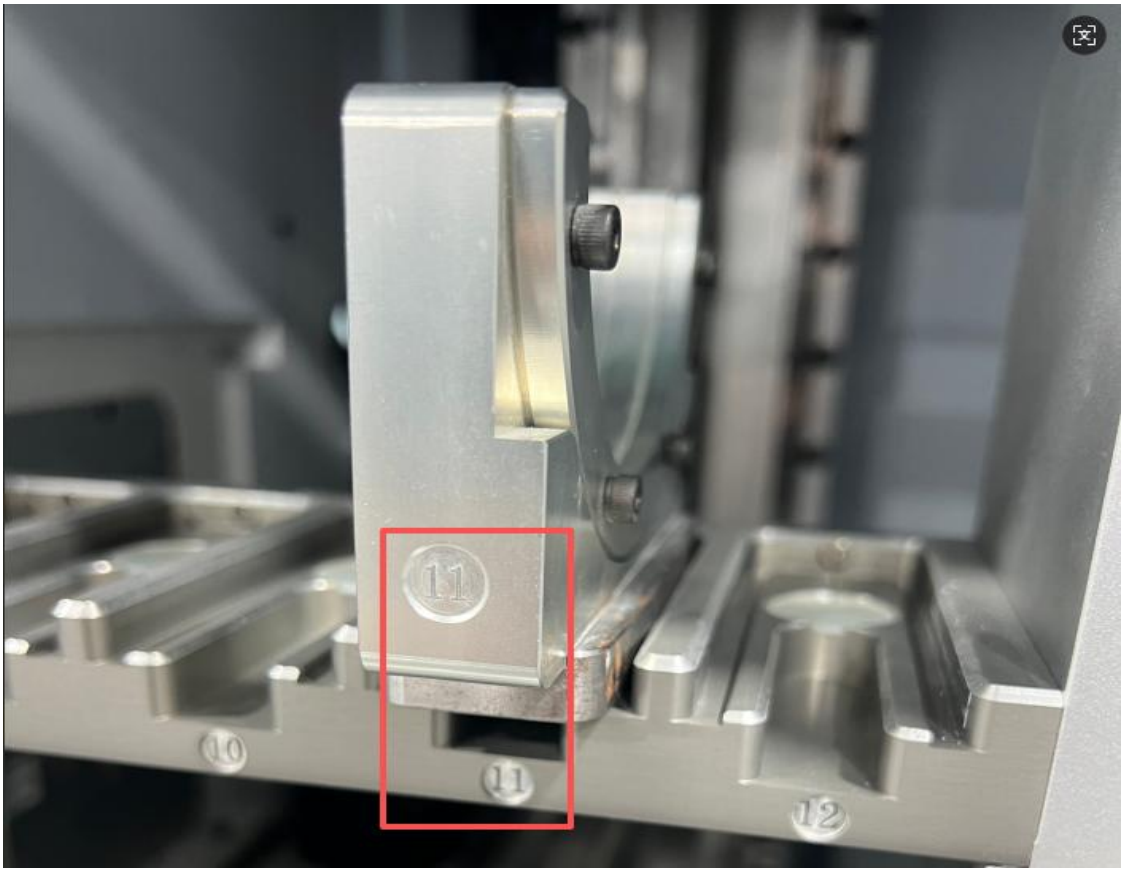
The storage fixture tray has 18 designated positions that require corresponding placement.



The sequence is arranged from bottom to top as 1-3, and from left to right as 1-6, 7-12, and 13-18.

13	14	15	16	17	18
7	8	9	10	11	12
1	2	3	4	5	6

The fixture should be positioned with the engraved numerical end facing outward, as shown in the figure below.



matters need attention :

1. The fixture is stored in the material bin at the start and end of each processing cycle, so the position of the bin clamp must not be misaligned.
2. The tongs must be placed in the correct sequence.
3. When manually placing sheet metal, ensure the orientation is correct and position it accurately.

1.7 Coolant passage

The blow-off system consists of the following two components:

- Gas source output assembly: Gas supplied by the spindle and air blowing pipe;
- External suction assembly: includes a suction device and an inhalation hose.

When the equipment is in normal operating condition, the spindle and air blowing pipe continuously deliver gas into the working chamber. Simultaneously, the external dust collection device connected to the working chamber removes debris, dust, and other impurities generated within the chamber through the suction holes.

A well-designed suction and blowing system can effectively prevent damage and wear to machine-sensitive components caused by debris and dust accumulation, ensuring operational stability of the parts.

[Note] : The suction and blowing system is only intended as an auxiliary impurity removal device during operation and cannot replace routine machine cleaning procedures. Failure to perform comprehensive machine cleaning as required will significantly reduce equipment service life.

1.8 Technical parameter

Specifications	Parameter
number of axles	Five-axis linkage
milling method	Auto Disk Swap
material tray quantity	18
milling material	Zirconia, wax, resin, composite materials
material dimensions	Disc with a diameter of 98 mm and a thickness of 10–30 mm
trip range	X/Y/Z:175-150-90 A:360° B:-38°~ +135°
main shaft speed	0~60000rpm/500W
drive	fully servo electric motor
milling tools	Quantity: 12 Diameter: 4 mm
size	932*730*855mm
quality	Total mass of the milling machine: 320 KG
required air pressure	4.5-7.5bar
compressed air flow rate	approximately 66 L/min
minimum vacuum suction capacity	Approximately 3000 L/min
power	800W
source	220—230V AC, 50/60 HZ

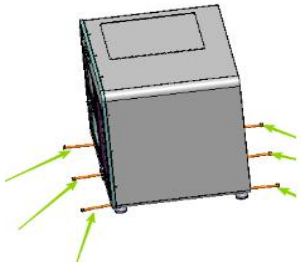
Charpter 2 Equipment transportation and installation

2.1 Handling, packaging, and storage

⚠ Warning: To ensure proper equipment operation during transportation, handling of transport packaging must be performed by qualified operators or maintenance personnel. Please review the following handling precautions carefully.

2.1.1 Safety guidelines for transportation

- The center of gravity position of the equipment must be clearly identified prior to transportation. During handling, any displacement of the center of gravity is strictly prohibited to prevent equipment tilting or falling.
- Prior to transportation, carefully inspect the weight and orientation markings on the equipment's outer packaging box to ensure the device remains balanced during handling.
- When handling equipment with lifting machinery, ensure that the stressed parts of the machinery remain consistently around the equipment's center of gravity and minimize equipment shaking as much as possible.
- During device lifting and lowering, continuous attention must be paid to potential tilting of the equipment. When conditions permit, the overall height of the packaging should be minimized to enhance handling safety.
- During handling, only the force-bearing areas specified by the equipment shall be used; applying force to non-force-bearing areas is strictly prohibited.
- Equipment outsourcing materials must only be removed after the installation of the equipment is completed, and shall not be disassembled prior to installation.
- At least 6 adult males are required for the handling process. The machine has a relatively heavy weight of approximately 320 kg.



Select the highlighted area (6 people)

2.1.2 Packaging

The transportation packaging of this equipment is specially designed based on the anticipated transportation method and conditions, utilizing specialized protective structures to minimize potential physical damage and other risks during transit. The packaging must be removed prior to equipment installation. When removing the packaging, every effort should be made to preserve its integrity, with a backup retained for reuse when the equipment needs to be returned to the factory.

2.1.3 Labeling on the outer packaging

The device is a high-precision instrument with numerous vulnerable internal components, and should be handled with care during transportation.

The device contains numerous electronic components and mechanically sensitive parts that require waterproofing, and exposure to moisture should be avoided.

When temporarily placing or storing equipment, position it according to the arrow direction.

During transportation and handling, avoid tilting or rolling the packaging box.

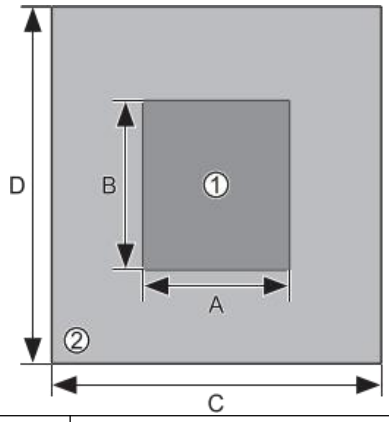
2.2 Accessories

First, check the delivery list to ensure completeness. Open the machine packaging and count the following items:

Order number	Item name	Specifications	Unit	Quantity
1	YRC-9PRO	932*730*855mm	table	1
2	carriage wheel	4mm	branch	7
3	clamping screw	M4	piece	4
4	power line	European Standard American Standard	item	1
5	screwdriver	(Phillips , Flathead)	piece	2
6	tee coupling	T-type tee/Y-type tee	individual	2
7	inner hexagon spanner	1-10	set	1
8	air tube	8MM*5M	twig	1
9	vacuum cleaner hose	50.8mm	twig	1
10	main shaft wrench		individual	1
11	lifting machine handle	20-160	branch	6
12	cake wax	98*14MM	individual	1
13	vacuum cleaner control cable		twig	1
14	vacuum cleaner clamp		individual	2
15	fuse rod		individual	2
16	main spindle detection accessory	Detection probe, wire	set	1
17	Wi-Fi kit	wireless connectors, network cables	set	1
18	softdog		individual	1
19	USB		individual	1
20	material tray	standard fixture	individual	18

2.3 Installation conditions

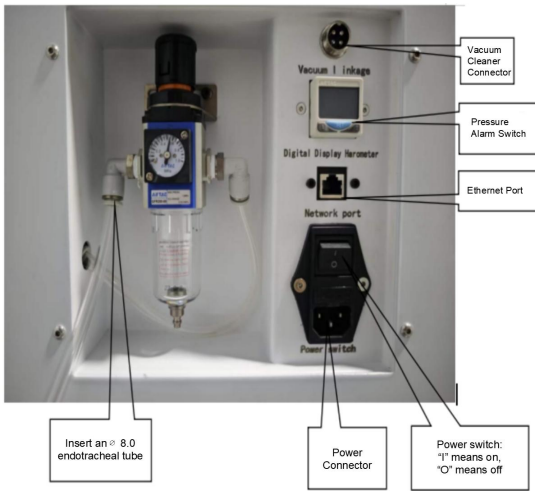
- The installation site must have sufficient load-bearing capacity (capable of supporting approximately 320 KG), and the installation surface must be firmly leveled.
- The indoor ambient temperature should be maintained within the range of 18°C to 25°C (ideal range), with a maximum limit of 32°C.
- Maintain a dust-free environment when setting up the installation location.
- The relative humidity of air should be below 80%.
- The power supply must provide 220-240 V AC power at 50/60 Hz frequency.
- Compression requires compressed air that meets equipment requirements, with a pressure range of 4.5-7.5 bar.
- Sufficient operational space must be reserved around the equipment installation area, with specific dimensions detailed in the attached drawings.



①	installation space
②	working space
A	932 mm
B	750 mm
C	1932 mm
D	1750 mm

[Note]: Connect the device power cord to an independent circuit with fuse protection, or ensure that no other devices share the power supply circuit to effectively avoid voltage fluctuations. Severe voltage fluctuations may interfere with the normal operation of the device control system, potentially leading to system failures.

2.4 Equipment installation



Device connection diagram

2.5 Removal and management of working chamber fillers

Prior to the initial startup of the equipment, the transport filler within the working chamber must be removed. This filler is used to protect the spindle and machine tool structure during equipment transportation, preventing damage caused by vibrations or impacts. Specific operational requirements are as follows:

1. Open the equipment work chamber and completely remove all internal transport fillers.
2. Clean the interior of the work chamber to ensure no residual filler debris remains;
3. Store the removed fillers properly for reuse when subsequent equipment requires transportation (e.g., return to the factory or relocation).

2.6 Pneumatic unit mounting device

1. Installation and maintenance specifications: During equipment installation and maintenance operations, ensure that no compressed air flows through the pressure regulator filter.
2. Pneumatic hose installation inspection: After the pneumatic hose is installed and before inflation, it must be confirmed that the hose is securely inserted into the corresponding connector and is free from damage.

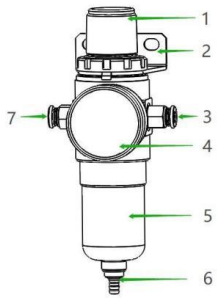
- Simply connect the electrical unit as shown.
- Compressed Air Connection Specifications: The connection between the machine and the compressed air supply source must be performed solely through the pressure regulator

filter provided with the equipment.

[Note]: The compressed air supplied by the input device must meet oil-free and dry conditions. If the compressed air is contaminated (e.g.If, for example, it is contaminated with moisture or oil, it may cause damage to the spindle and electrical components.

2.6.1 Introduction to pressure regulating filters

When connecting the machine to the compressed air supply system, a pressure regulator filter must be employed. This pressure regulator filter performs two core functions: first, it regulates the compressed air pressure input to the machine; second, it enables partial separation of moisture from the compressed air.



Pressure regulating filter diagram

1. Pressure adjustment knob 2. Fixed base 3. External compressed air interface 4. Pressure gauge 5. Water separator 6. Drainage device 7. Machine connection interface

2.7 Install the vacuum system

2.7.1 Vacuum cleaner requirements

Use a vacuum cleaner that meets all the following features:

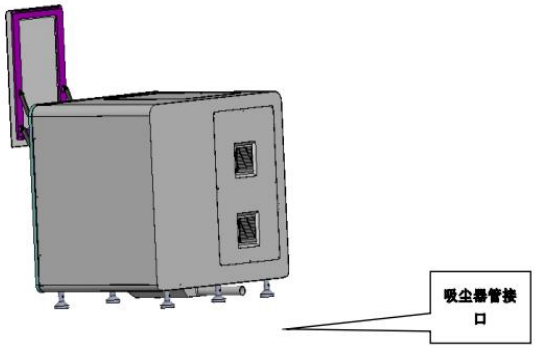
- Specifically designed for the dental field;
- Equipped with M-grade filters;
- Compatible with the working environment of machine tools;
- Protective devices are provided to prevent operator injuries;
- The minimum displacement must reach 3000 L/min.

2.7.2 Vacuum cleaner installation

1. Pre-installation preparation: Before installing the vacuum cleaner, carefully read the

installation manual provided with the device.

2. Installation steps:
   - Interface compatibility check: Verify whether the vacuum cleaner's suction port matches the bellows (inner diameter 50.8 mm). If mismatched, use an adapter for connection.
   - Connection of bellows to vacuum cleaner: Insert one end of the bellows into the vacuum cleaner's suction port to ensure a secure connection.
   - Connection of bellows to the machine: Insert the other end of the bellows into the machine tool's suction port to ensure a secure connection.
   - Automatic start-stop settings: To enable automatic control of vacuum cleaner activation and deactivation for machine tools, the machine tool must be connected to the vacuum cleaner via a linkage cable.
   - The vacuum cleaner connector is located at the rear of the device.



Vacuum cleaner hose connector

2.8 Connecting circuit

1. Aerospace joint connection: Connect the aerospace joint on the milling machine to the aerospace joint on the main unit sequentially via matching connecting cables, and tighten the joints to ensure stable connection.
2. Power connection:
   - Plug one end of the device's power cord into the power socket on the main unit's connection panel.

- Insert the plug at the other end of the power cord into a socket equipped with ground protection and overload protection functions.

3. Precautions for voltage usage:

   Important Notice: Severe voltage fluctuations may damage equipment. Significant voltage fluctuations could cause the control unit to stop functioning, potentially leading to system failures. Please adhere to the following requirements:

   - The device power cable must be connected to a dedicated circuit; or ensure that no other devices capable of causing significant voltage fluctuations during startup are connected to the same circuit.
   - If severe voltage fluctuations cannot be avoided in the operating environment, an additional voltage stabilizer must be installed to prevent equipment damage caused by extreme voltage fluctuations.

Charpter 3 Device operation

3.1 Pre-operation preparations

Before starting the device, complete the following checks to ensure it meets the operating conditions:

1. Verify that the equipment is placed on a level and stable surface to avoid potential vibration or shaking.
2. Check that all components are properly installed and all connections are functioning normally;
3. Verify that all parts and accessories are securely fastened without any looseness or displacement.
4. Confirm that all control systems have been installed and can operate normally after power-on testing.

3.2 Power on the device

1. The equipment has completed all installations, with sufficient compressed air supply and the work chamber door in the closed position. Note that the work chamber door must remain closed during equipment startup and operation.
2. Press the switch button on the host operation panel to start the device.
3. The device automatically resets to its original state. After the control system is fully activated, the device will enter the automatic reset program. Subsequent operations can only be performed after the reset action is completed and the display reminder window is closed. Operating the device without resetting to the origin is prohibited.

3.3 Device testing

After the initial installation or reinstallation following transportation, the basic performance of the equipment must be tested. The steps are as follows:

1. Insert the bur into the device;
2. Do not load the material tray; load any program and run the device.
3. Monitor the operational status of the device and verify whether functions such as lane changing, air blowing, and shaft operation are functioning normally.
4. Confirm the equipment is functioning properly and ready for processing. If the equipment fails to operate normally, contact the supplier immediately.

3.4 Overview of machining process

[matters need attention]:

- Prior to processing, it is imperative to read the operating manual and safety instructions, and familiarize oneself with operational standards and safety requirements.
- Before operation, thoroughly inspect the bur and material tray for damage. Any damage may cause part abnormalities and equipment damage during processing.
- The NC format machining program for the equipment is generated by CAM software such as HyperDENT through layout and calculation, containing all machining parameters and instructions, which can be transmitted to the equipment operating system via USB interface or network communication.

▪ YRC-9PRO processing operation steps:

1. Open the layout software, select the appropriate block size and material type based on processing requirements, and complete the layout operation;

2. Insert the adapter bur into the designated position of the device in accordance with the equipment installation requirements;

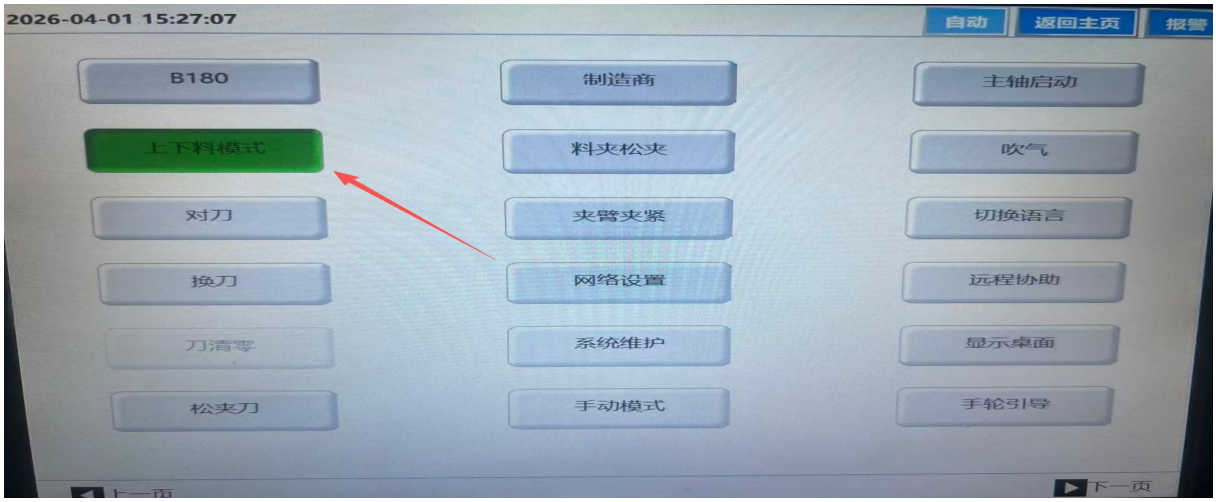
3. Place the workpiece tray in the correct position within the equipment's material bin, ensuring it is not inverted and fully inserted into the fixed compartment.

Therefore, this is an automatic disc-changing device. After-sales support must enable the loading/unloading mode in the backend to process multiple files; otherwise, the device will not operate normally.

4. On the device operation interface, click the "Load" button to access the program list,

then select the machining program to be executed;

5. After confirming the correct procedure selection, click the "Start" button to initiate the device's processing operation.



Go to system settings and open the loading/unloading mode button

6. Introduction to the Operation Interface

1. Import the NC format machining program generated by CAM software (multiple imports are possible after enabling loading/unloading mode).
2. This button opens the system interface. Click it and enter password 123 to access backend operations.
3. Breakpoint machining function: This feature allows you to track the milling progress before power loss after a device restart due to an abnormal power failure.
4. Sort the processing list by selecting files to adjust the milling sequence vertically.
5. Resetting the processing chamber (XYZAB axis reset) for the milling axis;
6. Manual repositioning of the manipulator (UVWC axis repositioning) for the silo shaft.

3.5 Milling burs insertion and replacement

- A compatible milling bur must be used, as mismatched model specifications may damage the spindle chuck or tool magazine.
- The tool holder of the lathe bur knife must have sufficient chamfer dimensions; lack of chamfer or insufficient chamfering may easily damage the chuck.
- The use of bur carvers with blade diameters exceeding the handle diameter (standard 4 mm) is prohibited.

You can insert 12 lathe burs into the tool magazine as shown in the figure. The equipment automatically replaces the lathe burs during machining.

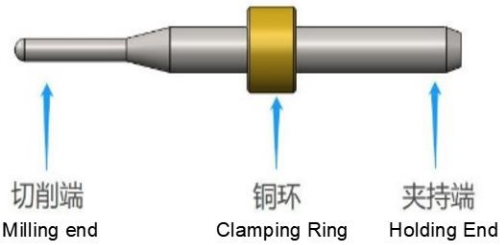
Tool magazine diagram

You can install the milling bur in two ways:

- Manually insert the bur into the tool magazine.

① Stop the spindle at the safe position, navigate to the second page of the operating system, grip the middle section of the spindle's loading bur with your hand, and click "Release Clamping Knife" to remove it.

② Insert the new lathe bur into the spindle, ensuring the fixed copper ring (as shown in the figure) tightly adheres to the spindle chuck. Then press the "Release Chuck" button to secure the lathe bur.



Milling Bur

③ Press the "Align with Knife" button to measure the length of the current new blade and automatically enter it into the system.

[Note]: After each release of the clamping knife, regardless of whether a new bur is replaced, it is essential to measure the blade length to prevent damage to the processed parts or even blade breakage.

- Through the spindle.

① Move all axes of the equipment to their default positions to ensure there are no material blocks in the fixture and no lath burs in the spindle chuck. If lath burs are present in the chuck, navigate to the second page of the operating system and click "T0" to automatically return the lath burs to the tool holder.

② Remove the old bur one by one from the knife holder in sequence.

③ Insert the new pins into the corresponding tool holders according to the serial number, ensuring the positioning copper rings are fully embedded to prevent improper installation.

④ Check the bur placement sequence and position of the new vehicle to ensure proper

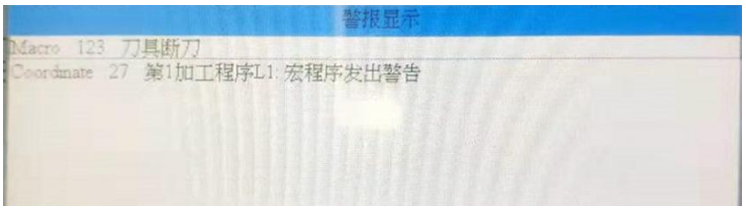
functioning of the subsequent automatic bur replacement system.

【Attention】：

- Avoid impact during bur placement to prevent bur damage, which may affect machining accuracy or cause equipment failure.
- The lathe bur should be replaced promptly if the operation exceeds the preset duration or if damage to the workpiece is suspected to be related to the lathe bur.
- Prioritize tool library tool change pins, with exceptions allowed only when the spindle tool holder is damaged and length measurement is impossible.
- The bur carriages must be placed into the designated tool holders according to preset specifications. Incorrect placement or mixing is strictly prohibited.
- The replacement of bur cartridges must be performed only by personnel who have undergone training and are proficient in both equipment and software operations.
- The operating system displays the current default tool number. If all tooling pins are properly returned to the tool library, the tool number will show as "0", as illustrated in the figure.

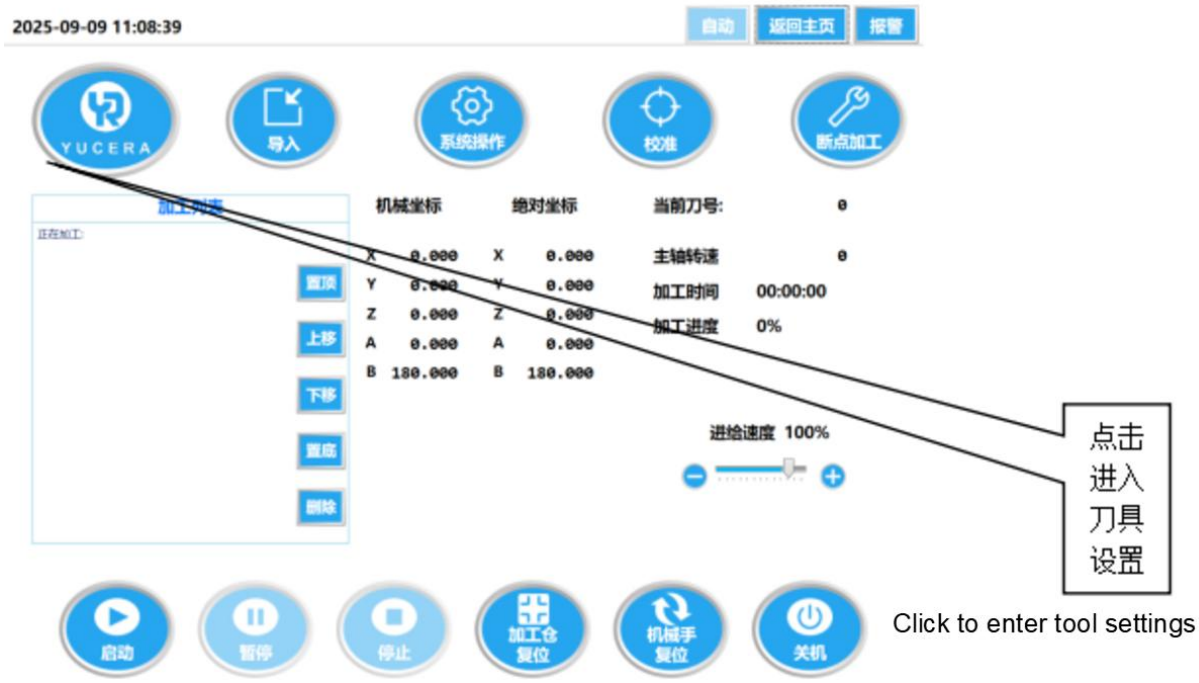
Knife tip display diagram

- A length check is performed before each tool bur extraction or reinsertion. The length deviation must not exceed the preset range. If the tool bur is not detected or the length deviation exceeds the range, the system will display the information shown in the figure below.

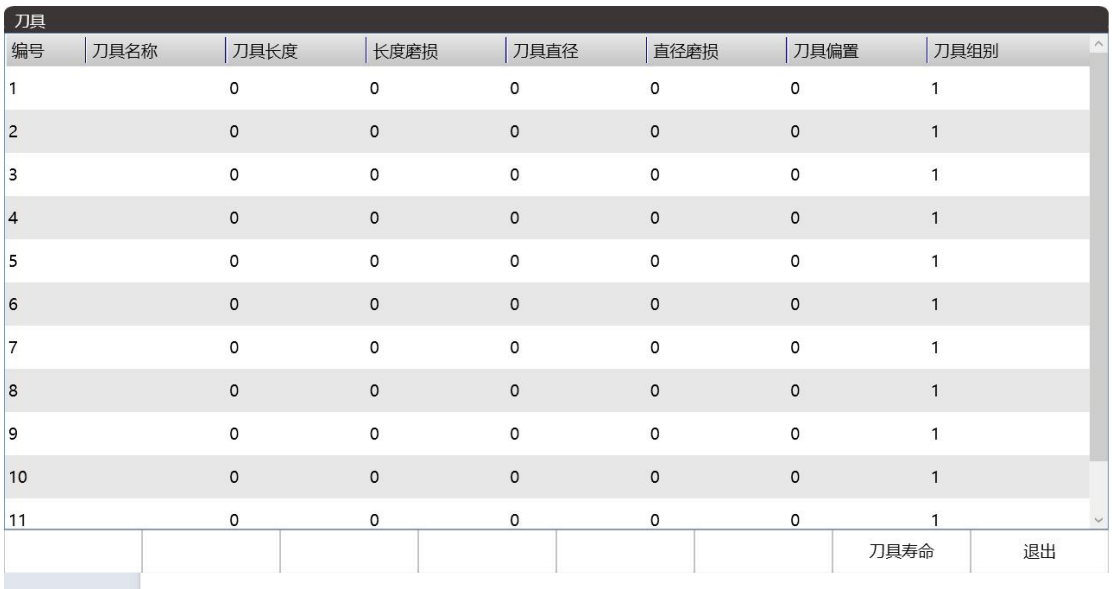


tool breakage diagram

- If tool error messages occur during processing, inspect the lathe bur or replace it before restarting the program.
- Setting of bur group and viewing of bur status parameters.



Click the main page LOGO to open the bur settings page



刀具

编号	刀具名称	刀具长度	长度磨损	刀具直径	直径磨损	刀具偏置	刀具组别
1		0	0	0	0	0	1
2		0	0	0	0	0	1
3		0	0	0	0	0	1
4		0	0	0	0	0	1
5		0	0	0	0	0	1
6		0	0	0	0	0	1
7		0	0	0	0	0	1
8		0	0	0	0	0	1
9		0	0	0	0	0	1
10		0	0	0	0	0	1
11		0	0	0	0	0	1

刀具寿命 退出

Tool Group Settings: This machine comes equipped with a total of 7 turning tools (TI-T7).

T1 = 2.0 mm, T2 = 1.0 mm, T3 = 0.6 mm, and T4 = 1.5 mm are zirconia turning tools and form Group 1;

T5 = 2.0 mm, T6 = 1.0 mm, and T7 = 0.6 mm are PMMA turning tools and form Group 2.

The tool magazine can hold 12 turning tools. Tools 8, 9, 10, 11, and 12 are spare turning tools. Set them to the same group as the active tools; when an active tool reaches the end of its service life, the machine will automatically pick up the corresponding spare tool.

Configure and click Import after completion.

3.6 Carriage information

The table below displays the manufacturer-provided specifications for the YRC-9PRO bur.

[Note]: Using non-manufacturer auto burs for processing may result in abnormal workpiece performance or even damage.

Knife size	specifications	Knife size	specifications
T01	ZIR Φ2.0	T05	PMMA Φ2.0
T02	ZIR Φ1.0	T06	PMMA Φ1.0
T03	ZIR Φ0.6	T07	PMMA Φ0.6
T04	ZIR Φ1.5P flat blade		

3.7 Install and remove the tray

The YRC-9PRO fixture is an open-type opening fixture with a material tray mounting fixture, as shown in the figure.

3.7.1 Load tray

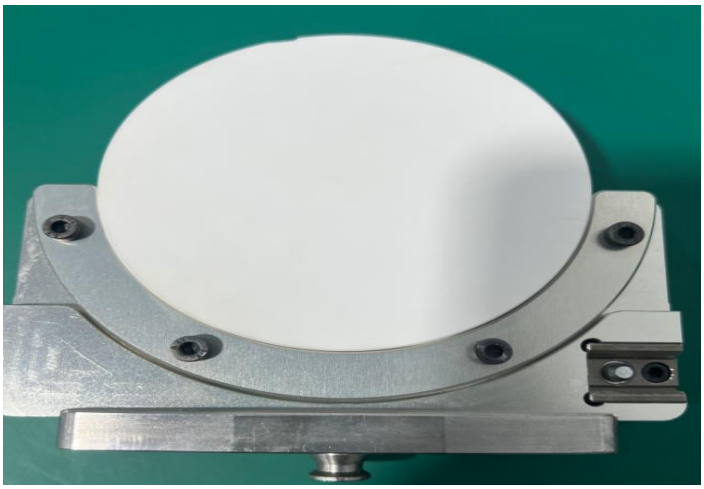
The Φ98 circular material tray must be secured using a dedicated fixture. The specific operational steps are as follows:

Open the equipment work chamber door and clean the groove area on the fixture to ensure there are no residual debris or impurities.

Using a screwdriver, sequentially loosen the three fixing screws on the fixture pressure plate to create space for placing the tray.

Place the Φ98 circular tray steadily into the fixture, then use a screwdriver to tighten the three previously loosened fixing screws one by one to ensure secure fixation, as shown in the

figure.



Material tray fixation diagram

[Note]: The screws must be tightened. If the material tray moves or vibrates during milling, it may cause damage to the equipment.

3.7.2 Remove the tray

To remove the part, simply loosen the securing screws and lift it out.

3.8 Program interrupt and stop

[Note]: When the program is interrupted or stopped, the operating system page will display a corresponding alert window to indicate the abnormal situation.

If the device pressure is insufficient, the program will automatically pause operation. Once the pressure returns to the normal range, the program will restart and continue execution.

You must manually cancel the current program if any of the following conditions occur:

- When the device fails;
- When the tool exhibits damage;
- During a sudden power outage;
- When there is an abnormal supply of milling fluid.

If the program is canceled, restart the program in the device system to resume operation.

3.8.1 Method for handling program interrupts

During program execution, if an interrupt occurs, the operating system interface will automatically display the corresponding exception prompt for the operator to view and confirm.

When the device interface displays "insufficient air pressure," check the following items one by one:

- Check the pressure values of the pressure-regulating filter element and the barometer to confirm whether they fall within the specified normal range for the equipment.
- Inspect the tracheal connector and tubing to confirm for air leakage;
- Check the operating status of the compressed air pump and confirm whether it is functioning normally.

3.8.2 Equipment fault handling methods

When a device failure is triggered by an emergency event, the control unit issues corresponding commands, and the operating system interface simultaneously displays error messages and error codes related to the fault for operator identification.

If the alarm cannot be resolved through standard procedures, promptly document all current alarm details (including error codes and fault symptoms) and contact the manufacturer's after-sales service for professional troubleshooting.

3.8.3 Methods for tool damage repair

During the machining process, if the tool breaks, the equipment cannot immediately detect this condition, and the spindle will continue rotating to perform milling until the next lathe bur is replaced. Only during the lathe bur length measurement phase, if an abnormal bur length is detected, the program will generate an error, and the error message will be displayed on the operating system interface.

Common causes of damage:

- The bur itself exhibits damage or excessive wear;
- The material selected during layout does not match the actual material processed.

- The lathe bur is improperly positioned or manually inserted into the spindle at an incorrect time, rendering it unsuitable for the current machining process. Therefore, the lathe bur must be replaced. The steps are as follows:

a. Open the equipment work hatch;

b. Remove the damaged bur from the work chamber;

c. If the turning bur is retrieved from the tool magazine by the spindle, first verify the correct placement of the bur within the tool magazine. After confirmation, insert the new compatible turning bur into the designated position.

d. If the bur is manually loaded onto the spindle, verify that the damaged bur matches the designated bur displayed on the operating system interface, then prepare and install a new correct bur.

e. Close the work cabin door and restart the program.

Charpter 4 Operating system page introduction

1. The 'material loading/unloading mode' must remain enabled to implement automatic tray replacement functionality.
2. The "tool change" function enables tool switching on the spindle.
3. The "pinch knife" controls the opening and closing of the spindle chuck;
4. Enter the administrator password yuc13579 for the 'Manufacturer' backend.
5. The 'material clamp loose clamp' control system manages the opening and closing of the processing bin's clamping disk.
6. The "arm clamp" controls the material bin's robotic arm for disc loading and unloading;
7. "Remote Assistance" launches remote software for automatic startup;
8. The 'Alarm' interface displays detailed information for any alarm.

4.1 Status display description

The status display window shows:

- Process list: Process files in the order of the list
- Status display; Processing time and progress with spindle parameters
- Device coordinates: for equipment maintenance
- Current tool number; the tool number held by the current spindle chuck (displayed as "0" when not held)

4.2 Button function description

4.2.1 Home page

- shut down

Disable the three functions: software restart, software shutdown, and shutdown.

- Reset processing bin

Return to the original state.

- firing

After loading is complete, click the 'Start' button to begin automatic operation of the machining program.

- suspend

To pause the program during execution, click the Pause button. After completing the operation, click Start to resume the program.

[Note]: The "Pause" button can only temporarily stop the movement axis motion and cannot halt the spindle rotation!

If the situation is severe, immediately stop the device by using the Emergency Stop switch.

4.2.2 Auxiliary page

- leading-in

When using the USB copy program, click the 'Import Program' button and select the program you want to copy from the left-side list in the pop-up window.

- Breakpoint processing

Continue processing from the previous progress after an unexpected power outage.

- system operation

Click the button to automatically navigate to the second auxiliary page, as shown in the figure.

- B180

Click "B180" to move the spindle to a safe position, rotate the B-axis to 180°, and select the A-axis to 90°.

- Clamping position

When clamping the workpiece is required, click 'Clamping Position' to position the machine's axes for optimal material loading.

- Knife adjustment

Pressing the 'Tool Detection' button enables tool length measurement for the current lathe bur on the spindle and records the data into the system.

- tool changing

Click the "Change Tool" button to manually switch tools. The tool-matching function will complete automatically after switching.

- Clear the knife

Click the "Reset Knife" button to automatically set the current system knife number to 0.

- network settings

When connecting the device to the network, access the Network Settings interface to manually configure the correct IP address and gateway for NC file transmission over the network.

- Main spindle startup

Manually start spindle rotation.

- scavenging

Manual switch for spindle blowing air.

- Sandwich knife

When the lathe bur exhibits abnormalities or requires replacement due to damage, click 'Release Clamping Tool' to open the spindle chuck and remove the bur. After properly inserting the new bur, click 'Close Spindle Chuck' again.

[Note]: Before reinserting or replacing the bur after each removal, always click "Knife Alignment" to check the current tool length.

Equipment maintenance and cleaning

4.3 Safety notice

To ensure stable machining accuracy and prolong equipment service life, it is recommended to perform regular maintenance and upkeep on the equipment. Prior to maintenance, ensure all axes are adjusted to a safe stopping position, and disconnect the power supply and power cord to guarantee operational safety.

⚠ Warning: After powering off the device, residual electricity may remain in internal electronic components for a short time. To avoid electric shock risk, wait several minutes after power-off until all components are fully discharged before performing maintenance operations.

⚠ Note: When cleaning equipment, use a damp cloth for wiping. To enhance cleaning efficacy, select appropriate cleaning agents. The use of abrasive cleaning agents is strictly prohibited to avoid surface damage to equipment, and cleaning agents containing corrosive components for rubber parts must be avoided to prevent aging and damage to seals, hoses, and other components.

All maintenance and related operations must be performed by professionally trained and certified personnel. Unauthorized operation by non-professionals is strictly prohibited. If maintenance of the equipment's pneumatic system is required, the main pneumatic system switch must be turned off prior to operation, and it must be confirmed that the internal system pressure and the entire air duct pressure have been reduced to atmospheric levels to prevent accidental release of high-pressure gas and potential safety incidents.

4.4 Accessory replacement warning!

The use of non-manufacturer-provided or inappropriate accessories may pose risks to

operators and could lead to equipment damage or even complete failure. Therefore, only original manufacturer-provided components or manufacturer-authorized accessories should be utilized.

For inquiries, please contact the manufacturer's customer service.

4.5 Regular cleaning

4.5.1 Equipment and part cleaning requirements

1. Daily cleaning can extend the service life of individual components and prevent failures caused by debris.
2. Regular cleaning can extend the service life of equipment.
3. For cleaning plastic components, use a suitable liquid cleaner to ensure the cleaning process does not damage the plastic surface or material properties.
4. To prevent dust and impurities from entering the core mechanical components and causing malfunctions or damage, do not use air guns for internal cleaning operations.
5. When cleaning the material fixture during placement, ensure the fixture and screws are clean to achieve optimal clamping performance.
6. The tool magazine and tool setter should be free of chips and other debris to ensure accurate length measurement and tool replacement. In case of damage or injury, contact the manufacturer immediately for replacement.

4.5.2 Main spindle chuck cleaning

Never spray oily sprays or compressed air containing oil-water mixture directly onto the spindle head, as such operations may allow these substances to infiltrate the spindle bearings, impairing spindle rotation performance or causing bearing damage.

The spindle chuck and inserted lathe bur must remain clean. If impurities enter the spindle, they will increase rotational resistance and affect rotational concentricity.

The normal cleaning cycle for the spindle chuck is once per week; if the bur is damaged due to impact, the spindle chuck must also be cleaned simultaneously.

[Note]: Always use dedicated tools for loading and unloading the spindle chuck, as shown in the figure.

Hexagon wrench diagram for spindle chuck

⚠Warning: Do not close the spindle chuck when it is not loaded. Rotating the spindle without a chuck may cause spindle damage. Additionally, ensure the lathe bur is always attached to the chuck.

◆ Main spindle chuck cleaning steps:

a. Reset the device to a safe position;

b. Confirm the spindle has stopped rotating;

c. Remove the spindle chuck using specialized tools;

d. Clean the chuck mounting hole of the spindle;

e. Clean the chuck with a small brush to ensure no residual impurities on its surface.

f. Reinstall the cleaned chuck onto the spindle and ensure it is properly tightened.

4.5.3 Inspect hoses, cables, and connections

a. First, power off the equipment and cut off the compressed air supply before performing the inspection procedure.

b. Check the connection status of the hose and cable to ensure proper connectivity; simultaneously verify that all connections on the connection plate are secure and free from looseness.

c. If damage to the hose or cable is detected, do not restart the equipment; immediately replace the damaged component with a spare part.

d. If cables or hoses are loose, reinsert them into the corresponding connection points. If the connection itself is damaged, immediately stop using the equipment and contact after-sales service for assistance.

4.5.4 Inspect the pressure regulating filter

a. If moisture, oil, or other solid particles are detected in the pressure regulating filter, immediately cease using the equipment.

b. After shutdown, verify whether the compressed air supply meets the equipment operation requirements. Do not restart the equipment until the requirements are satisfied.

c. After completing the aforementioned inspections, lower the drain valve of the pressure regulating filter to thoroughly remove internal impurities.

[Note]: If contamination occurs in the air source dryer, it may lead to equipment damage. Regular inspection and maintenance should be performed as required.

4.6 Guide rail maintenance

Regular maintenance of the lead screw and guide rails can effectively maintain machining accuracy and extend equipment service life. The specific operational steps and requirements are as follows:

1. Turn off the device power before maintenance to ensure safety.
2. Loosen the fixing screws of the pressure-reducing grid filter and remove the pressure-reducing filter.
3. Remove the screws from the equipment side cover plate and rear cover plate, then detach the rear cover plate.
4. Clean the accumulated dust inside the equipment with a vacuum cleaner.
5. Wipe the surfaces of the screw rod and guide rail with clean paper towels to remove surface contaminants.
6. Apply specialized lubricant evenly on the cleaned surfaces of the screw rod and guide rails.
7. Reinstall the previously removed cover plate and pressure regulating filter in the reverse order of disassembly to their original positions on the equipment, ensuring secure installation.
8. If you encounter unresolved issues during maintenance, please contact after-sales service personnel promptly.

4.7 Maintenance schedule

Maintenance Project	period
Clean the work chamber, tool setter, tool magazine, and bur carrier	Every day
Clean the spindle chuck	weekly
Pressure regulating filter	weekly
Clean the screw rod and guide rail	Every six months
Machine Tool Calibration	When necessary

4.8 Device calibration

This equipment has undergone professional calibration prior to factory release. No additional calibration procedures are required if the machining results comply with quality standards (with no defects).

The calibration process requires a certain amount of working hours, and improper operation may lead to equipment failure or even irreversible damage. It must be performed with caution.

If the processing results do not meet expectations, priority should be given to adjusting working conditions, including: checking whether the workpiece is securely fixed, inspecting bur wear and installation status, and verifying whether the processing materials comply with equipment compatibility requirements.

Prior to mandatory equipment calibration, professional guidance must be obtained from the supplier. During the calibration process, strict precision control must be maintained for the reading and recording of measurement data. In case of any operational doubts, the calibration procedure should be immediately halted and resumed only after confirmation with the supplier.

Disclaimer

To ensure the standardized use of equipment and protect the legitimate rights and interests of both parties, as the equipment manufacturer, we hereby inform you: Please carefully review the following disclaimer before reading and using this equipment manual. Once you activate or use this equipment, it indicates that you have acknowledged and accepted all terms of this disclaimer, and will comply with the provisions herein.

1. The operational guidelines and safety precautions specified in this equipment manual are primarily designed to ensure safe and standardized operation of the device. Please thoroughly read and fully comprehend the aforementioned content, and strictly adhere to the relevant operating procedures throughout the entire usage process. The equipment manufacturer shall not be liable for any safety incidents, personal injuries, or property losses resulting from non-compliance with these guidelines and procedures.

2. Usage Restrictions: The information and operational guidelines provided in this equipment manual are applicable only to the intended design purpose and expected usage scenarios of the device. It is strictly prohibited to use the device in non-intended, improper, or hazardous manner. The manufacturer shall not be liable for any losses, personal injuries, or property damage resulting from improper use of the device.

3. Disclaimer: All information and content in this equipment manual is provided based on existing knowledge and technology. The manufacturer has made every effort to ensure their accuracy and completeness. However, the manufacturer shall not be liable for any losses, damages, or inconveniences resulting from errors, omissions, or inaccuracies in the manual content.

4. Legal Compliance: Users shall comply with applicable laws, regulations, and rules to ensure that equipment usage meets corresponding regulatory requirements. Manufacturers shall not be liable for consequences arising from users' non-compliant use of equipment.

5. Warranty Limitations: The scope and duration of equipment warranty shall be subject

to the explicit warranty terms. The manufacturer shall not be liable for issues or damages exceeding the specified scope or duration. Please read and understand this disclaimer in detail before using the equipment.

If you have any questions regarding safe operation of the device or require additional information, please contact the manufacturer or authorized representative for consultation. Use of this device constitutes your acknowledgment of having read, understood, and accepted these disclaimer terms, and you agree to assume all potential risks and liabilities associated with the device usage.