SYJ-200 Precision Cutting Saw.

Operational Manual

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Please read the manual carefully before using this machine!

1. Introduction:

SYJ-200 automatic diamond saw is designed for precision cutting all type of materials up to 3 " diameter. The saw is equipped with 8" diameter diamond blade and touch-push panel to achieve automatically control. It is perfect cutting tool for metallurgical, ceramic and materials research laboratories. It features in:

- 1 HP high torque DC motor
- 1" dia spindle and 2" flange to accept 6 - 8" dia diamond blade
- Variable blade speed: 100-4500 RPM with digital display
- Cutting capacity: 3" Deep x 4" L x 3.5" W
- Programmable Y and X axis advancement via LCD panel to achieve automatic cutting with 0.01 mm precision.
  - X axis is for cutting feed which has Max. travel distance of 120 mm and adjustable speed from 1.0 mm/ minute to 20 mm/minutes
  - Y axis is for controlling thickness of slices, which can be programmed up to 90 mm distance.
- Quick lamp is included to make sample mount easy and fast
- Protective splash cover with electronic safety interlock
- Recycling coolant system with adjustable nozzles
- One 8" diameter x 0.025" thickness and 1"airbor sintered diamond blade is included for immediate use
- Dimension: 622mm x523mm x460mm
- Shipping weight: 65 Kg
- Two (2) year warranty - parts and labor

2. Technical Specifications

Item	Unit	Parameter
Working Revolution of the Principal Axis	RPM	300 - 4500
Max. Travel Distance of X Axis	mm	100
Max. Travel Distance of Y Axis	mm	80
Blade Size	mm	OD：φ200; Arbor：φ25 or φ32
Maximum Clamp Dimension	mm	60
Main Motor Power	W	400
Power Supply	V	220 V
Overall dimension	mm	730×540×480
Net weight	Kg	72

3. Structure overview:

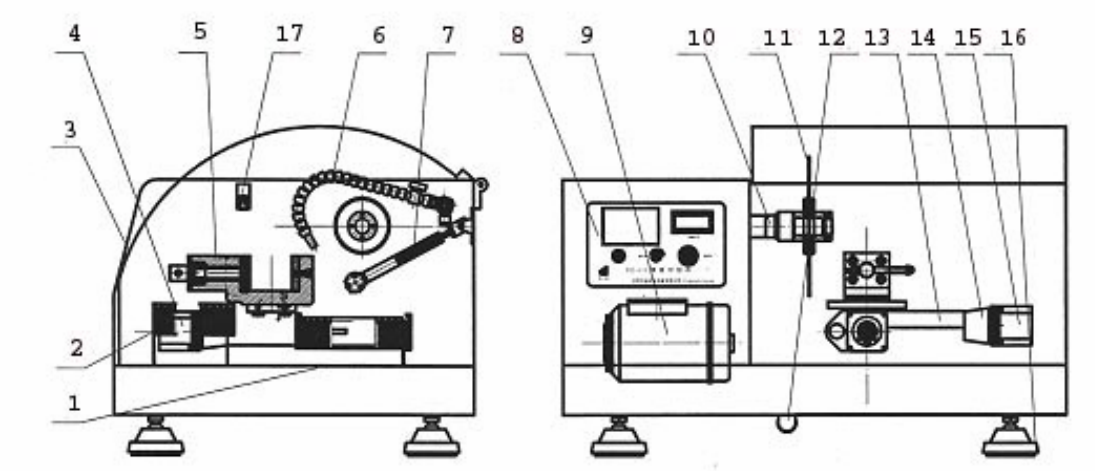


Fig. 1: Machine overlook

1. Chassis； 2. Shield； 3. Transparent protection cover； 4. Y-axis step motor；
5. Clamp； 6. Cooling tube with switch； 7. Pneumatic spring;
8. Front panel；9. Main motor； 10. Principal axis； 11. Round saw blade；
12. Coolant recycling tube； 13. X-axis moving worktable； 14. Step motor joint；
15. X-axis step motor； 16. Ground foot； 17. Assembled magnetic-controlled safety switches。

4. Working Principle:

The machine equips with ZYT-type permanent DC motor. The motor activates the magnetic field by permanent magnet and with close-loop self-cooling. The circuit to adjust the speed of the motor is with the pulse technology and with advanced short circuit protective function. The voltage has high stability and continuous adjustable. This guarantees the working is stable in low speed (no creeping or flying). The belts wheel on the motor drives the belts wheel on the spindle to revolve. The round blade is installed on the spindle and revolved together with the spindle to cut.

There is a device to spray coolant on the upside of the blade. The cooling device can be turned around a fixed base. It can be fixed by a M6 screw at a required position or move the ball twist tube to change the spraying direction of the coolant.

There is a clamp on the working table moving along the X-axis. Put the sample into the clamp and turn the hand-handle clockwise to clamp the sample tightly.

The supply of coolant: Connect both the inlet and outlet tubes into one coolant tank to realize the recirculation.

* In order to protect the threaded axis, antirust coolant must be used.

5. Installation and Preparation before Operation:

5.1. The machine should be installed on a stable desk in a clean and shaking-proof environment.

5.2. Check the power source if it meets the requirement (single phase 220 V/50 Hz) before turn on the power. Also check that the device should be grounded well.

5.3. Check the cleanness of spindle and the spacers, blade, ends of screws or it may seriously affect the process precision of the working sample.

5.4. Check the volume of the coolant to ensure the level of the coolant is more than 4/5 of the capacity of the coolant tank. If lower, please add.

5.5. Make sure the knob to adjust the motor speed on the front board is at the end of lowest speed when the machine begins to operate. Never start the machine with high speed, or the motor or other electric parts could be burned.

5.6. Make sure the safety switch of the transparent glass shield is at good working condition.

6. Operation:

6.1. Put the sample into the clamp and turn the hand-handle clockwise to clamp the sample tightly.

6.2. The feed speed along Y-axis which is dependent on the material to cut determines the revolution speed of the spindle. The feed speed along Y-axis must be adjusted form lower speed, or it may result in the distortion of the threaded axis or damage the working sample, etc. Details please see the related description of the operation control bellow.

7. The description of the touch panel and related power switches:

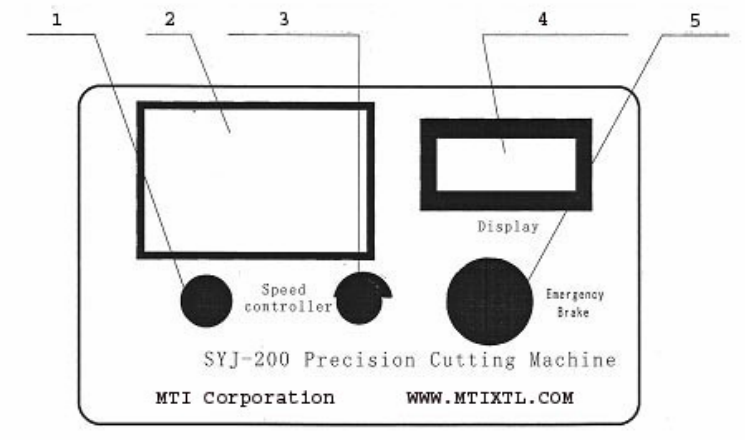


Fig 2: Front Panel

1. Power switch; 2. Touch screen; 3. RPM adjustment Knob for cutting motor; 4. RPM display meter for cutting motor; 5. Emergence brake.

Emergence brake: Cut the power immediately when pushing the knob if there is something wrong with the machine.

Power switch: The machine changes to working state when the power is on.

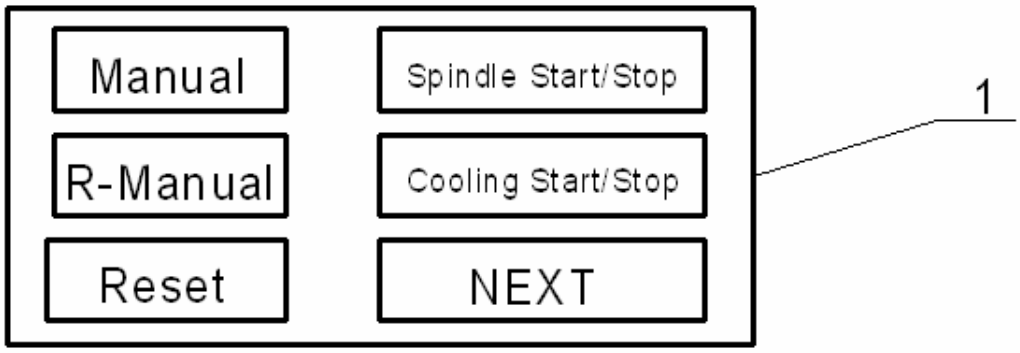
Touch screen: The working plate of the interface between human and machine，Operator operates it to control the working.

RPM adjustment Knob for cutting motor: Adjust the revolution of the main motor.
RPM display meter for cutting motor: Display the revolution of the main motor. (The actual revolution of the main motor = 10 x the number displayed on the meter).

The following interface screen appears when the machine starts up and the touch screen is on:

The interface screen will be automatically changes to the following operation interface screen after waiting 6 seconds:

The First Operation Interface Screen:



Manual — Adjust the positions of X-axis and Y-axis manually. Enter into sub man-controlled interface after pushing the Manual key.

R- Manual — Set up the feed speed of the step motor both X-axis and Y-axis when controlled manually.

Reset — Enter into sub man-controlled speed after touching the R-Manual key. Clear all acuminated data to move X-axis and Y-axis into 0. The system goes into the initial state. You need to re-input all new parameters to run again.

Spindle Start/Stop

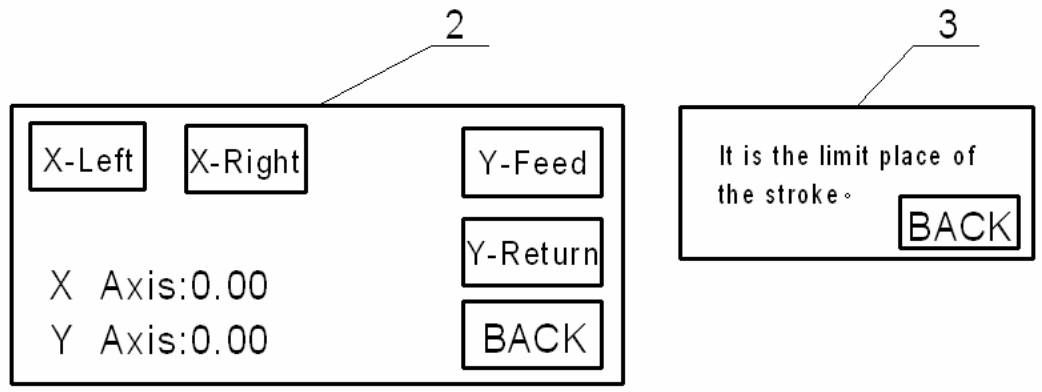
Show the current state of the spindle. Make sure the protection cover is closed. Push “Spindle Stop”, the spindle starts running into the working state. The screen shows “Spindle Start”. Push “Spindle Start”, the spindle stops running. The screen shows “Spindle Stop”.

Cooling Start/Stop

Show the current state of the coolant recycling system.
Push “Cooling Stop”, the coolant recycling system starts running. The screen shows “Cooling Start”. Push “Cooling Start”, the coolant recycling system stops running. The screen shows “Cooling Stop”.

NEXT

Go to second operation interface screen when pushing.



X-Left

Move X-axis left manually. (When X-axis moves the limit place on the left, the step motor stops automatically and a pop-up widow showing in the operation interface screen 3 above appears “It is the limit place of the stroke”. Push “Back” key on the pop-up keyboard and return to the first operation interface screen.

X-Right

Move X-axis right manually. (When X-axis moves the limit place on the right, the step motor stops automatically and a pop-up widow showing in the operation interface screen 3 above appears “It is the limit place of the stroke”. Push “Back” key on the pop-up keyboard and return to the first operation interface screen.

Y-Feed

Control Y-axis to move to feeding direction manually. (When Y-axis moves the limit place on the back, the step motor stops automatically and a pop-up widow showing in the operation interface screen 3 above appears “It is the limit place of the stroke”. Push “Back” key on the pop-up keyboard and return to the first operation interface screen.

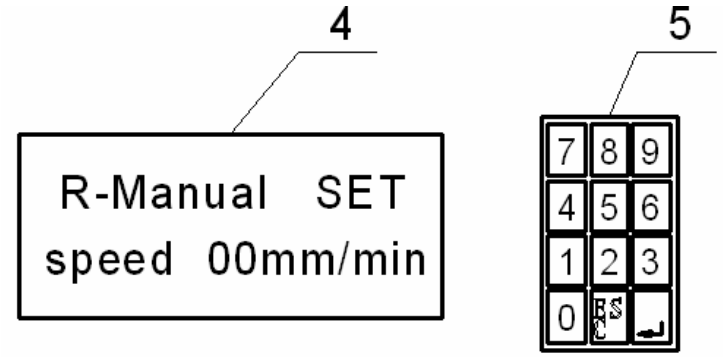
Y-Return Control Y-axis to return manually. (When Y-axis moves the limit place on the front, the step motor stops automatically and a pop-up widow showing in the operation interface screen 3 above appears “It is the limit place of the stroke”. Push “Back” key on the pop-up keyboard and return to the first operation interface screen.

X Axis Show the moving distance along X-axis. Accuracy to 0.01 mm.
Y Axis Show the moving distance along Y-axis. Accuracy to 0.01 mm.

BACK Push “Back” key to return to the first operation interface screen.

*Note: If any axis is on the limit position, it is unable to go to the future set-up page from the operation interface screen.

Manual Speed sub Interface Screen **Small Keyboard**

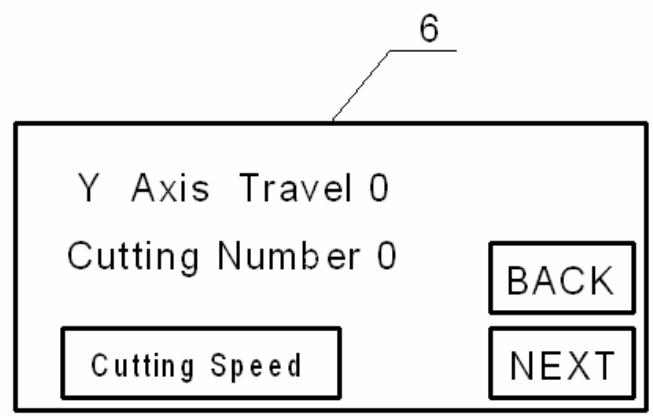


Speed Show the feeding speed of the X-axis and Y-axis step motors when controlled manually. A small keyboard will be pop-upped when a number is touched:

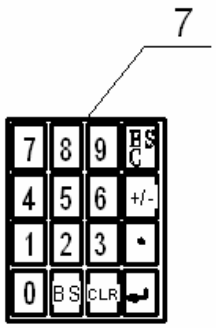
Input the number desired. Push “ESC” key to return but the data are not saved.

Push“ ”to return and save the data. The number has accuracy to single digit.

The Second Operation Interface Screen



Small Keyboard



Y Axis Travel Show the feeding distance of the Y-axis when cutting. Push the number behind to pop-up a small keyboard to set up the feeding distance. The maximum number to set up is 100 with accuracy to single digit.

Cutting Number Show the cutting number when cutting. Push the number behind to pop-up a small keyboard to set up the cutting number. The maximum number to set up is an integer within 99.

Cutting Speed Set up the feeding speed of Y-axis. Push it to make the screen go to the sub interface screen for cutting speed setting.

BACK Push it to make the screen go to the first interface screen.

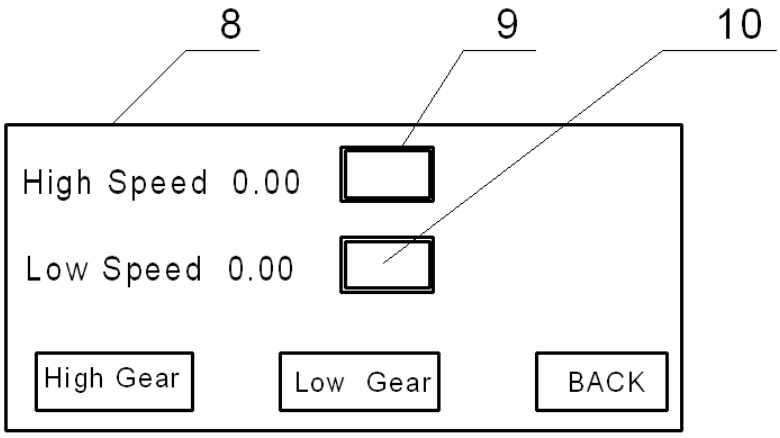
NEXT Push it to make the screen go to the third interface screen.

Small keyboard to set up the feeding distance of Y-axis:

Number Key Input the desired number by single click.
ESC Key Return directly without saving the new inputted number.
B S Key Delete the last digit of new data inputted.
CLR Key Delete the new data inputted and return to zero.
↵ Key Return and save the new inputted data.
+/-. Key No definition.

*** Note:** The interface function of the small keyboard to set cutting number is the same as above.

The sub interface screen for cutting speed setting:



High Gear Choose high feeding gear of Y-axis, the black frame 9 is on which is corresponding a high cutting speed.

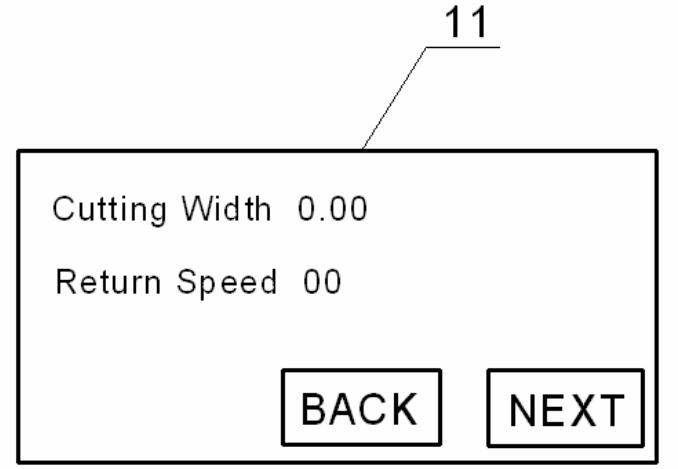
Low Gear Choose low feeding gear of Y-axis, the black frame 10 is on which is corresponding a low cutting speed.

High Speed Indicate the current set-up number of high gear. Push the number to pop up the cutting speed.
The interface screen of the set-up keyboard is the same as the keyboard 7. It can set up the integer within 50.

Low Speed Indicate the current set-up number of low gear. Push the number to pop up the cutting speed.
The interface screen of the set-up keyboard is the same as the keyboard 7. It can set up decimal fraction within 0.05 – 0.99 with accuracy to two decimal digits.

BACK Push it to make the screen go to the second interface screen.

The third interface screen:



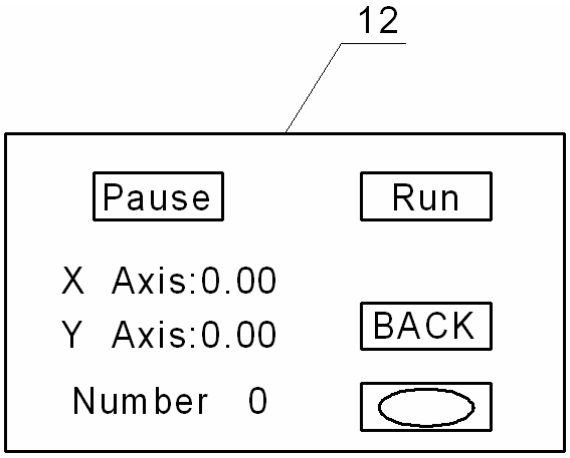
Cutting Width Indicate the distance between two adjacent cuttings of X-axis. Push it to pop-up a small keyboard to set up the distance of X-axis. The interface screen is the same as 7. It is possible to set up the number between 0 – 80 with two decimal digit fraction accuracy.

Return Speed Indicate the returning speed of the blade after cutting once. Push it to pop-up a small keyboard to set up the returning speed of the blade. The interface screen is the same as 7. It is possible to set up the integer within 50.

BACK Push it to make the screen go to the second interface screen.

NEXT Push it to make the screen go to the forth interface screen.

The forth interface screen:



Pause	Single click to stop the Y-axis step motor to feed temporarily and the data remain unchanged.
Run	Single click to make the Y-axis step motor begin to feed or feed continually.
BACK	Push it to make the screen go to the third interface screen.
X Axis	Indicate the current acuminated moving distance on X-axis.
Y Axis	Indicate the current acuminated moving distance on Y-axis.
Number	Indicate the current remained cutting number.

8. Maintenance:

Warning: This machine must use oil-base coolant. Never use water-base coolant or it will rust the machine.

8.1. Apply a little amount of #30 machine oil between the thread male and female of both X-axis and Y-axis every 8 hours.

8.2. Apply a little amount of #30 machine oil between the surfaces of the coattail guiding rails every 8 hours.

8.3. Clean all parts after the job is done.

9. Safety Notices:

9.1. The power plug should have grounding line and creepage-protection switch.

9.2. Never open the transparent protection cover when working. The power will be cut when opening the transparent protection cover. Check the assembled magnetic-controlled safety switches both before and after working to ensure the cleanness and sensitivity.

9.3. Check the blade carefully before installation. No crack is permitted. Tighten the nuts with special wrench.

9.4. Never let the coolant or other liquid into the inside of the machine.

9.5. Adjust the speed knob to the lowest end for the next running when the main motor is stopped. Never start the main motor at high speed or may damage the motor.

9.6. Never run the main motor overloading.

9.7. Pay attention specially: Please stop the machine immediately when the working table reaches limit position. In this case, the step motor is running but the working table is not moving. The coupling joint will be vibrating and making abnormal noise. When re-starting the machine, the working table must move to opposite direction to leave the limit position.

10. MTI Support

10.1. MTI Corporation provides one year limited warranty from date that we shipped the goods. If you find any defective part caused by manufacturer please feel free to contact

us. We will replace detective part and instruct you how to change the part by yourselves during warranty period. However, MTI Corp is not responsible for any damage or consequence damage caused by misuse. After warranty, MTI will continue to provide technical support and spare parts at a reasonable cost.

10.2. If you have any question, please contact us at info@mticrystal.com or call us at 1-888-5253070. MTI Engineers will instruct you how to use and maintain the machine.