



iPoli-2SC-250A Auto Metallographic Grinding-Polishing Machine

Instruction Manual



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Safety Caution

Before you install and use this product, please read this manual carefully. And pay special attention to the content of the reminders and suggestions, and observe the precautions; to avoid damage to the equipment, fire and personnel injury !

- Check whether the input range of power supply voltage is consistent with the equipment before use.

Whether the equipment grounding meets the requirements

- Determine whether the surrounding environment meets the installation requirements
- Operate the equipment according to the operating procedures
- Unplug the power when cleaning the equipment
- Do not disassemble the equipment in case of failure , please ask a professional to repair it to avoid electric shock.
- Please keep this instruction properly.

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1.Instruction

The iPoli-2SC-250A auto metallographic grinding polishing machine is a double-disc desktop grinding and polishing machine. According to international standards, using international advanced technology, it develops and manufactures a new type of grinding and polishing equipment that integrates central force and single point force.

Function: The rotation direction of the grinding and polishing plate can be selected arbitrarily, the three-stage fixed speed can be adjusted at will, and the grinding and polishing plate can be quickly replaced; the grinding and polishing head can be replaced with the central afterburner raindrop type and single-point blessing plate, and the grinding and polishing mode can be changed at will. One machine with multiple uses. The machine adopts an advanced microprocessor control system to control the speed of the grinding and polishing plate and the grinding and polishing head to achieve stepless adjustment, electronic adjustment of sample preparation pressure, and free adjustment of sample preparation time. This machine has the ability to quickly change the disc, and the grinding and polishing disc can be quickly removed and the grinding and polishing accessories can be changed to complete the operation of the grinding and polishing process. This machine uses a servo motor to control the rotation speed to make the rotation speed more accurate and stable, realizing a more stable low-speed torque. As a result, the performance of this machine is more stable and the operation is easier. The machine is equipped with a water-cooling device, which can cool the sample during grinding to prevent the metallographic structure from being damaged due to overheating of the sample and to flush away the abrasive particles at any time. The outer shell is made of glass fiber reinforced plastic, which has strong anti-corrosion ability, more beautiful appearance, improved anti-corrosion and anti-rust performance and easy cleaning.

It is suitable for automatic sample preparation in the process of rough grinding, fine grinding, rough polishing and fine polishing of various samples. It is an ideal sample preparation equipment for enterprises, research institutes and laboratories of universities and colleges.

2.Main Technical Parameters

Diameter Of Grinding Disc	φ250mm(can be customized φ230mm,φ300mm)
Disc Rotation Speed	50-1000 r/min(variable speed)and 300 / 600 / 900 r/min(three-stage constant speed)
Disc Rotation Direction	Adjustable forward and reverse selection
Polishing Head Rotation Speed	5-150 r/min(variable speed)
Quantity Of Samples Prepared	6 pcs
Input Air Pressure	0.4-0.7Mpa
Sample Preparation Time	0-3000 S
Sample Preparation Pressure	individual loading 20-70N central loading 150-300N
Sample Diameter	Standard φ30mm(can be customized φ22-φ45mm)
Input Power	single phase AC220V 50Hz
Input Voltage	1.1KW
Dimension	735*570*590mm
Net Weight	100KG
Gross Weight	120KG

3.Schematic Diagram Of The Whole Machine



Description of each part function:

Grinding and polishing Head: It contains mechanical electrical control ,which is an important part of the whole machine

Grinding and polishing head control panel: It can display the rotation speed of the grinding and polishing head, the grinding and polishing pressure, the grinding and polishing time, and the switch between the central pressure and the single-point pressure. Rotary encoder adjusts grinding and polishing parameters.

Grinding and polishing plate: also called "work plate", it is an important part of the grinding and polishing test. The sandpaper, flannel and other consumables are fixed on it,

3.Schematic Diagram Of The Whole Machine

and the sample is polished and polished.

Gripper: This machine has two kinds of grippers, one is a single-point force gripper and the other is a central force gripper. Give different blessings to the styles respectively.

Cooling water nozzle: the sample can be washed during grinding and polishing; it can be switched or rotated as needed.

Water retaining ring: prevent water splashing during grinding and polishing.

Grinding and polishing machine control panel: set the rotation speed, direction and three-level fixed speed of the working plate; start and stop control of the whole machine.



Please read the following terms and conditions carefully

4.Installation And Precautions

4.1 The equipment must be well grounded and a three-pole standard power socket must be used!

4.2 The equipment should be installed on a stable, vibration-free work surface with an ambient temperature of 10°C-30°C; a relative humidity of less than 85% and no corrosive gases and conductive dust around.

4.3 Open the box, remove the wrapping film of the whole machine and take out the accessories, put the whole machine and the base pallet in a suitable position, then remove the two bolts on pallet with the wrench, then move the whole machine to a stable work surface, connect the inlet and outlet pipe on the back side of the device and lock with the hooks.

4. Installation And Precautions

4.4 Determine and place the equipment according to the intake and drainage conditions, and adjust the 4 adjustable shock absorbers to make the equipment basically level and stable.

4.5 The grinding and polishing disc can be quickly replaced. Hold the grinding and polishing disc with both hands and gently lift it to remove it. Hold the other grinding and polishing disc flat with both hands and visually observe that the three piston rod holes of the grinding and polishing disc correspond to the three piston rods. When one of the holes corresponds, swing the grinding and polishing disc slightly to make the other two correspond. Insert the disc flat and press it by hand to make the bottom of the grinding and polishing disc completely contact the positioning surface of the grinding and polishing seat.

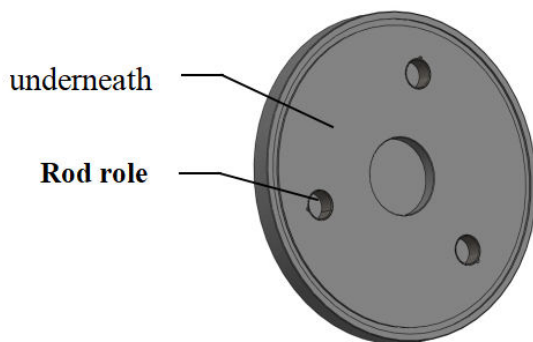


Figure 2

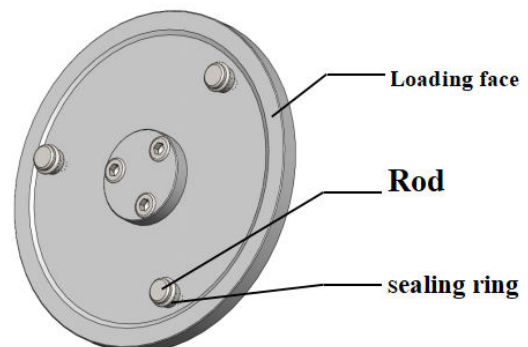


Figure 3

4.6 Installation of metallographic sandpaper and polished fabric

Wipe the upper surface of the polishing plate, paste metallographic sandpaper or polishing fabric with adhesive on it, visually observe that the distance between the sandpaper or fabric and the edge of the disk is basically the same, and evenly smooth it by hand to make it bond firmly.

4.7 Installation method of gripper

If you need to replace the holder, you can lift the locking sliding sleeve upwards, press the

4.Installation And Precautions

holding plate down to separate it from the holder, and replace it. Install the holder, and align the center axis of the holder with the grinding and polishing. In the center of the shaft, push up the locking sliding sleeve and insert the central axis of the holder into the locker, and then press the locking sleeve down to lock it (insert the stop pins on both sides of the central shaft of the holder into the teeth of the locking sleeve)finish installation.

4.8 Insert one end of the air pipe into the quick-change connector at the back of the grinding and polishing head, and insert the other end into the connector of the air source.



Note: the air source should meet the following requirements: the input pressure should be between 0.4 to 0.7mpa; Must be filtered by filter, the filter core precision 40um.

4.9 Insert the power cord connector into the power cord interface at the back of the grinding and polishing seat.



Figure 5

5. Operating Keyboard And Display

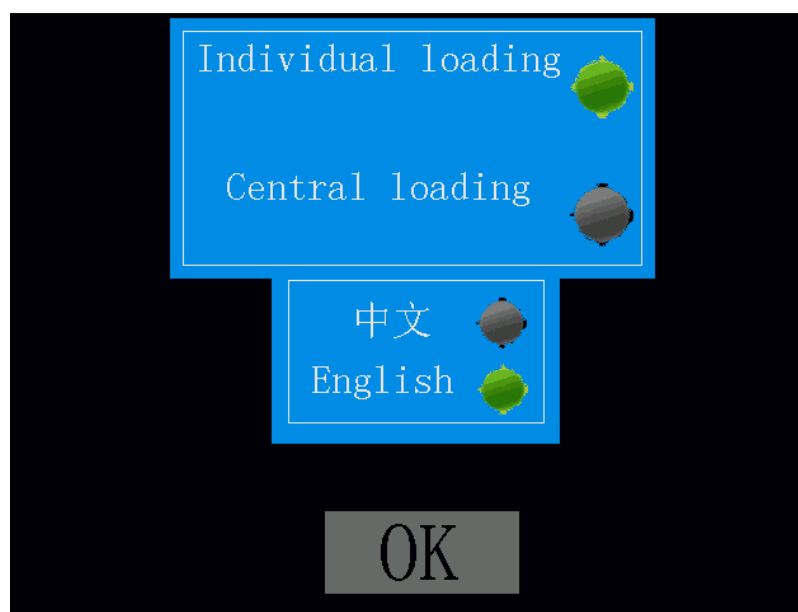
(1) Polishing head touch screen display:

Main screen:



The LCD display of the grinding and polishing head sequentially displays time, speed, and pressure from top to bottom.

Click the function key 18 on the upper left corner of the screen to pop up the function screen for you to select the required compression mode and language Settings. The following figure.



5. Operating Keyboard And Display

Select the mode and language, and click the OK button to exit.

(2) Key control instruction:

[Up/Down] In the single-point afterburner mode, this key controls the rising and falling of the single-point clamping plate.

[Lock/Unlock] Lock the position of the grinding and polishing head. When this button is released, pressing the start button of the grinding and polishing machine will not run.

[Rotary encoder] Press the grinding and polishing head inward once and the screen will display the modification frame, and the rotary encoder will modify the value in the frame.

[↑] Stepless speed regulation(↑) is to increase the speed. It can be adjusted when stopped or running.

[Fwd/Rev] Select the running direction of the grinding and polishing plate. If it is currently rotating, click Reverse.

[↓] Decrease the speed during stepless speed regulation(↓) It can be adjusted when stopped or running.

[1V] The machine can run at a constant speed of 300 rpm

[2V] The machine can run at a constant speed of 600 rpm

[3V] The machine can run at a constant speed of 900 rpm

[RUN] Start button, press this button to start working.

[STOP] Stop button, press this button, the device will stop running during operation.

6.Operation Instructions And Precautions

6.1 Insert the grinding-polishing seat power plug into the socket, press the power switch to "I" position, power in standby state; The display of the grinding head and the grinding seat shows the data before shutdown, and is in standby mode.

6.2 Application method of grinding

6.2.1 To use this machine for grinding, the specimen should do cutting for big piece or inlaying for irregular shape piece. If it is an interception sample of general equipment, it needs to be smoothed on the abrasive machine, and the water cooling is also used to prevent the structural change. It is recommended to use a dedicated cutting machine to intercept samples, which can be used for rough grinding directly.

6.2.2 Three steps of grinding, coarse grinding semi - grinding and fine grinding

1)Various parameters for grinding

Grinding parameters of the grinding and polishing seat

Process	Abrasive grit size	RPM of grinding disc	To achieve
Coarse Grinding	240#-400#	50r/min-600 r/min	Remove the machining marks left bu cutting
Semi-Refined	600#-800#	50r/min-800r/min	Remove rough grinding marks
Fine-Grinding	1000#-2000#	50r/min-1000 r/min	Surface near mirror face without obvious grinding marks
Note: the grit size of the metallographic abrasive paper and the rotary speed should be selected according to the different requirements of the metallographic sample. When the sample requires general, the semi-fine grinding procedure can be omitted. When the sample request is higher, the grinding step should be increased appropriately.			

6.Operation Instructions And Precautions

Grinding parameters of grinding head

Sample QTY(pcs)	Time (min)				pressure (N)	RPM of gripper (r/min)
	240#	600#	1000#	1500#		
1-4	To smooth	2-3	2-3	2-3	Individual 10-40N Central 150-200N	10-80
Note:1)1-4 clamps for samples in dia. 45mm; 2)The parameters in the table are obtained from steel samples. When preparing samples with higher hardness, the upper limit of the parameters is selected or determined by experience.						

2)Grinding method:

Individual loading mode

a. Raise the holder of the grinding and polishing head, and turn the grinding and polishing head to the top of the other grinding and polishing plate. Paste the grinding and polishing disc with sandpaper, and gently turn the grinding and polishing head back to the top of the grinding and polishing disc to be used (do not touch the plastic water retaining ring when falling); slightly rotate the grinding and polishing head to make the position on the grinding and polishing disc suitable, press The locking button locks the position of the grinding and polishing head, and then puts the sample into the sample fixing sleeve of the clamping plate.

b. Adjust the grinding and polishing time, rotation speed and pressure parameters of the grinding and polishing head, and then adjust the rotation speed and steering of the grinding and polishing seat. Rotate the rotary faucet to a position where the water can flow to the grinding and polishing plate and the holder will not touch when the holder falls. Press the water inlet button, slowly turn the water volume adjustment knob to open the cooling water valve, and adjust the water flow. It is suitable when the water flow changes

6.Operation Instructions And Precautions

from a drop shape to a column shape. Then press the start button, the sample cylinder falls to compress the sample, the grinding and polishing plate and the holder are running at the same time; turn the cooling water nozzle to make it close to the single-point indenter. At this time, pay attention to observe whether the sample is in good contact with the sandpaper and there is no jitter. After normal, the rough grinding can be carried out; when the predetermined time is reached, the equipment will automatically stop, and the cooling water nozzle will be turned back to the position before the start; the grinding and polishing head will be raised, Take out the sample and clean the surface to check whether the ground surface meets the requirements. If it does not meet the requirements, continue grinding according to the above operation method until the requirements are met.

Note 1: Ensure that the drainage is unobstructed, so as to prevent excessive water in the cavity from overflowing the inner wall into the equipment and causing damage to other mechanical parts.

Note 2: When the sample is coarsely ground for the first time, the pressure and speed should be appropriately reduced and the time should be extended.

C. Press the lock button to loosen the grinding and polishing head, press the up button to raise the holder of the grinding and polishing head, rotate and remove the grinding and polishing head, and install the selected semi-finishing or fine grinding metallographic sandpaper to the grinding and polishing plate. Turn back to the grinding and polishing head, the operation method is the same as that of rough grinding. Properly adjust each parameter until it meets the requirements of fine grinding. So far the grinding work is over.

Central loading mode

a.Remove the holder on the grinding and polishing head, select the center afterburner raindrop holder, and put the raindrop holder in the mounting style socket. Select the pattern that needs to be polished, put the pattern into the raindrop hole and touch the

6.Operation Instructions And Precautions

bottom of the receiving pan, use a wrench to tighten the outer top wire inward, and hold the pattern so that it cannot be pressed away. Follow this step to install all the raindrop holes in the blessing plate. Put the blessing plate back into the polishing head and lock it tightly.

b.Modify the grinding and polishing head parameters, select the center afterburner mode, set the grinding and polishing time, speed, pressure, adjust the cooling water valve, rotate the grinding and polishing head to the corresponding position of the grinding and polishing plate, press the lock button and then press the start button.

c.At this time, the grinding and polishing head holder starts to move downward and the grinding disc and the holder rotate at the same time. When the grinding and polishing sample mounted on the holder is in contact with the grinding and polishing disc, the sample will be ground and the test piece is in contact with the grinding disc.

6.3 How to use polishing

Polishing is divided into two steps: rough polishing and fine polishing.

1)Various parameters used in polishing,

Polishing parameters of grinding and polishing seat

Process	Polish Particle Size	Range of Milling Rotation	To achieve
Rough Polishing	W3-W5	50r/min-1000r/min	Remove fine grinding left by fine grinding and surface deformation layer
Fine Polishing	W0.5-W2	50r/min-1000r/min	The essence is thrown to a smooth, unscratched mirror

Note: 1. The type of abrasive used for polishing agent, the size of the abrasive and the milling speed and the used fabric shall be selected according to the different requirements of the sample. The commonly used abrasive/polishing consumables are: grinding cream, polishing powder, spray polish and suspension. The abrasive has aluminium oxide, chromium oxide, diamond and colloidal silica. etc.

2. When the sample request is higher, the polishing step should be increased appropriately.

6.Operation Instructions And Precautions

Polishing parameters of the grinding and polishing head

Sample QTY(pcs)	Time (min)		pressure (N)	RPM (r/min)
	Diamond	Aluminum Oxide		
1-4	1~3	3~5	Individual 5-30 Central 150-200	300
<p>Note:: 1. The parameters in the table are obtained from wool-polyester or electrostatic flocking based on steel samples and polished fabrics; When preparing samples with high hardness, the upper limit of parameters or the determination of the experience.</p> <p>2. Use short polishing time whenever possible.</p>				

2)Polishing method:

a.Rough polishing: press the polishing head up key to raise the holder, rotate and remove the polishing head, clean the polishing disk and install the flocking cloth on it. Turn the water volume adjustment knob to open the cooling water nozzle to make water drop onto the flocking cloth. After the flocking cloth is completely moistened, close to the edge of the grinding and polishing plate, and spray on the flocking cloth with high-efficiency diamond spray. Turn back to the grinding and polishing head, press down to lower the grinding and polishing head holder, slightly turn the grinding and polishing head to make the position on the grinding and polishing disk suitable, press the lock button to lock the position of the grinding and polishing head; then put the sample into the clamp Hold the plate sample in the fixed sleeve. Other operation methods are the same as rough grinding. Set the parameters, and then press the start button, the sample cylinder falls to compress the sample, the grinding and polishing plate and the holder rotate at the same time; pay attention to observe whether the sample is in good contact with the flocking cloth and there is no bounce, and the rough polishing can be carried out after normal . When the flocking cloth feels very sticky during operation, the polishing agent should be dilute.

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When the predetermined time is reached, the equipment will automatically stop, press the grinding and polishing head up key to raise the holder, take out the sample and clean the surface to check whether the polished surface meets the requirements. If it does not meet the requirements, continue polishing until it meets the requirements.

b.Fine polishing: Press the lock button to loosen the polishing head, turn it out of the polishing head, remove the rough polishing flocking cloth, clean the polishing disk, and install the fine polishing flocking cloth on it; turn back to the polishing head , Adjust the parameters appropriately. The operation method is the same as that of rough polishing. The polishing agent uses fine polishing abrasives until the sample meets the requirements of metallographic analysis. At this point, the polishing work is over, turn off the power switch and the water source switch.

Note 1: Keep the polishing fabric clean.



Note: the polishing pressure can not be too large, so as not to tear down the flocking cloth; The polished fabric should be pressed close to the polishing disk, and if the fabric comes off or the gripper is stuck, press the stop button quickly to stop the machine.

6.4 when the working temperature is below - 10 °C, the plastic parts should be especially handle carefully to avoid damage.

6.5 When the machine has abnormal sound, the machine should stop for inspection immediately.

6.6 After each operation, the cleaning and maintenance of the equipment should be done.



Note: no damaged sandpaper and polished fabric shall be used. Otherwise, grinding and polishing may damage the sample and the polishing disc

Note: users can buy dedicated polishing fabric and metallographic sandpaper from our company.

7.Simple Troubleshooting

Installation method

Symptom	Troubleshooting
Turn on the power switch without display	<ul style="list-style-type: none">•Check whether the power supply is available•Whether the power cord and socket are in good contact•whether the insurance tube is broken
Press start key device without reaction	<ul style="list-style-type: none">•Whether the cable connection is good•whether the motor is damage
Press the start key	<ul style="list-style-type: none">•Whether the button is damaged or not•The main control board is not working properly
After a period of time, the use of the feeling disk is insufficient	<ul style="list-style-type: none">•V Belt or synchronous belt wear, the belt should be replaced

Place the machine on the test plane, and adjust the damping pad under the machine to make the machine securely placed and in a horizontal position.

Connect and plug the inlet and drain pipes at the back of the machine.

Ground the grounding mark of the chassis well.

4.Insert the grinding and polishing head steadily into the column of the machine, and connect the aviation plug and the air pipe behind the machine.

5.The $\Phi 250\text{mm}$ quick-change plate needs to be inserted and placed stably by aligning the three positioning holes on the grinding and polishing plate with the three positioning pins on the base.

6.Insert the power plug, turn on the rear power switch and then turn on the emergency stop switch, press the start button to start the machine, and check whether the operation is normal.

7. After checking, you can operate and use.

8.Packing List

Name	Quantity
Auto Metallographic Grinding-Polishing Machine	1 SET
Product Manual	1 PC
Product Ccertification	1 PC
Packing List	1 PC
Polishing Cloth(Φ250mm)	2 PCS
Sandpaper (Φ250mm)	8 PCS
Grinding and Polishing Disc(Φ250mm)	2 PCS
Aluminum Buckle(Φ250mm)	2 PCS
Drain Pipe	1 PC
Inlet Pipe	1 PC
Pressure Tube(Φ8*3000mm)	1 PC
Water Separator	1 PC
Magnetic Disk	2 PCS
Anti-sticking Disc	5 PCS
Leveling Feet	4 PCS
Power Cord	1 PC
Dust Cover	2 PCS
Water Retaining Ring	2 PCS

Notes to users

Thank you for using our products to ensure that you get the best after-sales service of our company. Please read the terms and conditions as follows.

1.Product warranty scope

Any failure caused by the use of normal use

2.Product warranty period

The warranty period of our products is from the date of installation, within twelve months.

Long-term technical services shall be implemented after the warranty period

3.Non-warranty coverage

Any violation of the requirements of man-made accidents, natural disasters and other causes of damage, as well as the damage caused by unauthorized changes, as a waiver of warranty service.

Note: our company reserves the right of the final interpretation of this manual.

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