MLP-GP260

AUTOMATIC GRINDING/POLISHING
OPERATION MANUAL

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MN-MLP-GP260-E
V2

Special Warnings

1. In the box, please remove the grinding head according to the dismantling instructions.
2. When connecting the water pipe, the drain pipe must be lower than the fuselage to ensure no water leakage and smooth drainage.
3. When connecting the trachea, pay attention to the inlet direction should be consistent with the arrow above the pressure gauge, and the cup should be downward.
4. When connecting the power supply, make sure the power supply is firmly grounded.
5. Before lifting the grinding head, make sure that the grinding head is in the opening hole of the anti-splash cover, and the Rotary water nozzle is moved away (otherwise intervene).
6. When the grinding head is raised, it can only move to the left, not to the right (no fall protection).
7. When the grinding head is raised, do not let hands go under the gripper of grinding head (to avoid accidental falling and injury).
8. Damaged abrasive paper or polishing cloth shall not be used on the grinding disc (otherwise the workpiece may be ejected).
9. When the grinding head is dropped, do not move the grinding head to the edge of the grinding disc.
10. Before starting or stopping the grinding, move away the rotary nozzle (otherwise interfere).
11. Before water supply, make sure the rotary nozzle switch is closed.
12. Do not touch the rotating part with your hands during the grinding process.
13. Keep your hands away from the gripper and grinding disc before power is cut off completely.
14. Do not leave samples or dirt in the water tank (to avoid blocking the drain).

INSIZE

Contents

Safety Notice

Before you install and use this product, please read this manual carefully, and pay special attention to the contents and suggestions and observe the precautions so as to avoid damage to equipment, fire and personal injury!

Check the input range of the power supply before using and check if matches to the equipment.

Check if the grounding meets the requirements.

The operator must do some safety training before working and after qualified, the operator may use this machine.

We determined whether the environment meet the installation requirements. We operate the equipment according to the operating rules.

The cleaning equipment should unplug the power.

When trouble, do not allow to disassemble the equipment, we should ask professional maintenance, to avoid electric shock.

Please keep the manual good.

1. Foreword

MLP-GP260 automatic grinding /polishing machine is bench machine for single disc. It is one new generation of high-precision grinding/polishing machine with high precision and automatic sample according to the international standards and advanced international technology.

The machine adopts the advanced microprocessor control system, which makes the grinding disc and the grinding head realize stepless speed, sample pressure, time-setting intuitive and convenient. The operator only need replace the grinding disc or metallographic sandpaper and polishing cloth to finish the operation so that the machine has more widely application. The machine has the rotation direction which is arbitrary. And the grinding disc can be replaced. Meanwhile there are the following functions such as multiple sample clamping holder and pneumatic single point loading and grinding material is automatically distributed. Besides the machine has the following features, smooth rotation, safe and reliable, low noise and the aluminum base increases the rigidity.

The machine has the water cooling device and abrasive scouring nozzle, which can cool the specimen when grinding so as to prevent the

specimen microstructure from being damaged because of overheating. Meanwhile it will drain away the abrasive at any time. The shell is made of the ABS material and some spare parts are stainless steel so it is more beautiful in appearance and more easy to clean.

MLP-GP260 automatic grinding /polishing machine is suitable for the rough grinding, fine grinding, rough polishing to fine grinding process . It is an ideal sample preparation equipment for enterprises, research institutes and laboratories of colleges and Universities.

2. Main Technical Indexes

Grinding Disc Diameter: φ250mm
Grinding disc speed: 50-999r/min(Stepless)
150 r/min, 300 r/min(two speed control)
Polishing Head Speed: 50-150r/min(stepless speed)
Loading range: 5-60(N)
Sample Time: 0-995(S)
Sample Diameter: φ30mm(customized)
Input Voltage: single phase AC220V 50Hz
Input Power: 1.1KW
Dimension: 594×795×687(mm)
Net Weight: 98kg

3. Machine Schematic Drawing

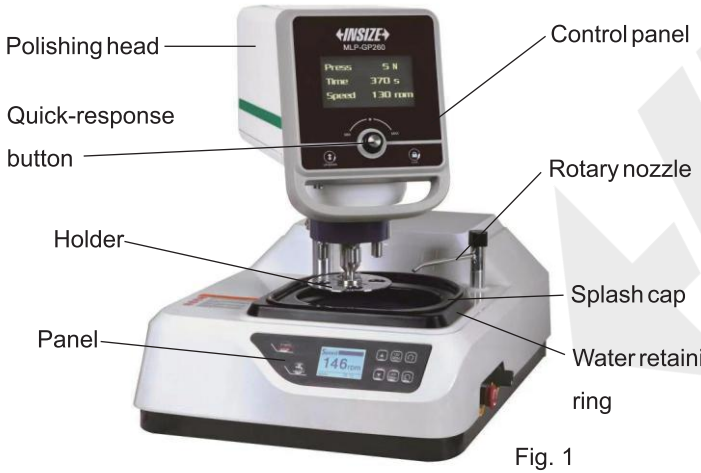


Fig. 1

Brief Introduction for Parts:

Grinding/Polishing Head: Including the mechanical and electrical control is the important part of the machine.

Polishing Head Control Panel: Input the controlling parameter such as grinding time ,grinding speed and pressure control.(Refer to details in the following)

Grinding Disc: Namely, Working Disc is an important part in the process of the polishing test. The surface on the grinding disc adopts the design of the anti-sticking(black coating).Its role is when replacing the metallographic sandpaper or the polishing cloth (as shown in Figure two),it is easy to clean the machine and meanwhile it is also fast to replace them.

Grinding disc may be either the working plate or another working plate consisting of the grinding disc, magnetic pad and diamond grinding disc(as shown in Figure 3).Then the magnetic pad will be pasted into the grinding disc ,which role is the diamond disc is pasted into the grinding disc through the magnetics. So the user may replace the different size of the diamond grinding disc and replace the different specification of sandpaper or polishing cloth .These two kind of stype can be convenient to polish the samples.(Note:When wiping the grinding disc, we should avoid scratching the anti-sticking layer.

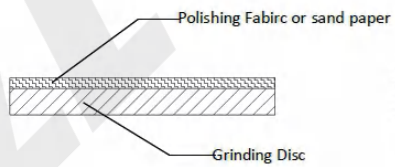


Fig. 2

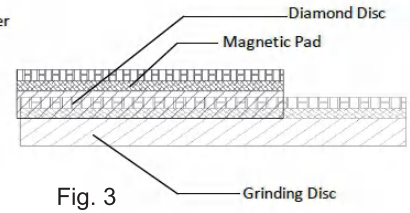


Fig. 3

Adjust the damping foot: Adjust the machine stable

Clamp holder: Clamp the sample and set the pressure 5-60(N).

Rotary nozzle: It can cool the sample when polishing the sample. The user can turn on or turn off .

Water-retaining Ring :Prevent the water from splashing in the grinding/polishing process.

Grinding Control panel: Set the speed direction for the working disc and start the machine and stop the machine.

Please read the following terms!

4. Installation & Precaution

4.1 The equipment must have a good grounding and must use the the power socket which is three level standard.

4.2 The equipment should be installed on the stable working table without the vibration. The environment should be ventilated and dry and the temperature is 10℃-30℃ and the relative humidity is less than 85%.There is no corrosive gas and conductive dust.

4.3 Please open the machine and remove the wrap from the machine and take out all accessories. After the machine with the package panel is raised, four bolts will be taken off with the wrench. And then the machine is moved to the table. The drainage pipe is jointing the hose hoop and then insert the drainage at the rear of the equipment. The hose hope will move

to the intermediate position and screw the hose hoop and fix the drainage and finally the water inlet is screwed into the inlet nozzle.

Drain pipe must be lower than the body parts in order to ensure no leakage, drainage smooth!

4.4 According to the situation of inlet and outlet, determine the location of the equipment and put it in place, adjust 4 adjustable cushion so that the equipment is on the basic level and make it stable.

4.5 Grinding disc can be changed quickly. When the hands take the grinding disc gently and the disc will be unloaded. The other grinding disc holds with the hands. When the three piston rod hole is on the same level with the three piston rod, you may fall down the grinding disc .

4.6 Installation methods of metallographic sandpaper and polishing fabric

Clean the upper disc and paste the metallographic sandpaper with the special glue or polishing fabric into the grinding disc.

4.7 Methods of installing the sample holder

If you want to replace the clamp holder, please loosen the two screws for 2 mm with the wrench on the shaft. Then the user can replace the clamp holder. When installing, you need clamp the pin shaft alignment notch on the rotating shaft inserted into the first end face contact, then the two screws tighten.

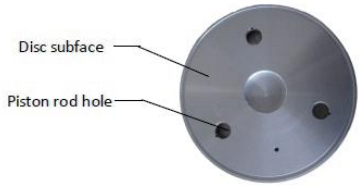


Fig. 4

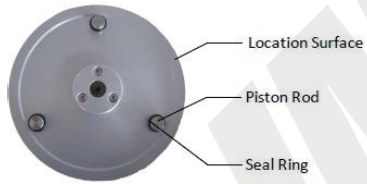


Fig. 5

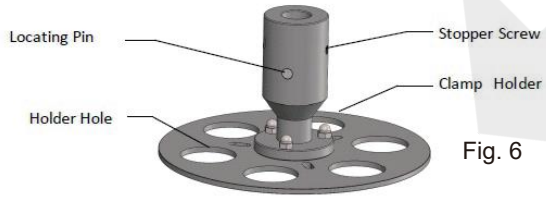


Fig. 6

4.8 After the swith of the tap water is off, connect the inlet pipe with the external pipe. Make sure that the inlet switch on the device has closed and then open the tap water switch.

The water inlet pipe parts can not leak.

4.9 Please put one container at the outlet or place the drainage pipe to the discharge. Counterclockwise rotation knob, open the two rotary nozzle were examined, the drainage pipe is smooth, the connecting part can not Water Leakage. Then close the two rotary nozzle, then press the button to

close the water inlet switch.

4.10 the pressure regulating filter (filter precision of 40 m, air pressure has been set to 0.7MPa) so that the cup down, with two M5 * 10 screws and a flat pad fixed on the rear seat wire hole on the pipe end 0.75 meters long into the rear of the grinding and polishing head quick joint, the other end is inserted into the adjustable pressure filter L thread two pass joint; the pipe end is 2 meters long adjustment screw insert filter through joint, the other end is inserted into the joint source, then connect the gas source.

The input pressure source should be between 0.6-0.9MPa, the flow is greater than or equal to 30L/min; when the connecting pipe should check whether the direction of variable intake pressure filter and pressure gauge at the top of the arrow, the cup should be down.

4.11 A socket with the power line and data line are respectively inserted into the polishing head and polishing the corresponding sockets in the end, both ends of the serial data line will need the two screws.

4.12 FY-5 Automatic/Manual Dripping Device for Optional Accessories

If you have purchased, the Installation methods are as follows(Read the FY-5 automatic/manual dripping device user manual).After opening the dripping device, the user move it to the working table and put it to the right side. Mounted on the suspension bottle plug and a liquid inlet and outlet tube, multi section adjusting pipe, so that the water faucet position the suspension infusion in grinding disc polishing fabric, can be on sample polishing.

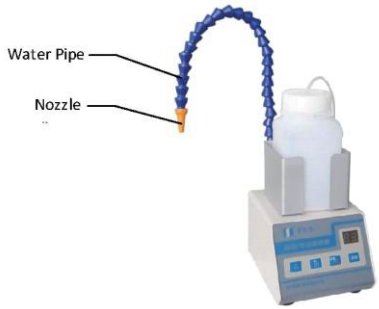


Fig. 7

5. Operating Button and Display Instructions

5.1.1 Grinding & Polishing Head Control Panel is shown below:

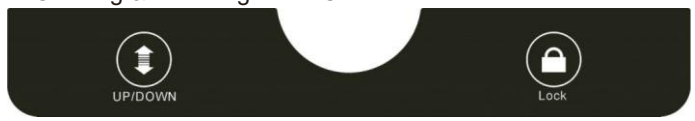


Fig. 8

Up/Down Button: Press this button and Unlock the grinding/polishing head and then the grinding/polishing head is rising and falling.

Locking Button: When the polishing head is falling down and adjust to the appropriate position, press this button and lock the grinding/polishing head. After the grinding/polishing head is only locked, the user can start the

machine.

5.1.2 Grinding & Polishing Seat Control Panel is shown below:

Fig. 9

Accelerator Key: press this button to accelerate the setting, the maximum value of 1000 r/min, each click to increase the value of 1; press and hold, to 10 increments each time.

Deceleration Key: press this button to slow down the setting, the minimum value of 50 r/min, each press to reduce the value of 1; press and hold, to each 10 values decrease.

Fixed Speed Key: press this key, the fixed speed is 150r/min setting.

Fixed speed key: press this key, the fixed speed is 300r/min setting.

Turning Button: Press this button and the grinding disc will rotate in the direction of the clockwise.

Turning Button: Press this button and the grinding disc will rotate in the direction of the counterclockwise.

Water- inlet Button: Press this button and the electromagnetic water valve is open and the water is connected. And then press this button again and the water is closed.

Start/Stop:Press this button and the machine begins rotating and press this button again to stop rotating.

5.2 LCD Description

After starting the machine, when the interface is coming, the user can not do any operation and when the interface automatically switches to the standby interface as shown in Figure 10, the user can do the operation.

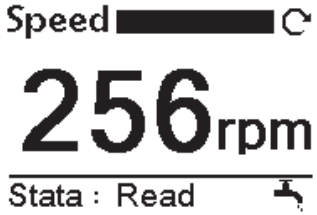


Fig. 10

The standby interface consists of two parts. The upper part displays the speed and the bottom is displaying the status information of the grinding/polising base. When the machine is in the standby, the interface at the lower left corner displays “READ”.When it is in the normal grinding ,it displays “RUNNING”.At the bottom of the right side it displays the lin state, the rotation direction and the switch state.

As shown in Figure 11 ,A indicates the grinding head is in the normal communication with the base. When Figure 11 appears, the grinding head is disconnected with the base. At this time, the user needs to check the communication line between the grinding head and the grinding and polishing base.

A B

Fig. 11

As shown in Figure 12, A stands for the rotation of the grinding/polishing disc and grinding disc clockwise. Figure B stands for the grinding disc counterclockwise.

A B

Fig. 12

When the Figure 13 appears, it stand for the valve open in the polishing base. When the icon disappeared, the water inlet electromagnetic valve is closed.

Fig. 13

When the user presses the stop button, the standby interface switches to the emergency stop as shown in Figure 14. At this time, all operations are prohibited. After screwing out the emergency stop button, the emergency interface remains for the short time to wait for the system reset. During this period, all the operations are still banned until the interface automatically switch to the standby interface.

Fig. 14

5.3 Grinding & Polishing Head LCD Instructions

After starting the machine, the interface automatically switches to the standby interface as shown in Figure 15, the user can do the operation. The interface is consisting of the pressure, time and the speed. The user can select the modified parameter by the rotation and then the parameter

is red as shown in Figure 15.

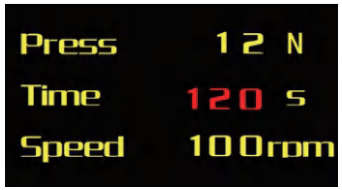


Fig. 15

After selecting the modified parameter, press the knob and activate the selected parameter. At this point, the parameter color is as shown in Figure 16.The rotary knob can change the activated parameter. After setting the parameter, the user can press the knob and the parameter will be inactivated. The color of the parameter will change back to the red. The user can choose other parameter by rotating the knob.

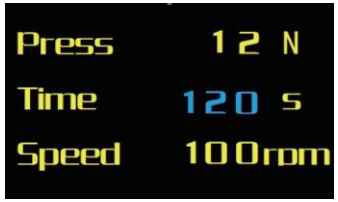


Fig. 16

When the system pressure is too low to meet the normal grinding and polishing needs, the system will show the interface as shown in Figure17, the pressure shortage, at which point the user needs to check the air pressure.

Fig. 17

When the user presses the emergency stop because of the emergency, the system will display the interface as shown in Figure 18. At this time, all the operation will be prohibited. The system automatically switches to the standby interface which can be the normal operation of equipment.

Fig. 18

When the grinding base and the control signal line of the grinding head are interrupted, the grinding head will show the prompt information as shown in Figure 20.

Fig. 20

6. Operation Description & Notice

6.1 The grinding power plug seat is inserted into the power socket, the power switch to "ON" position, power equipment, grinding and polishing head and polishing a screen show off before the data. At this time it is in the standby state.

6.2 Method of grinding:

After the metallographic sample has been cut or mounted ,the machine can grind the samples with th height of more than 15mm (Includes inlaid specimens) and the best height is 18mm-20mm.If it is general equipment to intercept the sample, it needs to be polished in the grinder, and dipped in water cooling, to prevent the recommended organizational changes. Special cutting machine to intercept the sample, which can be directly used for coarse grinding.

Grinding is divided into three steps: coarse grinding, semi fine grinding and fine grinding.

1) Each Parameter in the Use of Grinding/Polishing

Table 1 Grinding Parameters of grinding and polishing block

	Sandpaper Granularity	Grinding Disc Speed	Requirements
Coarse grinding	240#-400#	50r/min-999r/min	Remove the machining marks left by cutting.
Semi fine grinding	600#-800#	50r/min-999r/min	Remove the grinding marks of coarse grinding.
Fine grinding	1000#-2000#	50r/min-999r/min	Grinding to near the mirror surface without obvious grinding marks.
Remark: Abrasive size and grinding disc speed should be based on the requirements of the different metallographic specimen appropriate. When the sample requirements, omitting semi fine grinding steps. When the specimen is required, it should be appropriate to increase the grinding step.			

Table 2 Grinding Parameter of the Grinding/Poishing Head

	sample preparation time(min)				pressure (N)	clamp holder speed (r/min)
Samples number	240#	600#	1000#	1500#		
1-6		2-3	2-3	2-3	20-50	50-80
1-3		3-5	3-5	3	20-50	50-80

Note: 1) 1-6 clamp holder is suitable forφ22 andφ30 samples and 1-3 clamp holder is suitable forφ45 samples;
2) The parameters in the table is obtained according to the steel sample. When the samples have high hardness, the parameters will be determined according to the operator's experience.

2) Grinding Method:

a. Click the button to open the polishing head lifting up head switch, grinding head grinding head to rotate upward, another grinding disc above. The metallographic sandpaper or polishing fabric paste into the grinding disc, can also be diamond disk (or anti-stick disc) with magnetic adsorption pad good paste the grinding disc, if the disk should be anti sticking or metallographic sandpaper polishing cloth is pasted on the top, the grinding disc grinding head gently back to ready to use (falling to will support plate alignment of the opening of the positioning sleeve, press the inner) grinding and polishing head lifting key grinding head fall under a slight rotation of the polishing head; the grinding disc on the right position, press the locking key is grinding and polishing head grinding head lock, the sample holder into the hole.

b. Fine grinding and polishing head time adjustment in the standby mode, the speed and pressure parameters (optional 180s, 50r/min, 30N, operation can not be changed, and then adjust the seat) grinding speed (optional 300 speed key), to spin. The rotating nozzle to rotate after the water can flow to the grinding disc and the clamping edge for the whereabouts of and can not touch the position, press the water switch key, slowly turn the knob to open the rotary water faucets, and adjust the flow of water, with water from the droplets into columnar is proper. Then press the start button, press the sample falling cylinder specimen holder, grinding disc and rotate the rotary operation at the same time; close to the nozzle holder. Then observe the specimen edge with sandpaper contact is good, no normal beat, can be carried out after coarse grinding; at the scheduled time, the equipment will automatically shut down, turning back to the water before the start of the position; the specimen is removed and surface cleaning, check whether the grinding surface meets the requirements. If do not meet the requirements, according to the above method for grinding

operation continues until it reaches the requirements; if the replacement of sandpaper, to remove the sample and then click the button to open the polishing head lifting pneumatic switch, grinding and polishing head up after replacement.

1. Drainage should be ensured so as to avoid excessive water storage in the lumen and enter the equipment through the inner wall, resulting in the damage of other parts
2. After finishing and before turn off the air source,the grinding polishing head should be back to the upper disc so that the head will fall in to the middle position without air source.
3. After the stop button is stopped, and then press the start button, the device will run before the above stop speed.
4. The parameters of grinding and polishing seat can be set at any time, and the parameters of grinding and polishing head should be set at standby time
5. The rotating water faucet must be removed before the stop button and the start button, otherwise the interference will occur
6. When the sample is first rough grinding, the pressure and rotation speed should be reduced and the time will be prolonged when the sample is 22 mm.

6.3 Methods of Polishing:

Polishing is composed of rough polishing and fine polishing.

1) Each Parameter in the Use of polishing

Table 3 Polishing Parameters of the grinding/polishing seats

	Particle Size of Polishing Agent	Grinding Disc Speed Range	Requirements
Rough	W3-W5	50r/min-999r/min	Remove fine grinding scar and surface deformation layer left by fine grinding
Fine	W0.5-W2	50r/min-999r/min	Fine polished smooth mirror without scratches

Remark:
1. The use of abrasive polishing agent type, particle size and grinding disc speed and the fabric should be according to the requirements of the different metallographic specimen appropriate. Common grinding/polishing supplies: grinding paste, polishing powder, spray polishing agent and abrasive suspension. Aluminum oxide, chromium oxide, diamond and colloidal silica.
2. When the sample requirement is high, the polishing steps should be appropriately increased

Table 4 Polishing Parameter for the grinding/polishing head

	Sample Time(min)		Pressure (N)	Speed (r/min)
Sample Quantity	Diamond	Alumina		
1-6/1-3	1-3	3-5	10-20	300

Remark:
1. The parameters in the table is based on the steel samples and polishing cloth or wool fabric obtained by electrostatic flocking; when the sample preparation of high hardness, parameter selection and the upper limit or determined according to experience.
2. Use shorter polishing time as much as possible

2) Methods of Polishing:

a. Rough polishing: press polishing head lifting key grinding head rises, turning out the polishing head, the grinding disc (or anti-stick disc) wipe the flocking fabric mounted on the rotating knob to open water. Tap water to make the rotary, flocking, flocking cloth made after completely wet, turn back off water faucet. The suspension was prepared into FY-5 dripping device (optional accessory, see the FY-5 manual). Open drop switch, adjust the flow, the suspension drip on the flocking cloth after removal of the dropping liquid mouth close to the edge of grinding disc; or the use of diamond spray on flocking cloth back. Grinding head, grinding head lifting press button, then grinding and polishing head down, a slight rotation of the grinding head grinding disc on the right position, press the locking key is grinding and polishing head grinding head lock; then the sample is placed into the holder hole. Other operation. Coarse grinding method and the same. Set the parameters (grinding and polishing head optional 300s, 50r/min, 15N, 300r/min, optional seat grinding) and then press the start button, press the sample falling cylinder grinding disc holder, and at the same time of operation; observe the specimen and the

flocking cloth is a good contact, no beating, normal can be used for rough polishing. Mobile drop mouth close to the edge of the holder, and from the grinding disc center close position, the suspension to drip flocking cloth. Feeling flocking heavy viscous operation should be further diluted. Some polishing agent at the scheduled time, equipment automatic shutdown, the specimen is removed and surface cleaning check whether the polishing surface meets the requirements. If you do not meet the requirements, needs to be polished, until it reaches the requirements; then, close the switch drops. Click on the polishing head lifting button to open the pneumatic switch, the polishing head up.

b. Fine Polishing: Click on the polishing head lifting key grinding head rises, turning out the polishing head, remove the rough polishing flannelette, it will wipe the grinding disc polishing cloth flocking mounted thereon, which can also be the grinding disc (or anti-stick disc) removed, the other with a fine polishing grinding disc plant flannel (or anti disc) mounted to the grinding seat (or magnetic pad); back grinding head, adjusting the parameters. The operation method of the same and rough polishing, polishing agent use polishing abrasive, until the specimen reached the metallographic polishing work requirements. This will end, the polishing head off next to the grinding disc above, turn off the power switch and the power supply system. Shut off the water supply switch.

1. Keep polishing fabric clean.
2. The pressure of polishing can not be too large, so as not to tear the fabric polishing; polishing fabric should be attached in the grinding disc, if the fabric holder is off or stuck, should immediately press the stop button to stop.

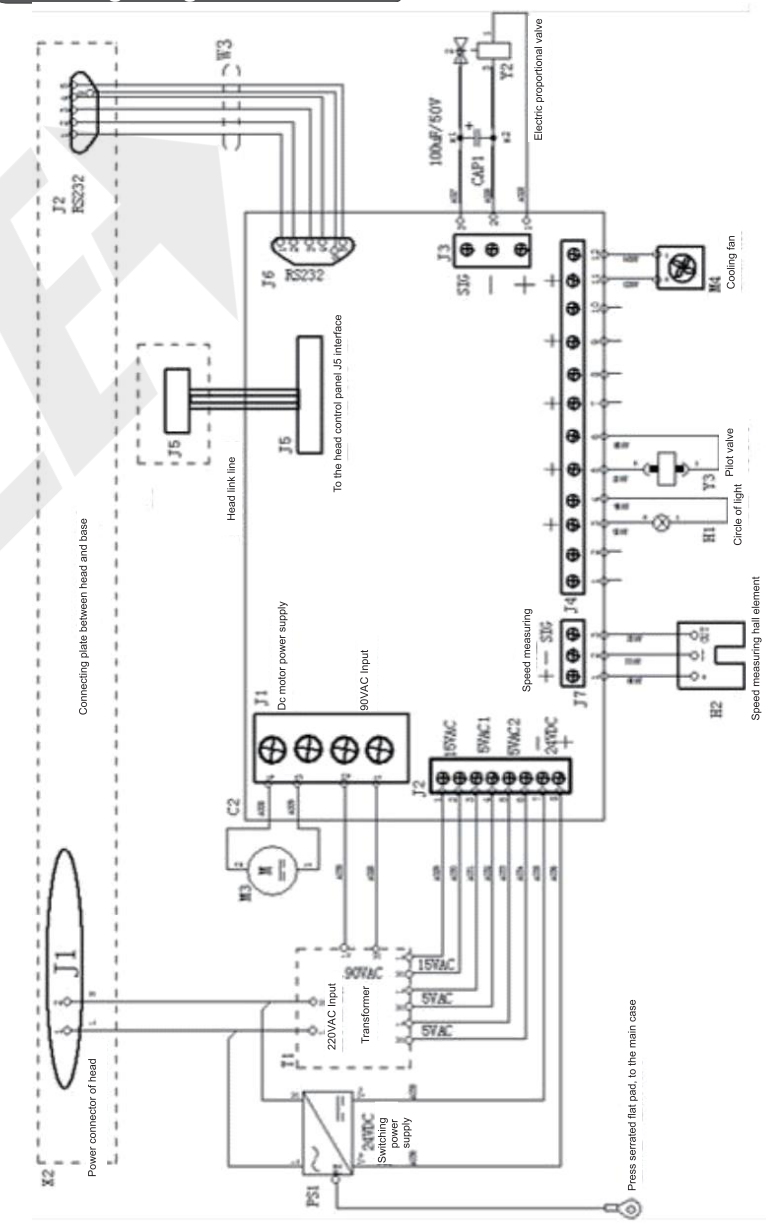
6.4 The plastic parts of the machine should be operated at a temperature lower than -10 degrees. Special care should be taken so as to avoid damage.
6.5 When the abnormal sound is found, the machine should be stopped immediately for inspection.
6.6 After finishing operating per time, the operator should keep the equipment clean.

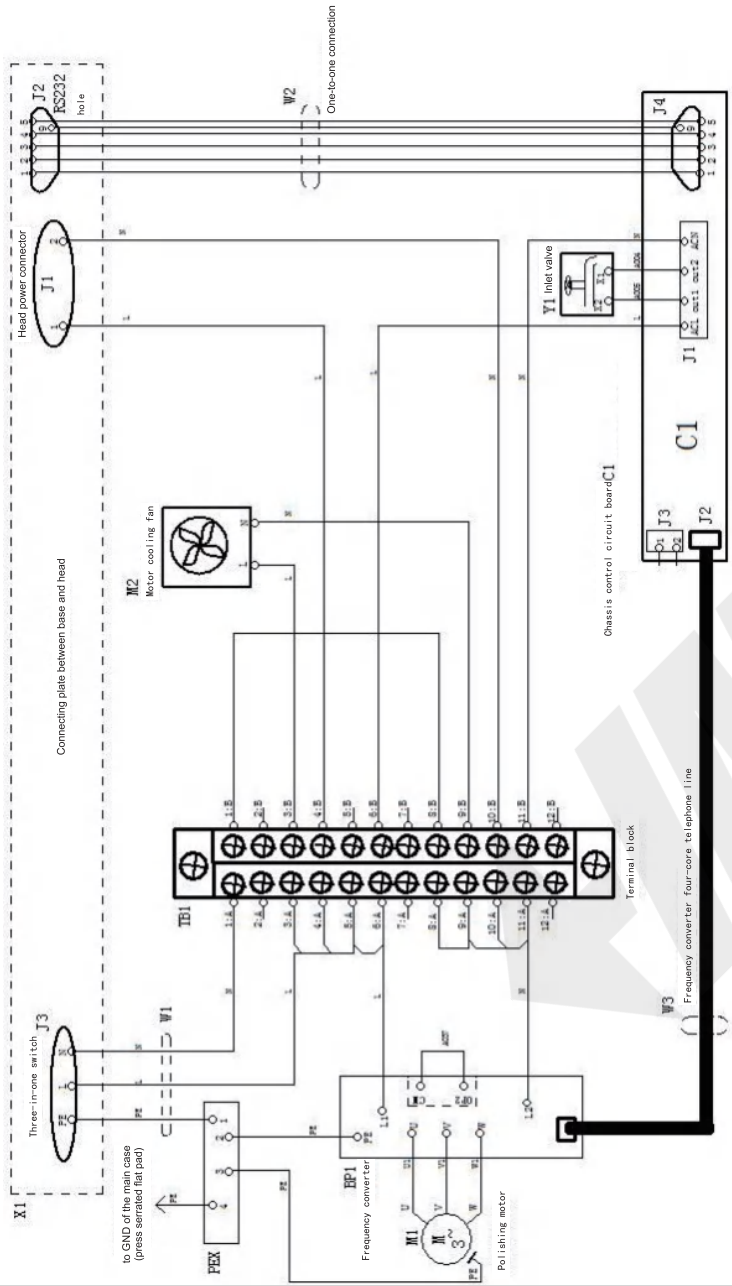
Notice:
Don't use the damaged sandpaper and polishing fabrics. Otherwise, when grinding/polishing, it will be dangerous.

7. Simple Trouble Shooting

Fault Phenomenon	Elimination Method
Press the power switch no display	◆Is there any electricity in the power supply ◆Good contact between power cord and socket ◆Whether the fuse is broken
Press the start button (red light is valid), the device does not respond	◆Whether the data line connection is good ◆Whether the motor is damaged
Press the start button (red light is invalid), the device does not respond	◆Whether the button is damaged ◆The main control board is not working properly
Inlet solenoid valve is not controlled (red light is valid)	◆Water is too dirty, repair or replace the inlet solenoid valve
Inlet solenoid valve is not controlled (red light is invalid)	◆Electrical circuit fault
There is a collision sound between grinding disc and piston rod when starting	◆The seal ring is worn, the seal ring should be replaced
After using for a period of time, the power of disk is insufficient	◆Check for tension and wear of multi-wedge belt or synchronous belt

8. Wiring Diagram




J2
RS232
hole
W2
One-to-one connection
J4
Head power connector
J1
Y1 Inlet valve
J1
C1
Chassis control circuit boardC1
J3
J2
M2
Motor cooling fan
Connecting plate between base and head
TB1
Terminal block
W3
Frequency converter four-core telephone line
J3
Three-in-one switch
W1
X1
to GND of the main case
(press serrated flat pad)
PEX
EP1
Frequency converter
M1
Polishing motor