

How to Troubleshoot the Following Unit in WEIHONG Laser Cutting System

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This document guides you how to troubleshoot the possible problems when the following unit (especially the amplifier SE001) fails to work in laser cutting system.

If the following unit does not work properly, software interface of **NcEditor V12** will show the following:

- capacitance value remains 0
- capacitance value is unstable and changes a lots

If the following unit does not work as desired, troubleshoot the following:

1. Check the connection among SE001 and peripheral components
2. Check if SE001 is damaged
3. Check the electrical connection of all machine components
4. Check the connection cables
5. Check the grounding of the machine
6. Others

Check the connection among SE001 and peripheral components

Make sure that all peripheral components well work to rule out failures that may be caused by peripheral components.

1. Replace RF cable with standard RF cable that was shipped by WEIHONG Company.

RF cable is a cable that connects the amplifier and laser cutting head. RF cable that is made by customers themselves or bought somewhere else may cause 0 or unstable values of capacitance in the software.

2. Replace the laser cutting head and other components.

Failure of the cutting head or related components may cause 0 or unstable values of capacitance in the software.

Pay much attention to the following:

- Ceramic rings of the cutting head
- Nozzle of the cutting head
- Whole cutting head

If the following unit remains non-working, go to the next.

Check if SE001 is damaged

Use the multi-meter to measure the impedance characteristics of the SE001 terminals, to make sure SE001 well works.

Do the following to troubleshoot:

1. Remove SE001 from the machine, and dis-connect it with other peripheral components.



2. Turn the gear of the multi-meter to Resistance, and use the multi-meter to measure the resistance between SE001 terminal 1 and 2.



- If the result is within range of $5.0k\Omega \sim 5.3k\Omega$, SE001 works well.
 - If not, SE001 is damaged.
3. Turn the gear of multi-meter to Resistance and Buzzer, and use the multi-meter to check the connection between SE001 terminal 2 and 4.
- If the Buzzer rings, the connection is good and SE001 works well.
 - If not, SE001 is damaged.

If above measurement results are out of range, SE001 is damaged. Please note down the measurement results and return the damaged SE001 to WEIHONG Company.

If above measurement results are within the range, but the following unit remains non-working, go to the next.

Check the electrical connection of all machine components

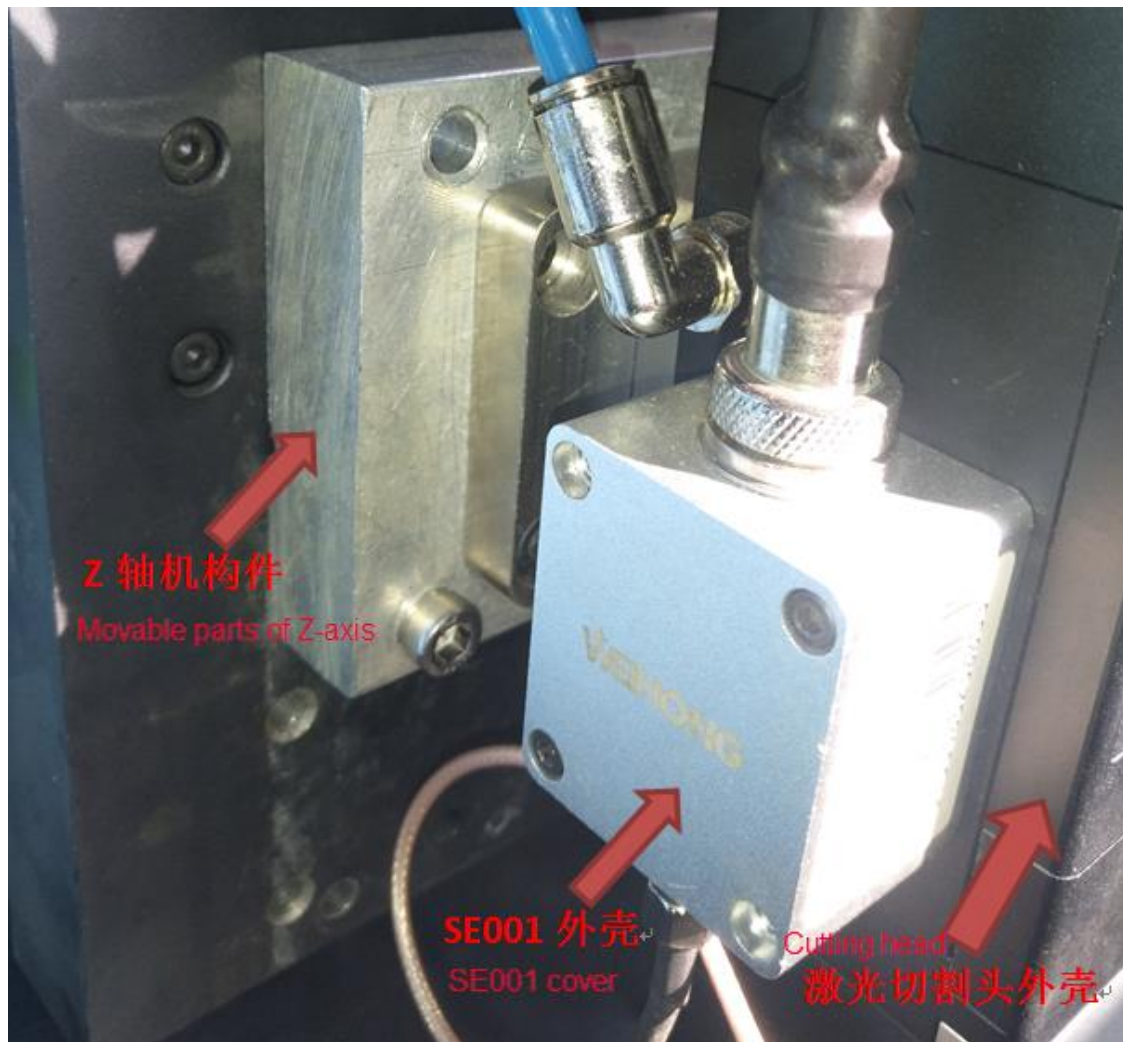
Use the multi-meter to check the resistances and make sure the connections of the whole CNC system, mainly including the following:

- The controller or control card
- Terminal boards
- SE001
- Machine

Firstly SHUT DOWN THE POWER SUPPLY before troubleshooting.

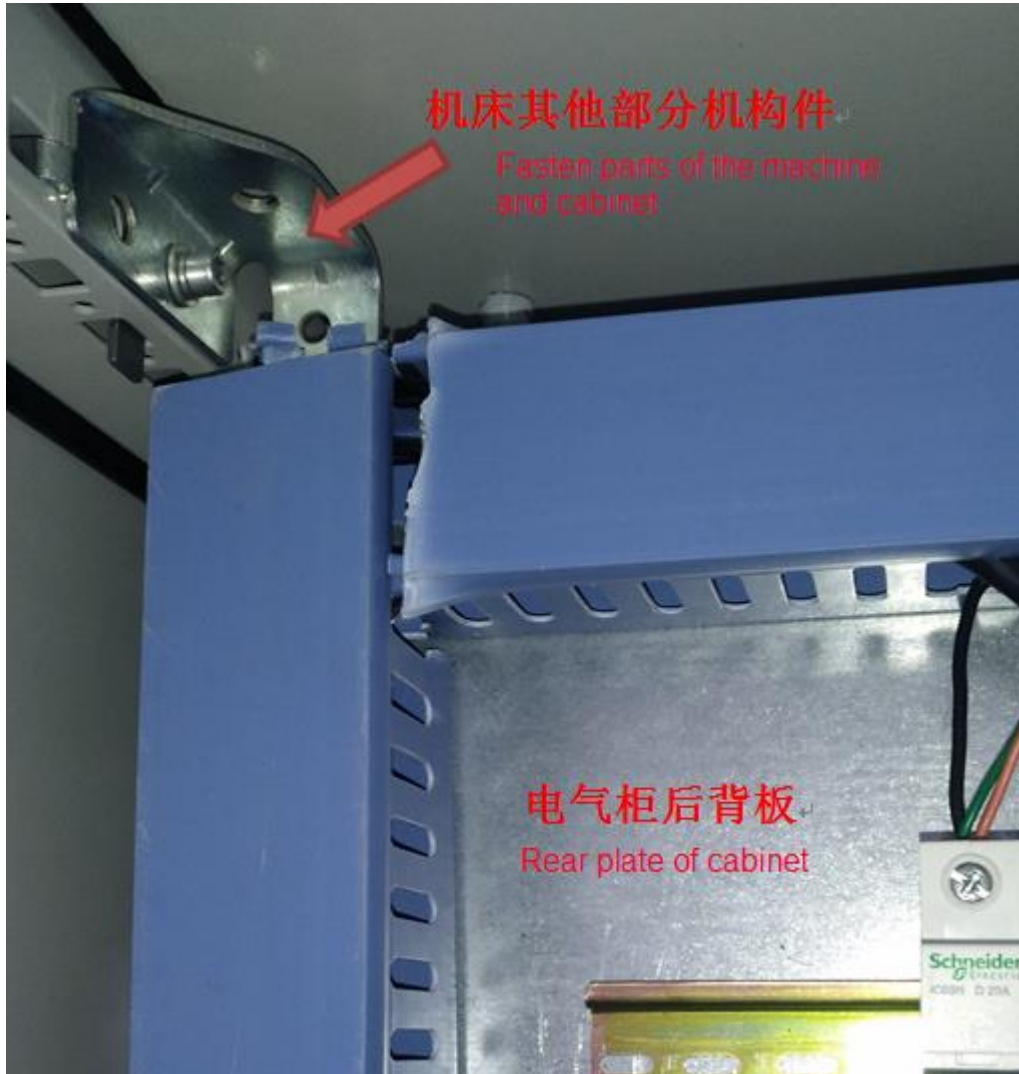
To troubleshoot, do the following:

1. Turn the gear of the multi-meter to **Resistance**, and use the multi-meter to measure the resistance between SE001 cover and the cutting head cover.



- If the resistance is within range of 0~1Ω, the connection between SE001 cover and the cutting head cover is good.
 - If not, the connection between SE001 cover and the cutting head cover is bad.
2. Turn the gear of the multi-meter to **Resistance**, and use the multi-meter to measure the resistance between the cutting head cover and movable parts in Z-axis.
 - If the resistance is within range of 0~2Ω, the connection between the cutting head cover and Z-axis is good.
 - If not, the connection between the cutting head cover and Z-axis is bad.
 3. Turn the gear of the multi-meter to **Resistance**, and use the multi-meter to measure the resistance between SE001 cover and the jagged iron bar under the workpiece to be machined.
 - If the resistance is within range of 0~2Ω, the connection is good.
 - If not, the connection is bad.

4. Turn the gear of the multi-meter to **Resistance**, and use the multi-meter to measure the resistance between rear plate of cabinet and jagged iron bar under the workpiece to be machined. If there are more than one rear plates, repeat the measurement process.



- If the resistance is within range of $0\sim 2\Omega$, the connection is good.
- If not, the connection is bad.

If any result is out of range, you need to rule out the electrical connections.

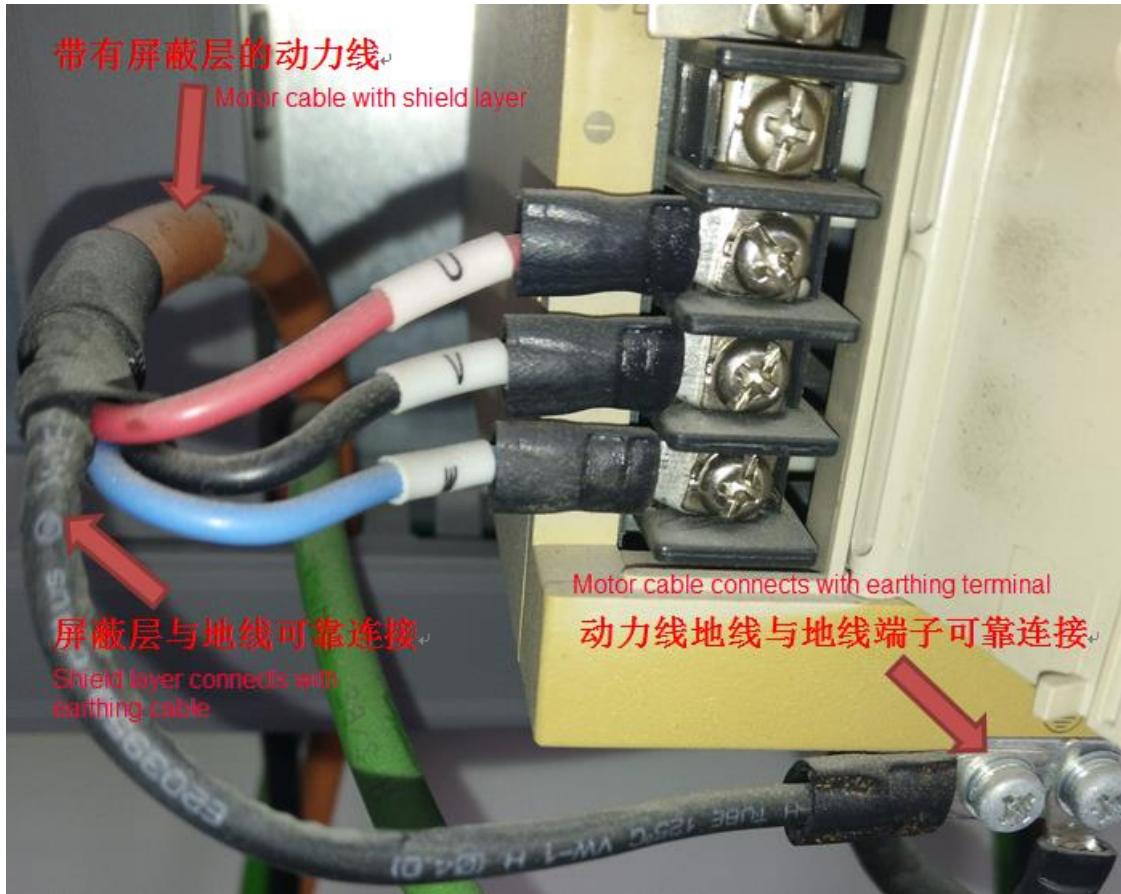
Check the connection cables

Connection cables that do not meet the specification requirements may cause interference among each components of the machine tool. Therefore, you need to check the following:

- The main motor cable must not be parallel to any other cables of the machine tool. And the length must be within 0.5m.

It is recommended to directly connect the main motor cable to the main switch of the machine, then immediately enter to the electrical cabinet.

- The motor cable that connects the drive to the motor must have a shield layer and a earthing cable. The earthing cable must be connected to the motor and drive at both ends of the cable.

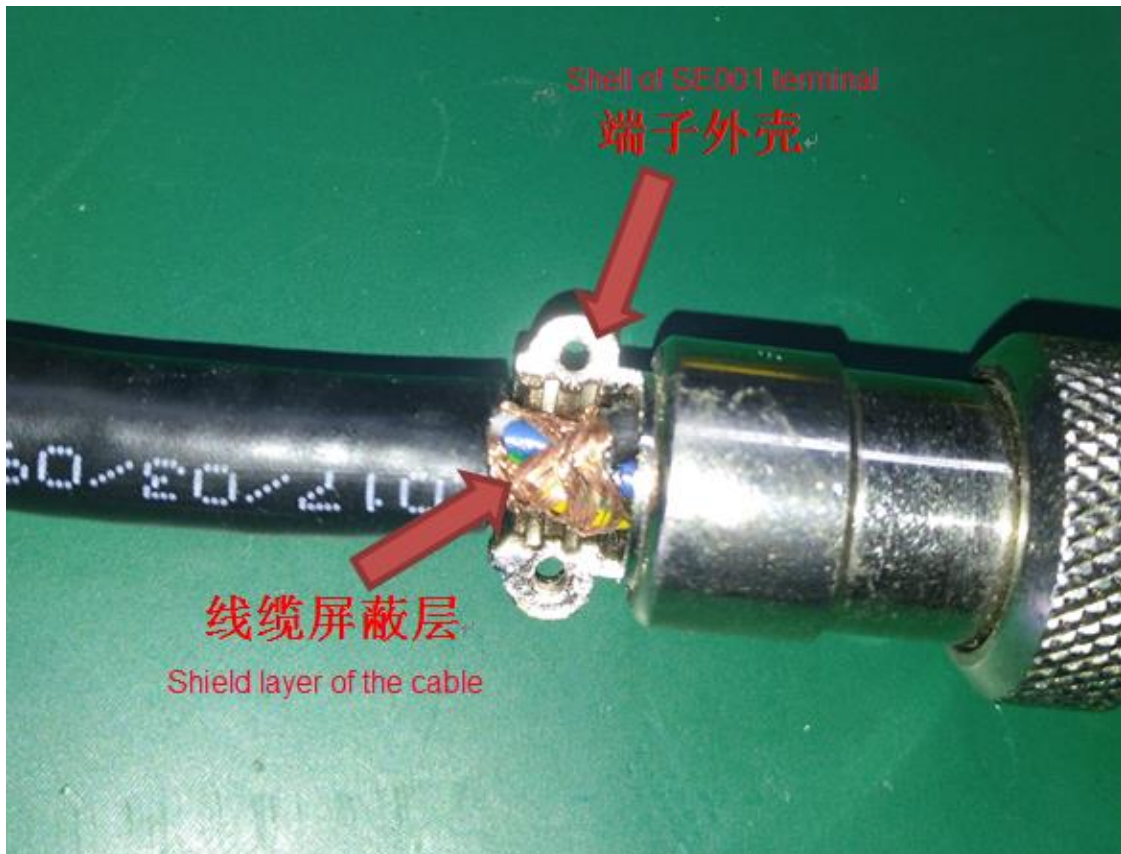


How to check the connection:

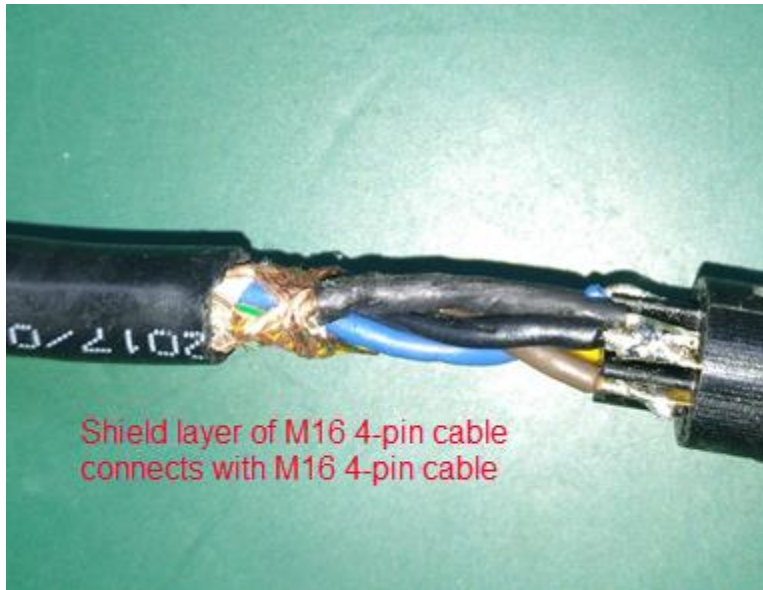
1. Remove all connection at both ends of the cable from any other device.
 2. Use the multi-meter to measure the resistance between two terminals.
 - If the result is within range of $0\sim 1\Omega$, the connection is good.
 - If not, the connection is bad.
- The servo cable that connects the drive and Lambda terminal board must have shield layer. The shield layer must firmly connects to the terminal shells at both drive side and Lambda side.

How to check the connection:

1. Remove all connections at both ends of the servo cable from any other device.
 2. Use the multi-meter to measure the resistance between two terminals.
 - If the result is within range of $0\sim 1\Omega$, the connection is good.
 - If not, the connection is bad.
- M16 4-pin cable that connects SE001 and EX33A terminal board should use the standard 15m or 20m cable that is shipped by WEIHONG Company.



If you decide to make the M16 4-pin cable by yourself or buy it somewhere else, make sure the cable has shield layer and connection between the pin No.4 and its metal cover is good.



Use the multi-meter to measure the resistance between the pin No.4 and the metal cover. If the result is within range of 0~1 Ω , the connection is good.

If connection cables fail to meet the requirements, it may cause non-working of the following unit. Replace the cables with standard ones.

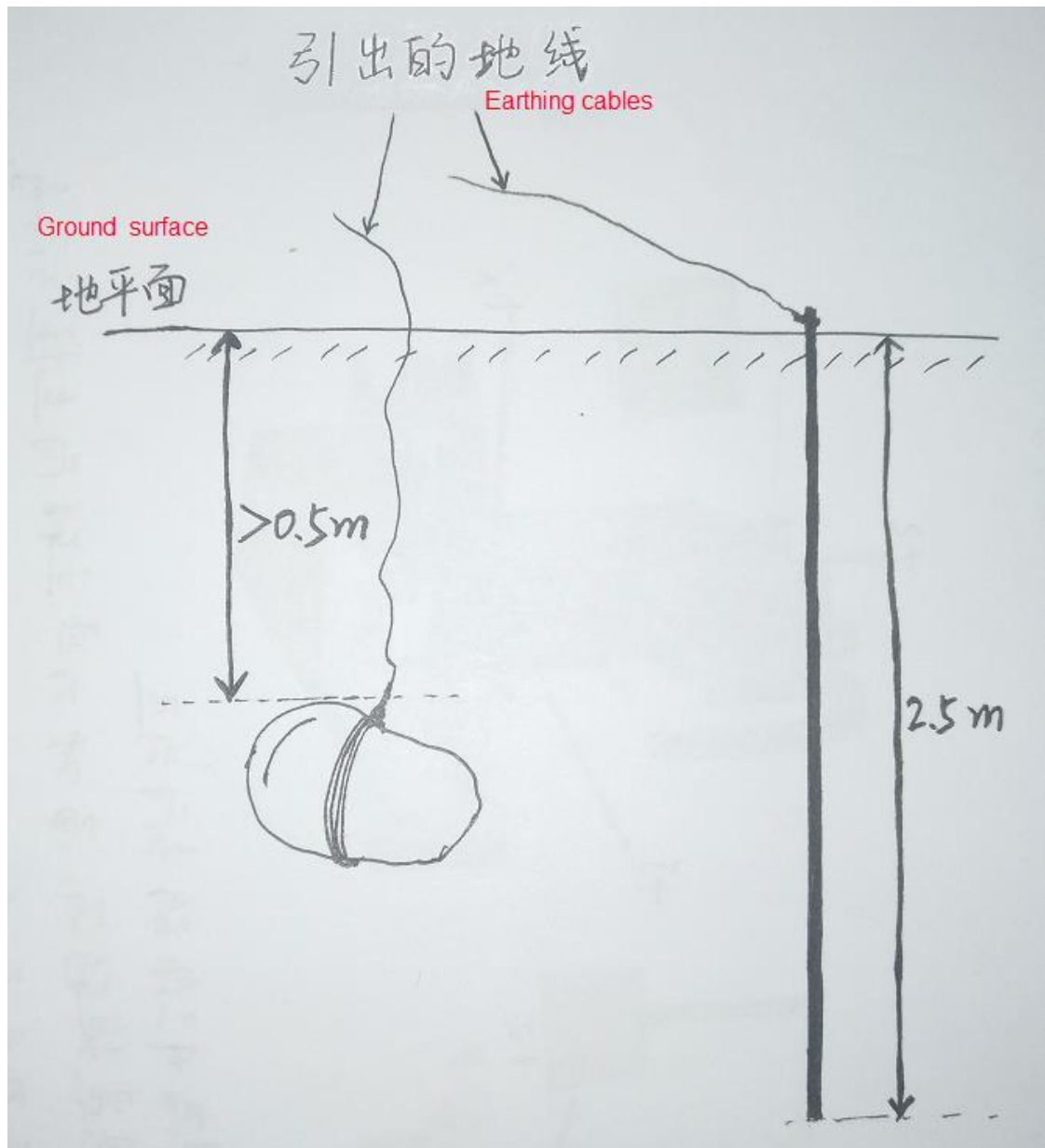
If all connection cables well work, but non-working of the following unit remains, go to the next.

Check the grounding of the machine

Bad grounding of the machine can cause severe injury to the machine and the operators. Therefore, grounding of the machine must be secured.

Make sure the following:

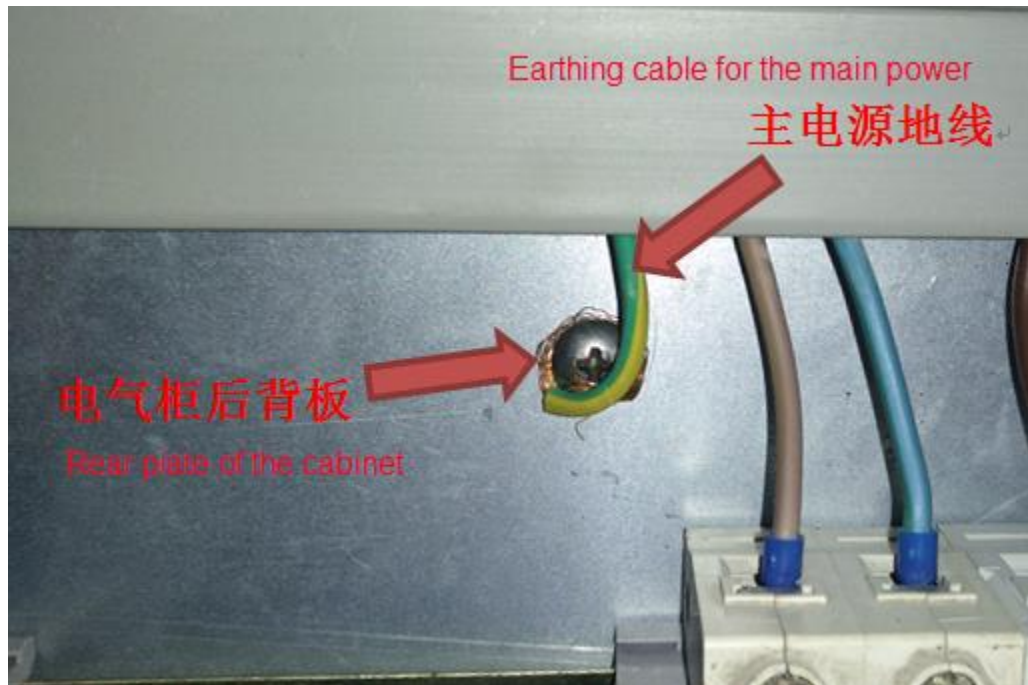
- Secure the grounding of the following:
 - The controller
 - The computer host that installs the control card
- Secure the grounding of the machine, including the following:
 - It is recommended to place the ground pile 2m next to the machine. Distance between the ground and the top surface of grounding device should be no less than 0.5m, and the length of the artificial vertical grounding device should be 2.5m.
 - Use a short but wide wire to connect the rear plate of the electrical cabinet and the ground pile.



Diameter of the wire must be greater than that of the power cable.
The shorter the wire length is, the better.

Use the multi-meter to measure the resistance between the rear plate of the cabinet and the ground pile. If the result is within range of $0\sim 2\Omega$, the connection is good.

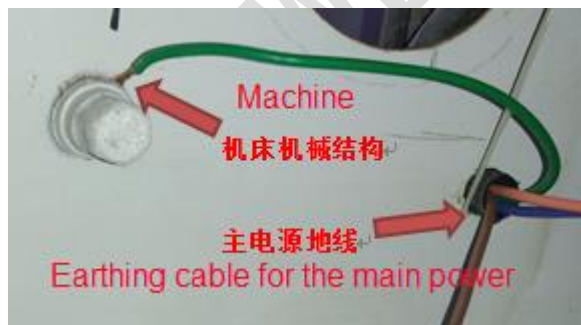
- If there is no ground pile, connect the main power earthing cable to the rear plate of the electrical cabinet at the position that the main power earthing cable goes through the machine.



- Diameter of the main power earthing cable must be greater than that of the power cable.

Use the multi-meter to measure the resistance between the main power earthing cable and rear plate of the electrical cabinet. If the result is within $0\sim 2\Omega$, the connection is good.

- Secure the grounding of other device, or connect the earthing cable to the rear plate of the electrical cabinet.



Use the multi-meter to measure the resistance between the metal cover or earthing cable and the rear plate of the electrical cabinet. If the result is within range of $0\sim 1\Omega$, the connection is good.

- If there are several rear plates of the electrical cabinet, use short and wide earthing cable to connect each of them.



Use the multi-meter to measure the resistance between two adjacent rear plates. If the result is within range of 0~2 Ω , the connection is good.

Others

If the following unit remains non-working, please do not hesitate to contact with WEIHONG Company for further technical support.

SPECIALIZED / CONCENTRATED / FOCUSED



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