

NOTE

Dear customer , please read the manual before installation, use or servicing of the unit.

INSTRUCTION MANUAL



11244-X



Caution! Read the instruction manual

**We have the right to improve and update the machine.
The picture and the content are just for your reference.**

1. Mechanical/Electrical/Illustration of Working Principle data

Electrical Data

MODE		SN:	
CE	S	EN50063:1989 ISO669:2000	
U_{in}=1~220V±15%		U₂₀=38V	
I_{1(max)}=8A		I_{2(max)}=8000A	
Duty = 10 M4 AL Studs/min @ 80%		Weight=16kg	

SN——Series number

CE, EN, ISO——Certification standards

U_{in}—— rated supply voltage

U₂₀——range of rated ac no-load voltage and number of adjustable steps

I_{1 (max)} ——max input welding current

I_{2 (max)} ——max output welding current

Duty——Duty cycle

Weight——weight of the welding equipment

2. CD stud mode

2-1. Summary

The machine is for Capacitor Discharge Stud Welding ,the weld able range is Ø3- Ø8mm. Stud materials are soft steel, stainless steel, aluminum, titanium (Ti), brass and copper screw. Stud Welding time is about 3/1000s-6/1000s,the time is very short, so the welding heat can not damage the base metal, even the base metal is sheet metal.

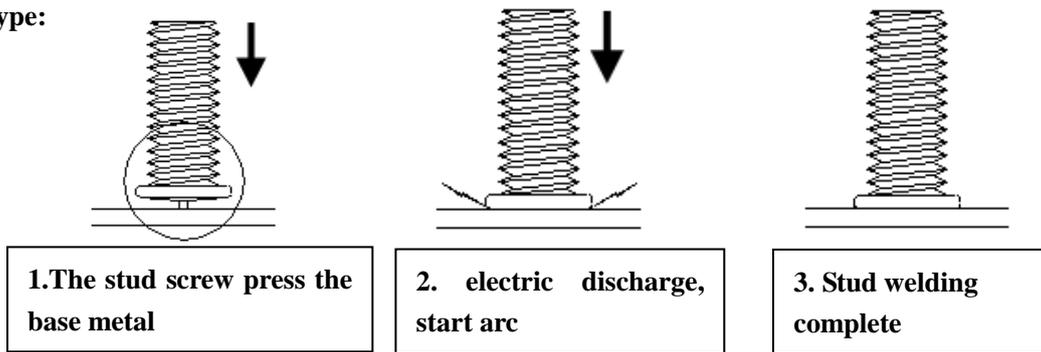
2-2. Matters need attention

- (1) Input power is AC110 / AC220 / AC380≥15A
- (2) Turn "off " the switch, when not use the machine.
- (3) Make sure turn "off " the switch, when connect or remove the cables of the machine.
- (4) The machine maintenance and repair must turn "off " the switch after 5 minutes.
- (5) The stud clamp is inside the stud welding torch. The inside diameter of stud clamp must suitable the stud screw. Do not use worn stud clamp.
- (6) Stud welding may to cause welding arc and metal spatter, protect your self with appropriate safety garments and goggles.
- (7) Make sure there are no flammable materials work area.
- (8) The machine must use special stud screw, so must use original spares.
- (9) Pleases contact the manufacturer ,as following situations:mechanical failure, reduce or increase the torch cable, change the standard equipment.

2-3. Stud welding and spot welding

2-3-1. stud welding (Diagram 1)

Contact type:

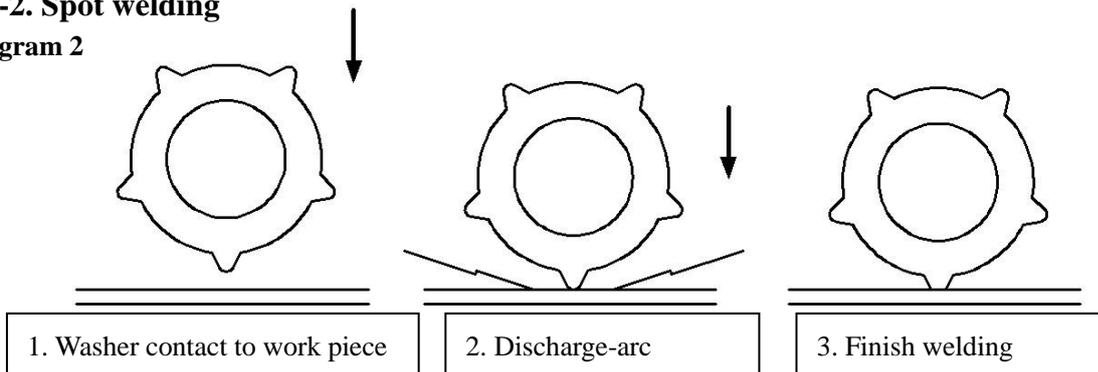


When mounting the stud, the stud extend the three support legs about 2mm. Confirm the stud welding position. Press the support legs on the work piece steady. Make sure the work piece is smooth and clean. Press the torch trigger, the stud screw will be welded on the base metal immediately. Check the stud welding strength. If the strength is not enough, please adjust the torch pressure. The work process is electric discharge, stud welding and recharge, repeat the steps.

Traditional method , such as rivets, lock screw and common welding, they must damage the base metal. But the stub welding does not damage the base metal.

2-3-2. Spot welding

Diagram 2



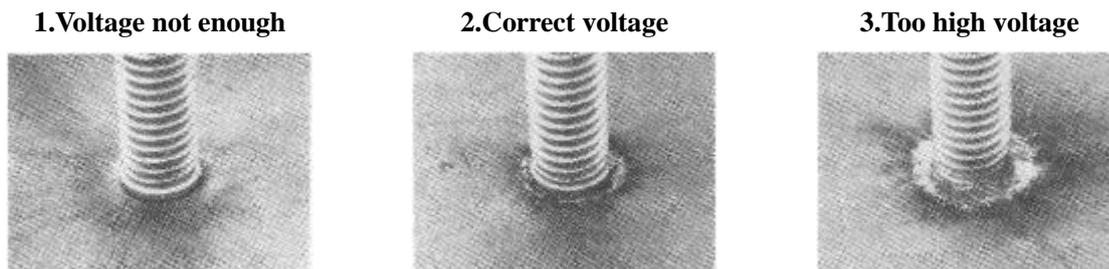
This is special spot welding function. It does not heat affect the back of work piece.

The back of the work piece is good appearance.

2-4. Stud welding visual test

Please refer to the picture as follow, and assessment the stud welding results.

If the stud welding results are not good. Please refer to Part 2-7, and adjust the charge voltage, torch head pressure or torch head height, according as the standard.(Note: only adjust one part at a time.)



2-5. Stud welding trouble

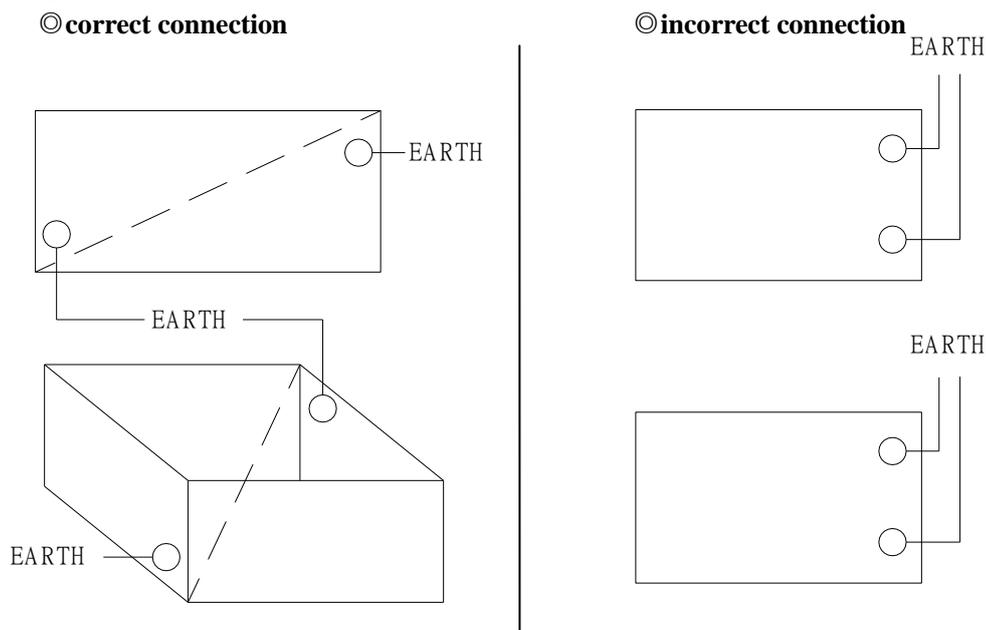
The following situation may cause the trouble, please remedy them before use the machine.

- (1) The earth cable and the metal are not good connection.
- (2) Torch cable or earth cable is winding.
- (3) The diameter of screw clamp and stud screw is not suitable. Or screw clamp is worn.
- (4) The base metal dirty, rusty, paint or other problem interfere with electricity conductivity.
- (5) The torch is not suitable for the base metal or stud screw (material or diameter).
- (6) The stud screw and the base metal are not good connection (Keep the stud screw connect the base metal vertically).
- (7) The stud welding voltage is not correct.
- (8) The capacitor is damage, or capacitance is not enough.
- (9) Welding torch movement is abnormal. (The support foot is abnormal)
- (10) Stud screw extends too long or too short from the stud clamp.
- (11) Base metal distortion or move, when welding.
- (12) Method for connect the earth cable:

① Cable must connect the base metal directly, and must connect more than two earth cables.

② The earth cable must connect on the diagonal position of the base metal.

(refer to the diagram as follow)



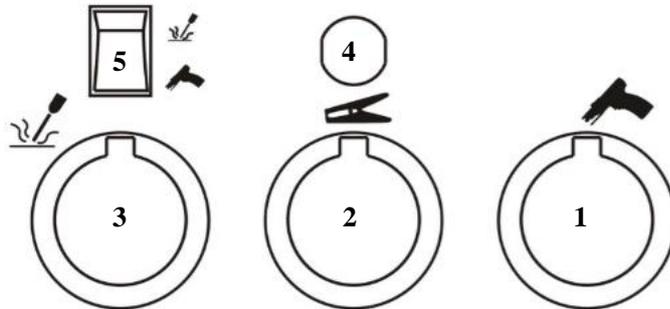
2-6. Welding mode, torch and earth cable choice

There are 3 welding mode for the machine

- (1) **Steel washer welding:** use quick puller slide hammer ,h type puller for the steel car body, please mount Euro and Japanese type torch to socket “1 ”and control socket “4” , mount earth cable to socket “2”.Select “**torch**” for switch “5”.
- (2) **Aluminum stud welding:** please mount stud welding torch to socket “1” and control socket “4”, mount earth cable to socket “2”.If use complete set stud welding torch with earth cable ,it is also the same. Please mount earth cable to socket “2” .Select “**torch**” for switch “5”.
- (3) **Brass electrode/ carbon electrode heating:**

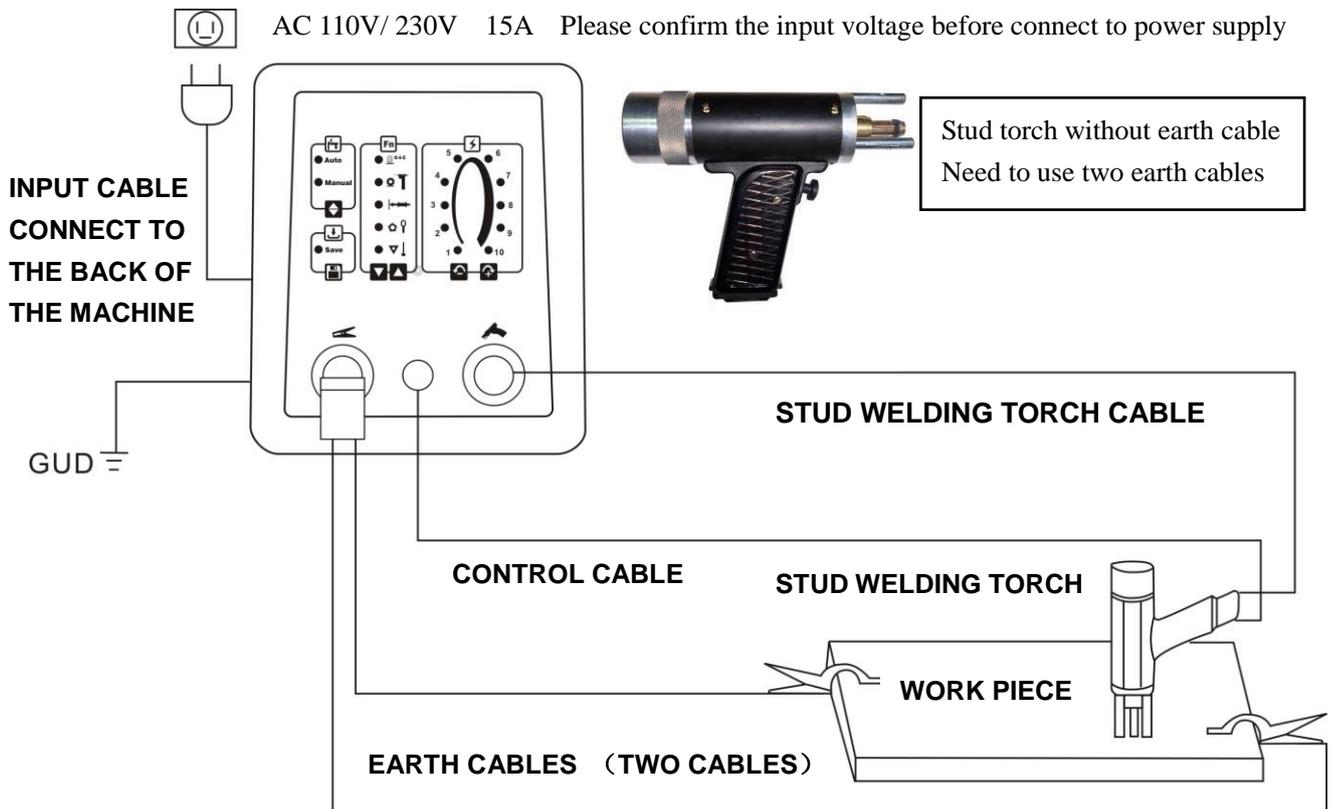
Please mount Euro and Japanese type torch to socket “1” and control socket “4” , mount earth cable to socket “2”.Select“**carbon electrode heating**” for switch “5”.

If use brass electrode heating function, please mount brass electrode(round or iron electrode) on the torch. If use carbon electrode heating function, please mount carbon electrode on the torch.

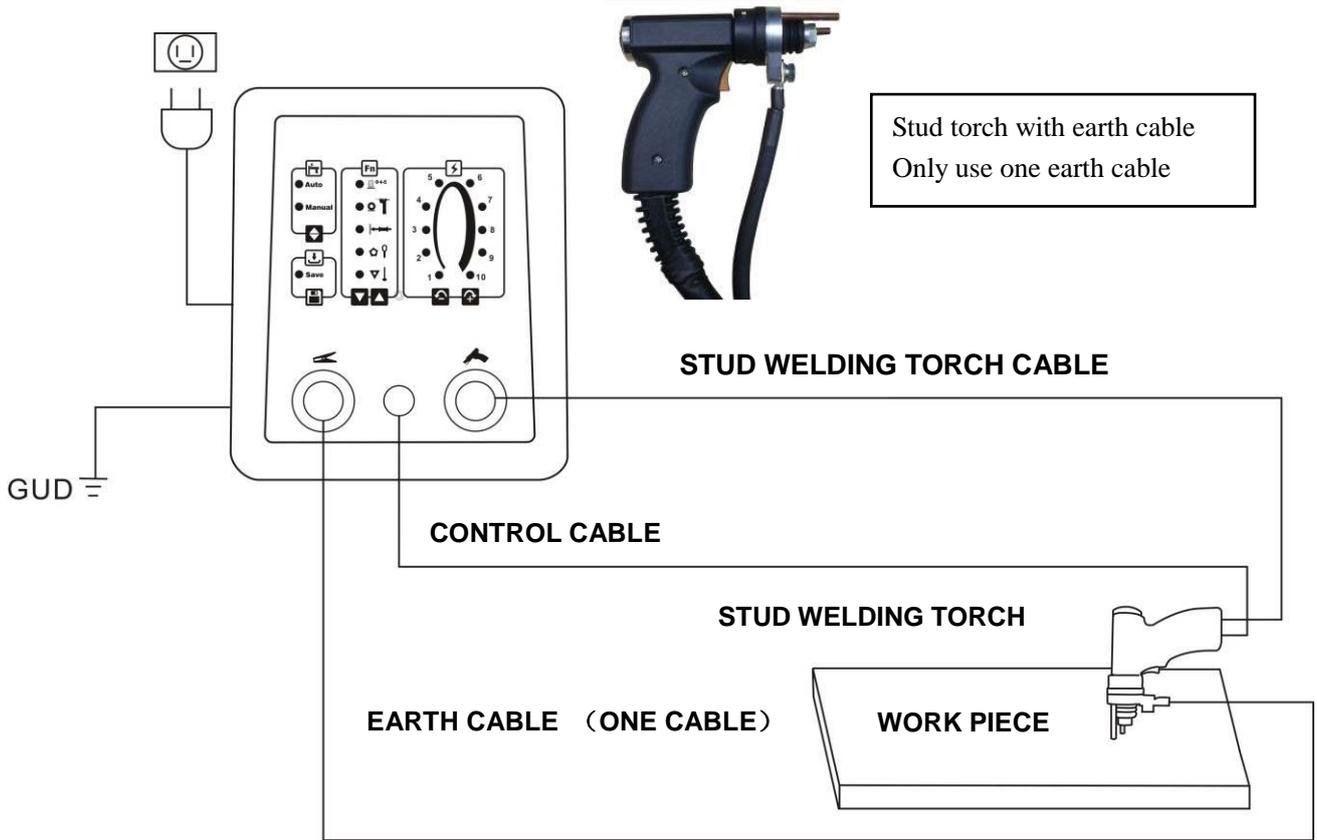


The cable connection, please refer to above the diagram.

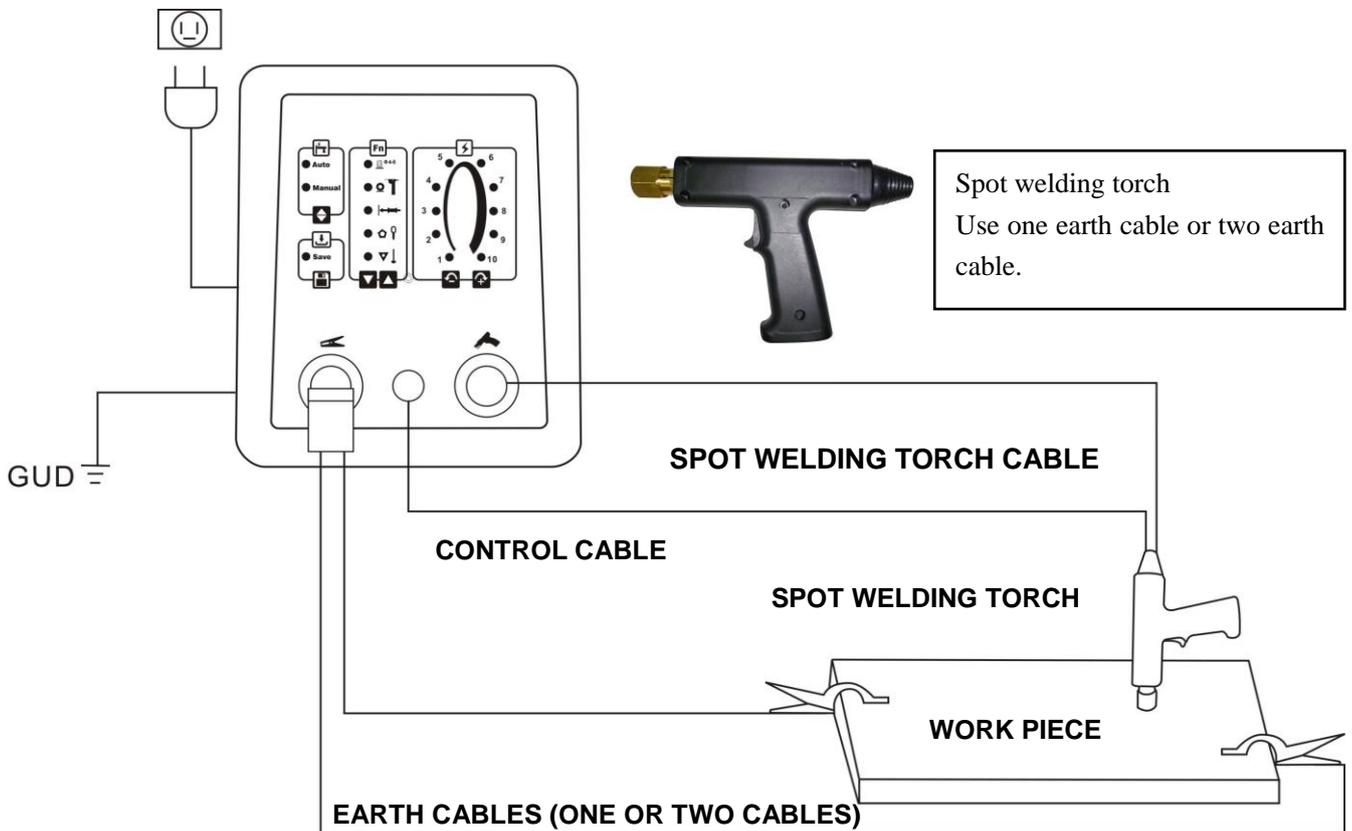
1) For stud welding-torch without earth cable



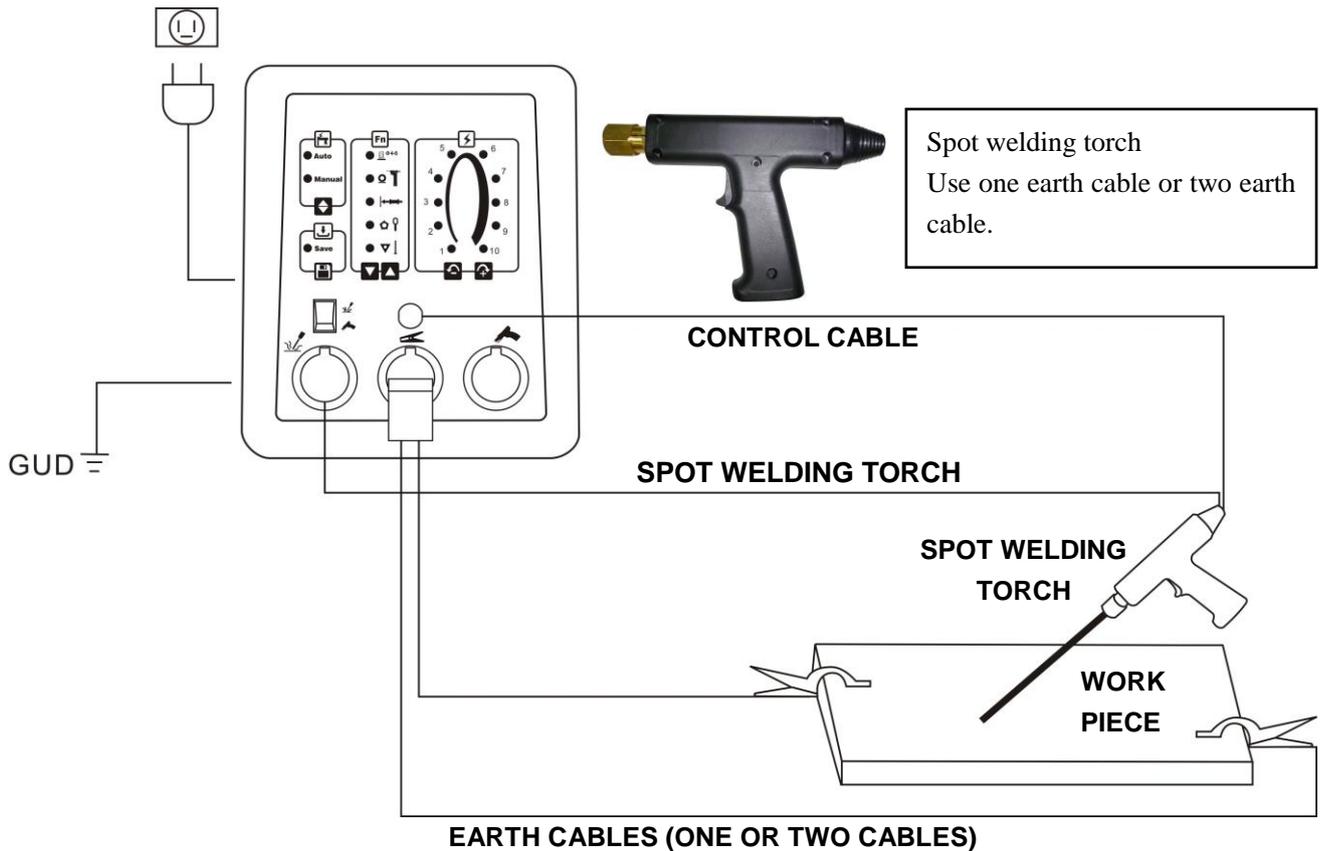
2) For stud welding-torch with earth cable



3) For spot welding



4) carbon electrode heating (optional function, only for carbon heating type machine)



Operation suggestions

The machine is different from traditional spot welder, it use patent power source design. The peak output current is over three times of traditional welder and the welding current is reduce to several msec. So it can greatly reduce welding heating effect for the car body and keep good surface. But caused by high welding current, if the output circuit is poor contact, it may burn black the work piece. It need good conduction and good contact.

Please note the following suggestion:

- 1) Polish and clean the work piece, whatever welding point or earth connection point.
- 2) The earth cable need to good contact and close to the welding point. Use two earth clamp, when aluminum stud welding. The welding point should be between the two earth clamp and keep equi-distance. It can avoid to arc deflection and improve the success rate of the welding.
- 3) Polish and clean the washer and electrode.
- 4) When use quick puller slide hammer or h type puller, make sure screw tight all conductive parts.
- 5) Press the torch, washer, electrode on the work piece with more strength, when welding operation. It is good for conduction. Please don't welding with weak pressure contact.

2-7. Controls on generator front panel

A——There is two mode for choice

Auto mode: after the welding torch and earth cable short circuit or contact for 0.5s, the machine will output.

Manual mode: trigger on the torch, the machine will output.

B——Welding parameter save

Finish adjust welding mode and welding power, the user can press "save" for save the setting.

C/D——welding function selection

 Φ 4-5 **Alu** Φ 4~5 aluminum stud (optional function, only for ALU type machine)

 Φ 4-5 Φ 4~5 steel stud

 round washer/tab shooter

 quick puller slide hammer

 star washer/steel tab

 triangle washer/ American stud

Choice the welding mode, the system will auto match welding power. And the power indicator display the power level 1-10 on the right side.

E/F——Output power adjustment

The larger number the higher output power.

There are 10 level for welding power. In general operation, the user only choice welding mode, the system will auto match welding power. But the user can adjust it by themself. After adjust the welding setting, it will don't cover the system recommended setting. Till to press "save", the machine will save customer setting and cover the recommended setting. (Keep to press the two buttons  for 2 second, the welding setting will be recover factory defaults.)

G——Socket for work clamp

H——Control socket for torch

I——Socket for torch

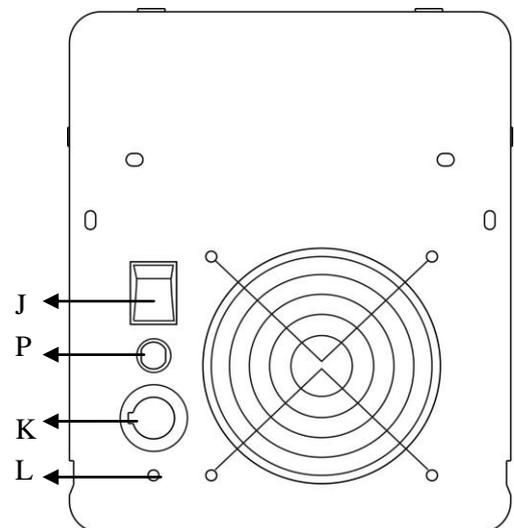
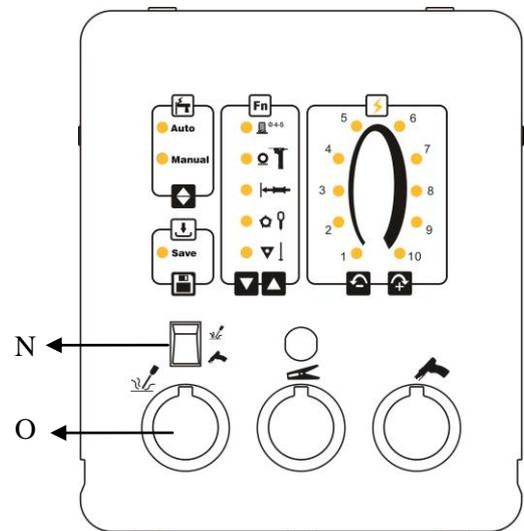
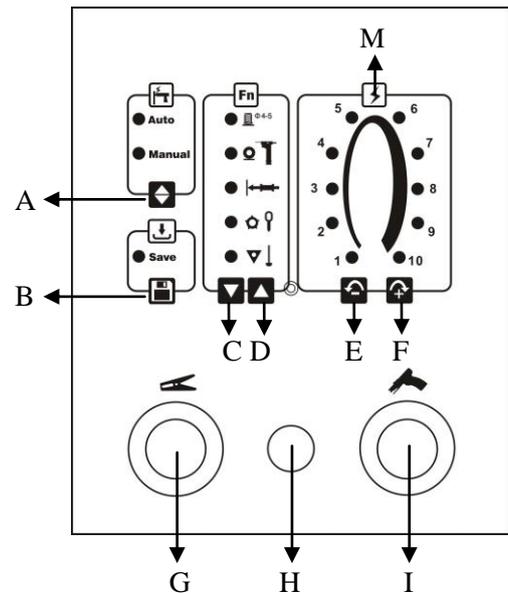
J——Power switch

K——Input power cable (Confirm the power voltage before use)

L——Ground connector for the machine case

M——Discharge indicator

When the indicator is light up, it means the machine charge is finish, The machine can welding operation. After discharge operation, the discharge indicator will light off for a few moment. When the discharge indicator is light off, it means the machine is charging. The time of light off will increase, following of the more setting power. If in manual mode, the user trigger on the torch



when the discharge indicator will light off, the machine can output, but it will reduce output power.

N—Brass electrode/ carbon electrode heating or welding function choice

O—Socket for brass electrode/ carbon electrode heating

P—fuse

2-8. Stud welding torch

2-8-1 torch (as diagram on right)

Torch work principle:

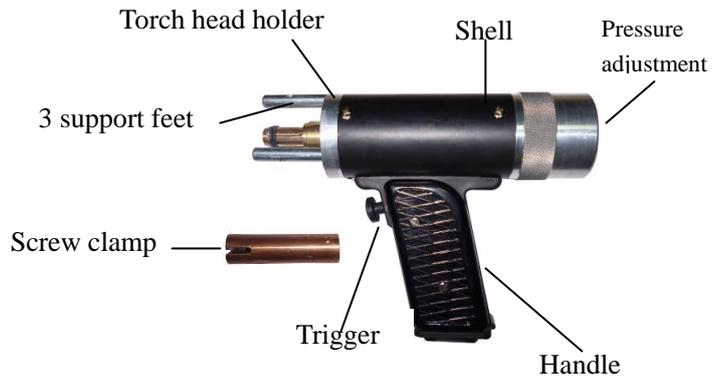
Press the stud screw connects to the base metal.

The welding torch will discharge by contact way.

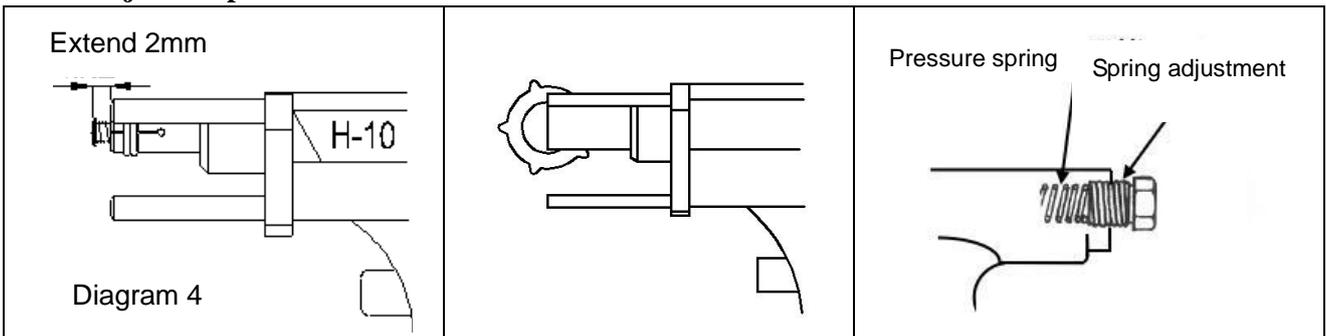
That applies to :

Soft steel, stainless steel stud screw.

Length of stud screw less than 150mm.



2-8-2 Adjust the pressure and extend distance

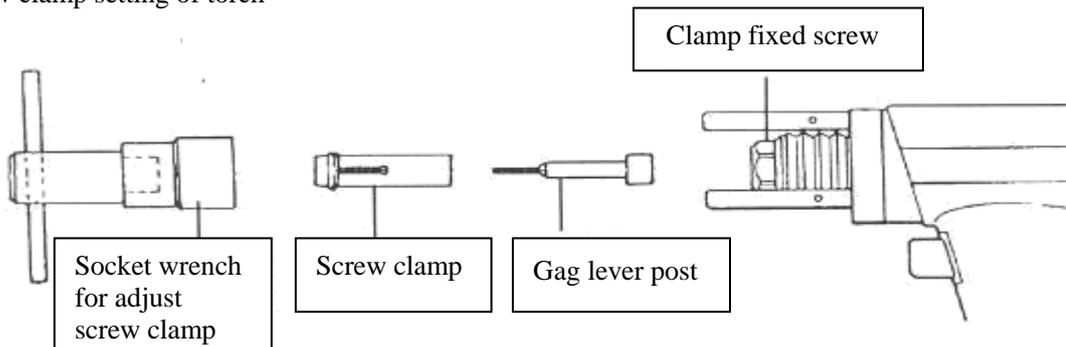


- 1, Stud screw extend 2.0mm from 3 support feet, as the diagram 4 on left
- 2, Turn left the Spring adjustment, stud welding heat will increase, torch pressure will reduce.
- 3, Turn right the Spring adjustment, stud welding heat will reduce, torch pressure will increase.
- 4, When torch pressure is not enough, please remove back cover and spring adjustment, then replace the pressure spring.

2-8-3 Stud screw clamp

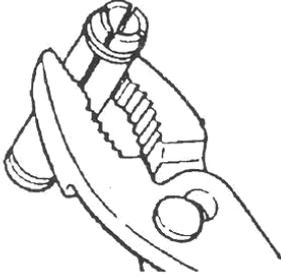
Stud screw clamp is the part for keep the stud screw carry welding current. So make sure the diameter of the clamp in accord with stud screw. When the diameter of the clamp is not suitable to the stud screw, the stud screw and clamp are easily damaged. That will cause stud welding trouble. Please pay attention to the problem.

stud screw clamp setting of torch



1. Use socket wrench to lose the clamp fixed screw.
2. Pull out screw clamp and gag lever post.
3. Insert screw clamp and gag lever post to torch head. Make sure the diameter of the clamp is correct and the length of the gag lever post is correct.
4. Use socket wrench to locking the clamp fixed screw.

Note: When Use new screw clamp, must use pliers to clamp the groove of the screw clamp. That can make sure the screw camp and stud screw close contact.



The groove expand in use, the stud screw will loose.
Use pliers to clamp it ,when meet the problem,
That can extend using life of the screw clamp.

2-9. Operating process for stud welding

Note: Protect your eyes and your body when stud welding. Please operate the machine as follow.

2-9-1 preparation for operation

- (1)Keep the work piece free of dirt ,oil, paint and rust.
 - (2)If the base metal is thin, it will dent at pressure .It must add a base plate, when stud welding.
 - (3)Select suitable stud welding torch, according as material, diameter, length of the stud screw,
 - (4) Make sure the diameter of the clamp is correct and the length of the gag lever post is correct.
- Install the screw clamp and gag lever post in the torch.
- (5)Make sure all the cables connect to the machine and workpiece. Connect input cable and turn on.

2-9-2 operate stud welding

- (1)Insert the stud screw to screw clamp.

Note: Make sure the stud screw insert to the end of the screw clamp and contact the gag lever post.

- (2)Keep the 3 support feet contact the base metal. The torch presses on base metal vertically.

(Diagram 25) Note: Keep H-10torch contact the base metal, after insert the stud screw.

- (3)Press torch trigger. Discharge→Stud welding complete.

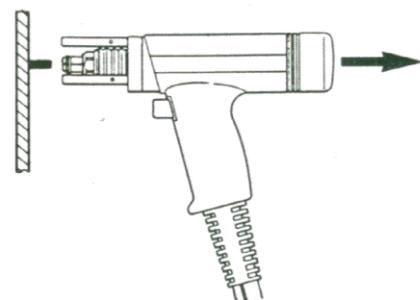
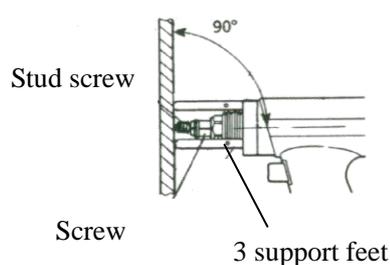
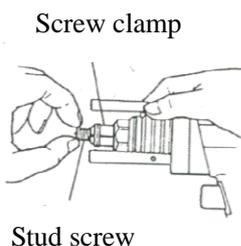
- (4) After stud welding complete, release the trigger, move back the torch vertically. **(Diagram 26)**

Please test stud welding and setting suitable the welding strength before formal production.

Diagram 25

Diagram 26

Diagram 24

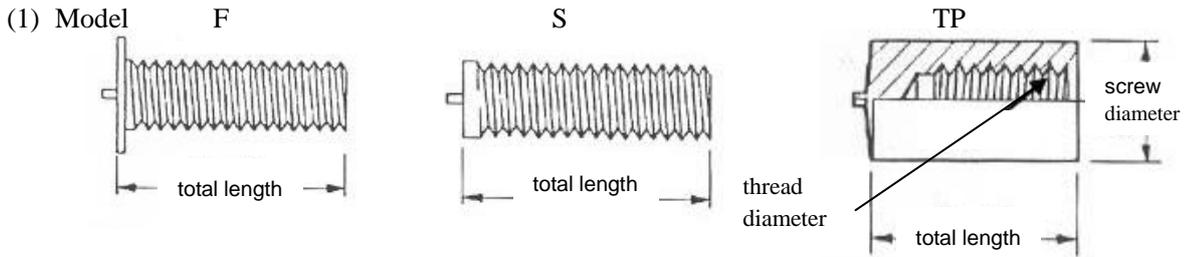


2-10. Maintenance

- (1) The machine and torch must be kept away from dust, humidity, rain.
- (2) Avoid vibration, when moving the machine.
- (3) Do not put the machine reverse, protect the machine.
- (4) Clean the dust and check the screw, which can keep the machine in good condition.
- (5) Turn off the switch, when not using the machine.

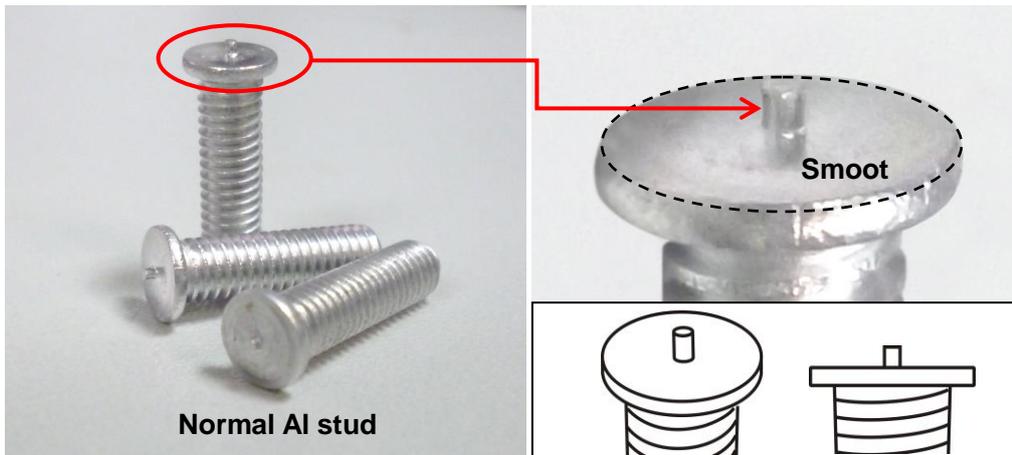
2-11. Select stud screw

Metal: soft steel, stainless steel, aluminum, titanium (Ti), brass, copper

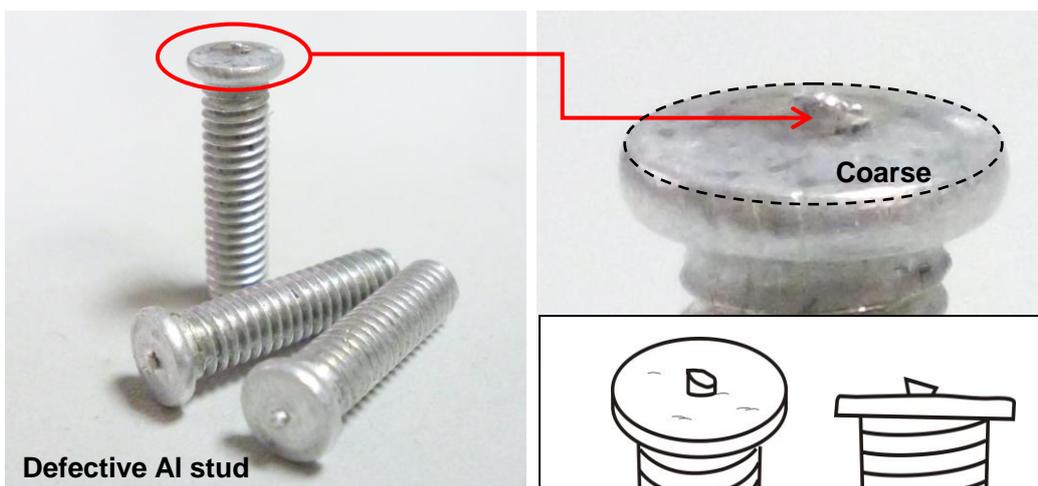


- (2) Dimension
- outside thread ----- thread diameter * total length
 - internal thread ----- screw diameter * total length - thread diameter

(3) Normal AL stud: The embossment is in the center of stud's end face. The top face of embossment is smooth. The size and height of the embossments are good consistency. The end face of stud is smooth.



Defective AL stud: The embossment is not in the center of stud's end face. The top face of embossment is not smooth. The size and height of the embossments are unevenness. The end face of stud is coarse.



3. Safety precautions

WELDING CAN BE HARMFUL TO YOURSELF AND OTHERS. The user must therefore be educated against the hazards, summarized below, deriving from welding operations. For more detailed information, order the manual.

ELECTRIC SHOCK - May be fatal.

Install and earth the welding machine according to the applicable regulations.

Do not touch live electrical parts or electrodes with bare skin, gloves or wet clothing.

Isolate yourselves from both the earth and the work piece.

Make sure your working position is safe.

FUMES AND GASES - May be hazardous to your health.

Keep your head away from fumes.

Work in the presence of adequate ventilation, and use ventilators around the arc to prevent gases from forming in the work area.

ARC RAYS - May injure the eyes and burn the skin.

Protect your eyes with welding masks fitted with filtered lenses, and protect your body with appropriate safety garments.

Protect others by installing adequate shields or curtains.

RISK OF FIRE AND BURNS

Sparks (sprays) may cause fires and burn the skin; you should therefore make sure there are no flammable materials in the area, and wear appropriate protective garments.

NOISE

This machine does not directly produce noise exceeding 80dB. The plasma cutting/welding procedure may produce noise levels beyond said limit; users must therefore implement all precautions required by law.

PACEMAKERS

The magnetic fields created by high currents may affect the operation of pacemakers. Wearers of vital electronic equipment (pacemakers) should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

EXPLOSIONS

Do not weld in the vicinity of containers under pressure, or in the presence of explosive dust, gases or fumes. . All cylinders and pressure regulators used in welding operations should be handled with care.

ELECTROMAGNETIC COMPATIBILITY

This machine is manufactured in compliance with the instructions contained in the harmonized standard, and must be used solely for professional purposes in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in non- industrial environments.

IN CASE OF MALFUNCTIONS, REQUEST ASSISTANCE FROM QUALIFIED PERSONNEL.

4. Trouble shooting

The machine with three protection function. If the machine is abnormal, please refer to the following:

1) Over heat protection

There is a aux transformer inside the machine. The aux transformer is with thermal switch. The temperature of the transformer will rise following the machine work duty. If the machine is over duty and over heat, the“auto”and “manual” indicator on front will light up, the machine will stop output. In general, the machine duty cycle is enough to car body repair. If the machine over heat protection on low work duty, please check the fan.

2) Short circuit protection

After the machine output power, if the torch and earth cable are keeping short circuit, the machine will stop charge. The torch and earth cable need to open circuit, the machine can charge and welding again.

3) Over current protection

In current sample is without this function. But we plan to add fuse in future. If the fuse is broken, it means the machine is abnormal and over current, please contact to the after service.

No power	<ol style="list-style-type: none">1. Check the source power.2. Check the input cable.3. Check the main switch.4. Please contact to the manufacturer.
No weld	<ol style="list-style-type: none">1. Check the output cable for torch & earth2. Check the connection for torch & earth.3. Check power fuse4. check transformer, maybe over heat5. Please contact to the manufacturer.
Fan is not working	<ol style="list-style-type: none">1. Check the power of fan.2. Check the fan, maybe something stuck in the fan.3. Please contact to the manufacturer.