INTEGRITY

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MADE IN CHINA

EDM

PORTABLE EDM TAP BREAKING MACHINE

INSTRUCITIONS

Dear users:

First of all, thank you for choosing the portable EDM tap machine breaking carefully produced by our company for you.

Our company's high - speed take out the broken tap machine has advanced design and excellent performance. The selection of our products proves that you have high requirements for the performance and service of machine tools.

Please read this manual carefully! This manual aims to make you familiar with the operation method of this machine tool, the problems that should be paid attention to in use and the maintenance measures that should be followed, so as to ensure that you can get better processing effect, extend the service life of the machine tool and reduce the failure.

Special statement:

This manual includes the latest information up to the time when this manual is printed. The company is solely responsible for the revision and explanation of this manual, and reserves the right to improve the product at any time after printing without notice. Some pictures in this manual are schematic drawings for reference only. If the pictures are inconsistent with the real objects, the real ones shall prevail.

catalogue

I, system parameters and composition

1. Main parameters and technical indicators

- Input power requirement-AC 220V/110V 6A
- spindle servo stroke -100mm
- Maximum power consumption -- - 400 w / 500 w / 600 w / 800 w
- output voltage -- -- -- - 10-70 v
- Clamping electrode diameter ---0.8-10mm
- Maximum processing speed -- about 1mm/min
- net weight: 13~15kg
- Working fluid: clean tap water/pure water/distilled water/electric spark fluid/kerosene (pay attention to fire prevention)

Outline size

	long	width	high
power box	356mm	160mm	280mm
Processing device 1	200mm	50mm	360mm
Processing device 2	200mm	55mm	360mm

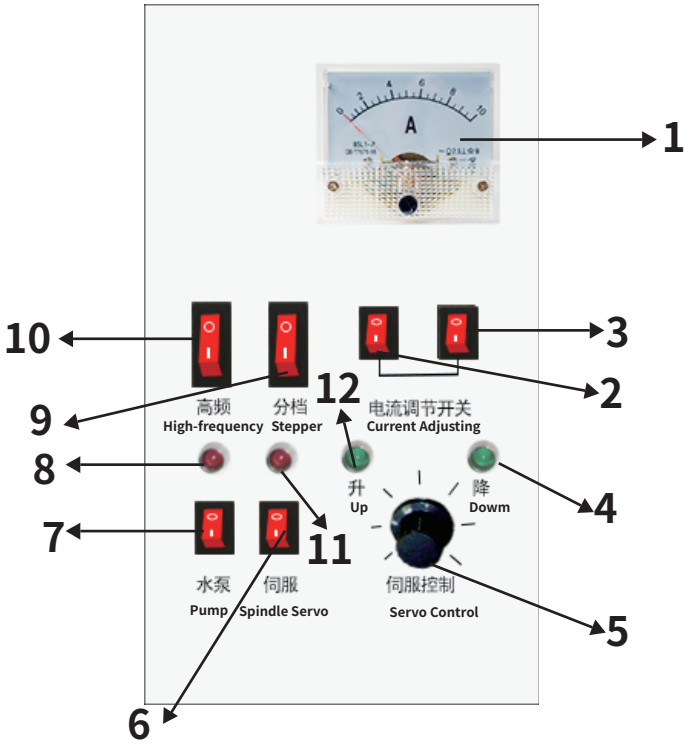
2, component

- power box
- mechanical device
- Auxiliary devices (magnetic gauge base, water pipe of magnetic base, electrode chuck and accessories) .Other electrodes can also be customized to customer needs.

II,Power section

1、operation panel

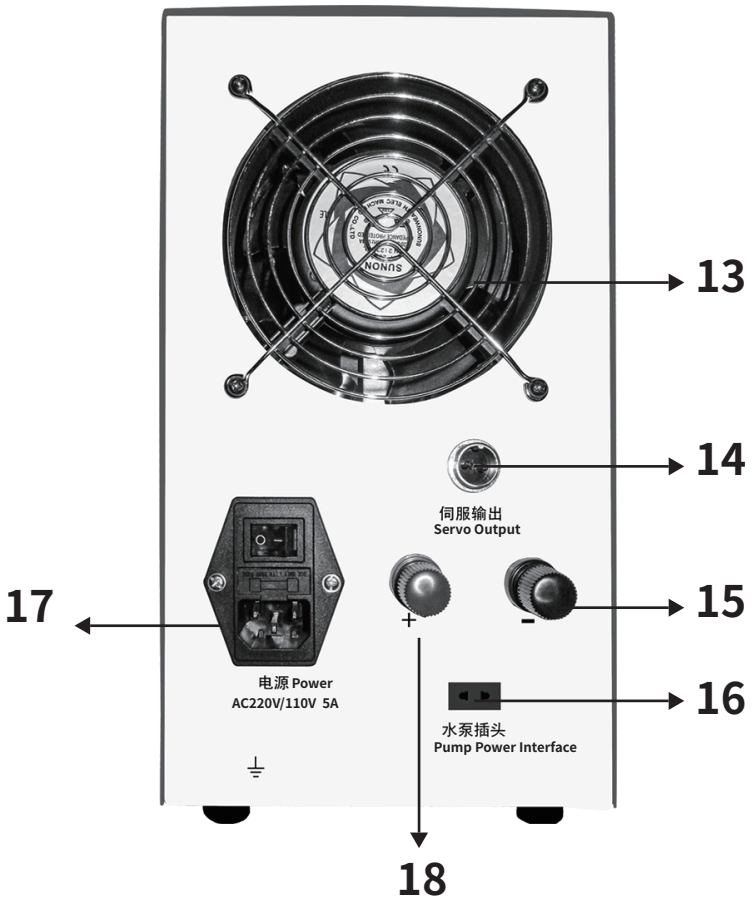
Front



Operating panel instructions

1.Ammeter 2. Processing current switch(1)
3.Processing current switch(2) 4.Down indicator
5. Spindle servo control knob 6. Spindle servo switch
7. Pump switch 8. Pump Indicator 9. Stepper Switch
10. High-frequency Power Switch 11. Servo Indicator
12. Lift indicator

Back

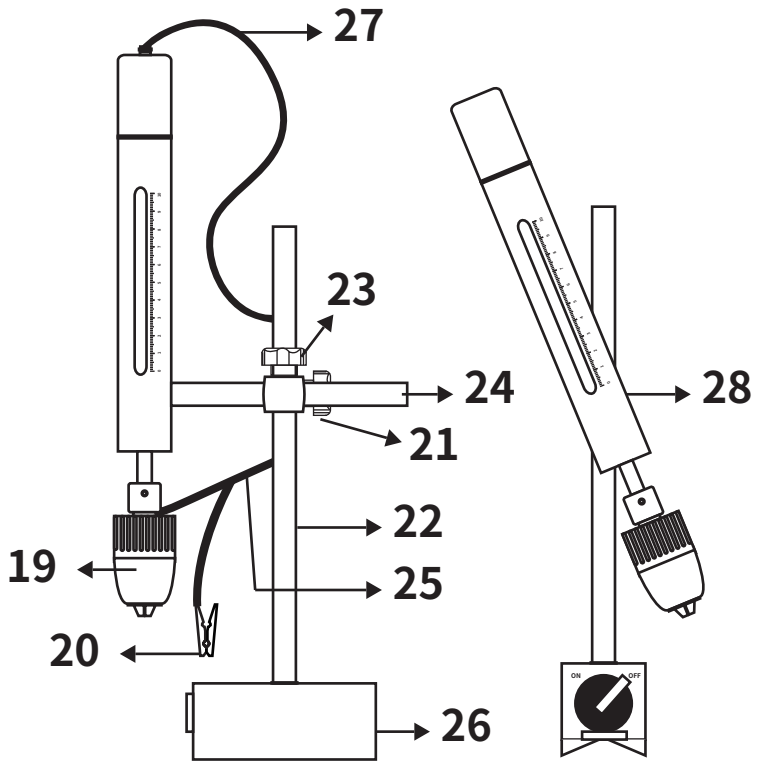


Operating panel instructions

13.Fan 14. Spindle servo output interface
15. High-frequency negative terminal (blue) 16. Pump Power Interface17. Main switch and safety seat
18. High frequency positive pole (red)

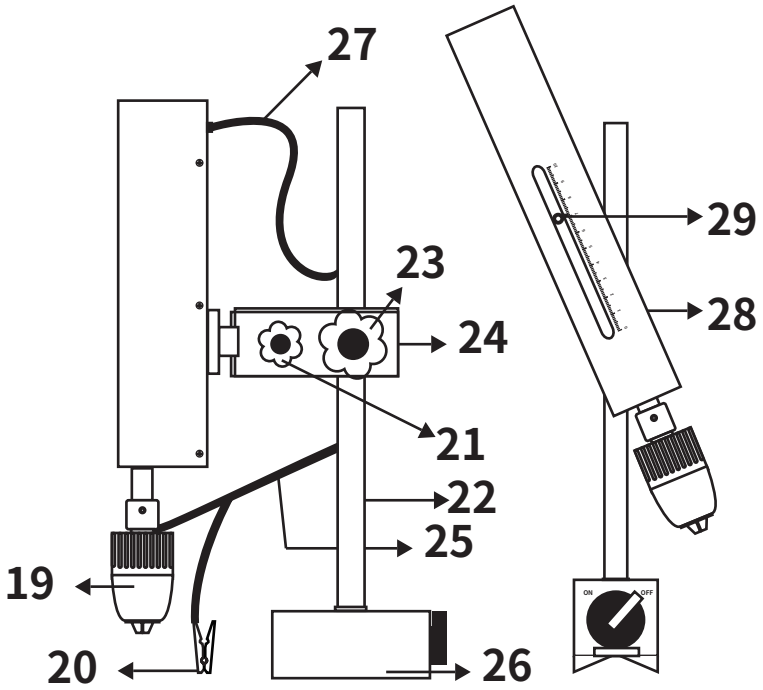
III,The mechanical part

(1) Processing device 1



19. Electrode chuck 20. Electrode wire clamp (clamp work piece) 21. Spindle head rotation control handle 22. Lift shaft
23. Lift arm lock handle 24. Lifting arm 25. Electrode line 26. Magnetometer seat 27. Servo power cord
28. The spindle can be rotated

(2)Processing device2



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23. Lift arm lock handle 24. Lifting arm 25. Electrode line
26. Magnetometer seat 27. Servo power cord
28. The spindle can be rotated 29.Fixed depth pointer

IV、Operating instructions

1. Operation steps

1.1 placement of mechanical components

As required, place the mechanical part in an appropriate position and open the magnetic switch of the magnetic gauge seat (26).

In order to make the spindle work smoothly, the magnetic gauge seat should be placed on a relatively flat working surface.

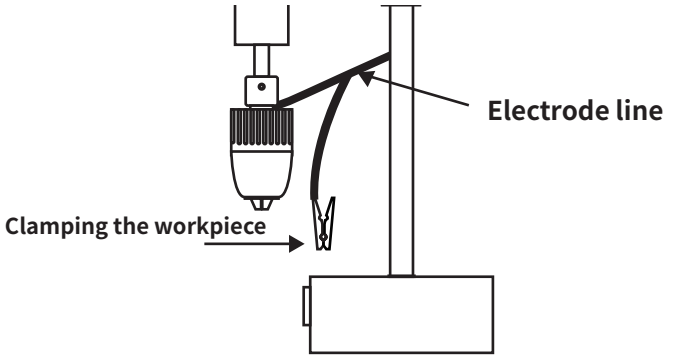
1.2 power and connection

(1) After the servo control plug into the power box panel 14 interface, and lock.

(2)The electrode wire is connected to the high-frequency terminal 15, 18 interfaces (red for the positive pole, black for the negative pole), and locked.

(3) insert the power cord plug in the attachment box into the power interface 17, and connect the other end to the 110V/220V power supply.

(4)Of the other end of the electrode line, respectively clamp workpiece and twisted to the spindle head. As shown in figure:



1.3 connect the flushing pipe

Connect the attached water pipe to the submersible pump.

Connect the other end of the hose to the attached slug pipe for flushing, then put the submersible pump into the water and finally insert the power plug of the submersible pump into port 16 at the rear of the chassis.ii

1.4 Installation Electrode

(1) Select and install suitable electrodes according to the need.
The size of the electrode can be chosen according to the size of the broken object.
The screw is equivalent to the drill bit.

Broken object	spec	Recommended electrode diameter	Remark
Tap	M3	ϕ1.5	Electrodes should be as short as possible to reduce jitter.
Tap	M4	ϕ2	Electrodes should be as short as possible to reduce jitter.
Tap	M6	ϕ3	
Tap	M8	ϕ4	
Tap	M10	ϕ5	
Drill bit (screw)	M3	ϕ2.1	
Drill bit (screw)	M4	ϕ3.2	
Drill bit (screw)	M6	ϕ4.5	
Drill bit (screw)	OverM8	Take it out by hand	Recommended method: make a "〇", "+","−", and screw it out

For electrodes that are larger than the size of the drill chuck,
the auxiliary card holder in the optional attachment can be used.
The handle fork can be clamped below the thickness of 5mm sheet electrode
(optional accessories according to the actual need to contact our company to purchase). As shown in figure (2)

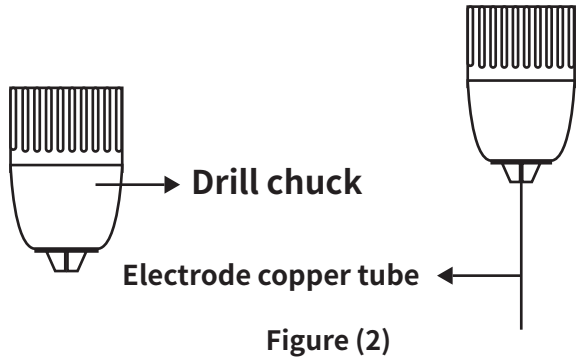


Figure (2)

1.5 start processing

(1)Switch on the power supply 17, adjust the spindle position and height, pay attention to ensure that the electrode and the broken coaxial, so as not to hurt the workpiece.
(2)After adjusting the position (center), open the water pump 7, open the high frequency switch 10 after the outlet of the water pipe, press the servo switch 6, rotate the servo adjusting knob 5 clockwise, rotate to the center line to the right side of the center line and turn the indicator light on, The spindle electrode starts to touch the workpiece gently, the lift indicator lamp flashes alternately, starts the processing.
(3)according to the need, adjust the appropriate current 2m3 and spindle service control 5 in time in order to achieve the appropriate processing parameters (the potentiometer indicates that the second processing is stable to the descending position).

Tip:
1. To ensure power access, remove rust and oil stains from the workpiece surface before processing.
2. Some protective measures should be taken to avoid water splashing.
3. Experimental results show that immersion processing has better effect.
4. Electrode loss should be taken into account in processing.

1.6 stop steps

When the machining is not stable, the processing speed is accelerated, or the hole below is found to start discharging, it is proved that the drill or tap has been broken, then the machine can be shut down, the steps are as follows:
(1)turn the servo adjusting knob 5 counterclockwise, Keep the rising indicator light on, the spindle head starts to pick up the electrode after leaving the workpiece, turn off the servo switch 6, turn off the water pump 7
(2)turn off the high frequency power supply switch 10
(3)turn off the main power supply switch 17

2. Operation instructions

(1)Selection of processing parameters

Current and Stepper Switch Refer to Table below:

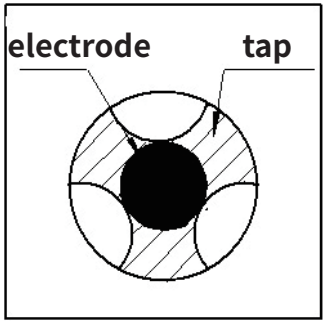
Electrode cross section	current regulating switch 2, 3	level switch9
less than 1mm²	Two off (low)	off
1-3mm²	one open and one close (medium)	open
greater than 3 mm²	two open (high)	open

(2)Faults and treatment methods

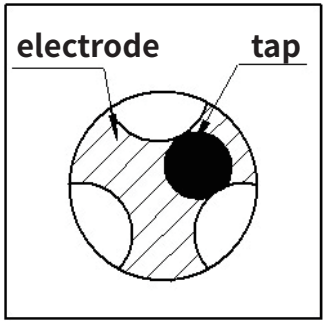
Fault phenomenon	cause	Rule out way
The spindle is not moving after starting the machine	1. Motor cable is not properly connected	Reconnect the plug
	2. Servo controller failure	contact our company in time
Electrode does not discharge after contact with workpiece	1. High frequency power cord not connected or unattached	Connect the high frequency power cord
	2. High frequency power supply failure	contact our company in time
The processing speed is fast and stable, but the interworking depth is not deep, and the electrode loss is very large.	1. The polarity connection of High Frequency Power Line	Adjust the polarity of the high frequency line
	2. Electrode diameter smaller than 2mm current and large	Adjust current regulation switch to reduce machining current adjustment servo knob.
Unstable machining, swing back and forth of the electric current meter pointer, relatively large amplitude	1. The servo speed is not suitablelure	Adjust the servo knob to stabilize the workpiece
	2. The workpiece or electrode is not clampede	Reinstall the workpiece and clamp the electrode
	3. The water medium deviates from the processing zone and the liquid supply is less than	Adjust the position of the flushing pipe
	4. To a certain depth	Adjust the height of the workpiece and continue working
Other conditions are normal and processing speed is very slow	1. Related to local water quality	Replacement of purified or distilled water

V、processing examples

1、different sizes of broken tap processing



▲ Remove small taps



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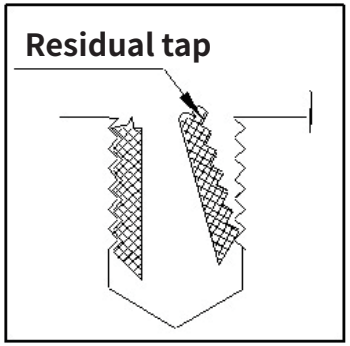
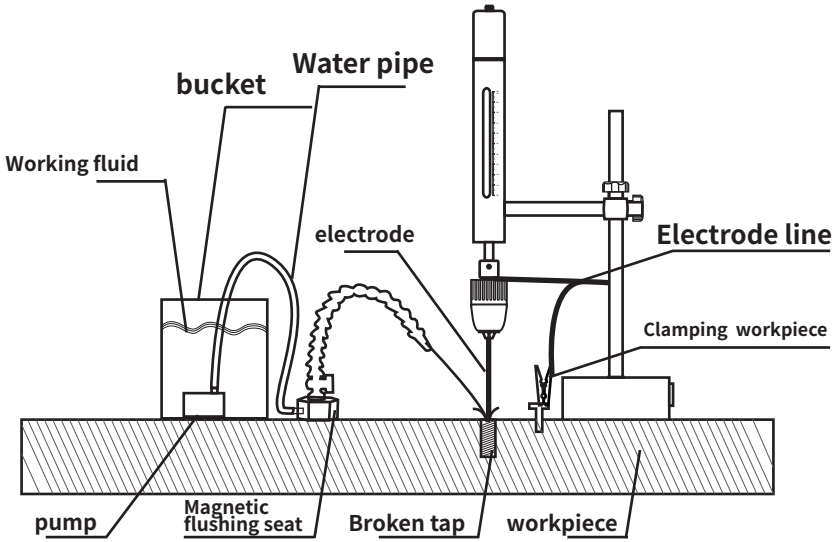
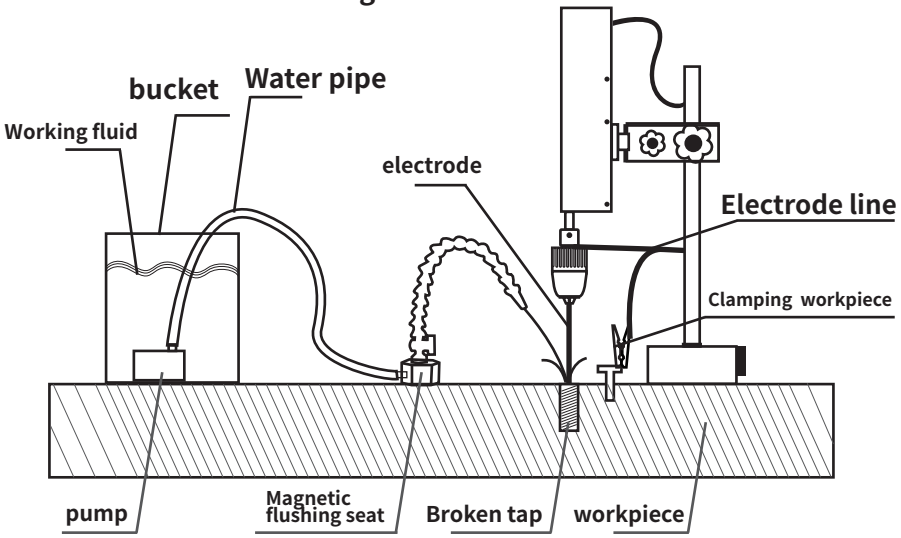


▲ Removal of residues

2.Schematic diagram of large workpiece and processing:

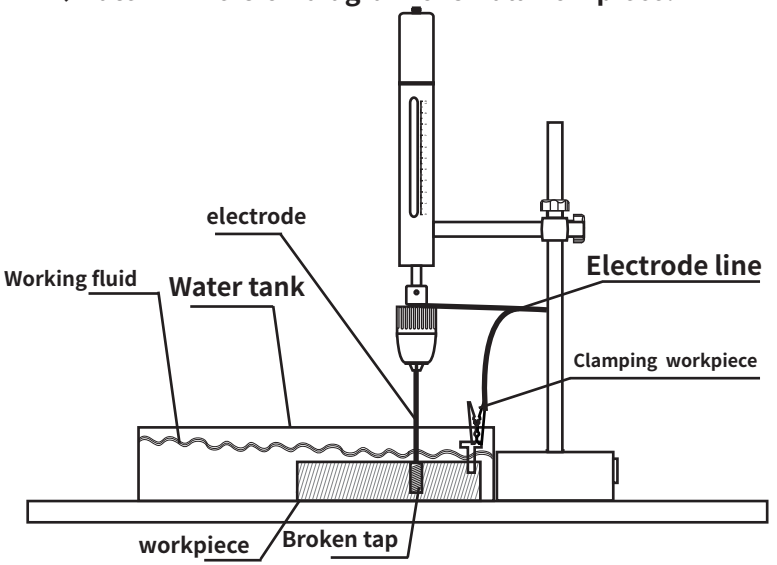


Processing device 1 Schematic

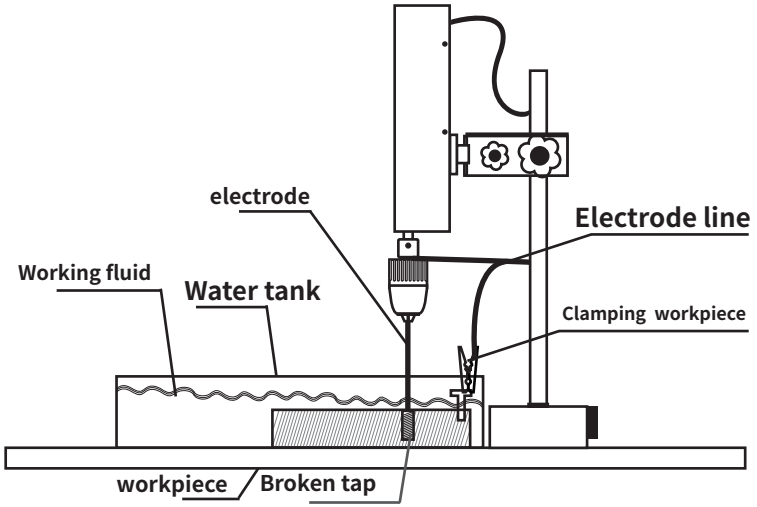


Processing device 2 Schematic

2、Water immersion diagram of small workpiece:



Processing device 1 Schematic



Processing device 2 Schematic

Special notes!!!

1. Please read the instruction carefully before operation!
2. It is equipped with external water pump, which is not under warranty, Pay attention to the following when using:

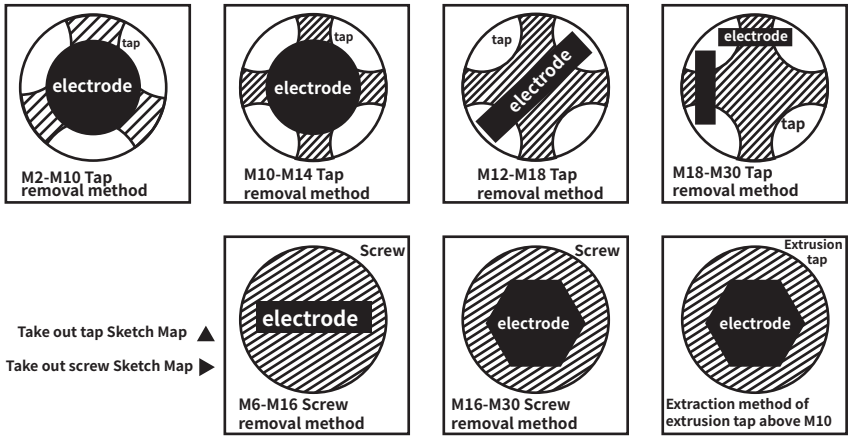
▶ Use clean tap water as working fluid. If pure water or distilled water is used, the processing efficiency will be doubled.

▶ If the circulating water is used, the water should be changed frequently, otherwise the dirty water will seriously affect the processing efficiency. The dirtier the water is, the lower the processing efficiency is, and the metal dregs in the water will easily jam the main water pump, which will greatly reduce the service life of the external water pump.

▶ After using the circulating water, the external water pump needs to be disassembled to clean up the metal residue left in the pump, which can greatly extend the service life of the external water pump.

3. Every 3-4 hours of continuous work, the machine needs to rest for 30 minutes, which can greatly extend its service life.
4. Prevent water and oil from the power supply and the moving part of the machine to avoid failure.
5. If using spark working fluid or kerosene, be sure to pay attention to fire prevention.During immersion processing, if using electric spark working fluid or kerosene, be sure to pay attention to fire prevention, and it is safer if the liquid level is more than 10 mm higher than the workpiece.
6. During the processing, the human body should not touch the electrode part at the lower end of the spindle to prevent electric shock.
7. Do not work in dangerous environments, such as fire zones.
8. If there is no need for flushing, please turn off the power switch of water pump. The water pump shall not operate without water.
9. During processing, water or other media must be used as working fluid. No water processing is allowed, and the water volume must be sufficient. It is forbidden to replace the water pump by manual flushing.
10. In the process of water working fluid processing, do not add antirust liquid such as cutting fluid into the water, otherwise the processing efficiency will be seriously affected.
11. The connection between the drill chuck and the processing device is made of insulating material. Care should be taken during installation and use. Do not use force or collision to prevent the insulation from breaking.
12. After the machine is processed, proper routine maintenance shall be done, such as cleaning the dust and putting it in a dry place. The water on the drill chuck shall be wiped dry and some lubricating oil shall be applied to prevent rusting.

Schematic diagram of other processing methods



The following formula is generally used to calculate the bottom diameter of a screw hole:

1. Tapping metric thread:

Pitch t<1 mm, dz=d-t ,t> 1 mm, dz=d- (1.04 ～1.06),t --pitch (mm)

dz-- diameter of drilling hole before tapping (mm)

d -- nominal diameter of thread (mm)

2. Inch screw thread

nominal diameter of thread	Cast iron and bronze	Steel and brass
3/16" ～5/8"	dz =25 (d-1/n)	dz = 25 (d-1/n)+0.1
3/4" ～11/2"	dz =25 (d-1/n)	dz = 25 (d-1/n)+ 0.2

On the type of dz--diameter of drilling hole before tapping(mm)

d -- nominal diameter of thread (in.)

n -- number of teeth per inch

Causes of common tap breakage and preventive measures

1. Cause analysis of tap breaking

(1)After processing blind hole thread, when the tap is about to contact the bottom of the moment, and the operator is not aware, still not to the bottom of the tapping speed, then the tap must be broken.

(2)The processing blind hole thread, if there is part of the chip failed to timely discharge and plug in the bottom of the hole, if the operator forced to continue tapping, tap is bound to break.

(3)The poor quality of the tap itself is one of the reasons that lead to the tap breaking in the tapping process.

(4)Of in the tapping process, because the operator's hands force is not balanced, resulting in the direction of force change and broken tap.This situation occurs in the smaller diameter thread processing.

(5)It is not matched with the tap. Processing, for example, the M5 thread x 0.5 should use shall be 4.5 mm drill base hole, if misused for M5 Ø 4.2 mm drill head processing, due to the smaller aperture, do not match with tap, torque is bound to increase.At this time, if the operator still does not find the wrong bit and continues to forcibly tap, then the tap breaking phenomenon is inevitable.

(6)at the beginning of tapping, the tap start positioning is not correct, that is, the axis of the tap and the bottom hole of the Central Line of the core, in the tapping process torque is too large, which is the main reason for the tap break, which caused by the phenomenon of tap break more than the previous all factors caused by the total tap break.The presence of this tap and the bottom hole of the heart of the phenomenon, it seems to be the operator's skill problem.The presence of this tap hole of the heart of the

phenomenon, it seems to be the operator's skill problem., but actually is due to insufficient tap structure. Currently used manual tap front are tapered, its original face contact with the bottom hole is dot, silk cone and the bottom hole concentricity all the skills and experience of the operator to maintain, should not only keep the tap around perpendicular to the bottom hole end face, and remain perpendicular to the bottom hole before and after the end, in a forced down the tap equal strength from both hands at the same time screw tap.So many things must be done at the same time, and it is difficult for a less skilled operator to do so.Even if the technical level of the senior technicians, in the manual tapping operation is not every time can grasp very accurately.

2.Prevention of tap breaking

(1)improve the structure of the tap. A cylinder with a length of 5 ~ 10mm and a diameter the same as that of the drill bit for the bottom hole is added at the front end of the head cone, which is used as the guiding part for the tap and the bottom hole to automatically maintain concentric, so that the tap itself can automatically maintain concentric with the bottom hole at the beginning of tapping.When tapping with this kind of tap, it can avoid the phenomenon that the tap is broken due to the different center of the tap and the bottom hole, and also can avoid the phenomenon that the tap is broken due to the mismatch between the bottom hole and the tap.At the same time, because it is impossible for the tap to enter the bottom hole which does not match the tap, it can effectively prevent the operator from misusing the drill bit.

(2)The essay strengthens workers' skill training and technical training, improves the theoretical level of manual tapping operation, and masters the practical skills in tapping operation.