

Operation Manual

VN-603



Congratulation on your new Deposit Welding Machine. We hope you will enjoy the machine and benefit the most from the machine. We therefore recommend you read this manual carefully before using the equipment.

Kindly contact us, if you need any assistance in operating the machine. We welcome all suggestions that can improve the machine performance.





WARNINGS



Misuse of the welder may cause danger to the users. Therefore, the equipment will be used only in compliance with relevant safety regulations. Special attention should be paid to the following:

Electric Shock:

- Welding equipment must be installed properly.
- Isolate yourself from the ground (eg use of footwear with rubber sole).
- Ensure proper maintenance of welding equipment. Never work with damaged cables or insulation.
- Repair and maintenance of the equipment shall be made by a person with the necessary technical insight.

Strong Light:

- Protect your eyes. Use colored eye protect glasses, which can protect your eyes from the blazing light.

Welding Fumes and Gas

- Smoke and gases generated by welding is dangerous to breathe. Ensure appropriate exhaust and ventilation.

Fire

- Welding sparks can cause fires. Flammable objects should be removed from the welding site.
- Work clothes should also be protected from sparks and splashes.

Please review this manual carefully before equipment is installed and put into use!

→ General introduction

VN-603 is a micro repair welder with deposition welding pulses. The welder can continuously deposit filler material onto the welding spots.

The machine can weld a variety of materials incl. all types of steel and iron, aluminum, copper, brass, bronze.

We recommend you use some time to practice, with support from the tips in this manual.

→ Technical data

1: The machine can weld in Fe, Cu, Al. The machine can not be used for welding: Sn, Zn.

2: The machine can be used:

- Defects in castings, such as pinhole, sand holes etc..
- Other small and precise welding tasks as a normal TIG welder can not perform.

3: Electric Input: 220V, 50Hz.

4: Power consumption 10-1200W.

8: Machine dimensions: 175×360×160 mm³.

9: Weight: 6.5kg.

→ Fillers and Collets

The machine is equipped with collets of below specifications:

Collet Ø3.2mm – Recommend to match $\text{Ø}3.2 \pm 0.1\text{mm}$ fillers.

Collet Ø3mm – Recommend to match $\text{Ø}3.0 \pm 0.1\text{mm}$ fillers.

Collet Ø1/1.5/2mm – Three holes in one collet. Recommend to match smaller fillers.

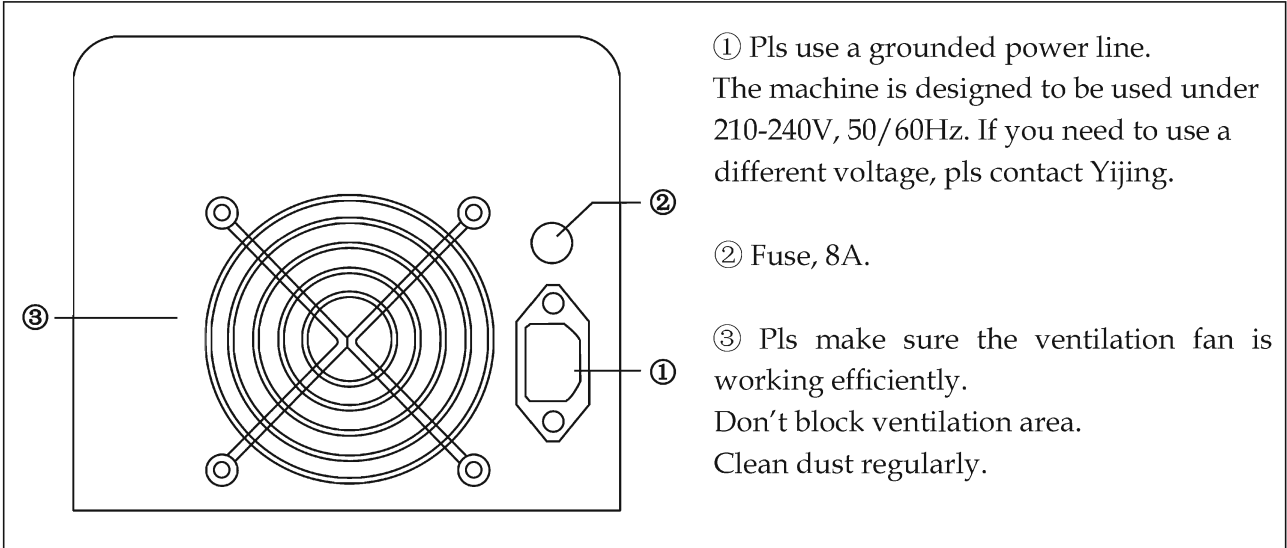
If you are using fillers thicker than Ø2.5mm, usually you can cut it by 8-10cm. If you are using fillers thinner than Ø2mm, usually 5cm feels more stable.

On special occasions, you can use long fillers as long as 15cm. Be aware that long fillers are more difficult to control precisely.

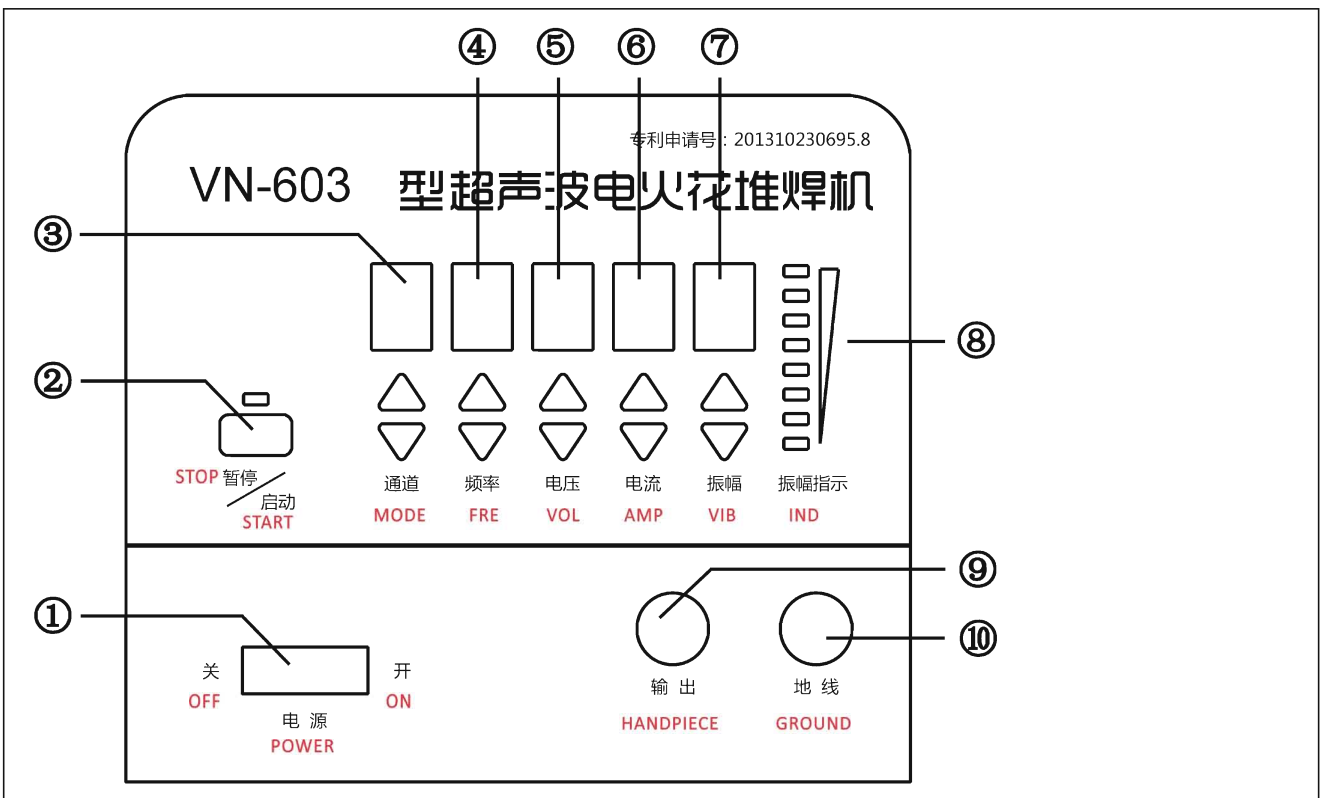
As the filler becomes shorter and shorter, you may need to restart the machine to search for best matching frequency.

Sometimes, especially when depositing aluminum, the filler break during the process. Cut the broken section, and go on depositing with the fine section.

→ Back Panel



→ Front Panel



① main power switch ② stop/start

③ Mode buttons: There are four modes with pre-set parameters.

Mode 1 is generally recommended precise repair. Especially if you are using thinner fillers.

Mode 1	Frequency	Voltage	Ampere	Vibration
	6	6	2	5

Mode 2 is generally recommend as a base setting for all kinds of repairs. You can add or lower the settings to get satisfactory performance.

Mode 2	Frequency	Voltage	Ampere	Vibration
		7	7	3

Mode 3 is recommended for fast repair with steel stick. This is a new and unique mode of VN-603.

Mode 3	Frequency	Voltage	Ampere	Vibration
		1	8	8

Mode 4 is recommended for super fast repair with steel stick. But the repair surface will be quite rough.

Mode 4	Frequency	Voltage	Ampere	Vibration
		1	9	9

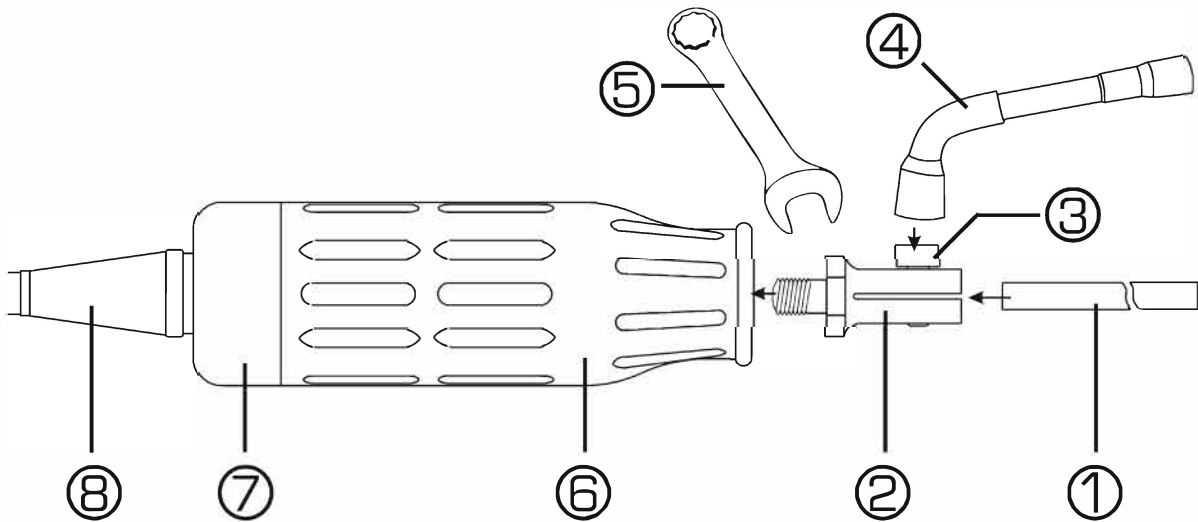
- ④ Pulse frequency. If you set frequency high, the machine deposits more pulses every second.
So the weld work will be faster, but the density will be looser.
- ⑤ Pulse voltage. If you set voltage high, the pulse energy will be acute and concentrated.
If you set voltage low, the pulse release will be softer and gentle.
- ⑥ Pulse Current. If you set current high, the material welded each time will be bigger.
So the repair work will be faster, but the material will be loose.
- ⑦ Vibration adjust. You can adjust vibration level. Usually the default level will be good. But for special filler specifications, you may add or lower levels.
- ⑧ Vibration Indicator. Usually, you should get 5-7 lights. If you only get four lights or even less, pls check connection (of filler-collet-handpiece, and filler length). Sometimes, when a filler is about 50mm long, you can get bad vibration. Cut the filler by 3mm and re-start.
- ⑨ Torch/Hand piece plug in
- ⑩ Ground cable plug in.

→ Good vibration – Very Important

Good vibration is vital to the work efficiency of the depositing process. There are several factors that may affect the vibrating status.

1. Filler-collet-handpiece connection. Pls make sure the connection is good, every time you start to use the machine, and re-check whenever you feel vibration is weakening.

Filler-Collet-Handpiece connection



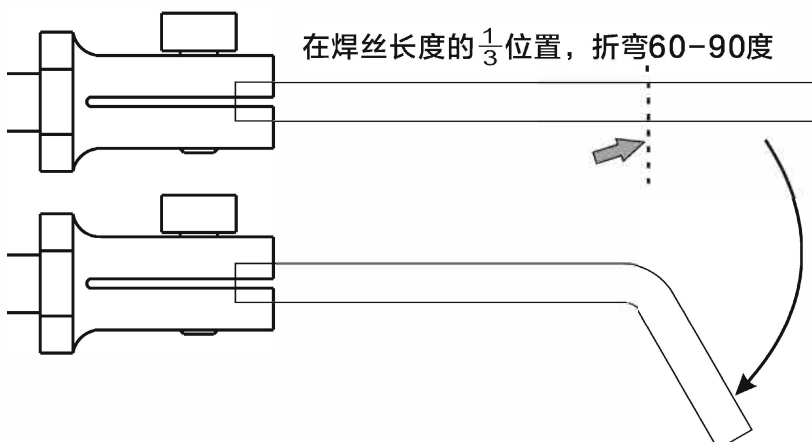
①Filler ②Collet ③Screw ④Wrench ⑤Spanner

⑥Handpiece (main body) ⑦Handpiece (cap) ⑧ connecting cable

The screw is used to fasten the collect. The screw should not tough the filler. Always use screws of the same specification, not bigger, nor longer.

2. Filler adjustment.

We recommend that you bend the filler as below, if operating space allows. If you need to repair in a narrow space, it can also work fine without bending. But usually bent fillers can repair more stable and fast. (Bending 60-90 degrees at 1/3 of the filler)



3. The connecting cable might break. Usually the break point is inside the rubber coat of the cables. You can't see with naked eyes. The easy way to tell is to use a new cable/handpiece set. If vibration is always stable with the new ones, and unstable with the old ones, pls find some electronic engineers to repair the broken cable.

→ **Basic welding method**

Press the fillers with proper pressure. A new user must practice on '**proper**' pressure.

If you press too hard, the vibration feels weak/dead, and the material builds up very slowly.

If you press too gently, the material builds up too fast, weld quality is bad. There are still many small gaps inside deposited materials.

If you are welding with big currency, you should be extra careful about the welding speed. Sometimes, when the material builds up too fast, you will see scattered bumps. You must fill the gap between bumps as soon as you notice them. If the bumps get taller, it will be very difficult to weld in between.

● **Repair Tiny hole**

Use thin fillers. Aim at the hole, and press for 1-2 second.

● **Repair Big hole**

When repairing the bottom of the hole, you must press harder than usual. Be careful of potential bump. If the hole is quite deep and steep, it's better to use fillers smaller than the hole diameter.

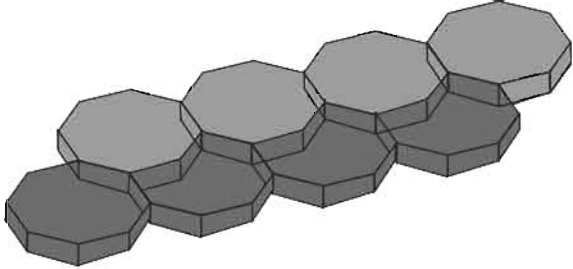
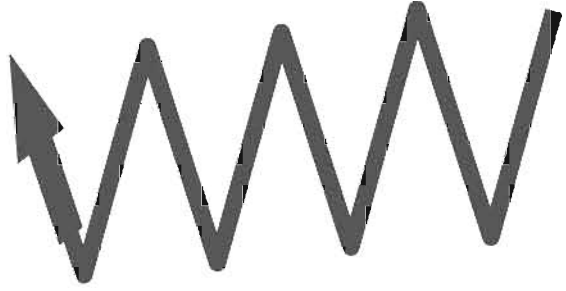
● **Repair Surface**

You must practice more before you can repair a big surface.

Pls repair one section by one section. Stay 1-2 seconds for each section ,before moving on to the next. Each time you move, the latest section should be repaired as evenly as earlier sections.

In other words, you repair one small block at one time, and repair the adjacent small blocks next.

Never slide long lines across the whole surface.

<p>Correct method of surface repair</p>  <p>Stay 2-3 seconds for each block, wait for the block to grow to certain thickness. Move to adjacent block, stay 2-3 seconds for the block to grow to certain thickness.</p>	<p>Wrong method of surface repair</p>  <p>Never fast slide across the certain. Always wait for the block to grow, before moving.</p>
---	--

→ FQAs

Q1: The handpiece/torch feels hot.

Yes, the handpiece feels a little hot when using, especially if the filler is quite short and conducts more heat to the handpiece. Pls use gloves to protect your hands, if you will use it for a long time. Don't cover the handpiece with thick cloth, that will shorten the service life of the handpiece by delaying its heat dispense.

The handpiece will be abnormally hot, if vibration is not conduct to collet-filler properly. So always make sure of filler-collet-handpiece connection.

Q2: No display when turning on the machine.

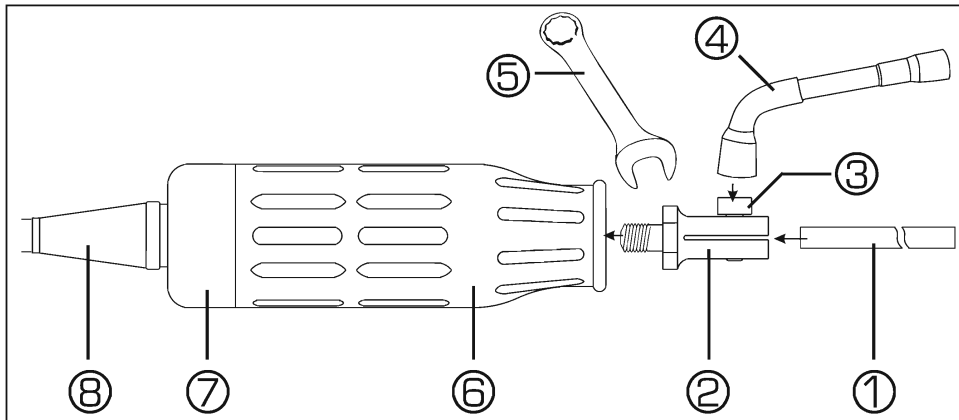
Pls check power supply and fuse. Pls be noted, the machine is designed to work under 210-240V AC, 50/60Hz.

Q3: Filler feels sticky on surface. Vibration indicates only few lights.

This is typical bad vibration. Pls follow the below process:

- (1) re-start the machine;
- (2) check filler-collet-handpiece connection;
- (3) check filler length. Avoid 50mm. Cut it by 3mm and re-start;
- (4) check collet, see if it is cracked;

(5) Always use matching screws and collets. If you are using screws of your own source, pls make sure they are the same as our original ones.



Q4: Weld too slowly. Weld doesn't grow.

- (1) Increase currency and voltage.
- (2) If you press too loose, the deposit area might grow an oxidized cover.

The material can't deposit on oxidized cover. Grind the oxidized cover and go on deposit.

Q5: Can't weld evenly. Material is bumpy and loose.

- (1) Decrease frequency setting.
- (2) Practice pressure and moving speed. Press evenly and move evenly.