

One-Shot Desoldering Gun: Back to Basics

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1 What is it?

The Xytronic One-Shot Desoldering Gun 2008 (hence 2008) is a device that looks like a high power soldering gun that has a “one-shot” vacuum pump to suck solder from a PCB.

“One-shot” means when you pull the trigger, the device actuates a solenoid that pulls a diaphragm, which in return creates a vacuum at the tip of the device. The solenoid releases after a full stroke whether you continue to pull the trigger or not.

The design contrasts the “industrial” desoldering guns that have continuously operating vacuum pumps. With a continuously operating vacuum pump, the operator only need to hold the trigger and the desoldering gun continuously create suction to remove solder.

2 Does it work?

Surprisingly, yes!

I tried to remove a four-pin header from a PCB with the 2008. Once the device heats up, I put the nozzle on the PCB as flat as possible and pulled the trigger. Most of the solder was removed with the first “shot”. Two or three shots are enough to remove all the soldering connecting a pin to the PCB.

As advertised, the device desolders through hole components.

3 How does this compare to...

Okay, it is not as good as the expensive continuously operating vacuum type. However, it beats most other techniques without a doubt.

You can try to remove through hole components using desoldering braid. This approach, however, never seems to remove *all* the solder connecting a component to the PCB. For years, I have tried to remove through hole components using desoldering braid and never once I was able to do it cleaning without tearing some pads or traces.

A better technique is to heat up all the pins (of the component to be removed) with a big blob of solder or a big soldering iron tip. This approach works for components with a relatively small pin count, say 3 or 4. Once you have 20 pins or so, this approach doesn't work anymore!

With chip-quick, you can apply the alloy to all the pins, then try to keep the pins hot enough to remove the component. Because chip-quick is a low melting point alloy, you only need about 200F to maintain its molten state. You can do this with the help of a heat gun. The drawback of this approach is that it is messy. You have to clean up all the chip-quick alloy before soldering a new component.

How about those hand-operated pumps/plungers? Call me all thumbs, but I have never found these desoldering pumps to work well. The problem is that you need a soldering iron to heat up the pin, then use the pump to remove solder. If you try to apply the pump while the soldering iron is still contacting, you will not get a good seal because the pump's nozzle cannot be pressed against the PCB flat. If you remove the soldering iron first, there is not much time before the solder becomes solid again.

Compared to all these techniques and products, a one-shot desoldering gun works *like miracle!*

4 Tips

The key to work with a desoldering gun, especially one without continuous vacuum, is temperature and positioning. The 2008 comes with a temperature control circuit. The temperature is set by a pot that is accessible only with a small screw driver. This is fine, since most people don't need to set the temperature frequently. In fact, this is a *feature* because you cannot accidentally change the temperature setting! The factory set temperature of my unit is about 285C. This is a good temperature, even for sensitive components. My Metcal tips are all 600F (299C).

Be patient, there is quite a bit of thermal mass to heat up. Don't try to desolder anything before the tip is hot enough to melt solder!

Besides temperature, you also need a good seal to utilize the vacuum to suck solder. There is no need to press the nozzle hard on the PCB, just make sure the lip of the nozzle is completely flat on the PCB. Combined with the molten solder, this creates a seal so that when the pump is actuated, the nozzle has nothing else (such as air) to suck except solder.

Remember to empty the solder evacuation chamber periodically. You don't want to find out the device doesn't work because it is full! The chamber is very easy to remove when the device is cool. The kit even includes a pair of tweezers so you can remove the chamber when the device is hot!

5 Room for Improvement

The one thing I find most annoying is that the base of the holder is just aluminum with no friction. It constantly slides on my bench. The fix is easy, just stick some rubber bumper pads on it!

6 Bottomline

I would not recommend the 2008 for any production work because it is much more efficient to have continuous vacuum for production work. However, for hobbyists and engineers doing prototype work, the 2008 is a capable and very cost effective desoldering device. I don't know how long it will last, but because its design is simple, I'd imagine it will last quite a while.

7 Where to get it?

Go to a search engine and look for "one shot desoldering", and you should find quite a few links to online shops that sell the 2008. I got mine from jameco.com for US\$100 (plus CA tax and shipping).