

Power Pole Assembly

I have switched over to using PowerPoles for nearly all my power needs. While there are many ways to skin a cat, these are some of the methods I have come to use.

Tools: There are many tools out there. I have tried many of them. These are the ones I prefer.

Crimp tool: I have narrowed down to this Klein 1006 tool for a couple of reasons.

This tool has two indent tits which crimp the 15 amp and 30 amp PowerPole contacts very nicely. I use the smaller tit for all the 15 and 30 amp crimps. The larger tit is handy for terminal ring contacts etc.

The width of the crimp is just the right size.

See photos below:





In the photo below notice the crimp, the Klein tool crimp width makes a deep crimp with the proper width as to not go too high or too low on the connector contact.



I have another tool that ratchets the crimp, very fancy and I only use it with the 45 amp crimps. I really do not like using it as once the connector contact is crimped it is very hard to get it to let go of the contact, sometimes to the point of breaking the contact.

(I have tried lubing the crimping contacts, tapping with a tool, wiggling it loose and talking dirty to it. Just not my favorite)



Wire stripping tool: In a pinch I just use my Benchmade pocket knife to cut the insulation on the wire to be crimped. When I am going to do several cables, or just not being lazy, I have found this tool to work great. I could not find a name brand but am pretty sure I purchased from DX Engineering, I see they now sell it under the "Summit Racing" brand, <https://www.dxengineering.com/parts/sum-900031r>.

I may have seen something similar at Home Depot as well.



There is a little trick to using this tool properly. In the photo below notice that my support hand is pressing down on the outside clamping ratchet. When squeezing the handles during normal operation both clamping ratchets move down to grip the wire and basically pull the insulation off. To keep the wire from slipping a little extra pressure with your support hand index finger stops any slipping.



Typically I strip the insulation around $\frac{1}{4}$ inch to fit in the contacts.



Wire cutting Tool: This tool is one of my favorites, pretty universal and you will notice it resembles scissors. Make no mistake, these are the Bomb. They cut through wire gauges up to 10 AWG like butter. They also work really well on toe nails, just be careful. The Klein 2100-7 is available at the Home Depot.



On to Power Pole Parts:

Power Pole Contacts: There are three basic sizes for the normally seen Power Pole series we generally use. (There are bigger housings if you search).

The three Contacts we use are the 15 amp, 30 amp and the 45 amp.

Note that the ratings are a little deceiving, the amperage name is tied to the inside diameter of the contact hole. The 15 and 20 amp outside diameter are identical, the 15 amp has more material in body making the hole holding your wire smaller.

The 15 amp contacts are used for 16 to 20 AWG wire.

The 30 amp contacts are used for 12 to 14 AWG.

The 45 amp contacts are best for 10 AWG.

I often like to make a cable with two sets of Power Poles on the cable end. I find that two 16 AWG wires fit nicely into a 30 amp contact, once again talking nicely to the contact to get the two wires in. I will show a photo further on down.



A word of caution here. Beware of very poorly made imitation contacts found on the market such as eBay and Amazon. Look for a brand name such as PowerWerx or DX Engineering etc.

I recently helped a fellow Ham do an install on his vehicle. He brought all the cabling and contacts. I quickly noticed that when crimping his supplied contacts that they felt very soft. I easily was able to pull the wire right out of the contact. (bubble gum metal)

The supplied red and black shells were also very poorly made. The Steel spring that holds the contact looked different and the shell physically was not as precisely made.

Some things such as shells, contacts and wire are just not worth the few bucks you save.

The Crimp Process:

The wire: But a good quality wire. The off shore Chi-Com type will typically not have writing along the insulation and quite often is not exactly the gauge they advertise. It is usually very shiny and made with cheap insulation, enough said.

Here again is a picture of the three different contacts we normally use:



The contact on the left is the 15 amp, center is the 30 amp and one on right is the 45 amp.



It is hard to see in the above photo but there is seam on the contact body and the flat curved end is tilted down.

You always want the “tit” on the crimp tool to crimp the NON-seam side of the contact body.

Keep the following rule in mind:

Tool tit down, contact seam up.



Finished crimp



Another rule to remember when doing a pair of wires, Keep the pair held flat between your fingers so that the Red wire is on the right hand side while holding the cable pointing away from you.



Now slide on the contact so you can see the seam on top of the contact body. Bend the other wire in the pair off to 90 degrees (so it won't get in the way while crimping) and the connector. Now crimp.

The Rules so far:

Tool tit down

Seam Up

Red right

Following these rules will also put the right geometry for applying the standard used in Power Pole side by side configuration.

When you are ready to attach the red shell into the black always remember:

Red body (the Male) slides into Black (female) when the Contact is tilting down.



You should have something looking like this after crimping and inserting contacts into Power Pole shells



Inserting the contact into the shell:

Some wires of smaller gauge can be difficult to push the contact into the shell housing.

Try first to pinch the wire as close as possible to the contact and while watching polarity of the shell body in reference to contact, attempt to push into shell body until you feel it click, (you may here it if your ears are good). See above photos on the correct way the contact fits into the shell body.

If you are having trouble with the wire bending while attempting to get the contact to snap in you can use a tool such as this. I use what is called a "Glock Tool". It was designed to push the pins out of your Glock pistols for disassembly to do a good cleaning.



The tool has a blunt end that you can get behind the contact. Observe proper rotation of contact pin while inserting into housing.



The tools diameter is small enough to fit into the shell body.

The Rules so far:

Tool tit down

Seam Up

Red right

Contact curl curving down

Red shell (male) into Black shell (female slot)

If you keep geometry of contact straight while inserting into shell correct you should be good to go.

As mentioned earlier you can make a cable with two sets of Power Poles on the end.

When using 16 AWG wire, which I use for my 45 watt solar panels, you can fit two 16 AWG in the 30 amp contact and daisy chain as many power poles as you wish.



Thanks for taking a look, hope it helps. I know there are many ways to put these Power Poles together. After many years and many mistakes I have come up with this method.

A quick reference I use for cable limitations:

Length vs Wire Gauge vs Amps.

If using a pair of wires such as zip cord, I double the length in the table. Example if I build a 10 ft. zip cord two wire cable I would use the 20 ft. length from table below.

Amps @ 12 Volts	LENGTH OF WIRE American Wire Gauge (AWG)						
	3'	5'	7'	10'	15'	20'	25'
0 to 1	18	18	18	18	18	18	18
1.5	18	18	18	18	18	18	18
2	18	18	18	18	18	18	18
3	18	18	18	18	18	18	18
4	18	18	18	18	18	18	18
5	18	18	18	18	18	18	18
6	18	18	18	18	18	18	16
7	18	18	18	18	18	18	16
8	18	18	18	18	18	16	16
10	18	18	18	18	16	16	14
11	18	18	18	18	16	16	14
12	18	18	18	18	16	16	14
15	18	18	18	18	14	14	12
18	18	18	16	16	14	14	12
20	18	18	16	16	14	12	10
22	18	18	16	14	12	12	10
24	18	18	16	14	12	12	10
30	18	16	14	12	10	10	10
36	16	14	14	12	10	10	10
40	16	14	12	12	10	10	8
50	16	14	12	10	10	10	8
100	12	12	10	10	6	6	4
150	10	10	8	8	4	4	2
200	10	8	8	6	4	4	2

Gary

KT7AZ

