

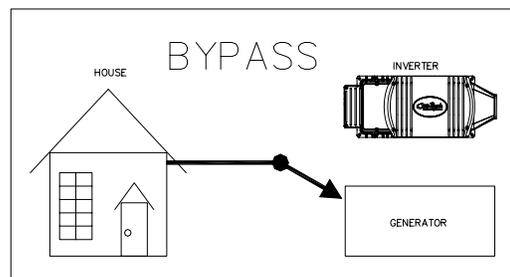
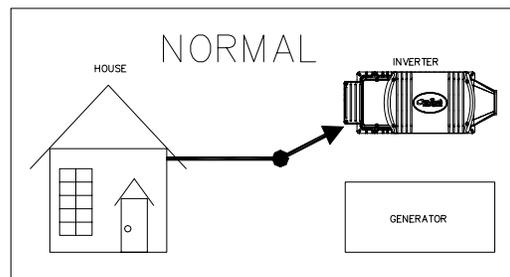
OutBack Power Systems

AC Input Output Bypass switches are confusing to many experienced installers. Outback Power Systems continues to expand flexibility and capability thus making this subject even more confusing. This document will attempt to shed some light on the possible configurations available with the OutBack products.

Let's start simple. What is an AC-Input/Output Bypass switch? Why do I need one?

The Bypass switch allows an inverter system to be “bypassed”, usually when there is a problem with the inverter. Review the following over-simplified pictures. The first one shown in the normal position depicts an inverter powering a house.

The second one shows the switch in the bypass position. The house is now being powered by a generator. The generator could just as easily have been grid too.



Notice that when bypassed, there is no electrical connection between the AC wiring and the inverter. This allows the inverter to be safely worked on or removed. Disconnection of the DC cabling is also required to de-energize the system.

Why do you need a Bypass switch? You don't want to be without one when your customer calls you at work and says “The lights are out, what do I do now ?” Your answer would be to throw the Bypass switch to the bypass position and start the generator. Anytime you want to work on your alternative energy system, it may be necessary to bypass the inverter to accomplish the task at hand.

The Bypass switch is a quick and foolproof way to keep the house powered up from your other AC source.

The following is a list of the Bypass switch part numbers offered for use in the PSAC and some typical applications. The OutBack PS2AC comes standard with a dual 50 amp Bypass switch and cannot be modified. The AC inputs are not mechanically tied to the bypass assembly on the PS2 system and must be turned off in addition to throwing the bypass switch.

AC-IOB-30 Used when the inverter has only a 30 amp transfer relay such as a Stat Power ProSine or Trace DR series

AC-IOB30D Used with the Vanner 120/240 VAC RE-4500 inverter

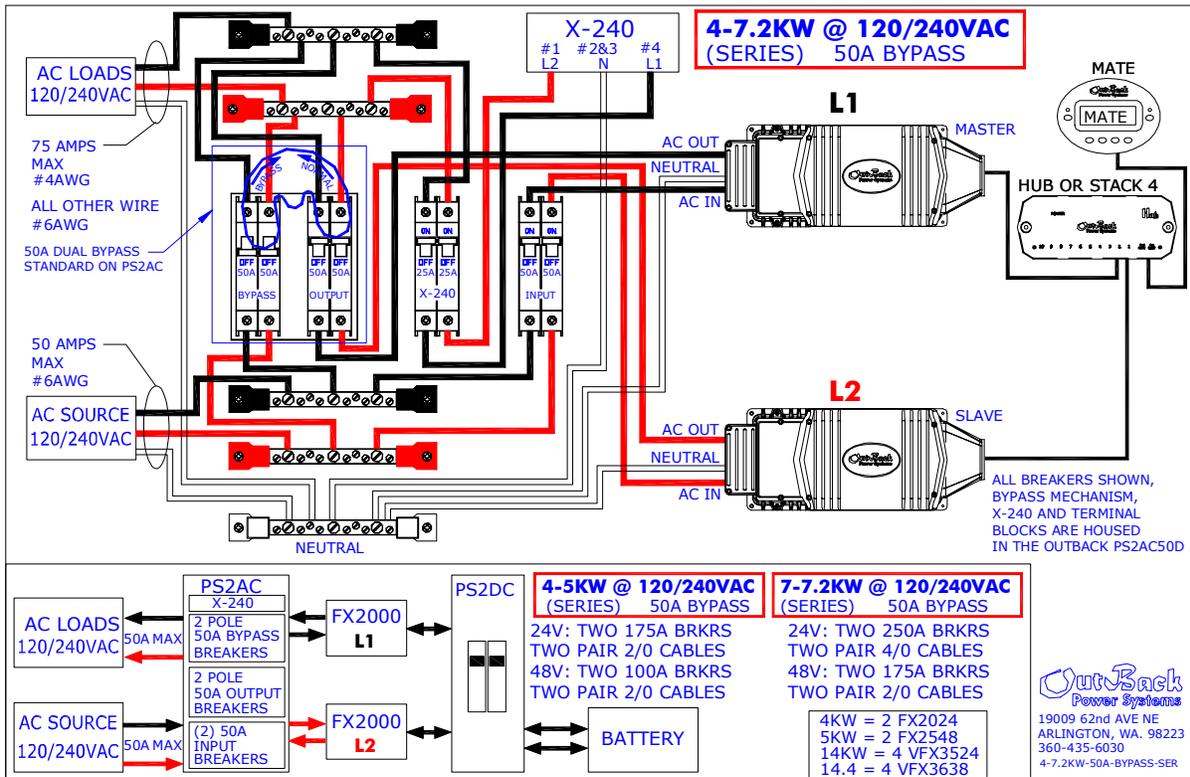
AC-IOB-60 Use with an inverter that has a 60 amp transfer relay such as the Trace SW or OutBack FX series. Two of these can be installed in a PSAC enclosure for use with two inverters. The inverters will be controlled independently. This has advantages and disadvantages. The advantage is that if one inverter is to be worked on, only one inverter needs to be bypassed. The house will still receive power from the other inverter. The disadvantage is that under this situation, the house may be receiving power on both leg1 and leg2 that is not out of phase. In other words, if the bypassed circuit has an AC input from either a generator or the grid, it will not necessarily be out of phase with the non-bypassed circuit. This is only a problem for a 240 volt load or for house wiring that utilizes a common neutral. Many homes are wired with common neutrals to save on wire. This out of phase condition can overload the neutral conductor.

AC-IOB-60D Use for two SW or FX inverters. Both AC legs are bypassed together so that the previous condition cannot happen.

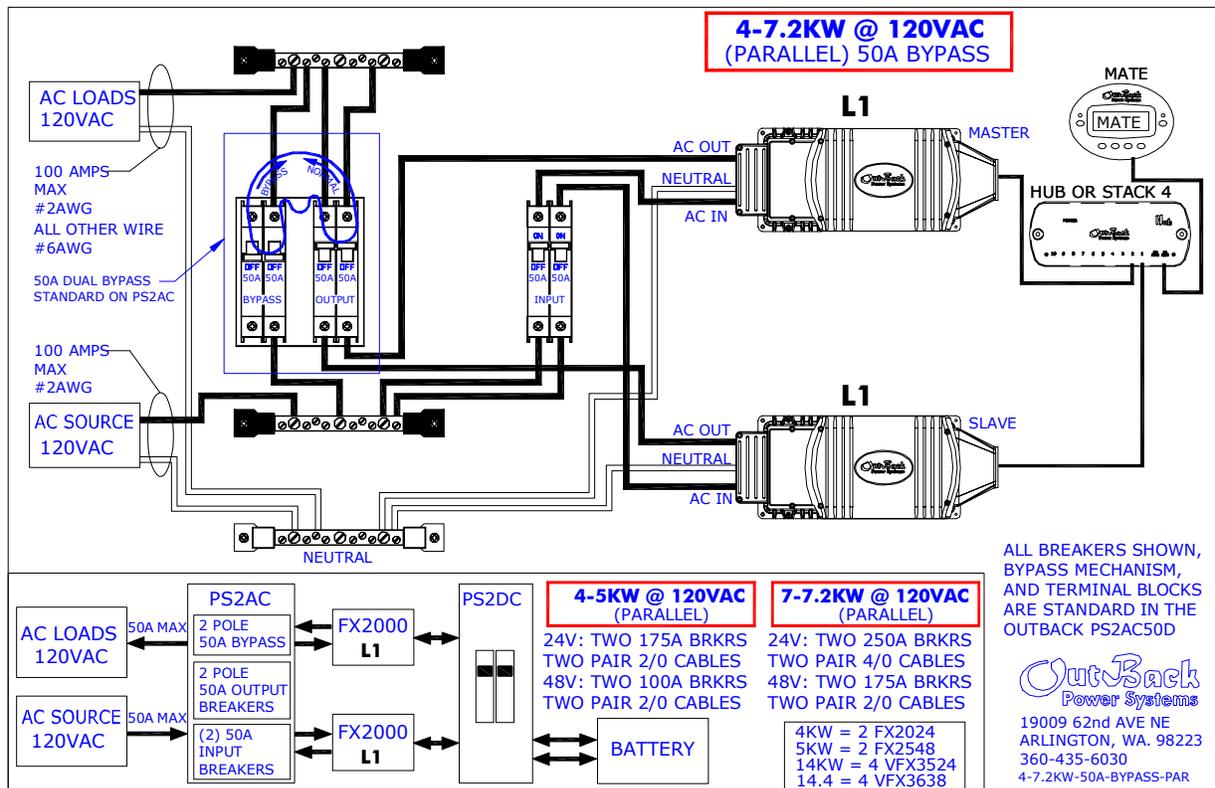
AC-IOB-100Q This bypass switch comes with a dual 100 amp breaker and 4 50 amp inverter output breakers. Most off-grid homes can get along with only a 60 amp Bypass, but if your generator is over that rating, this is the choice. Four OutBack inverters will put you over the 60 amp limit so for quad stacked FX's use this part. Another feature of this arrangement is the 4 inverter output breakers. Another way to use these bypass switches is with two inverters. You get four 50 amp breakers, so using two for AC input and two for AC output works fine. When installing 4 inverters you will need to add four breakers for the AC input in addition to the breakers that come with the kit.

AC-IOB-60Q Same as 100Q, but with a dual 60 amp bypass. Use with 12,000 watt generators max.

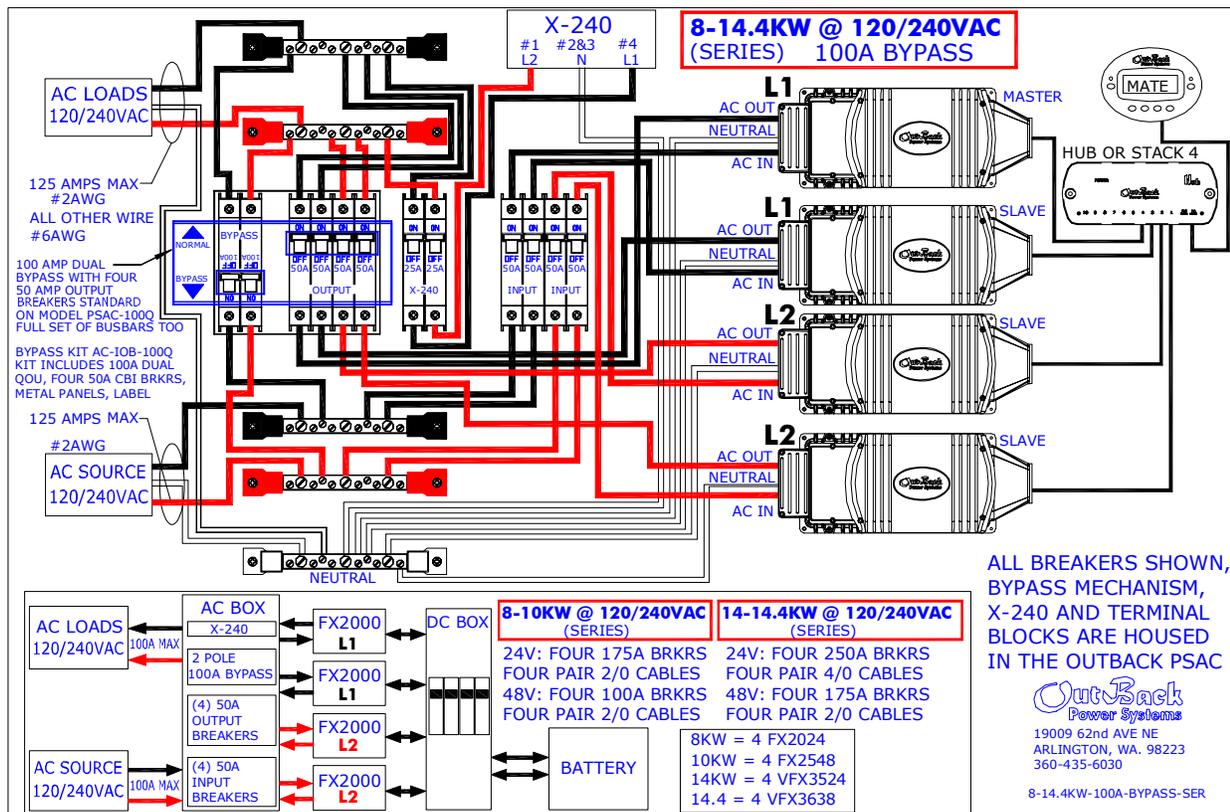
The following diagrams will help to show different installations. These diagrams are a reference only and are not necessarily complete. These diagrams are available on the OutBack website in AutoCAD format. You may want to download some and customize one to fit your particular system. DXF versions can be made available for those of you that have other Cad systems.



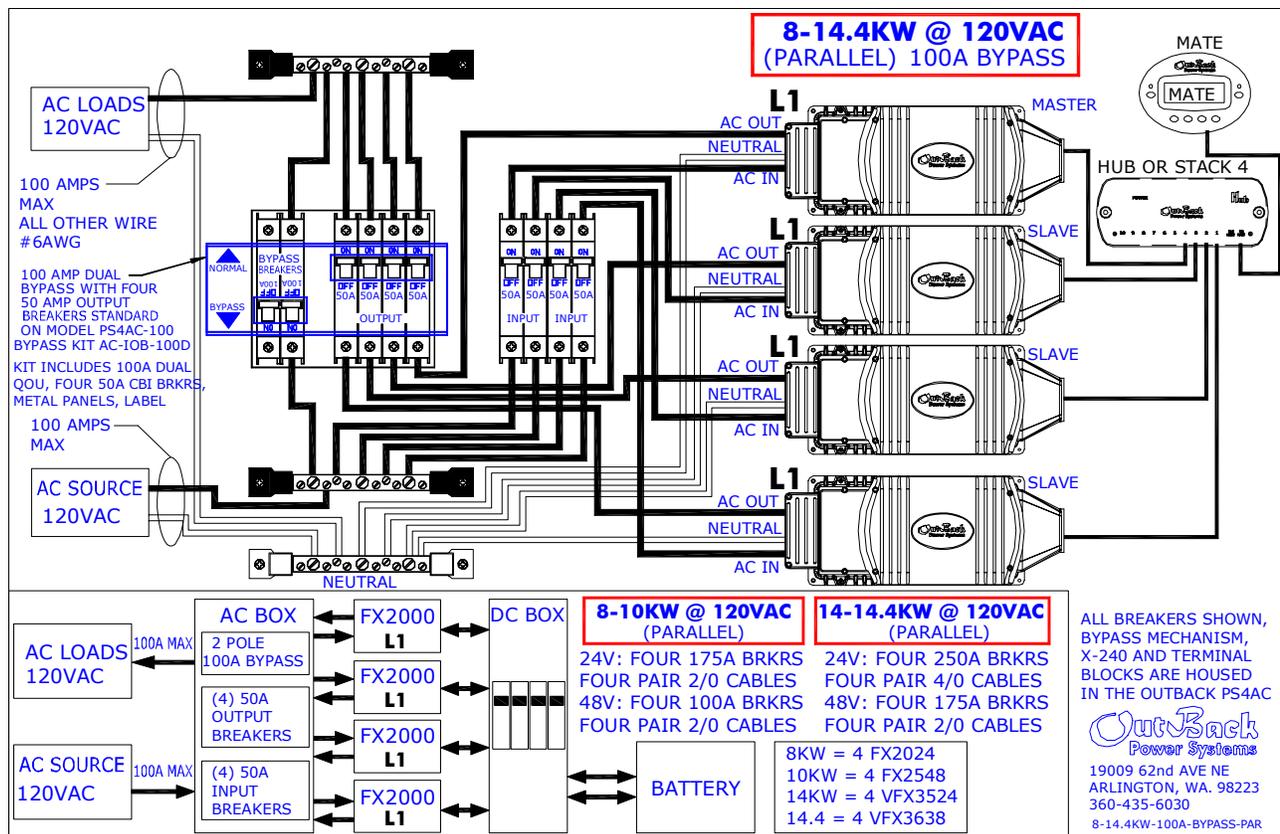
This arrangement is shown using the bypass switch that comes with the PS2AC50D



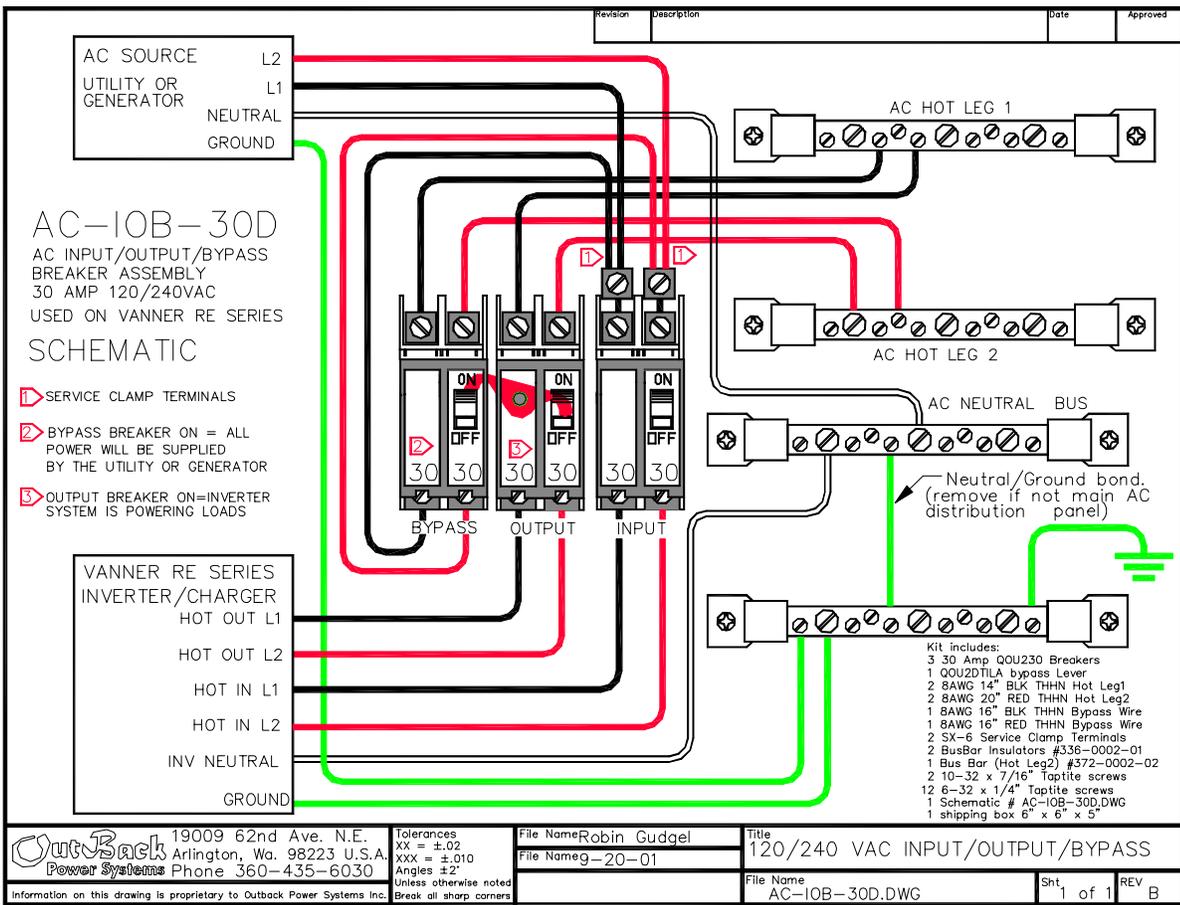
This arrangement is shown using the bypass switch that comes with the PS2AC50D



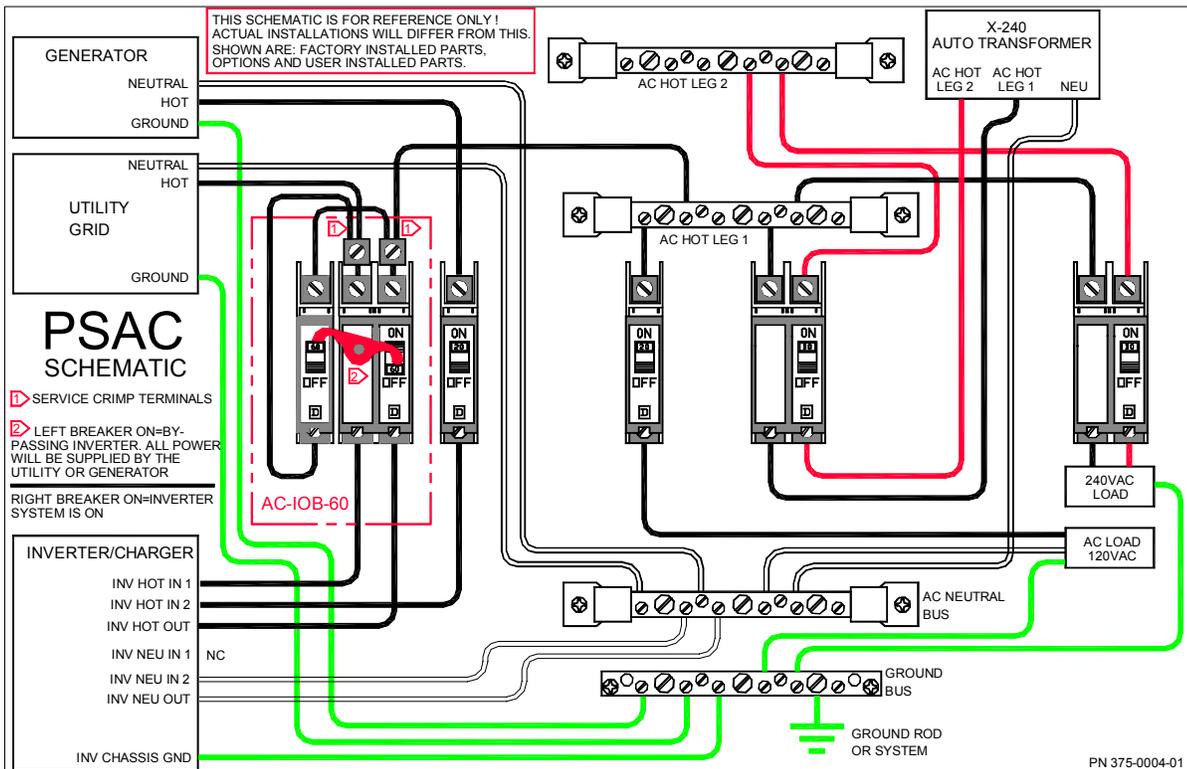
This arrangement shows the PSAC-100Q or (PSAC + AC-IOB-100Q same thing, different names)



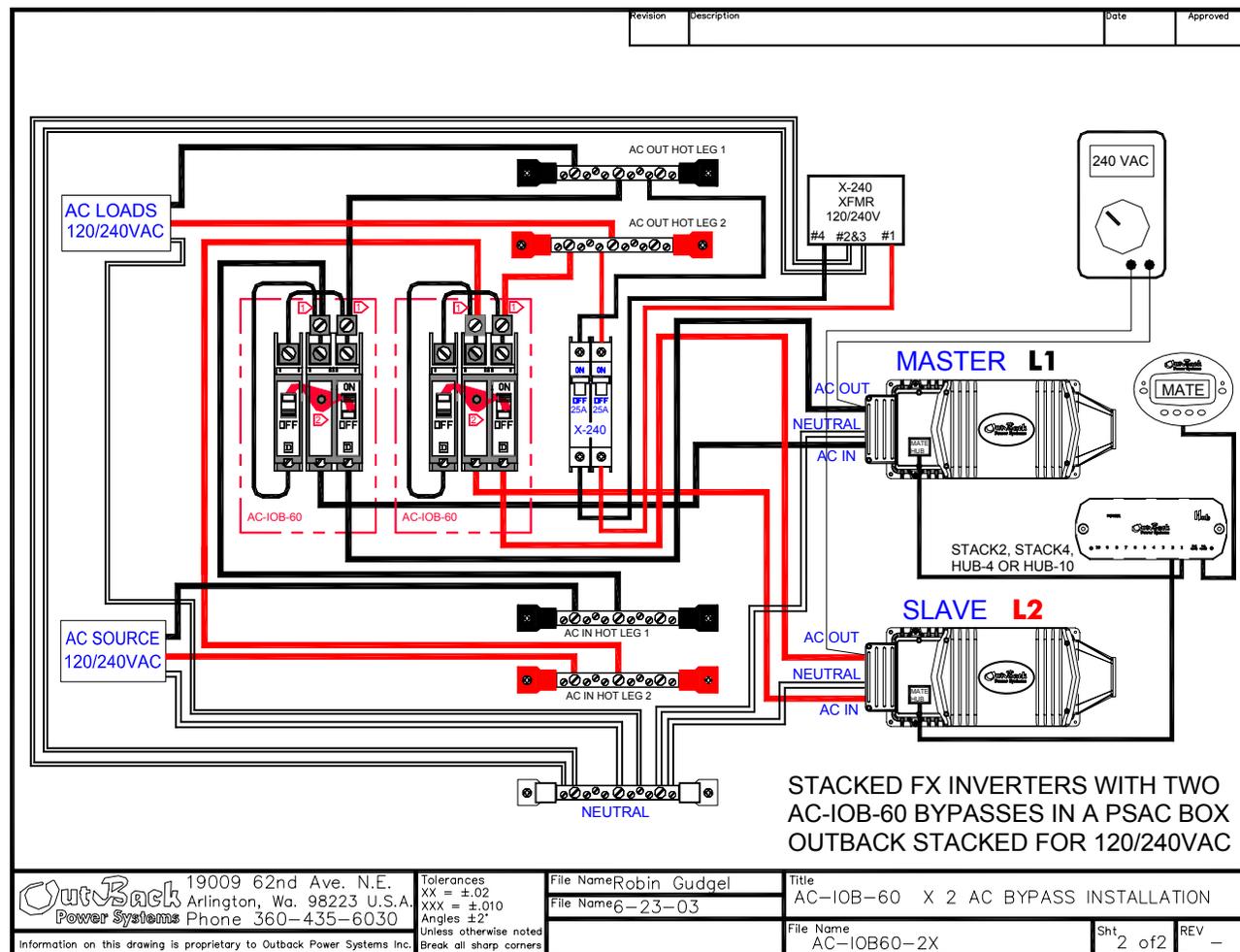
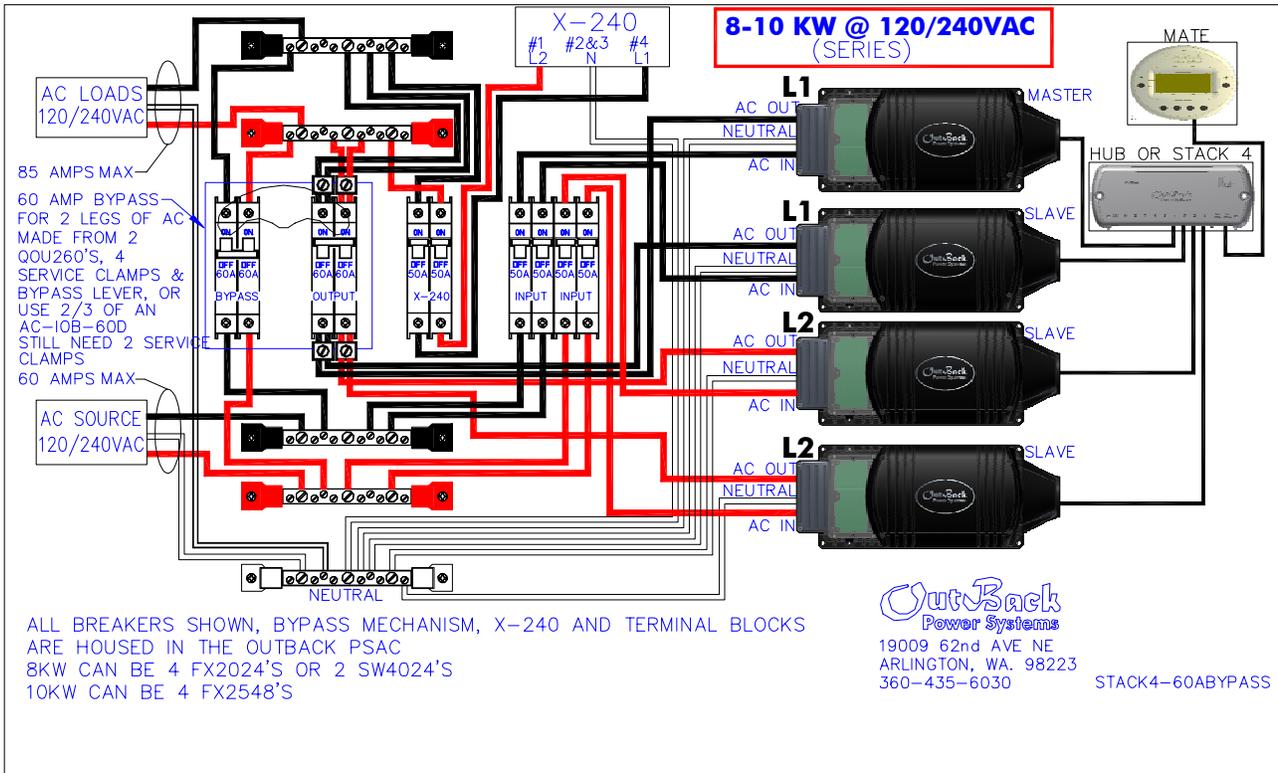
This arrangement shows the PSAC-100Q or (PSAC + AC-IOB-100Q same thing, different names)



PSAC-30D or (PSAC + AC-IOB-30D same thing, different names)



PSAC-60 or (PSAC + AC-IOB-60)



This arrangement is shown in the PSAC cabinet. (PSAC-60 + additional AC-IOB-60)

Below are examples of current flow of a quad bypass assembly. One example is shown in the normal position and the other is shown bypassed. The AC input breakers to the inverters are not mechanically tied to the bypass assembly. These inputs must be turned off separately to de-energize AC from the inverter.

