

## Pure Power Plug-In versus Power Perfect Box

We are frequently asked what the difference is between the Pure Power Plug-In and the Wire-In Power Perfect Box (PPBOX).

To better understand this difference, it is important to understand the terminology used in describing electrical systems. To begin, we can look at the term Phase as opposed to Circuit. Below is a diagram of a typical single-phase 240V electrical distribution panel that illustrates how a Power Perfect Box would be wired to it.

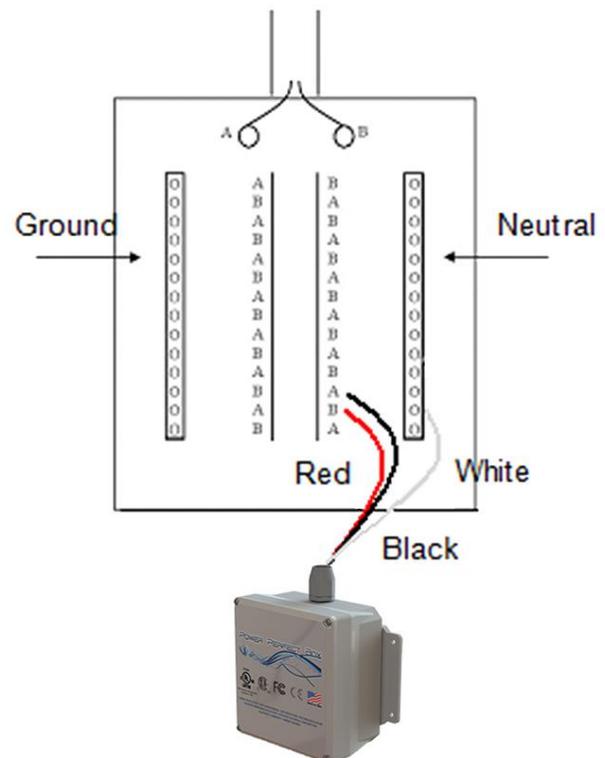
The two (2) large leads that come into a standard 240V distribution box from the utility company are each 120V leads, and can be seen at the top of Figure 1 (to the right) as Phase A and Phase B. These feed electricity to the breakers in the panel as shown. Most modern 240V panels have two columns of breakers, each receiving electricity from both Phase A and Phase B. Each breaker identifies a single circuit and is often referred to as a 'circuit breaker'.

Notice that the PPBOX is connected to a two-pole breaker and that while located on only one side of the panel, connects to both Phase A and Phase B. See that it also has a lead connected to the Neutral bar located on the right of the diagram. In this way the unit is able to be both a Phase-to-Phase & Phase-to-Neutral, energy management system. This provides the most complete power conditioning, harmonics filtering and surge protection for all the circuits on that panel and is in part why we call it 'Power Perfect'. This is the optimal solution for the common homeowner who has average electrical usage.

Harmonics filtering through Satic's use of harmonic rectifiers instead of capacitors results in lowering Total Harmonic Distortion (THD) and the lowering of the related electromagnetic field (EMF) radiation that comes from dirty energy.

This is the foundation of the Pure Power Plug-In (model ES120) because by simply plugging it in, it provides harmonics filtration and conditioning for one entire phase. Since there are two phases, A & B, for whole home mitigation you need two Pure Power Plug-Ins. Placing one on an A Phase circuit and one on a B Phase Circuit, you get the most complete protection. Going one step further, you can identify which circuit on each phase it should be installed on by determining the circuit with the most load or distortion.

Figure 1



By looking at a breaker panel, one can determine which circuit may have the greatest load for each Phase. Plugging in a Pure Power Plug-In on the most demanding circuit on each of Phase A and Phase B provides significant benefit to the specific circuit it is plugged into but also effects the entire set of related circuits on that Phase. In general, power becomes more efficient when THD is reduced, resulting in more real power to any specific load. This increased efficiency can also reduce electrical usage.

It is important to note that the Pure Power Plug-In does not provide Satic's PPBOX Phase-to-Phase power conditioning. Phase-to-Phase conditioning provides real-time amp reducing phase correction, providing even more efficiency that often results in lower power bills. The Pure Power Plug-In also does not provide the same level of system-wide voltage regulation and optimal surge suppression as the Power Perfect Box that is installed at the distribution panel. That doesn't mean that the Pure Power Plug-In isn't good at conditioning an electrical system's power. It simply means that its surge protection and voltage regulation is limited to primarily the circuit and phase that it is on.

Another aspect to consider when deciding which product is best for you is to look at the environment that the electrical system is serving. If a person is a renter, they may choose to purchase two Pure Power Plug-Ins, one for each Phase, as it can be taken with them when they move. Or to identify and treat specific hot spots, in home or office as the Pure Power Plug-In does a superior job of treating specific hot spot or problem areas of excessively high THD or EMF. However, as a Rule of Thumb, a general assessment can be done as to what is the right solution (including possibly the Power Perfect Box – Heavy Duty) using the following rules:

#### Square Footage of Residence

- |   |                       |
|---|-----------------------|
| • Homes/Apts. with area of 500SF to 1000SF  | 2 Plug-Ins            |
| • Homes/Apts. with area of 1000SF to 3500SF | PPBOX or 2-4 Plug-Ins |
| • Homes/Apts with area of 3500SF or greater | PPBHD or PPBSD*       |

#### Monthly Consumption Average (Rule of Thumb)

- |  |                       |
|--|-----------------------|
| • Homes consumption is less than 500 kWh/month       | 2 Plug-Ins            |
| • Homes consumption is between 500 and 1000kWh/month | PPBOX or 2-4 Plug-Ins |
| • Homes consumption is greater than 1000kWh/month    | PPBHD or PPBSD*       |

#### Utility Service Size (Rule of Thumb)

- |   |                       |
|---|-----------------------|
| • Homes with less than 60 Amps service        | 2 Plug-Ins            |
| • Homes with 60 Amps - 200 Amps of service    | PPBOX or 2-4 Plug-Ins |
| • Homes with greater than 200 Amps of service | PPBHD or PPBSD*       |

**\*Note:** PPBSD is chosen when there are significantly high levels of EMI.

Hopefully, this overview has provided a basic understanding of the differences between the Pure Power Plug-In and the Power Perfect Box. For more information please visit Satic's website at <http://www.saticusa.com> or call and ask for information from our customer service center at (406) 493-1861.