

Shipboard Power and Isolation transformers for UPS



Powerstar Inc. has been building UPS for shipboard power since 1993 in the USA.

What is Shipboard Power? Larger ships generate 120V 60HZ just like domestic Land based power plants. So why do you need a specialized UPS? Domestic land based power uses a hot wire 120V above ground and the neutral is at ground potential. Ships do not. Shipboard power uses both lines above ground potential- about 60V above ground. The ship designers do not want their metallic hulls to be conducting electricity. Think of a ship taking on seawater and the electrical system is still alive with a system with a grounded Neutral. A deck crew walks near a HOT lead- a wet power outlet let's say. Since seawater is highly conductive, the electricity will pass through him to get to ground. He gets zapped. So ships use a 3 phase ungrounded Δ Delta design generator. For battle field situations with this design, they also can tolerate a single phase- to-hull short and continue operating.

With land based electrical wiring, circuit breakers or fuses and switches are installed to only open the HOT side of the power feed. That is all that is needed to break the circuit as the other line- the NEUTRAL- is at ground potential. The shock hazard is removed by breaking just the HOT. But a ship's power still has power coming in on that other line and it has potential on it. Special double pole breakers are required onboard ships. BOTH HOT lines need to be opened to isolate the load from the generator. Powerstar sells all of its models with this special double pole input breaker.

Isolation Transformers

Many Powerstar Inc. UPS are equipped with an Isolation transformer. These protect a sailor from shock and help prevent noise (EMI) that may be created by the UPS or its load from being conducted back up the line. They also help to reduce that power line to ground capacitance by isolating the load's capacitance from the source.

Shock. Even though Ship generators have no connection to the hull, stray capacitance from the distribution lines to the hull can create enough of a conductance to carry milliamperes of current and that's all it takes to shock a sailor. Many electrical Naval engineers use our Input Line Isolation UPS like the PS3300LCS or PS6000ISOA to uncouple the line from the output supply.

EMI conducted emissions. Line Isolation transformers also can help to reduce high frequency noise from the AC input mains. All Powerstar Isolation transformers have a shield in the core that helps to prevent noise from coupling from the secondary to the primary windings. Powerstar has many units with this Isolation transformer enclosed with the UPS. Our most popular unit, the PS6000ISO, supplies 1500VA all in a 3u chassis with its built in Isolation transformer.

Stand Alone transformers. We can also supply a stand alone Isolation transformer mounted in its own enclosure with power outlets and breaker.

Voltage Step-down. By the way, our transformers can be had with different voltage taps if you need to connect to 240V or 400V and want to power 120V devices. So voltage conversion can be added to these models with only a slight additional charge. Is Europe or Australia one of your ports of call? Or are you a European coming to stop by in the US? We can build systems to work both ways.

