DySC™

FAQs

Why are voltage sags and momentary outages a leading power quality (PQ) problem?

Voltage sags and momentary outages are a major problem because they're a leading cause of equipment malfunction and downtime. In many industries, short duration voltage sags and/or outages that last for a fraction of a second lead to hours of production downtime. These interruptions add significant production cost in terms of scrap material and lost production time.

What causes voltage sags?

Voltage sags are a result of a fault (unintended path for current to flow) caused by lightning, fallen trees, auto/machinery accidents, rodents, or utility equipment failure on a power distribution system. In addition, voltage sags can result from energizing heavy loads or starting large motors.

Has any research been provided to validate these power quality issues?

Yes. The Electric Power Research Institute (EPRI) commissioned a study to quantify voltage sags. Known as the Distribution Power Quality (DPQ) study, it lasted from 1993-95, was supported by 24 utilities nationwide, examined over 3 million power line disturbances and was the most comprehensive power quality study ever completed to date. The results of this study indicated that voltage sags and momentary power outages represent over 92% of all PQ 'events' experienced by large industrial users.

What are the advantages of the DySC™ regarding voltage sags?

The DySC provides a patented electronic solution to voltage sag problems as well as deep sags and momentary power outages, representing 92% of all power quality events. It provides immediate recovery of voltage sags down to 50% for up to 2 seconds every 60-second interval. For momentary outages to zero volts, it provides 3 or 12 cycles (50-200 milliseconds) of recovery. It is the first product of its kind to optimize the amount of energy stored to reflect the characteristics of the utility system. This translates into a distinct competitive advantage and cost effective solution. The DySC has a much larger power to weight ratio, smaller package size, lower cost, and maintenance-free operation compared to other PQ solutions.

How does the DySC™ compare to a UPS?

An **U**ninterruptible **P**ower **S**upply (UPS) protects equipment from voltage sags, momentary power loss and extended power outages for up to several minutes. When the UPS circuitry senses a voltage sag, it transfers the protected load to a battery-based inverter. The UPS supplies power as long as the battery or batteries have stored energy, typically 3-20 minutes. It is difficult to accurately predict battery condition and state of charge, and expensive maintenance contracts are often required to maintain UPS batteries. If batteries need to be recharged, protection will be limited during the process. Battery replacement is expensive and the disposal issues must be addressed.

A comparable UPS is much less efficient and has higher operating costs then a DySC. For all practical purposes, a UPS was designed for constant loads (usually a computer load) resulting in performance limitations with dynamic loads such as large motor starting. Some UPS designs have a square wave output which may not be appropriate for factory automation equipment. A UPS is also much larger in size and weight then a comparable DySC with the same power ratings. Although the UPS is a more mature product, it comes with a higher cost.

A UPS will protect against longer outages than the DySC, however it will not provide 100% coverage. On a normal utility grid, a UPS will protect 96% of all events compared to 92% for the DySC. On a *premium grid* where there are no sustained outages, both a DySC and a UPS will provide 100% coverage.

How does a DySC™ compare to a TVSS device?

A **T**ransient **V**oltage **S**urge **S**uppression (TVSS) device is used to protect equipment from high voltage transients typically bypassing the surge current to ground. A TVSS does not offer any protection against the most common power line disturbances, which are voltage sags and momentary loss of power.

Does the DySC™ have TVSS protection?

Although the DySC is not sold or marketed as a surge suppression device, we supply input and output metal oxide varistors (MOV) on all units. They're specified to

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provide adequate transient protection to the DySC electronics. They are located on the line-to-neutral inputs and outputs and neutral-to-ground output. In addition, the DySC capacitors provide added transient damping. This offers a high level of protection against high voltage transients, and the maximum let through voltages are published on the DySC data sheets.

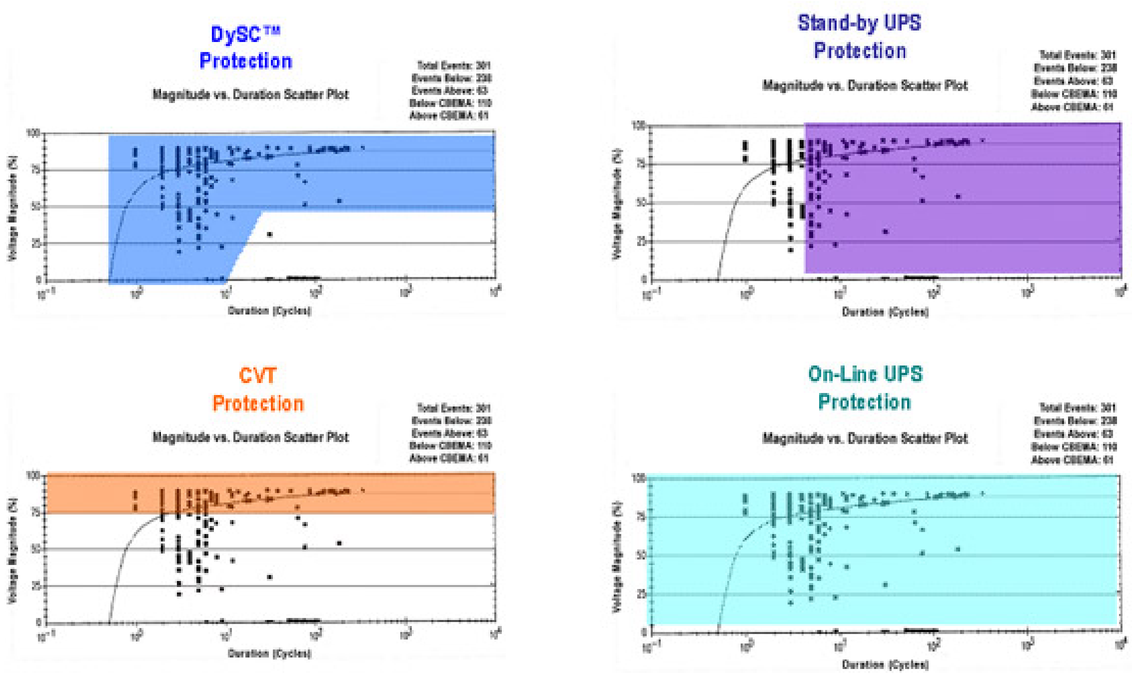
How does a DySC™ compare to a CVT?

A **C**onstant **V**oltage **T**ransformer (CVT) is a mature technology that is simple to apply. A CVT will provide a certain degree of voltage sag protection. Although normally specified over a ±15% input range, the CVT does not stop working outside this range. However for practical reasons if a CVT encounters a voltage sag in excess of 25%, it ceases to give a useful output. It will not protect against deep voltage sags or against momentary or extended power outages. CVTs are less efficient and have higher operating costs compared to a DySC. CVTs also generate more heat, which can cause enclosure heat dissipation concerns that potentially lead to additional space requirements for oversizing the enclosure. In considering equivalent power ratings, a CVT is more expensive than a DySC.

Do "premium" utility connections have voltage sags?

Yes. Many large manufacturing plants have a premium utility connection including redundant incoming lines and/or connection to a high voltage transmission network (>63KV). These facilities rarely experience extended outages as a result of this planning. On the other hand, they experience voltage sags and momentary outages that originate on the utility grid or within the facility. In these applications, the DySC provides comprehensive coverage for the majority of all their PQ events.

Comparing Power Quality Protection Options



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