

ARTICLE

Power Quality – voltage sags



Voltage sags or dips are constant issues even in developed countries with modern power networks

Although outages may not be frequent, the voltage issues caused by network faults, weather, or other power cable events are ubiquitous. With the advent of automation in modern industrial set-ups, the sensitivity of process to power quality events is growing. In fact, even a short event can halt processes unexpectedly and this in turn would lead to production shortages, wastage and product damage.

Voltage is not properly regulated in developing areas or countries with a weak power supply. Without proper voltage, it is not possible to operate the process reliably. In situations where the voltage is unbalanced or low, overheating of motors presents a major concern.

Voltage sags or dips can also be an issue in industrial areas, where a number of industrial sites are located together, even in developed countries with modern power networks. In such scenarios, the clustering of these power

utilizations means if a particular user disturbs the utility voltage it will impact other industries. Faults or weather events in other parts of the utility network can lead to voltage sags well below the nominal value and stay there for a number of seconds. Such fluctuations can stop the operation of sensitive production equipment.

If a manufacturing line stops, it has to be resumed and this can be a complex and costly process. Any damage to the equipment induced by power quality events can prove even more expensive. Moreover, equipment may largely depend on a steady power supply to give a quality end product. Hence, it would be best for companies to invest in equipment so that the risk of uncertain power supply is eliminated and at the same time a steady supply of clean and high-quality power is ensured.

The PCS100 Active Voltage Conditioner (AVC) products developed by ABB perfectly meet these requirements. They are specifically designed to protect industries from voltage events, thus enabling them to carry out their operations without interruption.

ABB stocks a wide range of power protection products and among these the PCS100 AVC product is quite unique. It is specifically designed for commercial and industrial applications and responds quickly to voltage surges and sags, corrects for voltage imbalance, and removes voltage flicker. The PCS100 AVC system includes two converters, which are not on the current path between the utility and the sensitive load. As an alternative, the corrective voltage injection can be obtained with a transformer winding between the load and the utility. This configuration presents an effective method for voltage correction.

The PCS100 AVC system eliminates the use of batteries and draws the extra energy needed to make up the correction voltage from the utility supply. This means, the cost of ownership for PCS100 AVC systems is lower as there are no maintenance costs, which are commonly associated with batteries. In addition, a redundant bypass system integrated in the

PCS100 AVC ensures that the load is constantly supplied from the utility in the event of a fault with the AVC. The PCS100 AVC comes with ratings ranging from 150 kVA to 3 MVA, realized in a low-voltage switchgear cabinet. The system provides high scalability in terms of power and voltage level as well as online voltage regulation in less than two milliseconds. It includes advanced control software, a reliable converter platform, and offers 99 percent efficiency.

The PCS100 AVC product range includes two models: the PCS100 AVC-20 for constant voltage regulation and the PCS100 AVC-40 for sag correction. Each system is designed to resolve different types of power supply issues.

To find out more about ABB's power protection solutions:

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