



Cross currents

FEBRUARY, 2008

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elmex & econix AT ELECRAMA 2008



Team elmex created an award winning stall this year with an overwhelming response from visitors...



econix SPDs : Surge Protective Devices

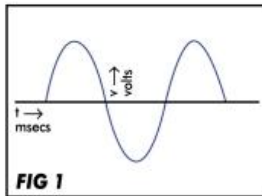


FIG 1

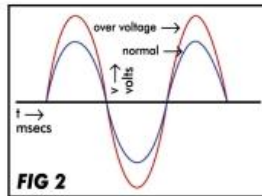


FIG 2

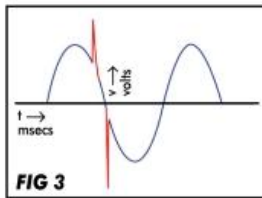


FIG 3

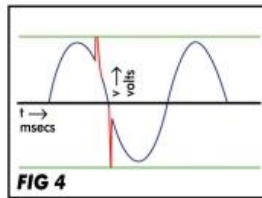


FIG 4

FIG 1 : Normal Supply Waveform (blue); **FIG 2** : Steady State over voltage (red); **FIG 3** : Transient over voltage (red); **FIG 4** : Expected clamping to protect equipment (green lines).

Industrial growth and modernization during last decades has seen control electronics and automation rising to high degrees of accuracy and sensitivity, simultaneously pushing component sizing to new levels of miniaturisation.

However, high sensitivity and miniaturization also cause severe stressing of electronic systems due to electrical supply system disturbances, chief among them are over voltages. These occur not only in Industrial automation and controls for processes and machines, but also in consumer electronics applications, such as computer systems and entertainment electronics sectors.

It is therefore very essential for the users in all above sectors to understand the nature and causes of system over voltages, their effects on the equipment and the means necessary to protect the equipment from the over voltages.

The present issue deals with the first part of the problem namely nature, causes and effects of over voltages. The second part in the forthcoming issue will be devoted to the protective devices for voltage surges.

Types, Nature and Causes of Over Voltages

There are two types of electrical supply system over voltages:

- Steady State Over Voltages (SsOV) - (FIG 2) and
- Transient Over Voltages (TrOV) - (FIG 3)

The Steady State Over Voltages are power frequency over voltages, generally caused when voltage and frequency control of Power System gets disturbed until it is regulated again, or due to sudden load throw-off. Electricity supply authorities control these voltage changes through various means such as tap changers etc. Modern users protect their equipment through the use of uninterrupted power supplies, servo stabilizers and other solid state devices.

Transient Over Voltage

The TrOV are more frequently caused by switching operations taking place in electrical system. When an equipment is switched off, the inductive energy in the system cannot dissipate instantly and converts itself into a transient over voltage lasting a few to several milliseconds. Unless suitable protective device is employed to discharge this energy safely, it will affect the components in electrical system, and more particularly electronic systems, which are sensitive to voltage surges.

Protection against transient over voltages is necessary for domestic appliances also, since air conditioners, microwave ovens, motor-loads, geysers etc., can cause switching transients, affecting LCD television, music systems, personal computers and so on.

Effect of TrOV

Transient Over Voltages, unless taken care of, can result in:

Disruption, Degradation and Damages.

Disruption : The logic and analogue levels of electronic systems are disturbed, resulting in malfunctioning of the equipment, such as: malfunctioning of control logics, leading to mechanical breakages, loss of data, software corruption, terminal crashes, tripping of RCDs etc.

Degradation : There is apparently no effect following one or few incidences, particularly when severity is low, that is, both the voltage and the frequency of TrOV are low. However frequent exposure to such TrOVs will reduce electronic component/equipment life and lead to eventual failure, apparently with no assignable cause.

Damages : TrOV of higher magnitude result in damage to components, circuit boards and I/O modules. Circuit boards can burn out due to severe TrOV. High voltage and low frequency transients, as well as high frequency and low voltage transients are equally damaging for the electronic components.

Transient Over Voltages can eventually result in production losses or even complete loss of equipment, to the industry employing modern control and automation system. In commercial and domestic sectors using electronic products, it can result in breakdowns and cost of repairs, or complete loss of equipment.

Installing protection against TrOV

Protective devices to take care of TrOV can be installed for individual sources of transient over voltages, or for individual equipment to be protected.

The sources of TrOV are numerous, namely electrical supply lines as well as data lines, communication cables etc., where ever inductive switching can occur. It is therefore customary to install surge protection on input lines (one source of TrOV) especially at the supply mains to factory or its shops, and also on each equipment individually, so that entire system TrOV are taken care of.

econix Surge Protective Devices : **econix** offers excellent solution for protecting all electronic equipment against transient over voltages. It is named **ECTRATECH** - **econix** Transient Assimilation Technology. It is a Surge Protective Device (SPD), which has infinite impedance for normal voltages and very low impedance for transient over voltages, so that the surges are easily discharged (or clamped, FIG 4). The response time is in nano seconds, for surges having rise time in milliseconds, so that the surge is effectively discharged much before it can affect electronic equipment.



In the forthcoming issue we shall discuss applications, features and range of **econix** Surge Protective Devices (SPD) for electronic equipment.

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Efforts of team **elmex** were richly awarded when our stall received the above Certificate for the Best Stall in the 75 sqm category. Over the years, this is our second award at ELECRAMA.



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Our Executive Director, Mr. Dilip Trivedi chaired the Low Voltage Switchgear session at Swicon 2008. Mr. Trivedi has an in-depth and wide ranging experience in the field of LV Switchgear. Team **elmex** is proud of his contribution and guidance at **elmex**.

As a token of appreciation towards conducting the session, technical Committee Chairman Mr. Tungare (Siemens - India) presented a memento to Mr. Trivedi.



**MIDDLE EAST
ELECTRICITY**
Exhibition & Conference
FEBRUARY 2008, DUBAI

elmex displayed a whole range of innovative products at the Middle East Electricity International Exhibition held at Dubai between February 10 to 13, 2008 at Zabeel Hall, Indian Pavilion, Stall # ZV 38.

elmex participates at important National and International Exhibitions to raise customer awareness.

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We welcome your suggestions and queries regarding our products and feedback about CROSS CURRENTS. Write to us at ask@elmex.net



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