

TRANSIENT VOLTAGE SURGE SUPPRESSION

The ever increasing demands for IT infrastructure and process control have resulted in the proliferation of sensitive electric equipment. Unfortunately, the quality of electrical power being supplied has not improved to accommodate the needs of this equipment.

Often, mistakenly, it is assumed that equipment connected through a UPS is immune to voltage transients as the output of the UPS is effectively de-coupled from the input voltage. Whilst this is true to a degree, severe transients can still migrate their way through the rectification / inversion process. The mal-operation of electronic equipment is frequently blamed upon poor software or hardware issues. In reality, a significant number of these events are caused by high frequency voltage transients appearing on the power supplies of electronic equipment. These transients can result in rogue digital signals which can cause software to hang or hardware to reset. Unless actual physical damage occurs to equipment the supply is rarely blamed. Unpredictable behaviour of equipment can, in many cases, be just as costly as equipment failure.

Voltage transients are generally external system events such as lightning strikes, grid switching, capacitor switching or faults although internal switching events can cause voltage transients. Traditional lightning protection in the form of lightning conductors are design to protect the building itself. Direct lightning strikes or induced lighting strikes will still result in potentially damaging transients being imposed upon the load.

Figure 1 shows a typical surge arrester scheme for an installation containing items of sensitive plant. The main incoming arrester is designed to absorb very high energy voltage transients. The trade off with such arresters is that they have a reasonably high let-through voltage which can still result in mal-operation and even damage to sensitive equipment. Often the main incoming surge arrester is the only one installed, which in some applications is all that is required but in others further more sensitive surge arresters need to be installed closer to the sensitive equipment.

Figure 1 shows a discriminated surge arrester scheme with lower energy surge arresters protecting the sensitive equipment, effectively mopping up the transient that is let through by the main surge arrester. The surge arrester on the output of the UPS is sometimes not included but is recommended in most cases.

PFC Engineering can offer a full surge arrester survey, design and installation service that will be tailored to the specific needs of a client's power system

PFC Engineering also offers a full harmonic analysis, design and installation service for active harmonic filtration systems, drawing on 35 years of power quality experience to provide an optimal harmonic filtering solution tailored to the sites specific needs.

A vertical photograph on the right side of the page shows a close-up of electrical hardware. It features a large, cylindrical metal component, possibly a surge arrester or a capacitor, with a red indicator light or window. The background is dark and out of focus, showing other parts of the equipment.

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PFC Engineering
Station Road
Great Chesterford
Essex CB10 1NY

t: 01799 530728
f: 01799 530235
e: info@pfc-engineering.com
w: pfc-engineering.com

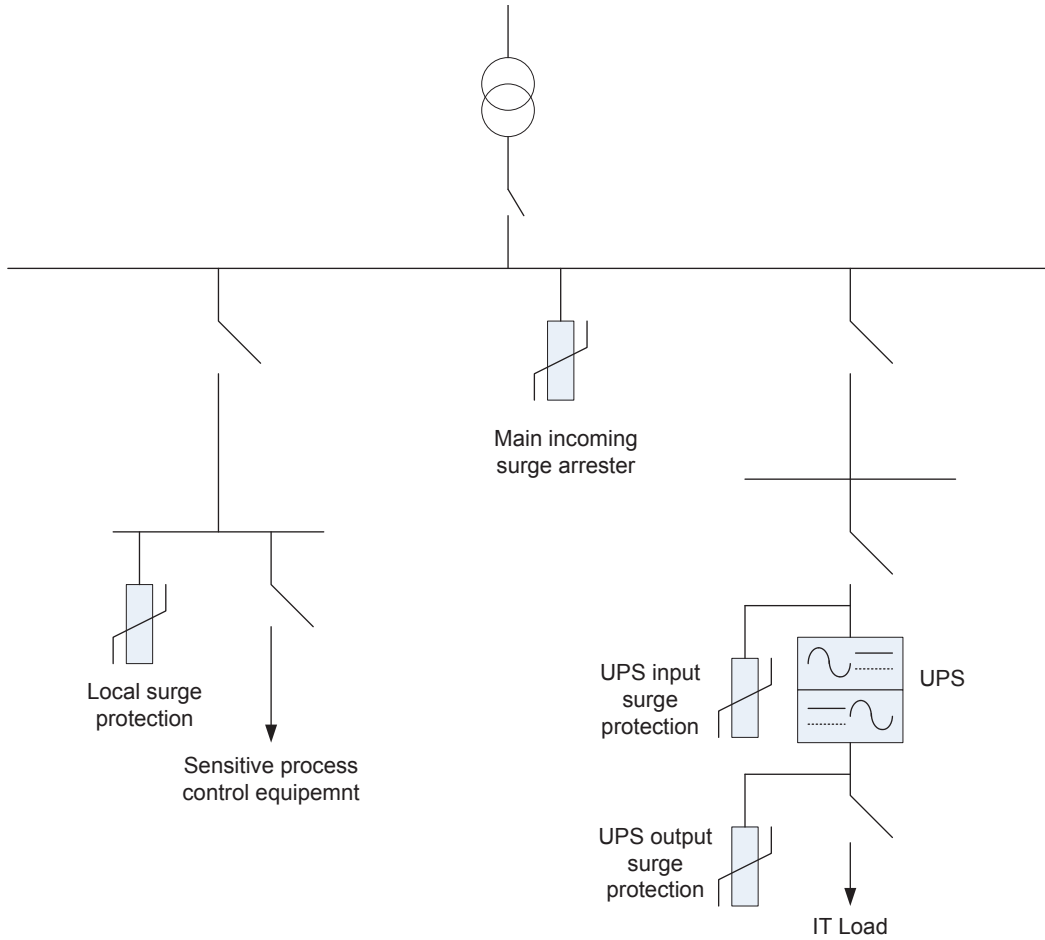


Figure 1: Typical surge arrester scheme

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