



Integral vs. Non-Integral Surge Protection

With the application of Surge Protective Devices (SPDs) becoming more commonly specified and, in many cases, mandated by either the owner or the engineering firm responsible for the facility, there is a question regarding the merits of integral vs. non-integral installation. A relatively short time ago, switchgear manufacturers did not offer surge protection in their product catalogs. As these manufacturers became aware of the benefits of surge protection and to increase their profit margins, they began to buy up independent SPD manufacturers and incorporate surge protection into their gear.

Ref. Standards:

UL 1449 4th Ed.
UL 1283 5th Ed.
C62.41.1: 2002 IEEE
C62.41.2: 2002 IEEE
C62.45: 2002 IEEE
C62.62: 2010 IEEE
C62.72: 2007 IEEE
NEMA
NEC 2014
NFPA 70
FIPS 94
MIL-STD 220A

Switchgear manufacturers touted the following benefits with integral installations:

- Simplified specification requirements
Reality: Sole source and lower performance
- Lower installation costs
Reality: Actual cost is higher, buried in total electrical gear package
- Shorter lead lengths which improves product performance
Reality: Phase conductors short but often diversion paths (neutral and ground connections) are longer

When one manufacturer acquires another, it is not unusual for them to “value engineer” the new acquisition as a means of increasing profitability. This normally leads to making the products less expensive to manufacture and, in some cases, a lessening of quality and performance. In addition, it is not uncommon for these types of Surge Protective Devices (SPDs) to be integral to the panel or switchboard.



Modular Series TSr 300

(Mounted on top of Service Entrance Switchgear)
Improved Accessibility & Status Indication

If a surge device which is integral to the electrical distribution switchgear fails, the entire system must be shut down and often completely replaced. New arc flash regulations make any necessary repairs both costly and cumbersome. Manufacturers of non-integral Surge Protective Devices (SPDs) typically have more experience and history in the industry, often offering products with improved performance and customer value.

The benefits of using stand-alone (non-integral) UL 1449 4th Edition SPDs are:

- Arc flash concerns are eliminated;
- The cost can be substantially less than the integral cost;
- SPD manufacturers can offer a full assortment of options which are not always available from the gear manufacturers;
- Devices can be readily added to existing equipment without requiring facility modifications or expensive redesign;
- SPD manufacturers normally provide their more robust systems in lieu of “value engineered” products for integral assimilation into gear.

We would like to become an information resource for surge protection applications. THOR SYSTEMS offers products and services that provide protection from the more *obvious external* to the more *frequent internal* transient voltage sources.

Ref. Documents:

TSI 068UL 1449 3rd EDITION CHANGES
TSI 068 Product Overview
TSI 056 Concerns of TVSS Integral to Switchgear & Panelboards
TSI 101 Suggestions to Update Specs to UL 1449 3rd Edition

Should you have any questions, please feel free to contact us (804.355.1100) or visit our Web site, www.ThorSystems.us.