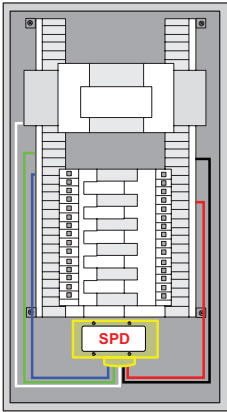


Internally Mounted versus Externally Mounted Surge Protective Devices

A Comparison of the Advantages and Potential Disadvantages



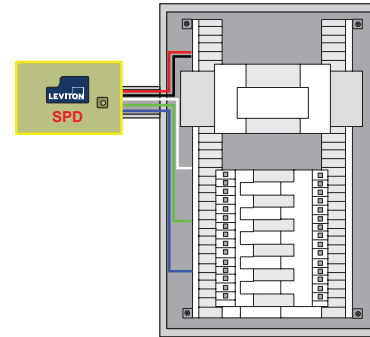
Internally Mounted SPD (Shown below in yellow)



Internal SPD lead lengths are typically 10-12 inches to each phase, 10-12 inches to the neutral and 6-8 inches or less to the ground terminal.

In some cases, internally wired surge protective devices actually have longer leads vs. externally mounted surge protective devices.

Externally Mounted SPD (Shown below in yellow)



External SPD lead lengths are also typically 10-12 inches to each phase, 10-12 inches to the neutral and 6-8 inches or less to the ground terminal.

Shorter lead lengths mean lower measured limiting voltage.

The measured limiting voltage is the residual let-through voltage, usually tested with an 8/20 waveform.

ADVANTAGES

Space Savings: Since the surge components are incorporated into the electrical panel enclosure, no surrounding wall space is needed for external mounting.

Single Vendor: Both the electrical panel and the SPD could be supplied by one vendor, potentially via one part number.

DISADVANTAGES

Risk of Downtime: If surge protective device requires maintenance due to MOV failure from a lightning strike, temporary overvoltage (TOV) or any other issue, the entire electrical panel bus would need to be switched off resulting in facility downtime. If the electrical panel bus must be kept live while performing the SPD maintenance, an electrician certified to work on a live bus would need to be called in and would be required to wear a protective arc flash suit.

Significant Risk of Conductive Residue: In certain instances, an MOV failure within a surge protective device will produce smoke (see above) that can deposit a layer of conductive residue within the panel. This conductive residue has been found to increase the risk of arc flash during maintenance.

Risk of Collateral Damage to Electrical Panel: If an extreme surge event occurs, the SPD could potentially combust, causing critical damage to other components within the electrical panel, disrupting power to the entire facility.

Limited Space Restricts Feature Options: Because internally mounted SPDs are subject to the space constraints of the electrical panel, they typically do not offer desirable feature options such as increased surge rating, surge counters, or integral disconnects.

No Visual Indicators to Verify Surge Protection Status: Since the SPD is within an electrical panel enclosure, there are no external indicators to verify surge protection status. Consequently, in the event of a problem, there is no way to visually warn users that the SPD needs to be repaired or replaced, putting downstream equipment at risk.

ADVANTAGES

Easy to Maintain in “Always On” Environments: An externally mounted Surge Protective Device can be connected to the panel via a standard circuit breaker. In the event that the surge device requires maintenance or replacement, the breaker is simply switched off with no impact to facility power.

Limited Risk of Conductive Residue: In certain instances, an MOV failure within a surge protective device will produce smoke. An externally mounted SPD keeps the resulting conductive residue away from critical electrical panel components, thereby reducing the risk of arc flash and facility downtime.

Isolates the Damage, Protecting your Electrical Panel: If combustion occurs due to an extreme surge event within an externally mounted SPD, the resulting damage is contained within the SPD enclosure. This protects the electrical panel components from potential damage and reduces the risk of facility downtime.

Additional Space for Increased Feature Options: Because externally mounted SPDs are not limited by the space constraints of the electrical panel, there is additional space for desirable feature options such as increased surge rating, surge counters, and integral disconnects.

Visual Indicators to Verify Surge Protection Status: A key benefit of external SPDs is that they can provide visual surge protection status indicators verifying that the unit is operating properly and protecting downstream equipment.

DISADVANTAGES

Requires Wall-mounting Space: An externally mounted surge protective device requires space for mounting adjacent to the electrical panel.