

Surge Protection for Automatic Transfer Switches

Best Practices Overview



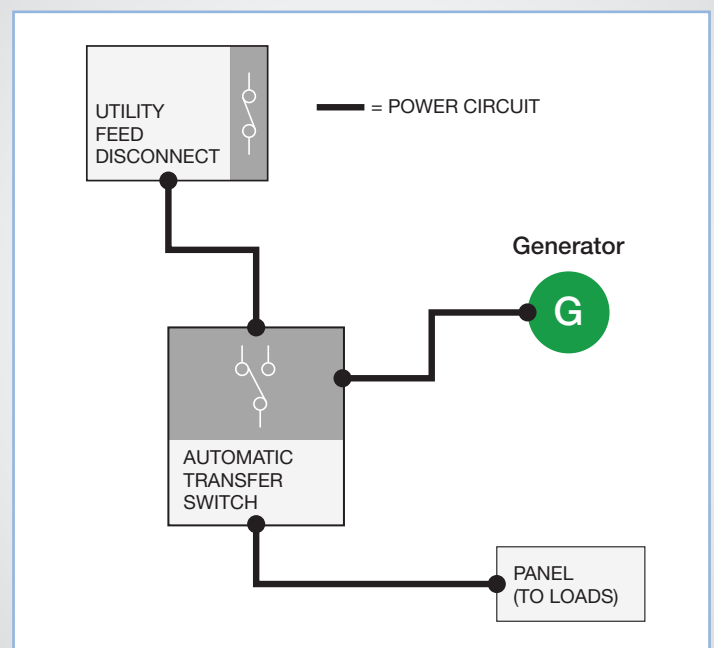
Install Multi-Point ATS Surge Protection from **Intermatic**

The purpose of an automatic transfer switch (ATS) is to automatically start a backup generator when normal utility power fails, switching the power source from the utility feed to the generator feed. To accomplish this, the ATS is equipped with electronic circuits that monitor the utility feed, control the starting mechanism of the generator, and control the switch that transfers the power source from the utility feed to the generator feed. When the utility feed comes back online and is stable, the ATS transfers the load back to the utility feed.

The electronics within an ATS are susceptible to the surge environment at the service entrance location where the ATS is installed. Power surges from the utility feed due to lightning, load switching, etc., can negatively impact performance and even cause premature ATS failures, rendering the system useless. Similarly, when a generator starts up, the voltage may not be stabilized at the instant the ATS makes the transfer. This initial surge of not-yet-unregulated power can damage electronic systems.

However, surge protective devices (SPDs) can reduce the risk of these issues. This overview focuses on applying SPDs to an ATS system to help mitigate damage that can occur due to expected surge environments.

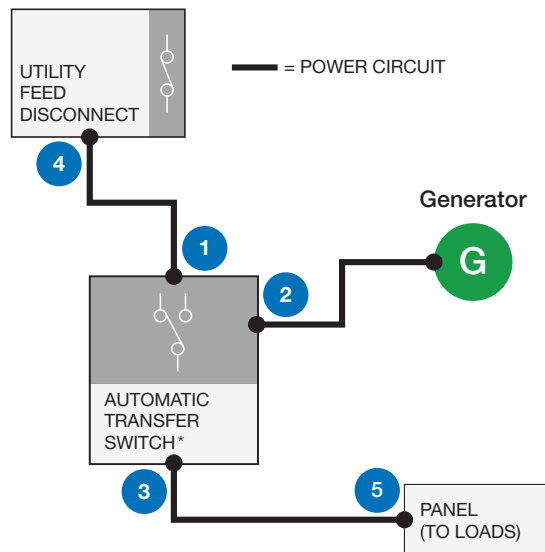
Diagram of a Typical ATS Layout*



ATS Points of Protection

Installation Best Practices and Product Recommendations

One Line Diagram of a Typical ATS Layout*



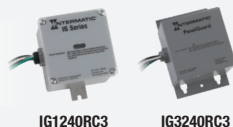
*ATS panel may not accommodate an SPD installation. Check with ATS manufacturer specs to ensure properly-sized knockouts and locations can accommodate the installation.

1. Utility Feed to the ATS

Installing surge protection at the utility feed to the ATS can prevent surge damage from upstream sources, such as lightning and switching surges created by the utility system operation.

Electronic circuitry is often included on the utility side of an ATS. These circuits require protection to ensure proper operation.

Recommendation: Install an outdoor-rated Type 1 SPD



2. Generator Input to the ATS

It's critical to protect the generator input to the ATS. This is especially true when the distance between the generator and the ATS exceeds 30 feet or has external/exposed wiring. In these cases, the ATS is unprotected to nearby lightning events to the wiring between the ATS and generator and to nearby lightning events to the ground or structures near the wiring.

Protection against surges is recommended for this location due to the presence of switching transients that often propagate between the generator and ATS.

Recommendation: Install an outdoor-rated Type 1 SPD



3. ATS Output

Adding surge protection to the immediate ATS output is highly recommended. This is because the wiring on an ATS's output is often routed outdoors and can be exposed to nearby lightning strikes through the ground or structures near the wiring.

Surge protection is recommended at this location due to the presence of switching transients that can propagate between the ATS and the loads connected to its output.

Recommendation: Install an outdoor-rated, Type 1 SPD



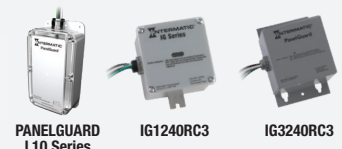
4. Utility Feed Disconnect

Protecting the utility disconnect feed helps safeguard the ATS (if a disconnect is present within the system).

Installing an SPD at this location offers additional layers of protection. With this approach, the SPD on the utility feed disconnect absorbs the largest portion of incoming surges and limits the exposure to the SPD, protecting the ATS utility input.

The result is that the voltage to which the ATS is exposed is reduced, which lessens the chance of failure or disruption to the larger system. The need for Type 1 surge protection at this location is increased if the distance between the utility feed disconnect and the ATS is greater than 30 feet or if it has external wiring.

Recommendation: Install an outdoor-rated Type 1 SPD



5. ATS Feed to Main Entrance to Breaker Panel

Installing an SPD at the main electrical panel is a critical step in protecting downstream loads in the building.

Placing an SPD at this location creates layers of protection for downstream loads.

Although this location is outside the scope of the ATS system, it is still important to account for it. Protection at this location is even more essential when the distance between the ATS and the loads exceeds 30 feet or has external wiring, as lines may be exposed to nearby lightning events.

Recommendation: Install a Type 1 or Type 2 SPD in this location (indoor- or outdoor-rated)



NEC Code Standards to Safeguard Dwelling Units

- The National Electrical Code has always contained requirements that protect buildings and people from the risks associated with electrical systems. This new code requirement will protect electrical devices and appliances that may not be protected by point of use SPDs.
- The code enforces usage of SPDs to protect against transient voltages, which can often damage sensitive electronics in life-saving devices such as fire detection and notification equipment.
- **NEC 2023 section 230.67:** New and replaced service equipment supplying all dwellings are now required to be protected by listed TYPE 1 or TYPE 2 Surge protective Devices.
- The location of the SPD shall be an integral part of the service equipment or located immediately adjacent to it.



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