

Re: Fuse and Circuit Breaker Replacement

An ESA incident investigation in 2023 found that an electrician replaced a fuse but did not confirm it was fully seated before re-energizing the switch with the enclosure door open. The loose connection created an arc flash, exposing the worker to serious injury.

The incident is a reminder that replacing an overcurrent device isn't just about matching the amp rating. Before replacing or resetting an overcurrent device, it is recommended to determine why it operated and correct the underlying cause. Selecting the right device, installing it correctly and securing the enclosure before restoring power can help prevent shock, arc flash and equipment damage. Although fuses and circuit breakers serve the same purpose, each has unique installation and compatibility requirements. Taking the time to verify the replacement device can help prevent serious incidents.

Replacing a fuse

Selecting the correct fuse is only part of the process. The condition of the equipment and proper installation are just as important.

- Follow your approved de-energization, lockout, testing and re-energization procedures.
- Verify the replacement fuse matches the equipment requirements, including amperage, voltage, class/type, time-delay characteristics and interrupting rating.
- Check the manufacturer's instructions and equipment markings before selecting a replacement.
- Inspect fuse clips and holders for wear, looseness, contamination, overheating or damage.
- Ensure the fuse is fully seated before closing the enclosure and reenergizing



Fuses may look similar, but they differ in size, class and interrupting rating. Always install the exact fuse specified for the equipment.

Replacing a circuit breaker

Replacing a circuit breaker involves confirming both the device and the equipment are suitable for one another. The following checks can help ensure safe installation.

- Confirm the replacement breaker is approved for the specific panelboard.
- Verify the breaker's ampere, voltage, pole configuration and interrupting ratings are appropriate for the application.
- Confirm the device is a circuit breaker, not a supplementary protector or rated disconnect.
- Inspect the panel bus and enclosure for damage, install the breaker according to the manufacturer's instructions and follow approved re-energization procedures.



Replacing a circuit breaker with the above depicted device removes critical overload and overcurrent protection. As a result, conductors and electrical equipment may overheat or fail violently, increasing the risk of personal injury, electrical fires and significant property.

Key Takeaway

Replacing an overcurrent device is more than a like-for-like swap. Before restoring power, verify the replacement device is compatible with the equipment, correctly selected for its intended use, properly installed and the enclosure is fully secured.