

ARCTEQ INNOVATION:

The standard-complying, resettable arc quenching device

ARC FLASH INCIDENTS

Arc flash faults are the most devastating types of faults known in power distribution systems. Arc flash incidents in MV and LV air-insulated switchgear and controlgear are known to cause several injuries and fatalities every year, mainly by causing burns in the second and higher degrees. Arc flash faults also cause severe equipment damage, leading to time-consuming repairs and extended power outages.

Arc flash has been the subject of intense study in the past decade. Standards (such as IEEE 1584 and NFPA 70E) have quantified that the incident energy of an arc flash is directly proportional to the system voltage, the fault current as well as –most critically– how long the fault persists.

LIMITING THE ARCING TIME

Arc flash protection relays based on light and current detection have been applied to both MV and LV systems since the 1980s. Combining a fast-acting circuit breaker and a trip time that is as fast as 2 milliseconds typically provides a total clearing time of 5–8 cycles. This significantly reduces the amount of incident energy when compared to traditional overcurrent-based protection.

To overcome the limitations caused by a circuit breaker's opening time Arcteq has developed arc quenching devices for both MV and LV systems. Arcteq's arc quenching devices are an excellent addition to the well-proven AQ 100 arc flash protection relay system. The operation of an arc quenching device begins when it receives a triggering signal from a connected arc flash relay. Next, it creates a low-impedance path for the fault current to flow through by closing the three phases together. The system voltages drop, and the fault is extinguished within 4 milliseconds from its initiation.

HARDENED, RESETTABLE AND ULTRAFAST

Arcteq arc quenching devices are fully resettable, and the system can be tested (and its operation time verified) both at the factory and on-site. A total arcing time of 4...5 milliseconds typically results in energy levels below 1.2 cal/cm². This ultrafast protection reduces system repair time from days and weeks to hours. The quenching devices are designed and built for heavy-duty use, and they are rated for fault currents of up to 100 kA to suite every application.

FOR LOW- AND MEDIUM-VOLTAGE SYSTEMS, FOR RETROFIT AND NEW INSTALLATIONS

Arcteq offers arc quenching solutions for both low- and medium-voltage applications. AQ-1000 is rated up to 690 V and can withstand 100 kA fault currents, whereas the stronger of the two SIQuench variants rates up to 24 kV and can withstand 50 kA fault currents.

A quenching device can be installed in either new or existing panels. Retrofitting the quenching device in an existing lineup is often an efficient way to prolong the switchgear's lifetime. Each busbar section requires one device, which is mounted in the most practical location within the switchgear. Typical locations include the voltage transformer compartments in medium-voltage applications and the incoming sections in low-voltage applications. When installing an arc quenching device, it is essential to ensure that the operation happens within the power system ratings.

NEW STANDARDS BY IEC AND UL

The first arc quenching device standards have been released for low-voltage applications. Arcteq's AQ-1000 arc quenching device has been successfully tested in accordance with the **UL 2748** standard ("Standard for Arcing Fault Quenching Equipment"). Additionally, AQ-1000 also complies with the newly released **IEC 60947-9-1:2018** arc quenching device standard.

Arcteq products are also an easy way to fully meet the new **IEC TS 63107** standard on the integration of internal arc fault mitigation systems in power switchgear and controlgear (PSC) assemblies. As a pioneer in arc flash systems, we provide products which can be integrated with any PSC assembly according to the latest standards and regulations.

Unlike other arc quenchers on the market, AQ-1000 and SIQuench can be fully commissioned.



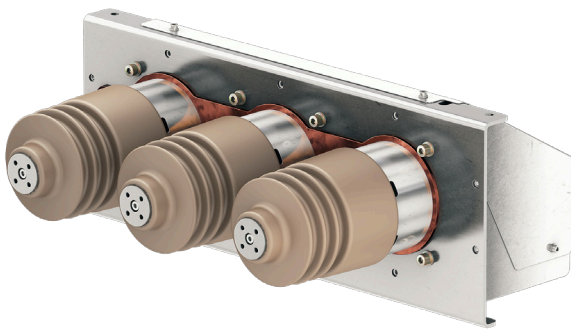
AQ-1000 arc quenching device

TECHNICAL SPECIFICATIONS



AQ-1000

- Maximum rated voltage: 690 V
- Auxiliary power supply: 85...265 V AC/DC or 18...72 V DC
- Binary input threshold voltage: 24 V DC
- Short-circuit withstand (IEC 60947-9-1/UL 2748): 100 kA for 200 ms, 50 kA for 1 s
- BIL: 12 kV
- Electrical life: 2 operations at 100 kA, 200 ms each
- Mechanical life: 100 operations
- Total system operating time: 4 ms



SIQUENCH 3AM4132

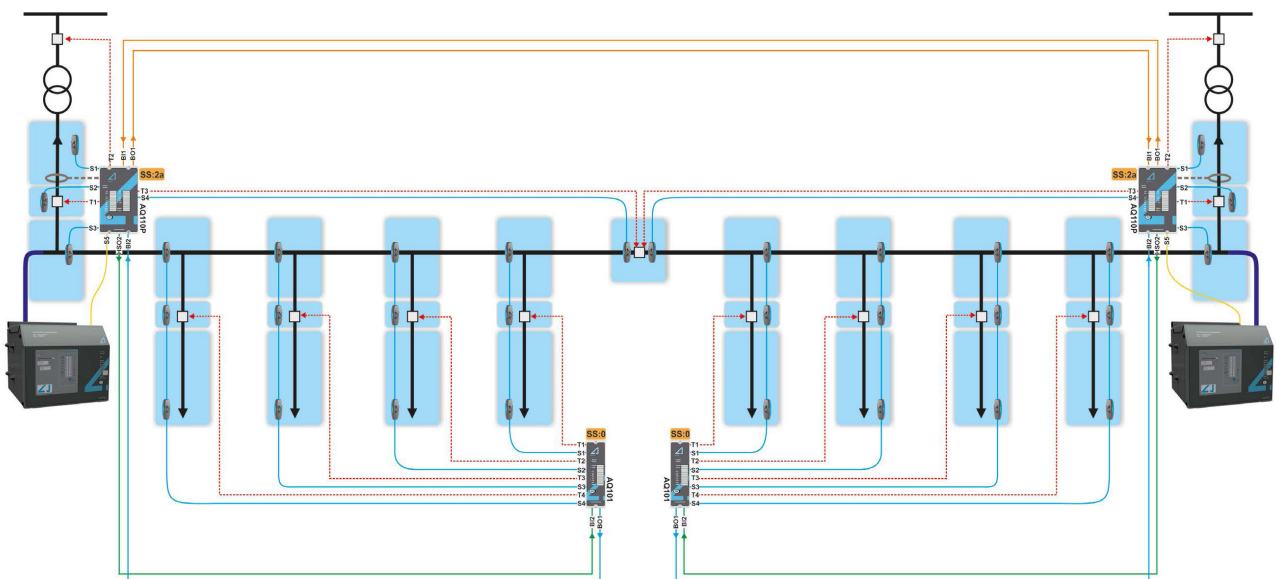
- Maximum rated voltage: 17.5 kV
- Short-circuit withstand: 31.5 kV for 3 s
- BIL: 95 kV
- Phase conductor displacement: 170 mm (total: 580 mm)
- Electric life: 5 operations below fault current
- Mechanical life: 30 operations

SIQUENCH 3AM4143

- Maximum rated voltage: 24 kV
- Short-circuit withstand: 50 kA for 3 s
- BIL: 125 kV
- Phase conductor displacement: 210 mm (total: 740 mm)
- Electrical life: 5 operations below fault current
- Mechanical life: 30 operations

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APPLICATION EXAMPLE:



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