

ELECTRIFICATION SERVICES

# Medium voltage load interrupter switch retrofit

Arc flash mitigation solutions for existing equipment



# Medium voltage load interrupter switch retrofit

ABB's medium voltage load interrupter switch (LIS) retrofit solution reduces arc flash incident energy levels for existing medium voltage equipment.

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01 A separate low voltage door permits access for breaker operation without the need to open the high voltage compartment

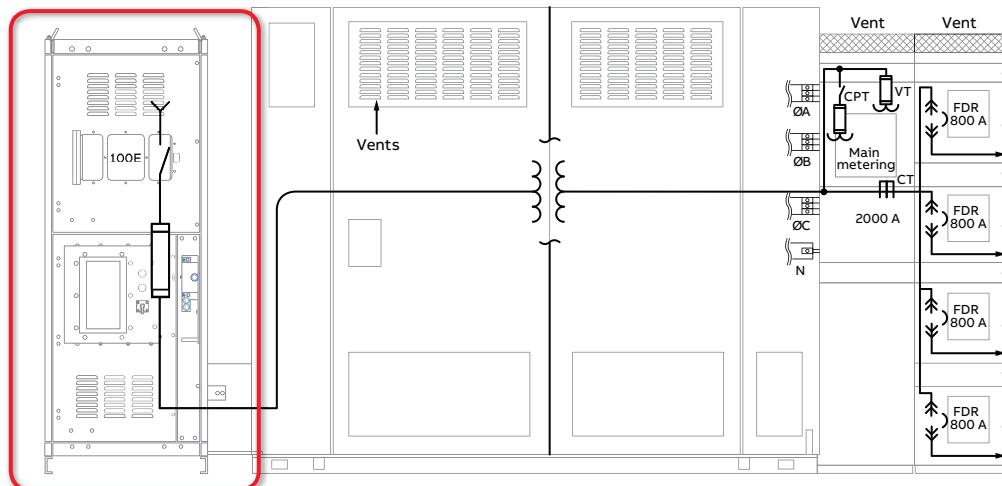
For facilities concerned with arc flash safety standards, the options may seem daunting and the costs out of reach. The fuses used by LIS to protect the transformer in an overcurrent situation are no longer adequate. Existing LIS may provide poor fault current interrupting times, resulting in high arc flash incident energy.

ABB's solution retrofits a fixed mounted ABB vacuum circuit breaker (VCB) into the fused compartment of the LIS. Operating in three cycles, the fast-acting VCB is superior to fuses and provides a new arc flash mitigation solution designed in response to current arc flash safety standards.

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With modifications, ABB can also provide retrofits to LIS made by other manufacturers.

The medium voltage LIS retrofit solution delivers safety and flexibility to existing equipment, offering:

- Reduced arc flash levels from the transformer down to the low voltage system
- Transformer protection via the latest relay technology (bus and transformer differential protection)
- Added transformer protection via an optional snubber application
- Relay options that provide upstream and/or downstream communications
- Retrofitting into existing LIS enclosures
- Minimal downtime for installation and commissioning (approximately 8–12 hours)
- Added reliability and quality of a fast-acting, 3-cycle vacuum circuit breaker with embedded pole technology
- Separate low voltage door for access during maintenance — without the need to open the high voltage compartment



02 Relion® relay

03 ANSI magnetic mechanism vacuum circuit breaker

**VM1 circuit breaker for quality protection**

The VM1\* circuit breaker is a three-phase AC indoor circuit breaker with 15 kV rated voltage. It controls and protects electrical equipment in industrial and mineral applications and in power plants and substations. Durable and reliable, the VM1 is especially suited for conditions that require frequent operation.

The ABB magnetically actuated design offers superior performance with minimal maintenance. Embedded pole technology simplifies pole assembly and provides increased assembly accuracy and quality. Embedded pole technology also improves the environmentally resistant capability of the breaker. The primary circuit is completely embedded in epoxy resin, helping minimize the risk of insulation fault caused by operating environment conditions such as dust, humidity, vermin, polluted ambient and high altitudes.

**Differential relay options**

The medium voltage LIS retrofit features Relion® relays. If required, customer-specified relays may be used as an alternative.

**Circuit breaker rating tables**

Rated voltage, kV	Up to 15
Frequency, Hz	50 / 60
Rated current, A	1200
Rated power frequency withstand voltage (1 min), kA	38
Rated lightning impulse withstand voltage (peak values), kV	95
Rated short circuit breaking current, kA	31.5
Rated short time withstand current (3 sec), kA	31.5
Rated peak withstand current, kA	82
Close and latch rating	82
Operating sequence, kA	10,000 operations
Rated auxiliary control voltage, V	30–50 V DC or 100–250 V AC/V DC
Opening time cycles	3
Closing time, ms	45–60

**Standards and approvals**

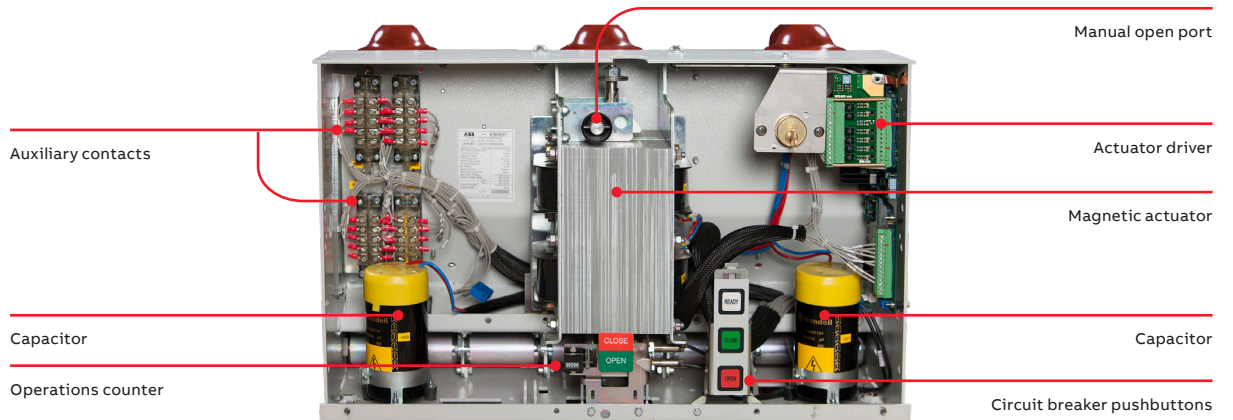
American National Standards Institute (ANSI) applicable sections of:

- ANSI/IEEE C37.20.3, C37.20.4, C37.22 — as existing and installed
- IEC-62271-200 standard
- National Electrical Code (NEC)

\* VM1 standard offering is magnetically actuated; an alternative spring-charged circuit breaker solution is available



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**ABB Inc.**

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