

ArcLimiter™

Arc flash mitigation solution for low voltage equipment using UFES



The industry is facing internal and external deadlines to perform arc flash (AF) mitigation within their facilities. ABB now offers an arc flash mitigation solution for low and medium voltage equipment that is unique in the industry - the ArcLimiter™, using ultra-fast earthing switch (UFES) in combination with fuses, improves the power quality for upstream processes during mitigation.

Other industrial solutions include replacing existing MV fused load interrupter switches with metal-clad switchgear, and adjusting protective relay time dials to act faster during an arc flash event. These solutions do not cover the zone between the transformer secondary and the line side of the LV breaker.

During an arc flash event, the ArcLimiter solution places zero volts (4 ms operating time) on the transformer primary extinguishing the LV arc flash in microseconds. There is no need to replace the existing MV fused switch or adjust relays. Simple analysis on low voltage systems (480 V and 600 V), based on IEEE std 1584, the arc flash calculation standard, shows that even with 60 kA available, incident energy can be reduced to 1.2 cal/cm². This brings the hazard risk category (HRC) to zero.

The ArcLimiter solution is appropriate for:

- Light industrial
- Commercial facilities
- Educational campuses
- Any facility using primary loop fed transformers with fused switches, and new or existing applications

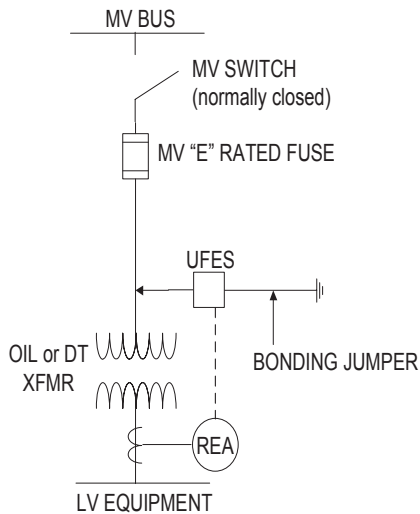
Many of these facilities may currently have MV to LV transformers (750 KVA – 5000 KVA) protected by:

- A MV power circuit breaker with protective relays
- A load interrupter fused switch

The ArcLimiter solution is primarily appropriate for applications with MV fused switches, and can be applied at any location between the fuse's load side and the transformer's primary connection. Since the UFES operates in 4 ms, operating speed becomes the critical parameter. The magnitude of the LV fault level becomes a secondary consideration.

For new systems, ABB offers the ArcLimiter as an option. For existing systems, MV Service can retrofit the ArcLimiter with full commissioning, paired with the REA system performing light and current sensing.

01 The UFES solution is appropriate for applications with MV fused switches



Benefits

- Greatly increased system and process availability by avoidance of heavy damages inside the switchgear, the equipment and the direct environment
- Reduction of downtimes and repair costs
- Increased operator safety
- Minimization of pressure rise and gases in the faulty compartment and surrounding switchgear building
- Reduction of Voltage Dip duration as seen by upstream devices during fault clearing

UFES available ratings

UFES primary switching element type U1 (electrical maximum characteristics for each voltage category-differen types available)					
Rated voltage (rms)	kV	1.4	17.5	27	36
Rated power frequency withstand voltage (rms)	kV	5	42	60	70
Rated lightning impulse withstand (peak)	kV	12	95	150	170
Rated frequency	Hz	50/60	56/60	50/60	50/60
Rated short-time withstand current (rms)	kA	100	50	63	40
Rated peak withstand current	kA	220	130	165	104
Rate duration of short-circuit	s	0.5	3	2	3
Rated short-cicuit making current	kA	220	130	165	104
Mechanical properties					
Dimension (diameter x height)	mm	-137 x 210			
Closing time	ms	< 1.5			
Contact bounce time	ms	0			
Service life expectation					
Number of closing operations		1			
Mechanical	years	up to 30			
Micro gas generator	years	up to 15			

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