

Alternate Maintenance Setting (AMS) Switch

Power-Zone® 4 Low Voltage Metal-Enclosed Drawout Switchgear



During day-to-day operation and maintenance of low voltage drawout switchgear, circumstances may exist where work must be done within the Limited Approach Boundary of energized conductors or components. In these cases, de-energizing the equipment may not be feasible due to electrical system design or operational limitations that introduce additional or increased hazards to personnel.

How does one decrease the hazard associated with potential arc flash? The use of an Alternate Maintenance Setting (AMS) Switch may be a desirable option for Low Voltage Drawout Switchgear.

Combined with the Masterpact® low voltage drawout circuit breaker, an AMS Switch option may decrease the time an arcing fault is allowed to exist. Since the thermal incident energy from an electric arc exposure is directly proportional to the time duration of the arc, reduction in the reaction time of the upstream protective device will result in less arc-flash hazard to any nearby personnel. It is desirable to clear the arcing fault as quickly as possible while maintaining overcurrent coordination of the distribution system.

The AMS Switch option provides a lockable switch that can be an integral part of your Lock Out/Tag Out (LOTO) procedure. Once the work has been performed, the switch can be returned to normal settings that provide the optimal protection and coordination.



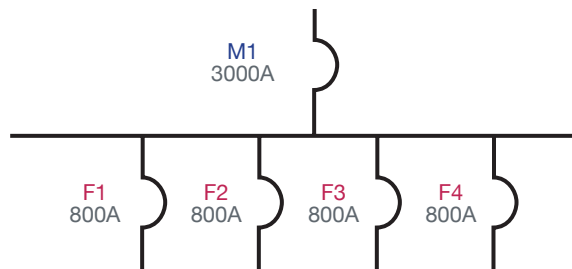
Power-Zone 4 Low Voltage
Metal-Enclosed Drawout Switchgear



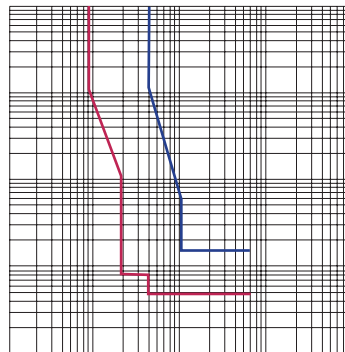
by **Schneider Electric**

How does the AMS Switch aid in reducing Arc-Flash Incident Energy (AFIE)?

Let us look at a typical low voltage electrical distribution system, such as the one illustrated by the drawing below. A desirable feature of this or any system would be electrical coordination. Electrical coordination is where the protective device immediately upstream of a fault would clear the fault without effect to other upstream protective devices. This is accomplished many times by intentionally inputting time delays at points along the protective device's trip curve.



The use of time current curves provides the insight required to ensure the coordination of the electrical system. The time current curves of both the main and feeder circuit breakers are plotted on the graph to the right; we can see that the main circuit breaker's trip curve is above and to the right of the feeder circuit breaker's trip curve. This enables the overcurrent protection of various portions of the electrical system and enables any fault on the load side of the feeders to be cleared by the appropriate feeder.



Reducing arc-flash incident energy (AFIE) levels has become an increasingly important consideration when designing electrical power systems. However, selective coordination of overcurrent protective devices is equally important, and both are often misunderstood. The best solution is to provide superior AFIE reduction without sacrificing selectivity.

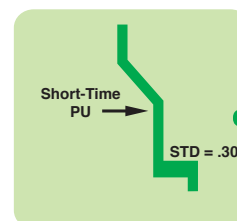
In order to quantify the arc-flash incident energy reduction, an arc-flash analysis must first be performed. Values must be calculated for the possible maintenance setting to determine if any practical difference to maintenance procedures (such as PPE levels) is even possible.

AMS Switch Features

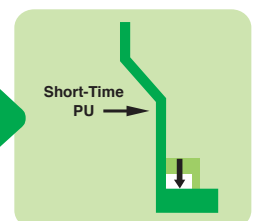


- Reduces the arc-flash incident energy hazard through the elimination of intentional short time delays when activated
- Maintains existing electrical system coordination when in use

AMS "OFF" Mode



AMS "ON" Mode



Masterpack® Arc-Flash Protection Circuit Breakers

Square D® brand Masterpack NW and NT low voltage power circuit breakers feature breakthrough technology that provides superior arc-flash protection especially at higher fault currents when a Zone Selective Interlocking (ZSI) scheme is used. When properly applied, they reduce AFIE without changing settings or temporarily compromising the system selective coordination.



Masterpack NW Drawout Power Circuit Breaker

Masterpack Circuit Breaker Features

- Provides arc-flash protection comparable to fast-acting current limiting fuses at high currents and better protection than fuses at lower currents.
- Simplifies calculations for the flash-protection boundary due to testing by Schneider Electric and published AFIE levels.
- Available in Square D brand equipment: PZ4 low voltage drawout ANSI switchgear, QED6 and QED2 UL-rated switchboards, and Model 6 low voltage motor control centers.



What is arc-flash?

According to NFPA 70E-2009, arc-flash is a “dangerous condition associated with the release of energy caused by an electrical arc.” It is measured in terms of arc-flash incident energy (AFIE), which is used to determine the appropriate level of Personal Protection Equipment (PPE), and in terms of an arc-flash protection boundary.

> To learn more

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