2014 NEC®: Arc Energy Reduction in EZM Main Devices *– An Approved Equivalent Means*

Introduction

The 2014 edition of the National Electrical Code® (NEC®) contains revisions to Article 240.87 that address the requirement for a means of arc energy reduction in circuit breaker devices 1200 A and above. The article specifies the following five clearing time reduction means as a way to comply with the standard for arc energy reduction:

(1) Zone-selective interlocking
(2) Differential relaying
(3) Energy-reducing maintenance switching with local status indicator
(4) Energy-reducing active arc flash mitigation system
(5) An approved equivalent means

The full text of the section is included at the end of the document.

Scope of Impact

All EZ Meter-Pak™ (EZM) Main Circuit Breaker devices containing 1200A, 1600A, or 2000A Main Circuit Breakers.

EZM Recommendation

Since ZSI, differential relaying and energy-reducing maintenance switches all cause a circuit breaker or switch to open instantaneously should an arc flash occur; it is expected that the instantaneous trip function on a circuit breaker should be considered an approved equivalent means. An instantaneous trip function, whether it is field adjustable or a nonadjustable override type, can reduce the arc energy if its pickup point is set below the prospective arc fault current.

In the case of EZM Main Circuit Breaker devices 1200A – 2000A, the main circuit breaker contained therein ships from the manufacturing facility with the instantaneous trip function set to the minimum level and thus can be considered an approved equivalent means to the methods outlined above.

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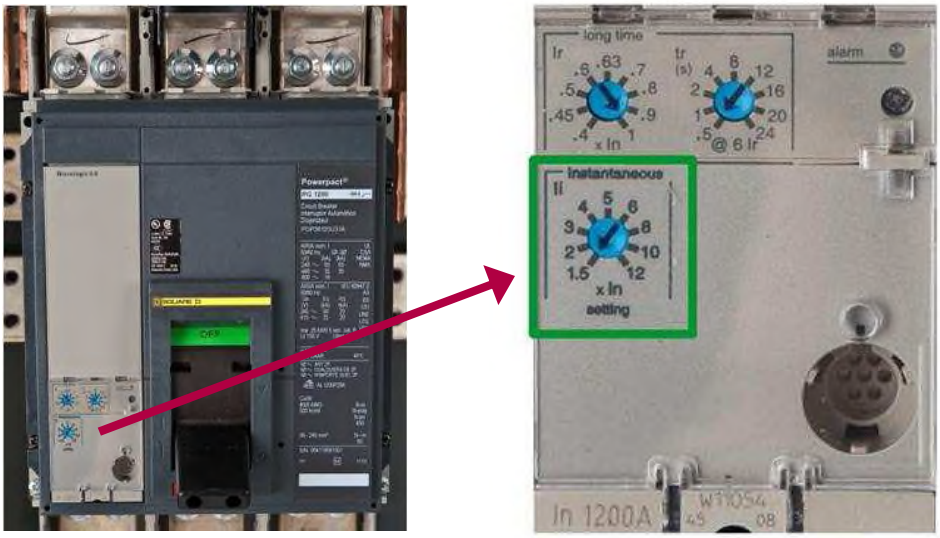
During the inspection process, the contractor and Authority Having Jurisdiction must visually confirm that the circuit breaker is set to the minimum level in order to ensure compliance (instantaneous trip at the minimum setting highlighted in green below).



If the application requires the installer to move the instantaneous trip function above the minimum setting, an arc flash study can be performed and used to support this action. As long as the calculated available arcing current is above the desired setting, the instantaneous trip will react to the arcing current and provide an equivalent means of reducing arc energy.

Full Text of 240.87

240.87 Arc Energy Reduction. Where the highest continuous current trip setting for which the actual overcurrent device installed in a circuit breaker is rated or can be adjusted is 1200 A or higher, 240.87(A) and (B) shall apply.

(A) Documentation. Documentation shall be available to those authorized to design, install, operate, or inspect the installation as to the location of the circuit breaker(s).

(B) Method to Reduce Clearing Time. One of the following or approved equivalent means shall be provided:(4) Energy-reducing active arc flash mitigation system

(5) An approved equivalent means

Informational Note No. 1: An energy-reducing maintenance switch allows a worker to set a circuit breaker trip unit to “no intentional delay” to reduce the clearing time while the worker is working within an arcflash boundary as defined in NFPA *70E-2012, Standard for Electrical Safety in the Workplace*, and then to set the trip unit back to a normal setting after the potentially hazardous work is complete.

Informational Note No. 2: An energy-reducing active arc flash mitigation system helps in reducing arcing duration in the electrical distribution system. No change in the circuit breaker or the settings of other devices is required during maintenance when a worker is working within an arc flash boundary as defined in *NFPA 70E-2012, Standard for Electrical Safety in the Workplace*.