Low Voltage Power Circuit Breaker Trip Unit and Arc Flash Safety

Power circuit breakers have a critical role for arc flash safety and equipment preservation. A circuit breaker may not be called upon to trip and clear a fault for years but when a fault occurs, it is expected to perform within specifications.

CSA recognizes the importance of maintenance as it relates to safety in CSA Z462 - Workplace Electrical Safety and Z463 - Guideline on Maintenance of Electrical Systems. The CSA standards recommend that breakers in critical or severe duty applications be inspected and tested annually. In addition, power circuit breakers, require maintenance at regular intervals for lubrication and to replace or upgrade worn or aged components.

In addition to proper maintenance, increasing worker distance from electrical equipment reduces worker exposure to arc flash energy.

Features can be added to power circuit breakers to put distance between workers and energized electrical equipment.

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Remote Trip Controls

Power circuit breakers can be equipped with new trip units that allow connection of hand held controls used to trip the breaker from a distance.

The breaker trip unit is connected to a receptacle on the breaker cubicle door.

The hand held controller can be plugged into the door mounted receptacle to control the breaker from a distance.

A laptop can also be connected via the door mounted USB port to check or change settings without opening the breaker cubicle door.

Maintenance Mode Selector

New electronic trip units are equipped with a "maintenance mode" input that activates faster trip settings. An external switch or sensor can be connected to the input to reduce arc flash energy for personnel that may be working near equipment downstream of the protective device.

Sluggish Breaker Detection and Self-Test

Modern breaker trip units will monitor the operating time of a breaker. When the trip unit initiates a breaker trip, it measure the time between triggering the actuator and when each pole interrupts the current. If this time is greater then the setting, the Sluggish Breaker alarm is set. If the Sluggish Breaker alarm is set, that is an indication that the breaker mechanism is in need of service. The internal logic of the electronic trip unit performs self-diagnostics and will generate and alarm if self-testing fails.

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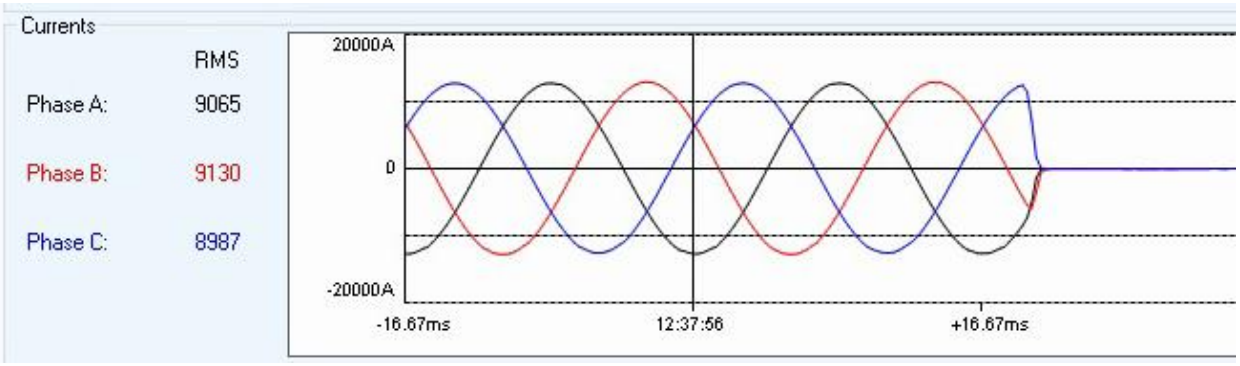
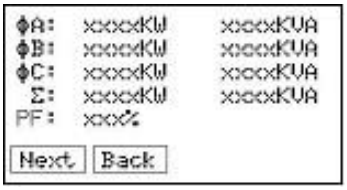
Network Communications

Modern breaker trip units are also equipped with network communication to allow monitoring of the breaker for alarms, trip event records, settings, breaker diagnostics, metering data. When electrical safety studies require changes to the breakers trip settings, the new settings can be programmed on all breakers over a network from a central computer. This avoids need to travel to each electrical room and avoids the arc flash hazards associated with opening doors to each breaker cubicle to check and change breaker settings. Breaker diagnostics and operations data can be combined with schedules for planning breaker maintenance according to CSA maintenance recommendations.



Metering and Voltage Protection

Trip units can also be equipped with voltage protection and metering features. Protection features include over and under voltage and frequency and phase imbalance for voltage sensitive loads. Metering features allow voltage, current and power metering and waveform capture over network communications for central data collection and settings management.



Modern Technology Added to Existing Breakers

New electronic trip units are available for many older power circuit breakers. These trip units add modern technology and features to traditional rugged breakers without the cost and outages necessary for complete switchgear replacements.

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