

Automatic Transfer Switch Option Circuit Breaker Trip - Normal and/or Emergency

Introduction

The 2014 National Electric Code (NEC), Article [240] provides the requirements for selecting and installing overcurrent protection devices (OCPDs).

An overcurrent exists when current exceeds the rating of conductors or equipment. It can result from overload, short circuit, or ground fault.

- **Overload** - A condition in which equipment or conductors carry current exceeding their rated ampacity.
- **Short Circuit** - The unintentional electrical connection between any two normal current-carrying conductors of a circuit; (i.e.: line-to-line (L-L) or line-to-neutral (L-N)).
- **Instantaneous** - The inrush current created when a load is initially connected to the power source. The over current protection must be sized to accommodate the expected inrush values of connected loads. It must also be sized to accommodate the total amount of fault, short circuit, current available to the load, if the breaker is closed on a fault.
- **Ground Fault** - An unintentional, electrically conducting connection between a current carrying, ungrounded conductor of a circuit and ground; either equipment or earth ground. During a ground fault, dangerous voltages and abnormally large currents exist.

An example of one of the potential outcomes of any of the faults mentioned above is an Arc Flash, shown in Figure 1.



Figure 1 - Arc Flash Example

This situation is very dangerous for the workers and any other people in the vicinity. It is important that every precaution that can be made to eliminate potential hazards be taken.

Over Current Protection Devices, (OCPDs)

OCPDs protect circuits and equipment, but they protect circuits in one way and equipment in another.

An OCPD protects a circuit by opening when current reaches a value that would cause an excessive temperature rise in the conductors.

The interrupting rating must be sufficient for the maximum possible fault / inrush current available on the line-side terminals of the equipment.

An OCPD protects equipment by physically opening when it detects a short circuit, too high of an instantaneous inrush current, or ground fault. Every piece of electrical equipment must have short-circuit current ratings that permit the OCPDs (for that equipment) to clear the faults without extensive damage to the electrical components of the load.

Conductor overload protection is not required where circuit interruption would create a hazard (i.e., a fire pump transfer switch). Short-circuit protection is still required.

Circuit breakers must be capable of being opened and closed by hand. Non-manual means of operating a circuit breaker, such as electrical shunt trip or pneumatic operation, are permitted only if the circuit breaker can also be manually operated.

Product Description (Option: MP [CBTN / CBTE], EM [23A / 23B])

This option provides standard circuit breaker trips within either, or both, control units of the transfer switch. When automatic controls are utilized in the ATS, the control units will come complete with bell alarms. Bell alarms will only change state when the breaker is tripped due to an overcurrent/fault event, not every time the breakers changes states. When tripped, the bell alarm provides the appropriate input to the controls and the appropriate light will be illuminated on the HMI.

At any point during normal operation, in the event that one, or both, control units are tripped open from an overcurrent/fault event, the trouble (TRBL) contacts will switch states. There are two (2) sets of form "C" Contacts provided for the TRBL signal to indicate a trouble condition.

Please note that these contacts will change state in any trouble event, not just an overcurrent condition.

Also note this option is available for manual transfer switches as options 23A or 23B.

Order Guide

Part Number Examples:

1. ICFA32000BPSB/CBTN/CBTE - Insulated Case ATS, 3 pole, 2000 Amp, 120/208Vac, **24Vdc Microprocessor Controls**, 65kAIC @ 480Vac, NEMA 1 Free Standing Enclosure, with Options Circuit Breaker on Normal and Emergency.
2. MCDA30400CESA/23A/23B - Molded Case ATS, 3 pole, 400 Amp, 277/480Vac, **Electromechanical Controls**, 35kAIC @ 480Vac, NEMA 1 Wall Mount Enclosure with Options 23A and 23B.
3. MCDM30400CESA/23A/23B - Molded Case MTS, 3 pole, 400 Amp, 277/480Vac, **Manual Transfer Switch**, 35kAIC @ 480Vac, NEMA 1 Wall Mount Enclosure with Options 23A and 23B.