POWERLINK® Remotely Operated Circuit Breakers for Emergency Lighting Circuits

POWERLINK ECB-G3EL circuit breaker

Identifying the proper controls for a lighting system can be a daunting task. Cost, space considerations, energy codes, desired operation, and NEC code compliance must all be considered when specifying a system. Often, controls for emergency lighting systems are also required which further compounds the complexity of the control system.

POWERLINK ECB-G3EL circuit breakers relieve much of the burden associated with designing such control systems. These UL listed circuit breakers provide a means to comply with the requirements of the National Electrical Code, 700.12(E). The circuit breaker contains both a remotely operated switched circuit for controlling the luminaires, and a manually operated unswitched circuit, which provides power to the unit emergency equipment's charging and detection circuit. Both circuits are electrically tied to the same source via a single common bolt-on connection that receives its supply from the panelboard bus.

Both circuits of the ECB-G3EL breaker contain a thermal-magnetic trip mechanism that protects their associated conductors from overcurrent. The circuit breaker also provides a common trip function ensuring both circuits will open whenever a fault occurs on either circuit and a common handle tie to ensure that both circuits are manually switched together.

POWERLINK ECB-G3EL circuit breakers incorporate many of the same robust features as other POWERLINK ECB-G3 breakers including:

- Handle Rating: 20A (both switched and unswitched circuits)
- Maximum Voltage Rating: 480Y/277Vac
- Interrupting Ratings: 65kA at 240Vac, 14kA at 480Y/277Vac
- Maximum Series Connected Ratings: 200KA at 240Vac and 100kA at 480Y/277V
- Rated Endurance On/Off/On cycles: 200,000 operations
- Breaker status viewing window for both circuits
- Auto/manual override selector for the remotely operated circuit
- UL listed Switch Duty Rated (SWD) and High Intensity Discharge (HID) ratings
- Lug wire size: (1) #12-8Al, #14-8Cu per circuit, 75°C conductors
- No breaker pigtails or other externally mounted hardware

Catalog Number: ECB142020G3EL

a brand of Schneider Electric

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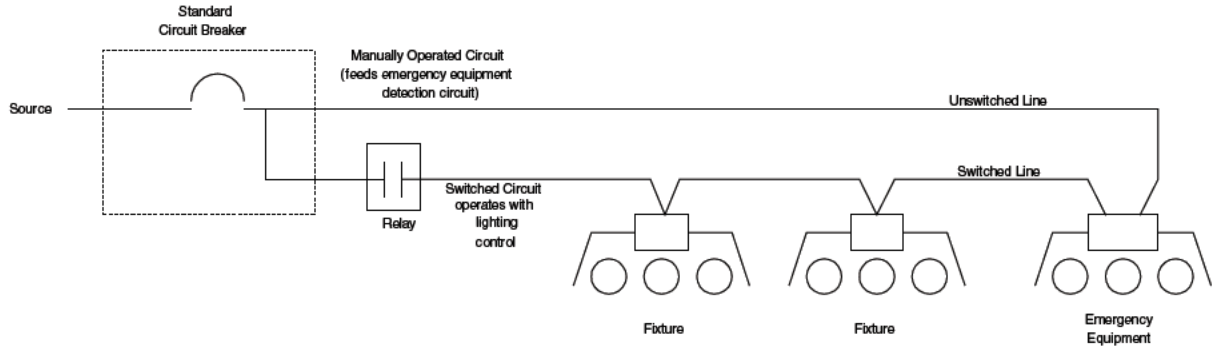
Understanding the Solution

NEC 700.12(e) pertaining to Unit Equipment used for emergency illumination states:

> *The branch circuit feeding the unit equipment shall be the same branch circuit as that serving the normal lighting in the area and connected ahead of any local switches.*

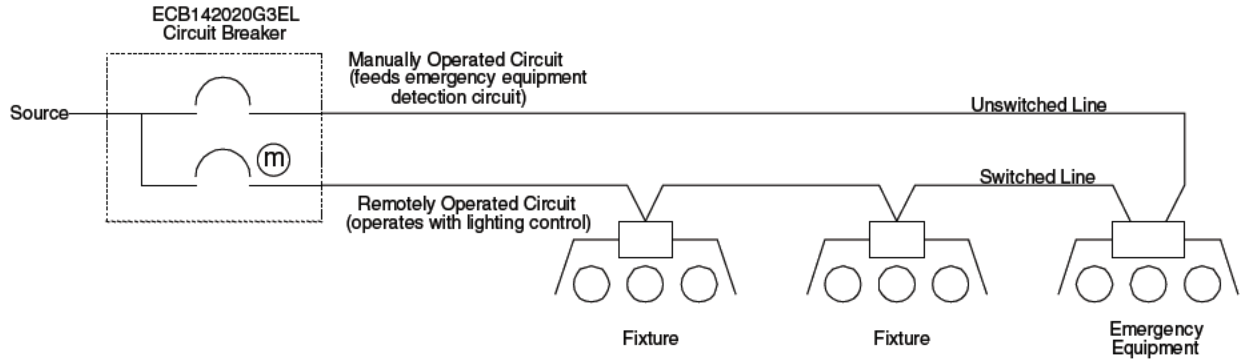
For many designers this creates a dilemma. If a remotely operated branch breaker is installed to provide the necessary overcurrent protection for the unit equipment, then whenever the breaker is remotely switched to the Off position (as would be expected during non-operating hours), then the equipment would see this as a power outage and activate the emergency luminaries. One approach to solving this problem is to use a standard circuit breaker and install a small relay on the load side of the circuit breaker to provide the remote control functions normally associated with a lighting control system.



Historical method for controlling emergency unit equipment

This solution is both awkward and expensive as it necessitates a separate box for housing the relay and the selection of a relay that meets the fault current requirements as outlined in NEC 110.10.

With the POWERLINK emergency lighting circuit breaker, the need for the relay is eliminated along with the extra box, wiring, and confusion over selecting a properly rated component. The circuit breaker mounts in a panelboard just like a standard breaker occupying only two panel spaces. Both switched and unswitched conductors are connected directly to the breakers load side lug.



Branch wiring using the ECB-G3 circuit breaker