

INFORMATIONAL LEAFLET

Miniature Circuit Breakers

UL489 vs UL1077



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01 Range of UL489
and UL1077 devices

From the left:
SU200M, SU200MR,
ST200M et S800U

Definition of branch circuits (UL489) and supplementary protectors (UL1077)

A branch circuit is defined as a circuit that has the first overcurrent device. UL489 has additional spacing requirements (over surface, through air) compared to supplementary protection.

Branch protection breakers also have some different spacing, and slight mechanical differences, internally to the breaker, as compared to a Supplementary Protector.

A Supplementary Protector is defined as an overcurrent device for protection of the end circuit. Or, said another way, may be added to a circuit to provide an extra level of protection for a specific component.

These devices require the use of an upstream protective device, or Branch Protection. It is not designed to be used as a substitute for Branch Protection.

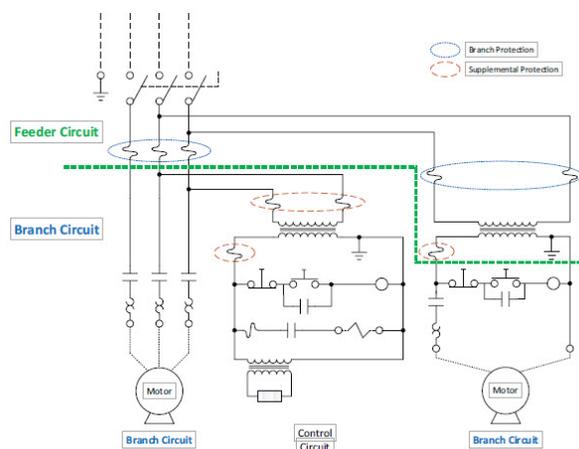
Often times we receive information requests on devices that require UL and CSA certifications.

In relation with miniature circuit breakers, they are known as UL489 / CSA C22.2 No.5 (branch rated devices) and UL1077 / CSA C22.2 No.235 (supplementary protectors)

Where to use supplemental protectors.

If the Branch Protection is adequate to protect the circuit and/ or components, a supplemental protector can be inserted. If the supplemental protector is part of the circuit, and then removed, and the Branch protection meets the above protection requirements, the supplemental protector is properly applied.

Drawing below based on UL “Description of terminology,” Figure 6.1 effective April 25, 2003 for UL508A, UL489 & UL1077 (UL copyrighted)

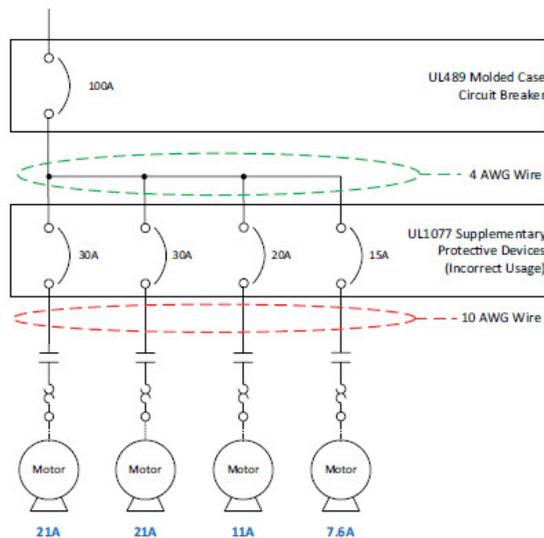


Misuse of supplemental protection

In this circuit, a UL489 molded case circuit breaker (MCCB) is correctly used as the main breaker for the four motors being controlled. However, each motor is protected by a UL1077 supplemental “miniature breaker.”

This is not correct and violates both the NEC and UL. Each individual motor circuit is a separate branch circuit and requires the use of a UL489 listed circuit breaker.

This is determined by evaluating the conductors feeding the loads. Supplemental protectors must be ignored because they are not listed branch circuit protective devices. Therefore, in this example, the 10 AWG conductors are only being protected by the 100A MCCB. **The 100A MCCB is too large to adequately protect the small 10 AWG conductors per the NEC.** The supplemental protectors must be replaced by appropriately sized UL489 listed circuit breakers.



Correct usage of supplemental protection

In this circuit, a UL489 molded case circuit breaker (MCCB) is again correctly used as the main breaker for the three heater loads being protected.

Each individual heater is protected by a UL1077 supplemental device. It is essential the wire feeding each individual heater is adequately protected by the UL489 breaker, and in **this case the wire size has not been decreased but remains 6 AWG throughout the circuit.** Since heaters may appropriately be connected in parallel, **the use of the supplemental devices is optional and therefore permitted.**

A failure of one heater may trip the associated supplemental device but not trip the upstream 80A breaker. This will allow the other two heaters to continue to function.

