Bussmann series Compact Circuit Protector (CCP) FAQs

Questions and answers on the applications, features and benefits of the Class CF CUBEFuse and Class CC Compact Circuit Protectors.
Q: Why would I replace the UL 1077 supplementary protectors that I currently install in my panels with the CCP?
A: UL 1077 supplementary protectors are being misapplied and used for branch circuit protection in numerous industrial control panel applications throughout the industry. They are intended to be used as a component within a finished product such as commercial appliances, kitchen appliances and lighting fixtures. These devices are not suitable for branch circuit protection and cannot be used for this purpose per 240.10 of the National Electrical Code®. The CCP is a cost effective, similar in size to a supplementary protector, but with higher interrupting ratings while providing better current-limiting overcurrent protection. The CCP with Class CC fuses or Class CF CUBEFuse (with Class J performance) is listed under UL 98 and can be used for branch circuit protection and as a branch circuit disconnect, making it easy to replace a misapplied UL 1077 supplementary protector.

Q: I use UL 489 Listed circuit breakers at 240V. Why would I replace them with the CCP?
A: UL 489 Listed circuit breakers rated for 240V may have a similar footprint as the CCP; however, their interrupting rating is typically less than 14kA. This limits the panel short-circuit current rating (SCCR) and the application of the equipment unless more expensive and larger circuit breakers with higher interrupting ratings are used. The CCP with CUBEFuse or Class CC fuses is similar in price to 240V circuit breakers, but provides an Interrupting Rating (IR) of 200kA and is rated at 600V. This makes it easier to design the CCP into different applications requiring effective overcurrent protection, high interrupting rating and increased equipment SCCR.

Q: I use a miniature circuit breaker to protect my control transformer since UL 508A allows the use of supplementary protection if I tap from the motor branch circuit.
A: When the control transformer is tapped from the motor branch circuit, only supplemental protection is required. However, the equipment SCCR cannot be higher than the interrupting rating of the control circuit overcurrent protection device. If the miniature circuit breaker has an IR of 5kA or 10kA, the total equipment SCCR will be 5kA or 10kA. The CCP-Class CC can be used in these applications to provide overcurrent protection, high interrupting rating and increased equipment SCCR up to 200kA.

Q: For motor applications, I use UL 508 Listed Self-Protected Starters (SPS) and a magnetic contactor rated for 480/277V with a SCCR of 65kA. What would be the benefit of using a CCP?
A: SPS with magnetic contactors typically have slash voltage ratings (480/277V). This limits the application to solidly grounded Wye systems only, and not permitted on ungrounded, resistance grounded or corner grounded systems which are becoming more common. The SCCR for self-protected starters and contactors also decreases at higher voltage ratings. The SCCR can also be decreased by the magnetic contactor if it is from a different manufacturer or if the manufacturer of the SPS and magnetic contactor has not tested the combination at a higher short-circuit current rating.
On the other hand, the 3-pole CCP with CUBEFuse or Class CC fuses, and a magnetic starter combination, can be used for this application. The voltage rating will be 600V, allowing it to be used with Wye grounded, ungrounded, resistance grounded or corner grounded systems.

The Bussmann series CUBEFuse and Class CC fuses have been tested with a variety of magnetic starter manufacturers, allowing CCP with CUBEFuse or Class CC fuses and magnetic starters to have a combination SCCR of 100kA and provide Type 2 “No Damage” Protection when properly sized. These combinations are detailed in the Type 2 Protection Tables in the Bussmann Division Selecting Protective Devices (SPD) handbook.

Q: I currently use a UL 489 circuit breaker rated for full voltage at 480V with a magnetic starter for motor applications. What benefit would the CCP provide if my combination is rated for full voltage?
A: UL 489 circuit breakers rated for 480V can have a variety of interrupting ratings, typically from 14kA up to 100kA. A circuit breaker with a high interrupting rating is very expensive compared to the 3-pole CCP with CUBEFuse and Class CC fuses. The footprint used in the panel is typically three times larger than a CCP, which also increases the overall cost of the equipment. Replacing the circuit breaker with a 3-pole CCP with CUBEFuse or Class CC fuses provides a much smaller footprint — up to 1/3 of the size and at a much lower cost — saving panel space.

Q: Can the CCP be used to protect Variable Frequency Drives (VFDs)?
A: Yes, the 3-pole CCP with CUBEFuse or Class CC fuses is a cost-effective, compact solution for protection of power electronic devices, such as VFDs. Many of the VFDs also have high combination short-circuit current ratings with Class CC or Class J fuses. With its UL 98 Listing, the 3-pole CCP can be used as a branch circuit overcurrent protection device and motor branch circuit disconnect.

Other devices available on the market, such as Motor Circuit Protectors (MCP), require that the VFD be listed as a combination in order to be used as a motor branch circuit disconnect or for branch circuit protection. In addition, most VFDs do not have combination ratings above 5kA with MCPs or circuit breakers. It may be possible to achieve a high SCCR with an SPS and VFD, but the voltage rating is typically slash rated, limiting the application to only solidly grounded Wye systems.

The CCP with CUBEFuse or Class CC fuses also has a full voltage rating of 600V and higher short-circuit current ratings than other devices such as SPS, MCP or UL 489 Listed circuit breakers, which typically are slash-rated or have an SCCR of less than 5kA.

Q: I currently use finger-safe modular fuse holders which provide the protection of a fuse and isolation when I want to isolate the load. What is the benefit of the CCP?
A: Per the NEC®, fuse holders listed to UL 4248 are not allowed nor rated to be used as a branch circuit disconnect. To isolate the load, a device such as a branch circuit disconnect switch listed to UL 98 should be installed upstream of the fuse holder for proper application.

The CCP with CUBEFuse or Class CC fuses offers a UL 98 Listed branch circuit disconnect switch and branch circuit overcurrent protection in the same footprint as a finger-safe modular fuse holder without the need of additional devices for load isolation.

Q: Can the CCP be used as a main disconnect?
A: Yes, the CCP with CUBEFuse or Class CC fuses is UL 98 Listed and can be used as a main or branch circuit disconnect for the panel and for branch circuit overcurrent protection.

Q: Has the CCP been tested for vibrating environments?
A: The CCP with CUBEFuse or Class CC fuses was tested for vibrating environments under the standard for UL 98, section SA7 without any mechanical or electrical failures observed.
Q: Does the local indication tell me exactly which fuse opened?
A: Yes, each pole of the CCP includes a local indication light which will illuminate when the switch is closed, circuit complete and energized, and the fuse in that pole has opened.

Q: What type of lockout device can I install in the CCP?
A: There are several lockout manufacturers that provide standard lockout devices which can be used for the CCP with Class CC fuses, such as pin-out, lockout devices by IDEAL Industries p/n: 44-779 or Brady p/n: 90844. As for the CCP with CUBEFuse, lockout/tagout requires using a 4mm shank lock.

Q: Does the CCP switch open when there is a short-circuit or overload?
A: No, the CCP switch is rated as a disconnect and does not trip on overloads or short-circuits, nor is it a shunt trip switch. In case of a short-circuit or overload, the fuse installed in the CCP will open and the switch will remain in the ON position until it is turned OFF by an operator in order to replace the fuse after the cause of the overcurrent condition has been corrected.

If the circuit has a magnetic contactor, such as for automatic motor control, the optional wired remote open-fuse indication can be utilized to signal a PLC and the contactor to de-energize all phases, if desired.

Q: Can I use several one-pole CCP devices and gang them together to build multi-pole units?
A: UL does not allow the assembly of multi-pole units from one-pole units due to the UL 98 or 508 Listing requirements. Therefore, two- and three-pole units need to ship assembled from the factory.

The Bussmann series CCP is offered in configurations of one-, two- and three-pole units per fuse model.

Q: Is there a comb bar available to use with the CCP?
A: Currently there is not a comb busbar available to use with the CCP. However, the CCP is rated for dual wiring and connection from CCP to CCP can be accomplished by wiring between them.

Q: Can I use the fork terminal connection on the CCP as my connection for line and load, or do I need to use the box lug connection?
A: The CCP includes a box lug connection and a fork terminal connection at the lineside and loadside. The fork terminal is used to connect the PLC remote monitoring device, if required. If the remote monitoring device is not installed, the fork terminal can be used as the line and load connection since it is rated for 30A.

Both connections can also be used at the same time, providing the flexibility of using both the box lug and the fork terminal connections.

Q: Is there a through-the-door mechanism for the CCP?
A: Currently there is not a through the door mechanism available for the CCP.

Q: How do I open the circuit after a fuse opens?
A: The CCP-PLC-IND can be used to send a 24Vdc output signal that a fuse in the CCP has opened. This could then be used to open a contactor (controller) and de-energize a circuit.

Note: PRACTICAL experience has demonstrated that motor running overload devices properly sized and maintained can greatly reduce the problems of single-phasing for the majority of motor installations. This is because the loss of one phase in a motor circuit will typically cause an overload current in the other phases(s). In some instances, additional protective means may be necessary when a higher degree of single-phasing protection is required. Generally, smaller horsepower rated motors have more thermal capacity than larger horsepower rated motors and are more likely to be protected by conventional motor running overload devices.

Summary of suggestions to protect against single-phasing of motor circuits:

1. For fully loaded motors, size the heater elements or set the overload protection properly per the motor nameplate FLA.
2. If the motor is oversized for the application or not fully loaded, then determine the full load current via a clamp on amp meter and size the heaters or set the overload protection per the motor running current.
3. Electronic motor overload protective devices typically have provisions to signal the controller to open if the phase currents/voltages are significantly unbalanced or phase loss occurs.
4. Install phase voltage monitor devices that detect loss of phase or significant imbalances and signal the controller to open.

For more information, see the Bussmann Division Selecting Protective Devices (SPD) handbook section: Motor Protection - Voltage Unbalance and Single-Phasing.

Q: Can the PLC remote fuse indication accessory CCP-PLC-IND be used for one-, two- or three-pole installations?
A: Yes. For one- and two-pole applications it is recommended to trim the unused wire terminals from the accessory prior to installation in the panel.

Q: In the event that a fuse opens in a two- or three-pole CCP, would the PLC remote fuse indication accessory tell me which fuse has opened?
A: The device will send a signal when one of the fuses opens, but it will not identify which fuse has opened. To identify which fuse opened, the CCP provides local indication.

Q: What voltage does the PLC remote fuse indication accessory accept?
A: The input voltage for the PLC remote indication accessory is 24Vdc. The output signal is 24Vdc and the circuit monitoring voltage across the CCP can be 100Vac to 600Vac.

Q: What is the function of the auxiliary contact accessory?
A: The auxiliary contact includes one NO (normally open) and one NC (normally closed) contact to signal the switch status (open or closed), and can be tied to a contactor or other device downstream of the CCP. It can also provide switch status to a building management system.

Q: How many PLC remote fuse indication accessories and auxiliary contact accessories can I install per CCP?
A: One PLC remote fuse indication accessory and one auxiliary contact device can be installed per CCP. The remote fuse indication accessory mounts on the left side of the CCP and the auxiliary contact mounts on the right side of the CCP.

Q: What tooling is required to mount the PLC remote fuse indication and the auxiliary contact accessories?
A: No tooling is required to mount the accessories to the sides of the CCP. A screwdriver is required to connect the spade terminals of the PLC remote fuse indication accessory to the CCP and unused wires can be trimmed as needed.
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