

# Interchangeability of Drawout Circuit Breakers in Switchgear Assemblies



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One of the key features of switchgear assemblies using drawout circuit breakers is the interchangeability of circuit breakers within an assembly. This feature allows users to make use of spare circuit breakers to replace circuit breakers which must be taken out of service for maintenance, minimizing down time when a circuit breaker problem occurs. The ANSI Standard for Metal Enclosed Low Voltage Power Circuit Breaker Switchgear, ANSI/IEEE C37.20.1, addresses interchangeability in §6.11.4. This section requires that “All removable elements of the same type and rating on a given assembly shall be physically interchangeable in the corresponding stationary housings. This need not include electrical interchangeability of electrical control circuits.” Switchgear of this type and the circuit breakers used in it typically have mechanical interference mechanisms for breakers of the same physical size but of different ratings. These mechanisms typically prevent interchanging breakers if either the frame size (maximum continuous current rating) or the interrupting rating differ. Trip device characteristics and ratings and electrical accessories available on this class of circuit breaker are so numerous and changeable that no attempt is made to prevent interchangeability of breakers with differences in these features. The ANSI Standard for Metal Clad Switchgear, ANSI/IEEE C37.20.2, addresses interchangeability in §6.2.5. This section requires that “All removable elements of the same type and rating on a given assembly shall be physically and electrically interchangeable. Removable elements not of the same type and rating shall not be interchangeable.” Since the breakers used in this class of switchgear are not provided with variable trip devices or very many optional electrical features, this is seldom a problem. Occasionally, however, a user desires to have some electrical accessory on some but not all breakers of a given rating in a particular assembly. Most commonly, this is an undervoltage device which may be required on motor feeder breakers but not on other breakers of the same rating. When this occurs, the easiest way to solve the problem is to furnish the required modification on

all breakers of that rating in the assembly. If this is not acceptable to the user, it may be necessary to make specific modifications to the control circuitry of the breaker with the accessory to prevent breaker interchangeability.

As part of the standard design of our PowlVac® circuit breakers, we provide interference mechanisms which prevent a breaker with a lower rating from being used in a cell with a higher rating, but allow a higher-rated breaker to be used in a lower-rated cell. While this feature is not strictly in accordance with the ANSI requirements, it allows users to minimize the number of spare circuit breakers required to replace all breakers in the assembly without using any breaker in a cell where it would not meet the needs of that circuit. ⚡

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