Indoor AC Medium Voltage Air Switch Withstand Ratings

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We are often asked a question on the indoor AC medium voltage air switch withstand ratings used in metal-enclosed switchgear. Even though the IEEE standards have changed the preferred ratings from asymmetrical to symmetrical currents, most of the switch users are still not clear on the ratings applied today. This technical brief will clarify these ratings so that the user can make an appropriate selection of the medium voltage switch.

The preferred ratings for the switches listed in the IEEE Std C37.32-1990 were based on the momentary asymmetrical currents. In the 1996 edition, the preferred ratings were changed to the short-time symmetrical withstand current ratings. This change was made so as to be in consistent with the circuit breaker standards. However, the asymmetrical short-time current can still be calculated by multiplying the symmetrical short-time current with a 1.6 factor. In the 2002 edition, the peak withstand current ratings (50 and 60Hz) were added to the preferred ratings list. In the 2011 edition, the IEEE Std C37.32 was consolidated in to IEEE Std C37.30.1 to facilitate harmonization of IEEE C37.30 series with existing IEC switch related standards. The IEEE Std C37.20.3 users will now have to coordinate with the preferred switch ratings listed in the IEEE Std C37.20.4.

When comparing the switch ratings with the circuit breaker and switchgear standard ratings, it must be noted that all the withstand ratings listed are symmetrical current ratings. Each switch has a preferred rated short-time withstand current and a peak withstand current rating assigned to it. The preferred short-time withstand current rating duration is 2s and the switch must be capable of withstanding the peak current for a duration of 10 cycles. The peak withstand current rating is 2.6 times the rated short-time symmetrical current. Since the switch is not capable of interrupting fault currents, a short-circuit current rating is not assigned. However, a short-circuit rating is assigned when a switch is applied in combination with a fuse. A switch with a fuse may be applied at short-circuit current rating that is higher than the rated short-time withstand and rated peak withstand rating of the switch alone. This switch and fuse application is required when the switchgear short-circuit rating is higher than the switch short-time withstand rating.

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