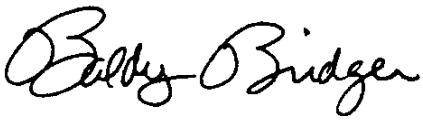
Fuses for Use in DC Control Circuits

January 9, 1991 See revised PTB #105 (September 14, 2012)

The majority of control circuits in metal-enclosed switchgear, particularly in metal-clad switchgear, are supplied from a dc power source. For nearly half a century Powell and other switchgear manufacturers have used 250-volt cartridge fuses (so-called "Code fuses") to protect these control circuits. Typical fuse types are Bussmann Type NON and Shawmut Type OT. The application of these fuses to this type of circuit has been generally successful and has been generally accepted by our customers.

From time to time, however, someone raises the question of the dc rating of these fuses. Bussmann advises me that the Type NON has been tested successfully for 10 kA interrupting capability at 250 V dc, which is the rating commonly ascribed to these fuses. Based on this test data, we can safely apply these fuses to dc control circuits where the short circuit level of the control circuit is 10 kA or less. The typical control battery used for switchgear can deliver a short circuit current of about 10 times its one-minute discharge rating, so it would be a very unusual dc control circuit that had a short circuit capability in excess of 10 kA.

Another question sometimes raised is whether or not these fuses are UL listed for dc applications. The answer is no. If a fuse with a UL listing for dc use is required, we should use either Fusetron Type FRN-R or Low-Peak Type LPN-RK. These fuses are dual-element time delay types which may be used in the same fuse blocks used for Type NON fuses.



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