

S&C Power Fuses may be mounted on transformer bushings under conditions where physical space is severely limited, such as in the case of a mobile substation. For such applications S&C live parts, as used in the upright style of mounting, are mounted directly on the transformer bushing and, at the opposite end of the fuse, on an insulator or surge arrester. When so mounted, the fuse must have the benefit of the full physical support as would be afforded by a complete S&C fuse mounting. Additionally, the transformer bushing may be limited in its ability to absorb the reaction forces of a fuse operation or the mechanical closing-in of a fuse unit. Accordingly, the following recommendations should be followed for satisfactory operation:

1. The hinge-end live parts of 34.5-kV, 46-kV, and 69-kV SMD-1A, SMD-2B, or SMD-2C Mountings●, upright style, can be mounted directly on transformer bushings with the main-contact end live parts mounted on surge arresters or insulators, subject to the following provisions:
 - (a) All live parts must be supported as rigidly as in a complete S&C fuse mounting. The necessary adapter brackets (not furnished) must be designed for strength and rigidity. Straight or formed pieces of $\frac{1}{4} \times 4$ -inch (6-mm \times 102-mm) bus bar, for example, are insufficient. Instead, adequately braced steel live-part adapters should be installed along with copper shunting members as required. For draw-lead bushings, adapters must transmit the fuse forces to the cap of the transformer bushing instead of to the stud or, in some types of bushings, to the heavy-wall metal tubing extending through the bushing rather than to the stud.
 - (b) Bushings, insulators, and surge arresters supporting the fuse live parts must, in turn, be securely and rigidly mounted. Relative movement of the fuse hinge-end live parts with respect to main-contact end live parts of only $\frac{1}{4}$ -inch (6-mm) can, in some cases, release the fuse from its **Closed** position.
 - (c) The live parts must be positioned at the same relative heights as on a complete S&C fuse mounting. This is necessary to maintain the proper slope of the fuse unit. Improper slope may impair the dropout action ("pop-up" action in the case of

upright mountings in this voltage category) or it may impose undue cantilever stress on the hinge-end live parts and supports.

- (d) The fuse live parts must be mounted on or above the supporting insulators or bushings such that the live parts are not offset, reducing the open-gap distance when the fuse is in the **Open** position. In addition to reducing the open-gap insulation level, such offset live parts may impair the fuse's interrupting performance because of their influence upon the dielectric field surrounding the fuse unit.
 - (e) The short-circuit interrupting duty must not exceed 1000 MVA, three-phase symmetrical. For higher interrupting-duty applications, the hinge-end live parts should be mounted on separate stand-off insulators. Additionally, all of the foregoing strength, rigidity and slope recommendations must be followed.
2. Alternatively (though not recommended as a general practice), the main-contact end live parts of 34.5-kV, 46-kV, and 69-kV SMD-1A, SMD-2B, and SMD-2C mountings in the upright style can be mounted directly on transformer bushings, with the hinge-end live parts at the line side mounted on surge arresters or insulators. The foregoing strength and rigidity recommendations must be observed. Additionally, the fuses must be positioned so the fuse exhaust patterns do not intersect and are not directed across phase-to-phase or phase-to-ground insulators or clearances (see S&C Information Bulletin 212-80).
 3. Mounting of live parts of 115-kV or 138-kV upright mountings directly on transformer bushings is not recommended. Location of the hinge end of the fuse at the transformer bushing would subject the bushing to excessive torsion and cantilever forces upon dropout (side-swing in the case of upright mountings in this voltage category) of the fuse unit. Reversing the fuse, so the main-contact end of the fuse is located at the transformer bushing, requires that the main-contact end live parts be positioned extremely high above the bushing terminals. This is because of the 15-degree slope (**Closed** position) of the fuse unit, plus the need to maintain proper clearance to ground, particularly clearance between the transformer tank and the

★ The strength, rigidity, clearance, and dielectric recommendations described in this document apply also where S&C SMD Power Fuses are to be incorporated into fused switches.

● Specifically not recommended for SMD-50 or SMD-3 mountings.



unblown fuse when the fuse unit is in the **Open** position. While mounting of 115-kV and 138-kV fuses on transformer bushings is not recommended, there may be situations where it is required. For such cases, the following recommendations should be followed for satisfactory operation of the fuse:

1. All fuse live parts must be held as rigidly as in a complete S&C fuse mounting.
2. Bushings, insulators, and surge arresters supporting the fuse live parts must be securely and rigidly mounted.
3. Torsional and cantilever strength of bushings and adapters, both alone and in combination, must be adequate for the loadings involved.
4. The fuse live parts must not be positioned so they change the slope of the fuse unit from that of a fuse unit in a complete S&C fuse mounting.
5. The fuse live parts must not be offset in such a way they reduce the open-gap clearance or introduce metal parts into the dielectric field surrounding the fuse unit.
6. The short-circuit interrupting duty must not exceed 1000 MVA, three-phase symmetrical.
7. With the main-contact end live parts mounted on the transformer bushings and the hinge-end live parts at the line side, the fuses must be positioned so the exhaust patterns cannot intersect and are not directed across phase-to-phase or phase-to-ground insulation or clearances (see S&C Information Bulletin 212-80).