MINIMUM MELTING TIME-CURRENT CHARACTERISTIC CURVES

SMU FUSE UNITS—S&C "K" SPEED

**BASIS:** These fuse units are tested in accordance with the procedures described in ANSI Standard C37.41-1969, and they are rated to comply with ANSI Standard Specifications for Distribution Cutouts and Fuse Links, C37.42-1968. As required by these standards, the minimum melting current is not less than 200% of fuse-unit ampere rating, and the minimum melting curves are based on tests starting with the fuse unit at an ambient temperature of 25°C and no initial load.

**CONSTRUCTION:** Fusible elements for fuse units rated 2k amperes and below are constructed, under controlled tension, under elements for fuse units rated 5k through 30k amperes are silver, helium-cooled, and arranged in the elements construction.

**TOLERANCES:** Currents plotted to minimum test points. Maximum variations expressed in current values are:
- Plus 10% for 2k through 30k ampere ratings.
- Plus 20% for 3k ampere ratings.

**APPLICATIONS:** Like all high-voltage fuses, these fuse units are intended to accommodate overloads, not to interrupt them. Accordingly, they are used as protective devices which are designed with a minimum melting current of 300% of the fuse-unit ampere rating (for fuse units rated 100 amperes or less) or 200% of the fuse-unit ampere rating (for fuse units rated over 100 amperes). As a result, these fuse units can clear considerable peak-load capabilities, however, these units should never be exposed to lasting in excess of the peak-load capacities listed in S&C Data Bulletin 440-195.

Since fuse units having nickel-chrome or silver element construction are not subject to damage by aging or transient overcurrents, it is unnecessary to replace airborne fuse units or either of these constructions in single-phase or three-phase installations when one or more fuse units have blown.

**COORDINATION:** Any preloading reduces melting time. While this phenomenon is generally pronounced in other makes of fuses having minimum melting currents of less than 200% of rating, the effect of preloading must nonetheless be determined for the S&C fuse units represented by these curves (see S&C Data Bulletin 440-195). To allow for this, the following conditions must be met:
1. When close coordination is required.
2. When, regardless of the accuracy of coordination, the fuse unit is subjected to temporary overloads.

There are cases where the coordination requirements may be very exacting. For example, in coordinating a transformer primary fuse with a secondary breaker and a source-side breaker, the time interval between the operating characteristics of the two breakers may be very critical. Under these circumstances there must be an extremely short time interval between the minimum melting and the total clearing characteristics of the fuse.

The fuse units represented by these curves possesses this short time interval feature, since—having a nondamageable fusible element of precise construction—they require:
1. An line as 10%, tolerances in melting current—comparable to the 20% tolerance of many fuses (20% and 40% respectively in terms of time).
2. No "salute zone" or buildup allowances.

This narrow time band normally will provide the desired coordination. If the selected S&C "K" Speed fuse unit does not meet the coordination requirements, check to see if the same ampere rating in the S&C Standard Speed, S&C Slow Speed, or S&C Very Slow Speed will satisfy.

Sometimes a selected ampere rating will fall to meet the coordination requirements in any available speed. In this case the selection of another ampere rating for either the protecting or protected fuse usually will satisfy all requirements.

Do not assume that other fuses that do not employ S&C's silver, helium-cooled fusible element construction can better receive a coordination impulse than the use of another ampere rating in one of the S&C speed options. Such other fuses, including "time-lag" speeds, "super-dow" speeds, and "high-surge" speeds, require the use of "salute zone" or buildup allowances and, in addition, they have larger construction tolerances (plus 20% in current, plus 40% in terms of time). The application of these two factors will provide a time interval between the adjusted minimum melting curve and the total clearing curve greater than in the case of S&C speed options.

**FUSE UNITS AVAILABLE**

- **Type:**
  - **K**
  - **Slow**

- **Amperage Ratings:****
  - 3K through 20K

- **These curves are also applicable to a previous design called GMD-30.**

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