

Fuses, 27 kV, SMU-20, Type K



1. Scope

This standard covers the requirements for 27 kV, SMU-20, Type K fuses.

This standard applies to the following Seattle City Light (SCL) stock numbers:

Stock No.	Type
684751	25 K
684756	50 K
684757	65 K
684758	100 K

2. Application

SMU-20, Type K power fuses are used for overhead cutouts and padmount switchgear.

S&C Electric Company (S&C) and Cooper Power Systems/Eaton (Cooper) both use “K” ratings to designate fast speed fuses. S&C refers to the fuses as SMU-20, whereas Eaton refers to them as CMU-20.


When installed on pole-top locations on distribution feeders, the fuse operates promptly to limit the stress on electrical systems due to short circuits. It provides isolation for the faulted circuit, limiting the size of interrupted service area.

When installed on the primary side of pole-mounted transformer on a distribution feeder, the fuse detects and interrupts all faults. Faults are detected and interrupted regardless of the it being on the primary or secondary side of transformer and regardless of the transformer winding connections.

The fuse also fits padmount switchgear when used with Stock No. 682585 end fittings.

Fuses are also well suited for protection of pole-top or station capacitor banks.

For fuse time-current characteristics curves, see Appendix A and B.



3. Industry Standards

Fuses and accessories shall meet the applicable requirements of the latest revision of the following industry standards:

IEEE Std C37.40; IEEE Standard–Service Conditions and Definitions for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories

IEEE Std C37.41; IEEE Standard–Design Tests for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories

IEEE Std C37.42; IEEE Standard–Specifications for High-Voltage Expulsion Type Distribution Class Fuses, Cutouts, Fuse Disconnecting Switches and Fuse links

IEEE Std C37.46; IEEE Standard–Specifications for High-Voltage Expulsion and Current-Limiting Type Power Class Fuses and Fuse Disconnecting Switches

IEEE Std C37.48.1; IEEE Standard–Guide for the Operation, Classification, Application, and Coordination

4. Requirements

Fuses shall meet the requirements shown in Table 4a.

Table 4a. Requirements

Overall design	Suitable for outdoor use
Top and bottom terminals	Suitable for use with S&C 3090 and Cooper CMU3095 outdoor end fittings
Fuse type	Expulsion
Speed	Fast speed – Type “K”
Operation action	Dropout
Element type	Silver
Interrupting medium	Boric acid
Color	Gray
Fuse tube material	Reinforced fiberglass or equivalent, UV resistant
Rated maximum voltage	27 kV
Maximum interrupting current, rms, symmetrical (kA)	12.5

Fuse shall have current ratings as shown in Table 4b.

Table 4b. Fuse Current Ratings

Type	Continuous Current (A)
25 K	25
50 K	50
65 K	65
100 K	100

5. Marking

Fuse units shall be marked according to the requirements of IEEE C37.42, Section 10.2, which includes:

- Manufacturer name or symbol
- Manufacturer type or identification
- Rated current
- Rated maximum voltage
- Rated minimum interrupting current
- Rated maximum interrupting current
- Rated frequency
- Identifying date code (month and year)

6. Packaging

Fuses and end fitting set shall be packaged individually to prevent damage during shipping, handling, and storage.

Shipping containers shall be legibly marked with the SCL purchase order number.

7. Issuance

Stock Unit: EA

8. Approved Manufacturers

Stock No.	Type	Continuous Current (A)	Cooper Catalog No.	S&C Catalog No.
684751	25 K	25	CMU703025	703025
684756	50 K	50	CMU703050	703050
684757	65 K	65	CMU703065	703065
684758	100 K	100	CMU7030100	703100

9. Sources

Fusing Equipment Catalog Data CA132038EN; "CMU Medium Voltage Power Fuses," October 2015

Descriptive Bulletin 242-32; "SMD-20 Power Fuses: Outdoor Distribution (14.4 kV through 34.5 kV)," April 2020

Shetab, Muneer; SCL Standards Engineer, originator, and subject matter expert for 6840.35

Specification Bulletin 242-31; "Type SM-4, SM-5, SMD-20, and SMD-40 Power Fuses: Outdoor Distribution (14.4 kV through 34.5 kV)," August 2020

TCC R240-91-153; Cooper Power Systems, Time-Current Characteristics Curves, Minimum Melt "K" Speed

TCC R240-91-159; Cooper Power Systems, Time-Current Characteristics Curves, Total Clear "K" Speed

TCC 165-2; S&C Electric Company, Minimum Melting Time-Current Characteristic Curves, SMU Fuse Units – S&C "K" Speed

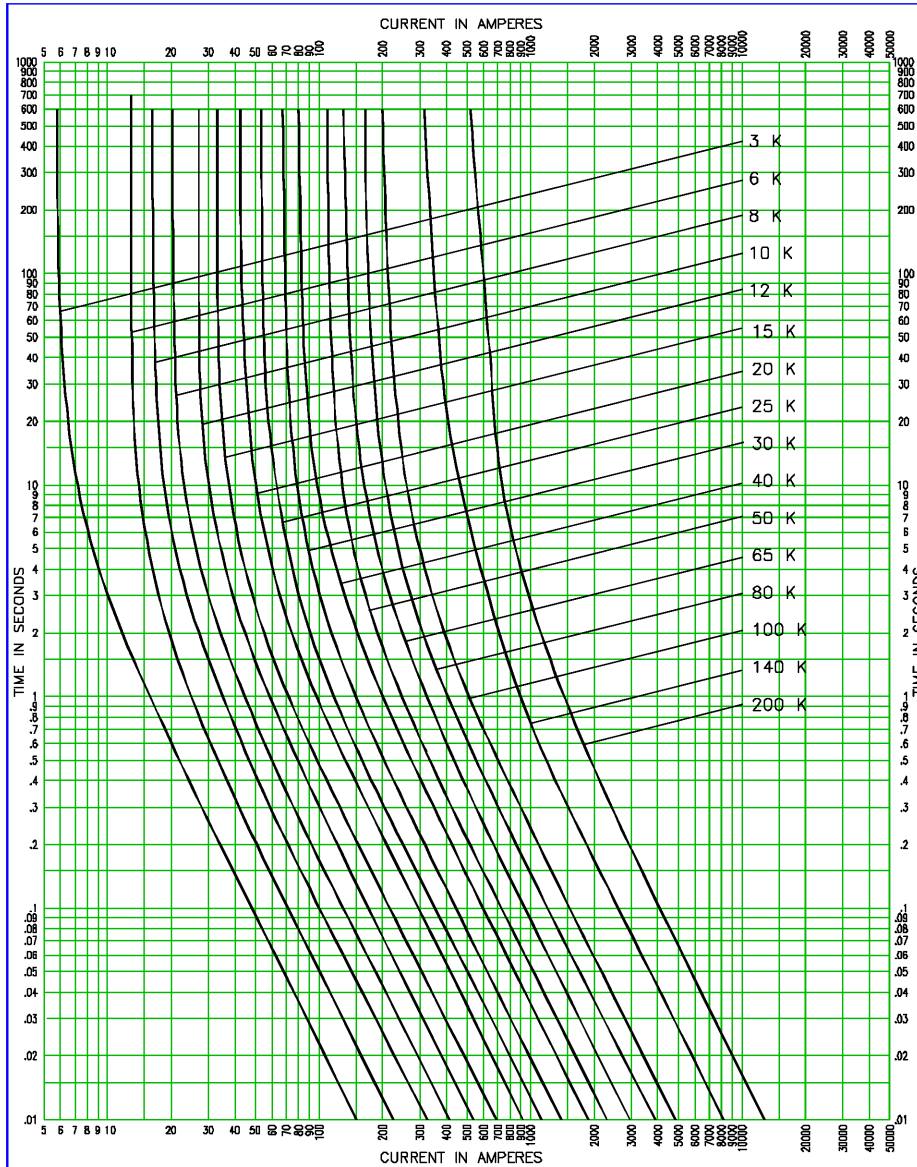
TCC 165-2-4; S&C Electric Company, Total Clearing Time-Current Characteristic Curves, SMU Fuse Units – S&C "K" Speed

Stock Catalog Page 68-7; July 29, 2008)

Appendix A. Cooper TCC Fuse Curves

Time-Current Characteristics Curves: Minimum Melt "K" Speed

TCC Number: R240-91-153

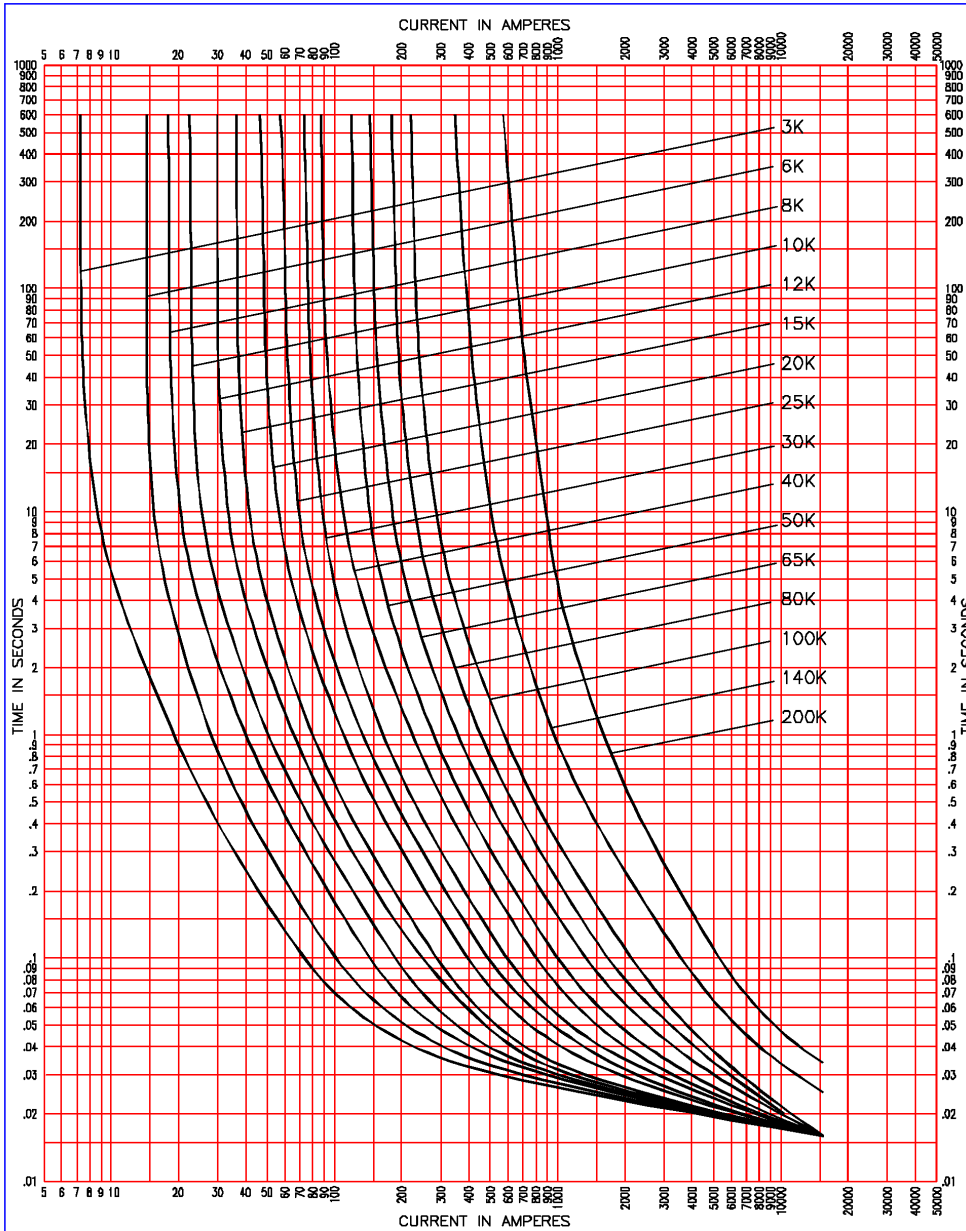


		TIME-CURRENT CHARACTERISTICS CURVES MINIMUM MELT K SPEED CMU 702XXX, CMU 703XXX & CMU704XXX FUSES	
DRAWN BY CSR	CHK'D _____	Tests made at LOW Volts ac at HIGH pf at 25°C with no initial load	
DATE 03/24/05	_____	Standards used as basis for data: IEEE C37.41-1984 & ANSI C37.42-1981(R1992)	
REPLACES 06/01	REV 02	REQ NO. _____	MINIMUM TEST POINTS PLOTTED SO VARIATIONS SHOULD BE PLUS
DWG NO. 42 39830 B 00	THIS DRAWING WAS PRODUCED ON A CAD SYSTEM, ANY MANUAL REVISION WILL VOID IT.		

Reference Data
 R240-91-153
 Page 1 of 1

Time-Current Characteristics Curves: Total Clear "K" Speed

TCC Number: R240-91-159



<p>COOPER Power Systems COMPONENTS AND PROTECTIVE EQUIPMENT</p>		<p>TIME-CURRENT CHARACTERISTICS CURVES 27kV & 38kV TOTAL CLEAR K SPEED CMU 703XXX & CMU704XXX FUSES</p>	
DRAWN BY CSR	CHK'D	Tests made at HIGH Volts ac at LOW pf at 25°C with no initial load	
DATE 03/24/05	DATE	Standards used as basis for data: IEEE 37.41-1994 & ANSI C37.42-1981(R1992)	
REPLACES 06/01	REV 02	RED. NO.	MAXIMUM TEST POINTS PLOTTED SO VARIATIONS SHOULD BE MINUS
DWG NO. 42 39836	B 00	THIS DRAWING WAS PRODUCED ON A CAD SYSTEM, ANY MANUAL REVISION WILL VOID IT.	
		Reference Data R240-91-159 Page 1 of 1	

Appendix B. S&C TCC Fuse Curves

Minimum Melting Time-Current Characteristic Curves: SMU Fuse Units – S&C “K” Speed

TCC Number: 165-2

