

X-Limiter™ Hinge-mount Current-limiting Fuse

GENERAL

The Cooper Power Systems Combined Technologies (CT) X-Limiter™ hinge-mount fuses are designed to fit the mountings manufactured by S & C Electric Company.

The X-Limiter hinge-mount fuses are full-range, current-limiting fuses to be used indoors or for metal clad applications, and outdoors for crossarm mounting or substation mounting, for the following S & C Electric Company mountings:

- Type SMD®-20 (see page 2)
- Type SML®-4Z (see page 5)
- Type SM®-20 (see page 6)
- Type SM®-4 (see page 7)

The availability of the X-Limiter hinge-mount fuse makes it easy to convert from expulsion fuses directly to a full-range, current-limiting fuse in the same mounting. The designs utilize the S & C standard end fittings (hinge-end and latched-end) to ensure a perfect fit in the mountings. The X-Limiter hinge-mount fuse's electrical and time current characteristics are identical to the X-Limiter fuse described in Catalog Section 240-56.

APPLICATION

X-Limiter hinge-mount fuses are rated at phase-to-ground voltage. This is an acceptable practice when:

- Loads are single-phase connected phase-to-ground.
- Three-phase transformers are Y-Y grounded or Delta Y grounded connected and secondary load is at least 50% Y connected. Alternately, three-phase transformers are separately protected on their primary side.
- Three-phase circuits are grounded "Y" connected and lines are single or three conductor shielded with intimate ground return path.
- Single-phase circuits utilize single conductor shielded cable with intimate ground return path.

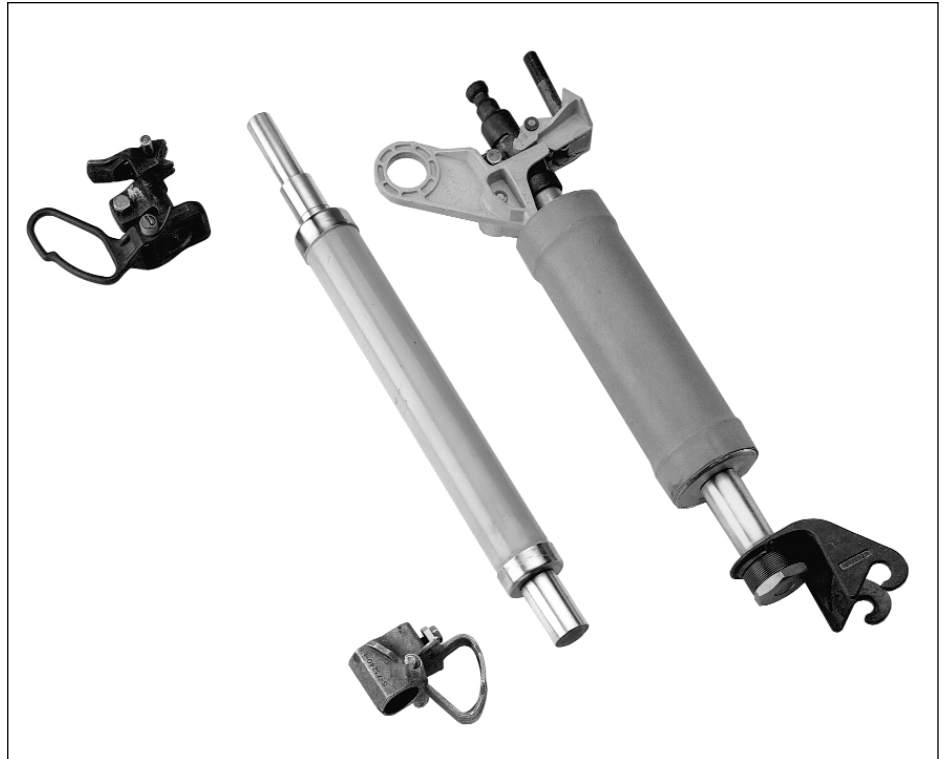


Figure 1. X-Limiter Hinge-mount current-limiting fuses for S&C SM-20 mount (right) and for S&C SMD-20 mount (left).

TABLE 1
Electrical Characteristics

Fuse Type	Full-range
Maximum Interrupting Current	50,000 A* rms symmetrical

* Except 17 kV parallel 80 and 100 A fuses are rated for 43 kA rms symmetrical.

PRODUCTION TESTS

Tests are conducted in accordance with Cooper Power Systems requirements.

- 100% Physical Inspection
- 100% I²t Testing
- 100% Resistance Testing

FUSES FOR S&C TYPE SMD-20 OUTDOOR MOUNTS

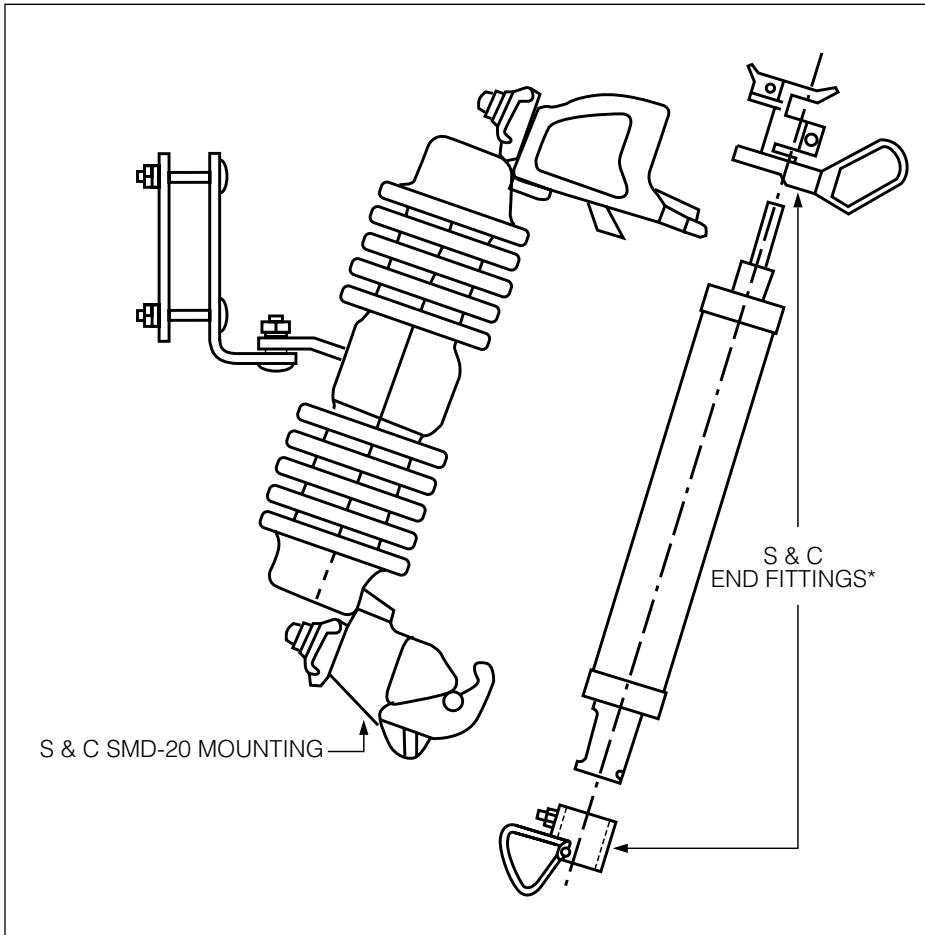


Figure 2.
X-Limiter Hinge-mount fuses with dropout indication for S&C Type SMD-20 mount.

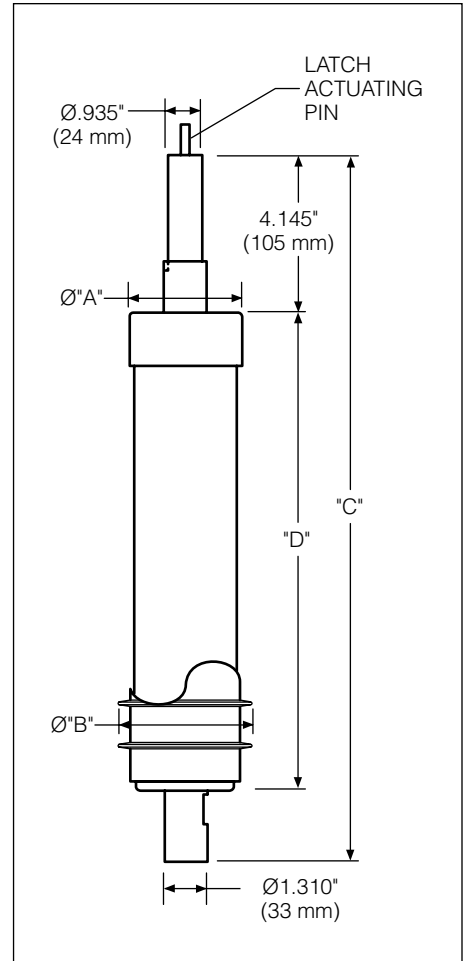


Figure 3.
X-Limiter Hinge-mount fuses with dropout indication (latch actuating pin) for S&C Type SMD-20 outdoor mount.

* The X-Limiter Hinge-mount fuse utilizes the upper and lower S & C end fittings. Typical S & C end fittings for the SMD-20 cutout is S&C #3095

TABLE 2
8.3 kV Type X-Limiter Hinge-mount Fuse for S & C 14.4 kV (17.0 kV) Type SMD-20 Outdoor Mount (Refer to Figures 2 and 3)

Current Rating (A)	Catalog Number* (Includes Dropout Indication)	Dimensions (Refer to Figure 3) Inches (mm)			
		A	B	C	D
10	83F010HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
12	83F012HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
18	83F018HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
20	83F020HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
25	83F025HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
30	83F030HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
40	83F040HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
50	85F050HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
65	83F065HD1A	3.13 (80)	4.40 (112)	18.16 (461)	11.80 (300)
80	83F080HD1A	3.13 (80)	4.40 (112)	18.16 (461)	11.80 (300)
100	83F100HD1A	3.13 (80)	4.40 (112)	18.16 (461)	11.80 (300)
125	83F125HD1A	3.13 (80)	4.40 (112)	18.16 (461)	11.80 (300)

*Standard fuse surface is "UV" resistant epoxy (A). For "UV" track resistant heat shrink sleeve replace "A" in catalog number with the letter "B". For EPDM molded track skirts replace "A" with letter "C".

TABLE 3
15.5 kV Type X-Limiter Hinge-mount Fuse for S & C 14.4 kV (17.0 kV) Type SMD-20 Outdoor Mount (Refer to Figures 2 and 3)

Current Rating (A)	Catalog Number* (Includes Dropout Indication)	Dimensions (Refer to Figure 3) Inches (mm)			
		A	B	C	D
10	15F010HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
12	15F012HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
18	15F018HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
20	15F020HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
25	15F025HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
30	15F030HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
40	15F040HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)
50	15F050HD1A	2.13 (54)	3.75 (95)	18.16 (461)	11.80 (300)

*Standard fuse surface is "UV" resistant epoxy (A). For "UV" track resistant heat shrink sleeve replace "A" in catalog number with the letter "B". For EPDM molded track skirts replace "A" with letter "C".

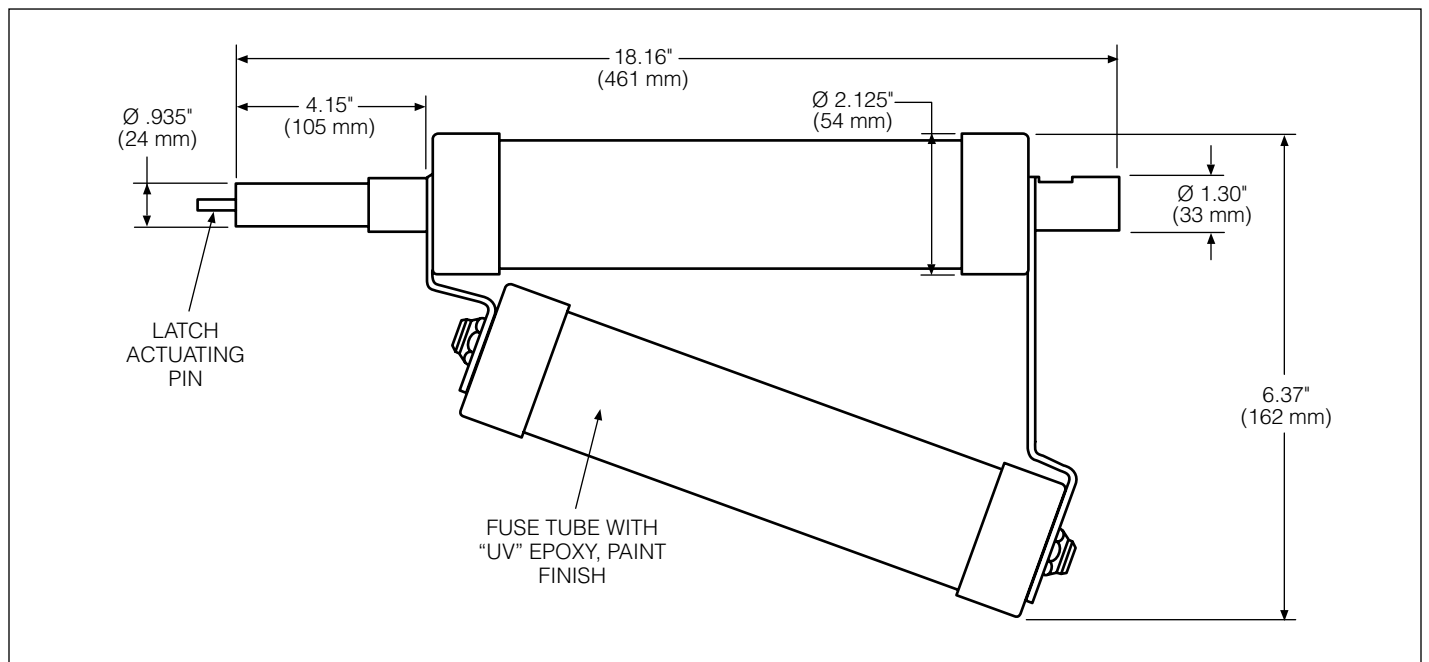


Figure 4.
17.0 kV X-Limiter Hinge-mount 65-100 A fuse with dropout indication (latch actuating pin) for S&C 14.4 kV (17.0 kV) Type SMD-20 outdoor mount.

* The X-Limiter Hinge-mount fuse utilizes the upper and lower S & C end fittings. Typical S & C end fittings for the SMD-20 cutout is S&C #3095

TABLE 4
17.0 kV Type X-Limiter Hinge-mount Fuse for S&C 14.4 kV (17.0 kV) Type SMD-20 Outdoor Mount (Refer to Figure 4)

Current Rating (A)	Catalog Number (Includes Dropout Indication)
65	15F065HD1A
80	15F080HD1A
100	15F100HD1A

X-Limiter™ Hinge-mount Current-limiting Fuse

TABLE 5
15.5 kV Type X-Limiter Hinge-mount Fuse for S & C 25 kV (27.0 kV) Type SMD-20
Outdoor Mount (Refer to Figures 2 and 3)

Current Rating (A)	Catalog Number* (Includes Dropout Indication)	Dimensions (Refer to Figure 3) Inches (mm)			
		A	B	C	D
10	15F010HD2A	2.13 (54)	3.75 (95)	21.46 (545)	15.10 (384)
12	15F012HD2A	2.13 (54)	3.75 (95)	21.46 (545)	15.10 (384)
18	15F018HD2A	2.13 (54)	3.75 (95)	21.46 (545)	15.10 (384)
20	15F020HD2A	2.13 (54)	3.75 (95)	21.46 (545)	15.10 (384)
25	15F025HD2A	2.13 (54)	3.75 (95)	21.46 (545)	15.10 (384)
30	15F030HD2A	2.13 (54)	3.75 (95)	21.46 (545)	15.10 (384)
40	15F040HD2A	2.13 (54)	3.75 (95)	21.46 (545)	15.10 (384)
50	15F050HD2A	2.13 (54)	3.75 (95)	21.46 (545)	15.10 (384)
65	15F065HD2A	3.13 (80)	4.40 (112)	21.46 (545)	15.10 (384)
80	15F080HD2A	3.13 (80)	4.40 (112)	21.46 (545)	15.10 (384)
100	15F100HD2A	3.13 (80)	4.40 (112)	21.46 (545)	15.10 (384)
125	15F125HD2A	3.13 (80)	4.40 (112)	21.46 (545)	15.10 (384)

*Standard fuse surface is "UV" resistant epoxy (A). For "UV" track resistant heat shrink sleeve replace "A" in catalog number with the letter "B". For EPDM molded track skirts replace "A" with letter "C".

TABLE 6
23 kV Type X-Limiter Hinge-mount Fuse for S & C 25 kV (27.0 kV) Type SMD-20
Outdoor Mount (Refer to Figures 2 and 3)

Current Rating (A)	Catalog Number* (Includes Dropout Indication)	Dimensions (Refer to Figure 3) Inches (mm)			
		A	B	C	D
10	23F010HD2A	2.13 (54)	3.75 (95)	21.46 (545)	14.85 (377)
12	23F012HD2A	2.13 (54)	3.75 (95)	21.46 (545)	14.85 (377)
18	23F018HD2A	2.13 (54)	3.75 (95)	21.46 (545)	14.85 (377)
20	23F020HD2A	2.13 (54)	3.75 (95)	21.46 (545)	14.85 (377)
25	23F025HD2A	2.13 (54)	3.75 (95)	21.46 (545)	14.85 (377)
30	23F030HD2A	2.13 (54)	3.75 (95)	21.46 (545)	14.85 (377)
40	23F040HD2A	2.13 (54)	3.75 (95)	21.46 (545)	14.85 (377)
50	23F050HD2A	2.13 (54)	3.75 (95)	21.46 (545)	14.85 (377)

*Standard fuse surface is "UV" resistant epoxy (A). For "UV" track resistant heat shrink sleeve replace "A" in catalog number with the letter "B". For EPDM molded track skirts replace "A" with letter "C".

TABLE 7
23 kV Type X-Limiter Hinge-mount Fuse for S & C 34.5 kV (38.0 kV) Type SMD-20
Outdoor Mount (Refer to Figures 2 and 3)

Current Rating (A)	Catalog Number* (Includes Dropout Indication)	Dimensions (Refer to Figure 3) Inches (mm)			
		A	B	C	D
10	23F010HD3A	2.13 (54)	3.75 (95)	27.60 (701)	14.85 (377)
12	23F012HD3A	2.13 (54)	3.75 (95)	27.60 (701)	14.85 (377)
18	23F018HD3A	2.13 (54)	3.75 (95)	27.60 (701)	14.85 (377)
20	23F020HD3A	2.13 (54)	3.75 (95)	27.60 (701)	14.85 (377)
25	23F025HD3A	2.13 (54)	3.75 (95)	27.60 (701)	14.85 (377)
30	23F030HD3A	2.13 (54)	3.75 (95)	27.60 (701)	14.85 (377)
40	23F040HD3A	2.13 (54)	3.75 (95)	27.60 (701)	14.85 (377)
50	23F050HD3A	2.13 (54)	3.75 (95)	27.60 (701)	14.85 (377)

*Standard fuse surface is "UV" resistant epoxy (A). For "UV" track resistant heat shrink sleeve replace "A" in catalog number with the letter "B". For EPDM molded track skirts replace "A" with letter "C".

FUSES FOR S&C TYPE SML-4Z MOUNTS

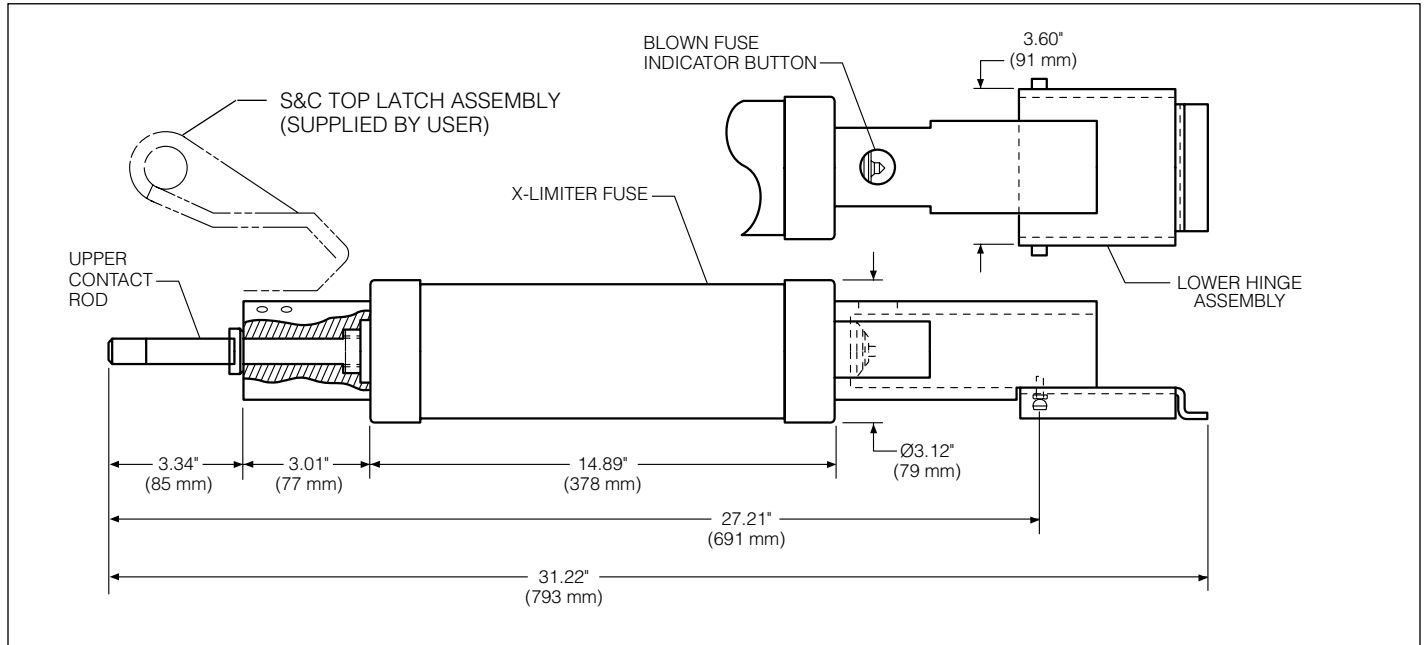


Figure 5.
X-Limiter Hinge-mount fuse for S & C Type SML-4Z indoor mount.

TABLE 8
15.5 kV Type X-Limiter Hinge-mount Fuse to fit S & C 25 kV
(27.0 kV) Type SML-4Z Indoor Mount (Refer to Figure 5)

Current Rating (A)	Catalog Number for Fuse with Upper Contact Rod and Lower Hinge Assembly*	Catalog Number for Fuse Replacement
50	15F050HZ2IEF	15F050HZ2I
65	15F065HZ2IEF	15F065HZ2I
80	15F080HZ2IEF	15F080HZ2I
100	15F100HZ2IEF	15F0100HZ2I
125	15F125HZ2IEF	15F0125HZ2I

*S&C Top latch assembly as shown in Figure 5 is not included and is supplied by the end user.

FUSES FOR S&C TYPE SM-20 INDOOR MOUNTS

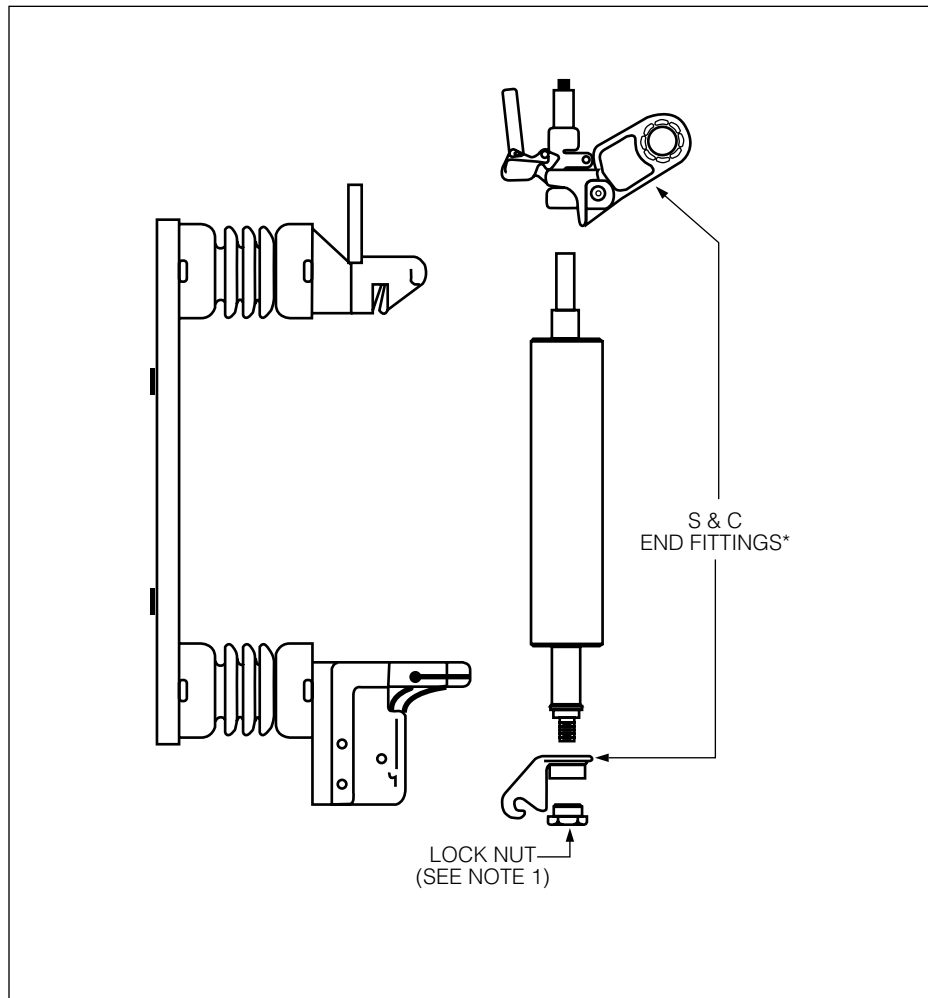


Figure 6.
X-Limiter Hinge-mount fuse for S & C Type SM-20 indoor mount.

* The X-Limiter Hinge-mount fuse utilizes the upper and lower S & C end fittings. Typical S & C end fittings for the SM-20 indoor mount is S&C #5040

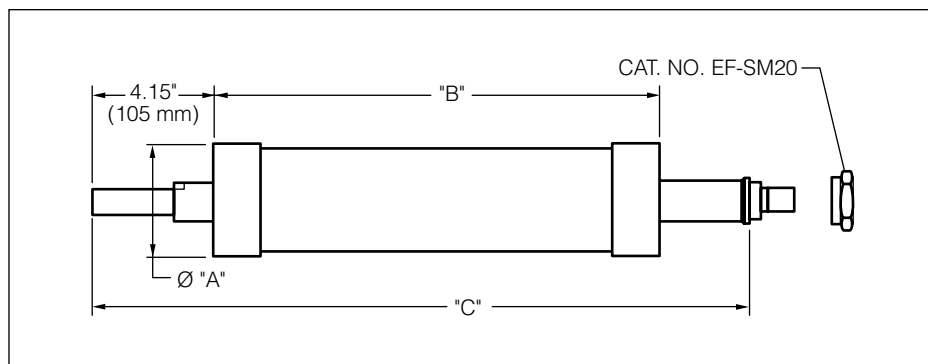


Figure 7.
X-Limiter Hinge-mount fuse for S & C Type SM-20 indoor mount.

TABLE 9
8.3 kV Type X-Limiter Hinge-mount Fuse to fit S & C 13.8 kV (17.0 kV) Type SM-20 Indoor Mounting*

Current Rating (A)	Catalog Number SM-20	Dimensions (Refer to Figure 7) Inches (mm)		
		A	B	C
10	83F010HC1	2.13 (54)	7.77 (197)	17.71 (450)
12	83F012HC1	2.13 (54)	7.77 (197)	17.71 (450)
18	83F018HC1	2.13 (54)	7.77 (197)	17.71 (450)
20	83F020HC1	2.13 (54)	7.77 (197)	17.71 (450)
25	83F025HC1	2.13 (54)	7.77 (197)	17.71 (450)
30	83F030HC1	2.13 (54)	7.77 (197)	17.71 (450)
40	83F040HC1	2.13 (54)	7.77 (197)	17.71 (450)
50	83F050HC1	2.13 (54)	7.77 (197)	17.71 (450)
65	83F065HC1	3.13 (80)	10.68 (271)	17.71 (450)
80	83F080HC1	3.13 (80)	10.68 (271)	17.71 (450)

*Typical S & C Mounting CAT #90412

TABLE 10
15.5 kV Type X-Limiter Hinge-mount Fuse to fit S & C 25 kV (27 kV) Type SM-20 Indoor Mounting*

Current Rating (A)	Catalog Number SM-20	Dimensions (Refer to Figure 7) Inches (mm)		
		A	B	C
10	15F010HC2	2.13 (54)	12.08 (307)	21.28 (541)
12	15F012HC2	2.13 (54)	12.08 (307)	21.28 (541)
18	15F018HC2	2.13 (54)	12.08 (307)	21.28 (541)
20	15F020HC2	2.13 (54)	12.08 (307)	21.28 (541)
25	15F025HC2	2.13 (54)	12.08 (307)	21.28 (541)
30	15F030HC2	2.13 (54)	12.08 (307)	21.28 (541)
40	15F040HC2	2.13 (54)	12.08 (307)	21.28 (541)
50	15F050HC2	2.13 (54)	12.08 (307)	21.28 (541)
65	15F065HC2	3.13 (80)	14.25 (362)	21.28 (541)
80	15F080HC2	3.13 (80)	14.25 (362)	21.28 (541)

*Typical S & C Mounting CAT #90413

Notes for Tables 9 and 10 and Figure 6 and 7:

1. Add the letter "N" to the catalog number to have the locknut furnished with the fuse (Example: 83F010HC1N)

X-Limiter™ Hinge-mount Current-limiting Fuse

FUSES FOR S&C TYPE SM-4 INDOOR MOUNT

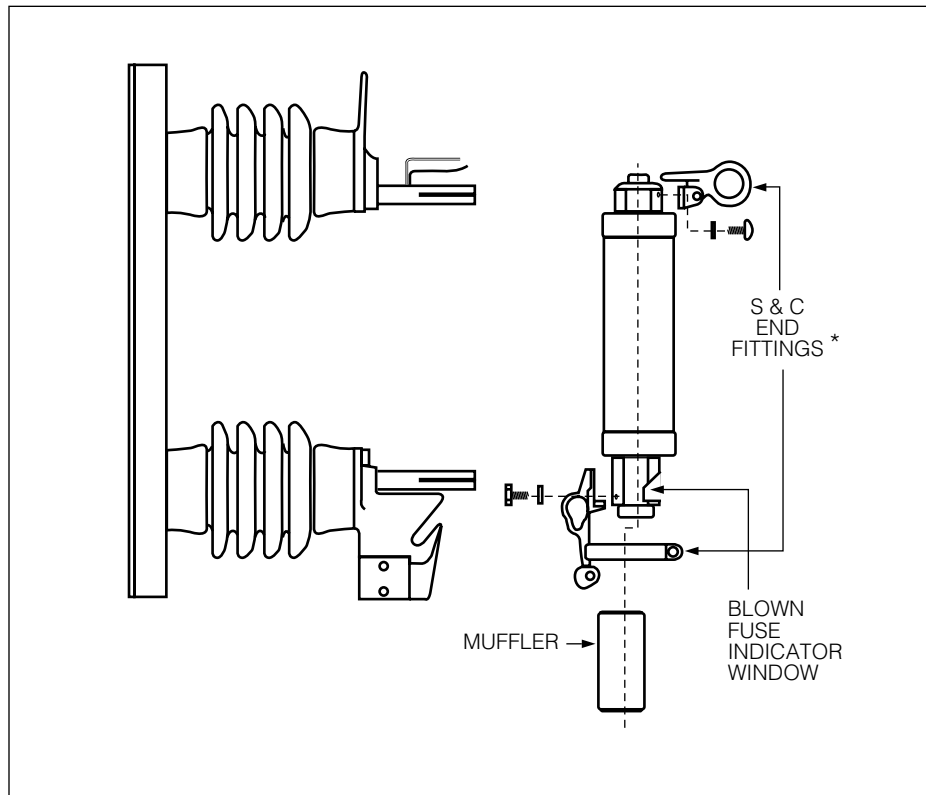


Figure 8.
X-Limiter Hinge-mount fuse for S&C Type SM-4 indoor mount.

* The X-Limiter Hinge-mount fuse utilizes the upper and lower S & C end fittings. Typical S & C end fittings for the SM-4 indoor mount is S&C #87119

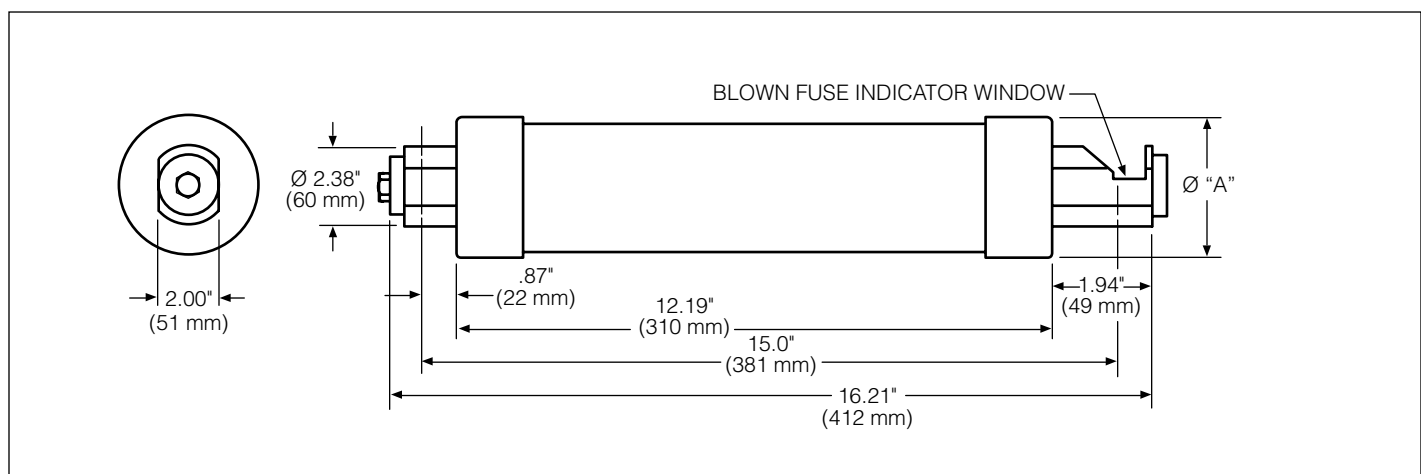


Figure 9.
15.5 kV X-Limiter Hinge-mount fuse for S&C 14.4 kV (17.0 kV) Type SM-4 indoor mount.

TABLE 11
15.5 kV X-Limiter Hinge-mount Fuse for S & C 14.4 kV (17.0 kV) Type SM-4 Indoor Mount (Refer to Figure 9)

Current Rating (A)	Catalog Number	Dimensions A inches (mm)
20	15F020VHA1A	2.13 (54)
25	15F025VHA1A	2.13 (54)
30	15F030VHA1A	2.13 (54)
40	15F040VHA1A	2.13 (54)
50	15F050VHA1A	2.13 (54)
65	15F065VHA1A	3.12 (79)
80	15F080VHA1A	3.12 (79)

Notes for Table 11:

1. S & C fuse is a boric acid expulsion devices use a muffler to control expulsion forces. Use of muffler is not required with current-limiting fuses but may be desirable to limit opening.

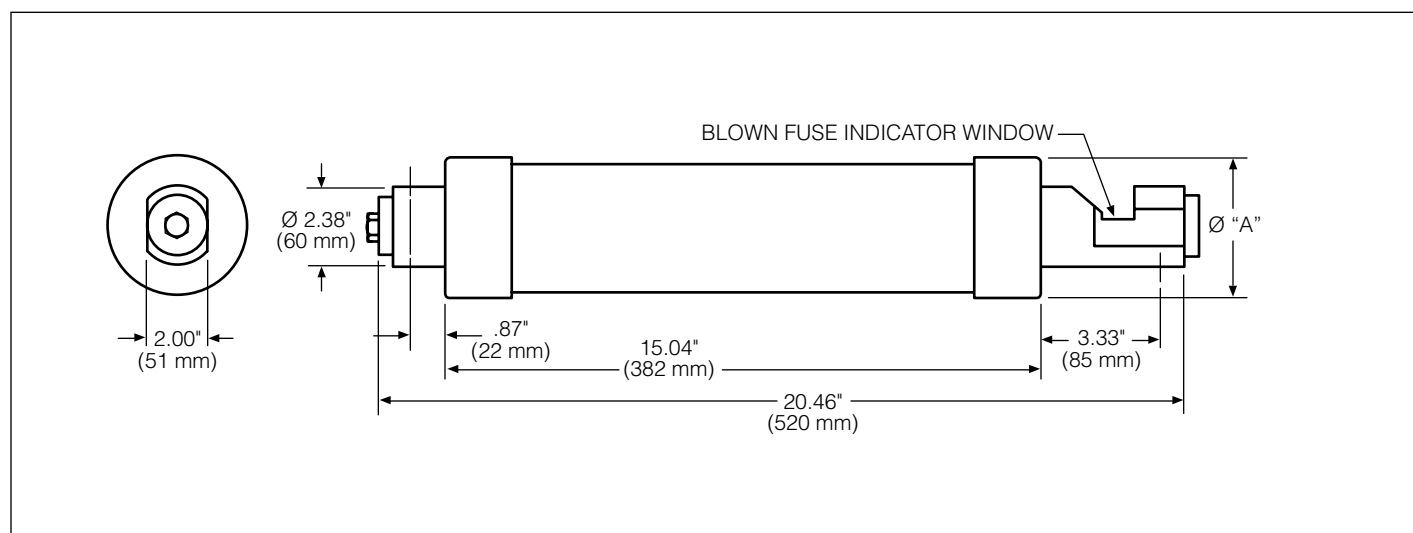


Figure 10.
15.5 kV X-Limiter Hinge-mount fuse for S&C 25 kV (27 kV) Type SM-4 indoor mount.

TABLE 12
15.5 kV X-Limiter Hinge-mount Fuse for S & C 25 kV (27 kV) Type SM-4 Indoor Mount (Refer to Figure 10)

Current Rating (A)	Catalog Number	Dimensions A inches (mm)
20	15F020VHA2A	2.13 (54)
25	15F025VHA2A	2.13 (54)
30	15F030VHA2A	2.13 (54)
40	15F040VHA2A	2.13 (54)
50	15F050VHA2A	2.13 (54)
65	15F065VHA2A	3.12 (79)
80	15F080VHA2A	3.12 (79)

Notes for Table 12:

1. S & C fuse is a boric acid expulsion devices use a muffler to control expulsion forces. Use of muffler is not required with current-limiting fuses but may be desirable to limit opening.

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Cooper Power Systems

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