

These ratings are the maximum interrupting ratings of the fuses listed based upon full line-to-line voltage across a single fuse. Obviously, this is only one criterion of fuse performance. These fuses have also been rigorously tested through the full spectrum of fault currents, from the lowest to the highest fault—not only primary faults but also secondary-side faults as seen from the primary side of the transformer—and under all realistic conditions of circuitry. In all S&C testing, especial attention is given to establishing and controlling circuit parameters to duplicate conditions as severe as those which will be encountered in the field. This involves testing at all degrees of asymmetry and matching the rate of rise of transient recovery voltage of the test circuit to that found in actual field applications. This rate of rise depends, in turn, on carefully established laboratory test conditions to obtain realistic natural frequencies and typical amplitudes of transient recovery voltage.

These short-circuit interrupting ratings have been determined in accordance with the procedures described in ANSI Standard C37.41-1988. Moreover, with respect to the requirement in this standard for testing with circuits

having an X/R ratio of at least 15 (corresponding to an asymmetry factor of 1.55), S&C's tests were performed under the more severe condition of X/R = 20, corresponding to an asymmetry factor of 1.6. Based upon recognition that there are many applications where the X/R ratio is *less* severe than the value of 15 specified by the standard, higher symmetrical ratings have been determined for many of the fuses listed, for X/R = 10 and X/R = 5. These higher ratings are set forth in the applicable power fuse descriptive bulletins.

It is normal practice to select a power fuse which has a nominal voltage rating that is nearest but never less than the nominal voltage rating of the system on which it is applied. However, special situations are often met—such as portable substations; standardization on a limited number of fuse voltage ratings; and later conversion to higher operating voltage—where a fuse of higher than normally required voltage rating is applied. Because of these situations, interrupting ratings for a range of system voltages have been listed for each fuse voltage rating where practicable.

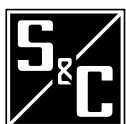


Table 1—Outdoor Transmission — Current Designs (Product in production)

kV, Nominal ↓		Short-Circuit Interrupting Ratings (Bold Font Is Nominal Rating) ^①														
Power Fuse Type →		SMD-50			SMD-1A			SMD-2B ^②			SMD-2C ^②			SMD-3		
Fuse	System	Amperes		MVA, 3-Phase Sym. ^③	Amperes		MVA, 3-Phase Sym. ^③	Amperes		MVA, 3-Phase Sym. ^③	Amperes		MVA, 3-Phase Sym. ^③	Amperes		MVA, 3-Phase Sym. ^③
		Sym. ^③	Asym.		Sym. ^③	Asym.		Sym. ^③	Asym.		Sym. ^③	Asym.		Sym. ^③	Asym.	
34.5	23	6 700	10 600	265	17 500	28 000	700				33 500	53 500	1300			
	27.6	6 700	10 600	320	17 500	28 000	840				33 500	53 500	1600			
	34.5	6 700	10 600	400	17 500	28 000	1000				33 500	53 500	2000			
46	23			...			...				31 500	50 500	...			
	27.6	6 000	9 600	...	15 000	24 000	...				31 500	50 500	...			
	34.5	6 000	9 600	...	15 000	24 000	...				31 500	50 500	...			
	46	5 000	8 000	400	13 100	21 000	1000				31 500	50 500	2500			
69	23			...			...	21 900	...	...				25 000	...	...
	27.6			...			...	21 900	...	...				25 000	...	...
	34.5	4 000	6 400	...	10 000	16 000	...	21 900	...	...				25 000	...	...
	46	4 000	6 400	...	10 000	16 000	...	21 900	...	...				25 000	...	...
	69	3 350	5 300	400	8 750	14 000	1000	17 500	28 000	2000				25 000	40 000	3000
115	69			...	5 000	8 000	...	10 500	16 800	...						
	115			...	5 000	8 000	1000	10 500	16 800	2000						
138	115			...	5 000	8 000	1000	10 500	16 800	...						
	138			...	4 200	6 700	1000	8 750	14 000	2000						

① Where no interrupting rating is listed, or when higher interrupting capacity is needed, refer to the nearest S&C Sales Office.

② The listed ratings apply only to SMD-2B and SMD-2C Fuse Units used with mountings that are of the latest design (i.e., incorporating upper end fittings having four attachment bolts for 69 kV and below, or three attachment bolts for 115 kV and 138 kV), or that have been modernized with new end fittings, as listed in the current Specification Bulletin 212-31.

③ Symmetrical ratings assigned are based on available symmetrical short-circuit current at locations where the X/R ratio is 20. See text on page 1 for a complete explanation.

Table 2 — Outdoor Distribution — Current Designs (Product in production)

kV, Nominal ↓		Short-Circuit Interrupting Ratings (Bold Font Is Nominal Rating)①											
Power Fuse Type →		SM-4②			SM-5③			SMD-20 (with SMU-20 Fuse Units)④			SMD-40 (with SMU-40 Fuse Units with Silencer④)		
Fuse	System	Amperes		MVA, 3-Phase Sym.⑤	Amperes		MVA, 3-Phase Sym.⑤	Amperes		MVA, 3-Phase Sym.⑤	Amperes		MVA, 3-Phase Sym.⑤
		Sym.⑤	Asym.		Sym.⑤	Asym.		Sym.⑤	Asym.		Sym.⑤	Asym.	
4.16★ or 4.8❖	2.4				37 500	60 000	155				25 000	40 000	105
	2.4/4.16Y				37 500	60 000	270				25 000	40 000	180
	4.8										25 000	40 000	210
7.2	2.4	17 200	27 500	70	28 000	44 500	115						
	2.4/4.16Y	17 200	27 500	125	28 000	44 500	200						
	4.8	17 200	27 500	145	27 000	43 500	225						
	7.2	15 600	25 000	195	26 000	41 500	325						
14.4 (50/60-Hz ratings■)	7.2	15 600	25 000	195	25 000	40 000	310						
	4.8/8.32Y	15 600	25 000	225	25 000	40 000	360						
	12	12 500	20 000	260	25 000	40 000	520						
	7.2/12.47Y	12 500	20 000	270	25 000	40 000	540						
	7.62/13.2Y	12 500	20 000	285	25 000	40 000	570						
	13.8	12 500	20 000	300	25 000	40 000	600						
	14.4	12 500	20 000	310	25 000	40 000	620						
16.5	12 500	20 000	355	25 000	40 000	715							
14.4 (60-Hz ratings)	7.2				34 600	55 000	430	14 000	22 400	175	25 000	40 000	310
	4.8/8.32Y				34 600	55 000	500	14 000	22 400	200	25 000	40 000	360
	12				34 600	55 000	720	14 000	22 400	290	25 000	40 000	520
	7.2/12.47Y				34 600	55 000	750	14 000	22 400	300	25 000	40 000	540
	7.62/13.2Y				34 000	54 000	780	14 000	22 400	320	25 000	40 000	570
	13.8				34 000	54 000	815	14 000	22 400	335	25 000	40 000	600
	14.4				34 000	54 000	850	14 000	22 400	350	25 000	40 000	620
16.5							14 000	22 400	400	25 000	40 000	715	
25	7.2/12.47Y	12 500	20 000	270	20 000	32 000	430	12 500	20 000	270	20 000	32 000	430
	7.62/13.2Y	12 500	20 000	285	20 000	32 000	455	12 500	20 000	285	20 000	32 000	455
	13.8	12 500	20 000	300	20 000	32 000	480	12 500	20 000	300	20 000	32 000	480
	14.4	12 500	20 000	310	20 000	32 000	500	12 500	20 000	310	20 000	32 000	500
	16.5	12 500	20 000	355	20 000	32 000	570	12 500	20 000	355	20 000	32 000	570
	23	9 400	15 000	375	20 000	32 000	795	12 500	20 000	500	20 000	32 000	795
	14.4/24.9Y 20/34.5Y ▲	9 400	15 000	405	20 000	32 000	860	12 500	20 000	540	20 000	32 000	860
34.5	23	9 400	15 000	375	17 500	28 000	695	10 000	16 000	400			
	14.4/24.9Y	8 700	13 900	375	17 500	28 000	755	10 000	16 000	430			
	27.6	7 800	12 500	375	17 500	28 000	835	10 000	16 000	475			
	20/34.5Y	6 250	10 000	375	17 500	28 000	1000	10 000	16 000	600			
	34.5	6 250	10 000	375	17 500	28 000	1000	10 000	16 000	600			

① Where no interrupting rating is listed, or when higher interrupting capacity is needed, refer to the nearest S&C Sales Office.
 ② For the 50-Hz interrupting ratings of 7.2-kV SM-4 Power Fuses applied at 8.32 kV or less, multiply the values shown by 0.9.
 ③ These ratings apply provided that mounting, holder, and refill unit are matched (identified by large arrow on nameplate or label). For interrupting ratings applying to previous designs, see pages 8 through 10.
 ④ 60-Hz ratings only.
 ⑤ Symmetrical ratings assigned are based on available symmetrical short-circuit current at locations where the X/R ratio is 20. See text on page 1 for a complete explanation.

★ Applies to 4.16-kV SM-5 refill unit in 7.2 kV holder.
 ❖ Applies to Power Fuse Type SMD-40.
 ■ Applicable to Power Fuse Types SM-4 and SM-5.
 ▲ Applicable to 25-kV Overhead—Pole-Top Style SMD-20 Power Fuses only, for protection of single-phase-to-neutral circuits (lines or transformers) only.

Table 3 — Indoor Distribution — Current Designs (Product in production)

kV, Nominal ↓		Short-Circuit Interrupting Ratings (Bold Font Is Nominal Rating)①											
Power Fuse Type →		SM-20 and SML-20 (with SMU-20 Fuse Units with Silencer②③)			SM-40 (with SMU-20 Fuse Units with Silencer②)			SM-4Z and SML-4Z with Silencer②③			SM-5S with Snuffler and SM-5SS, with Super Snuffler③④⑤		
Fuse	System	Amperes		MVA, 3-Phase Sym.⑥	Amperes		MVA, 3-Phase Sym.⑥	Amperes		MVA, 3-Phase Sym.⑥	Amperes		MVA, 3-Phase Sym.⑥
		Sym.⑥	Asym.		Sym.⑥	Asym.		Sym.⑥	Asym.		Sym.⑥	Asym.	
4.16 or 4.8 ❖	2.4				25 000	40 000	105				37 500	60 000	155
	2.4/4.16Y				25 000	40 000	180				37 500	60 000	270
	4.8				25 000	40 000	210						
7.2 ■	2.4							17 200	27 500	70	28 000	44 500	115
	2.4/4.16Y							17 200	27 500	125	28 000	44 500	200
	4.8							17 200	27 500	145	27 000	43 500	225
14.4 ● (50/60-Hz ratings■)	7.2										25 000	40 000	310
	4.8/8.32Y										25 000	40 000	360
	12										25 000	40 000	520
	7.2/12.47Y										25 000	40 000	540
	7.62/13.2Y										25 000	40 000	570
	13.8										25 000	40 000	600
	14.4										25 000	40 000	620
16.5										25 000	40 000	715	
14.4 ▲ (60-Hz ratings)⑤	7.2	14 000	22 400	175	25 000	40 000	310	15 600	25 000	195	34 600	55 000	430
	4.8/8.32Y	14 000	22 400	200	25 000	40 000	360	15 600	25 000	225	34 600	55 000	500
	12	14 000	22 400	290	25 000	40 000	520	12 500	20 000	260	34 600	55 000	720
	7.2/12.47Y	14 000	22 400	300	25 000	40 000	540	12 500	20 000	270	34 600	55 000	750
	7.62/13.2Y	14 000	22 400	320	25 000	40 000	570	12 500	20 000	285	34 000	54 000	780
	13.8	14 000	22 400	335	25 000	40 000	600	12 500	20 000	300	34 000	54 000	815
	14.4	14 000	22 400	350	25 000	40 000	620	12 500	20 000	310	34 000	54 000	850
	16.5	14 000	22 400	400	25 000	40 000	715	12 500	20 000	355			
25	7.2/12.47Y	12 500	20 000	270	20 000	32 000	430	12 500	20 000	270	20 000	32 000	430
	7.62/13.2Y	12 500	20 000	285	20 000	32 000	455	12 500	20 000	285	20 000	32 000	455
	13.8	12 500	20 000	300	20 000	32 000	480	12 500	20 000	300	20 000	32 000	480
	14.4	12 500	20 000	310	20 000	32 000	500	12 500	20 000	310	20 000	32 000	500
	16.5	12 500	20 000	355	20 000	32 000	570	12 500	20 000	355	20 000	32 000	570
	23	12 500	20 000	500	20 000	32 000	795	9 400	15 000	375	20 000	32 000	795
	14.4/24.9Y	12 500	20 000	540	20 000	32 000	860	9 400	15 000	405	20 000	32 000	860
14.4/24.9Y◆							12 500	20 000	540				
34.5	23	8 450	13 500	335				9 400	15 000	375	17 500	28 000	695
	14.4/24.9Y	8 450	13 500	365				8 700	13 900	375	17 500	28 000	755
	27.6	8 450	13 500	405				7 800	12 500	375	17 500	28 000	835
	20/34.5Y	8 450	13 500	500				6 250	10 000	375	17 500	28 000	1000
	34.5	8 450	13 500	500				6 250	10 000	375	17 500	28 000	1000

① Where no interrupting rating is listed, or when higher interrupting capacity is needed, refer to the nearest S&C Sales Office.

② 60-Hz ratings only.

③ For metal-enclosed gear and pad-mounted gear application of these fuses, there are no requirements for special reinforcement of enclosures, provided the enclosures reflect adequate consideration of all environmental factors such as controlled access, tamper resistance, and sealing against ingress of rodents, insects, and weeds. It is also necessary to provide adequate electrical clearance and space for fuse handling. See S&C Data Bulletins 252-62, 252-64, 792-60, and 795-60.

④ These ratings apply provided that mounting, holder, and refill unit are mated (identified by large arrow on nameplate or label). For interrupting ratings applying to previous designs, see pages 8 through 10.

⑤ Interrupting ratings listed in the row titled "14.4 kV (60-Hz ratings)" under the column headed "SM-5S, with Snuffler and SM-5SS, with Super Snuffler" apply only to SM-5SS Power Fuses. All other ratings listed in this column (which are 50/60-Hz ratings) apply only to SM-5S Power Fuses.

⑥ Symmetrical ratings assigned are based on available symmetrical short-circuit current at locations where the X/R ratio is 20. See text on page 1 for a complete explanation.

❖ Applies to Power Fuse Type SM-40.

■ Interrupting ratings shown for SM-4Z and SM-5S Power Fuses are equally applicable to 7.2-kV refill units installed in 7.2-kV holders for use in 4.8-kV mountings for system voltages through 4.8 kV, or in discontinued 7.2-kV mountings for system voltages through 7.2 kV.

● Interrupting ratings shown for SM-4Z and SM-5S Power Fuses are equally applicable to 14.4-kV refill units installed in 14.4-kV holders for use in 13.8-kV mountings, or in discontinued 14.4-kV mountings.

■ Applicable to Power Fuse Type SM-5S.

▲ Interrupting ratings shown for SM-5SS Power Fuses are equally applicable to 14.4-kV refill units installed in 14.4-kV holders for use in 13.8-kV mountings, or in discontinued 14.4-kV mountings. Interrupting ratings shown for SM-40 Power Fuses are equally applicable to 14.4-kV fuse units for use with 13.8-kV mountings.

◆ Applicable to solidly grounded neutral systems only with fuses connected by a single concentric-neutral cable (or directly coupled) to a transformer or transformers, each with a wye-grounded-neutral primary connection.

Table 4 — Outdoor — Previous Designs (Product discontinued)

kV, Nominal		Short-Circuit Interrupting Ratings in Amperes (Asymmetrical) and MVA (Three-Phase Symmetrical ^①) (Bold Font Is Nominal Rating)									
Power Fuse Type		Transmission								Distribution	
		SMD-1		SMD-2		SMD-2A		SMD-2B ^②		SMD-20 (with SMD-20 Fuse Units)	
Fuse	System	MVA	Amp	MVA	Amp	MVA	Amp	MVA	Amp	MVA	Amp
7.2	2.4									90	20 000
	2.4/4.16Y									105	20 000
	4.8									155	20 000
14.4	7.2									155	20 000
	4.8/8.32Y									180	20 000
	12									260	20 000
	7.2/12.47Y									270	20 000
	7.62/13.2Y									285	20 000
	13.8									300	20 000
	14.4									310	20 000
23	16.5									355	20 000
	7.2/12.47Y									270	20 000
	7.62/13.2Y									285	20 000
	13.8									300	20 000
	14.4									310	20 000
	16.5									355	20 000
	23									500	20 000
34.5	14.4/24.9Y									540	20 000
	27.6									540	20 000
	20/34.5Y									540	20 000
	34.5									540	20 000
	23									540	20 000
46	23	...	14 000	...	28 000	...	35 000	...	42 000	...	16 000 ■
	27.6	...	14 000	...	28 000	...	35 000	...	42 000	...	16 000 ■
	34.5	500	14 000	1000	28 000	1250	35 000	1500	42 000	475 ■	16 000 ■
	46	500	14 000	1000	28 000	1250	35 000	1500	42 000	600 ■	16 000 ■
	23	...	14 000	...	28 000	...	30 000	...	38 500	...	16 000 ■
69	27.6	...	14 000	...	28 000	...	30 000	...	38 500	...	
	34.5	500	14 000	1000	28 000	...	30 000	...	38 500	...	
	46	500	10 500	1000	21 000	1250	26 250	1750	35 000	...	
	69	500	10 500	1000	17 000	...	25 000	...		...
	115	500	7 000	1000	14 000	1500	21 000	...		...
115	115			1000	8 400						
	138			1000	8 400						
138	115			1000	8 400						
	138			1000	7 000						

① These ratings are those originally assigned, based on an asymmetry factor of 1.6, corresponding to an X/R ratio of 20.

② The listed ratings apply only to SMD-2B Fuse Units used with mountings that are of the latest design (i.e., incorporating upper end fittings having four attachment bolts), or that have been modernized with new end fittings, as listed in the current Specification Bulletin 212-31.

▲ Applicable to solidly grounded neutral systems only with fuses connected by a single concentric-neutral cable (or directly coupled) to a transformer or transformers, each with a wye-grounded-neutral primary connections.

■ For 50-Hz ratings, multiply values shown by 0.84. For superseded "long" 34.5-kV SMD-20 Fuse Units, rating is 13,000 amperes, RMS, asymmetrical.

Table 5 — Indoor Distribution — Previous Designs (Product discontinued)

kV, Nominal		Short-Circuit Interrupting Ratings in Amperes (Asymmetrical) and MVA (Three-Phase Symmetrical ^①) (Bold Font Is Nominal Rating)									
Power Fuse Type		SM-4A with Condenser		SM-4D with Sneezzer		SM-4B with Muffler		SM-4S with Snuffler		SM-5A with Condenser	
Fuse	System	MVA	Amp	MVA	Amp	MVA	Amp	MVA	Amp	MVA	Amp
7.2	2.4	45	17 500	45	17 500	72	27 500	70	27 500	78	30 000
	2.4/4.16Y	80	17 500	80	17 500	125	27 500	125	27 500	135	30 000
	4.8	90	17 500	90	17 500	144	27 500	145	27 500	156	30 000
	7.2	115	15 000	115	15 000	195	25 000	195	25 000	195	25 000
14.4	7.2	115	15 000	115	15 000	195	25 000	195	25 000	195	25 000
	4.8/8.32Y	135	15 000	135	15 000	225	25 000	225	25 000	225	25 000
	12	160	12 500	195	15 000	260	20 000	260	20 000	260	20 000
	7.2/12.47Y	170	12 500	200	15 000	270	20 000	270	20 000	270	20 000
	7.62/13.2Y	180	12 500	200	14 000	285	20 000	285	20 000	285	20 000
	13.8	185	12 500	210	14 000	300	20 000	300	20 000	300	20 000
	14.4	195	12 500	220	14 000	310	20 000	310	20 000	310	20 000
16.5						355	20 000				
23	7.2/12.47Y	...	12 500	...	12 500	...	20 000	270	20 000	...	20 000
	7.62/13.2Y							285	20 000		
	13.8							300	20 000		
	14.4	...	12 500	...	12 500	...	20 000	310	20 000	...	20 000
	16.5							355	20 000		
	23	250	10 000	250	10 000	375	15 000	375	15 000	435	17 500
14.4/24.9							405	15 000			
14.4/24.9▲							540	20 000			
34.5	23	...	10 000	...	10 000	...	15 000	375	15 000	...	17 500
	14.4/24.9Y							375	13 900		
	27.6	...	8 800	...	8 800	...	12 500	375	12 500	...	16 300
	20/34.5Y		7 500	280	7 500	375	10 000	375	10 000	560	15 000
	34.5	280	7 500	280	7 500	375	10 000	375	10 000	560	15 000

① These ratings are those originally assigned, based on an asymmetry factor of 1.6, corresponding to an X/R ratio of 20.

▲ Applicable to solidly grounded neutral systems only with fuses connected by a single concentric-neutral cable (or directly coupled) to a transformer or transformers, each with a wye-grounded-neutral primary connections.

TABLE CONTINUED ►

Table 5 — Indoor Distribution — Previous Designs (Product discontinued) — Continued

kV, Nominal		Short-Circuit Interrupting Ratings in Amperes (Asymmetrical) and MVA (Three-Phase Symmetrical ^①) (Bold Font Is Nominal Rating)							
Power Fuse Type		SM-5D with Sneezzer		SM-5B with Special Muffler		SM-5C with Muffler ^②		SM-5 (pre-1959) Indoor, with Muffler, and Outdoor	
Fuse	System	MVA	Amp	MVA	Amp	MVA	Amp	MVA	Amp
4.16★	2.4					155	60 000		
	2.4/4.16Y					270	60 000		
7.2	2.4	90	34 500	104	40 000	...	44 500	104	40 000
	2.4/4.16Y	150	33 500	180	40 000	...	44 500	180	40 000
	4.8	155	30 000	208	40 000	225	43 500	208	40 000
	7.2	195	25 000	270	35 000	325	41 500	270	35 000
14.4	7.2	195	25 000	270	35 000	...	40 000	270	35 000
	4.8/8.32Y	225	25 000	315	35 000	360	40 000	315	35 000
	12	300	23 000	390	30 000	520	40 000	390	30 000
	7.2/12.47Y	310	23 000	405	30 000	540	40 000	405	30 000
	7.62/13.2Y	325	22 500	430	30 000	570	40 000	430	30 000
	13.8	340	22 500	450	30 000	600	40 000	450	30 000
	14.4	350	22 500	470	30 000	620	40 000	470	30 000
16.5	400	22 500			715	40 000			
23	7.2/12.47Y	...	20 000	...	30 000	...	32 000	...	30 000
	7.62/13.2Y	...	20 000	...		...	32 000	...	
	13.8	...	20 000	...		...	32 000	...	
	14.4	...	20 000	...	30 000	...	32 000	...	30 000
	16.5	355	20 000	...	25 000	...	32 000		
23	435	17 500	620	25 000	750	32 000	620	25 000	
34.5	23	435	17 500	...	25 000	...	28 000	...	25 000
	14.4/24.9Y	450	16 800	...	22 500	755	28 000	...	
	27.6	485	16 300	...	22 500	835	28 000	...	22 500
	20/34.5Y	560	15 000	750	20 000	1000	28 000	750	
	34.5	560	15 000	750	20 000	1000	28 000	750	20 000

① These ratings are those originally assigned, based on an asymmetry factor of 1.6, corresponding to an X/R ratio of 20.

★ Applies to 4.16-kV refill unit in 7.2 kV holder.

② The listed ratings apply only to SMD-2B Fuse Units used with mountings that are of the latest design (i.e., incorporating upper end fittings having four attachment bolts), or that have been modernized with new end fittings, as listed in the current Specification Bulletin 212-31.

