

The enclosure and insulating-barrier dimensions listed herein have been determined using the minimum clearances (shown in Note 5, page 3) recommended to facilitate fuse handling and to maintain the inherent electrical ratings of S&C Power Fuses--Types SM-20, SM-4Z, SM-5S, and SM-5SS when installed in metal enclosures. These clearances are sufficient provided that normal consideration has been given to avoidance of point-gap configurations. When installing bus or cable connections and cable terminations, these clearances should be observed. (Note: Lesser clearances than those shown are acceptable only if substantiated by impulse testing of the complete assembly consisting of enclosure, power fuses, barriers, bus, connectors, terminators, etc.) In addition, enclosure dimensions should be sufficient--or barriers should be provided--to ensure a minimum clearance between the metal parts of a hookstick and ground during opening and closing operations as follows: 1 inch for system voltages through 15.5 kv; 2 inches for system voltages greater than 15.5 kv but not exceeding 27 kv; and 3 inches for system voltages greater than 27 kv but not exceeding 38 kv.

For enclosures wherein S&C Power Fuses are to be combined with interrupter switches in a "switch-over-fuse" configuration, recommended minimum clearances set forth in Note 5 on page 3 should be observed for both the switch and fuses in determining the enclosure dimensions. For enclosures wherein S&C Power Fuses are to be combined in a "fuse-over-switch" configuration, consult the nearest S&C Sales Office.

Enclosures containing S&C Power Fuses should be key or mechanically interlocked with a source-side interrupter switch to guard against: (1) opening the enclosure door with the switch closed and the fuse carrying load current and (2) closing the interrupter switch with the fuse enclosure door open. There are no requirements for special reinforcement of enclosures, provided the enclosures reflect adequate consideration of environmental factors such as controlled access, tamper resistance, and sealing against ingress of rodents, insects, and weeds.

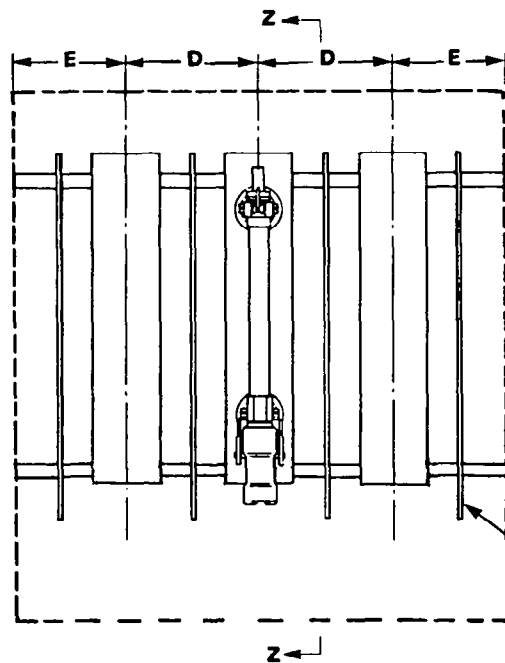
① Not applicable to submersible enclosures.



# S&C Power Fuses--Type SM

Indoor Distribution (4.16 kv through 34.5 kv)

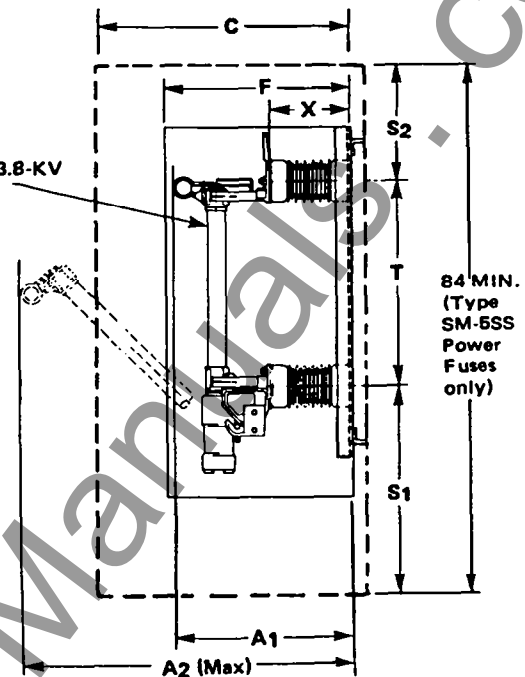
Minimum Construction Specifications  
For Indoor and Outdoor  
Metal Enclosures with Fuses



FRONT VIEW

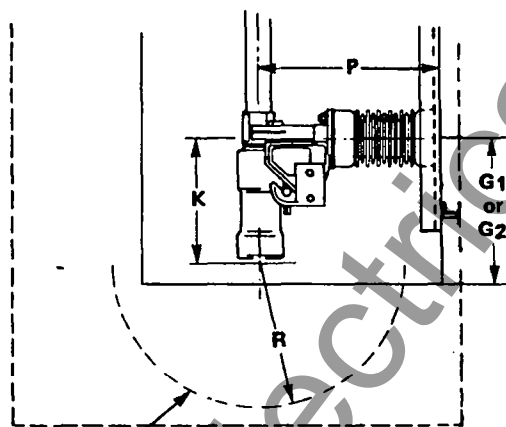
DISCONNECT STYLE 13.8-KV  
SM-4Z POWER FUSE  
ILLUSTRATED  
(SM-20 and SM-5S  
Power Fuses are similar)

INSULATING BARRIERS (4)  
(1/4-inch glass-reinforced  
polyester, NEMA grade GPO-3,  
or equivalent)



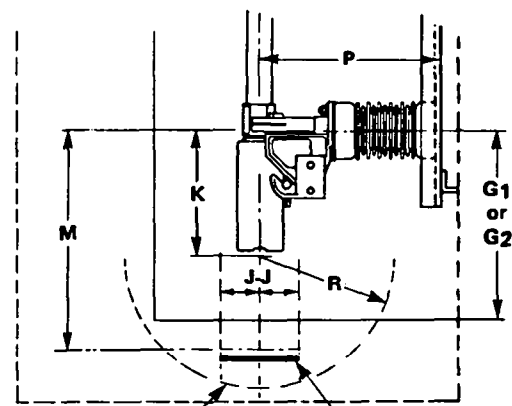
SECTION Z-Z

84" MIN.  
(Type  
SM-5SS  
Power  
Fuses  
only)



Electrical  
Clearance

DETAIL OF BARRIER AND  
CLEARANCE REQUIREMENTS  
FOR TYPE SM-20 AND  
SM-4Z POWER FUSES



Electrical  
Clearance

Optional  
Barrier ◇

DETAIL OF BARRIER AND  
CLEARANCE REQUIREMENTS  
FOR TYPE SM-5S AND  
SM-5SS POWER FUSES

◇ Surge arresters, potheads, terminators, or bus insulators may be located beneath cylindrical space "J-J" and within electrical clearance (radius "R") only when an insulating barrier is installed at or below the position indicated by dimension "M" (SM-5S only).

## NOTES

1. The enclosure and insulating-barrier dimensions listed herein have been determined using the *minimum* clearances (shown in Note 5) recommended to facilitate fuse handling and to maintain the inherent electrical ratings of S&C Power Fuses-Types SM-20, SM-4Z, SM-5S, and SM-5SS when installed in metal enclosures. These clearances are sufficient provided that normal consideration has been given to avoidance of point-gap configurations. When installing bus or cable connections and cable terminations, these clearances should be observed. In addition, enclosure dimensions should be sufficient or barriers should be provided to ensure a minimum clearance between the metal pans of a hookstick and ground during opening and closing operations as follows: 1 inch for system voltages through 15.5 kv; 2 inches for system voltages greater than 15.5 kv but not exceeding 27 kv; and 3 inches for system voltages greater than 27 kv but not exceeding 38 kv.
2. For enclosures wherein S&C Power Fuses are to be combined with interrupter switches in a "switch-over-fuse" configuration, recommended minimum clearances set forth in Note 5 should be observed for both the switch and fuses in determining the enclosure dimensions.
3. For enclosures wherein S&C Power Fuses are to be combined with interrupter switches in a "fuse-over-switch" configuration, consult the nearest S&C Sales Office.
4. Enclosures containing S&C Power Fuses should be key or mechanically interlocked with a source-side interrupter switch to guard against: (a) opening the enclosure door with the switch closed and the fuse carrying load current and (b) closing the interrupter switch if the enclosure door is open.

5. If the complete assembly consisting of enclosure, power fuses, barriers, bus, connectors, terminators, etc., is not impulse tested to verify that it will fully meet its assigned BIL rating, the assembly should be checked to ensure that the following minimum recommended clearances have been met or exceeded. Greater clearances may be required if corners, edges, or small-radius points exist.

Fuse Rating, Kv, BIL	Minimum Recommended Clearances, Inches		
	Metal-to-Metal <sup>①</sup> (phase-to-phase or phase-to-ground)	Energized Part-to-Barrier	Barrier-to-Ground (in vicinity of energized parts)
60	3½	½	½
95	6	1	1
125	8½	2¼	2¼
150	10½	3¼	3¼
200	15	4¾	4¾

① Where insulating barriers are provided, metal-to-metal distances should be measured around the edge of the barrier.

6. Dimensions "D" and "E" provide a minimum of 2 inches adjacent to the hinge in which to make cable or bus connections and still maintain the recommended clearance to barriers.
7. Clearance from holder (or fuse unit) in the closed position to any grounded part should not be less than the minimum recommended metal-to-metal clearances listed in Note 5.

Fuse Type	Rating			Minimum Dimensions, Inches																																	
	Amps. Max	Kv	BIL	Disconnect Style														Non-Disconnect Style														J <sup>o</sup>	M <sup>o</sup>	RA	S <sub>2</sub>	T <sup>o</sup>	X <sup>o</sup>
				A <sup>1</sup> <sub>o</sub>	A <sup>2</sup> <sub>o</sub>	C <sup>t</sup>	D <sup>o</sup>	E <sup>o</sup>	F	G <sup>1-D</sup>	G <sup>2</sup> <sub>o</sub>	K	P <sup>o</sup>	S <sub>1</sub>	A <sup>1</sup> <sub>o</sub>	C <sup>t</sup>	D <sup>o</sup>	E <sup>o</sup>	F	G <sup>1-D</sup>	G <sup>2</sup> <sub>o</sub>	K	P <sup>o</sup>	S <sub>1</sub>													
SM-20	200K or 200E	13.8	17.0	95	17%	31%	23%	8%	7%	17%	10	10	9	12%	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	9%	16	7		
		25	27	125	18%	34%	27	11%	9%	18%	11	11	9	13%	18%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10%	12	22%	8%		
		34.5	38	150	21	42	31%	13%	11%	21	12	12	9	16%	21%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12%	14	28%	10%		
SM-4Z	200E	4.8	5.5	60	13%	25%	17%	7%	5%	13%	9	9	9	9%	14%	13	18%	7%	5%	13%	10	10	9	8%	14%	—	—	—	—	—	8%	8%	12%	5%			
	200E	13.8	17.0	95	18%	30%	22%	8%	7%	18%	10	10	9	12%	17	15%	21%	9%	7%	18%	11	11	9	11	17	—	—	—	—	8	11%	16%	7%				
	200E	25	27	125	18%	35%	26%	11%	9%	18%	11	11	9	14%	19%	17%	25%	11%	9%	18%	12	12	9	12%	19%	—	—	—	—	10%	13%	20%	9%				
	200E	25	27	150	22%	41	33%	14%	11%	23%	12	12	9	19%	21%	22	32%	14%	11%	23%	13	13	9	17%	21%	—	—	—	—	12%	15%	20%	14%				
	200E	34.5	38	200	24%	48	39%	17%	14%	25%	14	14	9	20%	26	23%	38%	17%	14%	25%	15	15	9	19%	26	—	—	—	—	17	20%	28	16				
SM-5S	400E	4.8	5.5	60	15%	29%	18%	8%	6%	15	14	18	12%	10%	18%	15%	19	8%	6%	15	14	18	13%	10%	19%	4	19	8	8%	8%	12%	5%					
	720E	4.8	5.5	60	15%	29%	19	12%	8%	15	14	16	12%	10%	18%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	19	8	8%	12%	5%		
	400E	13.8	17.0	95	17%	34%	23%	10%	7%	21	15	18	12%	12%	20%	18	24	10%	7%	21	15	18	13%	12%	21%	4	19	8%	11%	16%	7%						
	720E	13.8	17.0	95	18	35%	24	14%	8%	21	15	18	12%	13	20%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	19	8%	11%	16%	7%		
	300E	25	27	150	24%	44%	34%	14%	11%	28%	15	20	12%	19%	23%	24	35%	14%	11%	28%	15	20	13%	19	24%	4	19	11	15%	20%	14%						
SM-5SS	300E	34.5	38	200	26%	50%	41%	17%	14%	30%	24	—	12%	21	29%	26%	41%	17%	14%	30%	24	—	13%	20%	30%	4	19	17%	20%	28	16						
	400E	13.8	15.5	95	—	—	—	—	—	—	—	—	—	—	—	18	24	10%	7%	21	18	—	14%	12%	23	5	25	8%	11%	16%	7%						

• Where complete S&C mountings are furnished, these dimensions are inherent to the fuses and are thus invariable. Where insulators or bases of greater height are used (as may be the case where live parts are furnished separately), these dimensions, as well as dimensions "C" and "F," must be adjusted accordingly.

† This dimension provides full BIL clearance from the fuse unit or holder to the enclosure door or panel-with the fuse unit or holder in the closed position only.

⊕ Add 1 inch to dimensions "D" and "E" if fuse mounting is equipped with the optional S&C ground stud.

□ Applies when incoming (source- or line-side) connection is made at upper end of fuse. Note: Type SM-5S Power Fuses rated 34.5 kv and Type SM-5SS Power Fuses rated 13.8 kv must have incoming (source- or line-side) connection made at the upper end of the fuse.

★ Applies when incoming (source- or line-side) connection is made at lower end of fuse.

§ Add 3 inches to dimension shown when incoming (source- or line-side) connection is made at the lower end of the fuse.

◆ The cylindrical space described by dimensions "J" and "M" must contain no switchgear components or terminators (SM-5S and SM-5SS only).

▲ Minimum distance to nearest switchgear component other than bus or cable of same phase.



S&C ELECTRIC COMPANY • Chicago  
S&C ELECTRIC CANADA LTD. • Rexdale

DATA BULLETIN

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