

Fusing Equipment

Electrical Apparatus-
240-55

ELX Full Range Current-Limiting Fuse

GENERAL

The ELX fuse is a full range current-limiting fuse designed to provide overcurrent protection. It is completely interchangeable with similar fuses using industry standard clip-style and dry well canister mountings.

Quiet, safe operating characteristics of the ELX fuse make it ideal for installations where flame discharge and loud operation are undesirable.

Typical applications include clip mounting air-insulated apparatus, pad-mounted equipment sectionalizing enclosures, metalclad switchgear and industrial vaults. Since the ELX fuse has no gas-evolving parts, it is ideal for use in dry well canisters. This fuse is also used in field refusable bushings, such as those used on pole-type and livefront pad-mounted transformers.

Both deadbreak and loadbreak dry well canister manufactured by Cooper Power Systems, General Electric, Westinghouse, and Kuhlman can be re-fused using the ELX fuse.

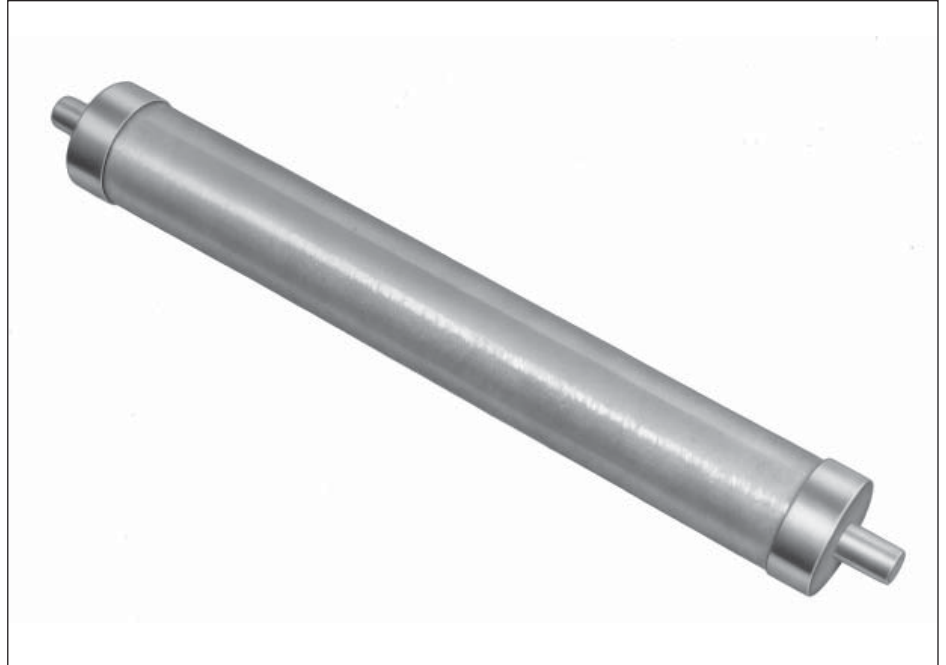


Figure 1.
ELX Full Range Current-Limiting Fuse.

PRODUCTION TESTS

Tests are conducted in accordance with Cooper Power Systems requirements.

- Physical Inspection
- I²t Testing
- Resistance Testing

TABLE 1
Electrical Characteristics

Fuse Type	General Purpose (Full Range) "C" Rated
Maximum Interrupting Current	50,000 A rms symmetrical

TABLE 2
Electrical Ratings

"C" Rating (A)	8.3 kV ¹		15.5 kV ²		23 kV	
	Minimum Melt I ² t (A ² •s)	Maximum Clear I ² t (A ² •s)	Minimum Melt I ² t (A ² •s)	Maximum Clear I ² t (A ² •s)	Minimum Melt I ² t (A ² •s)	Maximum Clear I ² t (A ² •s)
3	820	4,700	820	4,700	820	4,700
6	820	4,700	820	4,700	820	4,700
8	1,458	9,800	1,458	9,800	1,458	9,800
12	1,458	9,800	1,458	9,800	1,458	9,800
18	2,277	13,800	2,277	13,800	2,277	13,800
20	2,277	13,800	2,277	13,800	2,277	13,800
25	3,280	27,300	3,280	27,300	3,280	27,300
30	9,100	53,400	9,110	53,400	9,110	56,650
40	9,100	53,400	9,110	53,400	9,110	56,650
50	17,800	86,700	17,800	75,600	13,120	69,200
60	36,440	213,200	36,440	226,600	36,440	226,600
80	36,440	213,200	36,440	226,600	36,440	226,600
100	71,200	327,000	71,200	327,000	-	-

1. Tested and approved through 9.9 kV except for 50 A rated fuse.
 2. Tested and approved through 17.2 kV at 50 kA except for 50 A rated fuse which is tested and approved through 15.5 kV at 20 kA maximum interrupting current and parallel 50 A fuses tested and approved through 15.5 kV at 11 kA maximum.
- Shaded area indicates parallel fuse applications.

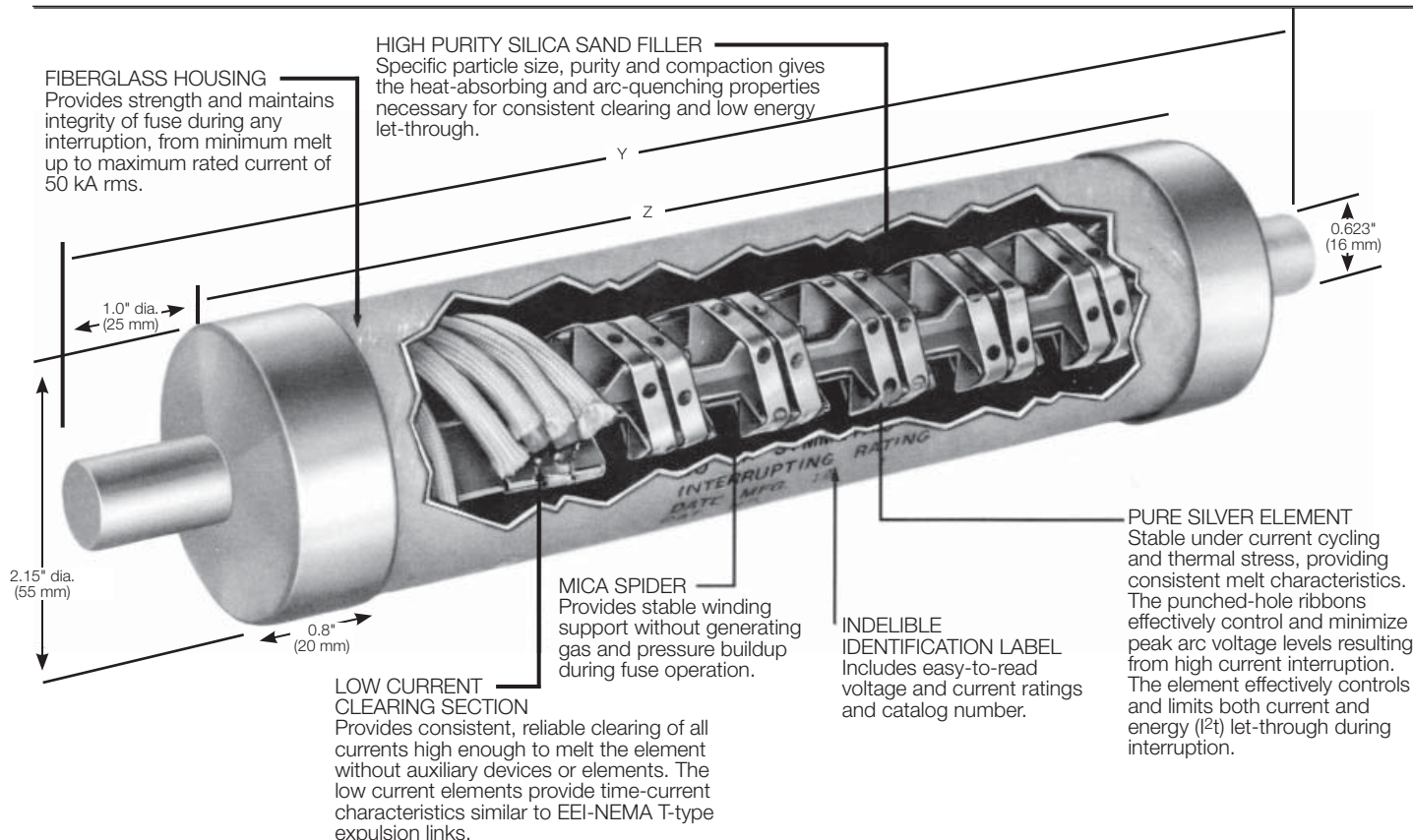


Figure 2. ELX Full Range Current-Limiting Fuse cutaway shows detail and dimensions. This fuses's dimensions allow mounting in industry standard clip-style and dry well canister mountings.

NOTE: Dimensions given are for reference only.

TABLE 3
ELX Fuse Dimensional Information

in./(mm)			
Voltage (kV)	Mounting Code	Y	Z*
8.3	4	10.11 (257)	8.20 (208)
15.5	5	14.37 (365)	12.46 (316)
23.0	6	17.21 (437)	15.41 (391)

*Maximum allowable length, including 0.060 in. thick solder tab at each end.

ORDERING INFORMATION

To order an ELX full range current-limiting fuse, determine the amperage and voltage requirements of the application and specify the fuse required from Table 4. For parallel fusing, order two fuses.

TABLE 4
ELX Full Range Current-Limiting Fuse

Continuous Current Rating (A)	Catalog Number		
	8.3 kV	15.5 kV	23 kV
3	3563003M11M	3564003M11M	3565003M11M
6	3563006M11M	3564006M11M	3565006M11M
8	3563008M11M	3564008M11M	3565008M11M
12	3563012M11M	3564012M11M	3565012M11M
18	3563018M11M	3564018M11M	3565018M11M
20	3563020M11M	3564020M11M	3565020M11M
25	3563025M11M	3564025M11M	3565025M11M
30	3563030M11M	3564030M11M	3565030M11M
40	3563040M11M	3564040M11M	3565040M11M
50	3563050M11M	3564050M11M	3565025M11M
60	3563030M11M	3564030M11M	3565030M11M
80	3564040M11M	3564040M11M	3565040M11M
100	3563050M11M	3564050M11M	-

Shaded area indicates parallel fuse applications.

METHOD A

Using the Correlation Tables

Use the correlation information in Tables 5 and 6 to determine the amperage and voltage ratings of the fuse required for the application. Then use Table 4 to determine the fuse catalog number.

Correlation is based on **IEEE Standard C57.92™** Loading Guide and **IEEE Standard C57.109™** Through-Fault Guide, and Cooper Power Systems' Fusing Application Guide CP7662A.

Contact your Cooper Power Systems representative for further information or other applications.

TABLE 5
Recommended Fuse Current Ratings (A) for Fuse in Dry Well Canister

Single-Phase Transformer kVA	8.3 kV								15.5 kV						23 kV			
	Nominal Single-Phase Voltage (kV) Phase-to-Ground																	
	2.4		4.16		4.8		7.2		7.62		12.0		14.4		16.0		19.9	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
10	6	8	3	6 ^a	3	6 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a
15	8	12	-	8	-	6	3	6 ^a	3	6 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a
25	18	20	6	12	6	12	-	6	-	6	3	6 ^a	-	3	-	3 ^a	-	3
37.5	20	30	12	18	12	18	6	12	6	8	-	6	3	6 ^a	3	6 ^a	3	6 ^a
50	30	40	18	20	18	20	8	12	8	12	-	6	-	6	-	6	3	6 ^a
75	50		25	40	20	30	8	20	12	20	6	12	6	12	6	8	-	6
100	50		30	50	25	40	20	25	20	25	12	18	8	12	6	12	6	8
167					50		30	50	30	50	20	25	18	25	18	20	12	18
250							50		50		25	40	20	40	20	30	18	25
333											40	50	30	50	25	40	20	30
500													50		40		40	

NOTE: Recommendations are based on fuse melting characteristics at a maximum oil temperature of 100°C. Recommended fuses meet inrush criteria of 12 times transformer full load for 0.1 second, and 25 times transformer full load for 0.01 second. Fuses have been derated 12% plus 0.2% per degree C above 25°C for dry well canister application.
 Column A = 140 - 200% of transformer rating.
 Column B = 200 - 300% of transformer rating.
 Shaded area indicates parallel fuse applications.
 a. Fuse allows load greater than 300%.

ORDERING INFORMATION (continued)

TABLE 6
Recommended Fuse Current Ratings (A)

Three-Phase Transformer kVA	8.3 kV										15.5 kV						23 kV			
	Nominal Three-Phase Voltage (kV) Phase-to-Phase																			
	2.4		4.16		4.8		7.2-7.96		8.32		12.47		13.2-14.4 ^d		20.8		22.9-24.9 ^e		34.5 ^e	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
ELX Fuse Mounted in Air ^b																				
15	-	6 ^a	-	3	-	3	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a
22.5	-	6	3	6 ^a	3	6 ^a	-	3	-	3	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a
30	8	12	-	6	-	6 ^a	3	6 ^a	-	3	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a
45	12	18	6	8	6	8	-	6 ^a	-	6 ^a	-	3	-	3	-	3 ^a	-	3 ^a	-	3 ^a
75	20	40	12	18	12	18	6	8	-	6	-	6 ^a	-	6 ^a	-	3	-	3	-	3 ^a
100	25	40	18	20	18	20	8	12	6	12	-	6	-	6	3	6 ^a	3	6 ^a	-	3
112.5	30	40	18	20	18	20	8	18	8	12	-	6	-	6	3	6 ^a	3	6 ^a	-	3
150	40	50	20	30	20	25	18	20	12	18	8	12	6	12	-	6	-	6	3	6 ^a
200	50	80	30	40	25	40	20	25	18	20	12	18	12	18	6	8	-	8	3	6 ^a
225	60	80	40	50	40	50	25	30	18	30	12	18	12	18	6	12	-	12	-	6
300	80	-	50	60	40	50	25	40	20	30	18	20	18	20	8	12	8	12	6	8
500	-	-	80	-	80	-	40	60	40	50	25	40	25	40	18	25	18	25	12	18
750	-	-	-	-	-	-	60	100	50	80	40	50	40	50	25	40	20	40	18	25
1000	-	-	-	-	-	-	80	-	50	80	50	80	50	80	30	40	30	40	20	25
1500	-	-	-	-	-	-	-	-	-	-	80	-	80	-	50	60	40	60	25	40
2000	-	-	-	-	-	-	-	-	-	-	-	-	100	-	60	80	50	80	40	60
2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-	80	-	50	60
3000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-	60	80
ELX Fuse Mounted in Dry Well Canister ^c																				
15	-	6	3	6 ^a	3	6 ^a	-	3	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a
22.5	6	12	-	6	-	6	3	6 ^a	-	3	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a	-	3 ^a
30	8	18	-	6	-	6	3	6 ^a	3	6 ^a	-	3	-	3	-	3 ^a	-	3 ^a	-	3 ^a
45	18	20	6	12	6	12	-	6	-	6	3	6 ^a	3	6 ^a	-	3	-	3 ^a	-	3 ^a
75	25	40	18	20	12	18	6	12	6	12	-	6	-	6	3	6 ^a	3	6 ^a	-	3
100	40	50	20	25	18	20	12	18	8	12	6	8	6	8	-	6	3	6 ^a	-	3
112.5	40	50	20	30	20	25	12	18	12	18	6	12	6	12	-	6	-	6	3	6 ^a
150	50	80	25	40	25	40	18	20	18	20	8	18	8	18	-	6	-	6	3	6 ^a
200	80	-	40	50	30	50	20	30	20	25	12	20	12	20	6	12	6	8	-	6
225	80	-	40	60	40	50	25	40	20	30	18	20	12	20	6	12	6	12	-	6
300	-	-	50	80	50	80	30	50	30	40	20	25	20	25	12	18	12	18	6	8
500	-	-	100	-	80	-	50	80	50	80	30	50	30	50	20	25	18	25	12	18
750	-	-	-	-	-	-	80	-	80	-	50	80	50	80	25	40	25	40	18	25
1000	-	-	-	-	-	-	-	-	100	-	60	100	60	100	40	50	40	50	20	30
1500	-	-	-	-	-	-	-	-	-	-	100	-	100	-	50	80	50	80	40	50
2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-	80	-	50	80
2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	80
3000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-

NOTE: Recommended fuses meet inrush criteria of 12 times transformer full load current of 0.1 second, and 25 times transformer full load for 0.01 second.
 Column A = 140 - 200% of transformer rating.
 Column B = 200 - 300% of transformer rating.
 Shaded area indicates parallel fuse applications.
 a. Fuse allows load greater than 300%.
 b. Recommendations are based on fuse melting characteristics at ambient temperature of 40°C. Fuses have been derated 0.4% per degree C above 25°C.
 c. Recommendations are based on fuse melting characteristics at maximum oil temperature of 100°C. Fuses have been derated 12% plus 0.2% per degree C above 25°C.
 d. For 26.7 kV phase-to-phase applications, contact your Cooper Power Systems representative. Request Application Guide CP8708.
 e. Limited to gnd Y/gnd Y transformer with no more than 50% delta connected secondary load (Phase-to-ground rated fuses are frequently recommended for Y-Y connections.)

METHOD B Using Time Current Curves

To determine or confirm the ELX fuse that will coordinate with upstream and downstream system requirements, use the time-current characteristic curves and specify the fuse indicated from Table 4.

For full size TCC curves, contact your Cooper Power Systems representative.

