

Fused Elbows

The fastest, most cost-effective way to improve a distribution system's reliability

Replace existing 200 A tap elbows with Elastimold® Fused Elbows to protect light-duty underground distribution systems, including sub-loops, radial taps, junctions, transformers and other equipment.

Elastimold® Fused Elbows provide full-range current-limiting fusing with 50 kA interrupting capability. They are rated for 5 kV ungrounded to 28 kV grounded Wye. Plus they provide 15/25 kV hotstick-operable, loadbreak elbow switching.



Combined Full-Range Current-Limiting Fusing 15/25 kV Hotstick-Operable, Loadbreak Elbow Switching Quickly improve the distribution system's reliability without the expense of adding a separate piece of switchgear or replacing existing sectionalizing cabinets.

High Fault Close Rating Current-limiting fuses improve the fault close rating of the elbow (10 kA) to that of the fuse, thereby reducing the risk of component damage or personnel injury.

EPDM Molded Rubber Deadfront Construction Elbows are fully sealed and submersible, and they insulate, shield and eliminate exposed live parts.

Two-Piece Housing Enables easy fuse replacement.

Application Information

- Construction: Submersible, non-venting, deadfront, corrosion resistant
- Ambient Temperature Range: -30°C to 65°C

Certified Tests

Elastimold® Fused Elbows have been designed and tested per applicable portions of IEEE, ANSI and other industry standards, including:

ANSI C37.40 Standard for Current-Limiting Fuse Service Conditions ANSI C37.41 Standard for Current-Limiting Fuse Design and Testing ANSI C37.47 Standard for Current-Limiting Fuse Ratings and Specifications

IEEE 386 Standard for Separable Connectors

Ratings

System Voltage Class (kV)	15	25*	25/28*
Nominal Fuse Voltage (kV)	8.3	15.5	17.2
Rated Maximum Fuse Voltage (kV)	8.8/10	15.5	17.2
Frequency (Hz)	50/60	50/60	50/60
BIL Impulse Withstand (kV)	95	125	140
One-Minute AC Withstand (kV)	34	40	45
Fifteen-Minute DC Withstand (kV)	53	78	78
Corona Extinction (kV)	11	19	21.5
Symmetrical Interrupting Capability (Amp)	50,000	50,000	50,000
Current Rating (Amp)	3–80	6–20	3-45

^{*}The 15.5 kV L-G rated fuse requires 75% grounded load to be applied on a 25 kV system.
The 17.2 kV L-G rated fuse requires at least 75% grounded load to be applied on a 28 kV system.

Fuses are only suitable for the system voltage class shown if the recovery voltage across the fuse will not exceed its rated maximum voltage. For three-phase applications, this generally requires that protected transformers be gndY–gndY and have at least 50% grounded load. Fuse replacement requires the elbow to be de-energized.







Fused Elbows

Electrical Characteristics of Elastimold® EFX-E Elbow Fuses

System Voltage Class (kV)	Nominal Fuse Voltage Rating (kV)	Current Rating	Cat. No.	Rated Max. Voltage (kV)		um Cont ırrent (2)		Peak Arc Minimum	Total I2t Melt I2t	Maximun (A²-Sec)
Class (KV)	voltage natilig (kv)	(A)		voitage (KV)	25°C	40°C	65°C	(kV)	(A²-Sec)	(3) (4)
		3	EFX083003-E		4.3	4.2	3.9	30	100	350
		6	EFX083006-E		9.5	9.0	8.5	32	620	2,7
		8	EFX083008-E		11.5	11.0	10.5	28	800	4
		10	EFX083010-E		14.0	13.5	13.0	28	800	4
		12	EFX083012-E		19.0	18.5	17.5	26	920	8
		18	EFX083018-E	10.0	21.0	20	19.0	26	1,31	9,5
15	8.3	20	EFX083020-E		26.0	25	24.0	26	1,62	11
		25	EFX083025-E		34.0	33.0	31.0	26	3,66	22
		30	EFX083030-E		37.5	36.5	34.5	26	5,25	30
		40	EFX083040-E		43.0	42.0	40.0	26	8,7	50
		45	EFX083045-E		49.0	47.0	45.0	26	12,8	70
		65	EFX083065-E	8.8	70.0	68.0	64.5	23	34	200
		80	EFX083080-E	0.0	80.0	77.5	73.5	22	51,2	280
		6	EFX155006-E		8.5	8.0	7.7	52	620	3
		8	EFX155008-E		10.5	10.0	9.5	40	800	4,3
25	15.5	10	EFX155010-E	15.5	13.0	12.5	12.0	40	800	4,3
23	13.3	12	EFX155012-E	15.5	16.0	15.5	15.0	38	920	8
		18	EFX155018-E		20.0	19.5	18.5	38	1,62	13
		20	EFX155020-E		23.5	22.5	21.5	38	2,2	16,5
		3	EFX172003-E		4.3	4.2	3.9	51	100	510
		6	EFX172006-E		9.5	9.0	8.5	54	620	3,25
		8	EFX172008-E		11.5	11.0	10.5	46	800	4,6
		10	EFX172010-E		14.0	13.5	13.0	46	800	4,6
		12	EFX172012-E		18.0	17.5	16.5	43	920	8,5
25/28	17.2	18	EFX172018-E	17.2	20.0	19.5	18.5	45	1,31	10
		20	EFX172020-E		24.0	23.0	22.0	45	1,62	12,5
		25	EFX172025-E		31.5	30.5	29.0	45	3,66	27,5
		30	EFX172030-E		35.5	34.5	32.5	45	5,25	37,5
		40	EFX172040-E		41.0	40.0	38.0	45	8,7	62,5
		45	EFX172045-E		46.0	45.0	42.5	45	12,8	87,5

^{1.} Designs have a 50,000 A RMS Symmetrical Rating (except 3 A, 17.2 kV — which was tested at 44 kA maximum).

^{2.} Fuses have a Rated Maximum Application Temperature (RMAT) of 65° C. RMAT is the maximum temperature of the air, in contact with the elbow housing, at which fuses have been shown to be suitable for use

Tabulated Maximum Total I2t values are for currents of 50,000 A at the nominal voltage of the fuse. Values for 8.3kV fuses at 10kV are approximately 30% higher. Values for 17.2 kV fuses at 15.5 kV are approximately 20% lower.

^{4.} Maximum total I2t values are reduced for currents below 50,000A. For example, at 10,000A, maximum total I2t values are approximately 15% less than the published values.

^{5.} Peak arc voltages listed are for 50,000A currents at the rated maximum voltage listed. Reduced currents and voltages will reduce the peak arc voltage. For more information, contact your T&B Regional Sales Office.

Maximum continuous currents at ambient temperatures other than those listed may be determined by derating the fuses by 0.2% per degree C over 25°C. For example: At 40°C the derating would be 15 x 0.2 = 3%, making the maximum continuous current of a 17.2kl, 25A fuse 31.5 x 0.97 = 30.5 Å.
 Time-current characteristic curves are published at 25°C. Reduction in the long time melting current of the fuses (approximately one hour and longer) due to higher ambient temperatures is the same as described above for "maximum continuous currents."



Fused Elbows

Recommended Elastimold® EFX-E Elbow Fuse at 40°C Ambient Temperature

					neco	iiiiieiide	u ruse C	un ent n	atings (A	iiiperes)						
Fuse Voltage					8.3	kV					15.5 kV (17.2 kV)					
1-Phase					Tra	nsforme	1-Phase	Voltage	Rating (I	kV), Phas	e to Gro	und				
Transformer	2	.4	4.	16	4	.8	7	.2	7.0	62	1	2	14	1.4	1	6
kVA	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В
10	_	6	_	6a	_	3	_	3	_	3	_	6a	_	6a	_	(3a)
15	_	10	_	6	_	6a	_	3	_	3	_	6a	_	6a	_	(3a)
25	12	20	_	8	_	8	_	6	_	6	_	6a	_	6a	_	-3
37.5	20	25	_	12	_	12	_	8	_	6	_	6	_	6a	_	(6a)
50	25	40	18	20	12	20	10	12	_	10	_	6	_	6	_	(6a)
75	45	65	20	30	20	25	12	20	12	18	_	10	_	8	_	-8
100	65	80	30	45	25	40	18	25	18	25	12	18	10	12	_	-10
167	_	_	65	80	45	65	25	45	25	45	18	-25	18	20	-12	-20
250	_	_	80	_	80	_	45	65	45	65	-25	-45	20	-30	-20	-30
333	_	_	_	_	_	_	65	_	80	_	-40	_	-30	-45	-25	-45
500	_	_	_	_	_	_	_	_	_	_	_	_	-45	_	-45	_

Recommended Elastimold® EFX-E Elbow Fuse at 40°C Ambient Temperature

Fuse Voltage							8.3	kV							1	5.5 kV	(17.2 k\	/)
1-Phase		Transformer 1-Phase Voltage Rating (kV), Phase to Ground																
Transformer	2	.4	4.	16	4.8		7.2-7.96		8.	8.32		.47	13.2-14.4		20.8		22.9-24.	
kVA	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В
15	_	6	_	3	_	3	_	3 ^a	_	3ª	_	6ª	_	6 ^a	_	6ª	_	(3a)
22.5	_	8	_	6 ^a	_	6 ^a	_	3	_	3	_	6 ^a	_	6 ^a	_	6 ^a	_	(3a)
30	10	12	_	6	_	6	_	6 ^a	_	3	_	6 ^a	_	6 ^a	_	6 ^a	_	(3a)
45	12	20	_	10	_	8	_	6	_	6ª	_	6 ^a	_	6 ^a	_	6 ^a	_	(3a)
75	20	30	12	20	_	12	_	8	_	8	_	6	_	6	_	6ª	_	-3
100	30	45	18	25	18	20	_	12	_	10	_	8	_	8	_	6 ^a	_	(6a)
112.5	40	65	20	25	18	25	_	12	_	12	_	8	_	8	_	6	_	(6a)
150	45	80	25	40	20	30	18	20	12	20	10	12	10	12	_	6	_	-6
200	65	80	40	65	30	45	20	25	18	25	12	18	12	18	8	10	_	-8
225	80	_	45	65	40	65	20	30	20	25	12	20	12	18	8	10	_	-10
300	_	_	65	80	45	80	30	45	25	40	18	25	18	25	12	18	_	-12
500	_	_	_	_	80	_	65	80	45	80	30	45	30	45	18	-25	-18	-25
750	_	_	_	_	_	_	80	_	80	_	45	65	45	_	-25	-45	-25	-40
1	_	_	_	_	_	_	_	_	_	_	80	_	_	_	-40	_	-40	_

Column A = 140-200% of transformer rating and Column B = 200-300% of transformer rating.



Ratings in parenthesis are 17.2 kV fuses.

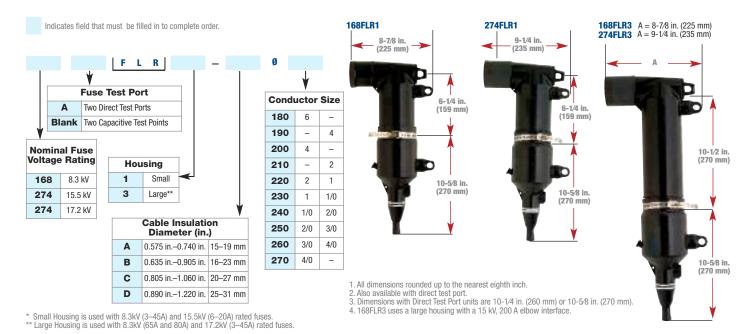
8.3 kV, 3–45 A fuses and 15.5 kV, 6–20A fuses are used in the small (size 1) elbow housing; 8.3 kV, 65–80 A fuses and 17.2 kV, 3–45 A fuses are used in the large (size 3) elbow fuse housing. Recommended fuses meet inrush criteria of 12 times transformer full-load current for 0.1 second and 25 times transformer full-load current for 0.01 second. Fuses also meet cold-load pickup criteria of 6 times transformer full-load current for 0.3 second and 3 times transformer full-load current for 10 seconds.

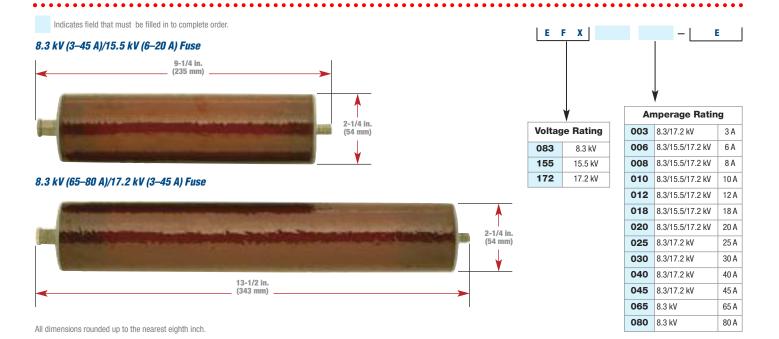
a. Fuse allows greater than 300% of transformer rating.



Full-Range Molded Current-Limiting Fuses

The following diagram shows how to construct a catalogue number for Fuse Housings and Full-Range Current-Limiting Fuses.







Full-Range Molded Current-Limiting Fuses

Application Information

Construction: Submersible, non-venting, deadfront, corrosion resistant **Ambient Temperature Range:**

- -30°C to 65°C for 6-50 A fuses;
- -30°C to 40°C for >50 A fuses.

Certified Tests

Elastimold® Molded Current-Limiting Fuses have been designed and tested per applicable portions of IEEE, ANSI, NEMA and other industry standards, including:

ANSI C37.40 Standard for Current-Limiting Fuse

Service Conditions

ANSI C37.41 Standard for Current-Limiting Fuse

Design and Testing

ANSI C37.47 Standard for Current-Limiting Fuse

Ratings and Specifications

ANSI/IEEE 386 Standard for Separable Connectors and

Bushing Interfaces

Ratings

5	15	25/28*	35
5.5	8.3/10**	15.5/17.2**	23
50/60	50/60	50/60	50/60
60	95	125/140	150
34	34	40-45	50
53	53	78	103
11	11	19/21.5	26
50	50	50	50
80-180	10–115	10-100	10-50
	5.5 50/60 60 34 53 11	5.5 8.3/10** 50/60 50/60 60 95 34 34 53 53 11 11 50 50	5.5 8.3/10** 15.5/17.2** 50/60 50/60 50/60 60 95 125/140 34 34 40-45 53 53 78 11 11 19/21.5 50 50 50

^{* 15.5} kV L-G rated fuses require 75 % grounded load to be applied on a 25 kV system.
** 17.2 kV L-G rated fuses require at least 75 % grounded load to be applied on a 28 kV system.

Fuse replacement requires the MCLF to be de-energized. Fuses are only suitable for the system voltage class shown if the recovery voltage across the fuse will not exceed its rated maximum voltage. For three-phase applications, this generally requires that protected transformers be gndY-gndY and have at least 50 % grounded load.



Assembled Fuse Unit with Optional Wall-Mounting Bracket



Full-Range Molded Current-Limiting Fuses

Electrical Characteristics of Encapsulated Fuses Used in MCLF

Nominal Fuse Voltage Rating (kV)	Current Rating (A)	Fuse Catalogue Number	Rated Maximum Voltage (kV)	Conti Cur	imum inuous rrent) (6)	Peak Arc Total I2t (kV) (5)	Minimum Melt l²t (A²–Sec)	Maximum Tota 2t (A ² -Sec) (3) (4)
			(KV)	25°C	40°C			(0) (4)
	80	M05CLF080		86	84		22,100	110,000
	100	M05CLF100		108	105		56,700	280,000
5.5	125	M05CLF125	5.5	137	133	15	109,200	530,000
	150	M05CLF150		159	154		176,000	860,000
	180	M05CLF180		185	180		259,000	1,270,000
	10	M15CLF010		14	13	28	800,000	4,000
	20	M15CLF020		23	22		1,620	11,000
	30	M15CLF030	10.0	35	33	26	5,250	30,000
	40	M15CLF040		43	41	20	8,700	50,000
8.3	50	M15CLF050		51	47		12,800	70,000
	65	M15CLF065		73	71		25,200	100,000
	80	M15CLF080	8.3	87	84	25	47,000	185,000
	100	M15CLF100	0.3	106	103	25	78,300	330,000
	115	M15CLF115		120	116		115,150	480,000
	10	M25CLF010		14	13	46	800,000	3,700
	20	M25CLF020		23	22		1,620	10,000
	30	M25CLF030	17.2	35	33	45	5,250	30,000
15.5	40	M25CLF040		43	41	45	8,700	50,000
10.0	50	M25CLF050		47	45		12,800	70,000
	65	M25CLF065		68	66		25,200	110,000
	80	M25CLF080	15.5	88	84	40	54,400	255,000
	100	M25CLF100		100	100		80,000	380,000
	10	M35CLF010		14	13	61	800,000	4,800
	20	M35CLF020		23	22		1,620	13,000
23.0	30	M35CLF030	23.0	35	33		5,250	38,000
	40	M35CLF040		41	40	60	8,700	61,000
	50	M35CLF050		47	46		12,800	82,000

^{1.} Designs have a 50,000 A all U/CERMSs Symmetrical Rating.

^{2. 10–50} A fuses have a Rated Maximum Application Temperature of 65°C, and 65–180 A fuses have a Rated Maximum Application Temperature of 40°C. (RMAT is the maximum temperature of the air in contact with the MCLF housing at which the fuses have been shown suitable for use.)

^{3.} Tabulated Maximum Total I2t values are for currents of 50,000 A at the nominal voltage of the fuse. Fuses that have a Rated Maximum Voltage higher than their Nominal Voltage Rating will have a higher I2t let-through when applied at voltages up to these higher values. For example, Maximum Total I2t values are increased by approximately 30% when 8.3 kV fuses are applied at 10kV and approximately 25% when 15.5kV fuses are used at 17.2 kV.

^{4.} Maximum total I2t values are reduced for currents below 50,000 A. For example, at 10,000 A, I2t values are approximately 15% less than the published values.

^{5.} Peak arc voltages quoted are for 50,000A currents at the rated maximum voltage listed. Reduced currents and voltages will reduce the peak arc voltage. Consult the factory for further information.

^{6.} Maximum continuous currents at higher ambient temperatures may be determined by derating the fuses by 0.2% per degree C over 25° C. For example: At 40°C, the derating would be 15 x 0.2 = 3%, making the maximum continuous current of a 20 A fuse 23.0 x 0.97 = 22 A.



Full-Range Molded Current-Limiting Fuses

Recommended MCLF at 40°C Ambient Temperature

					Re	comme	nded Fu	ıse Cur	rent Rat	ings (A	mperes))						
Fuse Voltage					(5.5 kV) 8.3 kV							15.	5 kV			23	kV
						Transfo	ormer 1	-Phase	Voltage	Rating	(kV), Ph	ase to	Ground				,	
1-Phase Transformer kVA	2	4	4.	16	4	4.8		7.2		7.62		2	14.4		1	6	34	4.5
	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В
10	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a
15	_	10	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a
25	_	20	_	10	_	10	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a
37.5	20	30	_	20	_	20	_	10	_	10	_	10a	_	10a	_	10a	_	10a
50	30	40	20	30	_	20	_	10	_	10	_	10a	_	10a	_	10a	_	10a
75	50	65	30	40	20	30	_	20	_	20	_	10	_	10	_	10	_	10a
100	65	-80	40	50	30	50	20	30	20	30	_	20	_	10	_	10	_	10
167	-100	-150	65	-80	50	65	30	50	30	50	20	30	20	30	_	20	_	20
250	-150	_	(100)	-125	-80	-100	50	65	50	65	30	50	30	40	20	30	20	30
333	-180	_	-125	-180	-100	-150	65	100	65	100	50	65	30	50	30	50	20	40
500	_	_	-180	_	-150	_	115	_	115	_	65	100	65	80	50	_	40	_
750	_	_	_	_	_	_	_	_	_	_	100	_	80	100	_	_	_	_
1	_	_	_	_	_	_	_	_	_	_	_	_	100	_	_	_	_	_

Recommended MCLF at 40°C Ambient Temperature

						nec		nded F	use Cu	rrent K	aungs	Amper	esj							
Fuse Voltage							8.3	kV							1	5.5 kV	(17.2 k	V)	23	Κv
1-Phase		Transformer 1-Phase Voltage Rating (kV), Phase to Ground										nd								
Transformer	2.	.4	4.	16	4.	.8	7.2-	7.96	8.	32	12	.47	13.2	-14.4	20	8.0	22.9	-24.9	34	1.5
kVA	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В
15	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a
22.5	_	10	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a
30	_	10	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a
45	_	20	_	10	_	10	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a	_	10a
75	30	40	_	20	_	20	_	10	_	10	_	10a	_	10a	_	10a	_	10a	_	10a
100	40	50	20	30	20	30	_	20	_	10	_	10	_	10	_	10a	_	10a	_	10a
112.5	40	65	20	30	20	30	_	20	_	20	_	10	_	10	_	10a	_	10a	_	10a
150	50	-80	30	50	30	40	20	30	_	20	_	10	_	10	_	10a	_	10a	_	10a
200	65	-100	40	65	40	50	20	30	20	30	_	20	_	20	_	10	_	10	_	10a
225	-80	-125	50	65	40	65	30	40	30	50	_	20	_	20	_	10	_	10	_	10a
300	-100	-150	65	-100	65	-80	40	50	30	50	20	30	20	30	_	20	10	20	_	10
500	-180	_	-100	-150	-100	-125	65	-80	50	80	30	50	30	50	20	30	20	30	_	20
750	_	_	-180	_	-125	-180	-80	-125	80	115	50	80	50	65	30	50	30	40	20	30
1,000	_	_	_	_	-180	_	-125	-180	115	_	65	100	65	100	50	65	40	65	30	40
1,500	_	_	_	_	_	_	-180	_	_	_	100	_	100	_	65	100	65	80	40	_
2.000	_	_	_	_	_	_	_	_	_	_	_	_	_	_	100	_	80	_	50	_



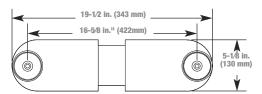
Column A = 140–200% of transformer rating and Column B = 200–300% of transformer rating.
Ratings in parentheses are 5.5kV fuses.
Recommended fuses meet inrush criteria of 12 times transformer full-load current for 0.1 second and 25 times transformer full-load current for 0.01 second.
Fuses also meet cold-load pickup criteria of 6 times transformer full-load current for 1 second and 3 times transformer full-load current for 10 seconds.

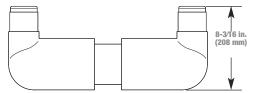
a. Fuse allows greater than 300% of transformer rating.



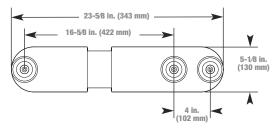
Full-Range Molded Current-Limiting Fuses

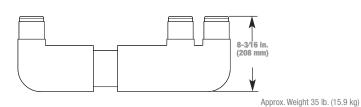
Model 22



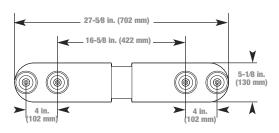


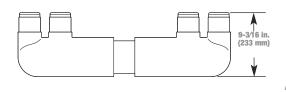
Model 222





Model 2222

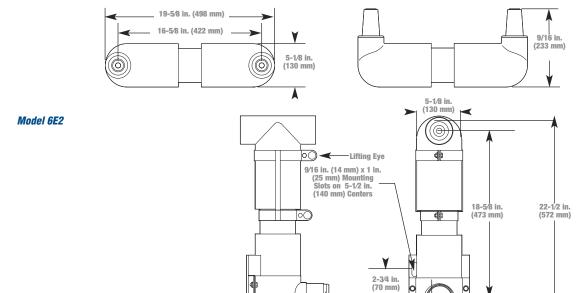




Approx. Weight 30 lb. (13.6 kg)

Approx. Weight 30 lb. (13.6 kg)

Model 66



11-1/8 in. (283 mm)

Approx. Weight 40 lb. (18.1 kg)

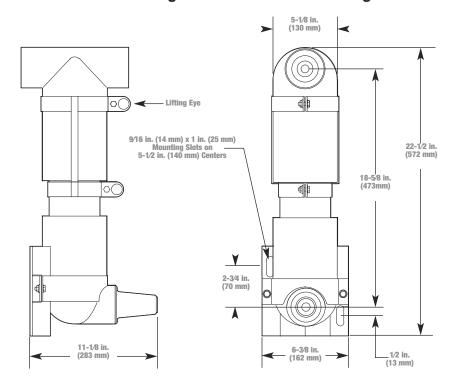
Approx. Weight 30 lb. (13.6 kg)

3/4 in. (19 mm)



Full-Range Molded Current-Limiting Fuses

Model 6E6

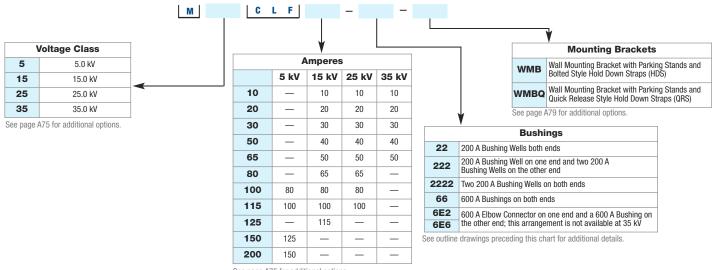


Other models are available such as 26.

Approx. Weight 30 lb. (13.6kg)

The following diagram shows how to construct a catalog number for a Molded Current-Limiting Fuse:

Indicates field that must be filled in to complete order.



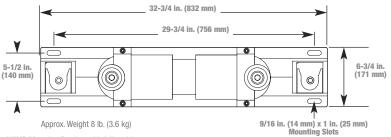
See page A75 for additional options.



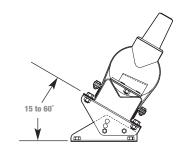


Full-Range Molded Current-Limiting Fuses

Mounting Options



Optional WMB Mounting Bracket with Adjustable Parking Stands for Vertical Mounting and Fuse Hold-Down Strips



Optional — TMA Universal Tilt Mounting

Optional Fuse Mountings

Option No.	Description
HDS	Bolted-Style Hold-Down Strap (Qty: 1 required per end fitting)
QRS	Quick-Release Style Hold-Down Strap (Qty: 1 required per end fitting)
WMB	Wall-Mounting Bracket with Parking Stands and Bolted-Style Hold-Down Straps
WMBQ	Wall-Mounting Bracket with Parking Stands and Quick-Release Style Hold-Down Straps
SMB	Support Mounting Bracket for use with Models 6E2 or 6E6 end-fitting arrangements includes Bolted-Style Hold-Down Strap
TMA-EM	Tilt Mounting Adapter bolts to bottom of Wall-Mounting Bracket WMB or WMBQ to enable up to 60° angle mounting (Qty: 2 required per installation)

The option number may be added as a suffix to the MCLF catalogue number.

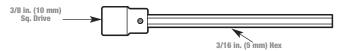
End Fitting Catalogue Numbers

Option No.	Description	System Voltage Class	IEEE 386-1995 Interface Reference
EF2	200 A Bushing Well End Fitting	5, 15, 25, 35	Figure 3
EF22	Double 200 A Bushing Well End Fitting	5, 15, 25, 35	Figure 3
EF6	600 A Bushing End Fitting	5, 15, 25, 35	Figures 11 and 13
EF6E	600 A Elbow Connector End Fitting	5, 15, 25	Figure 11

EF6E is equipped with a standard through-hole spade lug (Type 03700).

Use this table only if end fittings are to be ordered and shipped separately from the fuse. See pages A77-A78 for assembled units.

Assembly/Disassembly Tool



Other Options

Option No.	Description
MCLF-ADT	Hex Wrench for set screw removal and replacement when disassembling end fittings. Supplied as standard with replacement fuses.