

Time Delay M & MS-Series

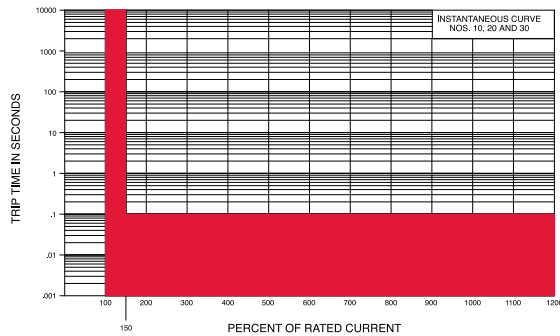
M, MS-SERIES TIME DELAY VALUES											
TRIP TIME SECONDS	PERCENT OF RATED CURRENT										
	Delay	100%	135%	150%	200%	400%	600%	800%	1000%	1200%	
	10, 20, 30	No Trip	May Trip	.100 Max	.100 Max	.100 Max	.100 Max	.100 Max	.100 Max	.100 Max	.100 Max
	12, 22, 32, 62, 72, 92		.300 - 7.00	.100 - 5.00	.100 - 2.00	.030 - .500	.008 - .300	.006-.150	.005 - .100	.005 - .100	
14, 24, 34, 64, 74, 94	3.00 - 70.0		2.00 - 40.0	1.00 - 15.0	.100 - 4.00	.008 - 2.00	.006-.800	.005 - .350	.005 - .160		

Notes:

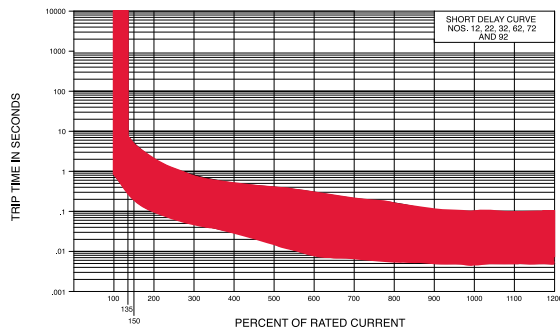
- 1 Delay Curves 12,14, 22, 24, 32, 34, 62, 64, 72, 74, 92, 94: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in this curve.
- 2 Delay Curves 10, 20, 30: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown in this curve.
- 3 All Curves: Curve data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading. Breakers are mounted in standard wall-mount position.
- 4 The minimum inrush pulse tolerance handling capability is 12 times the rated current on standard delays and 18 times the rated current on high inrush delays. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse. High inrush delays should be specified for applications with high initial surge currents of short duration, such as switching power supplies, highly capacitive loads and transformer loads.

Dual Rated AC/DC

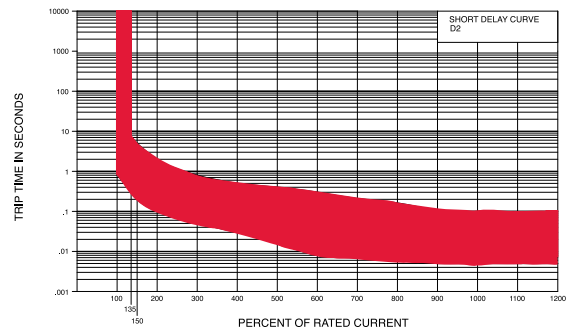
Instantaneous



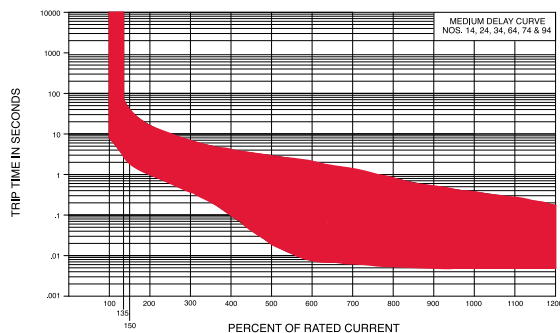
Short



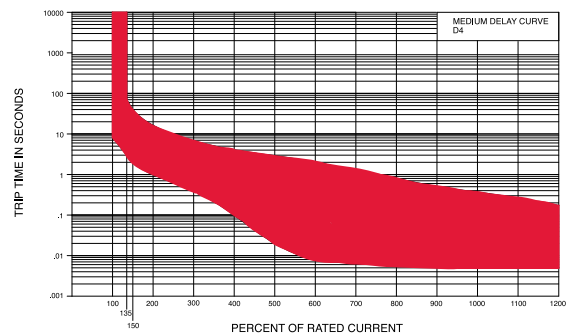
Short D2



Medium



Medium D4



Time Delay A, B, TB, C, CX, D, G, H, J, L & N-Series

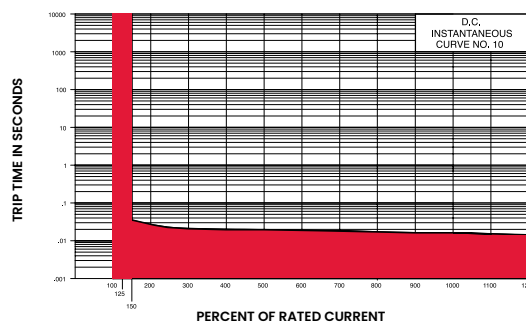
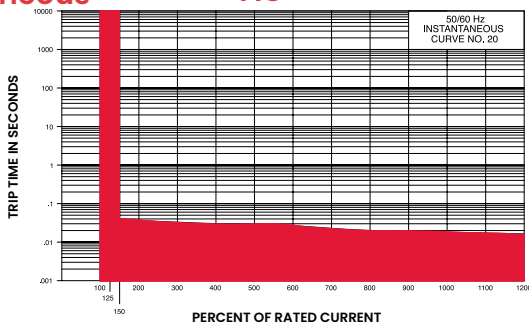
		A, B, TB, C, CX, D, G, H, J, L & N-SERIES TIME VALUES									
		PERCENT OF RATED CURRENT									
TRIP TIME (SECONDS)	Delay	100%	125%	135%	150%	200%	400%	600%	800%	1000%	1200%
	10		No Trip	May Trip	-	.032 Max	.024 Max	.020 Max	.018 Max	.016 Max	.015 Max
11	.013 - .125	.010 - .070		.008 - .032		.006 - .020	.005 - .020	.004 - .020	.004 - .020	.004 - .020	.004 - .020
12	.500 - 6.50	.300 - 3.00		.130 - 1.20		.031 - .220	.011 - .120	.004 - .090	.004 - .060	.004 - .040	
14	2.00 - 60.0	1.20 - 40.0		.600 - 20.0		.150 - 3.00	.030 - 1.30	.004 - .600	.004 - .100	.004 - .100	
16	45.0 - 345	20.0 - 150		9.00 - 60.0		1.40 - 11.4	.150 - 5.80	.009 - 3.70	.005 - 1.70	.005 - .500	
20	May Trip	.040 Max		.035 Max		.030 Max	.025 Max	.020 Max	.017 Max	.015 Max	
21	.014 - .150	.011 - .095		.008 - .055		.006 - .035	.005 - .027	.005 - .021	.004 - .018	.004 - .017	
22	.700 - 12.0	.350 - 4.00		.130 - 1.30		.027 - .220	.008 - .130	.004 - .090	.004 - .045	.004 - .040	
24	10.0 - 160	6.00 - 60.0		2.20 - 20.0		.300 - 3.00	.050 - 1.30	.007 - .500	.005 - .060	.005 - .040	
26	50.0 - 700	32.0 - 350		10.0 - 90.0		1.50 - 15.0	.500 - 7.00	.020 - 3.00	.006 - 2.00	.005 - 1.00	
32	May Trip	.400 - 8.00		.300 - 4.00		.130 - 1.30	.027 - .220	.008 - .130	.004 - .060	.004 - .040	
34	May Trip	1.80 - 100		1.20 - 60.0		.600 - 20.0	.150 - 3.00	.030 - 1.30	.004 - .110	.004 - .100	
36	May Trip	35.0 - 520		20.0 - 350		9.00 - 90.0	1.40 - 15.0	.150 - 7.00	.005 - 2.0	.004 - 1.00	
42	.700 - 12.0	.400 - 6.00		180 - 2.30		.050 - .600	.026 - .300	.018 - .200	.014 - .150	.012 - .130	
44	7.00 - 100	3.00 - 50.0		1.10 - 18.0		.220 - 3.00	.120 - 1.70	.075 - 1.20	.050 - .850	.042 - .720	
46	50.0 - 700	31.0 - .350		12.0 - 150		1.50 - 20.0	.700 - 10.0	.404 - 7.90	.260 - 6.50	.198 - 5.80	
52	.500 - 6.50	.340 - 4.50		.180 - 2.30		.051 - .600	.030 - .320	.018 - .220	.014 - .200	.012 - .130	
54	1.50 - 50.0	.750 - 35.0		.350 - 18.0		.110 - 3.00	.070 - 1.70	.045 - 1.40	.039 - 1.30	.035 - 1.30	
56	45.0 - 345	19.0 - 170		8.50 - 100		1.24 - 15.0	.410 - 9.00	.256 - 8.00	.210 - 5.50	.198 - 2.90	

Notes:
 UL489 C-Series Breakers available with Delay Curves 11, 12, 14, 16, 21, 22, 24, 26, 42, 44, 46.
 Delay Curves 11,12,14,16,21,22,24,26,42,44,46,52,54,56: Breakers to hold 100% and must trip at 125% of rated current and greater within the time limit shown in this curve.
 Delay Curves 32,34,36: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in this curve.
 Delay Curves 10,20: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown in this curve.
 All Curves: Curve data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading. Breakers are mounted in standard wall-mount position.
 On 50 amp and less current ratings, the minimum inrush pulse tolerance handling capability is 12 times the rated current on standard delays and 25 times the rated current on high inrush delays. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse. High inrush delays should be specified for applications with high initial surge currents of short duration such as switching power supplies, highly capacitive loads and transformer loads.

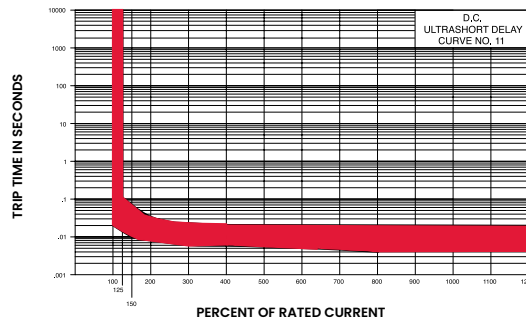
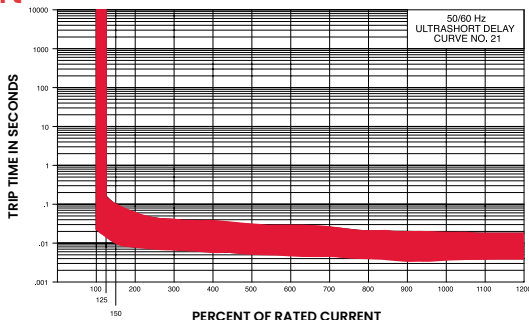
Instantaneous

AC

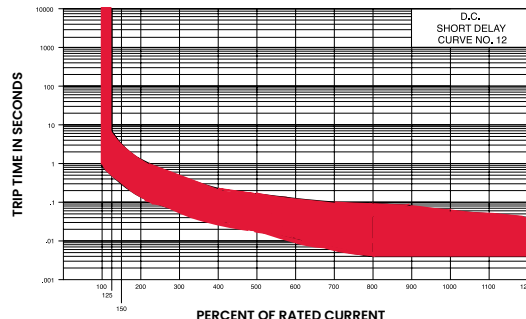
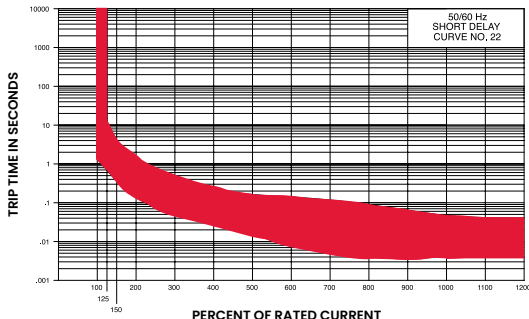
DC



Ultrashort



Short

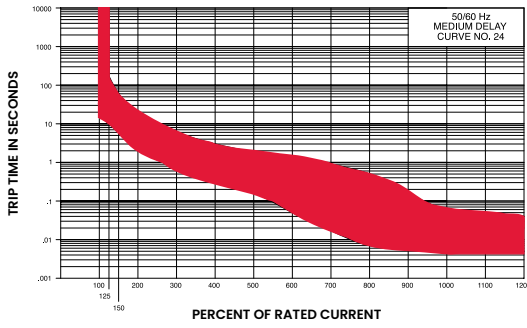


Time Delay

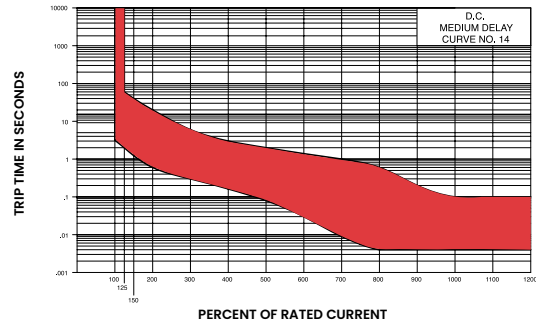
A, B, TB, C, CX, D, G, H, J, L & N-Series

Medium

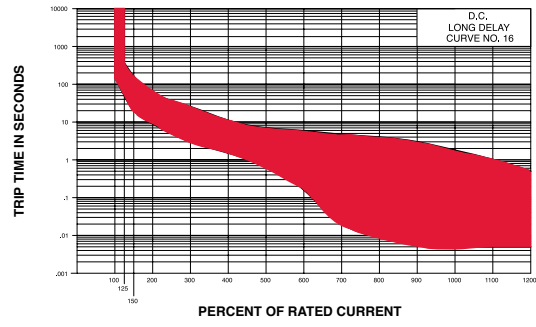
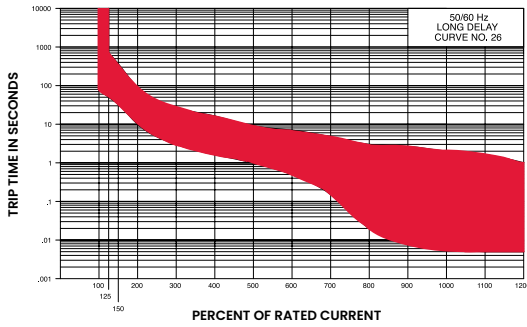
AC



DC

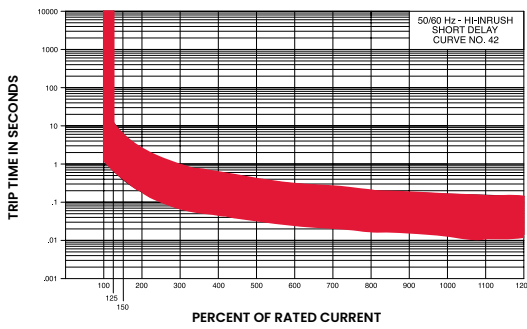


Long

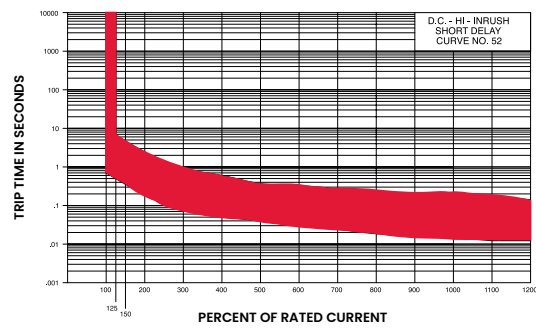


Short

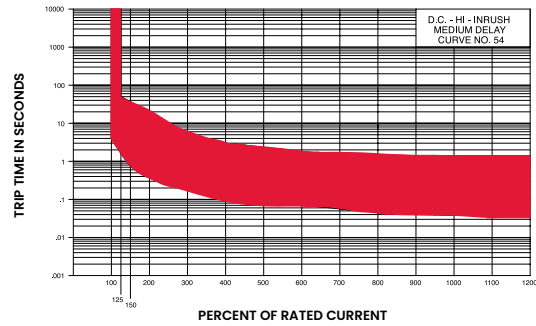
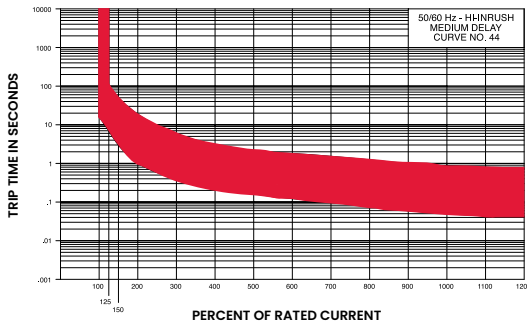
High Inrush AC



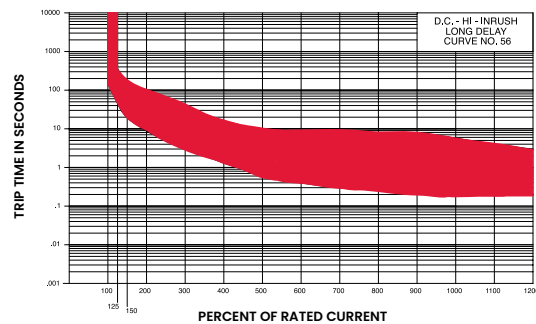
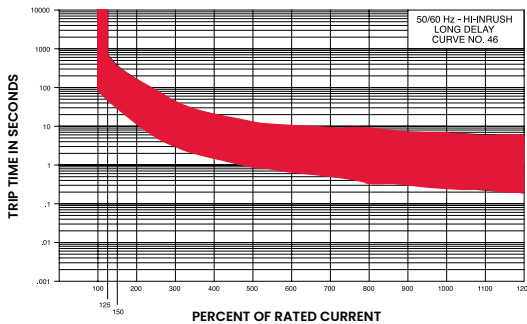
High Inrush DC



Medium



Long

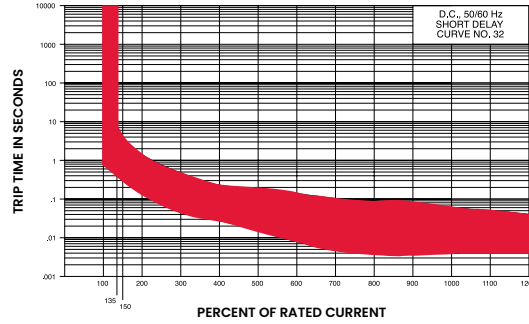


Time Delay

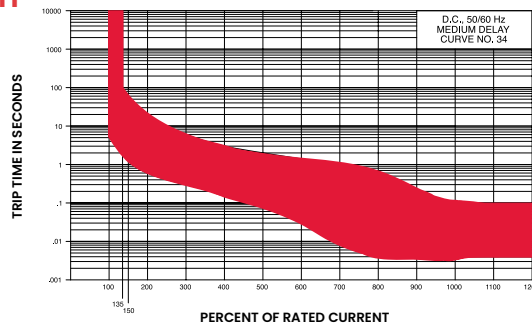
A, B, TB, C, CX, D, G, H, J, L & N-Series

AC/DC

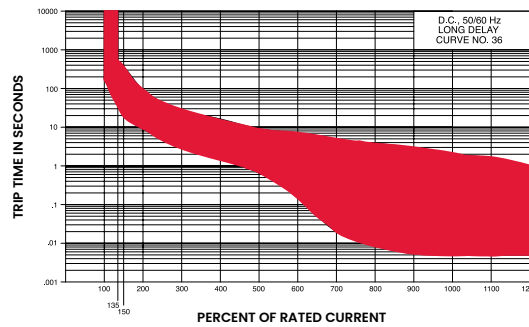
Short



Medium



Long



Time Delay E-Series

E-SERIES TIME DISPLAY VALUES											
TRIP TIME (SECONDS)	PERCENT OF RATED CURRENT										
	Delay	100%	125%	135%	150%	200%	400%	600%	800%	1000%	1200%
10		No Trip	May Trip	-	.001 - .038	.001 - .032	.001 - .021	.001 - .019	.001 - .019	.001 - .019	.001 - .019
12, 72	.600 - 7.00		.330 - 2.00		.150 - .800	.033 - .160	.016 - .071	.010 - .048	.008 - .040	.008 - .040	
14, 74	11.0 - 110		6.00 - 45.0		3.00 - 18.0	.280 - 3.50	.013 - 1.50	.010 - .130	.009 - .090	.009 - .080	
16, 76	100 - 800		50.0 - 360		20.0 - 120	3.00 - 25.0	.020 - 11.0	.010 - .700	.009 - .230	.009 - .200	
20	May Trip		.001 - .040		.001 - .031	.001 - .020	.001 - .020	.001 - .020	.001 - .020	.001 - .020	
22, 62	.800 - 5.00		.400 - 2.30		.150 - .900	.034 - .170	.020 - .080	.012 - .051	.010 - .040	.009 - .040	
24, 64	7.20 - 90.0		4.40 - 35.0		2.00 - 15.0	.500 - 3.50	.025 - 1.60	.012 - .330	.010 - .070	.009 - .050	
26, 66	50.0 - 500		32.0 - 250		14.0 - 120	2.50 - 24.0	.320 - 7.00	.0125 - 3.10	.011 - .130	.010 - .055	
30			.001 - .040		.001 - .032	.001 - .020	.001 - .020	.001 - .020	.001 - .020	.001 - .020	
32, 92			.450 - 5.20		.330 - 2.30	.150 - .900	.033 - .170	.016 - .080	.009 - .051	.008 - .040	.008 - .040
34, 94			5.80 - 73.0		4.40 - 45.0	2.00 - 18.0	.280 - 3.60	.013 - 1.60	.010 - .330	.009 - .090	.009 - .080
36, 96			42.0 - 600		32.0 - 360	14.0 - 120	2.50 - 25.0	.020 - 11.0	.010 - 4.10	.009 - .330	.009 - .200

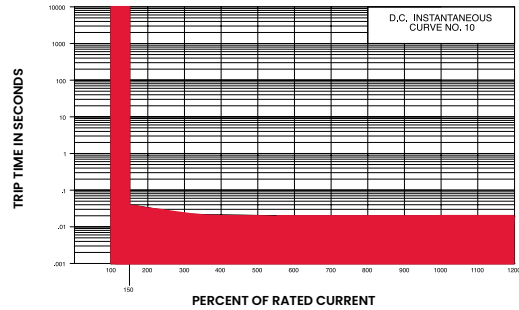
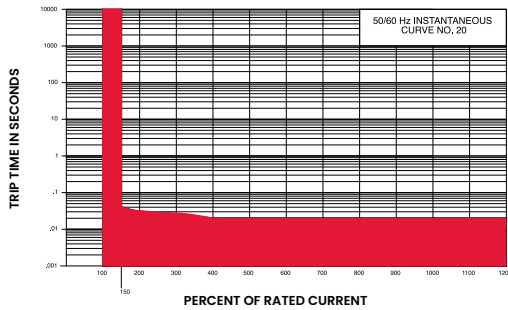
Notes

Delay Curves 10,20,30: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown in these curves.
 Delay Curves 12,14,16,22,24,26,62,64,66,72,74,76: Breakers to hold 100% and must trip at 125% of rated current and greater within the time limit shown in these curves.
 Delay Curves 32,34,36,92,94,96: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in these curves.
 All curves: Data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading; Breakers are mounted in standard wall-mount position.
 The minimum inrush pulse tolerance handling capacity on the above standard delays is 16 times rated current & 20 times rated current for high inrush delays based on a 60Hz 1/2 cycle, 8.33 ms pulse.

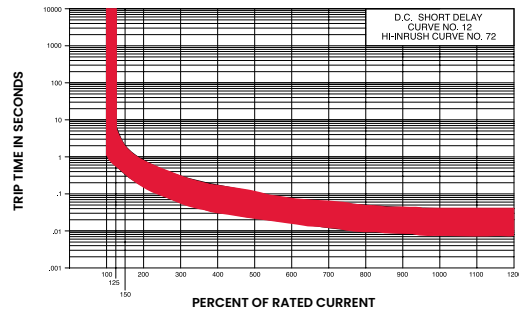
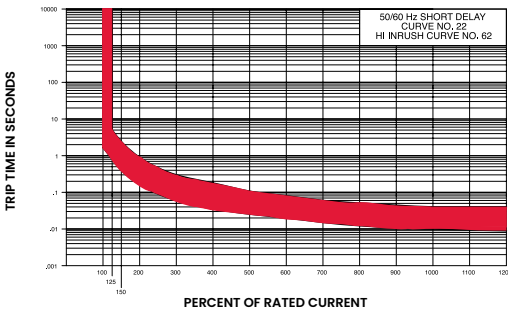
Instantaneous

AC

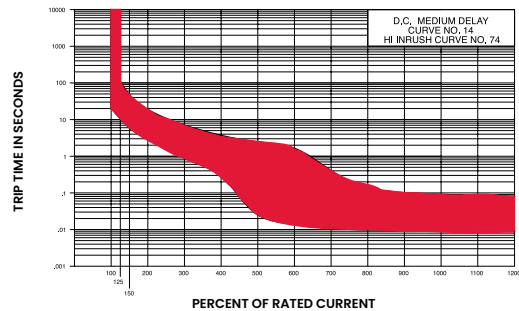
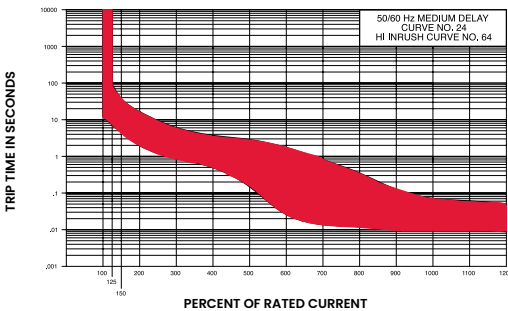
DC



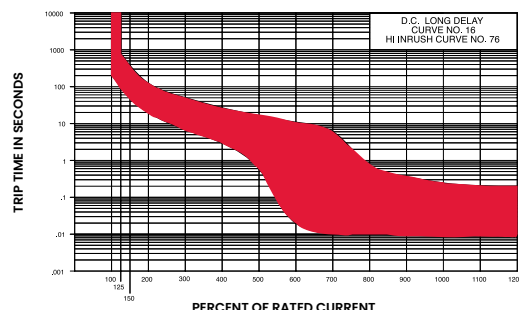
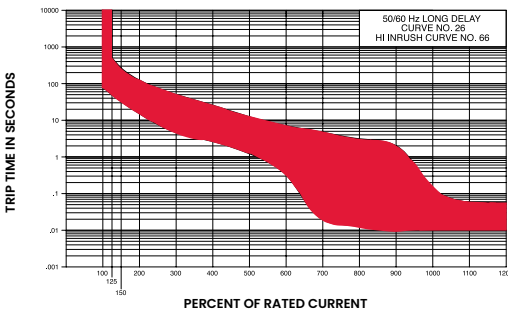
Short



Medium



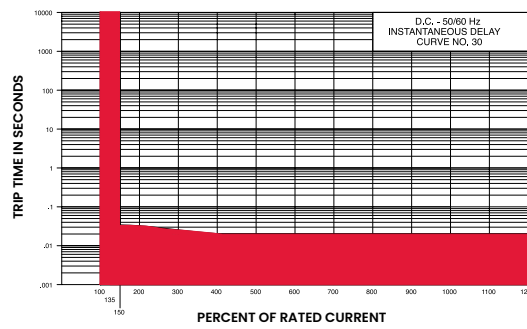
Long



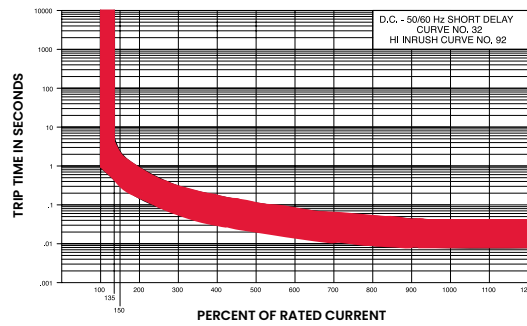
Time Delay E-Series

AC/DC

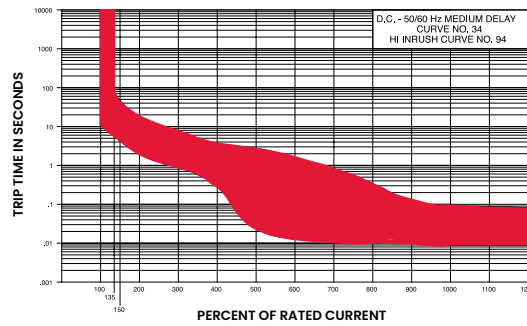
Instantaneous



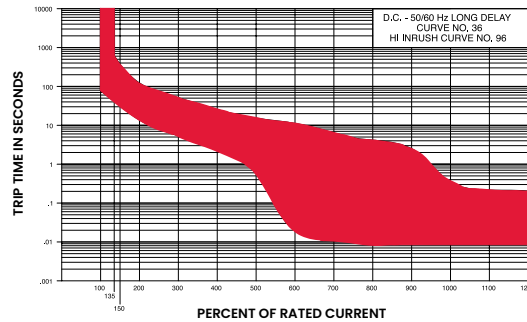
Short



Medium



Long



Time Delay F-Series

F-SERIES TIME DISPLAY VALUES									
TRIP TIME (SECONDS)	PERCENT OF RATED CURRENT								
	Delay	100%	125%	150%	200%	400%	600%	800%	1000%
	11	No Trip	.013 - .125	.010 - .070	.008 - .032	.006 - .020	.005 - .020	.004 - .020	.004 - .020
12	.475 - 10.0		.275 - 2.80	.140 - .850	.030 - .190	.015 - .125	.010 - .050	.008 - .038	
14	10.0 - 110		6.00 - 40.0	2.50 - 15.0	.500 - 3.00	.180 - 1.00	.010 - .280	.008 - .080	
16	110 - 1000		60.0 - 400	22.0 - 150	4.00 - 25.0	1.00 - 5.50	.010 - 1.80	.008 - .390	
22	0.44 - 10.0		0.25 - 2.80	0.13 - 0.90	0.030 - 0.19	0.015 - 0.125	0.010 - 0.055	0.008 - 0.045	
24	7.20 - 110		4.40 - 45.0	2.00 - 18.0	0.25 - 3.50	0.016 - 1.60	0.009 - 0.33	0.008 - 0.11	
26	100 - 1100		32.0 - 400	14.0 - 150	2.50 - 25.0	0.020 - 11.0	0.010 - 3.10	0.008 - 0.39	

