

Figure 11

Selectivity

A non-selectively designed system of overcurrent protection devices is shown in Figure 11. When a building power distribution system is designed without selectivity, potential safety hazards and costly power outages may result. A system with designed selectivity will assure that only the overcurrent protection device for a faulted circuit will open to limit a power outage to the faulted circuit.

Refer to Figure 12 for an illustration of the use of “ I^2t ” to determine fuse selectivity for short-circuit conditions.

Energy from fault current flow builds up heat inside fuses, breakers and conductors as the current flows to a fault loca-

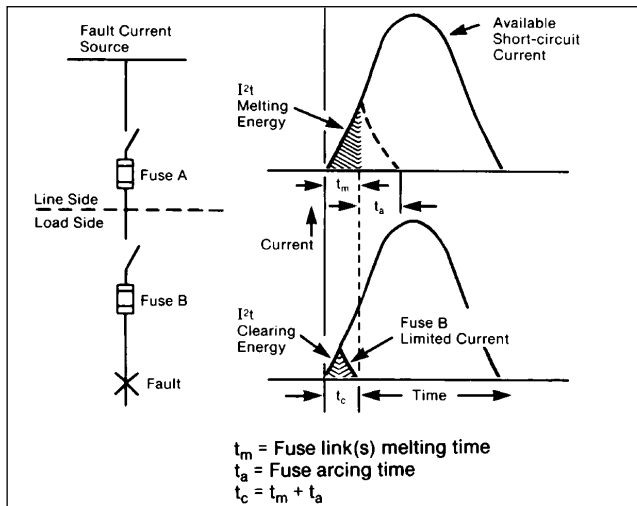


Figure 12

“ I^2t Melting Energy” is a reference to the value of “ I^2t Energy” required to melt the link(s) of Fuse A. “ I^2t ” is not an energy value, but a convenient reference used for comparison purposes. Actual energy would be “ I^2Rt ” where “ R ” is resistance. The value of resistance is so low compared to the other two values that it is ignored for convenience.

“ I^2t Clearing Energy” is a reference to the amount of energy that Fuse B allows to build up in the form of heat during Fuse B “Total Clearing Time.”

Figure 12 shows an obvious conclusion that if the “ I^2t Clearing Energy” of Fuse B is less than the “ I^2t Melting Energy” of the link(s) of Fuse A then Fuse A will not open when a fault on the load side of Fuse B occurs.

“Selectivity Ratio Guide” For Current Limiting Fuses*

Divide the amps rating of a load-side fuse into the amps rating of the line-side fuse. If the ratio is “Equal to or larger than” the table ratio, then a fault on the load side of the load-side

fuse will cause the load-side fuse ONLY to open to provide selectivity.

Circuit	Load-Side Fuse												
	Current Rating	A		0-600A			601-6000A	0-600A	0-1200A	0-600A	0-60A		
	Type	Time-Delay	Dual-Element Time-Delay	Fast-Acting			Fast-Acting	Time-Delay					
Class	L	RK1	J**	RK5	L	RK1	T	J	G				
Edison Symbol	LCL	LENRK LESRK	JDL	ECNR ECSR	LCU	NCLR SCLR	TJN TJS	JFL	SEC				
Line-Side Fuse	601 to 6000A	Time-Delay	L	LCL	2:1	2:1	2:1	4:1	2:1	2:1	2:1	2:1	N/A
			RK1	LENRK LESRK	–	2:1	2:1	8:1	–	3:1	3:1	3:1	4:1
	0 to 600A	Dual Element	J	JDL**	–	2:1	2:1	8:1	–	3:1	3:1	3:1	4:1
			RK5	ECNR ECSR	–	1.5:1	1.5:1	2:1	–	1.5:1	1.5:1	1.5:1	1.5:1
	601 to 6000A	Fast-Acting	L	LCU	2:1	2:1	2:1	6:1	2:1	2:1	2:1	2:1	N/A
	0 to 600A	Fast-Acting	RK1	NCLR SCLR	–	3:1	3:1	8:1	–	3:1	3:1	3:1	4:1
	0 to 1200A		T	TJN TJS	–	3:1	3:1	8:1	–	3:1	3:1	3:1	4:1
	0 to 600A		J	JFL	–	2:1	2:1	8:1	–	3:1	3:1	3:1	4:1
	0 to 60A	Time-Delay	G	SEC	–	3:1	3:1	4:1	–	2:1	2:1	2:1	2:1

Note: At some values of fault current, specified ratios may be lowered to permit closer fuse sizing. Plot fuse curves or consult with Edison Fusegear.

**General Notes: Ratios given in this Table apply only to Edison fuses. When fuses are within the same case size, consult Edison Fusegear.

*Consult Edison Fusegear for latest data.