



## TYPE EJ-2 FUSE APPLICATION 2400V & 4160V MOTOR CONTROLLERS

**SCOPE** This bulletin describes the Mersen / Ferraz Shawmut Type EJ-2 Fuses used in Type 230 and 230-PM controllers and discusses basis of "R" selection. Portions of this bulletin are extracted or paraphrased from manufacturer's literature.

**FUSE DESCRIPTION** The EJ-2 fuses are ribbon element, totally-enclosed, and non-vented. When these fuses interrupt, there is no noise and any pressure generated is self-contained and sealed. These fuses exhibit an increase in resistance immediately after melting, so that they have a current limiting effect on major fault currents. For Class I, Division 2 applications, these fuses are completely sealed (without operation indicators).

**APPLICATION** The EJ-2 fuses provide fault protection for the motor controller, motor leads, and motor. The fuses, in general, interrupt only fault currents that exceed any likely overload or stalled-rotor current. The fuses are for controllers used on power systems capable of producing fault currents up to 80,000-amperes RMS asymmetrical. On a 3-phase basis, that corresponds to 200-MVA at 2300-volts and 350-MVA at 4160-volts for symmetrical current calculations. This assumes 1.6 ratio between asymmetrical current and initial symmetrical current, for first-cycle fault interruption.

**BASIS OF FUSE "R" RATING SELECTION** Two criteria principally guide the "R" selection when EJ-2 fuses are applied in ELLIOTT CONTROL motor controllers-

- (A) **COORDINATION** The fuse "R" rating is selected so that the overload relay operating time is substantially faster than the minimum melting time of the fuse for all operating currents from full load up to 110% of the motor locked rotor current. This coordination with the overload relay characteristics protects the fuse from unnecessary operation due to motor starting, overload, or stalling. Considering 110% of motor locked rotor current, rather than just 100%, allows for system voltage variations and for variations in manufacturing tolerances. With the "R" rating so selected, the fuse interrupts only fault currents and is not damaged by operating or overload currents.
- (B) **LOAD CURRENT** In addition, the fuse "R" rating is selected so that the maximum load current will be substantially less than the maximum continuous current specified by the fuse manufacturer. This de-rating effects a safety factor to assure lower operating temperatures and allow for adverse environments, such as corrosive atmospheres.

"R"	MFRS AMPS*	MAX FLA#	MAX LRA
3R	100	45	300
4R	130	60	400
6R	170	90	600
9R	200	135	900
12R	230	180	1200
18R	390	270	1800
24R	450	360	2400

\* "MFRS AMPS" is Max Continuous Current Limit At 40C Ambient, as specified by manufacturer.

# "MAX FLA" is Nameplate Full Load Current, before adjusting for motor service factor.

