

## **DIVISION 16 - ELECTRICAL**

### **Section 16475 - Overcurrent Protective Devices**

#### **Introduction**

The general philosophy regarding the application of protective devices is that the circuit breaker or fuse at the source must be sized to protect the wiring. The motor protective device (overloads on a motor starter) should be sized to protect the motor (except where permitted under other sections of the NEC). Where a combination motor starter is used, it is preferred that a fused disconnect be utilized rather than motor circuit protectors. (Both for single units and motor control centers).

Wiring should be always sized to be adequate to serve the load served. The maximum rating of the protective device upstream of the wiring should never be higher than the 75 °C column of Table 310-16 of the NEC or as appropriate for the actual equipment being utilized.

The AIC rating of the protective device must be adequate for the available short circuit of the devices being used. Therefore it is imperative that with each design where the primary distribution to a building is being modified that a proper short circuit calculation be made and applied to the design. Where the short circuit rating of downstream devices is not adequate for the available short circuit current then either the downstream devices must be replaced with higher AIC rated devices or current limiting devices must be used.

The load analysis for the building should be calculated each time a modification to the building loading is done so that a general building overload or a feeder circuit overload will not occur due to inattention to this detail. Should the new loads introduce a situation which would cause either a building or a feeder overload then the Engineer should discuss the situation with the UA Electrical Engineer.

On new facilities all circuit breakers from the main to the 120/208 volt panelboards shall be coordinated and a copy of the coordination study provided to the UA Electrical Engineer during the construction of the facility but prior to ordering any electrical gear

#### **Part 1 - General**

- Circuit breakers shall be of the same manufacturer as that of the panelboard or switchboard in which it is manufactured.
- For new equipment circuit breakers shall be either GE, Cutler Hammer, Siemens, or prior approved equal.
- Fuses shall be as manufactured by BUSS, Littlefuse, or prior approved equal.

#### **Part 2 - Products**

- Circuit breakers shall be appropriate for the equipment in which they are being installed.
- 10,000 AIC minimum for 120/208 volt systems.
- 14,000 AIC minimum for all 277/480 volt systems.
- The actual ratings shall be as per the short circuit analysis for the appropriate building.
- Circuit breakers for new 120/208 volt panelboards shall be bolt on type.
- Circuit breakers for new 277/480 volt panelboards shall be bolt on type.
- Fuses shall be dual element time delay type fuses.
- Minimum AIC rating for fuses to be 200,000 AIC.

- Panelboard main breakers, panelboard branch breakers 100 amperes and larger, distribution panelboard breakers, and switchboard breakers shall be fully electric type. These breakers shall have at least 5 levels of adjustment, equal to Cutter Hammer “Digitrip OPTIM”. Where 5 levels are not sufficient for CLEAN coordination, the 10 levels of adjustability of the Digitrip OPTIM – 1050 is required. Enhanced thermal magnetic breakers are not to be used and will not be considered. **THIS PARAGRAPH SHALL BE INCLUDED IN ALL SPECIFICATIONS PREPARED BY ENGINEERING CONSULTANTS.** This information shall also be passed on to bidders in situations where contractors, such as CM at risk contractors, are formulating budgets during the early stages of project development.
- All switchboards shall have electronic interlocks for selective tripping.
- All fuses for new equipment shall be rejection type fuses with approved rejection pins at all disconnects.

### **Part 3 - Execution**

- Where multiple breakers are indicated on the drawings they shall be provided with a common trip and not as separate breakers “strapped” or “tied” together.
- Fuses shall be installed in such a manner that the fuse rating can be read from the front of the panel or switch without having to remove or rotate the fuse.

### **End of Section 16475**