

breakers or sets of fuses mounted in a single enclosure, in a group of separate enclosures, or in or on a switchboard or switchgear. There shall be no more than six overcurrent devices grouped in any one location.

- (3) Overcurrent relaying is connected [with a current transformer(s), if needed] to sense all of the secondary conductor current and limit the load to the conductor ampacity by opening upstream or downstream devices.
- (4) Conductors shall be considered to be protected if calculations, made under engineering supervision, determine that the system overcurrent devices will protect the conductors from overload conditions.

(3) Physical Protection. The secondary conductors are protected from physical damage by being enclosed in an approved raceway or by other approved means.

(D) Outside Feeder Taps. Outside conductors shall be permitted to be tapped to a feeder or to be connected at a transformer secondary, without overcurrent protection at the tap or connection, where all the following conditions are met:

- (1) The conductors are protected from physical damage in an approved manner.
- (2) The sum of the overcurrent devices at the conductor termination limits the load to the conductor ampacity. The overcurrent devices shall consist of not more than six circuit breakers or sets of fuses mounted in a single enclosure, in a group of separate enclosures, or in or on a switchboard or switchgear. There shall be no more than six overcurrent devices grouped in any one location.
- (3) The tap conductors are installed outdoors of a building or structure except at the point of load termination.
- (4) The overcurrent device for the conductors is an integral part of a disconnecting means or is located immediately adjacent thereto.
- (5) The disconnecting means for the conductors are installed at a readily accessible location complying with one of the following:
 - a. Outside of a building or structure
 - b. Inside, nearest the point of entrance of the conductors
 - c. Where installed in accordance with 230.6, nearest the point of entrance of the conductors

(E) Protection by Primary Overcurrent Device. Conductors supplied by the secondary side of a transformer shall be permitted to be protected by overcurrent protection provided on the primary (supply) side of the transformer, provided the primary device time-current protection characteristic, multiplied by the maximum effective primary-to-secondary transformer voltage ratio, effectively protects the secondary conductors.

ARTICLE 242

Overvoltage Protection

Part I. General

Δ 242.1 Scope. This article provides the general requirements, installation requirements, and connection requirements for overvoltage protection and overvoltage protective devices. Part II covers surge-protective devices (SPDs) permanently installed on premises wiring systems of not more than 1000 volts, nominal, while Part III covers surge arresters permanently installed on premises wiring systems over 1000 volts, nominal.

The delineation between surge-protective devices (SPDs) covered by Part II and those covered by Part III is the voltage rating of the supply system. The designations of SPDs are varied, depending on their location in the premises wiring system. For instance, a Type 1 SPD is permitted to be connected on the supply side of the service or building disconnecting means. Type 2 and Type 3 SPDs must be installed on the load side of OCPDs and are the devices referred to in previous editions as transient voltage surge suppressors (TVSSs). Two examples of SPDs are shown in Exhibit 242.1.

N 242.2 Reconditioned Equipment. SPDs and surge arresters shall not be reconditioned.

242.3 Other Articles. Equipment shall be protected against overvoltage in accordance with the article in this *Code* that covers the type of equipment or location specified in Table 242.3.



EXHIBIT 242.1 Two SPDs suitable for service-entrance installation — one for direct connection to panelboard busbars and one for mounting in a cabinet or enclosure knockout. (Courtesy of Eaton)