

The ground-fault sensor illustrated in Exhibit 230.25 is installed around the bonding jumper only. When an unbalanced current from a line-to-ground fault occurs, the current flows through the bonding jumper and the shunt trip causes the circuit breaker to operate, removing the load from the line.

Exception: The ground-fault protection provisions of this section shall not apply to a service disconnect for a continuous industrial process where a nonorderly shutdown will introduce additional or increased hazards.

(A) Setting. The ground-fault protection system shall operate to cause the service disconnect to open all ungrounded conductors of the faulted circuit. The maximum setting of the ground-fault protection shall be 1200 amperes, and the maximum time delay shall be one second for ground-fault currents equal to or greater than 3000 amperes.

Ground-fault sensor settings at low levels can increase the likelihood of unwanted shutdowns. The duration of the fault is limited to not more than 1 second for fault currents greater than 3000 amperes. This restriction minimizes the amount of damage done by an arcing fault, which is directly proportional to the time the arcing fault is allowed to burn.

Care should be taken to ensure that interconnecting of multiple supply systems does not interfere with proper sensing by the GFPE. An engineering study should be made to ensure that fault currents do not take parallel paths to the supply system, thereby bypassing the ground-fault detection device.

(B) Fuses. If a switch and fuse combination is used, the fuses employed shall be capable of interrupting any current higher than the interrupting capacity of the switch during a time that the ground-fault protective system will not cause the switch to open.

(C) Performance Testing. The ground-fault protection system shall be performance tested when first installed on site. This testing shall be conducted by a qualified person(s) using a test process of primary current injection, in accordance with instructions that shall be provided with the equipment. A written record of this testing shall be made and shall be available to the authority having jurisdiction.

Informational Note No. 1: Ground-fault protection that functions to open the service disconnect affords no protection from faults on the line side of the protective element. It serves only to limit damage to conductors and equipment on the load side in the event of an arcing ground fault on the load side of the protective element.

Informational Note No. 2: This added protective equipment at the service equipment could make it necessary to review the overall wiring system for proper selective overcurrent protection coordination. Additional installations of ground-fault protective equipment might be needed on feeders and branch circuits where maximum continuity of electric service is necessary.

Informational Note No. 3: Where ground-fault protection is provided for the service disconnect and interconnection is made with another supply system by a transfer device, means or devices could be needed to ensure proper ground-fault sensing by the ground-fault protection equipment.

Informational Note No. 4: See 517.17(A) for information on where an additional step of ground-fault protection is required for hospitals and other buildings with critical areas or life support equipment.

ARTICLE 235

Branch Circuits, Feeders, and Services Over 1000 Volts ac, 1500 Volts dc, Nominal

Part I. General

235.1 Scope. This article provides the general requirements for branch circuits, feeders, and services over 1000 volts ac or 1500 volts dc, nominal.

Informational Note: See ANSI/IEEE C2-2017, *National Electrical Safety Code*, for additional information on wiring over 1000 volts, nominal.

New Article 235 has been created to cover branch circuits, feeders, and services for installations over 1000 volts ac, 1500 volts dc, nominal. To aid in usability of the NEC®, much of the information within Article 235 has been pulled in from long-standing, medium-voltage requirements within other code articles, such as Articles 210, 215, 225, and 230.

Part II. Branch Circuits

235.3 Other Articles for Specific-Purpose Branch Circuits. Table 235.3 lists references for specific equipment and applications not located in Chapters 5, 6, and 7 that amend or supplement the requirements of this article.

TABLE 235.3 References for Specific Equipment and Applications Not Located in Chapters 5, 6, and 7

Equipment	Article	Section
Air-conditioning and refrigerating equipment		440.6, 440.31, and 440.32
Busways		368.17
Central heating equipment other than fixed electric space-heating equipment		422.12
Fixed electric heating equipment for pipelines and vessels		427.4
Fixed electric space-heating equipment		424.4
Fixed outdoor electrical deicing and snow-melting equipment		426.4
Infrared lamp industrial heating equipment		422.48 and 424.3
Motors, motor circuits, and controllers	430	