

ARTICLE 250

GROUNDING AND BONDING

Introduction to Article 250—Grounding and Bonding

No other article can match this one for misapplication, violation, and misinterpretation. The terminology used in Article 250 has been a source of much confusion but has been improved during the last few *NEC* revisions. It is very important for you to understand the difference between grounding and bonding in order to correctly apply the provisions of this article. Pay careful attention to the definitions of important terms located in Article 100 that apply to grounding and bonding. Article 250 covers the grounding requirements for providing a path to the Earth to reduce overvoltage from lightning strikes, and the bonding requirements that establish a low-impedance fault current path back to the source of the electrical supply to facilitate the operation of overcurrent protective devices in the event of a ground fault.

This article is arranged in a logical manner as illustrated in Figure 250.1 in the *NEC*. It may be a good idea for you to just read through the entire article first to get a big picture overview. Then, study Article 250 closely so you understand the details and remember to check Article 100 for the definitions of terms that may be new to you. The illustrations that accompany the text in this textbook will help you better understand the key points.

250.36 High-Impedance Grounded Systems

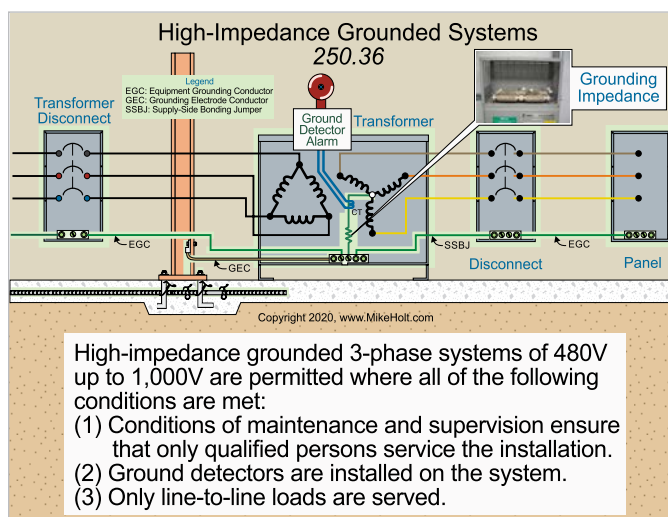
High-impedance grounded three-phase systems of 480V up to 1,000V are permitted where all the following conditions are met: ▶ [Figure 250-102](#)

- (1) Conditions of maintenance and supervision ensure that only qualified persons service the installation.
- (2) Ground detectors are installed on the system.
- (3) Only line-to-line loads are served.

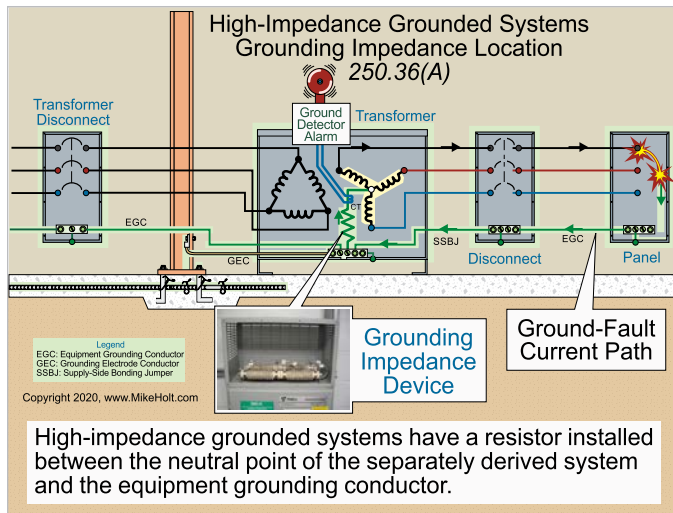
Author's Comment:

- ▶ High-impedance grounded systems are generally referred to as “High-Resistance Grounded Systems” in the industry. They are generally used where sudden interruption of power will create increased hazards and where a reduction of incident energy is needed for worker safety.

(A) Grounding Impedance Location. To limit fault current to a very low value, high-impedance grounded systems must have a resistor installed between the neutral point of the separately derived system and the equipment grounding conductor. ▶ [Figure 250-103](#)



▶ [Figure 250-102](#)



►Figure 250-103

Note: According to Annex O of NFPA 70E, *Standard for Electrical Safety in the Workplace*, high-impedance grounding is an effective tool for reducing arc flash hazards.