

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.

250.97 Bonding Metal Parts Containing 277V and 480V Circuits

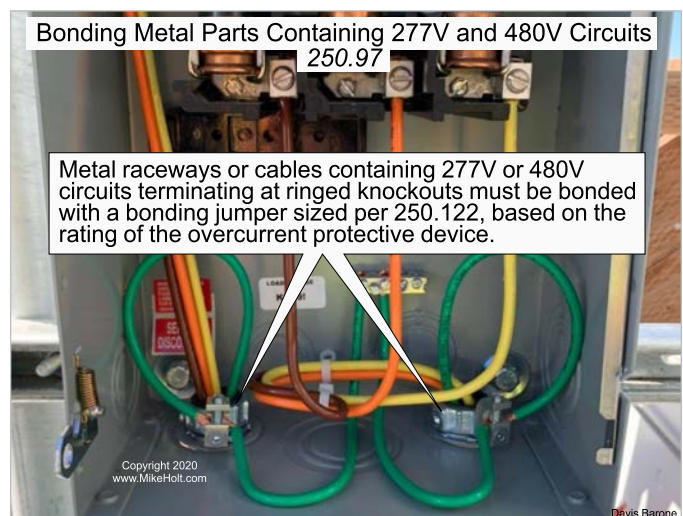


Scan this QR code for a video of Mike explaining this topic; it's a sample from the videos that accompany this textbook.
www.MikeHolt.com/20BGvideos

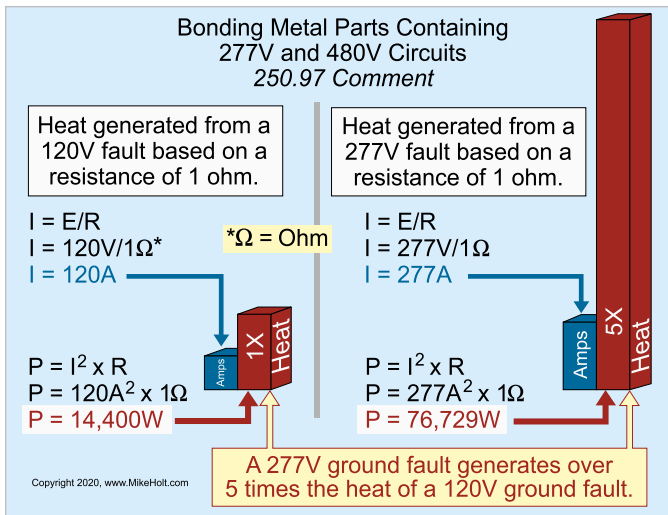
Metal raceways or cables containing 277V or 480V circuits terminating at ringed knockouts must be bonded to the metal enclosure with a bonding jumper sized in accordance with 250.122 [250.102(D)]. ▶ [Figure 250-183](#)

Author's Comment:

- ▶ Bonding jumpers for raceways and cables containing 277V or 480V circuits are required at ringed knockout terminations to ensure the ground-fault current path has the capacity to safely conduct the maximum ground-fault current likely to be imposed [110.10, 250.4(A)(5) and 250.96(A)]. Ringed knockouts are not listed to withstand the heat generated by a 277V ground fault, which generates five times as much heat as does a 120V ground fault. ▶ [Figure 250-184](#)

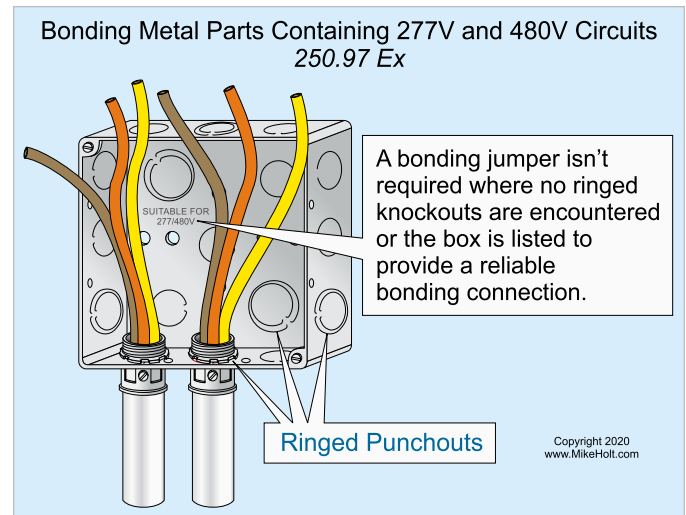


▶ [Figure 250-183](#)



▶Figure 250-184

Ex: Where oversized, concentric, or eccentric knockouts are not encountered, or where a box or enclosure with concentric or eccentric knockouts is listed to provide a reliable bonding connection, a bonding jumper is not required if the following methods are used: ▶Figure 250-185



▶Figure 250-185

- (1) Metal connectors for metal-sheathed cables
- (2) Two locknuts, on rigid metal conduit or intermediate metal conduit, one inside and one outside of boxes and cabinets
- (3) Electrical metallic tubing connectors, flexible metal conduit connectors, and cable connectors with one locknut on the inside of boxes and cabinets
- (4) Listed fittings