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ESA Electrical Safety Mining Services Group Tech Brief

Installation requirements when utilizing the primary feeder bond conductor as a ground conductor for a secondary isolated system.

NOTE: *This tech brief only applies to mini power racks and mobile equipment that are connected to a source of power using a portable power cable or an approved cable (Teck) provided the transformation does not exceed 15 kVA.*

Often times in mining, there is a requirement on a piece of machinery or in some remote location that is well removed from a mine power centre (MPC) for both 600 and 120 volt power. To accommodate this need, a 600 volt feeder is installed that typically will satisfy the 600 volt power requirements and to feed the primary side of a 600--120/240 volt transformer. As per Rule 10-206 of the CEC, the secondary system needs to be grounded. In lieu of installing a separate external grounding conductor that would be prone to abuse and mechanical damage, it has been common practice in mining to utilize the bond conductor of the primary feeder cable to serve as the

system grounding conductor. This brief recognizes this past practice and the need to document and establish consistent guidelines for a safe and reliable installation.

Minimum requirements are:

- Minimum #8 AWG bond conductor contained within the cable assembly.
- As per 10-806(1), for grounding conductor connections, the use of compression type connectors shall be used where practical.
- Transformer enclosure shall be of the type approved for the environment.
- Transformer shall be properly supported and secured.
- Transformation is limited to a maximum of 15 kVA with primary and secondary overcurrent protection as required by 26-254 or 26-256.
- Primary & secondary conductors shall be sized as required by 26-258 (keeping in mind the required minimum #8 AWG bond conductor).

If Portable Power Cable is used

- The feeder cable is supplied from a source that has ground fault protection and bond con-

ductor monitoring.

- Where ground-conductor monitoring is used, the supply shall be de-energized by a fail-safe circuit in less than 0.5 seconds, and a de-energized supply shall not become energized in the event of:
 - (a) The ground-check conductor becomes open;
 - (b) The ground-return conductor becomes open; or
 - (c) The ground-check conductor short circuits to ground.
- A ground-conductor monitoring system shall have an open-circuit voltage less than 100 volts and shall continuously indicate ground-circuit continuity.
- Shielded cable is recommended for an increased level of safety.

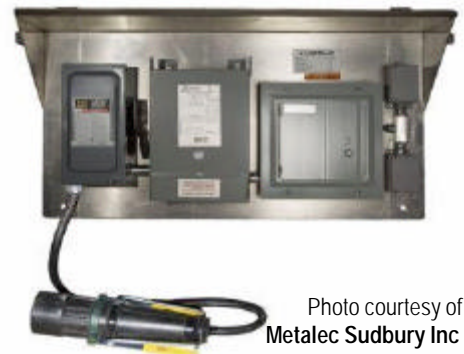


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