LINE SUPPLY GFCI CIRCUIT BREAKER'S AND AC DRIVES

Description:

Can a GFCI circuit breaker be installed on the AC power feeding a drive, or will the drive cause it to trip?

Answer:

The AC Drive most likely will cause the GFCI protection device to trip. The reason the AC Drive will cause this tripping of the GFCI is the Common Mode Current or Common Mode Noise (CM Noise) that the VFD is producing. The high rate that the IGBT is switched on and off is around (1 - 16 kHz). This switching creates Common Mode Electrical Noise. The Common Mode Noise is the current that appears on a conductor with respect to ground. This Common Mode Noise can and will travel throughout the plants ground system and even beyond. This Common Mode Noise can affect the operation of the application, and other equipment in the plant by interfering with signals from sensors, computers, PLC's, telephone and radio. The VFD does provide ground fault protection on the output of the VFD.

Documents or other reference material:

None

Corrective Actions:

The goal is to have all the Common Mode Noise return to the VFD. Here are some actions that will help reduce or eliminate the tripping of the GFCI. The motor cable should be VFD rated motor cable and the motor and shield should be grounded back to the VFD. The User Manual will provide information on how to correctly install the VFD. The installation of RFI/EMC filters before or inside the VFD. Installing an isolation transformer before the VFD and after the GFCI circuit breaker will help reduce the tripping of the GFCI.