

EARTH LEAKAGE PROTECTION WITH VARIABLE SPEED DRIVES

“Earth Fault” detection is provided by most inverters to detect current flow to earth in the event of an earth fault occurring. Inverters are not categorized as “Earth Leakage Protection” devices nor should they be used with earth leakage protection devices due for the following reasons.

1. Most inverters are fitted with Radio Frequency suppression components between the supply, DC Bus and protective earth. These components allow a small amount of current to flow to earth to reduce mains conducted interference. The Inverter must be grounded for correct and safe operation, and in a fixed installation, there are no regulations limiting the earth leakage current generated by the equipment.
2. Additionally it is known that three phase rectifier systems used in inverters can disrupt the operation of Earth Leakage Circuit Breakers. That is the ELCB will not operate correctly as a protection device. Therefore the use of ELCB's is not recommended with any three-phase rectifier systems. Ref Standard DIN VDE 0160 Section 6.5.
3. Radio Frequency Suppression Filters fitted to inverters to meet AS2064, will generally increase the leakage current to earth and may further increase nuisance tripping of the Earth Leakage protection devices.

SUMMARY

Use of suppression components connected to earth, the generation of high frequency earth currents and the requirements of VDE 0160 are common to the majority of all inverter manufacturers including PDL. Therefore operation of Inverters and 3-phase Earth Leakage Protection devices are not recommended.
