
Grounding Failure Case Study

Verifying Absence of Voltage

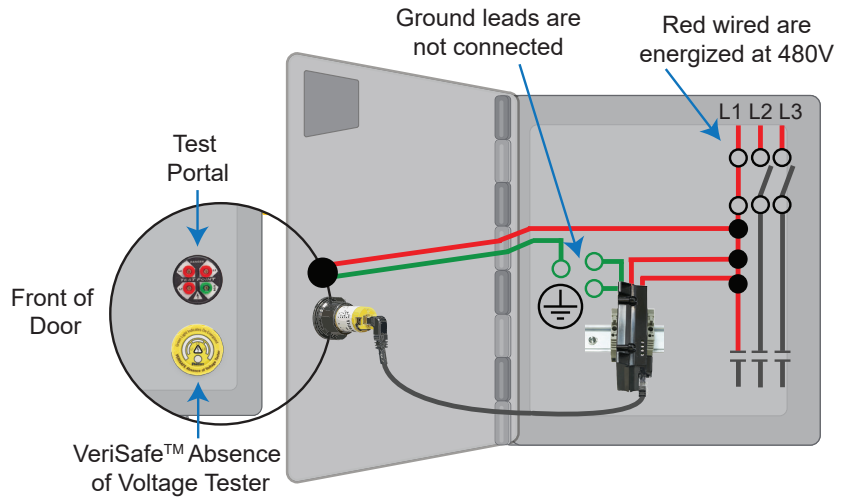





Electrical Enclosure with Incoming 3-Phase 480V AC Power

Situation

Worker approaches the enclosure and the disconnect switch for the 480V power source is in the OFF position. The disconnect switch has failed with one phase (L1) in the closed position (L2, L3 are open). The ground leads of the devices are NOT connected to ground because of an improper installation or termination failure.

The worker applies a lock. Following safety procedures, the worker performs an absence of voltage test with the electrical enclosure closed using a permanently mounted device.



Permanently Mounted Device	Failure Mode	Potential Cause	System State	Detection	Failure Effect	Incident Consequence
 Absence of Voltage Tester (AVT)	Ground lead(s) are NOT connected to ground	Improper installation or termination failure	Disconnect is in the OPEN/OFF position with L1 energized	YES The AVT will detect open ground (or phase) lead(s) and communicate the installation of sensor leads is not verified	AVT will detect open ground lead(s) and communicate installation is the reason the absence of voltage test cannot be confirmed	None - Incident Avoided
 Test Portal				NO Voltage measurement results in zero voltage when <u>voltage is present</u>	Worker erroneously considers electrical enclosure as deenergized	
 Voltage Test Station				NO The L1 LED for the voltage indicator will not be illuminated and measurement results in zero voltage when <u>voltage is present</u>		<ul style="list-style-type: none"> • Probable shock or arc flash event • Equipment damage is likely



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