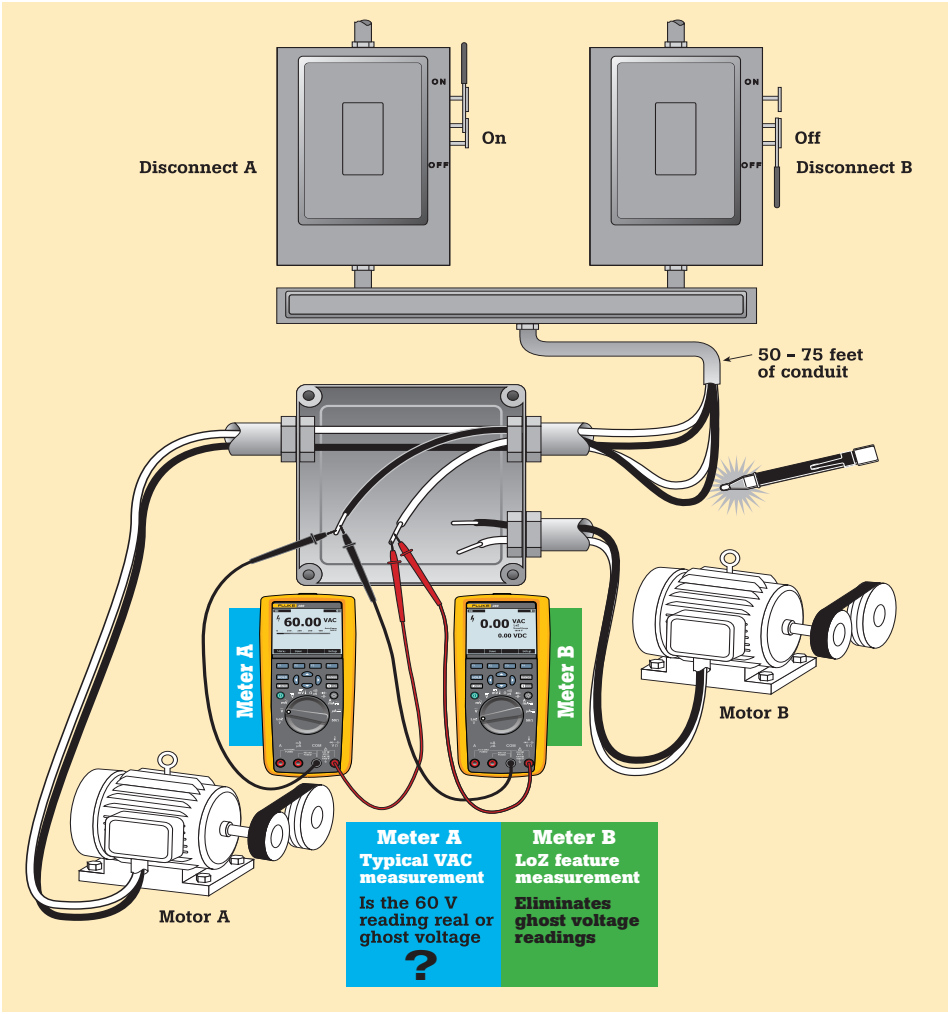
The most common places to encounter ghost voltages are blown fuses in distribution panels, unused cable runs or electrical wiring in existing conduit, open ground or neutral on a 120 V branch circuit or in card cages where 120 V control circuits are used to control assembly line or conveyor functions. Some amount of ghost voltage can be coupled from the hot side to the open side across the blown fuse. When facilities or buildings are built and wired, it's very common for electricians to pull extra wire through the conduit for future use. These wires are typically left unconnected until needed, but are subject to capacitive coupling. In the case of the control circuits, these circuits are typically located adjacent to unused control lines, thereby creating a potential for a ghost voltage measurement.

Absence or presence of voltage testing

Traditionally most electricians and plant maintenance professionals used some form of solenoid tester to determine whether circuits were energized or not. Because of their low impedance circuit, solenoid testers are not fooled by ghost voltage.

These testers did their job back in the day but they rarely comply with the current IEC 61010 safety standards and current North American regulatory requirements. They should not be used for troubleshooting purposes in high energy three phase distribution panels or for testing whether a circuit is energized.

The Fluke 289's LoZ function has a low input impedance, on the order of three kilohms. When the leads are placed on an open circuit that contains a ghost voltage, the low input impedance will cause the ghost voltage to dissipate and the meter will display a reading near zero volts indicating no voltage present.



Here's an example of how ghost voltages can occur and where they can confuse measurements.

When the leads are placed on a live circuit, however, the input senses the presence of "hard" voltage and then displays the actual voltage present.

Summary

Given the variety and complexity of measurement and testing requirements found in most facilities today, a meter with a dual impedance input offers the troubleshooter or technician more flexibility to cover applications or measurement needs ranging from basic voltage testing to troubleshooting sensitive electronic circuits.

Fluke. *Keeping your world up and running.®*