



Electrical Safety Protocol

Purestream Logan Operations

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Background

Electrical connections can be an electrocution hazard if not properly checked before applying power to the circuit. This procedure outlines the minimum safety requirements that must be satisfied before powering any electrical circuit. These procedures are applicable to both AC and DC systems.

Electrical Startup Checklist, Part A – Continuity Test

Safety Intent: Check electrical system for short/ground faults prior to startup.

Required Equipment: Multimeter that can test for continuity and resistance.

Execution: Perform continuity and/or resistance check at all specified locations.

Warning: Never check continuity on a live circuit.

- 1) Ensure all electrical connections are properly terminated.
- 2) Turn all disconnects to the off position.
- 3) Begin continuity check at the downstream side of the power source disconnect. This will be either the pole mounted disconnect for line power or the main circuit breaker for a generator. Continuity must then be checked on both sides (feed and supply) of all downstream disconnects.
- 4) Continuity shall be tested for the lines listed below:
 - a. **Between each phase of power.** Continuity indicates a fail. Transformers are an exception to this rule. When in doubt, remove the transformer from the circuit and test for continuity again.
 - b. **Between each phase of power and ground.** Continuity indicates a fail. An electrical short is present.
 - c. **Between the ground lug in or around the disconnect and any nearby conductive material that is not intended to carry power.** Examples include: Back panel, support frames, piping, and motor housings. Conductivity indicates a pass. Proper grounding is present. Resistance shall also be checked. A reading of 0.5 ohms or less indicates a pass.
- 5) The equipment is safe to power if all systems, both AC and DC, pass these tests.

Electrical Startup Checklist, Part B – Voltage Test

Safety Intent: Check electrical system for proper voltage after initial startup.

Required Equipment: Multimeter that can measure AC and DC voltage.

Execution: Perform voltage check at all specified locations.

Warning: Voltage check must be performed with the electrical system energized. This presents an electrocution hazard. The buddy system shall be used with both individuals aware of how to shutdown power to all electrical circuits being tested. Kill power in case of electrical shock. Do not attempt to pull someone from a hot electrical circuit using your hands.

- 1) Review the electrical schematic for the control system being tested. Make note of supply voltage(s) along with any AC and/or DC voltage changes.
- 2) Notify the Project Manager of any test that is failed.
- 3) AC Voltage Test
 - a. Place the multimeter on the proper AC (alternating current) setting.
 - b. Check each voltage as close to the supply as possible.
 - c. **480VAC System** – Check the voltage line to line. The voltage measured should be 460 – 480VAC.
 - d. **240VAC System** – Check the voltage line to line. The voltage measured should be 220 – 240VAC.
 - e. **120VAC System** – Check the voltage line to neutral. The voltage measured should be 110 – 120VAC.
- 4) DC Voltage Test
 - a. Place the multimeter on the proper DC (direct current) setting.
 - b. Check the voltage as close to the supply as possible.
 - c. Make note of the intended system voltage from the electrical schematic. The measured DC voltage should be within +/- 1VDC from what is shown on the drawing.