

NFPA 70E LIVE-DEAD-LIVE TESTING WITH HIGH-IMPEDANCE TEST POINTS APPLICATION NOTE

The Live-Dead-Live test is a critical component of NFPA 70E-compliant Lockout/Tagout (LOTO) procedures. It ensures a properly functioning voltmeter and confirms the absence of voltage before working on electrical equipment. GracePESDs® include high-impedance protected test points that enable this test to be performed safely and efficiently through closed doors without exposing personnel to energized conductors.

When installed on both the line and load side of electrical equipment with defined power paths, these Permanent Electrical Safety Devices (PESDs) enable a fully compliant Live-Dead-Live sequence in accordance with NFPA 70E 120.6(7):

1. Live – Verify the meter on a known voltage source (line side)
2. Dead – Test for absence of voltage on the load side
3. Live – Re-verify the meter on the line side again

NFPA 70E COMPLIANCE

ChekVolt® and Safe-Test Point™ PESDs align with NFPA 70E Article 120.6, specifically:

- 120.6(4): LED indicators (on ChekVolt®) illuminate when hazardous voltage is present until stored energy is released, warning users of residual voltage.
- 120.6(7): Touch-safe test points allow qualified personnel to use a portable meter to verify the absence of voltage and test meter functionality on a known voltage source, supporting Live-Dead-Live testing.

These PESDs meet the requirement that “before and after each test, determine that the test instrument is operating satisfactorily through verification on any known voltage source.

LIVE-DEAD-LIVE TESTING WORKFLOW

With test point PESDs installed on both line and load side:

1. Verify the meter on the line side, ChekVolt® or Safe-Test Point™ (known voltage source)
2. Test for absence of voltage on the load side
3. Re-verify the meter again on the line side
4. Proceed with grounding and maintenance as required

This procedure satisfies NFPA 70E 120.6(7). Exception No. 1 to 7 is not required if testing is done using these high-impedance PESDs and a portable voltmeter.



APPLICABLE GRACEPESDS®

Product Variant	Voltage Rating	Application Focus
ChekVolt® AC3	Up to 1000 VAC	Single-phase AC control panels
ChekVolt® DC2	Up to 1000 VDC	Two-wire DC systems (solar, EV chargers)
ChekVolt® DC3	Up to 1000 VDC	Three-wire DC systems (battery storage)
ChekVolt® 3kV	Up to 3kV DC	Utility-scale solar, rail, EV, mining
Safe-Test Point™	AC & DC up to 600V	Cost-effective, LED-free alternative
Safe-Test Point™ 3kV	Up to 3kV DC	DC-only applications requiring high voltage

Each model includes high-impedance test points designed for safe, voltmeter-compatible readings, and ChekVolts include an LED indication for voltage presence.

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SS-PESD-AN3-EN 2507

BENEFITS

- Improved Compliance: Supports Article 120.6 directly
- Increased Safety: No need to open the enclosure; reduces arc flash and shock risk
- Standardized Procedure: Simplifies and standardizes Live-Dead-Live testing
- Flexible Use: Compatible with AC, DC, and high-voltage applications up to 3kV
- Time & Cost Savings: Reduces LOTO time by up to 45 minutes per event and eliminates the need for a second qualified person

COMMON APPLICATIONS FOR LINE- AND LOAD-SIDE PESD INSTALLATIONS

Application	Description	Recommended PESD Variant
Isolator Switches	Used in LOTO procedures as the main disconnect. Line/load PESDs enable full Live-Dead-Live verification.	ChekVolt® or Safe-Test Point™
Motor Control Centers (MCCs)	Enable voltage testing at feeders or motor buckets without enclosure entry.	ChekVolt® or Safe-Test Point™
Variable Frequency Drives (VFDs)	Useful for identifying residual energy, stuck contactors, or backfeeds.	ChekVolt® or Safe-Test Point™
Transfer Switches / ATS Panels	Support voltage verification in systems with multiple incoming sources.	ChekVolt® or Safe-Test Point™
Robotics & Automation Panels	Frequently accessed panels benefit from fast, safe voltage testing.	ChekVolt® or Safe-Test Point™
Conveyors / Sortation Systems	Improve efficiency and safety in high-LOTO environments.	ChekVolt® or Safe-Test Point™
DC-Powered Equipment	Supports voltage verification in 3-phase DC systems like solar, battery, or EV infrastructure.	Safe-Test Point™ DC3
Medium Voltage Equipment (up to 3kV)	Enables high-voltage testing in substations, mills, and heavy industrial panels.	ChekVolt® 3kV or Safe-Test Point™ 3kV

CONCLUSION

GracePESDs® deliver a robust and versatile solution for performing safe, compliant absence of voltage verification. Whether using ChekVolt® or Safe-Test Point™ models on AC or DC systems—including high-voltage applications—installing test points on both line and load sides enables full Live-Dead-Live compliance with NFPA 70E. The result? Faster procedures, reduced labor, and safer teams