Personnel and Facility Protection

Identifying and correcting potential electrical safety hazards and maximizing machine uptime

At Leviton, we understand the importance of personnel and facility safety. Exposure to electricity is a serious, widespread occupational hazard that impacts workers in all job categories. Learn more about the risks associated with electricity and electrical devices, as well as mitigation strategies to deal with them safely and effectively.

SAFE & RELIABLE INDUSTRIAL CONNECTIONS • OVER 115 YEARS IN THE INDUSTRY

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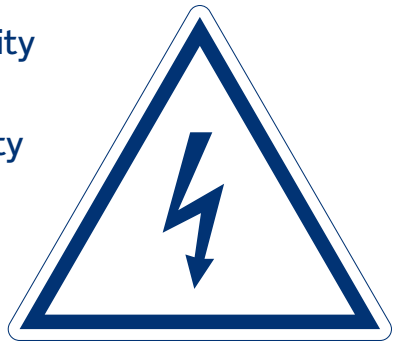
LEVITON®

PERSONNEL AND FACILITY PROTECTION

As more of the world becomes electrified, safety will remain a priority issue. Leviton sets the standard in electrical safety by developing, designing and manufacturing products that improve electrical safety while ensuring a safe work environment.

Most common electrical safety hazards can easily be eliminated simply by utilizing the proper equipment.



PERSONNEL PROTECTION

Hazard: Permanently installed non-GFCI receptacles installed in wet or damp indoor locations, on roofs or other outdoor locations.

Summary: The NEC requires GFCI protection for power outlets in all wet or damp locations.

Remedy: Install Leviton's SmartLock Pro GFCI receptacles, with safety features including tamper-resistant shutters, pilot and guide lights, and weather-resistant versions.

Applicable Standards: NEC Article 210.8(B), OSHA 29 CFR PART 1910.304(b)(3), 1926.404(b)(1), NFPA 70E Article 110.6

PORTABLE PERSONNEL PROTECTION

Hazard: Portable power tools being used on circuits without GFCI Protection.

Summary: A portable GFCI must be able to trip if a neutral wire is open.

Remedy: Use Leviton GFCI cordsets, available in both automatic and manual reset, providing open-neutral protection for added safety.

Applicable Standards: NFPA 70 (NEC) Article 590.6(A)(1), OSHA 29 CFR PART 1926.404(B)(1), NFPA 70E Article 110.5(D)

POWER PENDANTS

Hazard: Using standard electrical boxes that are not listed for use as pendants.

Summary: NEC Article 110.12 requires unused openings in boxes be closed off to provide the same level of protection they would get from a wall. Using wall boxes as pendants violates this provision.

Remedy: Use Leviton non-metallic portable outlet boxes that are designedfor this purpose. Coverplates with weather-resistant flip lids provide NEMA 3-R protection to receptacles not in use.

Applicable Standards: NEC Article 590.4(I), OSHA 29 CFR PART 1910.303(b)(1), 1926.403(b)(1)

OUTDOOR OR INDOOR WET AND DAMP LOCATIONS

Hazard: Plugs and connectors are failing due to contact from moisture and debris.

Summary: Unless identified for use in the operating environment, electrical conductors must not be used in damp or wet locations where they may be subjected to liquids, vapors, or other deteriorating agents having a deteriorating effect on the conductors.

Remedy: Utilize Leviton Wetguard® watertight plugs and connectors, featuring environmental ratings of NEMA 4, 4X, 6 & 6P and IEC IP66, IP67, and IP69K.

Applicable Standards: NEC Article 110.11, OSHA 29 CFR PART 1910.303(b)(6), 1926.432(a)(1)

RECEPTACLES IN DAMP OR WET LOCATIONS

Hazard: Receptacles mounted outdoors or in wet or damp locations are subject to corrosion and damage from water and UV exposure. They also do not have appropriate covers installed.

Summary: All 15A and 20A, 125V and 250V receptacles installed in damp or wet locations must be listed as weather resistant and be protected by a weatherproof cover when not in use.

Remedy: Use Leviton weather-resistant receptacles paired with Leviton's weatherproof covers.

Applicable Standards: NEC Article 406.9(A) and (B)

MECHANICAL INTERLOCKS

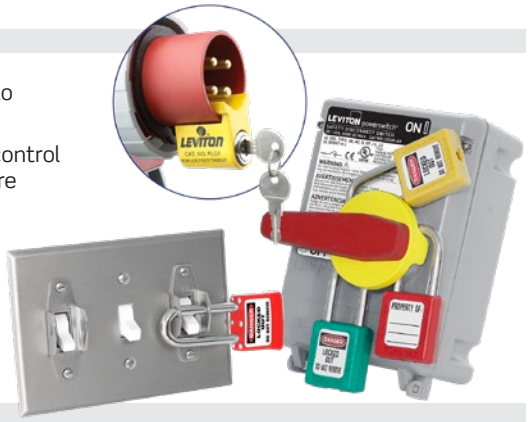
Hazard: Plugs and connectors are disconnected under load, potentially damaging or shortening the lifespan of both the connectors and connected equipment.

Summary: Not all disconnecting devices are rated for interrupting load currents. Disconnecting "live" circuits can result in arcing that can damage the device and connected equipment, while at the same time creating a safety hazard for the operator. Powerswitch® mechanical interlocks provide the required level of safety by preventing the unplugging of a device under load – the safety disconnect will de-energize the circuit before allowing the plug to be disconnected.

Remedy: Install a Leviton LEV Series Mechanical Interlock, which prevent the unplugging of a device under load. The safety disconnect will de-energize the circuit before allowing the plug to be disconnected.

Applicable Standards: NEC 430.102(B), 430.109(F), UL 60947-4-1 (supersedes UL 508), NFPA 70E Article 120

CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)



Hazard: Workers performing service or maintenance on machinery may be exposed to injuries from the unexpected startup of the machinery.

Summary: Employers must establish an energy control program, consisting of energy control procedures, employee training, and periodic inspections to ensure that before service and maintenance is performed, machines and equipment that could unexpectedly startup are isolated from their energy source(s).

Remedy: Leviton offers a variety of devices that can be used to prevent accidental reenergization of equipment, providing provisions for LO/TO.

Applicable Standards: NFPA 70E Article 120, OSHA 29 CFR PART 1910.147

SURGE PROTECTION

Hazard: Machine controls, and safety interlocks, emergency system loads, fire pumps, computers and other sensitive electronic equipment damaged by transient voltage spikes and surges.

Summary: Some statistics indicate that as much as 80% of all power source related downtime can be traced to transient activity. It is also estimated that protecting electrical and electronic equipment from voltage spikes and surges (transients) can increase the normal lifespan by a factor of two or three. These surges are not only generated from outside the facility (e.g. lightning or utility switching), but also inside the facility (motor load switching). Therefore, you must install sufficient protection to reduce the effects of both internally and externally generated spikes and surges.

Remedy: Implement an effective surge protective network – including service entrance, branch, and point-of-use protection – that protects the entire facility from the damaging effects of transient spikes and surges.

Note: In the National Electrical Code, there are now requirements to provide surge protection for critical operations, data centers, industrial machinery with safety interlock circuits, and emergency systems' switchboards and panelboards.

Applicable Standards: UL 1449, NEC Article 280, 285, 620.51, 645.18, 670.6, 694.7, 695.15, 700.8, 708.20

MOTOR CONTROL

Hazard: Motor driven machines have not been placed in an electrically safe work condition for servicing.

Summary: NFPA 70E mandates that machines must be completely disconnected from all sources of power, and be prevented from being re-energized until work is complete.

Remedy: Install a Leviton Safety Disconnect Switch, which provides means for disconnecting power and provisions for OSHA and NFPA compliance..

Applicable Standards: NEC Article 430.75(A), 430.102, 430.103, OSHA 29 CFR PART 1910.303(f)(1), 1910.305(j)(4), 1910.147, NFPA 70E Article 120

Hazard: Equipment power feeds are not placed close enough to controlled equipment to satisfy line-of-sight requirements.

Summary: The NEC requires that a disconnecting means for a motor and controller be located within line-of-sight (50 feet) of the controlled equipment.

Remedy: Install a Leviton Safety Disconnect switch between the power feed and controlled equipment, providing LO/TO protection.

Applicable Standards: NEC Article 430.102, OSHA 29 CFR PART 1926.417

Hazard: The space available around equipment does not allow compliance with the line-of-sight disconnecting means.

Summary: The Standards require that you must supply a means for disconnecting the circuit to a controller, as well as provide a means for isolating a motor from other loads on the circuit.

Remedy: Install a Leviton Manual Motor Controller that is also rated “Suitable As Motor Disconnect”.

Applicable Standards: NEC Article 430.102, UL 60947-4-1 (supersedes UL 508), OSHA 29 CFR PART 1926.417

WIRE MANAGEMENT

Hazard: Cable connections pull out or become damaged due to excessive motion or vibration. Strain reliefs used on bus drops don’t provide sufficient strain relief or cable bend control.

Summary: Flexible cords must be connected in such a way that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws. Flexible cords are permitted for use in bus drops for portable or stationary equipment, provided that appropriate strain relief grips are provided at the busway plug-in device and equipment terminations.

Remedy: Utilize Leviton wire mesh cable support grips to reduce strain on cable connections and control bend radius.

Applicable Standards: NEC Article 400.10, OSHA 29 CFR PART 1910.305(g)(2), 1910.305(g)(2)(iii), 1926.405(g)(2), NFPA 70E Article 205.14(2)

Hazard: Cable entrance to boxes, enclosures, cabinets and pushbuttons are not adequately protected from water ingress or cable strain.

Summary: Liquidtight Flexible Nonmetallic Conduit is frequently used in outdoor and direct burial applications where protection of the contained conductors from vapors, liquids and other debris is required. Only fittings listed for use with LFNC can be used.

Remedy: Utilize Leviton cord sealing grips to reduce strain on cable connections and control bend radius in wet or damp locations.

Applicable Standards: NEC Article 356.42, OSHA 29 CFR PART 1910.305(e)(1), 1910.305(g)(2)(iii), 1926.405(g)(2)(iv)

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