

Use of Bench Mounted Switches

Summary

The LESC approves as acceptable use, safety switches in certain bench mounted locations as per NFPA 70 Art. 110.2 and Art. 110.3. The switches are typically mounted to a metal bracket using the mounting holes on the back of the switch enclosure. An installation of this type was reviewed by the LESC for factors that would contribute to the practical safeguarding of persons using or likely to come in contact with the switch under normal operation. The LESC has deemed that the mounting of this switch to the workbench does not present a higher hazard than mounting the switch according to the generic instructions provided by the manufacturer.

Relevant Code, Standards and other information

NFPA Article 100 Definitions

Approved. Acceptable to the authority having jurisdiction.

Identified (as applied to equipment). Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular Code requirement.

FPN: Examples of ways to determine suitability of equipment for a specific purpose, environment, or application include investigations by a qualified testing laboratory (listing and labeling), an inspection agency, or other organizations concerned with product evaluation.

Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that the equipment, material, or services either meets appropriate designated standards or has been tested and found suitable for a specified purpose.

FPN: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. Use of the system

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employed by the listing organization allows the authority having jurisdiction to identify a listed product.

NFPA 70 Article 110.2

Approval. The conductors and equipment required or permitted by this code shall be acceptable only if approved.

NFPA 70 Article 110.3 Examination, Identification, Installation, and Use of Equipment

(A) Examination. In judging equipment, considerations such as the following shall be evaluated:

- (1) Suitability for installation and use in conformity with the provisions of this Code

FPN: Suitability of equipment use can be identified by a description marked on or provided with a product to identify the suitability of the product for a specific purpose, environment, or application. Suitability of equipment can be evidenced by listing or labeling.

- (2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided
- (3) Wire-bending and connection space
- (4) Electrical insulation
- (5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service
- (6) Arcing effects
- (7) Classification by type, size, voltage, current capacity, and specific use
- (8) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment

(B) Installation and Use. Listed or labeled equipment shall be installed and used in accordance with any instructions included in the listing or labeling.

* The 2006 UL white book listing for “switches, enclosed” (WIAX) does not include any information on mounting.

* The manufacturer’s instructions on switches of this type state “Mount the enclosure to the wall with screws or nails. Use the holes provided in the back of the enclosure.”

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OSHA Standard 1910.303(b)(2)

Installation and use. Listed or labeled equipment shall be installed and used in accordance with any instructions included in the listing or labeling.

OSHA Standard Interpretations - 07/16/2003 - Workplace use of electrical equipment designated as "Household Use Only" and recordkeeping requirements

July 16, 2003

Mr. Lawrence A. Gingerich, President
Proactive Environmental Inc.
24275 Potter Ridge Rd.
Creola, OH 45622

Dear Mr. Gingerich:

Thank you for your letter to the Occupational Safety and Health Administration's (OSHA's) Office of the Assistant Secretary. The Directorate of Enforcement Programs (DEP) received your letter on February 7. This letter constitutes OSHA's interpretation only of the requirements discussed and may not be applicable to any question or scenario not delineated within your original correspondence. You had several questions regarding workplace use of electrical equipment designated as "Household Use Only" and recordkeeping requirements. Our responses to your paraphrased issues and questions are provided below.

Issue: Regarding 1910.303(a) (Approval) and 1910.303(b)(2) (Installation and Use), I understand that electrical devices must be approved by a nationally-recognized testing laboratory (NRTL). Subpart S of 29 CFR Part 1910 authorizes OSHA to approve NRTLs and their listing. It is also my understanding that this section (specifically 1910.7) infers acceptance for use of anything that has a NRTL approval, as long as that equipment is used in a manner consistent with its designated function as required by 1910.303(b)(2), namely that it is "used or installed in accordance with any instructions included in the listing or labeling."

Question 1: Where is "... used or installed in accordance with," described? Is it in the NRTL listing requirements, on the label, or in the owner's manual?

Reply: Such instructions may be found in any of the sources you mentioned — either the NRTL or the manufacturer of the equipment.

To obtain product labeling or listing by a particular NRTL, it will usually be necessary for the manufacturer to comply with the applicable testing standard of that NRTL. For example, the standard used by Underwriters Laboratories (UL)

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for investigating commercial cooking appliances, including coffee makers, is UL 197. The UL standard for household coffee makers is UL 1082. Section 50 of UL 1082 sets forth several requirements for cautionary markings on the appliance and for the provision of instructions. In addition, Section 52 requires that an instruction manual or the equivalent be provided with the appliance that includes the safety instructions listed in Section 53 ("All Appliances") and the appropriate text from Section 54 ("Special Appliances"). Section 55 requires both that the instruction manual include appropriate instructions and caution statements regarding cleaning and maintenance and that instructions for mounting an under-cabinet or wall-mounted appliance be provided. In other words, many or all of the cautionary markings on or instructions provided with a UL-approved coffee maker will be the use and installation "instructions" that employers must comply with pursuant to §1910.303(b).

Question 2: Where or how is "Household Use" defined? Is this an appropriate designated function?

Reply: 29 CFR 1910, *Subpart S — Electrical*, does not define "Household Use" or "For Household Use Only." A NRTL, however, may use that terminology. For example, as stated above, UL 1082 requires that coffee makers intended for household type usage be marked "Household Use Only," "Household Type," or the like. The UL standard does not define "household," and we are not aware of any published definition by UL of the term "household use." According to Underwriters Laboratory, in distinguishing household use from commercial use it would consider factors such as, but not limited to: (1) level of anticipated daily use; (2) knowledge of the users; and (3) the care and cleaning of the machine.

Question 3: Is it acceptable for employees to use a UL-listed coffeemaker or other small appliance labeled as "Household Use Only" in an office or small break-room?

Reply: The employer must ensure that all electrical equipment used by employees meets or exceeds OSHA standards. Whether an employer's use of UL-listed coffee makers and other small appliances labeled "For Household Use Only" is allowed under the "instructions included in the listing or labeling" depends on an evaluation of the relevant factors, such as those mentioned in the answer to the preceding question. Like Underwriters Laboratories, OSHA recognizes that the use of small appliances in offices or break rooms may be comparable to their use in a household and thus would not be expected to present a higher level of hazard.

For additional guidance on UL-approved appliances used in an office or similar location(s), please contact:

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096

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Phone: (847) 272-8800

Website: <http://www.ul.com/>

Issue: Regarding 1910.304(f)(5)(v)(5) [sic] (Cord and plug connected appliances), I understand that such appliances with exposed non-current carrying metal parts that may become energized must be grounded if used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers.

Question 4: Although the employees are not standing on metal floors, what if the walls or partitions of an office, conference room, or cubicle are conductive? Must electrical devices with exposed metal parts be grounded under these conditions?

Reply: The actual subsection is §1910.304(f)(5)(v)(C)(5), which does not apply to the office workplace setting you describe (employees working in cubicles inside an office or conference room). However, it is always good practice to use grounded appliances wherever electrical hazards may be present. If such a workplace hazard is serious and recognized, the employer may be obligated by Section 5(a)(1) of the Occupational Safety and Health Act to prevent or correct the hazard.

Question 5: If an employee is using an ungrounded "Household Use Only" coffee pot for personal use and is electrocuted, would it be a recordable injury (death) according to 1904.5(b)(2)(iv)?

Reply: The injury (death) would not meet the exception found in §1904.5(b)(2)(iv) for "injury or illness [that] is solely the result of an employee eating, drinking, or preparing food or drink for personal consumption ..." As stated in the *Preamble to the Recordkeeping Rule* (66 *Federal Register*, 5951, Jan. 19, 2001), "... if the employee was injured by a trip or fall hazard present in the employer's lunchroom, the case would be considered work-related." Similarly, if an employee is injured by an electrical hazard present in the work environment, the injury would be considered work-related, and the electrocution example as stated above would be considered recordable.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA requirements are set by statute, standards, and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at <http://www.osha.gov>. If you have any further questions, please feel free to contact the Office of General Industry Enforcement at (202) 693-1850.

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Sincerely,
Richard E. Fairfax, Director
Directorate of Enforcement Programs

Discussion/Analysis

In many locations throughout the BNL site, enclosed switches have been mounted to workbenches as a means of disconnecting power to receptacle power strips attached to the bench. The switches are typically mounted to a metal bracket using the mounting holes on the back of the switch enclosure. AC power is supplied to the switch through #12 type-S flexible cord terminated in a 110-Volt receptacle outlet plug. The load side of the switch is connected to a power strip (tan) as shown in the photo below. The switch on the reviewed installation is UL-listed. In the reviewed installation, the bench was not secured to the floor. The benches are typically used for constructing, assembling, testing, and troubleshooting electric/electronic equipment.

NFPA 70 Article 110.2 states that equipment and installations are acceptable only if approved; that is acceptable to the Authority Having Jurisdiction (AHJ). One method for equipment to be acceptable to the AHJ is for that equipment to be listed with a Nationally Recognized Testing Laboratory (NRTL). The switch in question is NRTL listed. So the issue in this case is not the approval of the switch itself but rather the approval for use of the switch mounted to a workbench.

NFPA70 Art. 110.3 requires listed or labeled equipment to be installed and used in accordance with any instructions included in the listing or labeling. The “white book” for the NRTL does not specify any guidelines for the mounting of this type of switch. The next step for determining accepted use of electrical devices is to look into the manufacturer’s cautionary markings or instructions. Here, OSHA in a standard interpretation allows for employers to accept the use of equipment that, at face value, seems to go against the manufacturers instructions as long as the use does not present a higher level of hazard. (see OSHA Standard Interpretation - *Workplace use of electrical equipment designated as "Household Use Only" and recordkeeping requirements; question #3*).

For the switches in question, the manufacturer’s installation instructions discuss mounting the switch to “the wall.” The LESC feels that this instruction does not preclude the switch being mounted in locations where it would not be expected to present a higher level of hazard (i.e. where the switch would not be expected to become dislodged during normal operation). Examples might include unistrut mounting, the sides of equipment and work benches. The specific installation was reviewed by the LESC for factors that would contribute to the practical safeguarding of persons using or likely to come in contact with the switch under normal operation and has deemed that the mounting of this switch to the workbench does not present a higher hazard than mounting the switch to the wall.