

**REPORT ON DISCUSSIONS  
DURING UL MEETINGS  
WITH ELECTRICAL INSPECTORS  
AT THE  
2017 IAEI SECTION MEETINGS**





February 7, 2018

TO: Attendees of Underwriters Laboratories Inc. Meetings with Electrical Inspectors at the 2017 IAEI Section Meetings

SUBJECT: Report of Meetings

Underwriters Laboratories held meetings with Electrical Inspectors during the 2017 IAEI Section Meetings. Historically, these meetings have provided for an open exchange between the electrical inspection community and UL regarding any subject of interest to authorities.

UL acknowledges the importance of this feedback. The electrical inspector is an integral part of the UL information loop. It is the inspector, who during the examination of the final installation, can judge under field conditions, the adequacy of the constructions and markings for proper installation. It is the inspector who can pass this installation information to UL for use in modifying product safety requirements.

The questions and answers in this Report present the items discussed during the meetings. This is not a verbatim transcript; only the pertinent points have been recorded. Each question has been identified with the designation of the Section meeting at which the subject was discussed.

UL appreciates all those who took the time to participate in these meetings and provided us with information important for our endeavors and goals toward public safety. I would appreciate hearing from you on any comments or suggestions you have on this Report or the UL/Inspectors meetings.

UNDERWRITERS LABORATORIES INC.

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**FROM**

**UL MEETINGS WITH ELECTRICAL INSPECTORS**

**AT THE 2017**

**ANNUAL IAEI SECTION MEETINGS**

This report contains questions and answers from the 2017 meetings. Where necessary, the answers have been expanded to include information that may not have been available during the meetings. Where specific actions have taken place in response to the Inspector's input, the status of the actions is indicated. This report may provide insights into UL's intent and efforts that are associated with the certification of electrical equipment so that it meets the purposes of the National Electrical Code® and is installable in accordance with it. The questions have been arranged by subject matter and are identified in the margin with an identifier for the IAEI Section where the question was raised.

**UL Toll-Free Number for Code Authorities**

**800-595-9844**

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Regulators on the UL Web Site**

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

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## **IAEI Section Identifier Legend**

- (E) Eastern Section
- (NW) Northwestern Section
- (S) Southern Section
- (SW) Southwestern Section
- (W) Western Section

## 1.0 UL LISTING, CERTIFICATION, AND FIELD EVALUATION INFORMATION

**1.1** **Q.** What happens when a UL label on a product has been damaged or drilled through?  
**(E)**

**A.** The UL Certification (Listing) Mark on a product is the only method provided by UL to identify products manufactured under its Certification (Listing) and Follow-Up Services. The manufacturer should place the UL label in a location on the product where it is not blocking conduit entries or mounting holes.

If the UL Mark on a product has been damaged during installation, or it appears that the UL Mark may have been tampered with, the AHJ should consult with a member of UL's Regulatory Staff outlined at the front of this report. If the damage to the mark is so severe that it cannot be verified, then a UL field inspection should be performed to ensure that the product is Certified (Listed). UL field inspections are intended for installed equipment and products that are authorized to bear a UL Mark, but for whatever reason the UL Mark was not applied to the product when it left the factory.

To qualify for this service, the certified equipment or products must also have been manufactured at a UL-authorized manufacturing facility in accordance with UL's Follow-Up Services requirements and should not have been in use for more than one year or covered by the general coverage category for signs.

To inquire about a UL Field Inspection, contact UL Field Services at 1-877-UL-HELPS, prompt #2 (+1-877-854-3577) or visit <http://www.ul.com/field/>.

**1.2** **Q.** Does UL offer product certification or other services related to California Energy Commission Title 24, Part 6?  
**(SW)**

**A.** UL Certifies (Lists) electric signs for energy efficiency under the product category Electric Signs Certified for Energy Efficiency to California Code of Regulations, Title 24, Part 6 (ENVS). The UL guide information and certifications (Listings) for this product category can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [ENVS](#) at the category code search.

UL Certifies (Lists) luminaires for air-leakage-rate requirements of the International Energy Conservation Code and California Code of Regulations, Title 24, Part 6 under the following product categories, located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec). Enter the product category code shown below at the category code search:

Fluorescent Recessed Luminaires (IEVV)  
Incandescent Recessed Luminaires (IEZX)  
Light-emitting-diode Recessed Luminaires (IFAO)  
Low-voltage Lighting Systems, Power Units, Luminaires, and Fittings (IFDR)

UL is also approved as a Test Lab and Third-Party Certifier by the California Energy Commission (CEC) for numerous types of products. To view the full list, visit <https://cacertappliances.energy.ca.gov/Login.aspx> and click on “3rd Party and Test Laboratory Approvals” search on the login page. UL is approved by the CEC for numerous product types, including:

- Luminaires
- Ballasts
- Ceiling Fans
- Transformers
- Emergency Lighting
- Commercial Cooking Appliances
- Electric Motors
- Residential Pool Pumps
- Battery Chargers
- External Power Supplies
- Electric Water Heaters
- more

**1.3**  
**(SW)**

- Q.** For a UL field evaluation of a large number of luminaire retrofits, what is UL’s practice on completing the evaluation? Would UL work with the AHJ to agree on a sample size for the evaluation, or would UL have to look at all of the retrofits and label each one?
- A.** The full scope of the evaluation, including sample size, would be determined by UL, the customer, and the AHJ. UL would evaluate all of the units included in the scope of the evaluation, and if found in compliance, UL would affix a Field Evaluated Product label to each unit.

Typically, for projects with a large number of units, the UL engineer would perform the detailed evaluation on a sufficiently large sample size. Then, prior to applying each label, the engineer would perform a cursory evaluation on each additional unit to ensure that 100% of the lot complies with the requirements. If non-compliances are found, the engineer would ensure that all units are corrected prior to affixing UL labels.

For more information you can call UL’s Customer Service at 1-877-854-3577 then press 2, by E-mail at [FieldEvaluations@UL.com](mailto:FieldEvaluations@UL.com) or on the Web

at [www.UL.com/Field](http://www.UL.com/Field).

**1.4 (SW)** Q. For a UL field evaluation, is it UL's practice to consult with the AHJ in advance with a plan of action as it relates to NFPA 790/791, full/partial sampling, etc.?

A. Yes, in accordance with NFPA 790 Standard for Competency of Third-Party Field Evaluation Bodies and NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation, UL notifies the AHJ in advance of the field evaluation on-site work, giving the AHJ time to respond with any questions or concerns prior to the evaluation. UL would confirm the basic standard(s) to be used for the evaluation, as well as provide details with respect to sampling and labeling. The AHJ would be given the opportunity to be present at the evaluation.

For more information you can call Customer Service at 1-877-854-3577 then press 2, by E-mail at [FieldEvaluations@UL.com](mailto:FieldEvaluations@UL.com) or on the Web at [www.UL.com/Field](http://www.UL.com/Field).

**1.5 (NW)** Q. I have heard from a sign installer that UL is doing away with the certified sign program and moving to a contractor/installer certification system where the installer applies the certification mark. Is this correct?

A. No, what the sign installer told you is incorrect. Signs are required to bear a factory installed UL Certification (Listing) Mark. These Marks are not permitted to be installed in the field by the installer or contractor. UL Certifies (Lists) electric signs under the product category for Signs (UXYT). The UL guide information and Certifications (Listings) for UXYT can be located on UL Product Spec at <http://www.ul.com/productspec> and enter [UXYT](#) at the category code search. Within the guide information for this product category there are 2 permitted UL Marks. The first Mark is the UL Certification Mark. The [Certification Mark](#) for these products includes the UL symbol, the words "CERTIFIED" and "SAFETY," the geographic identifier(s), and a file number as well as the product identity in close proximity to the Certification Mark.. The other method is the Alternate (Listed) UL Mark. The Listing Mark for these products includes the UL symbol together with the word "LISTED," a control number, and the product name "Indoor Electric Sign," "Electric Sign" or "Electric Sign Section." For rebuilt signs the word "Rebuilt" precedes the product name. The Certification or Listing Mark of UL on the product is the only method provided by UL to identify products manufactured under its Certification and Follow-Up Service. Signs that do not bear a Certification (Listing) Mark can be Field Evaluated.



1.6  
(NW)

Q. I have heard that UL is changing their certification marks again is this correct?

A. No, the Enhanced UL Certification Mark program was launched in mid-2013, the enhanced UL Certification Mark can be used on both UL Listed and Classified products and is intended to make it easier and simpler for stakeholders to understand the scope of UL's certifications of a specific product. The enhanced UL Certification Mark makes it possible to bundle multiple UL certifications for multiple geographies into a single Mark design. Today, this mark is used for products certified to U.S., Canadian, European and Japanese requirements. This Mark utilizes a unique identifier to enable stakeholders to search UL's Online Certifications Directory at <http://www.ul.com/database> to quickly review detailed certification information. All currently existing versions of UL's Listing and Classification Marks remain valid and should continue to be accepted as an indication of certification. UL expects the transition to the enhanced Mark to happen over time, so you may not see it in the immediate future. For more information on this important development, please go to [www.ul.com/markshub](http://www.ul.com/markshub). Access to the Marks Hub is free and open to all regulators, but registration to use it is required.



1.7  
(NW)

Q. Is there a local field evaluation team in the Spokane Washington area?

A. Yes, UL employs Field Evaluation Staff all over the country and can provide next day service where required regardless of local staff availability. For more information you can call Customer Service at 1-877-854-3577 then press 2, by E-mail at [FieldEvaluations@UL.com](mailto:FieldEvaluations@UL.com) or on the Web at [www.UL.com/Field](http://www.UL.com/Field).

1.8  
(NW)

Q. How is UL combating counterfeiting of the UL certification and listing marks?

A. UL is committed to pursuing brand-protection initiatives that help safeguard and maintain the integrity of the UL family of marks.

One of the ways UL combats counterfeiting is by the use of holographic labels that can be verified by the use of an authenticator. Holographic labels are required for a number of product categories such as communications cables, cord sets and power supply cords. UL can provide authenticators to AHJ's as

an easy way to verify that the product is an authentic UL Certified (Listed) product.

Another way that UL fights counterfeiting is by training customs and border agents on how to spot counterfeit UL Marks. Seizing counterfeit products before they enter the Country is far easier than tracking them down once they hit the marketplace. UL has a zero tolerance policy for confiscated counterfeit products, where these products are destroyed rather than being returned to the manufacturer or distributor. UL aggressively prosecutes counterfeiting of the UL Mark to the fullest extent of the law.

For more information on UL's anti-counterfeiting solutions, please use the "Contact UL" button found on the anti-counterfeiting-solutions webpage at <http://www.ul.com/ace>.

- 1.9 (NW)** Q. Who Determines the placement and location of the certification mark on a listed or certified product, UL or the product manufacturer? I have seen equipment that has the UL mark located behind components or located such that it is difficult to view the mark.
- A. The manufacture has the responsibility for placement of the UL mark. The mark should be readily visible without someone having to remove components or look around equipment. If an AHJ encounters a piece of equipment where the UL Mark is placed such that it is not readily visible or obscured by a component, please contact your local Regulatory Services Staff member outlined in the front of this report to discuss this and potentially file a Product Incident Report at [www.ul.com/ahjreport](http://www.ul.com/ahjreport)
- 1.10 (NW)** Q. What is UL's position on the issue of Listing and Labeling and the marking being installed on the product versus being just included in the product information on-line or in the paperwork
- A. In general if a product does not bear the UL mark it is not a Certified (Listed) product and should be treated as such. Always see the UL guide information for the specific product category in question for information related to the marking requirements for those products. Some small products may have the Certification (Listing) Mark of UL on the smallest unit container in which the product is packaged with or without the UL symbol on the product.

The UL Mark on the product or in the case of small products on the smallest unit container is the only method provided by UL to identify products manufactured under its Listing and Follow-Up Service. If an AHJ comes upon a product that they feel is incorrectly marked they can contact their local Regulatory Services Staff member outlined in the front of this report to discuss this and potentially file a Product Incident Report at [www.ul.com/ahjreport](http://www.ul.com/ahjreport)

1.11  
(NW)

- Q.** Is a field evaluation mark OK by itself or do you need the report with the field evaluation?
- A.** UL's Field Evaluation Services follow the established policies and procedures found in NFPA 790 Standard for Competency of Third-Party Field Evaluation Bodies, and NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation. These standards require that each evaluation result in a complete report detailing the results of the evaluation and a statement of conformity made from the results. A copy of the report, should also be provided to the AHJ. Always ask for a copy of the report. After all identified issues have been fully resolved, all electrical testing has been satisfactorily completed, and the evaluation has determined that the equipment meets the applicable requirements of the standard(s), a Field Evaluation label should be affixed to the equipment.



For more information you can call Customer Service at 1-877-854-3577 then press 2, by E-mail at [FieldEvaluations@UL.com](mailto:FieldEvaluations@UL.com) or on the Web at [www.UL.com/Field](http://www.UL.com/Field).

1.12  
(SW)

- Q.** Some of UL's competitors want to simply provide a letter for field evaluation compliance and not a detailed report. What does UL do?
- A.** In accordance with NFPA 790 Standard for Competency of Third-Party Field Evaluation Bodies, and NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation, UL provides a detailed report of each evaluation. This report includes the scope and the findings noted during the evaluation of the equipment. If an AHJ needs to have an initial quick response as to the outcome of the evaluation prior to the issuance of the full report, one can be provided. However, a full, detailed report would always follow.

UL is accredited by IAS (International Accreditation Services, [IAS.org](http://IAS.org)) as

a Field Evaluation Body (FEB). Our specific accreditation number is FEB 107. A search may be conducted on the IAS.org website under Field Evaluation Bodies to identify Accredited Field Evaluation Bodies.

For more information you can call Customer Service at 1-877-854-3577 then press 2, by E-mail at [FieldEvaluations@UL.com](mailto:FieldEvaluations@UL.com) or on the Web at [www.UL.com/Field](http://www.UL.com/Field).

1.13  
(SW)

Q. What does the UL Mark mean? Sometimes it is not clear.

**A. UL Certification Mark**

The enhanced UL Certification Mark can be used on both UL Listed and Classified products and is intended to make it easier and simpler for stakeholders to understand the scope of UL's certifications of a specific product. The enhanced UL Certification Mark makes it possible to bundle multiple UL certifications for multiple geographies into a single Mark design. Today, this mark is used for products certified to U.S., Canadian, European and Japanese requirements. This Mark utilizes a unique identifier to enable stakeholders to search UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) to quickly review detailed certification information.

All currently existing versions of UL's Listing and Classification Marks remain valid and should continue to be accepted as an indication of certification.

UL expects the transition to the enhanced Mark to happen over time, so you may not see it in the immediate future. For more information, please go to [www.ul.com/markshub](http://www.ul.com/markshub) and select "Resources." Access to the UL Marks Hub is free and open to all regulators, but registration to use it is required.



Enhanced UL Certified Mark

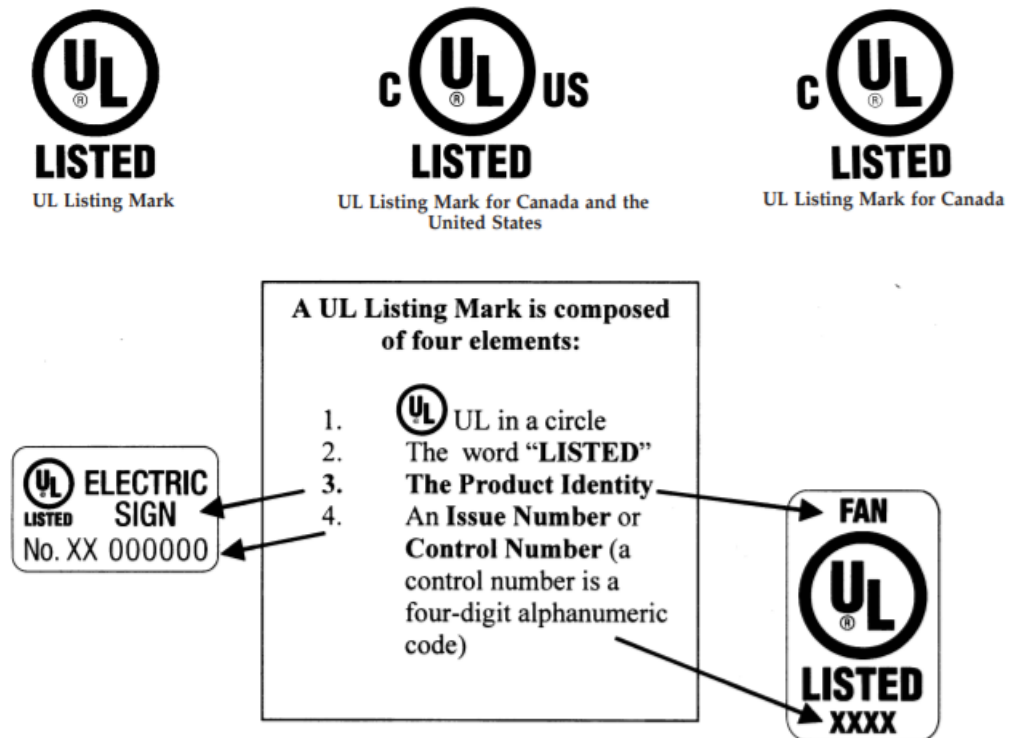


Enhanced UL Certified Mark

**Listing Service**

The UL Listing Mark on a product means that the manufacturer has demonstrated the ability to produce a product that complies with appropriate requirements regarding reasonably foreseeable risks associated with the product. The UL Listing Mark for Canada is applied to products for use in Canada that have been investigated to Canadian safety requirements. The UL Listing Mark for Canada and the U.S. is applied to products for use in the U.S.

and Canada that have been investigated to the requirements of both countries. UL conducts Follow-Up Service as an audit of the means the manufacturer uses to determine continued compliance of the product with UL's requirements.



## Classification Service

With UL's Classification Service, UL determines that a manufacturer has demonstrated the ability to produce a product that complies with its requirements for the purpose of classification or evaluation regarding one or more of the following: (1) specific risks only, such as casualty, fire or shock; (2) performance under specified conditions; (3) regulatory codes; (4) other standards, including international or regional standards; or (5) other conditions UL may consider desirable. UL conducts Follow-Up Service as an audit of the means the manufacturer uses to determine continued compliance of the product with UL's requirements.



UL's Classification Mark includes a qualifying statement designated by UL. A UL Classification Mark for Canada is used for products intended for the Canadian marketplace. It indicates that UL has used Canadian standards to

investigate the product for specific hazards or properties. A UL Classification Mark for Canada and the U.S. is used for products intended for the Canadian and U.S. marketplaces. This Mark indicates that UL has used the requirements of both countries to investigate the product for specific hazards or properties.

### **Component Recognition Service**

Many UL investigations of equipment involve an evaluation of the suitability of components such as relays, thermostats, switches, etc. for specific applications. Where such components are designed to comply with all the construction and performance requirements of the category, they are eligible for UL Listing and suitable for either field or factory installation.

In some situations, components of special design may be incomplete in construction or restricted in performance capabilities and not Recognized for use as field-installed components. These components may be entirely suitable for factory installation on other equipment where the limitations of use are known to the manufacturer and where their use within such limitations may be investigated by UL.

With UL's Component Recognition Service, UL determines that a manufacturer has demonstrated the ability to produce a component for use in an end product that complies with UL's requirements. This type of investigation takes into account the performance and construction characteristics of the end product and how the component will be used in that product. UL conducts Follow-Up Service as an audit of the means the manufacturer uses to determine continued compliance of the component with UL's requirements.



The UL Certification, Listing and Classification Marks comply with the definition of Listed and labeled in the National Electrical code (NEC) and other model installation codes, however, the UL recognized component mark does not.

- 1.14 (SW)**    **Q.** If a product comes from outside the U.S., does it have to have a certification Mark for the U.S?
- A.** Yes. If the product is being installed in the U.S., then it must meet U.S. National Standards.

Listing of electrical equipment is required in accordance with Federal, State,



and local jurisdictional requirements. The NEC specifically requires the use of Listed products or systems in numerous locations throughout the Code. “Listed” is defined in the NEC as follows:

*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 either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.*

*Informational Note: 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 employed by the listing organization allows the authority having jurisdiction to identify a listed product.*

Many jurisdictions permit Listing only by a Nationally Recognized Testing Laboratory (NRTL), accredited under OSHA’s (Occupational Safety and Health Administration) NRTL Program. See <https://www.osha.gov/dts/otpca/nrtl/index.html> for details on this accreditation.

As stated by OSHA:

*“Each NRTL has a scope of test standards that they are recognized for, and each NRTL uses its own unique registered certification mark(s) to designate product conformance to the applicable product safety test standards. After certifying a product, the NRTL authorizes the manufacturer to apply a registered certification mark to the product. If the certification is done under the NRTL program, this mark signifies that the NRTL tested and certified the product, and that the product complies with the requirements of one or more appropriate product safety test standards.”*

**1.15**  
**(SW)**

**Q.** Who is permitted to apply the field evaluation label to the equipment?

**A.** Only the UL Engineer may apply the UL Field Evaluation label. Each label is serialized and has a unique identification, which is noted in the report.

For more information you can call Customer Service at 1-877-854-3577 then press 2, by E-mail at [FieldEvaluations@UL.com](mailto:FieldEvaluations@UL.com) or on the Web at

- 1.16 Q. Are the Field Evaluation stats handed out at the UL meeting only from UL's  
(S) FE's?
- A. Yes, these are statistics that UL has been compiling since 2006. This was started at the request of the AHJ community as they were looking for statistics to support their requirement for field evaluations when they encountered unlisted or field modified equipment. The UL document provides statistics based on each state as well as the overall numbers associated with safety concerns such as proper nameplate markings, fire hazards, electric shock hazards, proper grounding and bonding as well as the minimum construction requirements.
- 1.17 Q. Is UL the only NRTL that develops standards for the U.S.?  
(S)
- A. No, per the National Electrical Code (NEC) Annex A (Product Safety Standards) other than UL Standards only identifies IEEE (Institute of Electrical and Electronics Engineers) Standards and IEEE is not an OSHA accredited NRTL. However, within some of the NEC informational notes, there are references to a few CSA (Canadian Standards Association) Standards and CSA is accredited by OSHA as an NRTL. Additionally, FM (Factory Mutual) is accredited by OSHA as an NRTL and they have written several hazardous location standards.
- 1.18 Q. How does an AHJ know what standard should be used to Certify (List) a  
(S) product?
- A. Some codes such as the International Code Council (ICC) codes, may indicate that where required to be listed (certified) to a specific standard, that standard will be identified within the specific code section. One example is the 2018 International Building Code (IBC) Section 2702.1.1;  
**2702.1.1 Stationary generators.** *Stationary emergency and standby power generators required by this code shall be listed in accordance with UL 2200.* Additionally, there are numerous NFPA Codes that where required to be listed (certified) to a specific standard will have the required standard identified within the specific code section such 2018 NFPA 101 (Life Safety Code) Section 7.9.2.5;  
**7.9.2.5** *Unit equipment and battery systems for emergency luminaires shall be listed to ANSI/UL 924, Standard for Emergency Lighting and Power Equipment.*



However, the 2017 edition of NFPA 70, National Electrical Code (NEC), states within the specific Articles that the equipment is to be listed (certified). In the case of the NEC, some Sections may include informational notes such as Informational Note No. 1 found in NEC Section 210.12(A);

**Informational Note No. 1:** *For information on combination type and branch/feeder-type arc-fault circuit interrupters, see UL 1699-2011, Standard for Arc-Fault Circuit Interrupters. For information on outlet branch-circuit type arc-fault circuit interrupters, see UL Subject 1699A, Outline of Investigation for Outlet Branch Circuit Arc-Fault Circuit-Interrupters. For information on system combination AFCIs, see UL Subject 1699C, Outline of Investigation for System Combination Arc-Fault Circuit Interrupters.*

In addition to informational notes, the NEC includes Annex A, that provides a list of product safety standards used for product listing (certification) where that listing (certification) is required by the NEC. It is understood that this list is current at the time of publication but that new standards or modifications to existing standards can occur at any time while this edition of the NEC is in effect.

The informational notes and Annex A are not to be considered as a mandatory part of the requirements of the NEC, but is intended only to provide users of the NEC with informational guidance about the product characteristics that the NEC requirements for listing have been based.

One may also search UL Product Spec for products and review the UL guide information for the appropriate product category and identify the standard used for certification (Listing). In addition to the UL guide information and certifications (Listings) the search results for UL Product Spec will also provide a link to the scope of the UL standard used for certification (Listing). UL Product Spec is located at [www.ul.com/productspec](http://www.ul.com/productspec). Using the “product type” search may be helpful in locating the certification (Listing) product category for a product.

- 1.19**    **Q.**    Does an assembly of Listed parts mean the overall assembly is Listed?  
**(W)**
- A.**    No. Assembling several Certified (Listed) parts together doesn't mean you have an overall Certified (Listed) assembly. The overall assembly would have to bear a Certification (Listing) Mark indicating that the assembly was Certified (Listed). The information on the Certification (Listing) Mark could be cross referenced to the UL guide information in UL Product Spec ([www.ul.com/productspec](http://www.ul.com/productspec)) or UL's Online Certifications Directory ([www.ul.com/database](http://www.ul.com/database)) to determine the scope of Certification (Listing) that the UL Mark covers.

For example, if you have a Certified (Listed) enclosure that contains several

Certified (Listed) contactors and other industrial control devices, that doesn't mean that is a Certified (Listed) industrial control panel. A Certified (Listed) industrial control panel that included the enclosure and all the devices in the enclosure would bear an Enclosed Industrial Control Panel Certification (Listing) Mark. You could verify that by using UL Product Spec ([www.ul.com/productspec](http://www.ul.com/productspec)) and enter the product identity that appears on the UL Listing Mark or adjacent to the UL Certification Mark at the product type search. The product identity is the term on the label that describes what is Certified (Listed), in this case "enclosed Industrial control panel". These panels are Certified (Listed) under the product category Industrial Control Panels ([NITW](#)). The UL guide information for NITW contains the scope of certification and how to identify the corresponding Certification (Listing) Mark for each type of Certification (Listing) under that category.

The NITW guide information states:

An **enclosed industrial control panel** is comprised of the enclosure, all components located within the enclosure, and all components mounted to the walls of the enclosure.

An **open industrial control panel** is comprised of a mounting sub-panel and all components mounted to the sub-panel, and is intended for installation into an enclosure in the field.

This category also covers **industrial control panel enclosures**. The enclosures may contain ventilation openings, observation windows, conduit fittings, environmental control devices, or maintenance luminaires. Industrial control panel enclosures are intended to house open-type industrial control panels or individual items of industrial control equipment installed in the field.

Then under the UL Mark section, it will identify the verbiage that will appear on the UL Mark.

## 2.0 Arc Fault Circuit Interrupters (AFCI's)

- 2.1 (NW) Q. Can you expound on the AFCI devices in 210.12 (A) that have length restrictions on the installation of the branch circuit conductors between the overcurrent device and the AFCI Device.
- A. The 2017 NEC has 2 methods for providing AFCI protection that are made up of a system of devices to provide the required arc-fault protection. Section 210.12(A)(3) provides for a Certified (Listed) Supplemental Arc Protection Circuit breaker in conjunction with a Certified (Listed) outlet branch-circuit type AFCI installed at the first outlet. The Outline of Investigation for Certifying (Listing) Supplemental Arc Protection Circuit Breakers was UL489E but this document has since been withdrawn due to a lack of consensus.

Section 210.12(A)(4) is the second method. This method allows for a Certified (Listed) outlet branch-circuit type AFCI device installed at the first outlet on the branch circuit in combination with a specified Certified (Listed) branch-circuit overcurrent protective device. 210.12(A)(4)(d) requires that the combination of the branch-circuit overcurrent protective device and the outlet branch-circuit AFCI be Certified (Listed) as a system-combination type AFCI. Recently these types of devices have been Certified (Listed) under the product category Arc-fault Circuit Interrupters, System-Combination Type Arc-fault Circuit Protection, (AWDT). The UL guide information and Certifications (Listings) can be located on UL Product Spec at <http://www.ul.com/productspec> and enter AWDT at the category code search.

The UL guide information for AWDT states: This category covers system-combination arc-fault circuit protection intended for installation in accordance with ANSI/NFPA 70, National Electrical Code. System-combination arc-fault circuit protection is a system consisting of a Certified (Listed) outlet branch-circuit AFCI installed at the first outlet of a branch circuit in combination with a specified Certified (Listed) molded-case circuit breaker installed as the branch-circuit overcurrent protective device. The system-combination is intended to provide protection of the branch-circuit wiring, feeder wiring, or both, and cord sets and power-supply cords connected to receptacles against the unwanted effects of arcing. **The Certified (Listed) outlet branch-circuit AFCI with its specified Certified (Listed) molded-case circuit breaker is packaged together as a Certified (Listed) system-combination arc-fault circuit protection system.**

The Certified (Listed) outlet branch-circuit AFCI and the Certified (Listed) molded-case circuit breaker that are part of a system-combination are provided with identification for use as a system-combination. This information includes the manufacturer, type or catalog number, and rating,

and is provided on the installation instructions packaged with the device, or the smallest unit packaging provided with the device, or both.

System-combination AFCIs are marked "System-Combination Arc-fault Circuit Interrupter" (or "System-Combination AFCI") where visible with a dead-front or faceplate removed, while the device is installed.

### 3.0 Meters and Metering Equipment

3.1 Q. Are meters used in photovoltaic (PV) systems required to be listed?  
(E)

A. The NEC doesn't specifically require meters used in PV systems to be Certified (Listed). However, in order to provide the additional safety requirements necessary for Certifying (Listing) electric utility meters that measure, monitor, record, transmit or receive electrical energy generation or consumption information, UL published UL 2735, the Standard for Safety for Electric Utility Meters.

This standard was developed to address problems that have been reported from field installations of smart meters, including fires, meters ejecting from meter socket bases and exposed live parts.

UL Certifies PV meters under the product category for Meters, Electric Utility, (POCZ). The UL guide information and Certifications (Listings) can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [POCZ](#) at the category code search. The UL guide information for POCZ states that these meters may or may not be under the exclusive control of the serving electric utility. When not under the exclusive control of the serving electric utility, such as in sub-metering applications, these meters are intended for installation in accordance with ANSI/NFPA 70, National Electrical Code.

Additional information on [Smart Meters](#) can be obtained in the UL technical library by visiting [www.ul.com/codeauthorities](http://www.ul.com/codeauthorities).

## 4.0 Luminaires and Signs

- 4.1 (E) Q.** How can UL certify a convertible type recessed luminaire that can be used in both insulation contact (IC) and non-type IC applications?
- A.** UL Certifies (Lists) recessed Type IC/non-IC luminaires under the product category for Incandescent Recessed Luminaires, Convertible, Non-IC/IC, (IFAH). The UL guide information and Certifications (Listings) can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [IFAH](#) at the category code search.

NEC 110.3(B) requires listed products to be installed in accordance with the manufacturers' installation instructions. UL 1598, the Standard For Safety For Luminaires requires that the rough-in section for a convertible recessed luminaire shall be marked with correlation markings that identify the trim/finishing section combinations that result in a Non-Type IC luminaire and those that result in a Type IC luminaire. The markings shall be located inside the housing or rough-in section and shall be visible during installation and inspection. Additionally, the trim/finishing section for a convertible recessed luminaire shall be marked with the manufacturer's identification and catalogue designation.

All luminaires employ a thermal protective device to deactivate the lamp(s) in the event increased temperature conditions result where the installation instructions are not followed.

It is the installer's responsibility to follow the manufacturer's installation instructions, as required by NEC 110.3(B), and to match the proper trim/finish section to the proper rough-in section to achieve the appropriate desired rating of either Type IC or Type non-IC. Then the inspector just needs to verify that the trim/finish section is compatible with the rough-in section to achieve the desired installation.

- 4.2 (E) Q.** NEC Section 410.116(B) requires a 3-inch separation between thermal insulation and a recessed luminaire that is not rated for insulation contact (IC). Does this separation requirement also apply to nearby HVAC ductwork that is insulated?
- A.** The intent of the 3-inch separation requirement from thermal insulation to non-type IC luminaires is to allow heat produced by the recessed luminaire to properly dissipate.

UL Certifies (Lists) incandescent recessed type luminaires under the product category Incandescent Recessed Luminaires (IEZX) located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [IEZX](#) at the category code search.

In the UL guide information for IEZX it states in part;

**TYPE NON-IC LUMINAIRE** — Recessed luminaires, except those identified as Type IC or for use in concrete only, are intended to be installed in an uninsulated or insulated ceiling (or wall), with all insulation kept a minimum distance of 3 in. from the sides of the luminaire and not placed over the luminaire such that it would entrap the heat produced by the luminaire. Other combustible materials are spaced, except at the points of support, at least 1/2 in. from the luminaire.

Type Non-IC luminaires are provided with thermal protection to deactivate the lamp(s) should insulation be placed over or in contact with the luminaire.

For proper heat dissipation, Type Non-IC luminaires are intended to be installed in a cavity as follows: If not marked with any spacing information, the luminaire is intended to be installed not closer than 1/2 in. from any surface forming the cavity behind the recessed portion of the luminaire and not closer than 1 in. from adjacent luminaires.

Luminaires intended for marked-spacing installation are marked "**INSTALL WITH MINIMUM SPACINGS BETWEEN A) CENTER-TO-CENTER OF ADJACENT LUMINAIRES: \_\_\_\_ INCHES; B) TOP OF LUMINAIRE AND AN OVERHEAD BUILDING MEMBER: \_\_\_\_ INCHES; AND C) LUMINAIRE CENTER TO SIDE BUILDING MEMBER: \_\_\_\_ INCHES.**" The marked-spacing luminaire is intended to be installed in a cavity that maintains these minimum spacings.

Individual obstructions, such as ceiling joists, barriers to maintain thermal insulation 3 in. from the luminaire and other structural support members may be in the cavity area above the luminaire provided (1) they are not closer than 1/2 in. from any part of the luminaire (except for points used in support of the luminaire), and (2) they do not seal off the luminaire from the remaining portion of the cavity. More than one marked-spacing luminaire may be installed in the same cavity, provided the marked spacings are maintained from each luminaire to cavity sidewalls and to adjacent luminaires. Spacings between adjacent luminaires are measured center to center, based upon the geometric center of the luminaire at the ceiling line.

HVAC ductwork may contain thermal insulation within the layers of the ductwork but the clearances to thermal insulation required in UL 1598, the Standard For Safety For Luminaires, are intended to address the thermal insulation installed for the purpose of insulating the building. The proximity and amount of nearby ductwork in relation to a recessed luminaire is different with each field installation and would require final approval from the AHJ to ensure that the luminaire is not subject to unusual circumstances.

**4.3**    **Q.**    Has UL certified any low voltage LED luminaires that are permitted to be  
**(E)**           installed within the storage space of a clothes closet?

**A.**    Yes.

UL Certifies (Lists) low voltage LED luminaires under the product category for Low-voltage Lighting Systems, Power Units, Luminaires and Fittings, (IFDR). The UL guide information and Certifications (Listings) can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [IFDR](#) at the category code search or on UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database).

To find an LED luminaire that has been specifically certified for use in the storage space of a clothes closet, visit [UL's Online Certifications Directory](#), type IFDR into the UL Category Code search field and then type "clothes closet" into the Keyword search field. This results in a list of manufacturers and a link to files that can be searched individually to see which luminaires have been certified for use in a clothes closet and their specific luminaire model numbers.

**4.4**    **Q.**    Are LED signs or monitor screens listed for use in the Class I Division 2  
**(E)**           location in the open area directly above a gasoline fuel dispenser?

**A.**    Overhead gasoline fuel dispensers are very common and many of them have an open area between the top of the main registering unit and the overhead outlet manifold where the fuel hose attaches. According to NEC 514.3(B)(1), the void area described above is considered a Class I Division 2 hazardous location and NEC 514.4 would require any wiring methods added in this area to comply with the provisions in Article 501.

Sometimes an electronic price sign or advertising display is installed in this void and wired either independently of the fuel dispenser or wired in such a way that it is powered from the existing fuel dispenser supply wiring.

If the sign derives its power from within the fuel dispenser and disruption of the dispenser circuitry is required to make the connection, this would be considered a modification of the Certified (Listed) equipment and would warrant the need for a field evaluation to determine if the modified equipment continues to comply with UL's requirements. An alternative would be to use a UL Certified retrofit assembly that is Certified (Listed) under the UL product category Retrofit Assemblies (ERKQ). The UL guide information and Certifications (Listings) for this product category can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [ERKQ](#) at the category code search. Otherwise, Certified (Listed) electric signs must only be installed in accordance with their installation instructions and in compliance with their marked ratings, including any environmental rating and classified location identification.

Additional information on [Dispenser Retrofitting](#) can be obtained in the UL technical library by visiting [www.ul.com/codeauthorities](http://www.ul.com/codeauthorities).



**4.5** **Q.** It is becoming quite common to see handrails or guardrails with integral LED lighting. Are these Certified (Listed) only as a luminaire or have they also been tested for other safety measures pertaining to handrails or guardrails?  
**(E)**

**A.** Without a description of the verbiage on the Certification (Listing) mark, additional information is needed on the specific product to provide a definitive answer.

Generally, the lighting portion of the handrail could be Certified (Listed) under the UL product category Low-voltage Lighting Systems, Power Units, Luminaires and Fittings, (IFDR). It is also possible that type of lighting product could be Certified (Listed) under the UL product category for Luminous Egress Path Marking Systems (IMZI) which addresses the visibility of the markings for purposes of building evacuation and support of NFPA 101 (Life Safety Code) Section 7.10.1.7. Any structural design requirements would not be a part of the product certification.

The UL guide information and Certifications (Listings) can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter either [IFDR](#) or [IMZI](#) at the category code search.

**4.6** **Q.** Are underwater pool luminaires Certified (Listed) for fresh water use only?  
**(E)**

**A.** UL Certified (Listed) underwater pool luminaires are marked to indicate their suitability for use in fresh water, sea water, or both.

Many swimming pools use a salt water chlorination system that has a salt level far lower than actual sea water. Luminaires marked as suitable for fresh water are also considered suitable for use in salt-treated water. UL Certifies (Lists) underwater pool luminaires under the UL product category Luminaires and Forming Shells, (WBDT). The UL guide information and Certification (Listings) can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [WBDT](#) at the category code search.

**4.7** **Q.** For air leakage markings on luminaires, why are the manufacturers permitted to self-declare compliance with CA Title 24 requirements on the same product that has a UL Certification (Listing) Mark?  
**(SW)**

**A.** Some manufacturers apply a separate label to the luminaire indicating “air-tight.” This is likely a self-declaration, and any such evaluation of this claim would not be by UL, and would be separate from the UL Certification (Listing) of the luminaire. UL agrees that this can be confusing and may imply that UL has Certified (Listed) the luminaire as “air-tight.”

If UL has evaluated the luminaire for air leakage in accordance with CA Title 24, Part 6 requirements, then the UL Certification mark would include the statement “Also Certified to ASTM E283.” See sample label below:



4.8  
(E)

Q. Is type CM wire permitted to be used for low voltage signs?

A. Yes, as long as the cable type is installed in accordance with its Certification (Listing) and the installation location is on the load side of a Class 2 power source.

According to 2017 NEC 600.33(A), Class 2 cable Certified (Listed) for the application that complies with Table 600.33(A)(1) or Table 600.33(A)(2) for substitutions shall be installed on the load side of the Class 2 power source.

Table 600.33(A)(2) was added in the 2017 NEC and identifies Type CM cable as a permitted substitution for cable Types CL3, CL2, CL3X and CL2X.

UL Certifies (Lists) Type CM cable under the product category Communications Cable (DUZX) and cable Types CL3, CL2, CL3X and CL2X under the product category Power-limited Circuit Cable, (QPTZ). The UL guide information and Certifications (Listings) for DUZX and QPTZ can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [DUZX](#) or [QPTZ](#) at the category code search.

According to the UL guide information for QPTZ, Type CL2 or CL3 cable is intended for general use in Class 2 or Class 3 circuits within buildings in accordance with Section 725.154 of the NEC. Type CL2X or CL3X cable is intended for use in Class 2 or Class 3 circuits within buildings (1) where the cable is enclosed in raceway or noncombustible tubing, or (2) in nonconcealed

spaces where the exposed length of cable does not exceed 10 ft, or (3) in one- or two-family or multifamily dwellings when the cable diameter is less than 0.25 in., in accordance with Section 725.154 of the NEC.

**4.9**  
**(W)**

**Q.** Are Certified (Listed) recessed luminaires evaluated for use with spray foam insulation?

**A.** UL Certified (Listed) recessed luminaires are not investigated for use installed in spray in foam thermal insulation. Luminaires marked "TYPE IC" may be installed such that insulation and other combustible materials are in contact with, and over the top of, the luminaire. However, this only anticipates batt and cellulose thermal insulation and is not intended for use with spray in foam thermal insulation.

Spray in foam insulation when sprayed undergoes a chemical reaction that causes the insulation to expand exponentially, sticks to everything it contacts and some cure to a hard mass. When foam expands it can ingress into any seams, gaps or openings in the luminaire or wiring compartment possibly coming into contact with live parts creating a fire hazard or affecting the operation of the thermal protector. The cured foam may also restrict access to the wiring compartment and restrict the ability for inspection of the luminaire and circuit conductors as is required by NEC 410.8. In addition, some of these foams only have a thermal index rating of 75 degrees C. Type IC rated luminaires are permitted to reach 90 degrees C on the recessed surfaces of the luminaire potentially creating a fire hazard by exceeding the temperature rating of the foam.

Incandescent recessed luminaires are Certified (Listed) under the product category Incandescent Recessed Luminaires (IEZX). Recessed LED luminaires are Certified (Listed) under the product category Light-emitting-diode Recessed Luminaires (IFAO). The UL guide information and Certifications (Listings) for these categories can be found on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [IEZX](#) or [IFAO](#) at the category code search.

## 5.0 Wiring Systems and Wiring Devices

**5.1**    **Q.**    Is cable armor enclosing a grounding electrode conductor required to be bonded at each end?  
**(E)**

**A.**    2017 NEC 250.64(E) requires ferrous metal raceways and enclosures containing grounding electrode conductors to be bonded at each end of the raceway or enclosure to the grounding electrode or grounding electrode conductor to create an electrically parallel path.

UL Certifies (Lists) armored grounding wire under the UL product category Grounding and Bonding Equipment (KDER). The UL guide information and Certifications (Listings) can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) enter [KDER](#) at the category code search.

An armored grounding wire, or cable armor, is often used when protection of a grounding electrode conductor is required as mentioned in NEC 250.64(B)(2) or 250.64(B)(3). An armored grounding wire does not meet the description of a raceway or an enclosure as defined in Article 100 of the NEC, and is considered grounding and bonding equipment as mentioned in Section 1.2 of UL 467, the Standard for Safety for Grounding and Bonding Equipment.

The cable armor of an armored grounding wire is designed to be wrapped tightly around one bare grounding conductor and has continuous intimate contact with the bare grounding conductor inside and therefore the actual armor surrounding the grounding electrode conductor does not require additional bonding.

**5.2**    **Q.**    Is Certified (Listed) Type NM-B cable evaluated by UL for use with spray foam insulation? Does the chemical reaction of the foam during curing damage conductor insulation?  
**(W)**

**A.**    UL Certified (Listed) nonmetallic sheathed cable (Type NM-B) has not been investigated by UL for use with spray in foam thermal insulation and it is unknown if the heat generated by the chemical reaction of the foam during the curing process will damage the conductor insulation or the cable sheath.

The cable manufacturer should be contacted regarding compatibility information.

Type NM-B cable is UL Certified (Listed) under the product category Nonmetallic Sheathed Cable (PWWX). The UL guide information and Certifications (Listings) can be viewed on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter [PWWX](#) at the category code search.

**5.3**  
**(W)**

- Q.** I've seen e cans of expandable foam from the local DIY center with a UL mark on the can. Are these certified to seal raceways exposed to different temperatures as required in 2017 NEC 300.7?
- A.** No, typically these expandable foams are only Certified (Classified) for surface burning characteristics. The UL Certification (Classification) Mark will identify the scope of its Certification (Classification). Always look at the UL Mark on the product and then look up the product identity in the product type search on UL Product spec at [www.ul.com/productspec](http://www.ul.com/productspec) .

To date UL has not Certified (Listed) any expanding foam that has been evaluated for stopping air flow and compatibility with conductor insulation or cable sheath.

Foam that has been evaluated for surface burning characteristics is Certified (Classified) under the product category Caulking and Sealants (BLIS). The UL guide information and Certifications (Listings) can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and entering [BLIS](#) at the category code search or enter expandable foam at the product type search.

The UL guide information for BLIS states: This category covers caulking and sealants certified as to surface-burning characteristics when applied to uncoated, high density (nominal 110 pcf), 1/4-in.-thick inorganic reinforced cement board, with flame-spread and smoke-developed values of 0, in longitudinal beads or strips at the specific percentages of exposed area or at full coverage at the specific sq ft/gal as shown in the individual certifications.

## 6.0 Appliances and Utilization Equipment

**6.1 (E)** Q. The installation instructions for some Certified (Listed) household refrigerators specify connection to a circuit that has no GFCI protection. Are these types of refrigerators tested to ensure the amount of current leakage to ground is at an acceptable level?

A. Yes, UL Certified (Listed) refrigerators are required to have a maximum 0.75mA leakage current, far below the 4-6mA trip range of a ground fault circuit interrupter (GFCI).

Household refrigerators are Certified (Listed) under the product category Household Refrigerators and Freezers (SHZZ) and are evaluated for compliance with the Standard for Safety for Household Refrigerators and Freezers, ANSI/ UL 250, or Household and Similar Electrical Appliances, Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers, UL 60335-2-24. Both standards limit the level of leakage current permitted to 0.75mA.

The 2017 NEC doesn't specifically require refrigerators to be GFCI protected. However, receptacles within 6 feet of a sink are required to be GFCI protected.

Even though Certified/Listed refrigerators meet the requirements in UL 250, or UL 60335-2-24 and have low leakage current, it appears some manufacturers installation instructions choose to limit the recommended locations where these refrigerators get installed. If the installation instructions recommend not to install on a GFCI protected circuit, then the owner should source a different refrigerator that does not have that recommendation.

The UL guide information and Certifications (Listings) for Household Refrigerators and Freezers ([SHZZ](#)) can be located on UL Product Spec at [www.ul.com/productspec](http://www.ul.com/productspec) and enter SHZZ at the category code search.

**6.2 (NW)** Q. I have seen gas fired furnaces, in the field that require a minimum of a 20 amp circuit. Does the standard require that the minimum supply circuit be marked on the equipment similar to what is found on the nomenclature for A/C units?

A. .  
The Basic Standard used to evaluate gas fired central furnaces is ANSI Z21.47/CSA 2.3 The Standard for Gas-Fired Central Furnaces. The marking requirements found in this standard require the furnace to be marked with the total input current.

UL Certifies (Lists) gas fired central furnaces under the product category for Heating and Cooling Equipment (LZFE), The UL guide information and Certifications (Listings) can be located on UL Product Spec at <http://www.ul.com/productspec> and enter [LZFE](#) at the category code search.

Additional information for marking of Heating and Cooling equipment can be found in the [2016 Marking and Application Guide for Electrical Heating and Cooling Equipment](#).

Page 10 Item #9 within the marking and application guide states:

**ELECTRICAL RATING, GENERAL**

The nameplate for each Listed unit includes the appropriate electrical ratings. These ratings identify the required characteristics of each electrical circuit to be connected to the unit and also the load characteristics that the unit will impose on each circuit.

For a unit with a single motor as its only energy consuming component, the motor nameplate may provide the required electrical ratings if all ratings on the motor nameplate apply to its use in the unit, and the motor nameplate is visible as installed. If motor ratings are shown on the unit nameplate, they take precedence over the ratings on the motor nameplate.