REPORT ON DISCUSSIONS DURING UL MEETINGS WITH ELECTRICAL INSPECTORS AT THE 2016 IAEI SECTION MEETINGS







March 17, 2017

- TO: Attendees of Underwriters Laboratories Inc. Meetings with Electrical Inspectors at the 2016 IAEI Section Meetings
- SUBJECT: Report of Meetings

Underwriters Laboratories held meetings with Electrical Inspectors during the 2016 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 2016

ANNUAL IAEI SECTION MEETINGS

This report contains questions and answers from the 2016 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.

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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. Inspectors are noting that small products may not have the UL mark on them or do not have all of the elements of a UL Listing Mark present on them. How can we be assured that these products are listed?
 - A. The UL guide information for each product category provides information on where you will find the UL Mark of each product type and how that Mark will appear. The UL guide information for each product category can be located by looking up the product using UL Product Spec, which can be accessed at www.ul.com/productspec. Search using a variety of means, including product type keywords, UL product category code, or browse through intuitive groups of UL products, systems, and assemblies. You can even search using a code section. Each of those options will lead you to the appropriate product category, and all manufacturers that have current UL certifications in that category.

For more information on using UL Product Spec, see our "How To Use UL Product Spec" videos located at <u>www.ul.com/psvideo</u>.

Once you have located the product category guide information, the last section of the guide information is the UL Mark section detailing how the mark should appear. Typically for products that are too small to fit all of the elements of the appropriate UL mark, the UL symbol on the product and the Listing or Certification Mark on the smallest unit container in which the product is packaged is the only method provided by UL to identify products manufactured under its Certification and Follow-Up Service. The <u>Certification</u> Mark for these products includes the UL symbol, the words "CERTIFIED" and "SAFETY," the geographic identifier(s), and a file number.

- 1.2 Q. We are seeing different looking UL labels on the products. They don't say Listed or Classified. What are the different labels?
 - A. These labels are UL Enhanced Mark Labels and UL's Smart Mark Labels which include QR codes. In an increasingly connected and complex world, UL is helping customers keep pace through the introduction of our Enhanced and Smart UL Certification Marks. This innovative system has been designed to meet the greater demand for transparency and efficiency while promoting greater market acceptance and buyer confidence.

Here are some examples of what those UL Marks look like.





MODULE

Smart Module



MODULE



Questions and Answers from UL Meetings with Electrical Inspectors at the 2016 Annual IAEI Section Meetings Page 3 of 31



1.Country Codes

Featuring a two-digit ISO country code to indicate the geography whose standards are used for Certification.

2. Unique ID

A unique identifier, typically the UL file number, provides access to product Certification information on a custom product page for Smart Marks or at www.ul.com/database for Enhanced Marks.

2. Attributes

Details aspects of a product Certified by UL, such as "Safety".

4. QR Code

Allows instant access to UL's product Certification information via mobile devices even when users are in the marketplace.

1.3 Q. How can we tell if the holographic labels on frequently counterfeited products are valid?

A. The gold hologram labels are for 56 U.S. product categories that are known to be susceptible to counterfeiting, The labels use color shifting ink, as well as other measures to make these more difficult to counterfeit. For these there are two UL Marks, one that can be seen on the left without a UL Authenticator and one on the right that is blacked out that can only be seen with UL Authenticator. We provide UL Authenticators to customs' agents and AHJ's and others who have a need for them. The sample below depicts the holographic label that has UL's Enhanced Mark:



If you are interested in obtaining a UL Authenticator, please contact the Regulatory Services staff identified in the front of this report for your area. You may also check out this link for more information on the products that require holographic labels. <u>http://www.ul.com/marks/ul-listing-and-classification-marks/hologram-ul-marks/</u>

- **Q.** Which products are required to have holographic UL labels and how will the AHJ know this?
 - A. Holographic UL Certified (Listed) labels are currently required on 56 U.S. product categories. If a product is required to have a holographic label, it will be indicated under the applicable guide card information such as fluorescent surface-mounted luminaires under the product category for Fluorescent Surface-mounted Luminaires (<u>IEUZ</u>) the UL Guide Information and certifications can be found on UL Product Spec at <u>www.ul.com/productspec</u> and enter IEUZ at the category code search field.

Product category IEUZ, under the title UL Mark states that the Certification Mark for this category requires the use of a holographic label. For a list of all UL Certified (Listed) products that are require a holographic label click on the following link:

http://www.ul.com/marks/ul-listing-and-classification-marks/hologram-ulmarks/

- 1.5 Q. Our jurisdiction has restrictions on what we can load on our computers how can we persuade our management and information technology staff that the UL Product Spec app is safe to load on government computers?
 - A. UL Product Spec is not an app, it is a free website accessed at <u>www.ul.com/productspec</u> by desktops, tablets and smart phones—add it to your home screen or bookmark it for instant access. The tool helps to find, verify or specify UL Certified products for the built environment. Quickly find the right information housed in our vast databases exactly when you need it.
 - **Q.** Does UL consider other non-electrical requirements when certifying a product for safety?
 - **A.** Yes. UL a UL Certification Mark means the product has been investigated for all foreseen hazards typically relating to electric shock, fire and injury to persons hazards.

In addition, UL doesn't only certify electrical products, UL writes safety standards and certifies products in a broad spectrum from building materials and fire resistive assemblies to plumbing fixtures and water treatment additives to sustainable products.

1.7 Q. Some panelboards come with instructions on how to make a modification such as a line side tap connection for a PV system. Is this legal? Will the original UL

Listing be voided if these modifications are made?

A. Per NEC 230.66, all service equipment shall be listed. The UL Certification (Listing) mark on the product is the manufacturers' declaration that the product was originally manufactured in accordance with the applicable UL requirements. The UL Mark applies to the product as it was originally manufactured and shipped from the factory.

Some Certified (Listed) Panelboards (QEUY) may have terminals or provisions for terminals, marked as taps, located on the supply side of the service disconnecting means. The suitability of these terminals as taps connected on the supply side of the service disconnect is intended to be determined in accordance with NEC® Sections 230.46, 230.82, and 705.12. Panelboards are not Listed to have their busbars tapped in the field unless there are existing holes in the busbars marked with the word "Tap" adjacent to the holes in the factory. Other holes in the busbar that are not marked with the word "Tap" are intended for the connection of overcurrent devices, other device's as identified by the product markings and in the installation instructions, or other uses identified by the manufacturer. When the electrical equipment Listing does not include product markings or instructions for tapping busbars, this situation should be treated like any other field modification of Listed equipment.

Some Certified power equipment may have markings identifying the location of where a tap can be located and the wiring terminals that must be used, along with installation instructions having specific directions on tapping the busbars. If this is the case, this equipment can be field modified, following those manufacturer's instructions and markings, in accordance with the National Electrical Code® (NEC) Section 110.3(B). Making field taps without this information from the manufacturer would be considered a non-evaluated field modification.

Unless UL investigates a modified product, UL cannot indicate that the product continues to meet UL's safety requirements. If a party wishes UL to determine if the modifications made to a UL Certified product comply with UL requirements, a UL Field Evaluation can be initiated to investigate the modifications. This investigation will only be conducted after UL consults with the AHJ to ensure that UL's investigation addresses all areas of concern and meets all of the AHJ's needs.

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

For more information on tapping busbars in panelbaords, go to UL Product Spec at <u>www.ul.com/productspec</u> and enter QEUY at the category code

search. The <u>results</u> for that search under the heading UL Publications will yield links to an article on <u>Tapping Busbars</u> as well as the <u>Panelboard Marking</u> and <u>Application Guide that also includes information on tapping busbars</u>.

1.8 Q. What is the process for contacting UL for a field evaluation? My jurisdiction (SW)likes a different field evaluation body because they are located close by. Does UL have an automated phone system?

A. There are a number of ways to contact UL for field evaluation services. To reach a live field evaluation customer service team member by phone, UL can be contacted at 1.877.UL.HELPS (1.877.854.3577), menu option 2. By email, <u>field@ul.com</u>. Or directly from our web page, <u>www.ul.com/field</u>. In addition, if you are using UL Product Spec (<u>www.ul.com/productspec</u>), you can click or tap on the "Request a Field Evaluation" link in the lower right hand corner of the screen.

Quotes for UL field evaluation services are provided in 1 day, with the field evaluation coordinated with the customer and the AHJ to be completed as quickly as needed.

UL field evaluations are only conducted by full-time qualified engineering staff with training and competencies demonstrated for the particular product being evaluated, in accordance with the criterion for Field Evaluation Bodies. UL is accredited by ICC-IAS as a Field Evaluation Body (FEB). UL has trained Field Evaluation staff located all around the U.S., including several in Southern CA.

- 1.9 Q. I was inspecting a steel cabinet for a fire training tower in my jurisdiction that was listed by an organization other than UL. The listing mark stated that it was listed to UL 508. What does this mean?
 - A. On certification marks by organizations other than UL, they may specify a UL standard number that was used for their evaluation. That is a declaration by the test lab that they used the UL standard for their evaluation of the equipment.

It should be clear however, that reference to a UL Standard number on a certification mark does not signify that UL evaluated the product. UL does not typically include the standard number on a UL Listing Mark. Only a UL Listing Mark signifies that UL has evaluated the product and has found it in compliance with the UL Standard

- **1.10 Q.** How do you know that a certification organization other than UL has used the right standard when evaluating a piece of equipment?
 - A. For a product Certified by UL, you can search UL Product Spec at <u>www.ul.com/productspec</u> to easily find the UL guide information for each product category. The UL guide information very clearly states which product standard is used to evaluate the product.

For an organization other than UL, they may not use the same requirements as UL for evaluation of a product. It is important to contact them directly or visit their website to determine which standard or requirements were applied.

Not all certification organizations are accredited by OSHA to evaluate all products. Under OSHA's Nationally Recognized Testing Laboratory (NRTL) Program, there are 17 NRTLs. Each has a specific number of standards that they are accredited for, as shown on the OSHA website: <u>https://www.osha.gov/dts/otpca/nrtl/nrtllist.html</u>

- 1.11 Q. Does a UL standard typically include requirements for NEC working (SW)(SW) clearances for equipment you have to enter, versus equipment with only external access?
 - A. In accordance with NEC 110.26, "Access and working space shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment." Specific requirements follow in NEC Sections 110.26(A) through (F).

Some UL Standards, such as UL 891 The Standard for Safety for Switchboards, anticipate walk-in sections, and specifically require that "switchboard sections supplied with and located in walk-in switchboard enclosures... shall comply with the working clearance requirements of the installation rules of the country in which they are to be installed."

UL 2755, the Outline of Investigation for Modular Data Centers, requires working space for equipment likely to require examination, adjustment, servicing, or maintenance while energized. These dimensional working space requirements are consistent with NEC 110.26(A).

However, there are some product standards that did not anticipate walk-in sections when originally developed and therefore such requirements may not be specified. When UL has become aware that such products are available, we have taken steps to propose revisions to the standard to specifically cover access and working space requirements.

A recent example was brought to our attention on a generator assembly, where a panelboard inside of a walk-in section did not have working space as specified in NEC 110.26. A proposal is under development for UL 2200, the Standard for Safety for Stationary Engine Generator Assemblies, in order to add working space requirements.

- 1.12 Q. I have a Listed piece of equipment that the manufacturer says it doesn't affect the Listing if a label is removed from the equipment in the field. They say the label is optional in their UL file and can be removed in the field. Is this correct?
 - A. No, typically removing a label from a Certified/Listed product after it leaves the factory would be considered a field modification to a UL Certified/Listed product.

When a UL Certified/Listed product is labeled at the factory it is the manufacturer's attestation that the product complied with all UL's certification requirements at the time of manufacture. If the product is modified after it leaves the factory UL does not know if the product continues to comply with UL's requirements unless UL evaluates the modification under a UL Field Evaluation. An exception to that would be if a Certified/Listed accessory kit was installed in accordance with the installation instructions.

If an AHJ needs assistance in determining if the label is required, they can contact their regional Regulatory Services representative from the list in the front of this report

For more information on Field Evaluations, contact UL's Customer Services at 877-854-3577,#2 or <u>www.ul.com/field</u>.

- 1.13 Q. Sometimes, a UL competitor will show up and perform a field evaluation without notifying the AHJ. Is this proper procedure?
 - A. According to NFPA 791 (Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation) Section 4.4 states that the Field Evaluation Body (FEB) should notify the electrical AHJ in writing when an evaluation is initiated and about to commence. As an AHJ, you may want to consider only accepting Field Evaluations from those accredited by ICC IAS AC354 (Accreditation Criteria for Field Evaluation of Unlisted Electrical Equipment). ICC IAS AC 354 requires that an accredited organization must meet all requirements of NFPA 790 and NFPA 791 and states that the

recommended practices and procedures in NFPA 791 are considered to be mandatory requirements for the purposes of IAS accreditation. UL is accredited as an FEB for electrical equipment through ICC IAS AC354; <u>http://www.iasonline.org/PDF/FEB/FEB-107.pdf</u>

- 1.14 Q. Does a field evaluation cover only fixed equipment or can equipment that has had a field evaluation be moved to a different location and still be covered under the original a Field Evaluation?
 - A. Field evaluations (FE's) on equipment are site specific and must have a final installation location. Generally, FE's are conducted on fixed or stationary equipment. However, it is possible to conduct an FE for a portable piece of equipment if it is understand that the portable equipment will remain within the building, facility, or compound.

On a rare instance, UL has field evaluated "portable load banks", however, the distribution center location was identified as the "location" of the equipment.

If the location of a field evaluated piece of equipment is moved from the original location, UL must re-evaluate the equipment at the "new" location since the equipment was originally evaluated based on the environmental and installation conditions at the original location. The FE label means the equipment met the requirements at the time of the original evaluation. UL does not know if the equipment has been modified, damaged, or continues to meet all of the safety requirements at the new location, including the environmental and installation conditions.

2.0 Overcurrent Devices

- Q. Regarding Class L fuses, a manufacturer recently indicated that other manufacturers have Class L fuses available, but these are not listed. Can you tell me if UL has Listings for Class L fuses rated 600 V?
 - Α.

UL has several Certifications (Listings) for Class L fuses rated 600 Vac.

UL Certifies (Lists) Class L fuses under the product category for Cartridge Fuses, Nonrenewable (JDDZ), the UL guide information and certifications can be found on UL Product Spec at www.ul.com/productspec and enter JDDZ at the category code search.

- Q. I have heard of some of the new dual function type GFCI/AFCI circuit breakers
 (W) experiencing nuisance tripping. If we experience any incidents, what resources are available regarding this issue?
 - A. If you experience any incidents with dual function GFCI/AFCI circuit breakers you should verify the incident and file an unwanted trip report at <u>www.afcisafety.org</u>, which is sponsored by NEMA (National Electrical Manufacturers Association). Unwanted tripping incident reports on that website will be investigated by the manufacturers of the devices to determine the cause and resolve any issue with these devices. After you have filed an unwanted tripping report with NEMA, UL encourages you to file a Product Incident Report (PIR) with UL at www.ul.com/ahjreport so that UL can track these issues and determine if any certification requirement revisions are warranted.

UL Certifies/Lists dual purpose AFCI/GFCI circuit breakers under the product category Circuit Breakers with Ground-fault Circuit Interrupter and Combination-type Arc-fault Circuit Interrupter Protection (DIYG). The UL guide information and Certifications/Listings can be located on UL Product Spec at www.ul.com/productspec and enter DIYG at the category code search.

- Q. Are UL Classified circuit breakers suitable for use in a series rated system?
 - A. No, UL Classified circuit breakers for use in specified equipment are not evaluated for use in series rated system combinations. UL Certifies/Classifies molded case circuit breakers for use in other manufacturer's panelboards under the product category Circuit Breakers, Molded-case, Classified for Use

in Specified Equipment (DIXF).

The <u>guide information for DIXF</u> states "This category covers molded-case circuit breakers rated 15 to 60 A, 120/240 V maximum that have been investigated and found suitable for use in place of other Listed circuit breakers in specific Listed panelboards, with ratings not exceeding 225 A, 120/240 V ac, to be connected to circuits having an available system short-circuit current of 10 kA maximum." And are required to be marked on the side of the breaker with the statement in part: "Classified for use only in specified panelboards where the available short-circuit current is 10 kA, 120/240 volts ac or less. Do not use in equipment connected to circuits having an available system short-circuit current in excess of 10 kA, 120/240 volts ac. "

The guide information and certifications for <u>DIXF</u> can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter DIXF at the category code search.

3.0 Service Equipment, Switchboards, Panelboards and Power Distribution Equipment

- 3.1 Q. Some new residential panelboards do not have enough terminals for the number of neutral and equipment grounding terminations that need to be installed. How is this possible for a listed panelboard?
 - A. UL Certifies (Lists) Panelboards under the product category for Panelboards (<u>QEUY</u>), the UL guide information and certifications can be found on UL Product Spec at <u>www.ul.com/productspec</u>. Just enter QEUY at the category code search.

Panelboards are Certified using the *Standard for Safety for Panelboards*, UL 67. The marking requirements in UL 67 include specific provisions for Equipment-Grounding terminals. According to the standard, unless it employs a wire-binding screw, the sizes of the wires and the wire combinations for which an equipment-grounding terminal is acceptable shall be marked on the terminal, panelboard, or panelboard enclosure. As well, if a terminal is acceptable for the connection of more than one conductor (as is permissible with equipment grounding conductors) and is intended for such use, the marking shall indicate the proper connection.

Manufacturers may provide grounding busbars that are suitable for terminating more than one equipment grounding conductor of the same size. If this occurs, labeling in the panelboard must identify that this is permitted.

The Standard also requires that the number of individual branch-circuit neutral terminals be not less than 75% of the total number of individual fuseholders or circuit-breaker poles capable of being installed in the panelboard. This requirement is intended to facilitate compliance with NEC Section 408.41 while also recognizing the likelihood that some 2-pole circuits or multi-wire branch circuits will be installed in most panelboards. It should be noted that there is a provision to provide fewer than 75%, with a lower limit of at least 50% of the total number of fuseholders or circuit-breaker poles. In the case where manufacturers provide less than 75% of the total number of individual branch-circuit neutral terminals, the panelboard is required to be marked to indicate the maximum number of circuits and the need to use multipole units to limit the number of terminals to a specific number.

Lastly, it should be noted that if additional terminals are needed, most manufacturers sell accessory busbars that can be added to the panelboard, those would be identified in the panelboard markings.

- **3.2** Q. Who is responsible to verify torque for a meter socket? Recently, an electrician found that several units received were not tight and had to tighten all of the connections.
 - A. UL Certifies (Lists) Meter Sockets under the product category Meter Sockets, (<u>PJYZ</u>), the UL guide information and certifications can be found on UL Product Spec at <u>www.ul.com/productspec</u>. Just enter PJYZ at the category code search.

Meter Sockets are Certified (Listed) for compliance with Standard for Safety for Meter Sockets, UL 414 which includes specific provisions for proper torqueing of terminations.

If a UL Certified product such as a Meter Socket is found to be defective or have loose terminals, a Product Incident Report (PIR) should be filed at <u>www.ul.com/ahjreport</u>. Once a product incident report is opened, UL verifies the concern, works to determine the root cause, and takes appropriate action to resolve the concern.

- **3.3** Q. Is an 84 Circuit Panelboard evaluated to determine that there is enough room inside the enclosure for the wiring associated with 84 separate branch circuits? For these types of panelboards there never seems to be sufficient room for all of the wires
 - A. Panelboards can be certified individually or in combination with a specific cabinet or enclosure. UL Certifies (Lists) Panelboards under the product category for Panelboards (<u>QEUY</u>), the UL guide information and certifications can be found on UL Product Spec at <u>www.ul.com/productspec</u>. Just enter QEUY at the category code search.

According to the QEUY guide information, only panelboards marked to indicate that they are for use in specific enclosures (identified by either catalog number or specific dimensional information) and panelboards labeled as "Enclosed Panelboards" have been investigated to determine that wiring space is adequate.

For enclosed panelboards and those panelboards identified for use in specific enclosures, the assembly is evaluated to ensure sufficient wiring space within the enclosure. This evaluation considers the installation of conductors likely to be employed in connecting the main and branch circuits to the panelboard. The required wiring space aligns with the requirements in NEC Section 312.8 regarding space for all conductors (40%) and for total area of conductors, splices, and taps (75%).

4.0 Luminaires and Signs

- 4.1 Q. I see that UL developed a LED Sign Retrofit Frequently Asked Questions whitepaper, was this shared with the sign industry?
 - A. Yes, these FAQ's were developed by the UL business Units for signs and these were shared with the sign industry. These FAQ's are available in UL Product Spec (<u>www.ul.com/productspec</u>) as part of the search results page for Sign Conversions, Retrofit (<u>UYWU</u>) under the UL Publications section look for <u>LED Sign Retrofit FAQ's</u>.
- **4.2** Q. How can the AHJ, verify that an emergency lighting luminaire is mounted / installed at the correct height?
 - A. NFPA 101 (Life Safety Code) provides the minimum foot candle values of emergency illumination required at floor level in specific areas of a building. Only an on-site inspection can truly validate that compliant coverage over the full means of egress has been achieved, as this coverage can be affected not only by the characteristics and mounting height of the individual luminaires but also their spacing from one another and the light reflecting / absorbing characteristics of the building materials and furnishings themselves.

UL Certifies (Lists) emergency lighting under the product category for Emergency Lighting and Power Equipment, (<u>FTBR</u>), the UL guide information and certifications can be found on UL Product Spec at <u>www.ul.com/productspec</u>. Just enter FTBR at the category code search.

Products Certified/Listed under FTBR are investigated for compliance with UL 924, the Standard for Safety for Emergency Lighting and Power Equipment. UL 924 includes a maximum mounting height marking requirement for emergency luminaires and for emergency battery packs that can be field installed to upgrade an existing luminaire to emergency luminaire capability.

The certification to UL 924 validates that the luminaire, under emergency power conditions and at that mounting height, is able to meaningfully contribute to the NFPA 101 required minimum illumination at floor level, in the immediate vicinity of that luminaire. However, it does not establish a specific area of coverage provided by that individual luminaire, hence the remaining need for on-site illumination measurements to ensure that full coverage along the means of egress is provided.

- 4.3 Q. Often, listed electric-discharge luminaires arrive on site equipped with a flexible cord, but no attachment plug. How can this be possible since cord-**(E)** and-plug connected luminaires are required to have a plug connection?
 - **A.** Not all cord-connected luminaires are required to have an attachment plug.

NEC 410.62(B) permits no attachment plug for adjustable luminaires and (C) provides specific conditions for cord-connected electric discharge luminaires. One of the wiring options in 410.62(C)(1)(2)(c) involves a grounding-type attachment plug cap or busway plug, while another option allows a direct wired cord connection without an attachment plug cap as long as the luminaire assembly is equipped with a strain relief and canopy having a maximum 152 mm (6 in.) long section of raceway for attachment to an outlet box above a suspended ceiling.

Field conditions and the desired installation method will dictate whether or not an attachment plug cap will be required.

- 4.4 **Q.** NEC 411.4(B) allows several listed parts to be put together to create a low **(E)** voltage lighting system. Is this now considered a UL Listed system?
 - No. NEC 411.4(B) allows the AHJ to approve a system that is composed Α. entirely of listed parts. For the installation described above, each individual part has its own listing and the AHJ would validate that each part has been installed in accordance with that listing and associated installation instructions. The installation instructions for a specific listed part may have additional requirements as to what other listed items it is compatible with.

As an alternative, when a Listed low voltage lighting system is installed per NEC 411.4(A), the UL investigation will have already addressed the suitability and compatibility of each identified component of the system. The AHJ then needs only to validate that the installation is in accordance with the system installation instructions. You can source UL products that comply with this Code section by going to UL Product Spec (www.ul.com/productspec), selecting the installation code search, then select your version of the NEC and enter section 411.4(A). Here is a list of those product categories that comply with 2014 NEC 411(A). Make sure you review the UL guide information for the product category to make sure the products are suitable for your application.

4.5 **Q.** NEC 600.4(A) requires signs and outline lighting systems to be marked with **(E)** the manufacturer's name, trademark, or "other means" of identification. A

recent sign installation was found to have no manufacturer name on the label but it did have a UL file number. Does the UL file number satisfy the language in 600.4(A) as "Other Means" of Identification? Can the UL file number be used to identify the sign manufacturer?

A. Yes, the UL file number is permitted to be used as the manufacturer's identification on UL Certified (Listed) signs.

Electric Signs are Certified (Listed) under the product category Signs (UXYT) and are investigated for compliance with UL 48, the Standard For Safety For Electric Signs. UL 48 includes similar language for identifying the manufacturer. According to the standard, a sign must be marked with the manufacturer's name, trade name, trademark, or identifier, as well as the electrical rating in volts and amps.

UL file numbers can be used by the AHJ to identify a sign manufacturer. Just go to the UL Online Certifications Directory at <u>www.ul.com/database</u> and type the file number into the search field and the manufacturers Certification (Listing) page will be displayed.

4.6 Q. For LED signs, is it required in the installation instructions to provide (SW) protection of conductors?

A. UL 48, the Standard for Safety for Electric Signs, and UL 879A, the Standard for Safety for LED and Sign Retrofit Kits, are the basic standards used to evaluate LED signs.

UL 48 requires that wiring shall be run and fastened reliably so as to be mechanically secure and positioned away from sharp edges, points, burrs, moving parts, and screw threads that might abrade or otherwise damage the wiring during shipment, installation and use.

Installation instructions are required to include instruction for any field wiring between the subassemblies and any components, and the connection to the source of supply.

UL 879A has additional requirements for LED signs and retrofit kits. It states that Class 1 wiring methods in accordance with Chapters 1-4 of the NEC shall be used for wiring between the LED unit and remote power units that are not marked Class 2 or "LPS" or "Limited Power Supply."

For Class 2 wiring, when permitted, wiring methods are required to be included in the installation instructions. Class 2 wiring methods complying with Article 300, Sections 600.12(C), 600.33, and Article 725 of the NEC, shall be used for wiring between the LED unit and remote power units marked

Class 2 or LPS. Class 1 wiring methods are permitted to be used to enclose Class 2 wiring.

UL Certifies (Lists) LED signs under the product category for Signs (<u>UXYT</u>), the UL guide information and certifications can be found on UL Product Spec at <u>www.ul.com/productspec</u> and enter UXYT at the category code search.

UL Certifies (Classifies) LED sign retrofit kits under the product category for Sign Conversions, Retrofit (<u>UYWU</u>), the UL guide information and certifications can be found on UL Product Spec at <u>www.ul.com/productspec</u> and enter UYWU at the category code search field.

- 4.7 Q. I have a facility where luminaires were retrofitted from T-12 to T-8, then to T-5 and now they are retrofitting one more time to LED. Is this permitted, and what important things should be considered in order to allow this?
 - **A.** This is possible if done correctly with the proper Certified/Classified retrofit kits for each conversion.

UL Certified LED retrofit kits are evaluated to be used in specific types of Listed luminaires or with generic types of Listed luminaires in accordance with their installation instructions. The starting premise for a UL Certified/Classified retrofit kit is that you are starting with a target luminaire that is already Listed/Certified with a different type of illumination technology (e.g. fluorescent, incandescent, etc.). Requiring the target luminaire to be Listed/Certified assures that the target luminaire complied with the appropriate UL lighting standard at the time of manufacture. If those T-12 to T-8 and then to T-5 conversions were all done with UL Certified/Classified retrofit kits that bear the appropriate Certification/Classification mark, then the target luminaire would meet the requirement for being equivalent to an originally Listed/Certified luminaire. If those conversions were made without using Certified/Classified retrofit conversion kits, then a UL Field Evaluation would be necessary to determine if the retrofitted luminaire was in compliance with UL's requirements.

UL Certifies/Classifies T-12 to T-8 to T-5 conversion kits under the product category Luminaire Conversions, Retrofit, (IEUQ) and LED retrofit kits under Light-emitting-diode Luminaire Retrofit Kits, (IFAR). The UL guide information and certifications be found UL Product can on Spec at www.ul.com/productspec and enter IEUQ or IFAR at UL Product Category search. For more information on UL Field Evaluations, please contact UL's Customer Service at 877-854-3577, #2 or www.ul.com/field or click on the "request a Field Evaluation" link in the lower right hand corner on UL Product Spec.

- 4.8 Q. A manufacturer of fluorescent tube lampholders states that tubular, self-ballasted LED lamps are not permitted to be installed into their lampholders originally intended for fluorescent lamps even if the self-ballasted lamps are listed. Can this be done?
 - **A.** Yes if they are UL Certified/Listed lampholders and if either the self-ballasted LED tubes are UL Certified/Listed or the LED retrofit kit is Certified/Classified.

UL certified fluorescent lampholders are Certified/Listed under the product category Lampholders, Electric Discharge, 1000 V or Less, (OKCT) and are evaluated for compliance with the requirements in the bi-national Standard for Safety for Lampholders, UL 496 / CSA C22.2 No. 43. The electrical and mechanical requirements in this standard do not distinguish between ballast-connected and line-connected lampholders. Suitable ratings are assigned to the lampholders based on the lampholders electrical spacing's to live parts. LED lamps can be powered by such lampholders as long as the lamps do not exceed the electrical ratings marked on the lampholders.

UL Certified/Classified LED Luminaire Retrofit kits ((IFAR)) include instructions for the installer that, when they reuse existing components such as lampholders, they are to examine all parts that are not intended to be replaced by the retrofit kit for damage and replace any damaged parts prior to installation of the retrofit kit. The luminaire conversion is expected to be performed by personnel knowledgeable with the applicable local and national electrical codes.

The tubular LED lamps included in many of these kits are certified to UL 1993, the Standard for Safety for Self-Ballasted Lamps and Lamp Adapters. UL 1993 limits the mass (weight) of G13-based lamps (T-12 or T-8) to 500 grams and G5-based lamps (T-5) to 200 grams. Heavier lamps would only be allowed as part of a retrofit kit if the kit includes a supplemental support means. Such a means would be subject to investigation as part of the retrofit kit's certification. UL also Certifies/Lists LED tube lamps for direct replacement under the Product Category Lamps, Self-ballasted, Light-emitting-diode Type (OOLV).

However, If a lampholder manufacturer chooses to limit where their devices should be used for commercial reasons, they are free to do so.

The guide information and certifications for Lampholders (OKCT), LED Luminaire Retrofit Kits (IFAR) and LED Self Ballasted Lamps, (OOLV) can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter OKCT, IFAR or OOLV at the UL Product Category search. 4.9 Q. Is the self-ballasted, LED tube type lamp an actual retrofit kit and what markings are required on the tube?

A. Self- ballasted LED tubes may be certified for field installation in one of two ways. The first is a direct lamp replacement, where the luminaire is not modified in any way and the LED tube lamp is Certified/Listed to operate in a ballast circuit. These self- ballasted tube lamps are Certified/Listed under the product category Lamps, Self-ballasted, Light-emitting-diode Type (OOLV). LED Tube Lamps Certified/Listed in OOLV will bear either the UL Certification or Listing mark, identifying it as an LED lamp. See the UL Mark section of the guide information for OOLV.

The other way a LED tube may be certified for field installation is when it is a component of a UL Certified/Classified Light-emitting-diode Luminaire Retrofit Kit (IFAR) where the original luminaire must be modified in some way to convert it to a LED luminaire (e.g. remove or bypass ballast, direct wire lampholders to the branch circuits, replace lampholders and reflectors, etc.). LED luminaire retrofit kits may incorporate self- ballasted or remote ballasted LED tubes to convert a fluorescent luminaire to an LED luminaire in accordance with the installation instructions and field applied markings provided with the kit. LED tube lamps covered under IFAR will bear a UL Certification or Classification Mark on the product together with the verbiage LED conversion retrofit kit for use in a specific model of luminaire or in accordance with the installation instructions. See the UL Mark section of the IFAR guide information.

The UL guide information and certifications for these product categories can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter either OOLV or IFAR at the category code search field.

- 4.10 Q. What markings will be present on a recessed luminaire that has been evaluated to meet ASTM E283 for air-tightness? Are all recessed luminaires required to meet ASTM E283 or can other methods be used to make a standard recessed luminaire pass the air leakage test required in the IECC?
 - A. Currently, UL Certifies (Lists) luminaires meeting ASTM E283 under product categories Light-emitting-diode Recessed Luminaires (<u>IFAO</u>), and Low-voltage Lighting Systems, Power Units, Luminaires and Fittings (<u>IFDR</u>), the UL guide information and certifications for these product categories can be located on UL Product Spec at UL Product Spec at <u>www.ul.com/productspec</u> and enter IFAO and IFDR respectively at the category code search.

Luminaires that have additionally been investigated for air leakage to ASTM E283, "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen," in addition to the UL Certification mark will be marked "ALSO CERTIFIED TO ASTM E283".

Per the 2015 IECC (International Energy Conservation Code) and the IRC (International Residential Code); all recessed luminaires installed in the building thermal envelope shall be IC-rated and labeled as having an air leakage rate not more than 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential. Additionally, all recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering

- **4.11 Q.** How long does it typically take to have a luminaire evaluated for air-tightness?
 - A. UL can generally complete the evaluation for air leakage to ASTM E283, "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen" in about one week from receipt of test samples
- **4.12** Q. What is the difference between a typical luminaire and one that has been specifically evaluated for grow operations?
 - A. UL Certifies (Lists) horticultural luminaires under the product category for Agricultural and Horticultural Luminaires (IFAU). The UL guide information and Certifications/Listings can be located on UL Product Spec at www.ul.com/productspec and enter IFAU at the category code search.

Horticultural luminaires produce a different spectrum of light than ordinary luminaires designed for general illumination, and often produce UV; they are generally installed at heights lower than ordinary luminaires; they are often installed with little physical separation from adjacent horticultural luminaires; they generally use cords, plugs and connectors for connection to power; and, they generally are high power rated to produce optimal growing conditions. These fundamental differences call for special safety considerations for proper installation and use of these products.

- 4.13 Q. Please explain how a convertible type IC/non-IC recessed luminaire can be installed properly in accordance with its listing.
 - A. UL Certifies (Lists) recessed type IC/non-IC luminaires under the product category for Incandescent Recessed Luminaires, Convertible, Non-IC/IC, (<u>IFAH</u>), the UL guide information and Certifications/Listings can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter IFAH at the category code search.

It is as simple as following the manufacturer's installation instructions. 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.

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 nation.

- 4.14 Q. Sometimes electric signs are installed with no listing labels on the sign letters.(S) What options are there when this occurs?
 - A. UL Certifies (Lists) signs under the product category for Signs (<u>UXYT</u>). The UL guide information and Certifications/Listings can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter UXYT at the category code search.

NEC 600.3 requires that signs are to be listed and installed in conformance with that listing, unless otherwise approved by special permission. Therefore, one option would be AHJ special permission. However, NEC 90.4 indicates that special permission is permitted where it is assured that equivalent objectives can be achieved by establishing and maintaining effective safety. NEC Article 100 defines special permission as the written consent of the AHJ. These requirements appear to place the burden of product safety on the AHJ.

A second option would be to not use the special permission option of NEC

90.4 and require that all signs are listed as previously stated in Section 600.3. With this option, the installer has the choice to either replace the sign with one that is properly Certified (Listed), or to remove the non-conforming sign and ship it back to the manufacturer (where it is subject to the UL follow-up procedures). Once back at a UL certified sign shop, the sign can be Certified (Listed) and then be re-shipped to be re-installed.

A third option would be to have the non-conforming sign field evaluated in accordance with the provisions of NFPA 790 (Standard for Competency of Third-Party Field Evaluation Bodies) and NFPA 791 (Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation). NFPA 790 identifies the minimum requirements for the qualification as well as competency of an organization performing field evaluations on electrical products whereas NFPA 791 covers the procedures for evaluating unlabeled electrical equipment for compliance with nationally recognized standards and any requirements of the AHJ. Annex A of the NEC identifies the applicable nationally recognized standard for electric signs as UL 48 (Standard for Safety for Electric Signs). UL is accredited as a Field Evaluation Body (FEB) for electrical equipment through ICC IAS AC354 and has performed numerous field evaluation of electric signs; http://www.iasonline.org/PDF/FEB/FEB-107.pdf

For more information on UL Field Evaluations contact UL's Customer Service at 877-854-3577, Prompt #2, www.ul.com/field or on UL Product Spec (www.ul.com/productspec), click on the "request a Field Evaluation" link in the lower right hand corner of the screen.

- 4.15 Q. As an AHJ, we do not have the ability to make sure that every recessed convertible type luminaire has the correct trim and lamp installed in order for it to be installed within its listing.
 - A. UL Certifies (Lists) recessed type IC/non-IC luminaires under the product category for Incandescent Recessed Luminaires, Convertible, Non-IC/IC, (<u>IFAH</u>), the UL guide information and Certifications/Listings can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter IFAH at the category code search.

UL 1598 (Standard For Safety For Luminaires) requires that a convertible luminaire shall comply with the applicable requirements for both Type Non-IC and Type IC recessed luminaires. Therefore, if the AHJ truly does not have the ability to ensure the manufacturers installation instructions are followed as required by NEC Section 110.3(B), Perhaps, the AHJ should consider it as a Type Non-IC luminaire and inspect the installation as one would for any other Type Non-IC luminaire.

- 4.16 Q. Are the UL electric sign labels with knife cuts currently being used for all signs or will some signs have standard labels without knife cuts?
 - A. UL Certifies (Lists) signs under the product category for Signs (<u>UXYT</u>) the UL guide information and Certifications/Listings can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter UXYT at the category code search.

UL Certified (Listed) labels for signs covered under UXYT have the tamperevident face-slits (knife cuts). The purpose of the face-slits is to inhibit the ability of removing the labels intact and re-applying them on another sign. Now with that said, until recently, indoor electric sign labels were **NOT** produced with face-slits. Previously, the indoor electric sign labels were produced on a paper stock that is naturally tamper-evident (it tears when removal is attempted). However, the paper labels have been replaced with the same material that is used for all other sign labels. Now face-slits are required for all UL Certified (Listed) labels covered by product category UXYT. There is one exception, signs covered under product category for Electric Signs Certified for Energy Efficiency to California Code of Regulations, Title 24, Part 6 (ENVS). The UL guide information and Certifications/Listings can be located on UL Product Spec at www.ul.com/productspec and enter ENVS at the category code search. Signs covered by product category ENVS require a holographic UL Certified Label with the word "ENERGY", these labels are not required to have face-slits.

- 4.17 Q. Does UL have any tools or resources to help the AHJ to know which sign manufacturers in a specific area are listed sign shops?
 - A. UL Certifies (Lists) signs under the product category for Signs (<u>UXYT</u>), the UL guide information and Certifications/Listings can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter UXYT at the category code search.

UL also provides the UL Online Certifications Directory at <u>www.ul.com/database</u> as a tool that can be used to locate manufacturers of UL Certified (Listed) signs:

Once you are at the UL Online Certifications Directory, there are many ways to search for sign manufacturer's, I suggest entering UXYT in the UL Category Code field and either a zip code in the US Zip Code field or a city in the City field. As an example, I entered UXYT and Phoenix and located 24 manufacturers of UL Certified (Listed) signs.



BEGIN A BASIC SEARCH

To begin a search, please enter one or more search criteria in the parameters below.

Company Name <u>(options)</u>	
City	Phoenix
US State	Select a state 🗸
US Zip Code	
Country	Select a country 🗸
Region	Select a region
Canadian Province:	Select a province
Postal Code (non-US)	
UL Category Code <u>(options)</u>	uxyt
UL File Number (help)	
Keyword	
SE/	ARCH CLEAR

ONLINE CERTIFICATIONS DIRECTORY

You may choose to Refine Your Search.				
Company Name	Category Name	Link to File		
AMERICA'S INSTANT SIGNS INC	Signs	<u>UXYT.E313002</u>		
ARIZONA COMMERCIAL SIGNS INC	Signs	<u>UXYT.E169491</u>		
ASSOCIATED SIGN CO INC	Signs	<u>UXYT.E243466</u>		
BAND SIGN SYSTEMS INC	Signs	<u>UXYT.E174543</u>		
BAXLA FABRICATION	Signs	<u>UXYT.E251829</u>		
BOOTZ & DUKE SIGN CO	Signs	<u>UXYT.E62322</u>		
CALIBER SIGNS L L C	Signs	<u>UXYT.E168064</u>		
CAS CORP, DBA NATIONAL MALLFRONT & DESIGN	Signs	<u>UXYT.E169182</u>		
CRAFT MASTER SIGN CORP	Signs	<u>UXYT.E117185</u>		
ELITE SIGNS L L C	Signs	<u>UXYT.E340709</u>		
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Search results

4.18 Q. Are agricultural luminaires the same as horticultural luminaires?

(<mark>S</mark>)

A. Yes. UL Certifies (Lists) both agricultural and horticultural luminaires under the product category for Agricultural and Horticultural Luminaires (IFAU), the UL guide information and Certifications/Listings can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter IFAU at the category code search.

UL defines agricultural and horticultural luminaires as follows:

Horticultural luminaire- A luminaire intended to provide a light source for growing flowers, vegetables and other plants, though they may also supplement general illumination within the installed environment.

Agricultural Luminaire – A luminaire intended to provide general illumination for an agricultural environment such as areas where chickens and livestock are kept or raised and fisheries, etc. These luminaires are installed in accordance with NEC Article 547 – Agricultural buildings.

5.0 Wiring Systems and Wiring Devices

- **5.1 Q.** Can multiple wires be terminated under a single Lug?
- **(E)**
- A. Yes, only for lugs and wire connectors identified for more than wire. The general provisions for terminals in distribution and control equipment is addressed in the UL guide information for Electrical Equipment for Use in Ordinary Locations, (<u>AALZ</u>), the UL guide information can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter AALZ at the category code search.

According to AALZ, under the heading of Distribution and Control Equipment Terminations, then Terminals, it states: "Product terminals, including wire connectors and terminal screws, are acceptable for connection of only one conductor, unless there is marking or a wiring diagram indicating the number of conductors which may be connected."

Wire connectors are Certified (Listed) under the product category Wire Connectors and Soldering Lugs, (ZMVV). The UL guide information for ZMVV states under the heading for Product Markings and Ratings, then for Multiple conductors — Connectors generally accommodate a single conductor under a clamping mechanism unless otherwise identified, such as with the number of conductors located parenthetically in front of the wire size or range. Some connectors may have a single-conductor wire range as well as a second multiple-conductor wire range. Some connectors, such as twist-on connectors, will have multiple conductors expressed in a list of wire combinations.

The UL guide information and Certifications (Listings) can be located on UL Product Spec at <u>www.ul.com/productspec</u> and enter <u>ZMVV</u> at the category code search.

- 5.2 Q. There are several manufacturers of listed refrigerators that have statements in the installation instructions that recommend against connection to GFCI protected receptacles. Are UL Listed refrigerators evaluated for leakage current levels that are compatible with GFCI's?
 - **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. UL 250 limits the level of leakage current permitted to 0.75mA.

The 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 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 and enter SHZZ at the category code search.

- 5.3 Q. Can UL provide information or insight on the new USB charging type, receptacle faceplates? I need help locating a similar Listed product and cannot find them in UL's Online Certifications Directory.
 - A. UL Certifies/Lists these USB charger/receptacle faceplates under the product category Power Supplies, Specialty (QQIJ). UL also Certifies/Lists a related faceplate that is also a nightlight under the product category Illuminated Cover Plates for Flush-mounted Wiring Devices (QBSA). The UL guide information and Certifications/Listings can be located on UL Product Spec at www.ul.com/productspec and enter either QQIJ or QBSA at the category code search.

6.0 Appliances and Utilization Equipment

- 6.1 Q. A Listed rooftop heating ventilator is installed with a disconnect switch located inside the unit from the factory. On the outside of the unit is a WARNING label stating "Do Not Open Door, until the unit comes to a complete stop". How can the unit be turned off, when the main switch is inside?
 - A. More information is needed on the specific product. In the event that a UL certified product was not constructed within the requirements of the applicable UL Standard, a Product Incident Report (PIR) should be submitted to generate an investigation by UL. This can be done online at <u>Market Surveillance Report</u> Form or <u>www.ul.com/ahjreport</u> and complete the form. Once the PIR is opened, UL verifies the concern, works to determine the root cause, and takes appropriate action to resolve the concern
- 6.2 Q. I've noticed storable pool pumps are being used for permanent pool installations. They used to have a UL Label on them, with a warning, but we do not see this anymore?
 - A. UL Certifies (Lists) storable pool pump/motor combinations under the product category for Swimming Pool and Spa Equipment Pumps, (WCSX), the UL guide information and Certifications/Listings can be located on UL Product Spec at www.ul.com/productspec and enter WCSX at the category code search.

According to the guide information for WCXS, pumps investigated for storable pools are so identified and are additionally marked "Do Not Use With Permanently Installed Pools." Pumps investigated for permanently installed pools are so identified and are additionally marked "Do Not Use With Storable Pools."

If these markings are not present on a UL Certified pool pump, a Product Incident Report should be filed at <u>www.ul.com/ahjreport</u> so that UL can work to resolve the concern.

- 6.3 Q. If a Listed dishwasher has a power switch marked with an "off" position, does it qualify as a unit switch and disconnects all ungrounded conductors per NEC 422.34?
 - A. Yes.

The Standard For Safety For Household Dishwashers, UL 749 does require dishwashers to be provided with a switch to control the motor circuit if the motor is rated more than 249 W (output). This switch is required to be connected in the ungrounded conductor of the supply circuit.

In addition, UL 749 also requires switching devices of the single-pole type that control the power supply to the appliance or to components, be connected in the ungrounded conductor of the supply circuit if the device could introduce a risk of fire, electric shock, or injury to persons when short circuited.

However, UL 749 does not require a marked "Off" position because there are no accessible hazardous parts and some dishwashers do not have a switch with a marked "OFF" position.

Household Dishwashers are Certified/Listed under the product category Dishwashers, Household (DMIY). The UL guide information and Certifications/Listings can be located on UL Product Spec at www.ul.com/productspec and enter DMIY at the category code search.

- 6.4 Q. The 2014 NEC requires GFCI protection for dwelling unit dishwashers. There are still a lot of dishwashers being produced that are purchased for existing homes where there is no GFCI protection provided for the dishwasher. Is there discussion in the dishwasher product standard to provide GFCI protection?
 - A. No, not for indoor use dishwashers. Presently there are no proposals to UL 749, the Standard for Safety for Household Dishwashers to require integral GFCI protection in household dishwashers.

However, for cord connected outdoor use dishwashers, there is a proposal to include the following statement, or equivalent, "WARNING - Risk of Electric Shock. Do Not Use an Extension Cord. Connect Dishwasher Cord Directly to a Dedicated Outlet Suitable for Installation in Damp or Wet Locations and Protected by a Ground-Fault Circuit-Interrupter (GFCI) in Accordance with Local Codes. If an Outlet is Not Provided, Contact a Qualified Electrician for Proper Installation".

If an interested party would like to submit a proposal to a specific Standard Technical Panel (STP) to revise a UL Standard please visit UL's Collaborative Standards Development System (CSDS) located at <u>http://ulstandards.ul.com/develop-standards/csds/</u>