UL 879A

STANDARD FOR SAFETY

LED Sign and Sign Retrofit Kits

UL Standard for Safety for LED Sign and Sign Retrofit Kits, UL 879A

First Edition, Dated December 12, 2012

Summary of Topics

These revisions to ANSI/UL 879A include the following changes in requirements:

- ***Deletion of Supplement SA***

- ***Markings for Kit Installation Instructions***

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated May 27, 2016.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

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UL 879A

Standard for LED Sign and Sign Retrofit Kits

First Edition

December 12, 2012

This ANSI/UL Standard for Safety consists of the First Edition including revisions through August 16, 2016.

The most recent designation of ANSI/UL 879A as an American National Standard (ANSI) occurred on August 16, 2016. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or effective date information.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at http://csds.ul.com.

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INTRODUCTION

1 Scope

1.1 General

1.1.1 This standard covers LED (light emitting diode) kits intended for field installation to retrofit signs already installed in the field and LED kits intended for installation in new signs.

1.2 Retrofit kits

1.2.1 These LED kits are intended to replace the electrical components related to the type of illumination used in a sign, such as neon, fluorescent, and HID. Neon sign components include neon tubes, tube supports, neon power supplies, and all secondary wiring from the neon supply. Fluorescent sign components include fluorescent tubes, ballast, and ballast secondary wiring, and in some cases lampholders.

1.2.2 Retrofit kits include the power supply or transformer, power supply or transformer enclosure, the LEDs and the LED mounting means, and installation instructions.

1.3 New sign construction

1.3.1 Component power units may be incomplete with respect to electrical enclosure, mounting, supply connections, etc.

1.3.2 LEDs, secondary wiring, and LED transformers or supplies may be provided separately.

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this standard shall comply with the requirements for that component. See the Component Appendix for a list of standards covering components used in the products covered by this standard.

2.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard;

b) Is superseded by a requirement in this standard.

2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

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3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 Undated References

4.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

5 Glossary

5.1 CLASS 2 CIRCUIT – The wiring, conductors and components connected only to a Class 2 supply source. See Class 2 Supply Source, 5.2.

5.2 CLASS 2 SUPPLY SOURCE – An electrical source, such as a transformer, power supply, or battery, having an open-circuit voltage that is less than 30 Vrms (42.4 Vpeak) or 60 Vdc and having limited energy available in the circuit under load conditions, including short-circuit and extremely low resistance. A Class 2 supply source can be either inherently limited or non-inherently limited.

a) INHERENTLY LIMITED SUPPLY SOURCE – A transformer, power supply or battery having no discrete protective device that is relied upon to limit the output energy available from the supply. A power supply or battery with internal current and energy limiting circuitry shown to be reliable is eligible to be identified as inherently limited. Transformers, power supplies and batteries may be provided with protective devices as long as they are not relied upon to limit the output.

b) NON-INHERENTLY LIMITED SUPPLY SOURCE – A transformer, power supply or battery having a discrete protective device that automatically interrupts the output when the current and energy output reaches a prescribed limit.

5.3 CONDITIONS OF USE – Parameters and specifications that identify the proper use of a component according to the requirements to which it has been determined to comply, and limitations of the use of the component in a sign or outline lighting.

5.4 DAMP LOCATION – The designation for a component that has been evaluated generally for use in exterior locations where protected overhead from rain and snow, or interior locations where subject to moderate degrees of moisture, primarily by humidity and condensation. Protected overhead is generally considered to be within an area formed by an imaginary line drawn from the outer edge of the eave, overhang, or signbody inward at a 45° angle from vertical. Additionally, the interior of a sign body provided with a sign face and installed in an outdoor exposed location is a damp location. Examples include partially protected areas such as under a canopy, under a roofed porch, or indoors in a car wash away from a direct water spray.

5.5 DRY LOCATION – The designation for a component that has been evaluated for use in an environment where the component is not normally subject to dampness or wetness. Examples include inside an indoor shopping mall, inside a retail store, in an attic or scuttle, and other similar places.

5.6 ELV CIRCUIT – A secondary circuit with limited voltage and energy that reduces the risk of fire and shock in accordance with the requirements in the Standard for Information Technology Equipment Safety – Part 1: General Requirements, UL 60950-1.

5.7 HAZARDOUS ENERGY LEVEL – A stored energy level of 20 J or more, or an available continuous power level of 240 VA or more, at a potential of 2 V or more.

5.8 LPS-LIMITED POWER SOURCE – Power supplies identified as ″LPS″ or where the output is considered limited power, are considered equivalent to power supplies with Class 2 outputs.

5.9 POLLUTION DEGREES:

a) POLLUTION DEGREE 2 – Normally only non-conductive pollution. However, temporary conductivity is capable of being caused by condensation.

b) POLLUTION DEGREE 3 – Conductive pollution, or dry, non-conductive pollution that becomes conductive due to condensation.

5.10 RETROFIT KIT – A general term for a complete subassembly of parts and devices for field conversion of utilization equipment.

5.11 SAFETY EXTRA-LOW VOLTAGE (SELV) CIRCUIT – A secondary circuit with limited voltage and energy that reduces the risk of fire and shock in accordance with the requirements in the Standard for Information Technology Equipment Safety – Part 1: General Requirements, UL 60950-1.

5.12 WEATHERPROOF – See Wet Location, 5.13.

5.13 WET LOCATION – The designation of a component that has been evaluated for use in a location that is subject to a direct spray or splashing of water or other liquids. Examples include locations used for outdoor channel letters and outline lighting or indoors in a car washing area in a direct water spray.

CONSTRUCTION

6 Power Supplies and Transformers

6.1 General

6.1.1 Power supplies and transformers are required to operate within their rated input and output ratings.

6.1.2 Power supplies and transformers shall be enclosed in an electrical enclosure.

6.1.3 Power supplies and transformers may have more than one Class 2 or LPS output.

6.2 Power supplies

6.2.1 General

6.2.1.1 Except for features specified in this standard, power supplies shall comply with the requirements of the Standard for Electric Sign Components, UL 879.

6.2.2 Power supplies for portable LED signs

6.2.2.1 Direct plug in or through cord style power supplies marked ″Indoor Use″ are suitable for portable signs only.

6.2.2.2 Direct plug in or through cord style power supplies marked for ″I.T.E. Use Only″ are suitable for portable signs only. I.T.E. denotes Information Technology Equipment.

6.2.2.3 Direct plug in or through cord style power supplies marked ″Class 2″ or ″ LPS″ do not require an electrical enclosure for the LEDs. LPS denotes Limited Power Source.

6.2.3 Power supplies for permanently wired signs

6.2.3.1 Secondary circuits connected to the output of power supplies complying with the requirements in the Standard for Information Technology Equipment Safety – Part 1: General Requirements, UL 60950-1 and having secondary circuits that are SELV or ELV, and that are not hazardous energy level, are to have the secondary circuits wired as Class 1 circuits.

6.2.3.2 Secondary circuits connected to the output of power supplies complying with the requirements in the Standard for Information Technology Equipment Safety – Part 1: General Requirements, UL 60950-1 and having secondary circuits that are ″LPS″ may be wired as Class 2 circuits.

6.2.3.3 Power supplies evaluated for use in Pollution Degree 2 environments are restricted to indoor or dry location signs.

6.2.3.4 A Pollution Degree 2 evaluated power supply that is completely conformal coated or potted may be used in a damp, wet, or outdoor sign.

6.2.3.5 A Pollution Degree 2 evaluated power supply installed in an enclosure equivalent to a Type 3, 3S, or 4X enclosure may be used in a damp, wet, or outdoor sign.

6.2.3.6 A Pollution Degree 3 evaluated power supply installed in an enclosure equivalent to a Type 3R enclosure or an enclosure meeting the Water Exclusion requirements of the Standard for Electric Signs, UL 48 may be used in a wet or outdoor sign.

6.3 Transformers

6.3.1 Except for features specified in this standard a transformer shall comply with the requirements of the Standard for Electric Sign Components, UL 879.

6.3.2 A transformer shall be required to operate within its rated input and output ratings.

7 Enclosure of Live Parts

7.1 General

7.1.1 All live parts are to be enclosed in accordance with the enclosure material and opening requirements of this standard. The live parts that are required to be enclosed are all parts connected to an electrical circuit that is not designated as complying with Class 2 or LPS requirements and the live parts are not otherwise enclosed in accordance with the requirements in the Standard for Electric Signs, UL 48.

7.1.2 Components with integral electrical enclosures with provision for permanent wiring in accordance with this standard are considered to comply.

7.1.3 Components installed in a Type 3, 3R, 3S, or 4X enclosure are considered to comply.

7.1.4 Components where the electrical enclosure is provided as part of a new factory built sign are considered to comply.

7.2 Metal enclosures

7.2.1 Sheet metal enclosures shall have a minimum thickness in accordance with the Standard for Electric Signs, UL 48.

7.3 Polymeric enclosures

7.3.1 An enclosure of polymeric material shall comply with the requirements in this section. Polymeric material includes thermoplastic and thermosetting materials and composite type materials bonded together by organic compounds. Thermosetting material is a polymeric material such as phenolic and epoxy that are cast rather than molded.

7.3.2 The temperature rating of a polymeric material shall be determined by its RTI, either with or without impact.

7.3.3 The minimum temperature rating required for a particular application shall not be less than 70°C (158°F) and no less than the maximum operating temperature as determined by temperature test.

7.3.4 A polymeric enclosure material shall have a minimum flammability rating as follows:

a) For components intended for use in fixed or stationary signs, 5 VA;

b) For components intended for use in fixed or stationary signs and where all live parts within the enclosure are fully potted, V-2; or

c) For components intended for use in portable signs, V-2.

7.3.5 A thermoplastic type potting material that fully encapsulates live parts and also functions as an enclosure shall have a minimum flammability rating of V-2.

7.3.6 A polymeric enclosure material exposed to sunlight shall be resistant to UV radiation with water in accordance with the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

7.3.7 A polymeric enclosure material used in a product where water is in constant contact or is intended to be installed on the bottom of a sign body or enclosure of the outdoor portion of an outdoor sign shall comply with the Water Exposure and Immersion Test in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

7.3.8 A polymeric enclosure material shall have a Comparative Tracking Index (CTI) PLC of 0 or 1.

7.3.9 A polymeric enclosure material located within 0.8 mm (0.03 in) of any uninsulated live part or within 13 mm (0.5 in) of any unenclosed mechanical contacts that make and break current, including the brush contacts of motors shall:

a) Have a minimum PLC rating for hot-wire ignition (HWI) of 2; and

b) Have a minimum PLC rating for high-current arc resistance to ignition rating (HAI) of 2.

7.3.10 A polymeric enclosure material shall comply with the Mold Stress Relief Distortion Test in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

7.4 Openings

7.4.1 Ventilation openings shall not be permitted in what is intended to be the top or bottom of an electrical enclosure after installation. Ventilation openings in what is intended to be the side of an electrical enclosure after installation are permitted when they do not permit the entrance of a 12.7-mm (1/2-in) diameter rod and are louvered and baffled to prevent line of sight to open core and coil components.

7.4.2 The articulated probe with web stop as shown in the Standard for Luminaires, UL 1598, shall not be able to contact uninsulated live parts or magnet wire.

7.4.3 Outdoor electrical enclosures shall have no openings other than required 6.4-mm (1/4-in) drain openings in the bottom.

8 Supply Connections

8.1 Knockouts for trade size 1/2 fittings shall be provided when fittings or bushings are not provided for field supply connections. Knockouts shall withstand a 10-lb knockout test as specified in the Standard for Luminaires, UL 1598.

8.2 Secondary connections may be pig-tail leads a minimum 1.5-m (5-ft) long, 152.4-mm (6-in) long pigtail leads within a wiring compartment, or a terminal connector. A terminal connector for connection to Class 2 output circuits is not required to be enclosed.

9 Separation of Circuits

9.1 Secondary circuit wiring shall be insulated for the maximum voltage involved or completely and permanently separated from the wiring of other than secondary circuits or Class 2 circuits.

10 Over-Current Protective Devices

10.1 An over-current protective device shall not be connected in the neutral (grounded) conductor unless the device simultaneously interrupts the grounded and ungrounded supply conductors.

11 Fuses

11.1 Fuses shall be inaccessible by being located completely within an electrical enclosure unless the fuseholder is of the type that will prevent insertion of a higher current rated fuse (i.e. lockout type extractor fuseholder).

11.2 Where a fuse is provided, it shall be mounted in a fuseholder of the proper type and rating, or be soldered by pigtail style leads directly to a printed wiring board or be mounted using surface mount technology.

11.3 The fuse type identification and ampere rating shall be marked on or adjacent to the fuse and fuseholder. See Required Markings, Section 24, for wording.

12 Circuit Breaker or Supplementary Protector

12.1 A supplementary protector or circuit breaker connected in the supply circuit shall open all ungrounded conductors.

12.2 For a vertically mounted circuit breaker or supplementary protector, the down position shall be the off position.

13 Thermal Protective Devices

13.1 A thermal protective device relied on to comply with the performance requirements of this standard shall:

a) Comply with the requirements of other appropriate standards listed in Appendix A of this standard as appropriate for the type of thermal protective device used; and

b) Be located where it is capable of being either mechanically secured or physically trapped so as to be subject to consistent heat sensing.

14 Thermistors

14.1 A thermistor, Positive Temperature Coefficient (PTC) or Negative Temperature Coefficient (NTC) resistance, provided to limit the output of a unit to within the required current or power levels, or with maximum temperature requirements or otherwise used to obtain acceptable test results shall comply with the requirements of other appropriate standards listed in Appendix A of this standard and shall have a Calibration Class of C1 or C2.

15 LED Units or Modules

15.1 General

15.1.1 These requirements apply only to the LED displays provided as either a panel or module for use in a sign.

15.1.2 LED lamps, including tubular LED lamps that are intended to replace fluorescent lamps and use existing lampholders only for mechanical support and are powered by separate supply connections shall comply with the requirements for tubular lamps in the Standard for Self-Ballasted Lamps and Lamp Adapters, UL 1993.

15.2 Conditions of use

15.2.1 Typical locations of use include installation in dry, damp or wet locations.

15.2.2 Suitability of rain enclosure shall be determined if intended for wet location.

15.2.3 Mounting position shall be specified if the enclosure has ventilation openings.

15.2.4 Each LED circuit is restricted to Class 2 or LPS limits.

15.2.5 Suitability of electrical enclosure and secondary wiring shall be determined if single circuit power requirements exceed Class 2 or LPS limits.

16 Secondary Wiring

16.1 Class 1 wiring

16.1.1 Class 1 wiring methods in accordance with Chapters 1 – 4 of the National Electrical Code, ANSI/NFPA 70, shall be used for wiring between the LED unit and remote power units not marked Class 2 or LPS or Limited Power Supply. An example of this wiring method includes conduit with appropriate liquid-tight fittings.

16.2 Class 2 wiring

16.2.1 Wiring methods are not specified. Recommendations for Class 2 wiring, when permitted, shall be included in the installation instructions.

16.2.2 Class 2 wiring methods in accordance with 300, 600.12(C)(1)(2), 600.33, and 725 of the National Electrical Code, ANSI/NFPA 70, shall be used for wiring between the LED unit and remote power units marked Class 2 or LPS.

16.2.3 Class 1 wiring methods may be used to enclose Class 2 wiring.

16.2.4 Cable assemblies or wiring with lengths external to the unit not exceeding 3.05 m (10 ft), coiled or uncoiled, and supplied by a limited power source or NEC Class 2 source of supply as defined in the National Electrical Code, ANSI/NFPA 70, may be constructed of materials rated VW-1 or FT-1 or better with no additional requirements.

16.3 Class 3 wiring

16.3.1 Recommendations for Class 3 wiring, when permitted, shall be included in the installation instructions.

16.3.2 Class 1 rain tight wiring methods may be used to enclose Class 3 wiring.

16.3.3 Class 2 circuits operating at over 15 Vrms ac or 30 Vdc or 12.4 Vdc interrupted at 10 to 200 Hz in a wet location shall use Class 3 wiring methods. These wiring methods are specified in Chapter 725 of the National Electrical Code, ANSI/NFPA 70. Examples include PLTC cable marked ″Sunlight Resistant″ or ″Sun Res″, SJTW or SW cord may also be used. Suitable rain tight fittings are required to keep water from entering the LED unit or the remote power unit.

PERFORMANCE

17 General

17.1 Unless otherwise specified, all tests are to be conducted with the sign component connected to a rated frequency source of supply of 60 Hz when rating is ac. The test voltage of the source of supply is to be adjusted to within 5% of the rated voltage.

18 Input Test

18.1 The current input shall not exceed 110% of the components rating when operated at rated voltage.

19 Normal Temperature Test

19.1 A product, when mounted and operated as intended in service, shall not exceed the temperature rise limits specified in the Standard for Electric Signs, UL 48.

20 Dielectric Voltage Withstand Test

20.1 A component shall withstand without dielectric breakdown a dielectric voltage applied between live parts of opposite polarity and between live parts and dead metal parts.

20.2 A dc voltage of 1.41 times the ac test voltage shall be applied when the component has across the line capacitors in the circuit.

20.3 Reference the Standard for Electric Signs, UL 48, for test method.

21 Abnormal Operation Test

21.1 Power supplies or transformers provided with a fan or blower are to be tested with the rotor of the fan or blower stalled. Motor winding temperatures shall be measured during the test and shall not exceed 150°C (302°F) for a Class 105 insulation system.

21.2 A component shall not result in a risk of fire or electric shock as a result of being subjected to the stalled rotor test. A dielectric voltage withstand test is to be conducted after the abnormal operation test.

22 Installation and Assembly Test

22.1 A sign component that involves any degree of assembly or installation shall be installed and assembled in a method typical of factory and field conditions in accordance with the installation instructions. An assembled and installed component shall comply with the requirements in the end product standard. Assembly and installation shall include and identify possible misuse and abnormal assembly and installation that can result in the need for either construction revisions or, where not feasible, warning instructions to minimize the potential misuse and abnormal condition that could exist.

MARKINGS

23 Marking Method

23.1 A marking shall be legible and use one or more of the following methods:

a) Lettering on a pressure-sensitive label;

b) Paint stenciled lettering;

c) Ink-stamped machine lettering;

d) Ink-hand-stamped lettering;

e) Indelibly printed lettering;

f) Die-stamped lettering;

g) Embossed lettering; or

h) Molded or cast lettering.

23.2 The characters of embossed, molded, or cast lettering, either in or out, shall be a minimum of 0.25 mm (0.010 inch) in depth.

23.3 The characters shall be of lettering that is at least 3.2 mm (0.125 inch) in height.

24 Required Markings

24.1 The following markings are required:

a) Company name;

b) Model designation;

c) Factory Identification – A component produced or assembled at more than one factory shall have a distinctive marking, which may be in code, by which it is able to be identified as manufactured at a particular factory;

d) Date of manufacture;

e) Input, volt and amps;

f) Output per circuit, volts and amps;

g) Total output current, amps;

h) Fuse Replacement Marking – the fuse type identification and ampere rating shall be marked on, or adjacent to, the fuse and fuseholder. Wording shall be equivalent to the following: ″Caution – For continued protection against risk of fire or shock replace only with same type and rating of fuse″;

i) Electrical enclosures with ventilation openings shall be marked to indicate the top surface of the enclosure by the word ″TOP″;

j) Electrical enclosures shall be marked for installation in dry, damp, or wet locations as determined by investigation. Enclosures identified as Type 3, 3R, 3S, or 4X are suitable for wet location and may be so marked;

k) For Class 2 or limited power outputs the following shall be marked verbatim: ″Class 2″ or ″LPS″ or ″Limited Power Source″ as appropriate; and

l) For Class 2 or limited power outputs the following shall be marked verbatim when the power supply has multiple Class 2 or limited power source outputs: ″Warning: Risk of electric shock or fire, do not connect outputs in series or parallel.″

24.2 Markings shall be located on the component where visible during servicing after installation in a sign, and, where the user marking is also to be a user marking for a sign, be located where visible during servicing after installation on a sign when the component is installed as intended.

24.3 The adhesive of permanent type markings on pressure-sensitive labels and nameplates shall be suitable for the mounting surface material involved, temperature involved, but no less than 90°C (194°F), and the environment to which it will be subjected.

INSTALLATION INSTRUCTIONS

25 LED Kits for Factory Installation in New Signs

25.1 Each bulk shipment of a component shall include at least one set of installation instructions.

25.2 The instructions are to include the following information:

a) Kit parts list;

b) Determine required number of LEDs for illumination;

c) Determine number of power supplies;

d) Loading of power unit;

e) Mounting LEDs;

f) Wiring from power unit to LEDs;

g) Supply wiring to power unit;

h) Mounting of disconnect switch; and

i) Wiring from power unit to LEDs.

26 LED Kits for Field Installation in Existing Signs

26.1 Each retrofit kit packaging shall include a set of installation instructions. Multiple LED kits identified on a bulk packing list for a single sign or job location shall include at least one set of the installation instructions.

26.2 The instructions are to include the following information:

a) Kit parts list;

b) Identification and preparation of host sign;

c) Identify what parts to remove;

d) Determine if disconnect switch needs to be installed (for example a switch may be integral to a neon power supply);

e) Repair and seal any unused openings in the electrical enclosure of a wet or outdoor sign;

f) Determine required number of LED's for illumination;

g) Determine number of power supplies;

h) Loading of power unit;

i) Mounting LEDs;

j) Wiring from power unit to LEDs (including any bonding instructions);

k) Supply wiring to power unit (including any grounding instructions); and

l) Mounting of disconnect switch.

26.3 The markings and information specified in Table 26.1 shall be included in the installation instructions in accordance with 26.4 – 26.11.

Table 26.1
Markings for installation instructions

Item	Text	Reference
A.	WARNING – Risk of fire or electric shock. LED Retrofit Kit installation requires knowledge of sign electrical systems. If not qualified, do not attempt installation. Contact a qualified electrician.	26.4
B.	WARNING – Risk of fire or electric shock. Install this kit only in host signs that have been identified in the installation instructions and where the input rating of the retrofit kit does not exceed the input rating of the sign.	26.4
C.	WARNING – Risk of fire or electric shock. Installation of this LED retrofit kit may involve drilling or punching of holes into the structure of the sign. Check for enclosed wiring and components to avoid damage to wiring and electrical parts.	26.4
D.	Installer should 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.	26.5
E.	Installers should not disconnect existing wires from lampholder terminals to make new connections at lampholder terminals. Instead installers should cut existing lampholder leads away from the lampholder and make new electrical connections to lampholder lead wires by employing applicable connectors.	26.6
F.	WARNING – To prevent wiring damage or abrasion, do not expose wiring to edges of sheet metal or other sharp objects.	26.7
G.	″Do not make or alter any open holes in an enclosure of wiring or electrical components during kit installation.″	26.8
H.	″Repair and seal any unused openings in the electrical enclosure. Openings greater than 12.7-mm (1/2-in) diameter require a metal patch secured by screws or rivets and caulked with non-hardening caulk. Smaller openings may be sealed with non-hardening caulk.″	26.9
I	WARNING: To avoid potential fire or shock hazard, do not use this retrofit kit with existing shunted bi-pin lampholders in the host sign. Note: Shunted lampholders are found only in fluorescent signs with Instant-Start ballasts. Instant-start ballasts can be identified by the words ″Instant Start″ or ″I.S.″ marked on the ballast. This designation may be in the form of a statement pertaining to the ballast itself, or may be combined with the marking for the lamps with which the ballast is intended to be used, for example F40T12/IS. For more information, contact the LED retrofit kit manufacturer.	26.10
J	″This sign has been modified to operate LED lamps. Do not attempt to install or operate * lamps in this sign″ shall be marked on the retrofitted sign where readily visible by the user during normal maintenance including relamping. ″ * ″ shall be replaced by the original illumination type such as ″fluorescent,″ ″HID,″ etc. This marking shall be provided on a separate permanent label that is intended to remain in the applied position for the lifetime of the sign under conditions of normal use.	26.11

Note:

1) Except for marking item ″J″, all text shall be clearly incorporated in the installation instructions and shall be legible.

2) The marking for item ″J″ shall have a minimum letter height of 2.4 mm (3/32 in) and shall be in Univers Bold, Arial Bold, Helvetica Bold, or Zurich BT Bold or equivalent font.

Table 26.1 Continued on Next Page