



GUIDE

FOR THE PROPER ELECTRICAL INSPECTION OF LED SIGNAGE

by Roger Rumsey

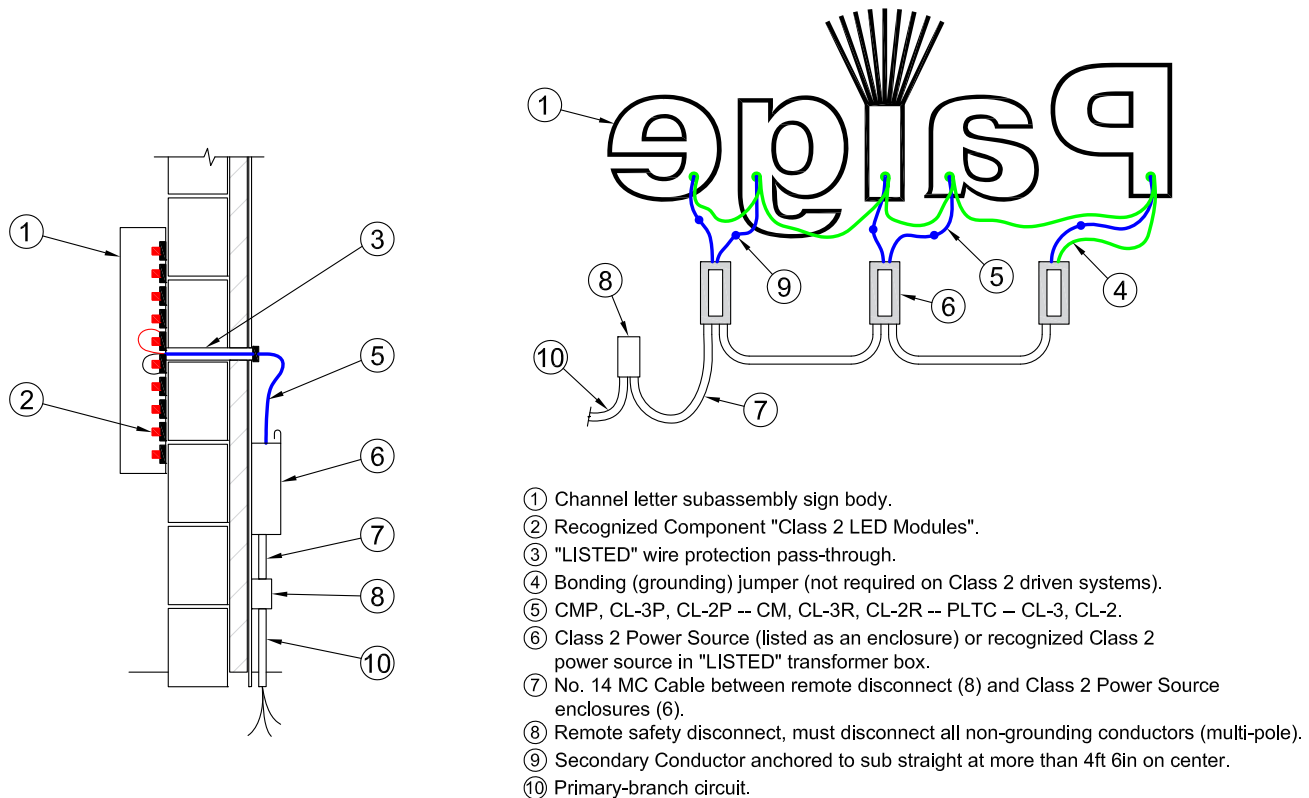
In many applications, LEDs are replacing neon as a light source for signs, causing confusion as to what is required by the NEC. Using drawing E1-RA as a basis for applicable references in the 2014 NEC, this article provides information on products and installation methods for LED signage. The drawing represents a typical (most common) installation. The Code references related to the drawing provide guidance to code requirements for signs that are different from the typical.

Before addressing the drawing, you should consider these general observations:

Q. What parts of the NEC apply to a LED sign installation?

A. Chapters 1–4, Article 600, and Article 725, Part III.

In all noted *NEC* requirements, the product and use of product are directly quoted, except for Section 3 concerning protection of the cable as it



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passes through a wall. In this one and only instance, you, the inspector, have to decide intent. Article 600.33(C) directs you to Article 300.4; only in 300.4(B) does the Code identify a type of cable. It is reasonable to believe that if NM cable requires a listed bushing, then those wires identified by 725,154(A) would also require a listed bushing/pass-through.

The following questions and answers relate to the numbers on drawing E1-RA.

1. Channel letter subassembly sign body:

Q: Comply with NEC requirements?

A: Yes, if in compliance with 110.3(B) and 600.3.

110.3(B) Installation and Use. Listed or labeled equipment shall be installed and used in accordance

with any instructions included in the listing or labeling.

600.3 Listing. Fixed, mobile or portable electric signs, section signs, outline lighting and retrofit kits, regardless of voltage, shall be listed, provided with installation instructions, and installed in conformance with that listing unless otherwise approved by special permission.

2. Recognized Component: Class 2 LED Modules

Q: Comply with NEC requirements?

A: Yes, if in compliance with 110.3(B) and 600.3.

3. Listed wire protection pass-through:

Q: Comply with NEC requirements?

A: Yes, if in compliance with 600.33(C) and 300.4(B?).

600.33(C) Protection Against Physical

Damage. Where subjected to physical damage, the conductors shall be protected and installed in accordance with 300.4.

4. Bonding:

Q: Required by NEC?

A: No, if the circuit between the power source and LED sign component is less than 50 volts dc and the conductors are not intermingled with other power or electric light circuits.

600.7(B)(1) Bonding of Metal Parts, Exception. Remote metal parts of a section sign or outline lighting system only supplied by a remote Class 2 power supply shall not be required to be bonded to an equipment grounding conductor.

5. Secondary conductors:

Q: What wiring methods comply with NEC requirements?

A: **600.33 LED Sign Illumination Systems, Secondary Wiring.** The wiring methods and materials shall be installed in accordance with the sign manufacturer's installation instructions using any applicable wiring methods from Chapter 3 and the requirements for Class 2 circuits contained in Part III of Article 725, as applicable.

725.154 (A) Class 2 and Class 3 Cable Substitutions. Plenum--CMP, CL3P, CL2P; Riser--CMR, CL3R, CL2R; General Purpose--PLTC, CMG/CM, CL3, CL2.

6. Class 2 Power-source (listed as an enclosure) or recognized Class 2 power-source in LISTED transformer box.

Q: Does the description in #6 comply with the NEC requirements?

A: Yes.

600.21 Ballasts, Transformers, Electronic Power Supplies and Class 2 Power Sources. Ballasts, transformers, electronic power supplies and Class 2 power sources shall be of the self-contained type or be enclosed by placement in a listed sign body or listed separate enclosure.

7. 14 AWG MC Cable between (#8) and (#6).

Q: Does this comply with NEC requirements?

A: Yes, if in compliance with requirements of Article **330 Metal-Clad Cable.**

8. Remote safety disconnect.

Q: Does this comply with NEC requirements?

A: Yes, if the disconnect opens all ungrounded conductors.

600.6 Disconnects. Each sign and outline lighting system, feeder circuit or branch circuit supplying a sign, outline lighting system or skeleton tubing shall be controlled by an externally operable switch or circuit breaker that opens all ungrounded conductors and controls no other load. The switch or circuit breaker shall open all ungrounded conductors simultaneously on multi-wire branch circuits in accordance with 210.4(B). Signs and outline lighting located within fountains shall have the disconnect located in accordance with 680.12

9. Secondary Conductor attachment.

600.33(B) Installation. Secondary wiring shall be installed in accordance with (B)(1) and (B)(2).

(1) Support wiring shall be installed in a neat and workmanlike manner. Cables and conductors installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable is not damaged by normal building use. Such cables shall be supported by straps, staples, hangers, cable ties or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4(D).

(2) Connections in cable and conductors shall be made with listed insulating devices and be accessible after installation. Where made in a wall, connections shall be enclosed in a listed box.

10. Branch Circuit by licensed electrician

References:

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