



# NEC Code & UL Standards for Lighting Systems Operating at 30 Volts or Less



Read Across & Down

		SECONDARY WIRE & BURIAL DEPTH				MAX VOLTS	UL NEC	LUMINAIRE LISTING	POWER SUPPLY TRANSFORMER			
Grade	Wire Type & Burial Depth					Max Secondary Volts at Power Supply with no load (Open Circuit) NEC = NATIONAL ELECTRIC CODE NFPA-70 UL = UNDERWRITERS LABORATORIES, INC.	Article 411.3 (B-2) Listed NEC - 2008 Grounded Isolation for LV Wet Location Secondary Circuit Protector 25A Max Open / Bare Conductor (When Tested)					
	6"	Wire to Class 1 NEC - Chapter 3			UF-B Q-Wire			LV Cable				
	Below Grade			UF-B = Underground Feeder - Burial								
Wet	Landscape	<b>UL 1838 - LV Landscape Lighting System: 15V AC / 30V DC Max Output at Power Supply - No Load</b> <p>Luminaires + Power Supplies must be UL 1838 Listed as complimentary components for lighting garden, walkway, patio areas, trees and similar outdoor locations with in ground and above ground fixtures; and for certain indoor locations such as atriums and shopping malls. This listing also covers luminaires submersed in or floating on ponds, rivers, water features and lakes or a portable self contained fountains per NEC Article 682 where immersed persons would not be present as defined by luminaire installation instructions.</p> <p> UL 1838 allows LV Underground Lighting Cable - no other listing permits this wire type. 120V Primary only. Not for indoor use.  <i>Note: NEC Annex A = UL 1838 120V Only Low Voltage Luminaire Primarily for Wet Locations</i></p>										
	Indoor											
	Submersed	<b>UL Pool &amp; Spa Listing: 15V AC only Max Output at Power Supply - No Load</b> <b>Indoor &amp; Outdoor</b> <p>Luminaires + Power Supplies must be UL Pool &amp; Spa Listed as complimentary components for lighting a Pool, Spa, permanent fountain or other bodies of water intended to contain immersed persons. All wiring must be Class 1 per NEC Chapter 3. 120V Primary only.  <i>Install per NEC Article 680 120V Only Low Voltage Luminaire for Submersed Locations with immersed persons</i></p>										
	Dry or Damp	<b>UL 2108 - LV Lighting System: 30V AC / 30V DC Max Output at Power Supply - No load</b> <p>Luminaires + Power Supplies must be UL 2108 Listed as complimentary components. This Standard covers:  <b>411.3 (A) Listed Systems</b> for exposed bare conductor systems comprised of cable, linear track or the like where the support structure is exposed and current carrying; here the Power Supply must be listed as part of the same identified lighting systems.  <i>Note: Use Power Supply as defined in Luminaire installation instructions.</i>  <b>411.3 (B) Assembly of Listed Parts</b> covers mono, dual or multi point LV Luminaires which are an assembly of listed parts if a UL 2108 Low Voltage Luminaire Power Supply is utilized. For wet Location luminaires UL 2108 covers luminaires with up to 30 volt input provided they are Class 1 wired per NEC Chapter 3. For wet Location luminaires with inputs not exceeding 15 volts, UL 1838 applies.  <i>Note: NEC Article 411 + Annex A = UL 2108. Low Voltage Luminaire Primarily for Dry and Damp Locations</i></p>										
Obsolète for LV Remote - Dry, Damp & Wet	<b>UL 1598 - Luminaires: 30V AC / 30V DC Max Output at Power Supply - No load</b> <p>This UL Standard applies to line voltage luminaires for use in non-hazardous locations and allows up to 600 volts input and all wiring must be Class 1 per NEC Chapter 3. Low Voltage luminaires powered by remote transformer are <b>NOT</b> covered by this standard.  <b>This Listing does not cover:</b> <ul style="list-style-type: none"> <li>LV Landscape Lighting products and Submersible Luminaires installed in the United States at 15V or less. (UL 1838 is the Standard per NEC-Annex A)</li> <li>Swimming Pool &amp; Spa Luminaires (UL Pool &amp; Spa is the Standard per NEC Article 680)</li> <li>Low Voltage Lighting Systems powered by remote transformers (UL 2108 is the Standard per NEC 411 &amp; Annex A)</li> </ul> <i>Note: NEC Article 410 Intended for Line Voltage Luminaires for Dry, Damp and Wet Locations</i></p>											
	<b>UL 506-General Purpose or Specialty Transformers: 600V Max</b> <p>This UL Standard is a transformer standard only and is not a complimentary component to any luminaire standard. UL 1838, Pool &amp; Spa and 2108 does not permit the use of UL 506 transformers unless the transformer is additionally tested and subsequently listed to UL 1838, Pool &amp; Spa or 2108. A UL-506 transformer may be tested as an internal components to a UL-1598 luminaire, to be an integral transformer.   The Scope of UL-506 (Section 1.2) specifically excludes use in Landscape Lighting Systems and for use in Pool &amp; Spa Lighting Systems. Additionally, a Cord and Plug connection is not permitted. In no instance can a UL-506 transformer be used in Landscape or Pool &amp; Spa Lighting. A UL 1838, UL Pool Spa and UL 2108 Power Supply may power a UL-1598 luminaire that was listed prior to the UL-2108 effective date since these Luminaires are required to be Class 1 wired per NEC Chapter 3. <b>General Purpose Transformer</b></p>											

### Key

Complimentary Component

Power Supply

Transformer

Yes

Optional

No

Exceeds Standard

The UL limit of 15 volts AC at the Power Supply under no load (Open Circuit) was established for life safety due to shock potential in wet conditions. The Standard also requires a grounded isolation barrier between the primary and secondary windings. In the Pool & Spa Standard the primary must be 120V & the connection must be in a separate junction box or compartment.

	Q-SET = 3 UL Listings	UL 1838 UL Pool & Spa UL 2108
	Q-HEX = 2 UL Listings	UL 1838 UL 2108
	QOM = 1 UL Listing	UL 1838