

## Models FCLS-Slim & HFCLS-Slim (Regular & High Efficiency Flexible Cathode Light Strip)

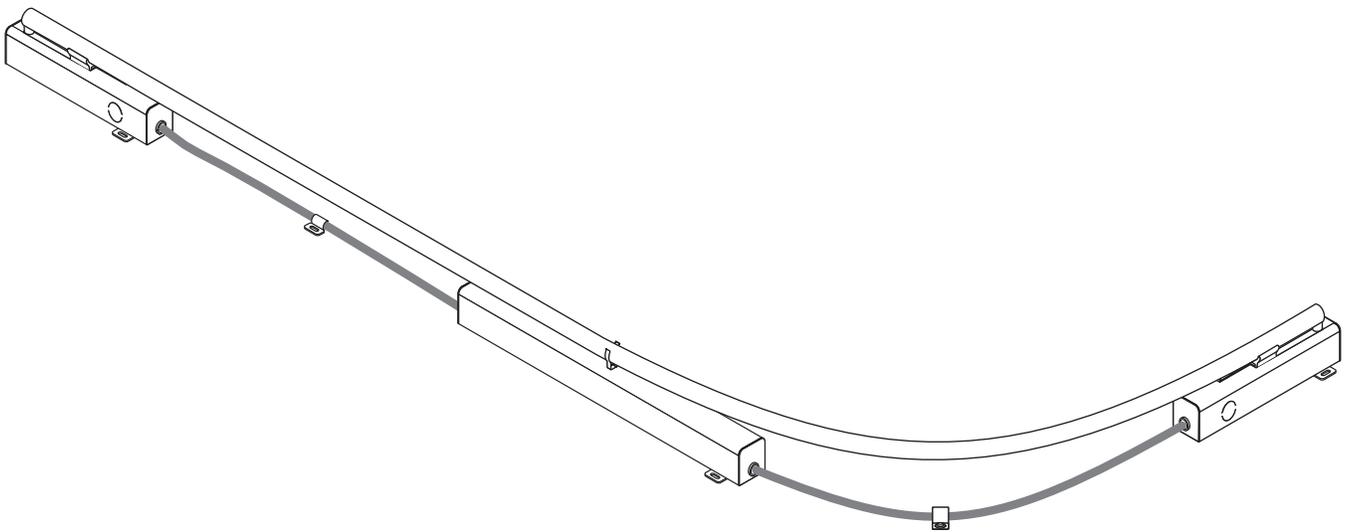
For indoor dry or protected indoor damp location installation only.  
Operating temperature range 55° F to 90°F.



Patent 6,454,431  
Patent 7,293,895

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### PLEASE READ THIS MANUAL THOROUGHLY PRIOR TO INSTALLING THIS LUMINAIRE

**WARNING:** These luminaires are to be installed in surface-mounted, non-concealed locations only. They may not be recessed into the building structure. No part of the luminaire may be concealed behind drywall, permanent ceiling, or any other similar structure.

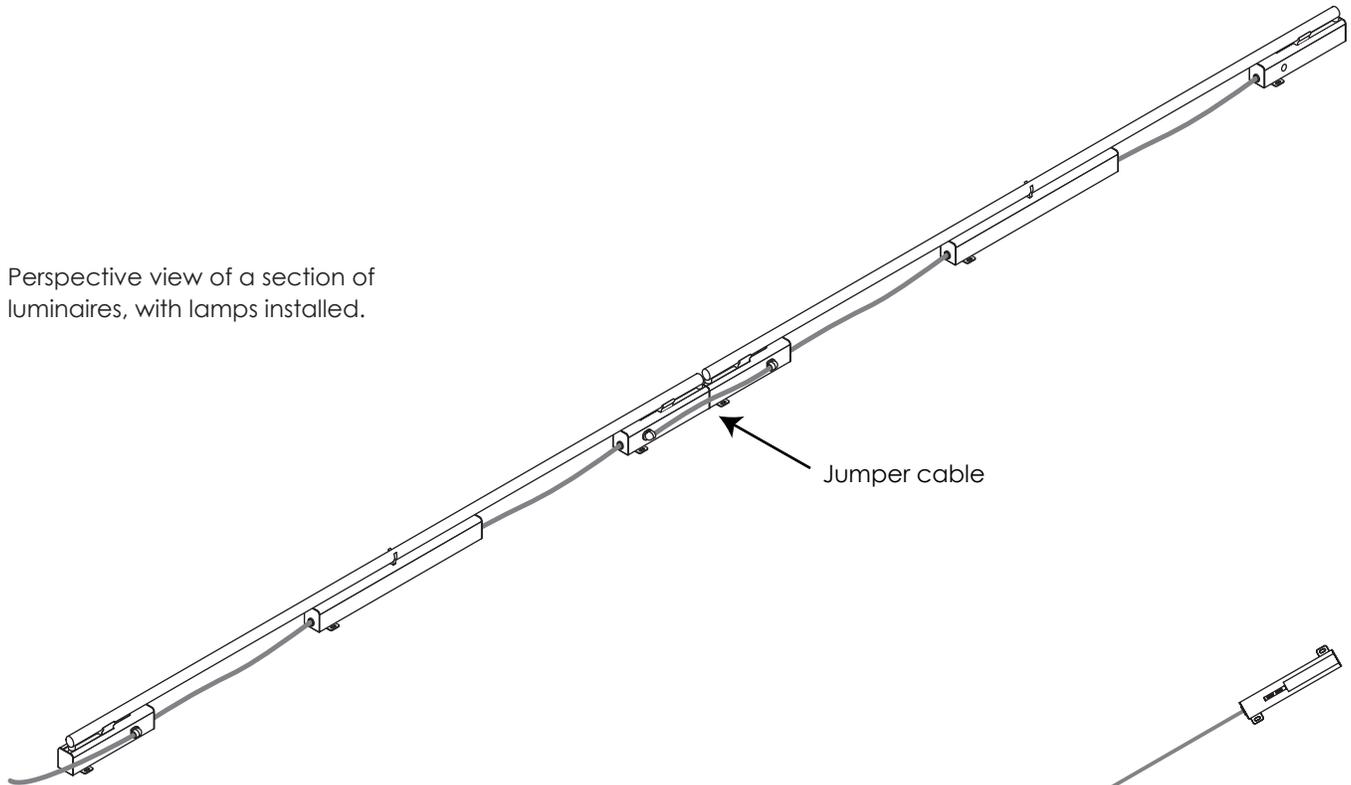
This luminaire must be installed by a licensed electrical contractor, and must be installed in accordance with all applicable local, and national electric codes.

This flexible cold cathode fluorescent luminaire has been designed to allow a single flexible luminaire to be utilized with a variety of cold cathode lamp shapes and sizes. The modular connection method used to electrically wire one luminaire to the next allows for rapid installation. Each luminaire is composed of three anodized aluminum enclosures, permanently connected by two lengths of flexible electrical cord. The middle enclosure contains the ballast. The two end-enclosures each contain a lampholder into which lamp ends are inserted and electrically connected. A jumper cable to interconnect luminaires is provided with each luminaire. Utilizing electrical quick connects and snap-in strain reliefs, the jumper cable is connected to an adjacent luminaire to the branch circuit. Integral mounting brackets are incorporated into each of the aluminum enclosures, allowing the electrician to mount the luminaires with the lamps in place.

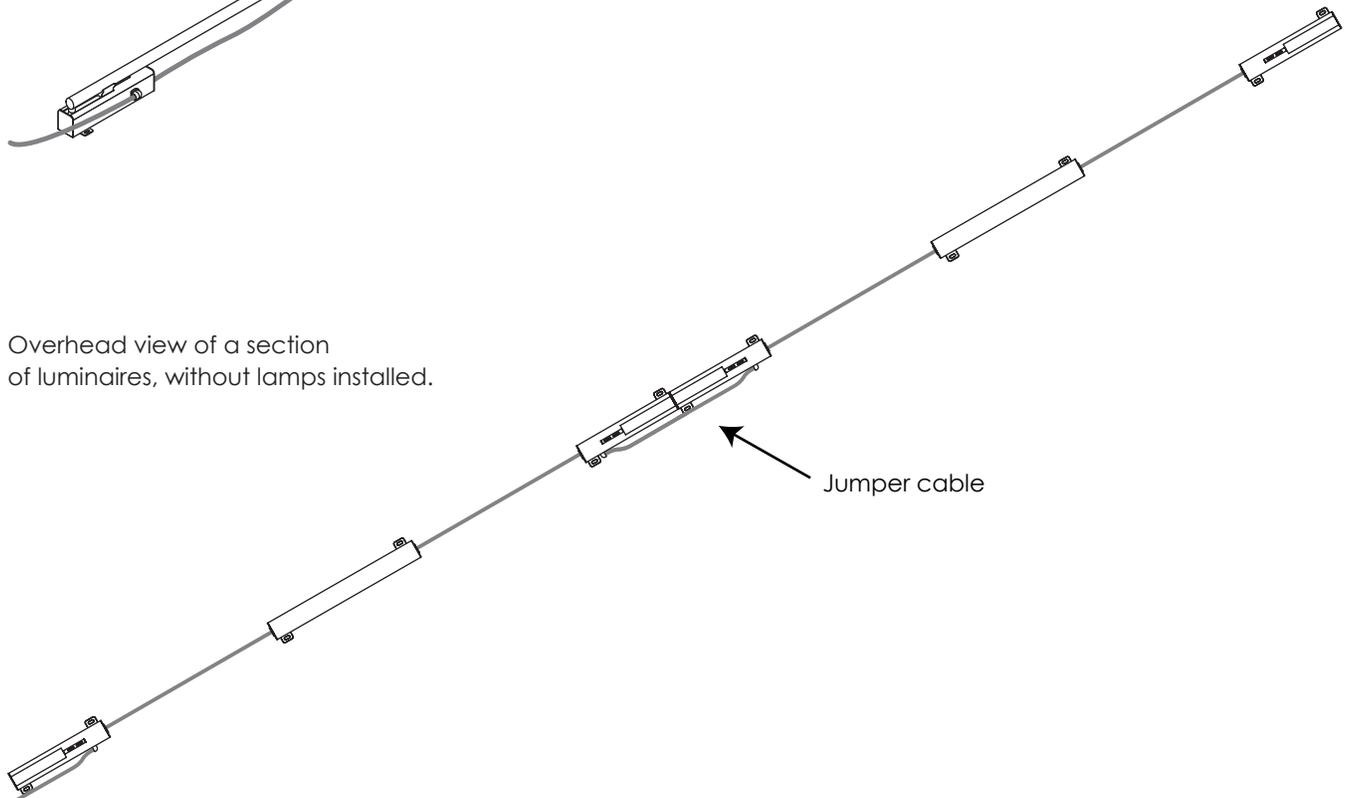
### TYPICAL LUMINAIRE CONFIGURATION

The FCLS-Slim is a flexible fluorescent luminaire, and can be configured in the field to accommodate straight, curved or bent lamps from Cathode Lighting Systems. Interconnections are made externally from one luminaire to the next using modular jumper cable assemblies which install quickly and easily.

Perspective view of a section of luminaires, with lamps installed.

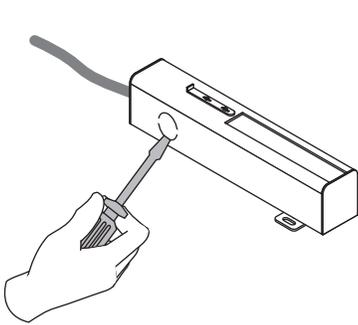


Overhead view of a section of luminaires, without lamps installed.

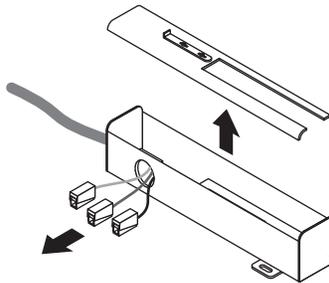


**PREPARING THE LUMINAIRE FOR INSTALLATION**

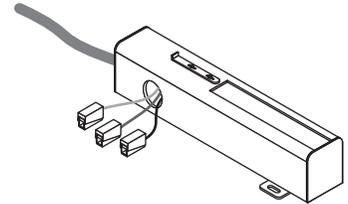
Luminaires are shipped pre-assembled from the factory. The only field preparation required is that the pryouts at the end of each luminaire must be removed and the quick-connect wiring inside must be withdrawn so that it may be connected to the pre-assembled jumper cables. In some instances, a luminaire (or array of luminaires) will terminate, and no wiring will be required into the last enclosure. The pryouts are intended to be left undisturbed in these situations.



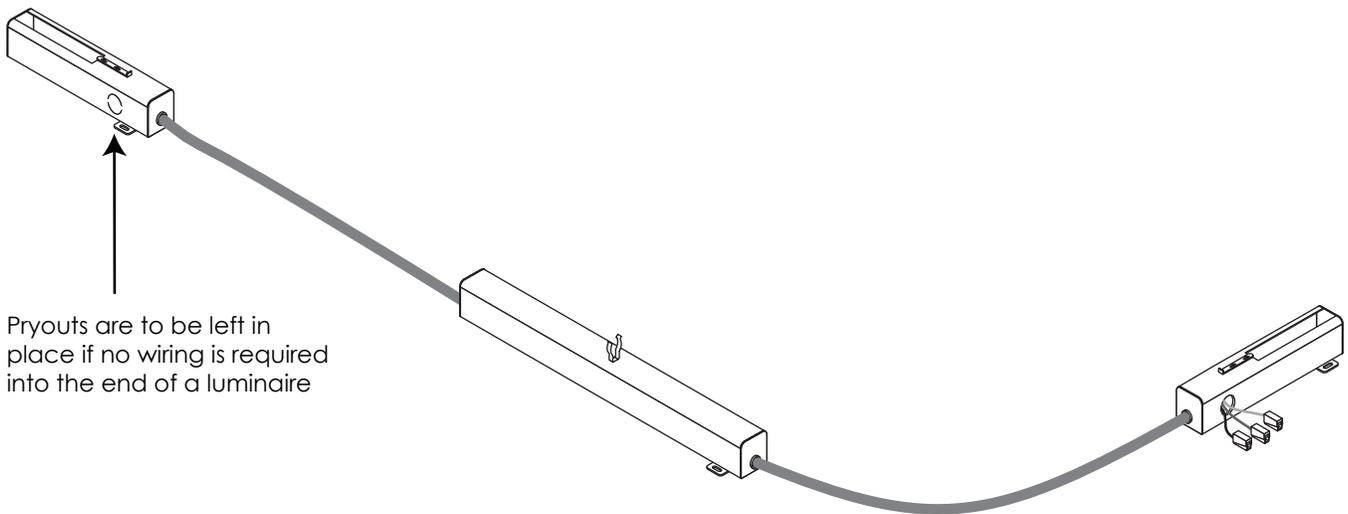
**Step No. 1:**  
Remove pryout



**Step No. 2:**  
Remove snap-on cover, discard pryout slug and carefully feed the three quick connect terminals and wire through the open hole



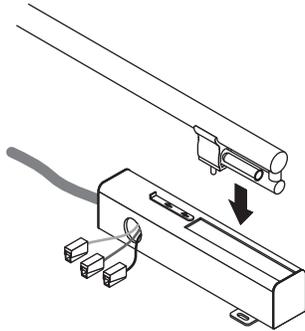
**Step No. 3:**  
Replace snap-on cover



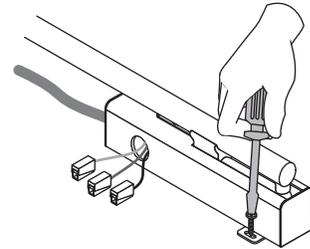
**INSTALLATION SEQUENCE OVERVIEW**

This luminaire is designed to be daisy-chained together, using a pre-assembled jumper (to connect one luminaire to the next) and quick connect terminals which allow for tool-free wiring. All luminaires are shipped from the factory with internal quick wiring terminals which must be relocated so that they are accessible from the luminaire's exterior. Once they have been relocated, they are connected to the jumper cable and then re-inserted back into the luminaire.

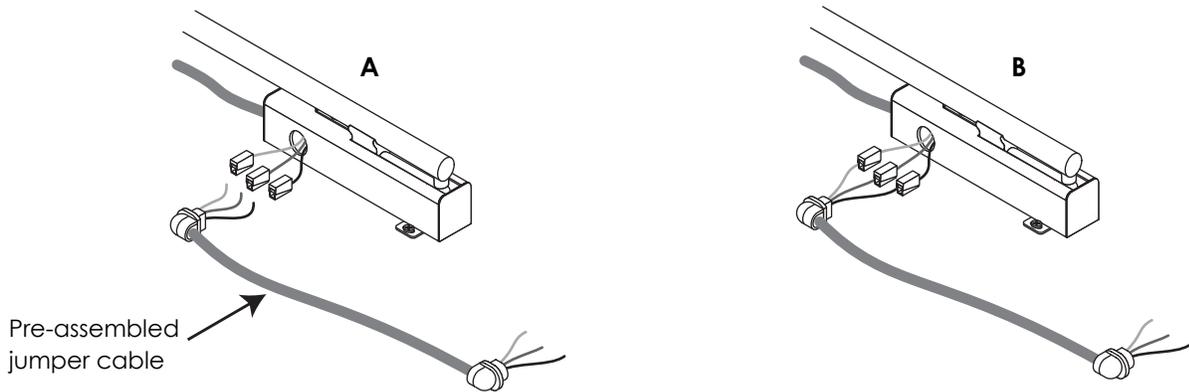
**Step No. 1:**  
Insert lamp



**Step No. 2:**  
Mount luminaire



**Step No. 3:**  
Connect jumper wires to quick connect terminals: Black to Black (hot) , White to White (neutral) and Green to Green (ground)



**Step No. 4:**  
Carefully install wiring back into luminaire and push snap-in strain relief into the hole until it clicks into place. Jumper may now be connected to the adjacent luminaire or to the branch circuit.



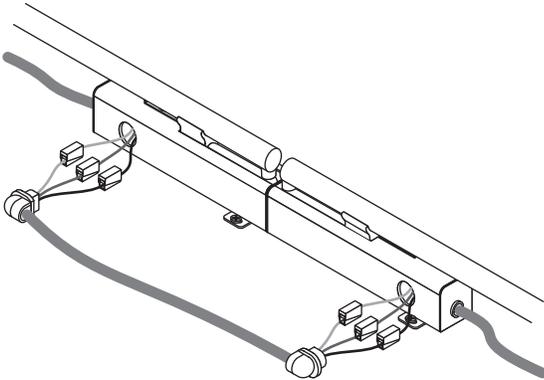
**INSTALLATION SEQUENCE OVERVIEW (Continued)**

Shown below are schematics of the two typical configurations which utilize the jumper cable.

**Wiring to an adjacent luminaire**

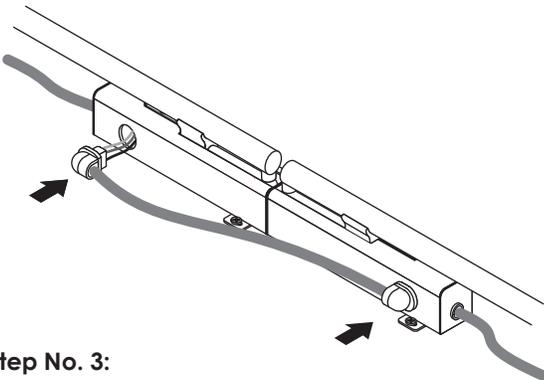
**Step No. 1:**

After luminaires have been mounted in place, make the electrical connections, using the integral quick connect fittings.



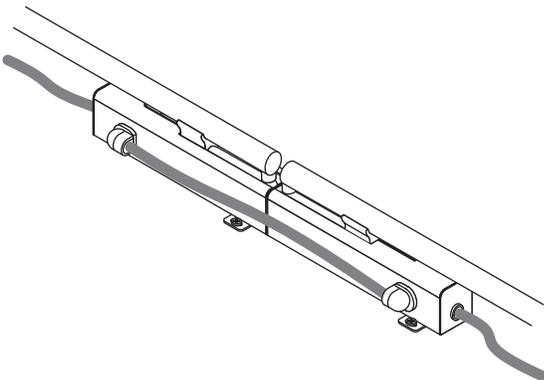
**Step No. 2:**

Push the connections carefully back into the luminaire and snap the strain relief fittings into the luminaire.



**Step No. 3:**

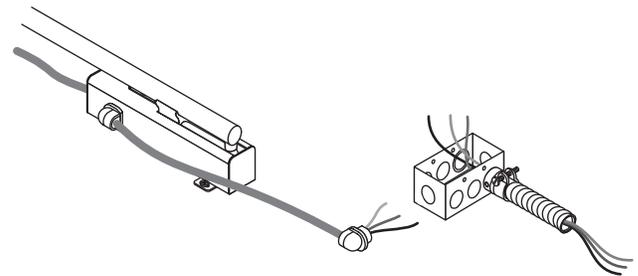
The completed connection



**Wiring from the luminaire to the branch circuit**

**Step No. 1:**

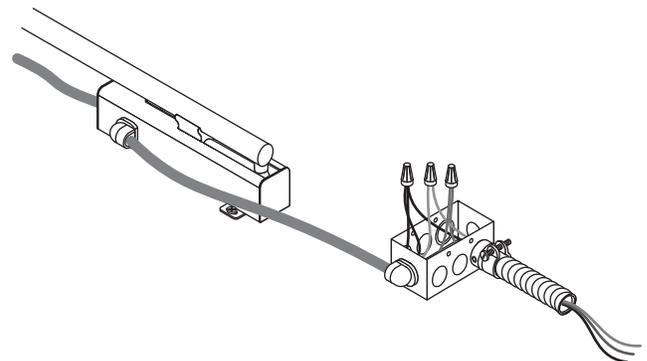
With one end of the jumper cable attached and electrically connected to the luminaire, snap the strain relief into the 1/2" (trade size) pryout in the junction box



**Step No. 2:**

Using UL-listed wire connectors, connect:

- the black lead of the jumper cable to the hot branch circuit or the hot dimmer lead
- the white lead of the jumper cable to the neutral branch circuit or neutral dimmer lead
- the green lead of the jumper cable to ground

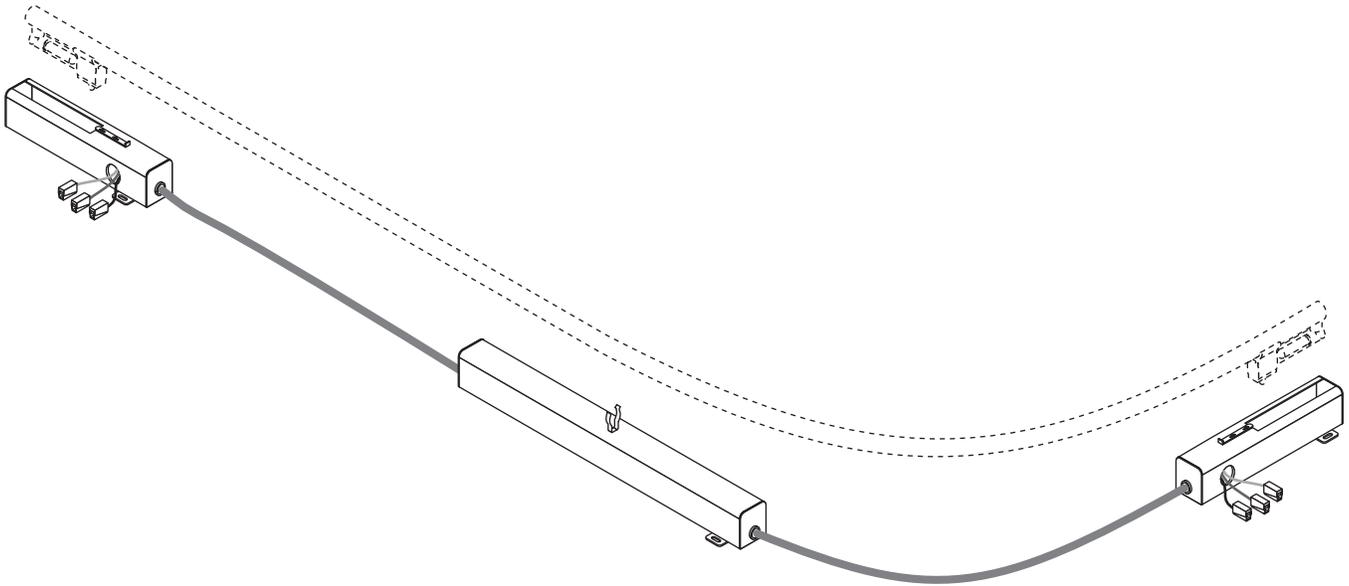


## MOUNTING THE LUMINAIRE

WARNING: ALL CIRCUITS MUST BE DE-ENERGIZED DURING THE INSTALLATION OF THIS PRODUCT

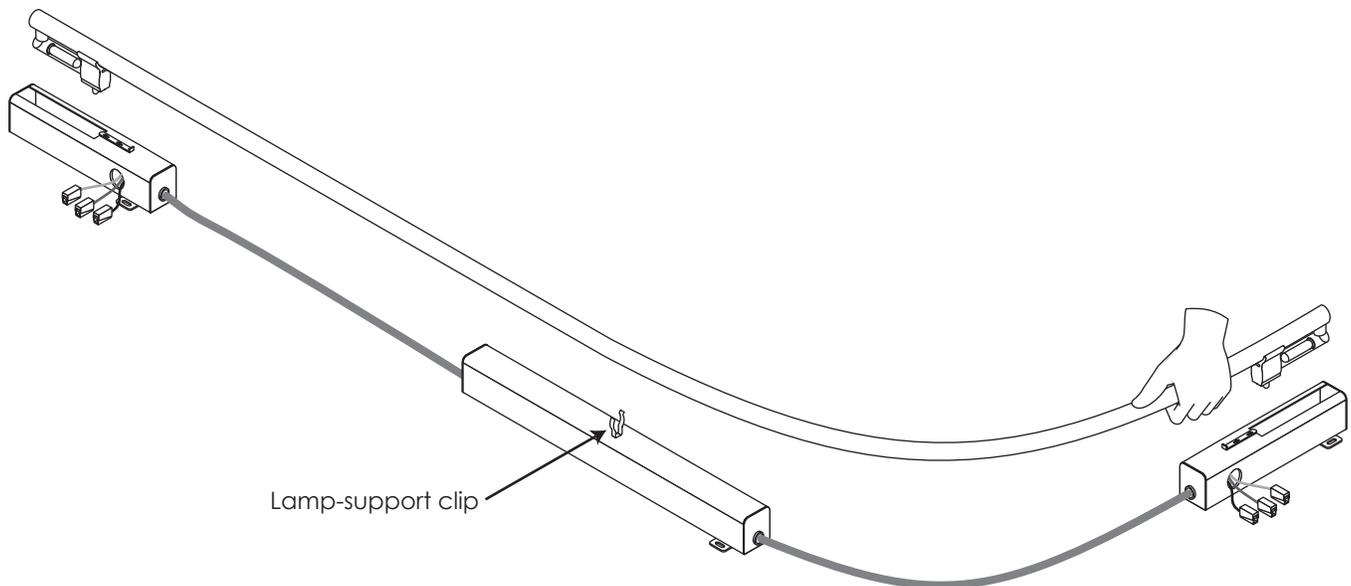
### Step No. 1:

After removing the luminaire has been removed from its factory packaging and quick connect terminals have been pulled from within the luminaire to the outside, luminaire may be arranged on the mounting surface, using the lamp as a guideline.



### Step No. 2:

Carefully install the lamp into the luminaire, making sure lamp contacts are fully seated in the lampholders and the middle section of the lamp is snapped into the lamp-support clip.

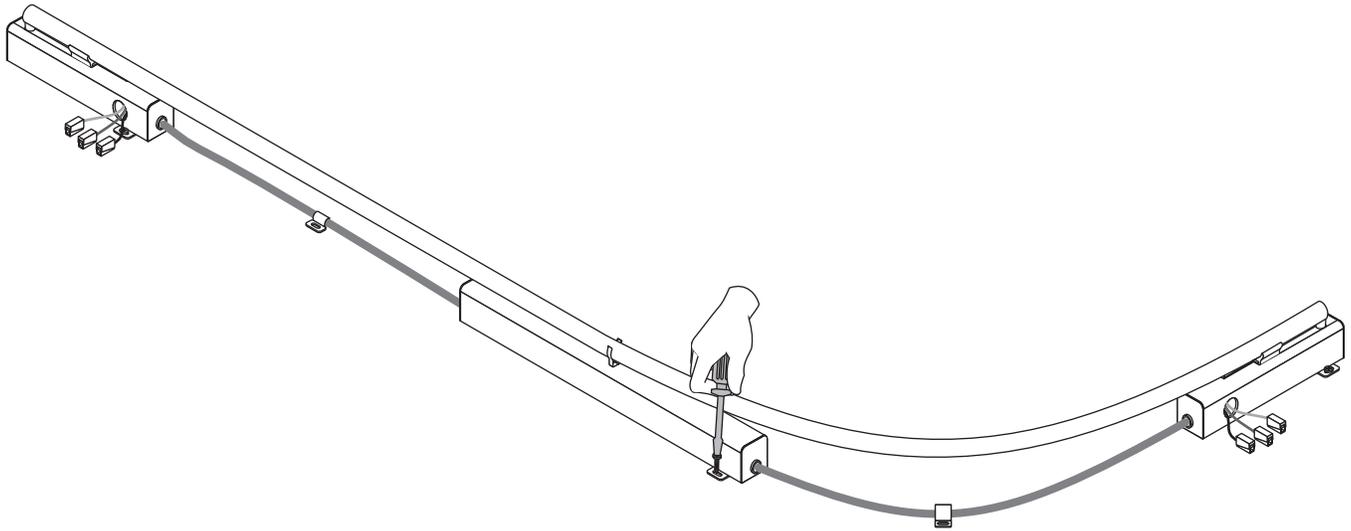


## MOUNTING THE LUMINAIRE

WARNING: ALL CIRCUITS MUST BE DE-ENERGIZED DURING THE INSTALLATION OF THIS PRODUCT

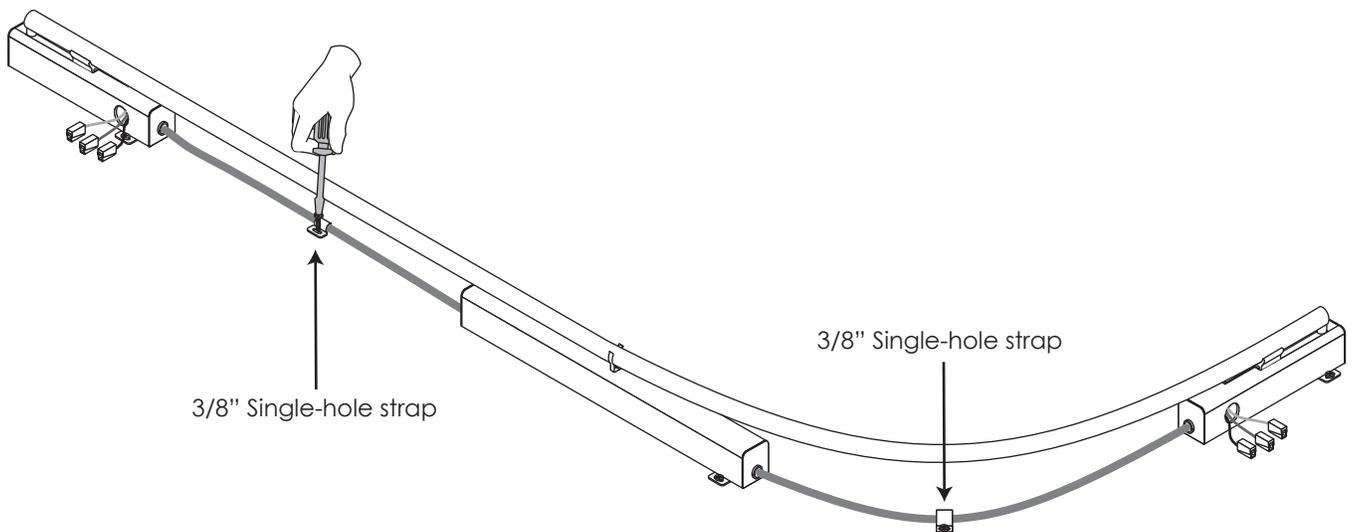
### Step No. 3:

Using the correct fasteners, fasten each of the three metal boxes to the mounting surface. Please note that each metal box has a mounting tab on each side.



### Step No. 4:

Using 3/8" single-hole cable straps (two straps are included with each luminaire) and the correct fasteners, secure the two flexible cords that interconnect the center ballast enclosure to the end lampholder enclosures. The cable straps should be installed in the middle of each cord segment.

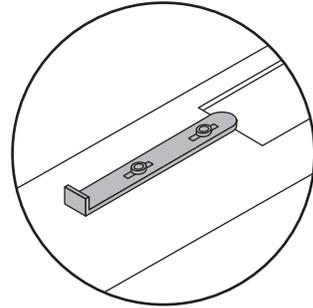


**LAMP LOCK FEATURE**

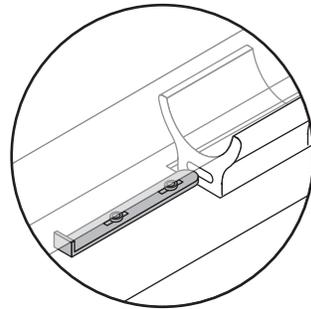
Luminaire ends are equipped with a sliding lamp-lock clip. The clip mates with a slot in the lamp base. The lamp can only be removed from the luminaire if the clip is disengaged.

**Step No. 1:**

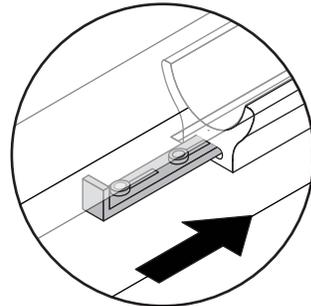
The lamp-lock clip slides forwards and backwards

**Step No. 2:**

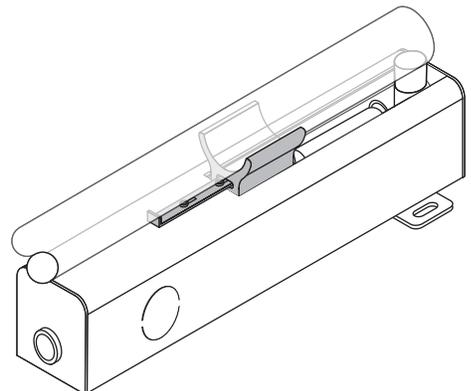
With the clip in its unlocked position, the lamp is inserted into the lampholder.

**Step No. 3:**

With the lamp properly installed, the clip is moved into its final locked position.

**Step No. 4:**

Final position of lamp-lock clip (typical for both lamp ends) Lamp cannot be removed from lampholders unless clip is slid to its unlocked position.

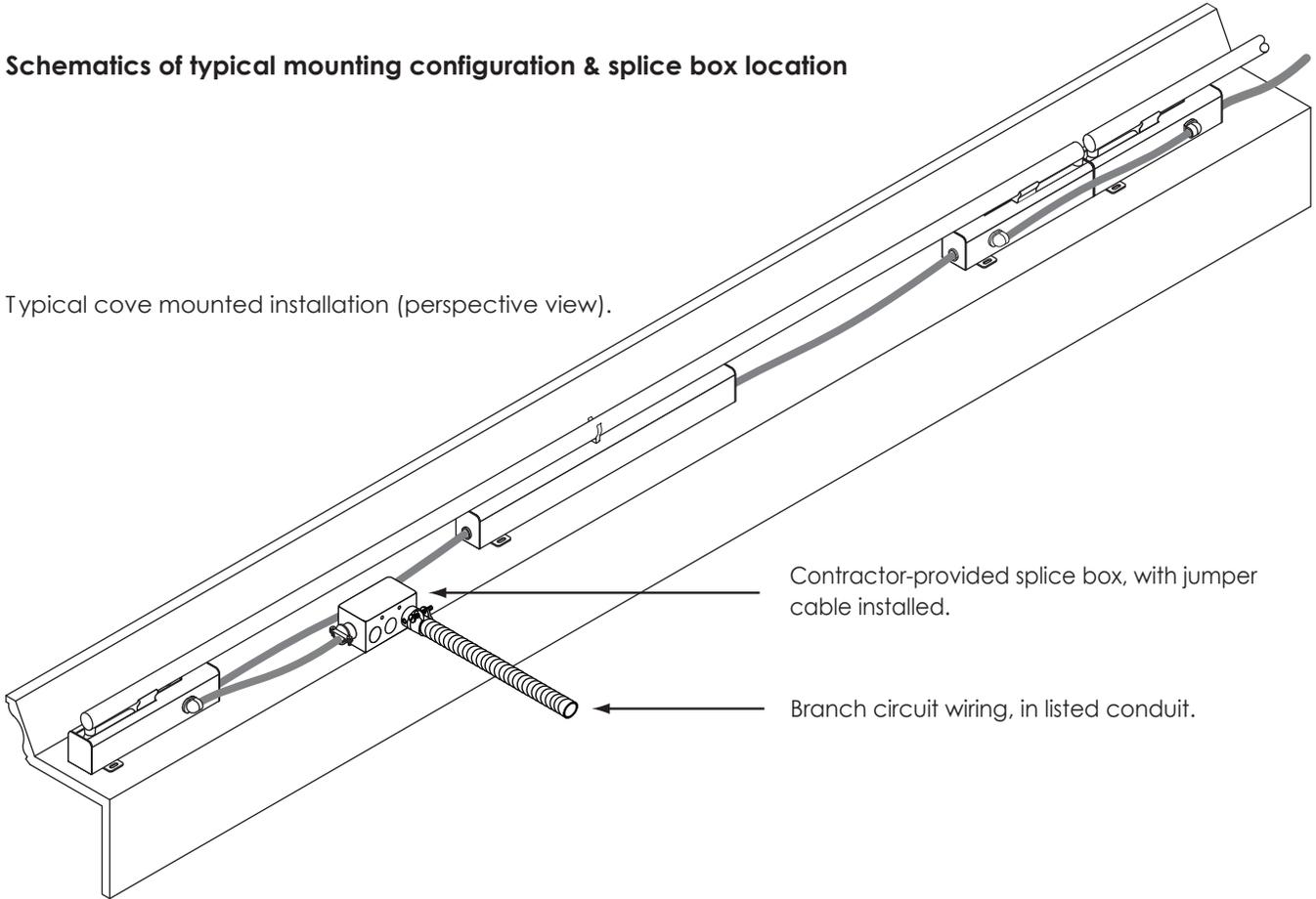


**CONNECTION TO THE BRANCH CIRCUIT**

Each luminaire or luminaire array (depending upon the requirements of the lighting installation) are powered from a branch circuit. A splice box (for each circuit) is installed in the cove. The #14 jumper cable extending from the end of the luminaire is wired directly into the splice box, which is wired (in conduit) to the branch-circuit breaker panel. Splice box may either be a Handy Box or a 1900 box. If the jumper cable is not long enough to reach the splice box, #14 AWG 3-conductor SJO cable may be supplied by the installing electrical contractor.

**Schematics of typical mounting configuration & splice box location**

Typical cove mounted installation (perspective view).

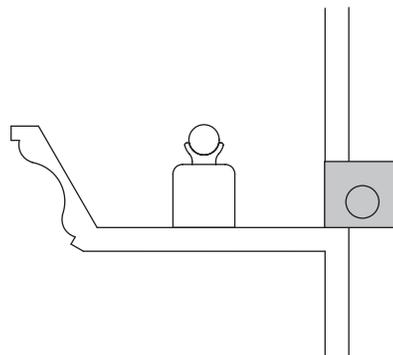
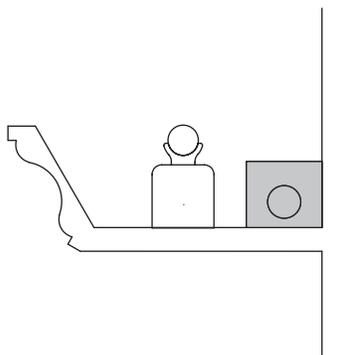


Contractor-provided splice box, with jumper cable installed.

Branch circuit wiring, in listed conduit.

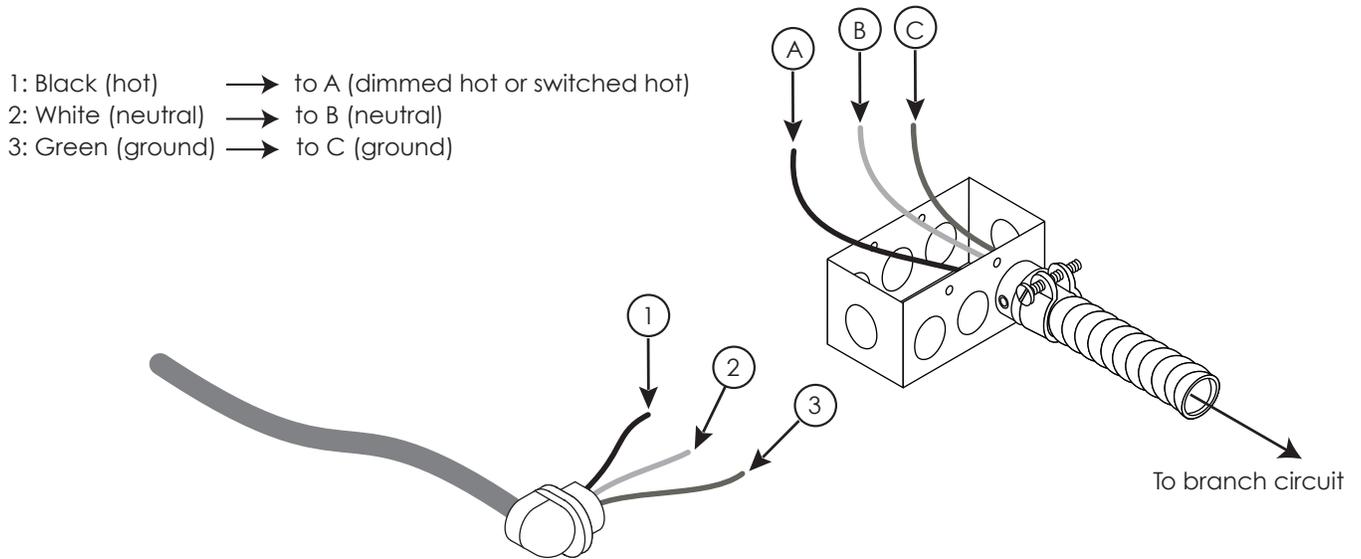
Detail of FCLS-Slim luminaire installed within a cove, showing the splice box surface-mounted inside the cove.

Detail of FCLS-Slim luminaire installed within a cove, showing the splice box flush-mounted inside the cove.

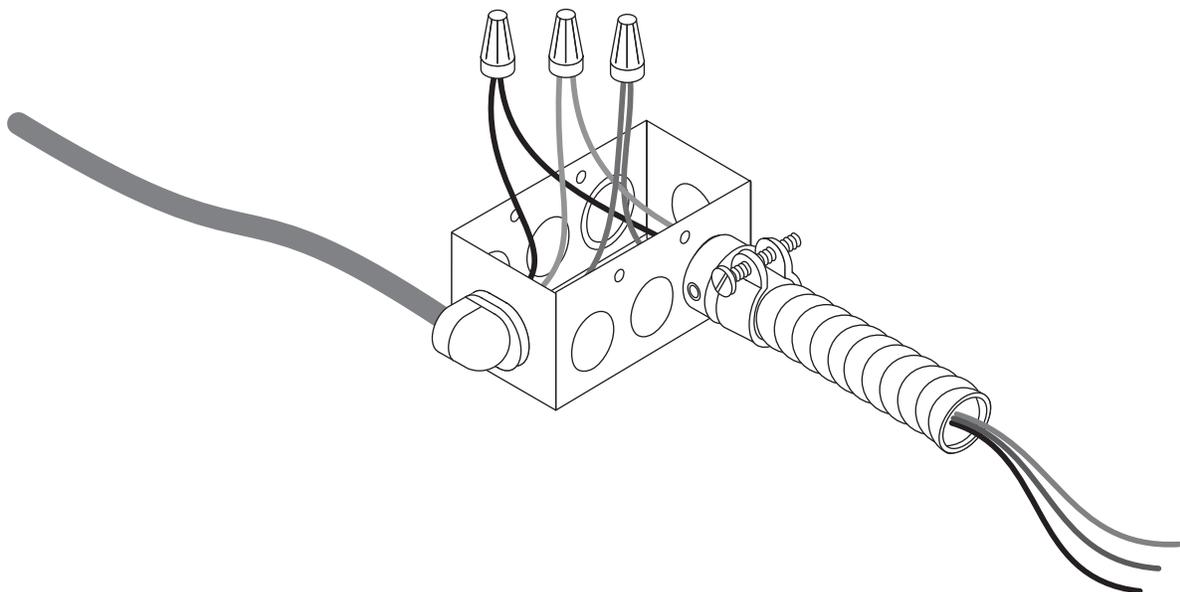


**WIRING DIAGRAM**

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Splice box shown prior to closing, with connections made, using the properly-sized UL-listed wire connectors.



**ELECTRICAL INFORMATION**

Fixture type	Primary voltage	Primary amps / VA	Watts per foot*	Dimming protocol	Maximum luminaires per 15 or 20A circuit*	Maximum lamp footage per 20-amp circuit*
FCLS-Slim	120 volts	.46 amps / 55 VA	7.8	2-wire	26 @ 120 volts	182 feet
FCLS-Slim	277 volts	.2 amps / 55 VA	7.9	2-wire	60 @ 277 volts	420 feet
HFCLS-Slim	120 volts	.34 amps / 41 VA	5.8	2-wire	35 @ 120 volts	245 feet
HFCLS-Slim	277 volts	.15 amps / 42 VA	5.9	2-wire	80 @ 277 volts	560 feet

\*Values are based upon an average 84" lamp length.

**DIMMER SELECTION**

Electronic low-voltage dimmers using reverse-phase dimming are strongly preferred (e.g. Lutron NTELV Lutron Vierti VTELV). This type of dimmer will produce the best low-end dimming effects (dimnable to 1%) and will make the ballast silent during dimming.

Forward-phase low-voltage magnetic dimmers may also be used (e.g. Lutron NTLV), however low-end dimming performance will be compromised (luminaires will only dim to 20%) and ballast noise may be audible during dimming.

**CIRCUITING NOTES**

Connection cable ratings: #14 AWG, maximum allowable current for this cable is 12 amps.

**DO NOT EXCEED MAXIMUM NUMBER OF LUMINAIRES PER CIRCUIT.**

Branch circuit requirements: Conduit or MC cable containing two conductors, plus a ground wire. A dedicated circuit is required.

**SYSTEM CHECKLIST (PRIOR TO ENERGIZING)**

The circuit may be energized after the following items have been completed:

- A. Luminaires are properly fastened and lamps are properly installed and seated within the lampholders.
- B. All electrical connections between luminaires have been mated properly.
- C. Cable straps have been properly installed.

**TROUBLESHOOTING**

**Lamp will not light.**

The ballast in this luminaire is equipped with integral open-circuit and ground-fault protection. If the luminaire is energized without a lamp in place, the ballast will turn itself off automatically. To reset the ballast, the primary power must be turned off, and then on again. If the luminaire still does not light, the lamp could be inoperable. Contact the factory for further assistance.

**Lamp exhibits a rolling or spiraling effect**

Turn the luminaire off for five seconds, and then turn on for two seconds. Repeat this procedure 5-10 times. The rolling or spiraling should stop. If the lamp continues to roll or spiral, remove the lamp from the luminaire, wipe it with a clean rag, and reinsert the lamp. If the lamp continues to appear unstable, contact the factory for further assistance.

