

Please Read

Dimming and Switching **Panels**

LUTRON®

Installation Guide LCP128™ (LCP) and GRAFIK Systems™ (LP and CCP)

English

Español

Deutsch

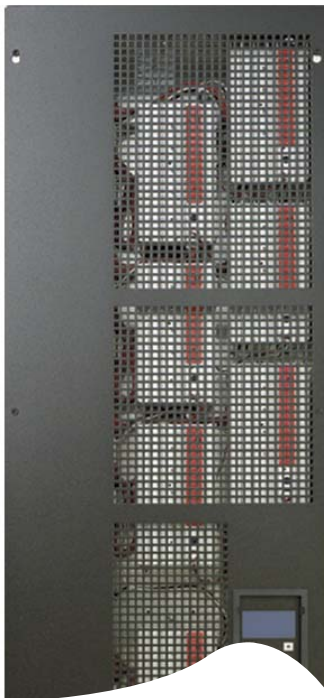
Français

中文

Português

Nederlands

Italiano



LCP Panel shown

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Overview

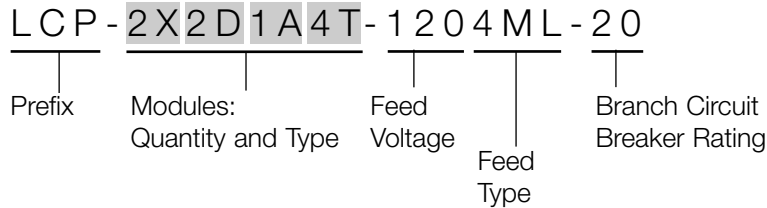
Use this guide to successfully install a dimming and switching panel. This guide describes panel installation, wiring, and load activation.

Panel Model Number Guide

LCP128™ (LCP) (120 V~ only)

See page 5 for 230/220-240 V~

Example



Prefix

LCP = LCP dimming panel

Module Types

X S D Q A M F T

List modules in the order shown above. Insert the quantity before each module code. Omit codes for modules not used in panel. See table below for limits on numbers of modules per panel.

- X** = Four-Circuit Switching (Relay) (XP)
- S** = One-Circuit Dimming (1U)
- D** = Two-Circuit Dimming (2U)
- Q** = Four-Circuit Dimming (4U)
- A** = Four-Circuit Adaptive Dimming (4A)
- M** = Four-Circuit Motor (4M)
- F** = Four-Circuit Quiet Fan Speed (4FSQ)
- T** = 0-10 V, DALI (broadcast), DSI, and PWM Ballast Control (TVM)

Feed Voltage

120 for 120 V~

Feed Type/Input Ratings

FT = Feed-through panel (circuit breakers not included) / 120 V~

3ML = 1 phase 3 wire feed (split phase) / 120/240 V~

4ML = 3 phase 4 wire feed / 120/208 V~

Branch Circuit Breaker Rating

Omit for feed-through panels

20 for 20 A branch circuit breakers

Frequency - All Model Numbers and Voltages

50/60 Hz

Output (Load) Ratings

Module Type	Rating
XP	16 A per circuit
1U, 2U, 4U	16 A per module
4A	16 A per module, 10 A per output
4M	16 A per module, 5 A per output (1/4 HP motor), 1 motor per output
4FSQ	2 A per output (single ceiling fan)
TVM	50 mA per channel, 750 mA per system

Module Quantity Limits

Panel Size	Feed type	TVM	4A	4U	4M	XP
Mini	Feed-through	NA	Any combination up to 3 modules			
Mini	Feed-through	0-4	Any combination up to 2 modules; must have 1 4U or XP module minimum; each 4U or XP module can control only 2 TVM modules			
Mini	Breakers	NA	Any combination up to 3 modules			0
Mini	Breakers	0-4	Any combination up to 2 modules; must have 1 4U module minimum; each 4U module can control only 2 TVM modules			0
Standard	Feed-through	NA	Any combination up to 9 modules			
Standard	Feed-through	0-12	Any combination up to 8 modules; must have 1 4U or XP module minimum; each 4U or XP module can control only 2 TVM modules			
Standard	Breakers (main lugs)	NA	Any combination up to 9 modules			0
Standard	Breakers (main lugs)	NA	Any combination up to 7 modules			
Standard	Breakers (main lugs)	0-12	Any combination up to 7 modules; must have 1 4U module minimum; each 4U module can control only 2 TVM modules			0
Standard	Breakers (main lugs)	0-12	Any combination up to 5 modules; must have 1 4U or XP module minimum; each 4U or XP module can control only 2 TVM modules			

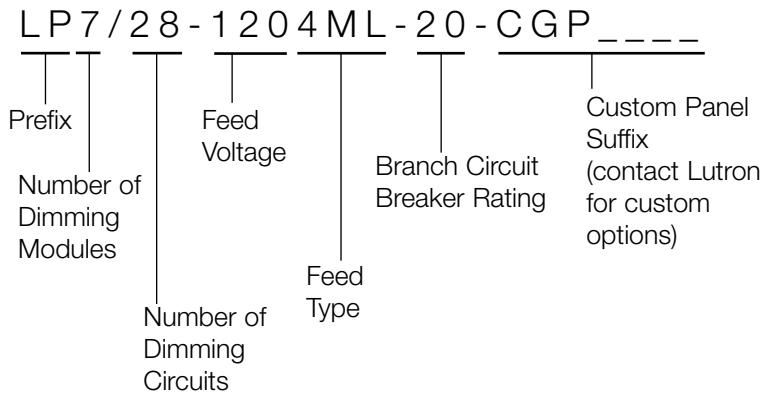
Notes

- Consult Lutron for panels with custom breaker needs.
- TVM = 0 is a TVM-ready panel; TVM modules can easily be installed in the future.
- TVM = NA is not TVM-ready

Panel Model Number Guide (continued)

GRAFIK Systems™ (LP) (all voltages)

Example



Prefix

LP = LP dimming panel

Number of Dimming Modules

Indicates number of 4-circuit (4U) dimming modules in the panel: 1 through 8; also indicates number of full load circuits

Number of Dimming Circuits

Indicates number of dimming circuits in the panel: 4, 8, 12, 16, 20, 24, 28, or 32; each module has four dimming circuits

Feed Voltage

120 = 120 V~

230 = 230 V~ (CE)

240 = 220-240 V~ (non-CE)

Feed Type

2ML = 1 phase 2 wire feed

3ML = 1 phase 3 wire feed (split phase)

4ML = 3 phase 4 wire feed

Mxx = Main Breaker;

xx = breaker size in amps (custom panel option)

IS = 3 phase 4 wire isolation switch (230/220-240 V~ only)

Input Ratings

120 V~

120/240 V~

120/208 V~

Branch Circuit Breaker Rating

20 for 20 A branch circuit breakers (120 V~ only)

20 A branch circuit breakers have a 16 A continuous load rating

15 for 15 A branch circuit breakers (120 V~ only)

15 A branch circuit breakers have a 12 A continuous load rating

13 for 13 A branch circuit breakers (230 V~ CE only)

16 for 16 A branch circuit breakers (220-240 V~ non-CE only)

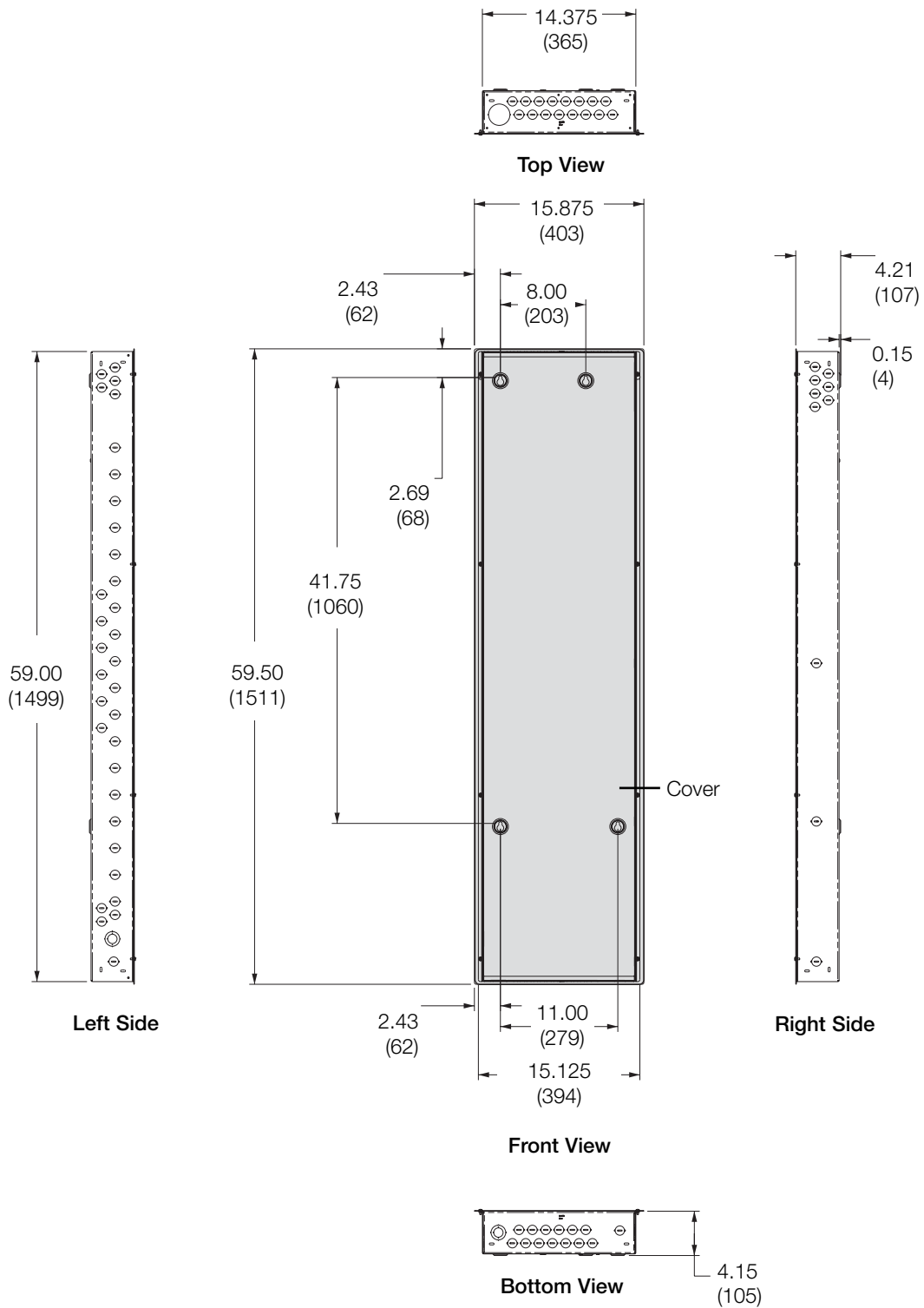
Custom Panel Suffix (optional)

Indicates panel with special options

Panel Dimensions (continued)

Standard Panel

Dimensions are in inches (mm).



Panel Mounting

Mounting Guidelines

- For Indoor Use Only! NEMA, Type 1 enclosure, IP20.
- Panel generates heat. Mount only where ambient temperature is 32-104 °F (0-40 °C).
- Relative humidity must be < 90% non-condensing.
- Reinforce wall structure for panel weight and local codes; see table.
- Allow 12 in. (305 mm) clearance above and below panel.
- Mount within 7° of true vertical.
- Mount panel where audible noise is acceptable. (Internal relays click.)
- Mount panel so line (mains) voltage wiring is at least 6 ft. (1.8 m) from audio or electronic equipment and associated wiring.
- Install in accordance with all national and local electrical codes.

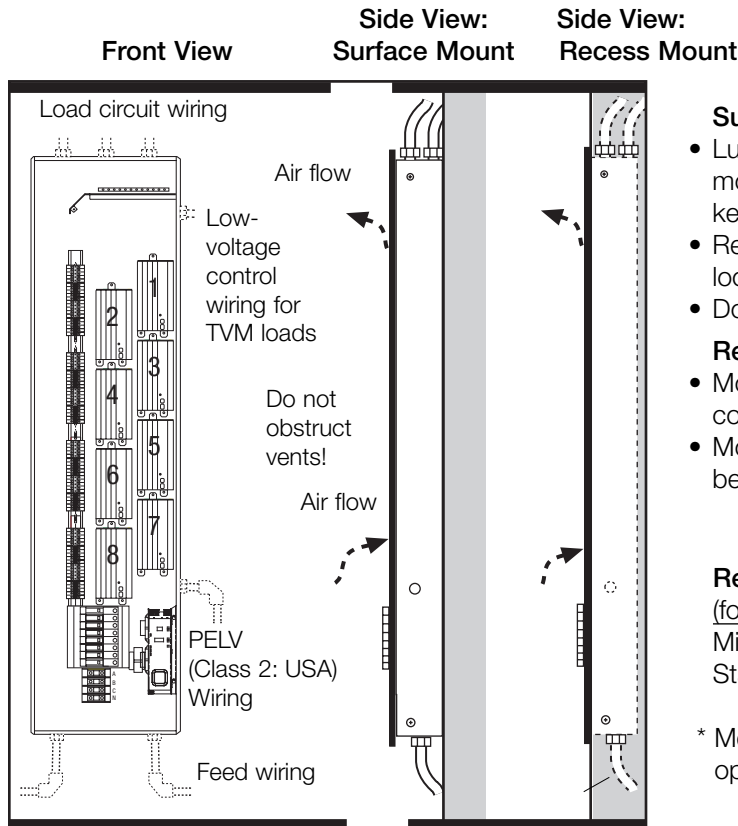
No. Modules	Max. Heat BTUs (Kcal)/Hr.	Max. Weight w/o Packaging Pounds (kg)
1	90 (22.68)	24 (11)
2	170 (42.84)	35 (16)
3	250 (63.00)	37 (17)
4	330 (83.16)	68 (25)
5	410 (103.32)	71 (26)
6	490 (123.48)	74 (27)
7	570 (143.64)	77 (28)
8	650 (163.80)	80 (29)
9	730 (183.96)	83 (30)



Caution! This equipment is air-cooled. Vents must not be blocked or you will void the warranty.



Caution! 230 V \sim panels with 13 A circuit breakers are intended for industrial or commercial use only.



LP8/32-1204ML-20 shown

Surface Mounting

- Lutron recommends using 1/4 in. (6 mm) mounting bolts (maximum size accepted by keyholes).
- Reinforce wall structure as required for weight and local codes.
- Do not mount panel directly to wall board/drywall.

Recess Mounting

- Mount to wall stud by screwing through slots in corners of panel.
- Mount panel between flush and 1/8 in. (3 mm) below finished wall surface.

Recommended Mounting Heights*

(for LCP128 systems)

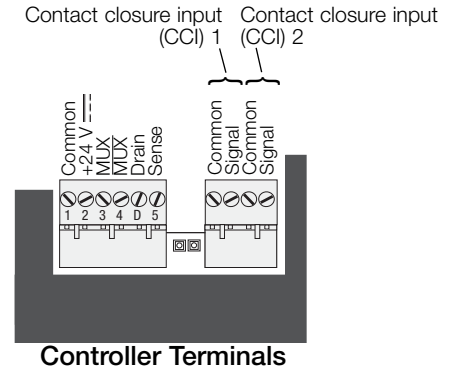
Mini	45 in. (1143 mm)
Standard	25 in. (635 mm)

* Measure from floor to bottom of panel; optimal viewing height for controller.

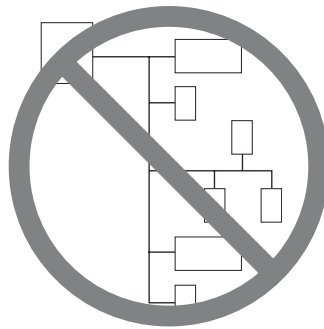
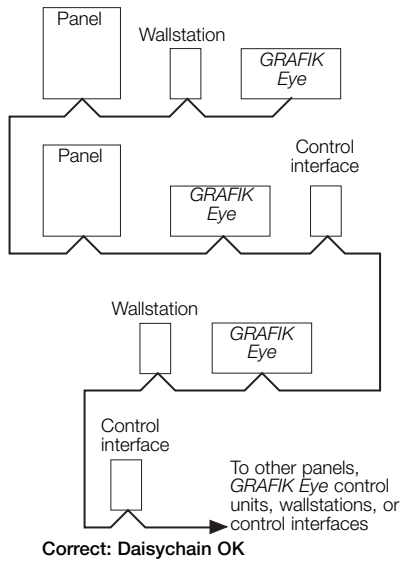
System Wiring Overview

Review the options below for information on wiring your panel correctly into your specific system.

A. LCP128 panel: Refer to the *LCP128 Setup and Operation Manual* for detailed wiring information.

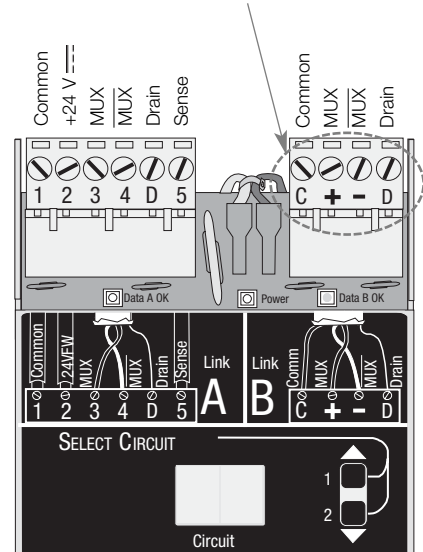


B. LP or CCP panel as a part of a GRAFIK Eye 4000 lighting system: Refer to the *GRAFIK Eye 4000 Installation, Setup, and Operation Manual* and the system overview pictured here for detailed wiring information.



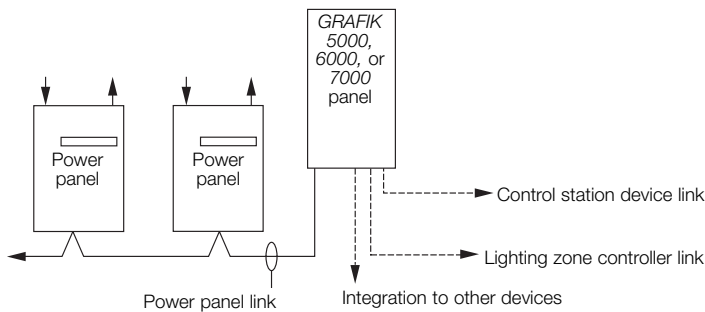
Incorrect: Branch, T-tap, or home run not acceptable

Note: Single-link circuit selectors will not have Link B connector.



Circuit Selector Terminals

C. LP or CCP panel as a part of a GRAFIK 7000 lighting system: Refer to the *GRAFIK 7000 Installation, and Maintenance Guide* and the system overview pictured here for detailed wiring information.



Wiring (continued)

Feed and Load Wiring Overview

Feed Wiring (Mains Voltage Wiring)

- Preferred feed wiring entry for panels with main lugs/isolation switch is from the bottom left of the panel.
- Preferred feed wiring entry for feed-through panels is from the top or bottom left of the panel, wired directly to module terminal blocks.
- Run wiring so that line (mains) voltage wiring will be at least 6 ft. (1.83 m) from sound or electronic equipment and its wiring.
- Refer to Feed Wiring pages for more information.

Load Circuit Wiring

- Connect load wiring to the appropriate terminal block set for each module.
- For 230 V \sim and 240 V \sim panels, “Hot” is referred to as “Live”. Therefore, terminals will be labeled DL and L.
- The Dimmed Hot/Live (DH/DL) terminal block is grouped with a numbered Hot/Live (H/L) (H1, H2, etc./L1, L2, etc.). The number represents both the module and circuit breaker number.
- Output terminal blocks accept one #14-#10 AWG (2.5-4.0 mm²) wires. Preferred entry is from the top left of the panel.
- Refer to Load Wiring pages for more information.



Caution! Common neutrals are not permitted. Run separate neutrals for each load circuit.



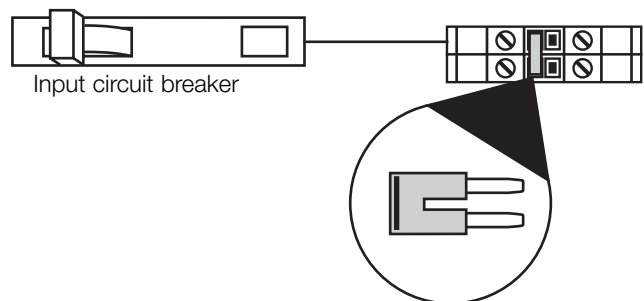
Caution! Panels require entry of wires as specified. Improper entry will block serviceable parts and impede air flow through the panel.

Temporary Lighting

You do not need to install a temporary distribution panel. Connect load wires into the appropriate terminal blocks. Each input breaker can supply power to a load while the bypass jumper protects the module from load faults.



Caution! Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause over-voltage damage to the equipment. Do NOT remove bypass jumpers at this point--they protect the modules from load faults.



Bypass jumper protects the module from load faults.

Ratings

LP/LCP/CCP Panels

Feed-Through Panels (all voltages)

Number of Modules	Feed Type	Max. Feed
1 2 3 4 5 6 7 8 9	1Ø, 2W #14-#10 AWG (1.5-4.0 mm ²)	120 V \sim : 20 A 230 V \sim : 13 A or 16 A 220-240 V \sim : 16 A

Panels with Breaker (120 V \sim only)

Number of Modules	Feed Type
1 2 3	1Ø, 2W 1Ø, 3W 3Ø, 4W #14-#10 AWG (1.5-4.0 mm ²)

Panels with Main Lugs (120 V \sim only)

Number of Modules	Feed Type	Maximum Feed
4 5 6 7 8 9	1Ø, 3W or 3Ø, 4W #14-#2/0 AWG (25-70 mm ²)	175 A

Panels with Breaker (220-240 V \sim and 230 V \sim only)

Number of Modules	Feed Type
1 2 3	1Ø, 2W 1Ø, 2W 3Ø, 4W #14-#12 AWG (1.5-4.0 mm ²)

Panels with Isolation Switch (220-240 V \sim and 230 V \sim only)

Number of Modules	Feed Type	Maximum Feed	
		230 V \sim	220-240 V \sim
4 5 6 7 8	3Ø, 4W #14-#2/0 AWG (25-70 mm ²)	125 A	125 A

Feed-Through Panel: Feed and Load Wiring (all voltages)

General Notes

- Typical dimming/switching legs shown.
- Do not remove bypass jumpers until after load wiring has been verified.

Wire sizes for power feed, to each input

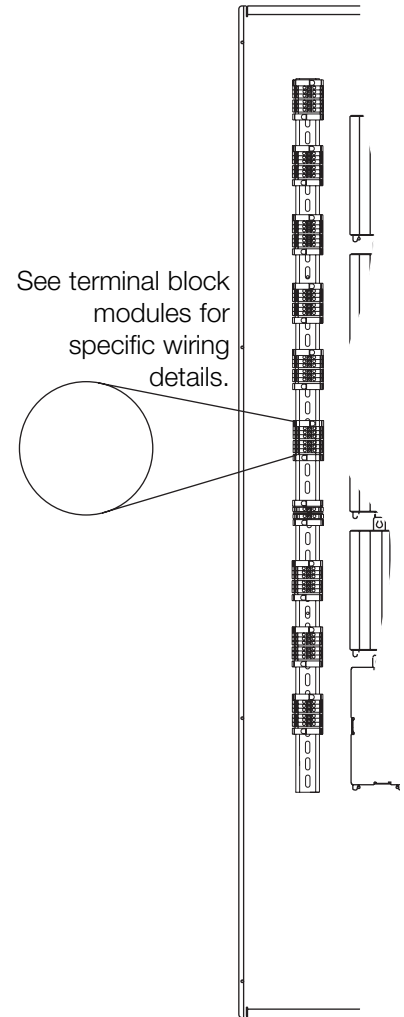
- Power feed: #14 AWG (2.5 mm²) to #10 AWG (4.0 mm²)
- Neutral feed: #14 AWG (2.5 mm²) to #10 AWG (4.0 mm²)

Wire sizes for load wiring, from each output

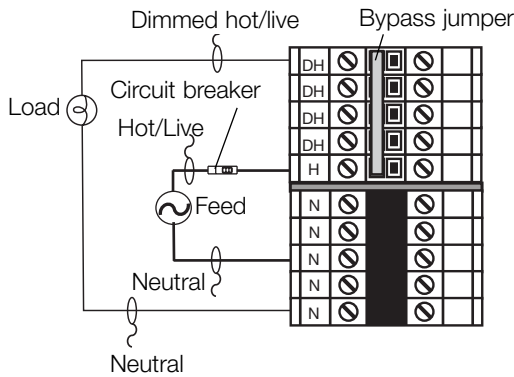
- Dimmed hot (live): #14 AWG (2.5 mm²) to #10 AWG (4.0 mm²)
- Load neutral: #14 AWG (2.5 mm²) to #10 AWG (4.0 mm²)

Control Circuit Power

- Supplies power for internal operation.
- Requires dedicated feed with same voltage and phase as panel.
- Must be 1/4 in. (6 mm) away from PELV (Class 2: USA) control wiring harness.
- Panel voltage (see pages 2-3) indicates feed voltage.
- For 230 V \sim and 240 V \sim panels, "Hot" is referred to as "Live". Therefore, terminals will be labeled L and DL.

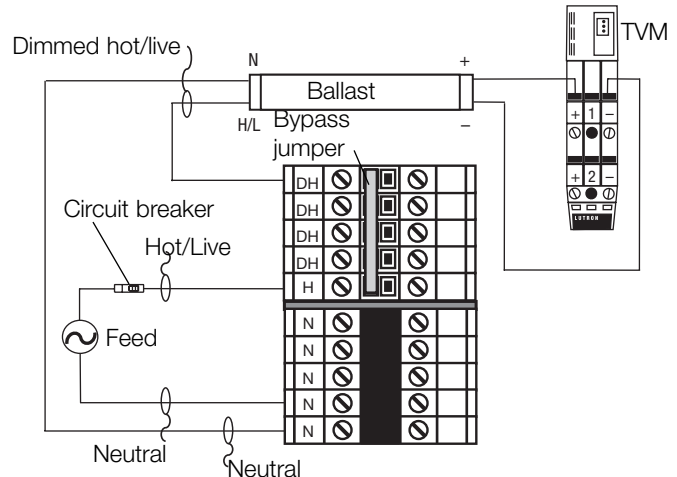


- 4-Circuit Dimming Module (4U)
- 4-Circuit Adaptive Dimming Module (4A)
- 4-Circuit ELV Dimming Module (4E: 230 V \sim and 220-240 V \sim only)
- 4-Circuit Quiet Fan Speed Module (4FSQ)

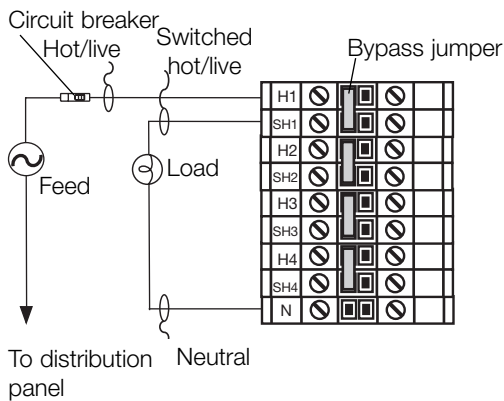


TVM Module

For 0-10 V, PWM, Tridonic® DSI, and DALI loads. Each TVM controls two consecutive circuits of lighting and are the first circuits in the panel. Maximum low-voltage ballast control current: 50 mA per zone, 750 mA per panel. Dimming or switching module is used to switch power to the ballast.

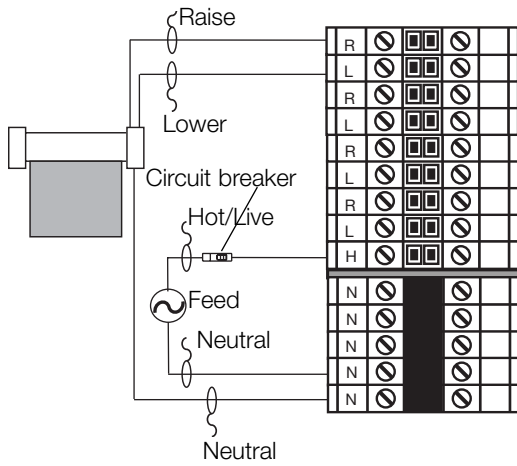


4-Circuit Switching (Relay) Module (XP)

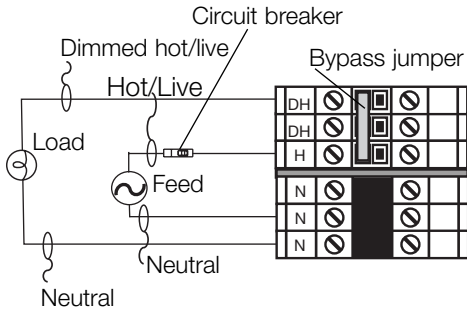


Feed-Through Panel: Feed and Load Wiring (continued)

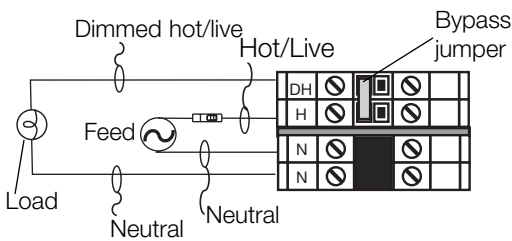
4-Circuit Motor Module (4M)



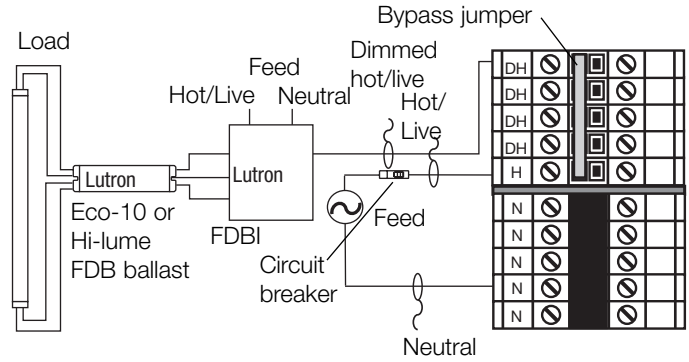
2-Circuit Dimming Module (2U) (LCP and CCP only)



1-Circuit Dimming Module (1U) (LCP only)



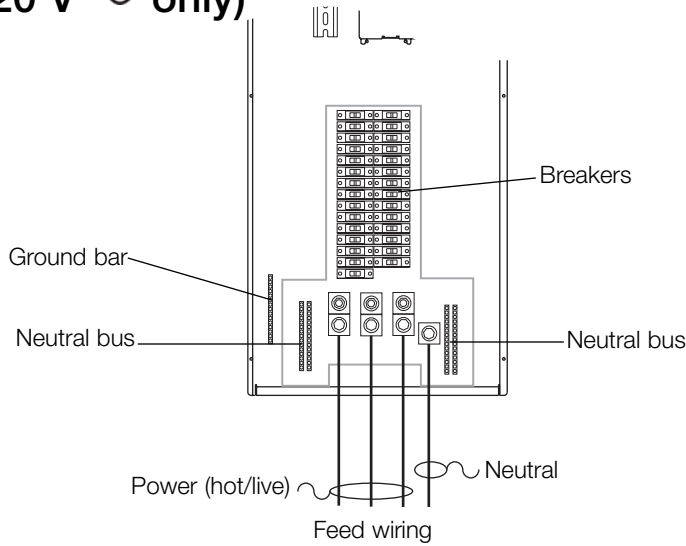
Connecting an NGRX-FDBI to a Panel



Refer to FDBI Installation Sheet for detailed wiring.

Panel with Main Lugs: Feed Wiring

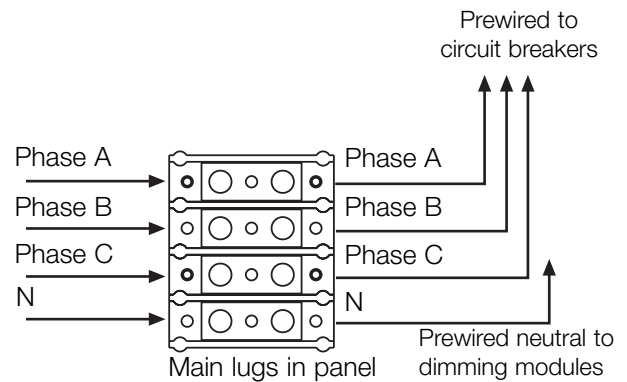
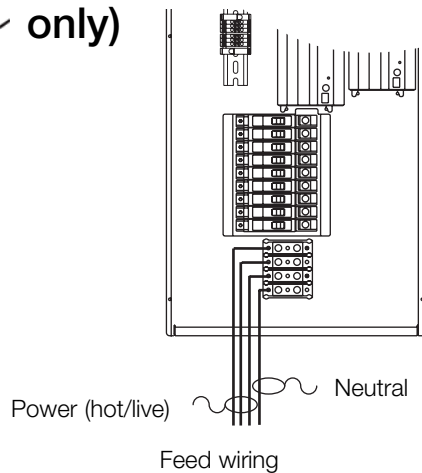
Dimming and Switching Panels (120 V ~ only)



Notes

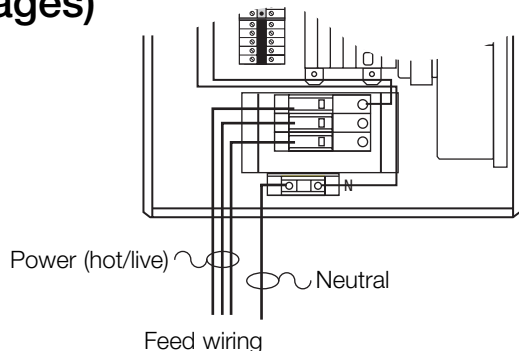
- See page 15 for load wiring details.
- On **dimming panels** only, the input breaker of Circuit 1 supplies current to Load Circuit 1 and to the Control Wiring (2 A draw max.). Panels with switching modules have a dedicated circuit breaker for the control circuit.

Dimming Panels (120 V ~ only)

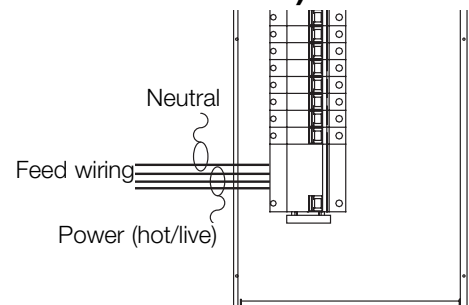


Main Lugs feed wiring gauge:
#2/0 AWG (70 mm²)

Mini Panel Breaker Wiring (all voltages)



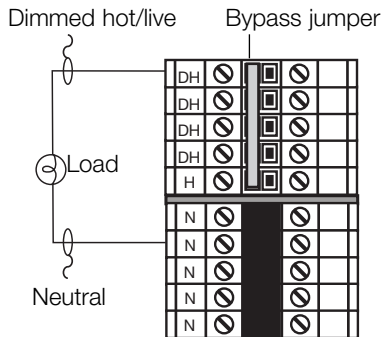
Dimming Panels Isolation Switch (230/220-240 V ~)



Panel with Main Lugs: Load Wiring

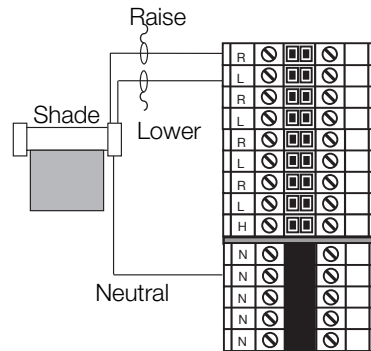
Typical Dimming/Switching Leg Shown

- 4-Circuit Dimming Module (4U)
- 4-Circuit Adaptive Dimming Module (4A)
- 4-Circuit ELV Dimming Module (4E: 230 V \sim and 220-240 V \sim only)
- 4-Circuit Fan Speed Control Module (4FSQ)

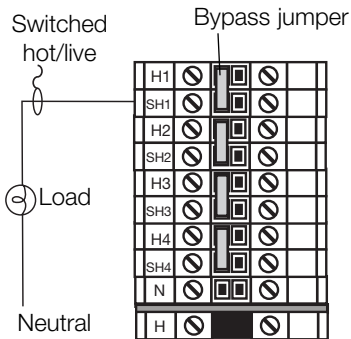


Caution! Do not remove bypass jumpers until after load wiring has been verified.

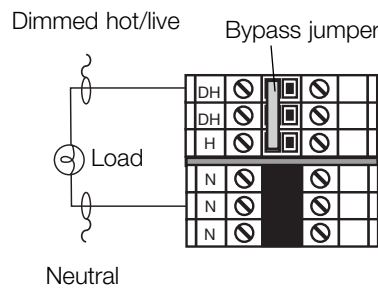
4-Circuit Motor Module (4M)



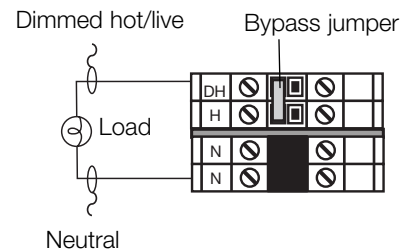
4-Circuit Switching Module (XP)



2-Circuit Dimming Module (2U) (LCP only)

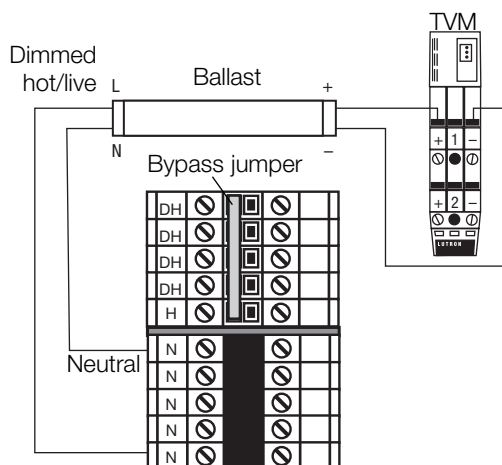


1-Circuit Dimming Module (1U) (LCP only)



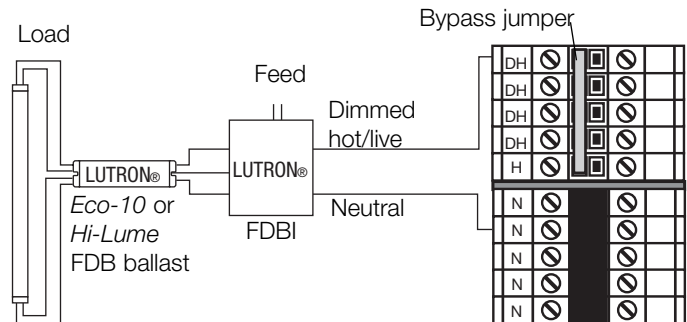
Load Wiring for TVM Module

For 0-10 V, PWM, and Tridonic® DSI loads. Each TVM controls two consecutive circuits of lighting and are the first circuits in the panel. Maximum low-voltage ballast control current: 50 mA per zone, 750 mA per panel.



Connecting an NGRX-FDBI to a Panel

For Hi-Lume® FDB or Eco-10™ Fluorescent Dimming Ballast



Activate Loads in Bypass

Activate Loads in Bypass

A. Complete load wiring.

B. Check that the bypass jumpers are in place.

These jumpers protect from load faults and must be used to check load wiring when it is installed or modified.



Caution! Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause damage to the equipment.

C. Turn circuit breaker 1 ON.

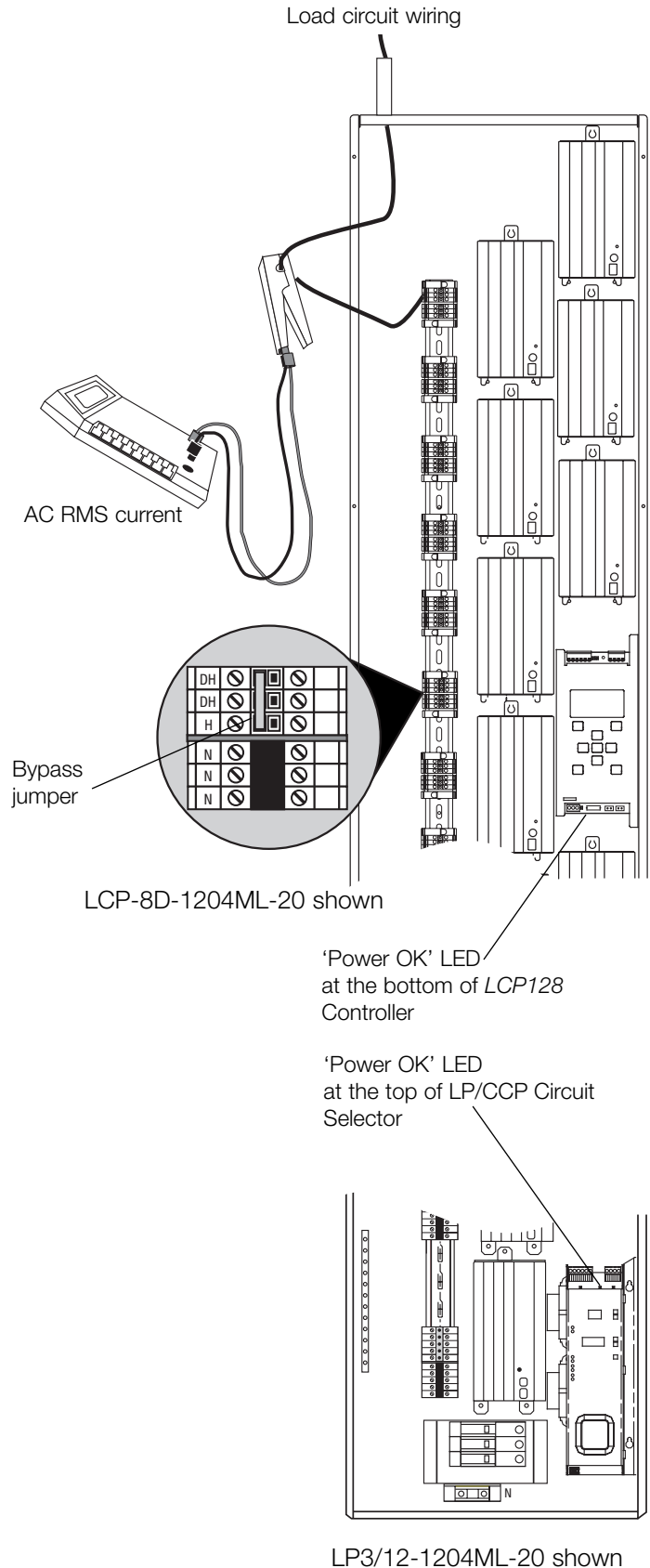
The load(s) should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equivalent to 16 A.

Circuit breaker 1 powers the control wiring as well as Circuit 1's dimmer and load(s). Check that the Power OK LED on the Controller (*LCP128*) or circuit selector (LP or CCP) is ON. If the Power OK LED is OFF, turn OFF the control circuit breaker (breaker 1) and check for a miswire on the low voltage link.

D. Turn next circuit breaker ON.

The load should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equal to 16 A.

E. Repeat step D for each circuit with completed load wiring.



Complete Installation

You have completed your panel installation.

For Onsite Factory Commissioning, call Lutron Technical Support and select Startup to schedule a field service visit. Allow for 10 working days between day of call and scheduled visit.

If you purchased Telephone Startup (LCP128 only), stop here and complete the Control Location, Panel, and Control Station Tables that are located in the back of the *Setup and Operation*. Once the tables are complete, call Lutron Technical Support and select Startup. Please call 24 hours prior to desired system startup.

In the U.S., Canada, and the Caribbean: 1.800.523.9466

In Mexico: +1.888.235.2910

In Europe: +44.207.702.0657


In Asia: +65.6220.4666


In Japan: +81.355.758.411

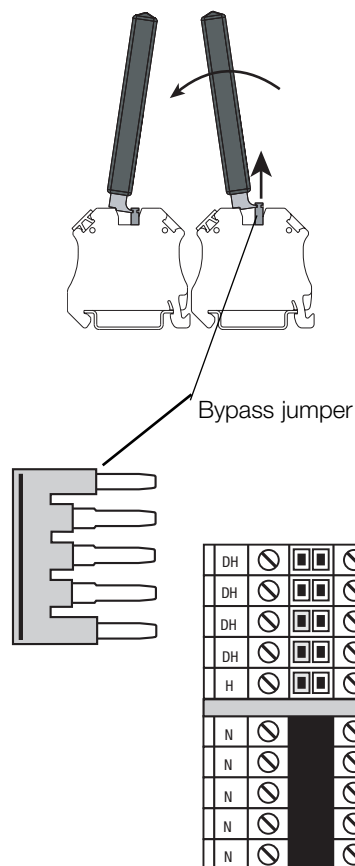
In all other countries: +1.610.282.6701

Remove Bypass Jumpers

- A. After all load wiring has been checked, turn circuit breakers OFF.
- B. Remove and store the bypass jumpers for possible future use.
- C. Turn circuit breakers ON.

 **Note.** All circuits are now set to the default Non-Dim load type. Non-Dim load types will respond by immediately going to full ON in any lighting scene (except the OFF scene).

 **Caution!** Reuse the bypass jumpers whenever work is being done on a load. Damage caused by short-circuits and miswiring is not covered by the product warranty.



Module with 4 outputs shown

Panel installation, control station wiring, and load activation are now complete.

Next Step: Refer to the *Setup and Operation Manual* to set up the functions and operation of the panel.

Notes

Warranty

Lutron Electronics Co., Inc. One Year Limited Warranty

For a period of one year from the date of purchase, and subject to the exclusions and restrictions described below, Lutron warrants each new unit to be free from manufacturing defects. Lutron will, at its option, either repair the defective unit or issue a credit equal to the purchase price of the defective unit to the Customer against the purchase price of comparable replacement part purchased from Lutron. Replacements for the unit provided by Lutron or, at its sole discretion, an approved vendor may be new, used, repaired, reconditioned, and/or made by a different manufacturer.

If the unit is commissioned by Lutron or a Lutron approved third party as part of a Lutron commissioned lighting control system, the term of this warranty will be extended, and any credits against the cost of replacement parts will be prorated, in accordance with the warranty issued with the commissioned system, except that the term of the unit's warranty term will be measured from the date of its commissioning.

EXCLUSIONS AND RESTRICTIONS

This Warranty does not cover, and Lutron and its suppliers are not responsible for:

1. Damage, malfunction or inoperability diagnosed by Lutron or a Lutron approved third party as caused by normal wear and tear, abuse, misuse, incorrect installation, neglect, accident, interference or environmental factors, such as (a) use of incorrect line voltages, fuses or circuit breakers; (b) failure to install, maintain and operate the unit pursuant to the operating instructions provided by Lutron and the applicable provisions of the National Electrical Code and of the Safety Standards of Underwriter's Laboratories; (c) use of incompatible devices or accessories; (d) improper or insufficient ventilation; (e) unauthorized repairs or adjustments; (f) vandalism; or (g) an act of God, such as fire, lightning, flooding, tornado, earthquake, hurricane or other problems beyond Lutron's control.
2. On-site labor costs to diagnose issues with, and to remove, repair, replace, adjust, reinstall and/or reprogram the unit or any of its components.
3. Equipment and parts external to the unit, including those sold or supplied by Lutron (which may be covered by a separate warranty).
4. The cost of repairing or replacing other property that is damaged when the unit does not work properly, even if the damage was caused by the unit.

EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF ANY TYPE, INCLUDING ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. LUTRON DOES NOT WARRANT THAT THE UNIT WILL OPERATE WITHOUT INTERRUPTION OR BE ERROR FREE.

NO LUTRON AGENT, EMPLOYEE OR REPRESENTATIVE HAS ANY AUTHORITY TO BIND LUTRON TO ANY AFFIRMATION, REPRESENTATION OR WARRANTY CONCERNING THE UNIT. UNLESS AN AFFIRMATION, REPRESENTATION OR WARRANTY MADE BY AN AGENT, EMPLOYEE OR REPRESENTATIVE IS SPECIFICALLY INCLUDED HEREIN, OR IN STANDARD PRINTED MATERIALS PROVIDED BY LUTRON, IT DOES NOT FORM A PART OF THE BASIS OF ANY BARGAIN BETWEEN LUTRON AND CUSTOMER AND WILL NOT IN ANY WAY BE ENFORCEABLE BY CUSTOMER.

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TO MAKE A WARRANTY CLAIM

To make a warranty claim, promptly notify Lutron within the warranty period described above by calling the Lutron Technical Support Center at (800) 523-9466. Lutron, in its sole discretion, will determine what action, if any, is required under this warranty. To better enable Lutron to address a warranty claim, have the unit's serial and model numbers available when making the call. If Lutron, in its sole discretion, determines that an on-site visit or other remedial action is necessary, Lutron may send a Lutron Services Co. representative or coordinate the dispatch of a representative from a Lutron approved vendor to Customer's site, and/or coordinate a warranty service call between Customer and a Lutron approved vendor.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

These products may be covered under one or more of the following U.S. patents: **5,309,068; 5,633,540; 6,046,550; 6,091,205; 6,188,181; 6,380,692;** and corresponding foreign patents.

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