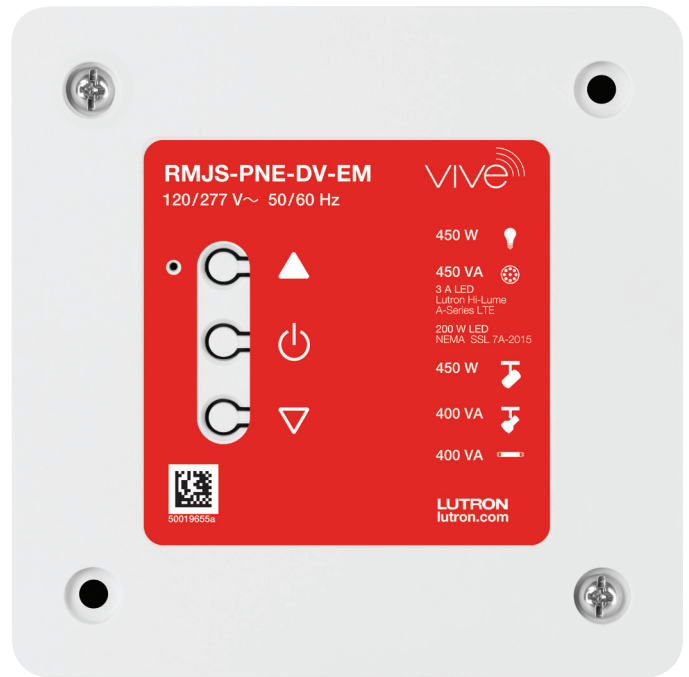
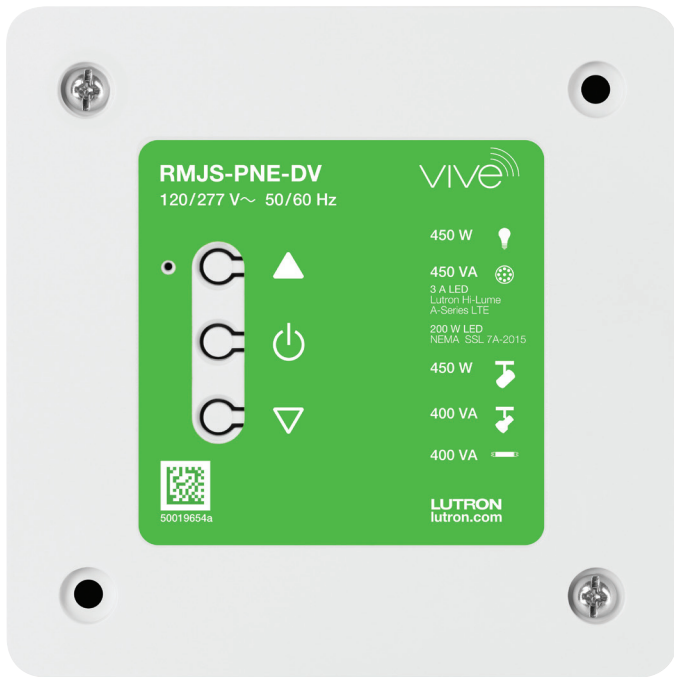


## Vive PowPak - Phase-Select Dimming Module: Best Practices

This document provides support and relates to various aspects of the installation, use, and troubleshooting of:  
Vive PowPak – Phase-Select Dimming Module (RMJS-PNE-DV)  
Vive PowPak – Emergency Phase-Select Dimming Module (RMJS-PNE-DV-EM)

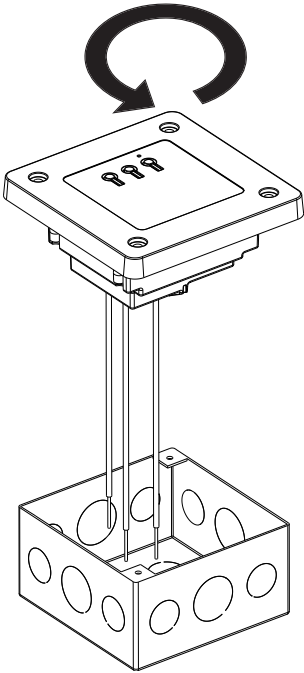
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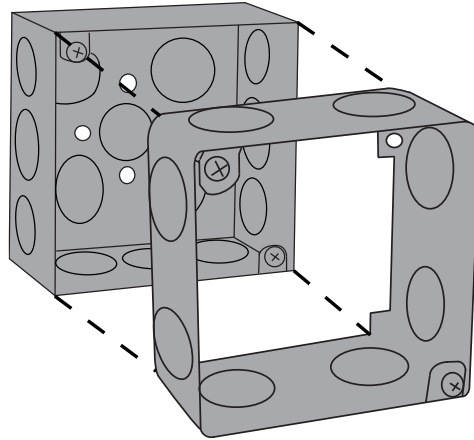


## I. What to do if the device doesn't fit in the J-box

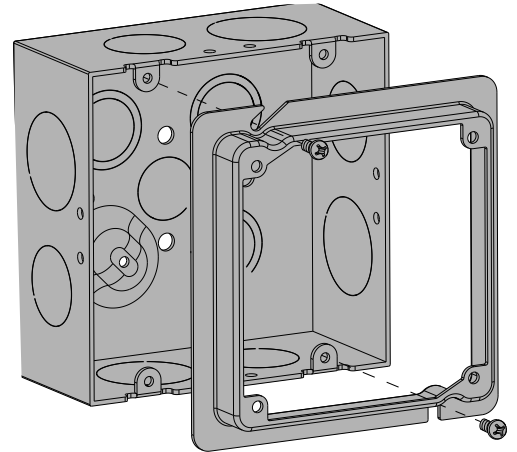
Note: A 4 in x 4 in (101.6 mm x 101.6 mm) junction box with minimum depth of 2.125 in (53.97 mm) is required.



**Option A:** Turn device 90, 180, or 270 degrees or, relocate conduit hardware to a different knockout.



**Option B:** Add a 4 in x 4 in (101.6 mm x 101.6 mm) junction box extension ring (e.g., Raco p/n 201), or replace with a deeper junction box (e.g., Garvin p/n 52181-S).



**Option C:** Use a 4 11/16 in x 4 11/16 in x 2 1/8 in (119 mm x 119 mm x 54 mm) junction box (e.g., Raco p/n 258), plus adaptor to convert to 4 in x 4 in (101.6 mm x 101.6 mm) (e.g., Raco p/n 855 or 859).

## II. Recommended phases for load types

Different load types may require either reverse-phase (sometimes called “trailing-edge”) or forward-phase (sometimes called “leading-edge”) dimming. See install guide for procedure to change phase.

**Note:** The factory default setting is REVERSE-phase

Load Type	Example Light Source/Fixtures	Dimming Phase
Incandescent/Halogen	Line-voltage tungsten filament lamps, including line-voltage (120 V~) halogen lamps	Reverse
LED		
NEMA SSL 7A-2015 <sup>1</sup>	Screw-in dimmable LED bulbs rated NEMA SSL7	Forward
Lutron Hi-lume 1% 2-wire LED driver	LED downlights, LED troffer, LED linear pendant, and LED linear recessed, etc., driven by Lutron Hi-lume LED driver	Forward
Other LED drivers and self-ballasted lamps	LED downlights, LED troffer driven by reverse-phase LED driver unless otherwise specified	Reverse
Electronic low-voltage transformers (ELV)	Low-voltage track lights/spots/strip fixtures with AR111, MR16, MR11, PAR36 etc., powered by electronic (solid state) transformer	Reverse
Magnetic low-voltage transformers (MLV)	Low-voltage track lights/spots/strip fixtures with magnetic (core and coil toroidal) transformer supplied low-voltage lighting (6, 12, and 24 V~)	Forward
Tu-wire & Advance Mark X Fluorescent <sup>2</sup>	Fluorescent lighting fixtures driven by Tu-wire and Advanced Mark X dimmable ballasts	Forward
PHPM-PA-120, PHPM-PA-DV , PHPM-PA-277/DV	See PHPM spec sheet. Support all of the loads listed above	Forward

<sup>1</sup> See <https://www.lutron.com/TechnicalDocumentLibrary/048637.pdf> for more information

<sup>2</sup> See <https://www.lutron.com/en-US/general/Pages/Advance/AdvanceBallast.aspx> for more information

### How to Select Phase on PowPak Module (Phase Selection mode)

Most loads are expected to use the default setting of reverse-phase, however some require forward-phase for proper functionality.

**A** Enter **Phase Selection mode**. Press and hold **Raise “△”** & **Lower “▽”** buttons for 12 seconds. Indicator LED will flash and load will fade to OFF.

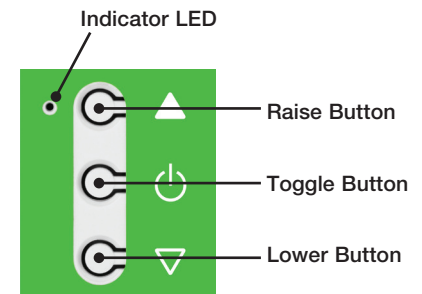
**B** Pressing the **Raise “△”** button sets the current phase to forward-phase, and pressing the **Lower “▽”** button sets the current phase to reverse-phase.

Indicator LED Feedback:

(Reverse-phase): Flashes 1 time with a 1 second interval and then turns OFF for 2 seconds

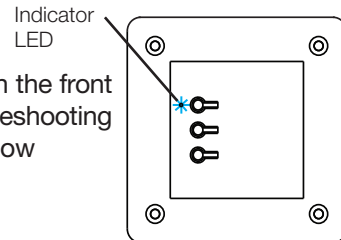
(Forward-phase): Flashes 2 times with a 1 second interval and then turns OFF for 1 second

**C** Press and hold the **Toggle “⏻”** button for 6 seconds. Indicator LED will flash for 5 seconds. Load will fade to full ON.



### III. Troubleshooting

Indicator LED: The phase-select dimming module is equipped with an indicator LED through the front label that indicates when the module is in error mode or is in normal operation. When troubleshooting this module, verify the LED flash sequence on the module for any error codes. The table below explains the meaning of the error and a recommended course of action.



#### Indicator LED Blink Codes

The LED on the PowPak module will flash when certain load limitations are exceeded.

LED Sequence	Indicator LED Blink Mode	Possible cause	Solution
LED flashes 1 time then turns off for 4 seconds	Shorted Component detection mode	Line condition issue	Cycle power. If fault doesn't clear, contact Lutron technical support.
		MLV transformer overloaded	Check load wattage. Cycle power.
LED flashes 2 times then turns off for 3 seconds	Over Voltage Protection mode (OVP)	MLV load is connected with module in reverse-phase	Cycle power. Change phase to FORWARD (see section II).
LED flashes 3 times then turns off for 2 seconds	Over Current Protection mode (OCP)	Non-NEMA 410 compliant load is connected	Cycle power. Change phase to REVERSE. If fault doesn't clear, contact Lutron technical support.
		Non-dim load is connected	Cycle power. Change load to phase-dimmable type.
		DH-neutral miswire	Correct the wiring. Cycle power.
		Load exceeds maximum ratings	Reduce load to no more than max rating. Cycle power.
LED flashes 4 times then turns off for 1 second	Over Temperature Protection mode (OTP)	Load exceeds maximum ratings	Reduce load to no more than max rating. Allow module to cool down. Cycle power.
		Ambient temperature is too high	Reduce ambient temperature. Allow module to cool down. Cycle power.
LED turns ON while TOGGLE/RAISE/LOWER buttons are pressed and turns OFF 2 seconds after being released	Normal Mode	—	—
LED will flash On and Off at 2 second intervals	Emergency mode	Power outage greater than 250 ms	Restore normal power. RMJS-PNE-DV-EM will remain in emergency mode for 90 minutes after normal power is restored (Standalone) or will return to Normal mode between 3 and 10 minutes after normal power is restored if in a Vive system.

A power reset (toggle the circuit breaker) is required to exit each of these modes. The PowPak module will retry twice when in OVP mode. Failure to startup after that requires a power reset.

**Miswires:** It is important to ensure correct wiring to the PowPak module. The Miswire Matrix Table below gives you an indication of the effect on the lighting load in each of the following miswire events.

#### Miswire Matrix Table

	PowPak Black Line/ Hot Wire	PowPak White Neutral Wire	PowPak Red Dimmed Hot Wire	LED Load	Incandescent Load
<b>Connected to Field Wire</b>	Dimmed Hot	Neutral	Line/Hot	<b>Lightly loaded</b> - Load will flash <b>Heavily loaded</b> - Will commission, toggle On and Off but no dimming capabilities	Load does not operate, no damage
	Neutral	Line/Hot	Dimmed Hot	Load does not operate, no damage	Load does not operate, no damage
	Line/Hot	Dimmed Hot	Neutral	Module in Over Current protection (OCP) mode. See comment above in <b>Error Codes</b>	Module in Over Current protection (OCP) mode. See comment above in <b>Error Codes</b>

#### IV. Testing of RMJS-PNE-DV-EM

Facilities will need to test their emergency power systems from time to time (inspections and periodic testing). To test Emergency (red-labeled) PowPak controls for emergency response, Lutron must simulate a set of real-world events. The step-by-step guide, followed carefully, will ensure a proper test. Run the steps below noting results and relative times for each step. This data will be required for further troubleshooting if that becomes necessary. The general steps are:

1. Turn off all power (normal and normal/emergency feeds), wait a few seconds and verify all power is off
2. Turn on only emergency power, and verify both emergency zone lockout functionality and no functionality on normal-only powered circuits.

##### Step-by-step guide

1. System is in a normal operating state. The feeds to the lighting control system should all be on. The chart below refers to the feeds for the Vive devices

Normal Only Feeds	Normal / Emergency Feeds
On	On

2. Turn off all power (DO NOT engage emergency back-up power) and wait a few seconds

Normal Only Feeds	Normal / Emergency Feeds
Off	Off

3. Ensure power is OFF for a few second (greater than 250 ms) and verify the lighting control system is powered off:
  - For hubs, verify that the LED in the antenna DOES NOT pulse
  - For the PowPak, attempt control from battery-powered Pico remotes. The lights will remain off as the fixtures and PowPak have no power
4. Engage emergency back-up power. IMPORTANT – DO NOT restore normal power

Normal Only Feeds	Normal / Emergency Feeds
Off	On

5. Validate functionality:
  - a. **IMPORTANT – MUST VERIFY** – Hub is off: You must ensure that the hub (connected to normal power/no battery backup) is OFF. Verify that the antenna LED on the hub DOES NOT pulse. Refer to the Vive Hub Installation at [www.lutron.com](http://www.lutron.com)
  - b. **Normal powered fixtures are off:** Attempt to control lights with battery-powered Pico remotes. Normal powered fixtures should remain OFF.
  - c. Emergency powered zones are locked on: While testing the normal powered, verify the emergency fixtures functionality:
    - Verify that these fixtures stay locked at their emergency levels (do not respond to manual controls or sensors)
    - Verify that they remain locked until one of the follow things happens:
      - a. The PowPak has been on for more than 90 minutes since backup power was supplied
 OR
      - b. Normal power is returned to the hub. After the hub boots up it signals to the Emergency PowPak that normal power has been restored.

**IV. Testing of RMJS-PNE-DV-EM (continued)**

6. Test failure in the validation step may indicate several different things and more troubleshooting is necessary. To continue, take the following actions:

a. Return the electrical distribution system to normal functionality

Normal Only Feeds	Normal/Emergency Feeds
On	On

b. Wait at least 10 minutes to ensure that the lighting system and all building systems are back to full functionality

c. If this is the first attempt, return to step 1. and attempt the testing from the beginning. This time paying special attention to carefully follow the test setup in steps 1-3

d. If you have already attempted the test twice, arrange to contact Lutron technical support hotline with the proper on-site support for continued troubleshooting. This often includes:

- The inspector attempting to validate the system
- An electrical contractor who can discuss and validate the electrical distribution and backup power system
- End-user's facilities group

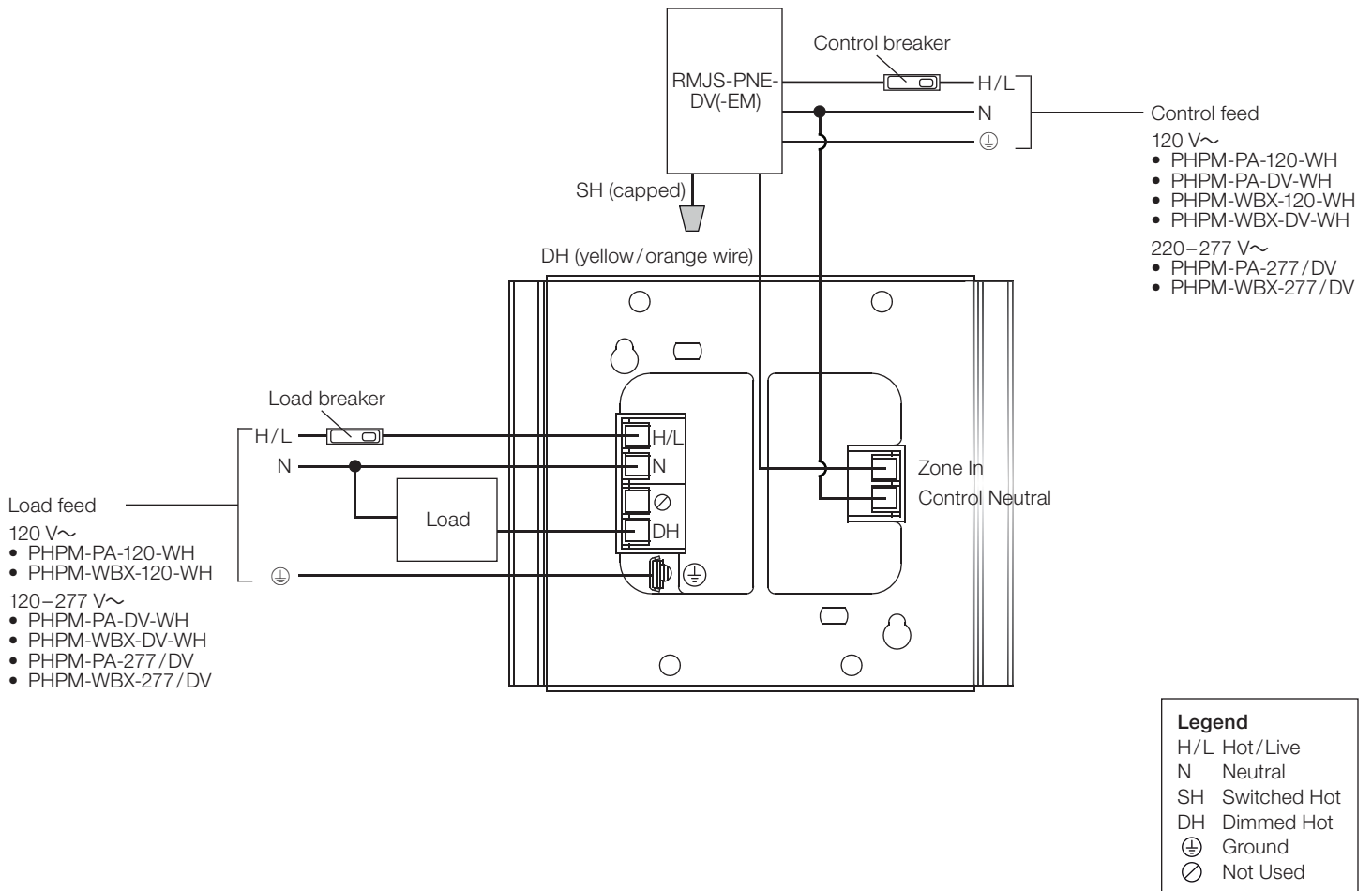
7. After successful validation of the system, return the electrical distribution system to normal functionality

Normal Only Feeds	Normal/Emergency Feeds
On	On

**NOTE:** In a real-world power outage event, the emergency backup-power equipment that performs steps 1-4 must have a delay of greater than 250 ms between loss of normal power and supply of backup power. Simulating real-world functionality must also ensure this 250 ms delay. Hence why we wait a few seconds after turning off all power.

## V. Increasing the Load Rating: Connecting to a PHPM

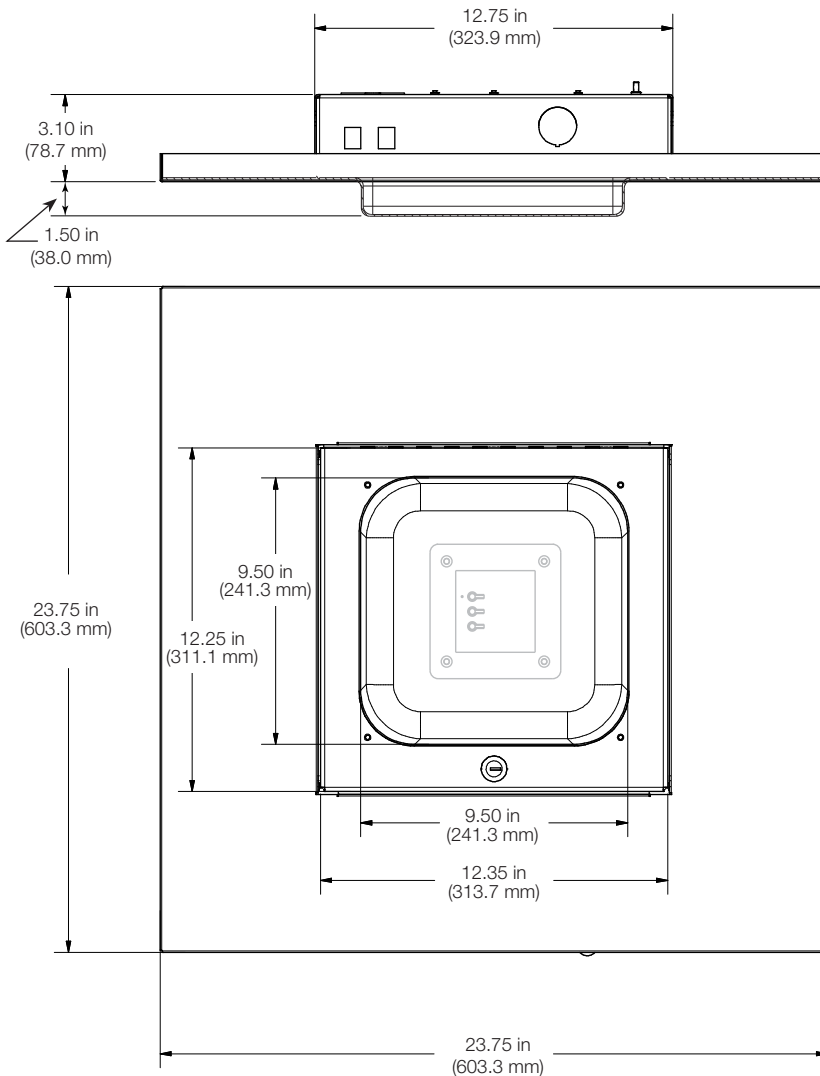
For applications requiring higher wattage ratings than that of the Vive PowPak phase-select dimming module alone, use a power booster (PHPM-PA-120-WH, PHPM-PA-DV-WH, or PHPM-PA-277 / DV). A maximum of three PHPMs may be used with one Vive PowPak phase-select dimming module. For wiring diagrams, see pages 4-6 at <https://www.lutron.com/TechnicalDocumentLibrary/369835.pdf>



## VI. Chicago Plenum Installation

Mounting inside an enclosure may be required in a Chicago Plenum ceiling and may be desired in applications that require tamper resistance such as schools and high security areas. The following describes installing the Vive PowPak phase-select dimming module inside a 23.75 in x 23.75 in (603 mm x 603 mm) suspended ceiling enclosure with an exposed ABS bubble protruding below the ceiling plane.

The Vive PowPak phase-select dimming module should be installed in a 4 in x 4 in (101.6 mm x 101.6 mm) junction box (see section I for more information), which is mounted in the center of the Oberon 1077-WA ceiling enclosure. This installation method provides a clean installation with a protected and locked enclosure while maintaining the full Lutron Vive system performance.



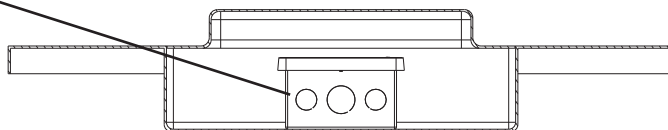
**Manufacturer:** Oberon  
**Model number:**  
 – 1077-WA-CCEA for  
 Chicago Plenum installation

### NOTES:

1. The Vive PowPak phase-select dimming module should be mounted in the center of the enclosure for optimal RF performance.
2. Mount no more than one Vive PowPak phase-select dimming module inside the protective enclosure.

### Enclosure Cutaway

4 in x 4 in (101.6 mm x 101.6 mm) junction box





**VII. For more information, see the following documents:**

Specification submittal:

<http://www.lutron.com/TechnicalDocumentLibrary/3691150.pdf>

Installation guide:

[http://www.lutron.com/TechnicalDocumentLibrary/RMJSPNEDV\\_InstallationInstructions.pdf](http://www.lutron.com/TechnicalDocumentLibrary/RMJSPNEDV_InstallationInstructions.pdf)

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