

Common Neutral Interaction

Common neutral interaction is interaction or “cross talk” between dimmers on separate phases in a 3-phase system that share the same neutral wire. When solid-state dimmers are operating, voltage and current spikes occur and are transmitted onto the neutral wire. Normally this is of little concern, except when the neutral wire is common to two or more phases of a 120 V~/208 V~, 3-phase, or 4-wire system. Under this condition, the voltage/current spikes may feed back to the dimmers via the common neutral wire, causing interaction between the dimmers.

Note: Common neutral interaction should not be confused with dimmer-to-dimmer interaction, which is between two dimmers on the same phase.

Symptoms

- Lights flicker steadily at certain dimmer settings.
- Lights flash to “full” output at certain dimmer settings.
- Light level of a dimmer on one phase inadvertently changes when a dimmer on another phase is adjusted.

Recommendations

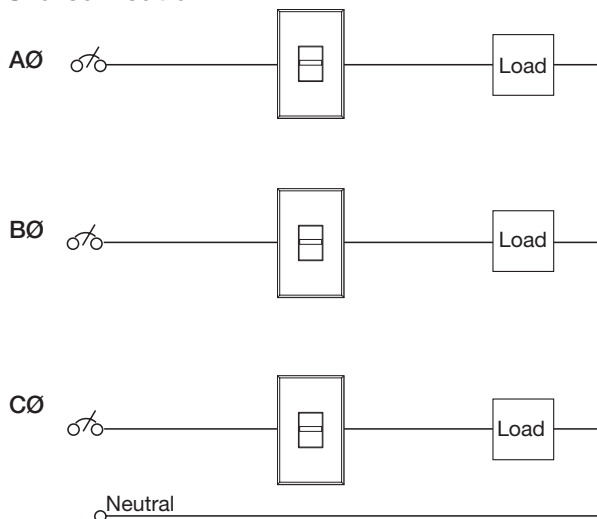
Lutron recommends the following methods to avoid common neutral interaction:

1. Separate neutrals
2. Lamp Debuzzing Coils (LDCs)

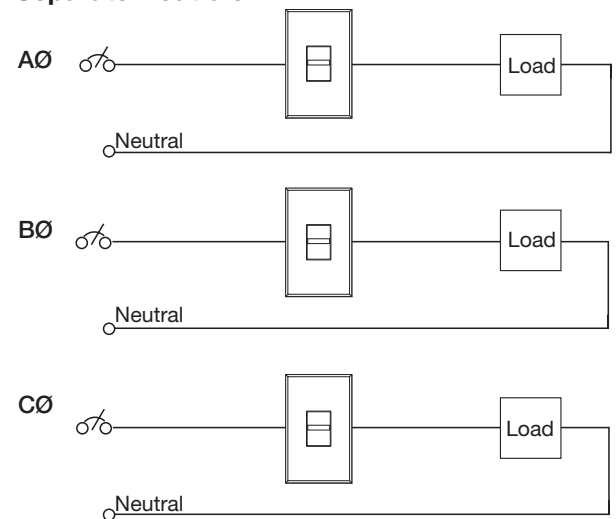
1. Separate Neutrals

The best way to avoid common neutral interaction is to run a separate neutral wire for each phase of the 3-phase system (see below).

Shared Neutral



Separate Neutrals



2. Lamp Debuzzing Coils (LDCs)¹

If it is not possible to run separate neutrals for each phase (e.g., an application with existing wiring), an LDC can be used to “clean up” the voltage/current spikes creating the interaction. When an LDC is wired in series with the dimmer, it slows down the inrush of current during the rapid switching cycle of the dimmer. As the current inrush is slowed down, the interaction between separate phase dimmers is reduced.

Lutron has four LDC models available to help reduce common neutral interaction . The type of LDC required depends on the total wattage of the lighting load. Listed below are the model numbers and their respective capacities.

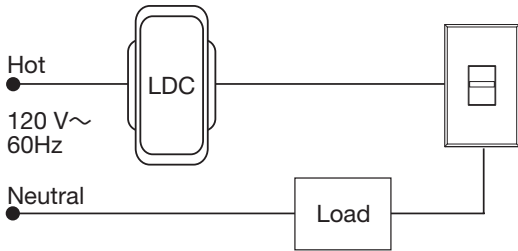
Model	Ratings
CPW0035	100–200 W
CPW0036	200–400 W
CPW0037	400–800 W
CPW1346-OCP	600–1200 W

Note: For loads over 1200 W, call Lutron® Technical Support at 1.800.523.9466

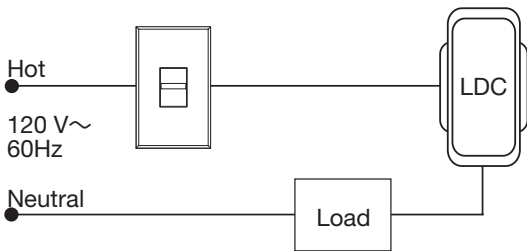
LDC Installation

LDCs may be wired in series with the dimmer on the line side or load side. Each dimmer requires its own LDC. During normal operation, LDCs may make an audible buzz and, therefore, should be mounted in an area where the noise will not be objectionable (e.g., an electrical closet, a basement, or above a drop ceiling). LDCs are designed to easily mount onto a standard 4” x 4” junction box.

Line Side Installation



Load Side Installation



¹ LDCs are not to be used with reverse-phase dimmers

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