

Phase Adaptive Control From a 0–10 V_{DC} Controller

Overview

Lutron offers a wide variety of controls for any load type. However, there are applications where adding more controls would be difficult or cost-prohibitive. For these instances, Lutron provides a variety of load interfaces that can convert one control type to another. This application note describes how to use load interfaces to convert a 0–10 V_{DC} output to a phase adaptive output using load interfaces.

Please note that the solution described in this Application Note using a BCI-0-10 is not recommended for new designs. It is always preferred to use native load controllers, rather than interfaces, whenever possible. For example, myRoom and HomeWorks systems could use phase-adaptive DIN modules, Quantum could use GRAFIK Eye QS main units, and Athena could use the LED+ Phase-Adaptive Energi Savr Node units.

Discussion

The BCI-0-10 is a device that takes in a 0–10 V_{DC} signal, and outputs a 3-wire fluorescent signal. The BCI-0-10 is capable of accepting a 120–277 V_{AC} Line/Hot, and providing a dimmed hot with the same voltage. If the BCI-0-10 is being fed with 120 V_{AC}, the standard PHPM-WBX-DV-WH can be used in conjunction with the BCI-0-10. If the BCI is being fed with 277 V_{AC}, the PHPM-WBX-277/DV must be used.

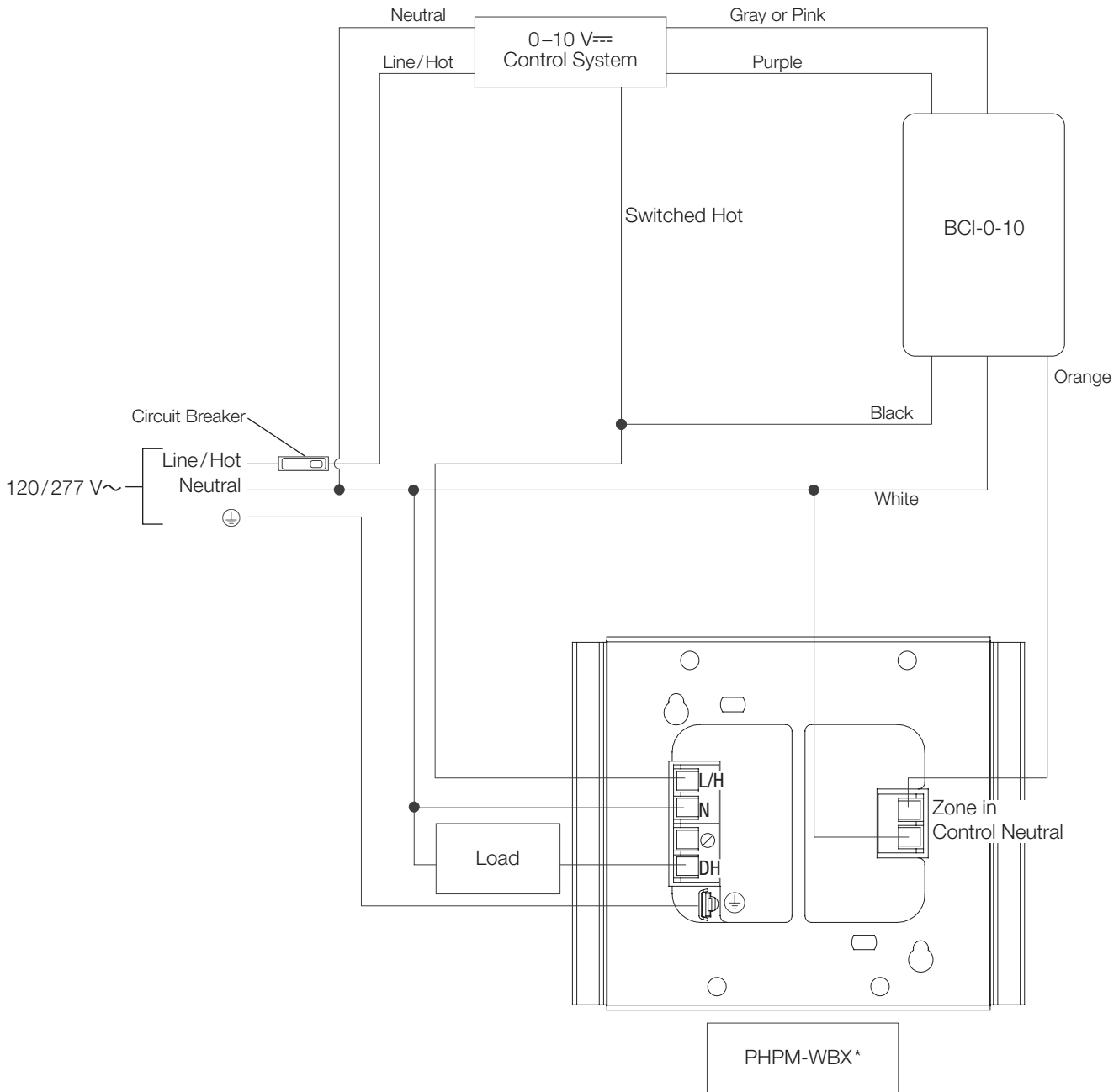
The PHPM-WBX units take in a 3-wire fluorescent signal and output a phase-adaptive signal. In addition to the dimmed hot feed from the BCI-0-10, the PHPM-WBX units also accept a separate 120–277 V_{AC} switched hot load feed. This separate load feed is used to provide the phase adaptive signal to the load.

Phase adaptive technology is a dimming method that uses integrated circuitry to analyze the line feedback from the load connected to it, and select forward or reverse phase based on what it sees. This technology will run in reverse phase unless it sees specific loads (namely MLV) that require a forward phase signal to run well. At that point, the phase adaptive device will switch into forward phase mode.

For more details regarding these individual products, please see their individual spec sheets.

Wiring

For a 120/277 V~ load, being fed off of the same distribution circuit as the BCI-0-10:



* When the BCI-0-10 is being fed with 120 V~ from the 0-10 VDC control system, use the PHPM-WBX-DV-WH. When the BCI-0-10 is being fed with 277 V~ from the 0-10 VDC control system, use the PHPM-WBX-277/DV.

Special Considerations

This combination of interfaces should not be put on the same 0–10 V_{DC} output as other 0–10 V_{DC} fixtures. The difference in dimming curves can cause differing light outputs. In addition to that, the ability to independently adjust the low-end trim of the two fixtures will be lost. This could present an issue when resolving low-end performance issues.

The 0–10 V_{DC} control system must be capable of providing current for the load in addition to the PHPM and BCI interfaces.

Please note that up to 3 PHPM-WBX units can be controlled by a single BCI-0-10. When assigning loads to a 0-10 V_{DC} Energi Savr Node in the corresponding design software (Q-Design, HomeWorks Designer, etc.), all of the associated fixtures must be listed as a 0-10 V_{DC} load type within the Fixtures definition.

For questions regarding this application note or any other design assistance, please contact Lutron.

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